

MARIIA CHEBOTAREVA

Functional Overlapping
Competing Jurisdictions (FOCJs)
as a Possible Tool for Inter-municipal
Cooperation in the Provision
of Russian School Services



DISSERTATIONES RERUM OECONOMICARUM
UNIVERSITATIS TARTUENSIS

71

MARIIA CHEBOTAREVA

Functional Overlapping
Competing Jurisdictions (FOCJs)
as a Possible Tool for Inter-municipal
Cooperation in the Provision
of Russian School Services



Faculty of Social Sciences, School of Economics and Business Administration,
University of Tartu, Estonia.

The dissertation is accepted for the defense of the degree of Doctor Philo-
sophiae (in Economics) on June 15–16, 2021 by the Council of the School of
Economics and Business Administration, University of Tartu.

Supervisors: Associate Professor Diana Eerma (PhD),
University of Tartu, Estonia
Professor Dr. Dr. h.c. Peter Friedrich (em.),
University of Tartu, Estonia

Opponents: Professor Dr. Florian Bartholomae, Munich Business School
Professor Dr. Martina Eckardt, Andrásy University Budapest

The public defense of the dissertation is on August 23, 2021 at 10.00 in room
1018, Narva mnt 18, University of Tartu.

The research leading to this dissertation was supported by the European Com-
munity Mobility Programme Grant “Aurora II – Towards Modern and Innova-
tive Higher Education”, coordinated by the University of Turku, Finland. The
publication of this dissertation is granted by the School of Economics and Busi-
ness Administration, University of Tartu.



European Union
European Regional
Development Fund



Investing
in your future



ISSN 1406-1309
ISBN 978-9949-03-667-7 (print)
ISBN 978-9949-03-668-4 (pdf)

Copyright: Mariia Chebotareva, 2021

Tartu University Press
www.tyk.ee

TABLE OF CONTENTS

AUTHOR'S PUBLICATIONS AND CONFERENCE PRESENTATIONS	7
LIST OF ABBREVIATIONS	9
INTRODUCTION	10
Motivation for the research	10
Aim, research question and research tasks	15
Novelty of the thesis	17
Methodology and steps of the analysis	18
Delineation and limitations of the analysis	20
Structure of the thesis	23
Acknowledgements	27
1. FOCJ THEORETICAL BACKGROUND	29
1.1. FOCJ definition and characteristic features	29
1.2. FOCJ as a form of inter-municipal cooperation	33
2. DETERMINATION OF FOCJ MANAGEMENT BEHAVIOUR BY MICROECONOMIC THEORY	47
2.1. Basic models of the establishment, current operation and competition for members of FOCJs	47
2.2. Modelling of FOCJ management behaviour in monopoly and oligopoly	66
2.3. Discussion of management decisions considering different restrictions	116
3. APPLICATION OF FOCJS UNDER EMPIRICAL CONDITIONS IN RUSSIA	154
3.1. Object of empirical research and methodology	154
3.2. Analysis of legal forms and municipalities suitable for school FOCJs	166
3.3. Empirical insights for school FOCJs via interviews	180
3.4. Discussion of empirical results, recommendations for introducing school FOCJs in Russia: FOCJ Statute and Memorandum	198
CONCLUSIONS	231
FUTURE RESEARCH	242
REFERENCES	245
APPENDICES	261
Annex 1. Terms and Definitions	263
Annex 2. Guidelines for the interviews in Russia	269
Annex 3. Overview of interviews with experts in the provision of Russian school services	278

Annex 4. Translated interview responses with respect to the groups of interviewees	280
Annex 5. Guidelines for the interview with Bodensee water provision association	299
Annex 6. Bodensee water provision association: interview answers	301
SUMMARY IN ESTONIAN – KOKKUVÕTE	321
CURRICULUM VITAE	336
ELULOOKIRJELDUS	338

AUTHOR'S PUBLICATIONS AND CONFERENCE PRESENTATIONS

Publications related to the thesis topic

1. **Chebotareva, M.**, Friedrich, P. (2020). Tax Shifting Decisions of Functional Overlapping Competing Jurisdictions' Management. In: Peter Eichhorn, Daniel Klein, Joachim Merk, Anke Rahmel (Eds.). *Decision Making in the Public Sector* (15–26). Lage, Germany: Jacobs-Verlag.
2. **Chebotareva, M.** (2018). Application of Functional Overlapping Competing Jurisdictions concept to inter-municipal cooperation in the Russian school sector. *Modern economics: problems and solutions*, V. 7, 114–131.
3. Friedrich, P., **Chebotareva, M.** (2017). Options for Applying Functional Overlapping Competing Jurisdictions (FOCJs) for Municipal Cooperation in Russia. In: Mateusz Lewandowski, Barbara Kozuch (Eds.). *Public Sector Entrepreneurship and the Integration of Innovative Business Models* (73–107). Hershey PA, USA: IGI Global.
4. **Chebotareva, M.**, Friedrich, P. (2017). Microeconomic Models of Functional Overlapping Jurisdiction (FOCJs). *Estonian Discussions on Economic Policies*, XXV (1), 27–52.
5. **Chebotareva, M.** (2016). Functional jurisdictions as a tool for increasing efficiency of the Russian general education system financing. In: Ludmila Ponomarenko, Kirill Litvinskiy, Igor Shevchenko (Eds.). *The Materials of International conference "Economic development of Russia: a growth driver or a challenge generator"* (219–222). Krasnodar: Kuban State University (Russia). (In Russian).

Publications on other topics

1. Gogoleva, T., Kanapukhin, P., **Chebotareva, M.** (2014). Factors affecting the development of preschool education services market in Russia. In: Valeriy Grebennikov, Irina Shchepina (Eds.). *The Materials of 37th international scientific school-seminar "System modelling of social-economic processes"* (163–166). Voronezh: Voronezh State Pedagogical University (Russia). (In Russian).
2. **Chebotareva, M.** (2012). Russia on the world market of educational services. *Young Scientist*, 2, 249–252. (In Russian).

Presentations on thesis topic:

1. **Chebotareva, M.** (2020). FOCJ as an opportunity of municipalities to cooperate in the Russian school education sector. *8th Dialogue on Social Market Economy "The Role of Higher Education in Different Economic Systems"*, January 31- February 1, Tartu, Estonia.
2. **Chebotareva, M.** (2019). Tax Shifting of Functional Overlapping Competing Jurisdictions (FOCJ). *The 20th International Scientific Conference "Quantitative Methods in Economics"*, June 17–19, Warsaw University of Life Sciences – SGGW, Warsaw, Poland. (with prof. Peter Friedrich (em.)).

3. **Chebotareva, M.** (2018). Functional Overlapping Competing Jurisdictions (FOCJ) as a Possible Tool for Inter-Municipal Cooperation in the Russian School Education Sector. *Inaugural Nordic International Business and Export Marketing Conference 2018* (NIB&EM Conference 2018), November 3–4, Tallinn, Estonia.
4. **Chebotareva, M.** (2018). Theoretical aspects of inter-municipal cooperation in the form of Functional Overlapping Competing Jurisdictions. *2nd Tongji-UT Economics Seminar*, December 10, Tongji University, Shanghai, China.
5. **Chebotareva, M.** (2018). Theoretical aspects of inter-municipal cooperation in the form of Functional Overlapping Competing Jurisdictions. *SHU-UT High Impact Research Seminar*, December 11, Shanghai University, School of Economics, Shanghai, China.
6. **Chebotareva, M.** (2017). Functional Overlapping Competing Jurisdictions (FOCJ) as a Possible Tool for Inter-municipal Cooperation in the Russian School Education Sector. *Russian Summer School for Institutional Analysis 2017: The EU Practices for Young Researchers: Studying Economics of Institutional Development*, July 1–7, Higher School of Economics, Moscow, Russia.
7. **Chebotareva, M.** (2017). Microeconomic models of functional overlapping competing jurisdictions (FOCJS) as a tool for inter-municipal cooperation. *Tongji University (Shanghai) and University of Tartu Summer School in Economics*, August 7–8, University of Tartu, School of Economics and Business Administration, Tartu, Estonia.
8. **Chebotareva, M.** (2017). Functional Overlapping and Competing Jurisdictions (FOCJ) as a tool for inter-municipal cooperation in Russia. *PhD Summer School in Economics, Management, Governments and Politics, Political Science, Law and Public Administration*, June 26–28, Saka Manor, Estonia.
9. **Chebotareva, M.** (2017). Functional Overlapping Competing Jurisdictions (FOCJ) as a possible tool for inter-municipal cooperation in the Russian school education sector. *Estonian Economic Association Conference, PhD poster session “Meet the practitioner, test your research idea”*, January 26, Tallinn, Estonia.

LIST OF ABBREVIATIONS

ANO	Autonomous non-commercial organizations
Art.	Article
CC	Civil Code
CES	Constant elasticity of substitution
EGTC	European Grouping of Territorial Cooperation
EU	European Union
FA	Federal act
FOCJ	Functional Overlapping Competing Jurisdictions
FSES	Federal State Educational Standards
GP	General partnership
IMC	Inter-municipal cooperation
LLC	Limited liability company
LP	Limited partnership
Mln.	Million
NB	Net benefits
No.	Number
NP	Nash product
PCG	Public corporative governance
PPP	Public-private partnership
RF	Russian Federation
RT	Research task
Sec.	Section
TB	Total benefits
TC	Total costs
Thou.	Thousands
UK	United Kingdom
USA	United States of America
РФ	<i>Российская Федерация</i>

INTRODUCTION

Motivation for the research

Demographic issues and the declining birth rate (see Figure 1) are influencing municipalities and regions in Russia. According to the United Nations, the Russian population will decrease from 143.9 million people in 2017 to 132.7 million in 2050 (United Nations 2017: 26). The number of municipalities is consequently decreasing as well. For comparison: in 2010, there were 23,907 municipalities and in 2018 this number fell to 21,945 (*Федеральная служба государственной статистики* 2018).

The debates on how to solve this issue in Russia are mainly directed towards territorial reforms: the abolishment of rural and urban settlements, renaming them and the amalgamation of rural settlements by merging small rural settlements into bigger ones (*Маркварт, Францке* 2017). This discussion is moving towards centralization in many spheres, including, for example, school education, where some experts have introduced the idea to transfer school administration to the regional level (Mann, Briller 2005; Andreev 2013). However, others insist that municipal enlargement is not necessarily the only or the best solution and that the centralization of public service provision can be avoided (*Маркварт, Францке* 2017; *Филатова et al.* 2014; *Маркварт* 2010). Therefore, this thesis suggests an alternative approach to resolve the consequences of depopulation in Russia by means of inter-municipal cooperation. One such consequence is a decrease in consumer demand for municipal services – water and electricity provision, public transport and school services (*Маркварт* 2016).

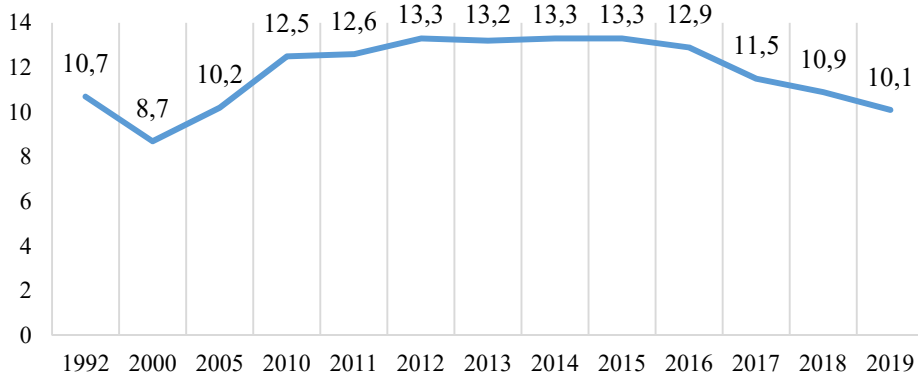


Figure 1. Birth rate (per 1,000 population) in Russia, 1992–2019

Source: Compiled by the author based on *Малков et al.* 2019; Federal State Statistics Service 2020.

The declining birth rate will also result in a reduction in school-age children (see Figure 2), which is so far compensated for by the slight birth rate increase of previous years. However, the tendency of yearly school abolishment is obvious and is confirmed by the statistics: the number of schools decreased by approximately 10,000 from 2010 to 2018 (see Figure 2).

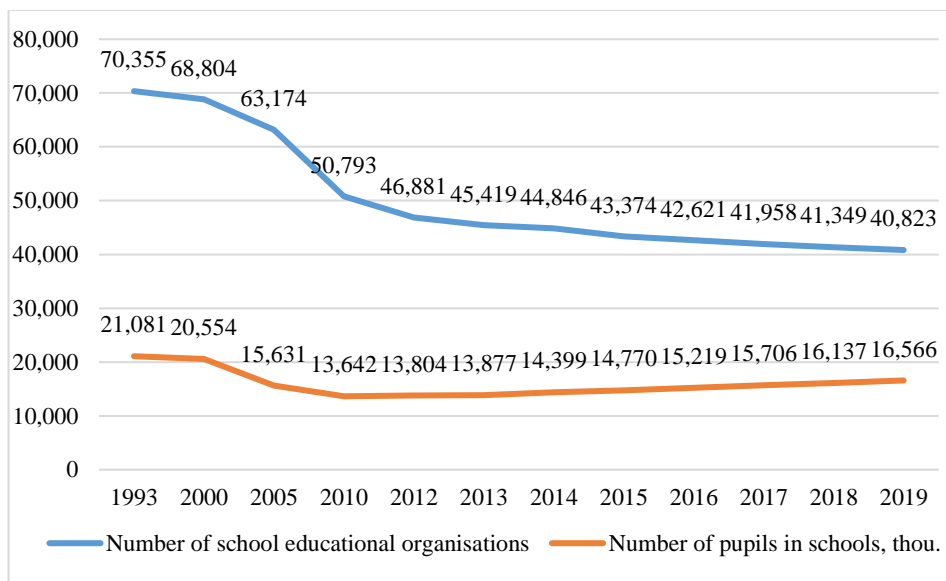


Figure 2. Overall number of school educational organisations (primary, basic, secondary) and number of enrolled pupils (thou. persons) (beginning of academic year)
Source: Compiled by the author based on Суринов et al. 2016, 2017; Малков et al. 2019; Federal State Statistics Service 2020; Bondarenko et al. 2020.

At the same time, the reduction in the number of school-age children makes it increasingly difficult to provide a high-quality education (especially in rural areas), since school financing is directly related to the number of pupils enrolled. Well-financed schools can afford to employ more qualified teaching staff and have sufficient material and technical resources. In Russia, despite the overall positive dynamics of state financing of education at current prices, state expenditures at real prices are decreasing (see Figure 3). In these conditions, inter-municipal cooperation would allow Russian municipalities to obtain cost reductions related to the operation of schools and achieve economies of scale (Bel, Sebó 2019; Baba, Asami 2020; etc.).

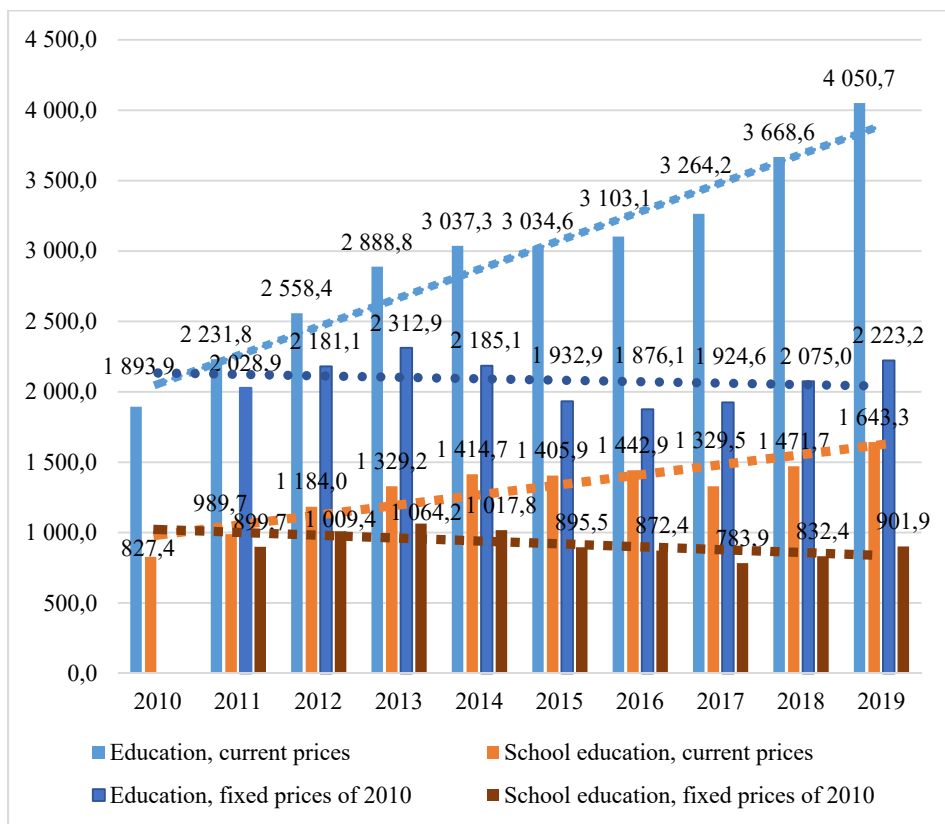


Figure 3. Consolidated budget expenditures of the Russian Federation (billions of roubles)

Source: Author's calculations based on Суринов et al. 2017; Bondarenko, Gokhberg et al. 2017, 2018; Bondarenko, Borodina et al. 2020; Гохберг et al. 2020.

Inter-municipal cooperation is mostly regulated by Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation”. Based on this law and literature, three possible types of legal forms for inter-municipal cooperation in Russia can be emphasised (Ирискина 2010; Петроградская 2010; Миронова 2014):

- Associative forms (associations, unions)
- Contractual forms (short- and long-term contracts)
- Economic forms (joint stock companies, non-commercial organisations, etc.)

Associative and contractual forms are developing rapidly, while economic forms of cooperation between Russian municipalities are underdeveloped (Бутова, Пухова, Щужин 2013; Бутова, Смирнова, Миловидова 2014). One possible form for economic long-term cooperation is Functional Overlapping Competing Jurisdictions (hereinafter referred to as FOCJs). FOCJs are proposed by the author as an alternative to the amalgamation of municipalities, the centralization

of school administration and a way of preventing a decrease in the quality of school education in Russia.

This thesis stems from the concept of Functional Overlapping Competing Jurisdictions (FOCJs) initially introduced by Bruno S. Frey and Reiner Eichenberger (Frey 1999, 2001, 2005, 2009; Frey, Eichenberger 1995, 1996, 1997, 1999, 2001a, 2001b, 2002; Eichenberger, Frey 2006). These scientists initiated the discussion on an alternative form of competitive federalism “that is not dictated from above but emerges from below as a response to citizens’ preferences” not only for developed capitalist countries, but also for countries in transition (Eichenberger, Frey 2006). In the thesis, the author defines FOCJs as economic units, not as the political establishments initially created by Frey and Eichenberger.

Four types of FOCJs are discussed in the literature (e.g. Eckardt, Friedrich 2014). These types are classified based on membership criteria (the FOCJ’s members). If members are natural people, it is an FOCJ of type I. If members are governmental units (e.g. municipalities), then FOCJs of type II appear. FOCJs of type III include subjects of public and private law, and type IV comprises all of the members mentioned in the other three types. This thesis concentrates on FOCJs of type II with municipalities as members, which means that the focus is on FOCJs as a form of inter-municipal cooperation.

The FOCJ concept is related to existing economic theories, for example, the Club theory (Buchanan 1965), since the optimal size of both clubs and FOCJs is defined according to a comparison of marginal utility, which members get from the consumption of public services, and the marginal costs that they must pay. Competition for members among FOCJs is rooted in Tiebout’s “Voting with feet” concept¹ (Tiebout 1956). However, in Tiebout’s “Voting with feet”, citizens choose a combination of taxes and public services suitable to them by moving to another municipality, but in FOCJs, citizens do not have to geographically move in order to receive services that satisfy them, they simply leave one FOCJ and become members of another one regardless of its geographical location.

Examples of FOCJ-like cooperation exist in Switzerland and the USA with citizens as members (FOCJ of type I). In the USA, there are special purpose districts. In Germany and other German-speaking countries, there is *Zweckverband*², which is analogous to FOCJs of type II with municipalities as members.

This thesis is an interdisciplinary work with an emphasis on economics, but also contributes to law and jurisprudence by providing legal recommendations for how FOCJs of type II can be applied in Russia. Modern realities and the intensifying demographic crisis in Russia demonstrate a serious need to transform existing Russian public institutions juridically as well as economically and

¹ Tiebout deals with citizens (private householders) who choose jurisdictions in which to live and respectively more appropriate for them combination of taxes and quality of services. Here, FOCJs compete for members who, according to FOCJs of type II, are municipalities.

² Inter-municipal public purpose association.

politically. Following the example of many Western countries, the Russian economy has been encouraged to apply adequate juridical forms of public units for modernizing the provision of public services (Friedrich, Chebotareva 2017). As a result, this makes the process of providing public services more flexible and strategic.

The topic of this thesis is very important since it offers an answer to the question of whether inter-municipal cooperation in the form of FOCJs of type II is possible in Russia, and under which institutional³ conditions. In the literature, FOCJs of type II are not tackled as separate legal entities with their management, supreme bodies, production and demand functions in the provision of school services (only partly in Friedrich, Reiljan 2011). However, it is very crucial to develop a microeconomic theory for FOCJs of type II, which is lacking so far, in order to analyse possible changes in FOCJ of type II management behaviour if external and internal political and economic factors vary.

In the framework of this thesis, FOCJ of type II management⁴ is defined as executive bodies which administrate and organise the daily procurement of FOCJs of type II. For example, a sole executive body (chairman, president, etc.) and collective executive bodies (council, board, presidium, committee etc.). FOCJ of type II executive bodies make decisions regarding the fee level for FOCJ of type II members, the amount and quality of factor inputs, etc. on daily basis. Thus, FOCJ management behaviour means the reaction of FOCJ of type II management bodies to changing internal and external factors, such as the decisions of an FOCJ of type II's founders (municipalities) and competitors, the volume of labour and materials, factor prices, tax rates, financial aid from higher rank jurisdictions, the changing utility function, the production function, demand, etc. It is crucial to consider managers' reactions because, after FOCJ of type II establishment, a daily procurement is delegated to the employed management of FOCJs of type II. Mathematically, the assumptions regarding FOCJ of type II management behaviour are expressed via four cases of FOCJ management utility functions in subchapter 2.2 of this thesis.

As a research object, the author focuses on Russian school services. The actuality of the chosen research object has been justified above. The applicability of the microeconomic theory developed in this thesis to other sectors of economy (not only Russian) must be investigated in further research.

³ Here, under institutions the author mainly means formal rules, such as legal acts, documents, etc.

⁴ The definition of FOCJ management can be given in a narrow and broader sense. In the thesis, definition is narrower since it includes only managerial decisions of FOCJ executive bodies. However, FOCJ Assembly of Members as well as Supervisory Board also participate in making managerial decisions, they are usually long-term and more fundamental, e.g. in which legal form FOCJs should be established, which service volume should be produced, etc. (Eichhorn, Friedrich 1976).

Aim, research question and research tasks

In this thesis, the author addresses the following **main research question**: Are FOCJs an applicable tool for inter-municipal cooperation in the provision of Russian school services considering FOCJ management behaviour?

In order to answer the main research question, the author formulates several **sub-questions**:

1. What are Functional, Overlapping, Competing Jurisdictions (FOCJs)?
2. Which other forms of inter-municipal cooperation exist?
3. Which types of FOCJs are suitable for inter-municipal cooperation?
4. Is there a microeconomic theory for the FOCJs of type II that explains FOCJ management behaviour?
5. How to decide which municipalities will establish an FOCJ of type II?
6. How should FOCJ of type II management decide on the fee and factor input policy for the current FOCJ of type II operation?
7. How do the optimal solutions of models, in particular, the current operation model, depend on the utility function of management and market forms?
8. How to determine the optimal distribution of members between two competing FOCJs of type II?
9. How can typical financial conditions influence optimal solutions on the establishment, current operation and competition for members phases?
10. Are the legal forms possible for FOCJs of type II in Russia?
11. Are there municipalities which are allowed to cooperate in Russia?
12. How to avoid unfavourable management decisions⁵ by introducing institutional regulations of a particular legal company form?

The author makes the conclusion regarding the **applicability** of Functional Overlapping Competing Jurisdictions of type II to inter-municipal cooperation in the provision of Russian school services based on:

- the results of microeconomic modelling for identifying favourable management behaviour in order to avoid the mismanagement of school FOCJs of type II. The decisions of management, which are not desired by member municipalities, do not fulfil the aims for which FOCJs of type II should be established. Thus, it is not possible to speak about FOCJ of type II applicability to the provision of Russian school services if the aims of FOCJ management deviate from those emphasised by the FOCJ of type II statutory documents;
- the analysis of legal documents, looking for the most appropriate legal form that coincides with the characteristic features of FOCJs of type II and the non-commercial requirements for school education activity; and

⁵ Decisions of FOCJ of type II management can be unfavourable from the member municipalities point of view. Management by their decisions may create such undesirable situation that can lead to bankruptcy of FOCJs of type II and non-fulfilment of public goals. Management can act not in interests of members, but, for example, in their own interests (see Williamson 1964; Heinen 1966; Lingnau, Härtel 2014; etc.).

- the interview with public officials in Russia who are responsible for the management of schools on a municipal and regional level, school directors and parents.

Therefore, the **aim** of the research is to develop theoretical microeconomic models for FOCJ of type II management's decision-making and the Statute for school FOCJs of type II in Russia. Theoretical models include the FOCJ of type II establishment phase, the current operations phase, competition for members as well as a behavioural analysis of FOCJ of type II management and members in the monopoly and oligopoly. The proposed models can be used as a basis for inter-municipal cooperation in the form of FOCJs of type II, considering the institutional specificities of a particular country. The Statute considers the following aspects:

- the legal form in which FOCJs of type II may be established in Russia according to the Russian Civil Code
- the economic requirements for FOCJ of type II establishment
- the special requirements for schools in Russia with respect to management, financing and subordination

In order to achieve the aim, the author sets up the following **research tasks**:

RT1: Define the main characteristics of FOCJs and the types of FOCJs.

RT2: Analyse and systematise the literature devoted to FOCJs and alternative forms of inter-municipal cooperation.

RT3: Formulate a basic microeconomic model of the establishment of an FOCJ of type II, considering grants from higher rank jurisdictions and special financial means.

RT4: Formulate a basic microeconomic model of the current operation of an FOCJ of type II, considering grants from higher rank jurisdictions, special financial means and different cases of FOCJ management behaviour under monopolistic and oligopolistic market conditions.

RT5: Formulate a basic microeconomic model of the competition for members of an FOCJ of type II, considering grants from higher rank jurisdictions and special financial means.

RT6: Identify the legal forms in which FOCJs of type II may exist in Russia and could be used for inter-municipal cooperation in the provision of school services.

RT7: Identify the level of municipalities in Russia that can freely and independently decide on cooperation in the form of FOCJs of type II.

RT8: Develop a school FOCJ of type II Statute and Memorandum based on the appropriate legal form of the company (association).

The research tasks and research questions are connected in a way that answering the research questions fulfils the research tasks. Answers for all research questions are summed up in the conclusions of the thesis.

Novelty of the thesis

This thesis contributes to literature by filling in at least four research gaps. First, there is no detailed investigation on FOCJs of type II as economic units. All previous analyses are mainly devoted to FOCJs as political instruments and therefore describe FOCJs of type I. Only a few approaches focus on FOCJs of type II where Functional Overlapping Competing Jurisdictions are economic units and their management behaviour is analysed with economic theory instruments (Friedrich, Kaltschütz, Nam 2004; Gabbe 2008; Friedrich, Eckardt 2014; Friedrich, Chebotareva 2017; Chebotareva, Friedrich 2017, 2020). Thus, this thesis develops a microeconomic theory for FOCJs of type II as a basis for the decision-making of municipalities, FOCJ management and higher rank jurisdictions.

Second, this thesis is the first attempt at applying the concept of FOCJs to Eastern European and developing countries, for example, in the Russian context. Previous authors mainly observe the United States and Western Europe (Switzerland, Germany, etc.) and forms of inter-municipal cooperation (IMC) similar to FOCJs in these countries (Steiner 2003; Huber 2011; Duncombe, Yinger 2007; Longley, Sneed 2009).

Third, there is no research related to inter-municipal cooperation in Russian school education. A few authors (*Ирискина* 2010; *Бутова, Смирнова, Миловидова* 2014; *Гриценко* 2001; *Власова, Джек* 2009; *Рагозина* 2009) have investigated the economic long-term cooperation of municipalities that have established legal company forms, but not FOCJs. These investigations are mostly descriptive and lack a theoretical microeconomic basis for developing FOCJs of type II in Russia.

Fourth, previously, the FOCJ concept has not been analysed in the institutional legal framework of a particular country for which FOCJs are suggested. Hence, a very important range of factors has been sorted out from the analysis and has not been considered in recommendations for the adequacy of FOCJs.

Since FOCJs of type II are treated as public economic units, this thesis also contributes to the literature on public corporative governance (PCG) (e.g. Papenfuß, Schaefer 2017; Ellwood, Garcia-Lacalle 2016; OECD 2018; Bozeman, Johnson 2015; Benz, Frey 2007; Calabrò, Torchia 2011; etc.). The aim of PCG is, on the one hand, to improve the effectiveness, efficiency and sustainability of public sector organisations in the performance of public tasks and, on the other hand, to enhance public welfare and ensure the serving of public interests (Expert Commission of the German Public Corporate Governance-Modelcode 2020). The first part of this aim is fulfilled by employed management; the second by supervising municipal authorities. To maintain responsible management as well as supervision of municipal-owned enterprises, a special regulatory framework of PCG in the form of Public Corporate Governance Codes can be developed (OECD 2019; Spennlingwimmer 2017). This is suggested for school FOCJs of type II as well.

This thesis is also unique in the combination of methods applied to investigate inter-municipal cooperation. Qualitative (document analysis and interviews with local officials) and quantitative (microeconomic and mathematical modelling) approaches complement each other. Among the variety of methods applied for studying IMC, mathematical modelling has not received deserved attention as the method which can be involved in developing a microeconomic theory in order to establish inter-municipal cooperation. This thesis fills this gap as well.

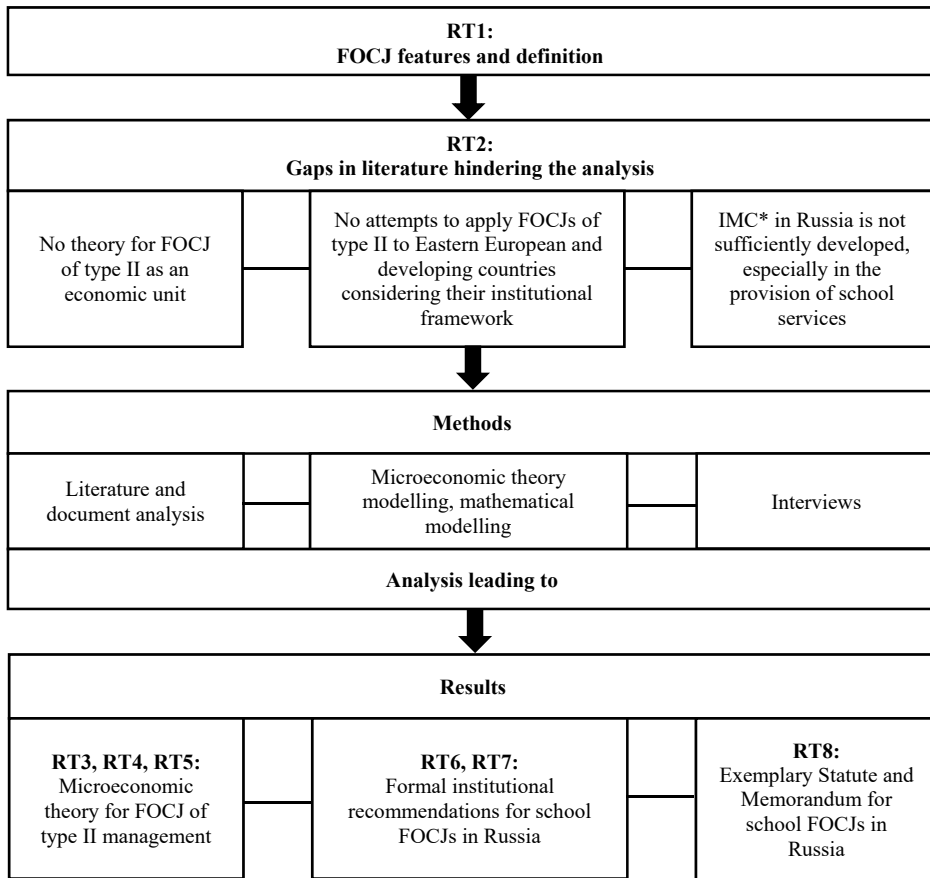
Methodology and steps of the analysis

The interdisciplinarity of this thesis can be emphasized by the variety of methods applied, from mathematical modelling and literature analysis to the analysis of legal acts and interviews. Precisely, the study methodology has been developed according to the research tasks and aim of the thesis and based on **literature analysis**. In Chapter 1, the author has studied literature devoted to FOCJs and forms of inter-municipal cooperation similar to FOCJs of type II mainly with respect to school education in different countries. The relationships between research tasks, the methods to complete them and study results are schematically demonstrated in Figure 4.

Literature analysis has revealed a wide variety of methods for studying inter-municipal cooperation. The most popular is a regression and statistical analysis (e.g. Bel, Warner 2016; Warner 2006; Silvestre et al. 2020; Bischoff, Wolf-schütz 2020; Baba, Asami 2020; Arntsen, Torjesen, Karlsen 2018; etc.). Some of the preceding authors conduct surveys (Aldag, Warner 2018; Swianiewicz, Teles 2019; Bel, Fageda, Mur 2013); others organise case studies (Hophmayer-Tokich, Kliot 2008), inventory and comparative analysis (Hulst, van Montfort 2007, 2011). Interviews with local officials and document analysis are frequently applied in many studies as well (Klimovský et al. 2014; De Peuter, Wayenberg 2007; Haveri, Airaksinen 2007). This thesis has also involved the latter methods due to the opportunity to receive very detailed information via semi-structured in-depth interviews with open-ended questions. Previous studies mainly concentrate on empirical methods. Theoretical methods of microeconomic and mathematical modelling are not widely applied. However, they are useful for developing a microeconomic theory to establish inter-municipal cooperation in countries where IMC does not exist or is not sufficiently spread.

Stemming from the gap in literature, in Chapter 2, the method of **micro-economic theory modelling** is used to analyse FOCJs' management behaviour considering the importance of higher rank jurisdictions (federal and regional authorities) through grants and other financial aids, changes in factor prices, taxes, changes in demand, cases of management utility function, etc.

In subchapter 2.2, the author extensively applies **mathematical modelling** of FOCJ of type II management behaviour and runs computer simulations using Wolfram Mathematica as a software tool.



*Inter-municipal cooperation

Figure 4. Steps of the analysis in relation to the research tasks
Source: Compiled by the author.

To develop microeconomic models, literature on competition in the oligopolistic market (Stackelberg 2011; Krelle 1961; Gravelle, Rees 2004) is analysed in Chapter 2. Public finance literature (Musgrave, Musgrave 1989; Olson 1969) has been considered as well, since FOCJs of type II are public units and principles of public finance should be applied to their establishment and current operation. Literature on FOCJs has been analysed assuming that FOCJs of type II are economic units of public law serving as a tool for inter-municipal cooperation. Literature on IMC in Russia is additionally observed in Chapter 3.

To develop school FOCJs of type II Statute and Memorandum and provide recommendations on how to establish FOCJs in Russia, the author has conducted a **document analysis** (see Chapter 3). Federal Act No. 131 “On the general principles of local self-governance organisation in the Russian Federation”, the Russian Federation Civil Code and separate acts on legal forms of

companies have been studied. The provision of school services with the help of FOCJs of type II cannot be organised without considering Federal Act No. 273 “On Education in the Russian Federation”, the Budget Code, educational regulations on regional and municipal levels and similar documents. Suitable legal forms and how they match the main features of FOCJs of type II have been identified with the help of document analysis. An analysis of the municipality levels that are appropriate for FOCJ cooperation in Russia has also been conducted based on an investigation of legal acts.

Additionally, to prepare school FOCJs of type II Statute and Memorandum and gather information which cannot be received from document analysis, **interviews** seem particularly appropriate to obtain information from experts (Walliman 2001; Creswell 2014; Miles, Huberman, Saldaña 2014). The author defines experts as the main decision-makers at the school administration level in municipalities and regions, school headmasters and parents.

The author has conducted two blocks of interviews. One block has been completed in the Voronezh region of Russia. These interviews are necessary to learn about school circumstances in Russia with respect to financing, administration, etc. and to understand whether the characteristic features of FOCJs of type II are suitable for the Russian school system. The other block is an interview with *Bodensee* water provision association (*Bodensee-Wasserversorgung*). The latter has been conducted in order to gain an insight into how management of the association, which applies inter-municipal cooperation, is organised in practice. The author aims to discover what is important for the management of *Bodensee-Wasserversorgung* to consider in their operational process and establishment documents.

Delineation and limitations of the analysis

This thesis concentrates on the concept of FOCJs as a tool for inter-municipal cooperation. Therefore, only FOCJs of type II where municipalities cooperate is under investigation in this thesis. At the same time, this work does not substantially analyse other forms of inter-municipal cooperation, including joint projects and contracts, public-private partnerships, etc. The author provides a broader overview of the alternative forms of inter-municipal cooperation in Chapter 1. A short observation of the conditions and forms of inter-municipal cooperation in Russia are discussed in Chapter 3 to gain an understanding of how much IMC is developed in this country. This thesis does not look for the most appropriate form of inter-municipal cooperation and does not consider municipal reform as an alternative approach to deal with depopulated municipalities in Russia. A cost-benefit analysis of the different forms of IMC has not been conducted since the focus of the thesis is on the applicability of FOCJs of type II as a form of inter-municipal cooperation in the Russian context. Therefore, the literature devoted to the different forms of inter-municipal cooperation is only discussed in order to provide an appropriate research context, and the

literature on the advantages and disadvantages of administrative reforms is excluded from the analysis.

Additionally, the literature review mainly focuses on FOCJs and FOCJ-like cooperation⁶ in the educational sphere; other publicly provided services have been observed without going deeply into details since the provision of other public services (e.g. water supply, waste collection) can be organised with their own specificities, such as consideration of other production factors, by different levels of governance (e.g. regional, federal authorities). The investigated literature, institutional regulations and laws include the year 2020.

The theoretical models developed in this thesis use microeconomic theory, not macroeconomic theory. The author does not aim to make a regional equilibrium model for the distribution of FOCJs of type II in Russia, but rather analyse the internal decisions and goals of FOCJ of type II managers and owners (municipalities). The location and number of all FOCJs of type II in Russia are not determined by an equilibrium model, e.g. using Tiebout's approach (Tiebout 1956). Moreover, deterministic modelling, not stochastic, is applied. Deterministic models do not have any random changes. In such models, the behaviour of an object is determined by specific values of initial conditions and input variables. In other words, everything in these models is precisely defined (determined) (*Советов, Яковлев* 2001). Stochastic models are not used; since there are no data on FOCJs of type II in Russia, no stochastic variables can be included. In general, any statistical analysis is not possible since there is no empirical evidence in Russia where FOCJs of type II do not exist.

When modelling the management behaviour of FOCJs of type II, the author investigates the monopoly case and detects the reactions of FOCJ of type II management to the changing conditions of the oligopolistic market, excluding other market structures (such as Cournot 1838; Chamberlin 1933; Varian 2010). In oligopoly, for the sake of simplicity, the situation with two FOCJs of type II (duopoly) is tackled, which already makes the analysis complicated enough. For the models, basic ideas of production and consumer theory are used (Frisch 1964; Henderson, Quandt 1980; *МЭНКЬЮ* 1999; Jehle, Reny 2011). Some aspects of public choice theory, in particular, voting rules for decision-making in FOCJs of type II in relations between the members and management of FOCJs of type II, are discussed in subchapter 2.3 of the thesis.

Game theoretical approaches (Bartholomae, Wiens 2016; *фон Нейман, Моргенштерн* 1970; *Петросян* et al. 2012) are only partially applied in the model of 'Current operation considering an active negotiating higher rank government' (subchapter 2.1) and the model of 'Current operation considering internal self-administrative structures' (subchapter 2.3). Game theoretical assumptions are also given when modelling management behaviour in duopoly.

⁶ Under 'FOCJ-like cooperation' the author understands those forms of IMC which are not explicitly called 'FOCJ', but possess the same characteristics. Such as, for example, *Zweckverband* in German-speaking countries.

The principal-agent problem (for example, Spremann 1987; Jensen, Meckling 1976, etc.) is involved in the model of ‘Current operation considering internal self-administrative structures’, where the principal is an assembly of member municipalities that can directly, through an order or by negotiation with management, decide on the volume of produced output, FOCJ of type II management is treated as an agent. Principal-agent relationships are, to some extent, included in the models of FOCJ establishment, current operation and competition for members, where FOCJs of type II receive a grant from higher rank jurisdictions (provinces or regions). Again, in all of these models, the principal-agent problem is not further developed.

The empirical part focuses on the school services (primary, basic and secondary general education) of the Russian Federation. Other levels of education are not tackled since regional and federal authorities are in charge of vocational and higher educational institutions, respectively. The municipal level of administration is responsible for school educational organisations.

This thesis deals with decision analysis in municipalities and schools based on documents, laws, interviews with public officials and schools’ management in order to identify relevant factors for theory and the institutional performance of FOCJs of type II. Empirical insights from the interviews are dated from the period from October to November 2017 and are geographically restricted by the Voronezh region. This region has been selected for the analysis because it is an illustrative example of the socio-demographic problems that exist in Russia: declining birth rate, reduction in the number of schools and pupils (see Chapter 3). On the regional borders, the Khokholsky and Liskinsky municipal areas are under observation because they not only have decreasing populations but also can be described as rural (school abolishment is especially intensive in rural areas).

There are different ways to coordinate management behaviour, such as a special regional policy, regional subsidisation, direct orders, etc. These are not discussed in this thesis. Instead, the author has developed a special legal framework, like Statute and Memorandum, as these documents should exclude unfavourable management decisions in the long run.

Since other forms of inter-municipal cooperation are discussed in Chapter 1 only to create a research background, not to conduct a comparative analysis, the advantages and disadvantages of the establishment of FOCJs of type II in Russia are not extensively covered by this thesis. Nevertheless, the thesis emphasizes the advantages of the formalised long-term forms of IMC to which FOCJs of type II belong in subchapter 1.2.

The author does not conduct an *ex-post* evaluation of an FOCJ of type II policy implementation to Russian regions since FOCJs of type II have not yet been introduced in Russia. Instead, an *ex-ante* assessment of the applicability of FOCJs of type II from an institutional and microeconomic theory point of view has been studied.

Since the thesis is restricted to economic issues and does not discuss the political situation in Russia, whether FOCJ of type II is an attractive concept for Russian politicians is not investigated either. Thus, the accompanying general

adaptation measures after the establishment of FOCJs of type II (financing by Federation, Regions, Municipalities and FOCJs; changes in school planning, school location for parents and pupils; school relevant educational pedagogical questions such as matters of distance learning, changes in schooling programmes; necessity of transportation for teachers and pupils; career system and education of staff and teachers; whether schools included in the FOCJs of type II stay legal persons or become subsidiaries thereof, etc.) are not the focus of the thesis and deserve special attention in further studies considering the situation in separate regions. Follow-up interviews with politicians are required to elaborate on these topics. So far, only the opinions of Russian school education authorities at municipal and regional levels regarding the applicability of FOCJs of type II to existing Russian realities has been revealed via interviews. No resistance has been detected at these levels.

The study is lacking statistical data on FOCJs of type II in Russia, since these do not exist in Russia so far. Thus, the developed models cannot be verified or tested with econometric methods and the hypotheses cannot be constructed and tested by applying econometric analysis.

The empirical analysis in the part concerning an interview with *Bodensee* water provision association might possess some limitations because service-specific questions could not have been addressed to the interviewee in Germany. Obviously, school and water provision services are quite different in terms of required equipment, knowledge of staff, etc. However, the aim of this interview regardless of service specification was to gain information about how FOCJs of type II operate in practice, what the most important provisions to be considered are in its Statute, what the legal basis for its procurement is, etc.

The interview responses of Russian school educational authorities and school management may contain some limitations concerning their potential intention to show that they follow legal requirements and carefully fulfil their tasks. However, this does not disturb the analysis since the main aim of these interviews was to understand how school service provision is legally and practically organised and what is important to consider when FOCJs of type II are introduced in Russia.

Additionally, prepared school FOCJs of type II Statute and Memorandum are exemplary for Russia, which means that they are conditionally applicable to other countries and other public services. Similarly, FOCJs of type II as a concept for inter-municipal cooperation cannot be suggested for all regions of the country since population density, which affects the applicability of the concept, is different among Russian regions.

Structure of the thesis

The thesis consists of three chapters. The first chapter provides a literature review devoted to the FOCJ concept, starting from its initial definition as a political form of federalism to the recent definition – FOCJs of type II as economic

units. In which sectors and spheres functional jurisdictions are applicable and what forms of inter-municipal cooperation similar to FOCJs are present in different countries has also been discussed in subchapter 1.1. Subchapter 1.2 defines the term ‘inter-municipal cooperation’ in the framework of this thesis. A general observation of the different forms of inter-municipal cooperation is given here. The links between FOCJs of type II and IMC definitions are shown in subchapter 1.2 as well.

The second chapter contributes to the development of a microeconomic theory for the decision-making of the management and members of FOCJs of type II. The author models three phases of economic activity of FOCJs of type II, applying methods of microeconomic theory modelling and mathematical modelling. The optimal solutions for models of the establishment, current operation and competition for members of FOCJs of type II, considering different financial means and grants from higher level jurisdictions, are discussed in subchapter 2.1. Subchapter 2.2 shows how the optimal solutions for the current operation model of the FOCJ of type II depend on the utility function of management and market forms. How changes in factor inputs, the production function, the utility function of management, the demand function and the negotiation process between management and members defines management decisions and how to avoid unfavourable management decisions is discussed in subchapters 2.3 and 3.4, respectively.

The third chapter is empirical, where FOCJs of type II as a form of inter-municipal cooperation is applied to the case of Russian school education. The primary, basic and secondary (complete) general education stages are investigated with respect to the sources of their financing, administration and main decision-making bodies (subchapter 3.1). In subchapter 3.2, the author, applying document analysis, is looking for the proper legal form for FOCJs of type II and for the adequate level of municipalities, considering sector specifics (the non-commercial character of school services and who is responsible for the provision of school services) in Russia.

An interview method in subchapter 3.3 plays a crucial role in collecting information about the conditions for the potential establishment of FOCJs of type II for Russian school services as well as in providing useful hints on how FOCJs of type II are performing in the legal form of *Zweckverband* in Germany. Furthermore, the results of subchapters 3.1–3.3 and Chapter 2 have been used to develop recommendations in the form of Statute and Memorandum for school FOCJs of type II in Russia. Their exemplary provisions are shown in subchapter 3.4. General conclusions regarding the applicability of FOCJs of type II to Russian school services and possible directions for future research finalise the thesis.

The relationships between chapters are shown below in Table 1, where the structure of the thesis is demonstrated in connection with the methods, research questions and research tasks.

Table 1. Structure of the thesis in relation to the research tasks and questions

Research task	Methods	RT is completed in	Research questions related to the results
RT1: Define the main characteristics of FOCJs and the types of FOCJs.	Literature analysis	Subchapter 1.1	1. What are Functional, Overlapping, Competing Jurisdictions (FOCJs)?
RT2: Analyse and systematise the literature devoted to FOCJs and alternative forms of inter-municipal cooperation.	Literature analysis	Subchapter 1.1, 1.2	2. Which other forms of inter-municipal cooperation exist? 3. Which types of FOCJ are suitable for inter-municipal cooperation?
RT3: Formulate a basic microeconomic model of the establishment of an FOCJ of type II, considering grants from higher rank jurisdictions and special financial means.	Microeconomic theory modelling, mathematical modelling	Subchapter 2.1, 2.3	4. Is there a microeconomic theory for the FOCJs of type II that explains FOCJ management behaviour? 5. How to decide which municipalities will establish an FOCJ of type II?
RT4: Formulate a basic microeconomic model of the current operation of an FOCJ of type II, considering grants from higher rank jurisdictions, special financial means and different cases of FOCJ management behaviour under monopolistic and oligopolistic market conditions.	Microeconomic theory modelling, mathematical modelling	Subchapter 2.1, 2.2, 2.3	6. How should FOCJ of type II management decide on the fee and factor input policy for the current FOCJ of type II operation? 7. How do the optimal solutions of models, in particular, the current operation model, depend on the utility function of management and market forms?
RT5: Formulate a basic microeconomic model of the competition for members of an FOCJ of type II, considering grants from higher rank jurisdictions and special financial means.	Microeconomic theory modelling, mathematical modelling	Subchapter 2.1, 2.3	8. How to determine the optimal distribution of members between two competing FOCJs of type II? 9. How can typical financial conditions influence optimal solutions on the establishment, current operation and competition for members phases?
RT6: Identify the legal forms in which FOCJs of type II may exist in Russia and could be used for inter-municipal cooperation in the provision of school services.	Literature and document analysis, interviews	Subchapter 3.1, 3.2, 3.3	10. Are the legal forms possible for FOCJs of type II in Russia?

Research task	Methods	RT is completed in	Research questions related to the results
RT7: Identify the level of municipalities in Russia that can freely and independently decide on cooperation in the form of FOCJs of type II.	Document analysis, interviews	Subchapter 3.1, 3.2, 3.3	11. Are there municipalities which are allowed to cooperate in Russia?
RT8: Develop a school FOCJ of type II Statute and Memorandum based on the appropriate legal form of the company (association).	Literature and document analysis, interviews	Subchapter 3.3, 3.4	12. How to avoid unfavourable management decisions by introducing institutional regulations of a particular legal company form?

Source: Compiled by the author.

ACKNOWLEDGEMENTS

I would like to express my deep gratitude to all of the people who supported me on my way to this achievement. It would not have been possible without the Erasmus Mundus Aurora II mobility grant, which gave me the opportunity to start my research activity at the University of Tartu as a visiting PhD student from Russia. It was a point where my life radically changed. Therefore, special thanks goes to the European Union taxpayers and the University of Turku (Finland) as an Aurora II project coordinator.

As the main encouragers of my work, I would like to first of all thank my supervisors – Professor Peter Friedrich and Associate Professor Diana Eerma. They always had time for our discussions. Thank you for sharing your immense knowledge and providing me with your support and sincere belief in me! It has been a thorny path, but I have learnt enormously from you along the way.

I would also like to acknowledge the comments and suggestions I received from the pre-defence committee and especially from the opponents – Associate Prof. Eve Parts and Prof. Dr Florian Bartholomae – who helped me polish and improve my thesis. I express my deep gratitude to Prof. Tiiu Paas, Prof. Juri Sepp and Dr Oliver Lukason. Prof. Tiiu Paas deserves special recognition for her encouragement and trust during my doctoral studies. I also thank Prof. Dr Martina Eckardt for accepting to discuss my thesis at the final defence.

These acknowledgments would not be complete without mentioning colleagues from the School of Economics and Business Administration. My special thanks goes to the Head of Chair of Public Economics and Policy, Prof. Kadri Ukrainski, for organising our fruitful discussions during chair sessions. I am also thankful to Professors Toomas Haldma, Maaja Vadi, Urmas Varblane, Priit Vahter, Peter Hwang, Tiia Vissak, Dafnis Coudounaris and Kadi Timpmann for their comments and questions on different stages of my thesis development and under various circumstances. I am grateful to Katrin Tamm, Tiia Haldma, Ülle Maidla, Riina Viilup and Anneli Kütt for their kind organisational and administrative assistance. I also thank our librarians Sirje Haas and Herly Parve for their help with ordering books that have been important for my research.

This thesis would not have materialised without the Dora Plus doctoral student mobility grants that financed my research visits to the University of Konstanz (Germany) and Voronezh State University (Russia). With the help of this financial support, I got the chance to complete an empirical part of my thesis. I would like to thank all of my interview partners who found time in their busy schedules to answer my questions. My deep gratitude goes to the Doctoral School in Economics and Innovation for enabling my participation in a number of doctoral schools and conferences.

I would also like to recognise the important role of Dr Indrek Zolk from the Institute of Mathematics and Statistics who verified my models. Thank you for your time and devotion! I am also grateful to Matthias Heilig for introducing me to the fascinating world of Wolfram Mathematica.

Furthermore, I would like to acknowledge my Master's thesis supervisor, Prof. Tatiana N. Gogoleva, who inspired me to turn down a scientific path and played a significant role in organising interview meetings in Voronezh. She also gave me the chance to gain valuable teaching experience as her assistant. My deepest appreciation belongs to my PhD studies supervisor at Voronezh State University, Prof. Pavel A. Kanapukhin, for his understanding and patience.

Above all, I would like to thank my parents Vera and Sergey for supporting me in all of the activities I have initiated and for creating favourable conditions that gave me the opportunity to study. All possible mistakes and errors are the sole responsibility of the author.

1. FOCJ THEORETICAL BACKGROUND

1.1. FOCJ definition and characteristic features

Functional Overlapping Competing Jurisdictions is a relatively new concept introduced in the 1990s by Swiss scientists Frey and Eichenberger as a means to intensify the principles of direct democracy and federalism in Europe. The concept assumes that national states as the only identity of the citizen are outdated in global society. Individuals can therefore also be citizens of organisations outside the nation. New interpretations and variations of the FOCJ concept have developed over time (e.g. Friedrich, Eckardt 2014), but the core statements remain unchanged. This chapter firstly provides a definition of Functional Overlapping Competing Jurisdictions and the main features which are rooted in the historical ideas of panarchy and anarchocapitalism (Tucker, de Bellis 2016). Next, it classifies FOCJs with respect to membership criteria and sums up the experience of those organisations that show features similar to FOCJs. The connection between the developed FOCJs concept and the forms of inter-municipal cooperation are investigated in the following subchapter.

Functional Overlapping Competing Jurisdictions are economic units that possess four features defining their name⁷. They are **functional** because they may perform various functions, i.e. education, water provision, healthcare, etc. **Overlapping** means that their territories do not coincide with municipal borders and that more than one jurisdiction with the same functions can act in the same region. Jurisdictions performing different functions can also overlap in the same territory. FOCJs **compete** with one another for clients and members, who can be citizens, municipalities or other subjects of public and private law. Members can choose in which FOCJ they want to participate. They are called **jurisdictions** because they show a degree of autonomy and authority, have internal democratic procedures and have the right to levy taxes and collect entrance fees from their members (Frey 1999, 2001, 2005, 2009; Frey, Eichenberger 1995, 1996, 1997, 1999, 2001a, 2001b, 2002; Eichenberger, Frey 2006; Friedrich, Eckardt 2014).

The functional orientation of these independent units enables them to offer citizens individual or multiple services or service packages according to their preferences, thus taking advantage of economies of scale, which allows them to offer services at a reasonable price. Furthermore, spill-overs can also be avoided since the circle of beneficiaries corresponds to the circle of cost bearers. Local differences in demand are also considered, as FOCJs are not geographically tied and are therefore flexible. The overlapping structure guarantees the efficient size of these units. Democratic political competition between FOCJs has led to the desired fiscal equivalence and the economic use of funds, as FOCJs also

⁷ The definition is given for this thesis. Here, FOCJs are economic units, not political establishments, as initially created by Frey and Eichenberger (for example, 1999, 2006).

have the possibility to collect taxes for their performance tasks (Frey, Eichenberger 1995).

The main advantage of FOCJs, as Frey and Eichenberger have pointed out, is the decentralisation of powers, which allows for the consideration of multiple consumer preferences and the generation of more transparency for citizens regarding the activities of public authorities. The authors called FOCJs a ‘fifth freedom’⁸, which is intended not to destroy the nature of federal states, but to create alternative organisations. Therefore, the fifth freedom permits the formation and existence of FOCJs within time (Eichenberger, Frey 2006).

In general, **four types of FOCJs** can be distinguished:

- FOCJs of type I with citizens as members. Citizens living in various municipalities establish an FOCJ to provide services.
- FOCJs of type II with governments as members, e.g. municipalities, counties, states, nation states, the European Union.
- FOCJs of type III comprising municipalities, other governments, other subjects of public law and of private law (firms etc.).
- FOCJs of type IV with members who are individuals (e.g. citizens) and/or other private and public entities, e.g. associations, chambers, churches, municipalities, private and public firms (Friedrich, Eckardt 2014).

Frey and Eichenberger characterise the main features of FOCJs focusing only on type I. Later, Friedrich and Reiljan (2011) and Friedrich and Eckardt (2014) further developed FOCJ classifications, including types II, III and IV. However, there is not much literature devoted to FOCJs. In particular, an FOCJ theory integrated into a microeconomic theory with respect to supply, demand, management and cooperation conditions is missing.

FOCJs have been considered as a tool for inter-governmental cooperation (Friedrich, Popescu 2006; Bartholomae, Popescu 2007; Friedrich, Ukrainski, Timpmann 2014) and alternative governments (in the case of FOCJ type I) without territories, like quangos (Friedrich, Ukrainski 2013). FOCJs of type II are widely investigated in the work of Friedrich and Reiljan (2011) and Friedrich and Eckardt (2014). The integration of FOCJs of type II into economic theory was developed in the latter work.

Literature on FOCJs also considers functional jurisdictions as a means for cross-border cooperation between EU countries (Friedrich, Ukrainski 2013; Metis 2014; Eckardt, Gritsch 2016). Several studies have analysed historical cases of FOCJ-like organisations (e.g. Hansa trade union, school boards in England) (Frey 2005; Smith 2011; Fink 2012; Shaw 2012; Eckardt, Gritsch 2016) and attempts to implement FOCJs in several sectors such as general education, forestry and population policy (Friedrich, Popescu 2006; Friedrich, Reiljan 2011).

The FOCJ concept, originally only FOCJs of type I, is rooted in the theory of panarchy introduced by Paul Emile de Puydt in 1860. De Puydt pointed to the

⁸ Four economic freedoms include free movement of labour, materials, goods and services (Frey, Eichenberger 1999).

right of people to select any form of governance without changing their place of life (Tucker, de Bellis 2016). He applied the idea of competitive market to political governments. Individuals are free to consume services from any governments if they find their services to be of better quality. Previously, the same ideas were promoted by Gustave de Molinari in the context of security services (Hart 1982) and later by Le Grand E. Day, Max Nettlau, John Zube and others (Tucker, de Bellis 2016).

There has been no detailed investigation of FOCJ behaviour as an owner (jurisdiction) and as an economic unit. There are only a few approaches to micro-economic theory linked to FOCJs (Friedrich, Kaltschütz, Nam 2004; Gabbe 2008; Friedrich, Eckardt 2014; Chebotareva, Friedrich 2017).

There are some examples of local organisations whose characteristic features (i.e., single-functional, overlapping, competing juridical organisations) coincide with the definition of FOCJs. They can be found in the USA, Germany, England, Switzerland, etc. in different fields and spheres, which is reflected in Table 2.

Due to the lack of availability of primary education in districts across England and Wales from 1870–1902, local authorities created School Boards, which were responsible for raising school funds and charging fees in cases where local funds were not sufficient (Shaw 2012). They were directly elected and independent of existing forms of local government (Gillard 2018). Later, School Boards were abolished and the provision of school education became more centralised. However, the system of School Boards in England became one of the first initiatives of local authorities to offer non-denominational education.

In Switzerland, the functional cooperation of municipalities exists in many municipal tasks, including school services (Steiner 2003). In some municipalities in the cantons of Zurich, Thurgau, St. Gallen, Appenzell, etc., public municipal schools are not administered by the political municipality, but by a separate school municipality. The school municipality is thus an independent public-law organisation that exists with the political municipality. The municipal territory of the political municipality and school municipality is often identical but can also be different (Huber 2011).

The most famous historical example of functional cross-border cooperation is the Hanseatic League. Members of this organisation followed the Hanseatic Statute, which established clear rules, and had trade privileges from the 12th to 16th centuries. The aim was to represent common economic interests (Dollinger 1976).

In modern times, Germany and Poland conduct cross-border cooperation to jointly protect and preserve national park Lower Odra River Valley, which is located on the German-Polish border. For this purpose, a special legal form of cooperation with a legal personality – European Grouping of Territorial Cooperation (EGTC) – is applied (Scholich 2007).

Table 2. Examples of municipal functional organisations in different countries

Sphere	Organisation	Author	Country
School services	School Boards	Shaw 2012; Gillard 2018	England and Wales
	School municipalities (communes)	Steiner 2003; Huber 2011	Switzerland
	Special purpose districts	Duncombe, Yinger 2007; Longley, Sheed 2009, etc.	the USA
Other publicly provided services	Trade	Dollinger 1976	Germany, Poland, Russia, the Baltic republics
	Social and healthcare system, utilities and waste disposal, construction industry, local police, granting of civil rights and the internal organization of the civil authorities, finances and municipal administration, water provision, etc.	Ruester, Zschille 2010; Bönisch et al. 2011; Debela 2020; Linder 2010	Germany, Switzerland, Austria
Water supply, fire protection, wastewater treatment, electric power, traffic control, environmental protection, suppression of criminal activities, accident prevention, etc.	Special purpose districts	Mizany, Manatt 2002; Texas Senate Research Center 2008.	the USA
	Environmental protection	Schulich 2007	Poland and Germany
Utility services, air quality and climate change, regional parks, sewerage, liquid and solid waste management, housing, delivery of drinking water	Cross-border protected area German-Polish National Park “Lower Odra River Valley” Alberta Regional Services Commissions, Metro Vancouver Regional District	Slack, Bird 2013; Slack 1997	Canada

Source: Compiled by the author.

Germany and France have a long tradition of inter-municipal cooperation (West 2007). In these countries, municipalities cooperate in water supply, environmental protection, tourism, public parks and other things. They mainly function in the form of public inter-municipal associations and special purpose associations (e.g. *Zweckverbände* in Germany) (Heinz 2007). Single functions can be transferred to *Zweckverbände* (Bolgherini 2011). For example, in the land *Baden-Württemberg*, 147 municipalities jointly provide water from Lake Constance to members of *Zweckverbände Bodensee-wasserversorgung*. Cooperation in the form of *Zweckverbände* is similar to FOCJs of type II with municipalities as members.

There are also examples of FOCJs of type III in Germany. *Rhein-Main-Verkehrsverbund* (regional transport association), for example, comprises 15 counties, 11 cities and the Land of Hesse (OECD 2014: 283).

However, examples of the FOCJs of type I initially introduced by Frey and Eichenberger are detected in Switzerland and the USA. In the USA, special districts are forms of local government that provide public services similarly to cities. Unlike cities, they act more as private firms which consider consumer preferences while delivering services. Their definition varies from state to state. In their article, Goodman and Leland (2019) refer to the US Census Bureau, which defines special districts as “independent, special purpose governmental units that exist as separate entities with substantial administrative and fiscal independence from general purpose local governments”.

Regional services commissions in Canada are autonomous bodies. The provincial government offers grants to commissions to support their establishment and operation. Commissions do not levy taxes from municipalities; they are financed mainly by user fees and have the authority to approve their own budgets. Commissions operate on a full cost-recovery basis and cover both operating and capital costs (Slack 1997). A good example of such an organisation is Metro Vancouver Regional District, which comprises four entities and consists of 21 member municipalities. Although they are independent, they delegate certain public administration services to the District. Each entity is governed by the Board of Directors annually elected from local politicians. The number of votes directors possess in the Board of Directors is proportional to the population of municipalities (Slack, Bird 2013).

1.2. FOCJ as a form of inter-municipal cooperation

Within the framework of this thesis, the author defines inter-municipal cooperation according to its main characteristics (IMC Toolkit Manual 2010):

- based on a public or private legal basis, the mutually beneficial joint work of two or more municipalities⁹ which aims to fulfil public tasks

⁹ Municipalities are entities in the first level of territorial administration (IMC Toolkit Manual 2010: 7).

- participants who have the status of legal entities and possess the competencies, powers and resources to cooperate
- cooperation is voluntary; however, the law may occasionally oblige municipalities to cooperate in particular cases
- cooperation and appropriate arrangements between municipalities are permanent
- municipalities maintain indirect control over the decisions and services that result from cooperation
- activity which does not refer to the cooperation of municipalities with legal entities of another nature and status (e.g. Regions, Federation), households, public and private firms
- actions which do not include cross-border cooperation between neighbouring municipalities of different countries

Following this definition, FOCJs of type I, which are more frequently discussed in literature on the FOCJs, only indirectly relate to inter-municipal cooperation via citizens who are members in this type (Chebotareva, Friedrich 2017). Municipalities can directly be FOCJ members in types II, III and IV, but only type II coincides with the definition of inter-municipal cooperation.

The thesis relies on three main streams of literature. First, literature devoted to the FOCJ concept, its characteristic features and the functional cooperation of municipalities in different fields and countries. The name of this type of cooperation can vary from country to country, but the author considers here that all of them should possess features of Functional Overlapping Competing Jurisdictions. Subchapter 1.1 provides a more detailed overview of this literature.

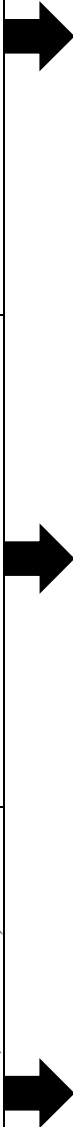
Second, in subchapter 1.2, the author opens up a broader discussion on FOCJs as a form of inter-municipal cooperation, considering studies devoted to inter-municipal cooperation as such.

Third, literature devoted to inter-municipal cooperation in Russia has been analysed in subchapter 3.2 in order to show the forms of inter-municipal cooperation and legal possibilities for FOCJs in Russia via literature analysis. Table 3 summarises the literature covered by the thesis and leads to the gaps which the thesis fills in.

Table 3. Literature analysis

<p>Subchapter 1.1: Literature devoted to FOCJs and functional cooperation, especially to schools</p>	<p>Subchapter 1.2: Literature devoted to alternative forms of inter-municipal cooperation</p>	<p>Subchapter 3.2: Literature devoted to IMC in Russia</p>
<p>FOCJs as a form of federalism (Frey 1999, 2001, 2005, 2009; Frey, Eichenberger 1995, 1996, 1997, 1999, 2001a, 2001b, 2002; Eichenberger, Frey 2006)</p>	<p>Strengths and weaknesses of different forms of inter-municipal cooperation (Osterrieder et al. 2006; Citroni et al. 2013; Grossi, Reichard 2008; Reichard 2002; Swianiewicz, Teles 2019)</p>	<p>Institute of inter-municipal cooperation is underdeveloped and underestimated in Russia (Бумова, Лухова, Шукин 2013; Ладыгин 2011; Маркварт 2010; Guņnikova 2012; Даутов 2018; Гайнанов et al. 2017)</p>
<p>FOCJs as a tool for inter-governmental cooperation (Friedrich, Popescu 2006; Bartholomae, Popescu 2007; Friedrich, Ukrainski, Timpmann 2014)</p>	<p>IMC typology (Hulst, van Montfort 2007; Osterrieder et al. 2006; Citroni et al. 2013; Haveri, Airaksinen 2007; Garrido 2007, Kelly 2007)</p>	<p>Uncertainties and gaps in laws concerning inter-municipal cooperation hinder the development of inter-municipal cooperation in Russia (<i>Тероградская</i> 2011; <i>Урманов</i> 2013; <i>Маркварт</i> 2010; <i>Осталец</i> 2017)</p>
<p>FOCJs as alternative governments without territories like quangos (Friedrich, Ukrainski 2013)</p>	<p>The scope of IMC and level of institutionalisation (Teles 2016; Swianiewicz, Teles 2019; Hulst, van Montfort 2007, 2011; Haveri, Airaksinen 2007)</p>	<p>Factors impeding Russian inter-municipal cooperation (<i>Разозина</i> 2009; <i>Рамазанов</i> 2019)</p>
<p>Focus on FOCJs of type II (Friedrich, Reijjan 2011; Friedrich, Eckardt 2014)</p>	<p>The consequences and effects of IMC with respect to service level, tax collection, cost savings, municipal public spending (Allers, de Greef 2018; Bel, Warner 2015; Bel, Fageda 2006; Frere et al. 2014; Bel, Gradus 2018; West 2007)</p>	<p>Forms and types of IMC in Russia (<i>Урманов</i> 2013; <i>Арумова</i> 2012; <i>Миранова</i> 2017). Some authors (<i>Гриценко</i> 2001; <i>Власова, Джек</i> 2009; <i>Разозина</i> 2009; Kozlova, Makarova 2018: 136) distinguish between contractual (short-term and long-term contracts) and associative forms of inter-municipal cooperation. Others (<i>Ирискина</i> 2010; <i>Бумова, Смирнова, Миловидова</i> 2014) add to this classification economic forms of cooperation in Russian municipalities.</p>
<p>FOCJ as a means for cross-border cooperation between EU countries (Friedrich, Ukrainski 2013; Metis 2014; Eckardt, Gritsch 2016)</p>	<p>Driving factors of inter-municipal cooperation (Bel, Warner 2016; Citroni et al. 2013; Haveri, Airaksinen 2007; Swianiewicz, Teles 2019)</p>	<p>Forms of inter-municipal cooperation without creating legal persons and delegating legal powers to them, such as consultation, working groups, joint arrangements, etc. (<i>Незодуйко</i> 2008; <i>Разозина</i> 2009; Frolova et al. 2017)</p>

<p>Subchapter 1.1: Literature devoted to FOCJs and functional cooperation, especially to schools</p>	<p>Subchapter 1.2: Literature devoted to alternative forms of inter-municipal cooperation</p>	<p>Subchapter 3.2: Literature devoted to IMC in Russia</p>
<p>Historical cases of FOCJ-like organisations (Frey 2005; Smith 2011; Fink 2012; Shaw 2012; Eckardt, Gritsch 2016)</p>	<p>The research methods applied for IMC analysis: econometric probit and meta-regression analysis (Bel, Warner 2016; Warner 2006), case studies (Hoplmeier-Tokich, Kliot 2008), survey (Swianiewicz, Teles 2019), inventory and comparative analysis (Hulst, van Montfort 2007, 2011), interviews with local officials and document analysis (Klimovský et al. 2014; De Peuter, Wayenberg 2007; Haveri, Airaksinen 2007)</p>	<p>Historical aspects of IMC development in Russia (Москаленко 2016; Лажинцева, Шлегель 2017; Иркина 2010)</p>
<p>Attempts to implement FOCJs in several sectors such as general education, forestry, population policy (Friedrich, Popescu 2006; Friedrich, Reiljan 2011)</p>		<p>Some papers discuss possible spheres of IMC such as common innovative projects, tourism, solid-waste recycling, retraining of municipal employees (Бумова, Смирнова, Миловицова 2014; Pakhalov, Saks 2020), water provision, household waste collection, communal services (Gutnikova 2012)</p>
<p><i>Zweckverband</i> in Germany, Switzerland, Austria (Ruester, Zschille 2010; Bönisch et al. 2011; Debela 2020; Linder 2010)</p> <p>Special purpose districts in the USA (Mizany, Manatt 2002; Texas Senate Research Center 2008; Duncombe, Yinger 2007; Longley, Sneed 2009)</p>		<p><i>Турэль</i> 2015 and Gutnikova 2012 have conducted a quantitative statistical analysis of inter-municipal development at the federal and regional levels</p> <p>As a new form of IMC, some authors have investigated the role of inter-municipal cooperation in the development of regional agglomerations (Михайлова 2010; Бабун 2012; Победин 2013; Рождественская, Кабалинский 2016; Антонов 2020)</p>
<p>School boards in England and Wales (Shaw 2012; Gillard 2018)</p>		<p>Cases of cross-border cooperation show that Russia established municipal contacts primarily with the neighbouring countries of the Baltics region, Finland, Norway and Poland (Тынккынен 2008; Anishenko, Serguin 2012; Fedorov 2013; Zaitseva, Korneevets, Semenova 2016; Цветкова 2017)</p>

<p>Subchapter 1.1: Literature devoted to FOCJs and functional cooperation, especially to schools School municipalities in Switzerland (Steiner 2003; Huber 2011)</p>	<p>Subchapter 1.2: Literature devoted to alternative forms of inter-municipal cooperation</p>	<p>Subchapter 3.2: Literature devoted to IMC in Russia The advantages of inter-municipal cooperation in Russia and its stages of development are discussed in literature as well (Gutnikova 2012; <i>Ладыгина</i> 2011; <i>Меркулов</i> 2020)</p>
		
<p>Gaps in the literature</p>		
<ul style="list-style-type: none"> - no detailed investigation of FOCJ behaviour as an economic unit - no investigations about FOCJs applied to Eastern European and developing countries 	<ul style="list-style-type: none"> - mathematical modelling has not been applied for developing a microeconomic theory for inter-municipal cooperation - the FOCJ concept has not been analysed within the institutional legal framework of a particular country for which IMC is suggested 	<ul style="list-style-type: none"> - no research related to inter-municipal cooperation in Russian education

Source: Compiled by the author.

This subchapter discusses the alternative forms of IMC grouped in the middle column of Table 3. The literature devoted to inter-municipal cooperation is rather diverse and covers many aspects, such as the strengths and weaknesses of different forms of inter-municipal cooperation (Osterrieder et al. 2006; Citroni et al. 2013), IMC typology (Hulst, van Montfort 2007; Osterrieder et al. 2006; Citroni et al. 2013), their scope and level of institutionalisation (Teles 2016; Swianiewicz, Teles 2019), the consequences and effects of IMC with respect to service level, tax collection, cost savings, reduction of municipal public spending (Allers, de Greef 2018; Bel, Warner 2015; Bel, Fageda 2006; Frère et al. 2014; Bel, Gradus 2018; Baba, Asami 2020), factors driving cooperation, such as state subsidies for IMC (Bel, Warner 2016; Bischoff, Wolfschütz 2020), small population size and fiscal stress (Arntsen, Torjesen, Karlsen 2018). Inter-municipal cooperation has been studied using a variety of research methods: econometric probit and meta-regression analysis (Bel, Warner 2016; Warner 2006), case studies (Hophmayer-Tokich, Kliot 2008), interviews with local officials and document analysis (Klimovský et al. 2014). The latter methods are applied in this thesis as well.

Each paper devoted to inter-municipal cooperation mostly provides an original typology of forms and types, for example, Hulst and van Montfort (2007, 2011) offer their own classification of IMC forms. Hulst and van Montfort (2007) distinguish between purely inter-municipal arrangements and mixed institutions. They have investigated eight European countries applying inventory and comparative analysis, which consider such criteria as tasks to fulfil, the degree of institutionalisation and the scope of decision-making powers. As a result, the authors distinguish between four basic types of inter-municipal cooperation: quasi-regional governments, planning forums, service delivery organisations and service delivery agreements.

Quasi-regional governments are established for the coordination of municipal policies in one or several sectors. They have the financial resources to fulfil the task as well as decision-making and administrative bodies.

Planning forums are weakly connected networks of municipalities and other participants which do not form a stable organisation with decision-making bodies. On the other hand, service delivery organisations provide services on a regular basis and execute those functions of municipalities which are transferred to them or they can be municipalities' agents.

By signing service delivery agreements, municipalities decide to cooperate in service provision without establishing a joint organisation. Municipalities may order services from one or several other participating municipalities or from an outside private company (Hulst, van Montfort 2011: 127).

There can be different levels of institutionalisation in an inter-municipal cooperation, from informal 'handshake agreements' to formal IMC arrangements. However, the experience of developed countries shows that to be long-lasting and stable, cooperation of municipalities should be formalised (Osterrieder et al. 2006: 20). Cooperation in the form of FOCJs is the one which belongs to a for-

mally organised type, therefore it has the advantages of the medium- and long-term forms of IMC.

The forms of IMC largely depend on the aims and existing capacities of municipalities and can generally be classified in the following way (Osterrieder et al. 2006: 19–26):

- Joint service provision: when municipalities are not capable of providing all municipal services individually, they establish a joint body to improve service delivery.
- Joint administration: this form of cooperation is used by municipalities to jointly carry out administrative functions. A joint organisation can also be created to fulfil the functions.
- Joint planning and development: municipalities may develop a common plan of action to enhance the economic prosperity of certain territories.
- Purchase of services: this type of cooperation implies that municipalities buy services from each other for a particular fee. Usually, a larger municipality sells to smaller ones.
- Joint funding of investments: municipalities cooperate to create a joint pool of resources. In this way, they share the costs of investment in a new project. A clear advantage of this form is that all risks are shared as well.
- Exchange of experience: municipalities may share their ‘good practices’ by providing advice or technical support to neighbouring municipalities, which helps increase the quality of services.
- Creation of a new tier of government: a new level of governance can be created between local and central authorities. In this case, municipalities should transfer some of their responsibilities to a new intermediate level.
- Multiple modalities: all previously discussed forms of IMC can be combined to achieve the desired goals.

The occurrence of different forms of IMC is related to the evolutionary development of local and regional governance in Europe. In particular, the existence of IMC initiatives largely depends on the structure of initiatives and legal framework favouring or hindering inter-municipal cooperation (Citroni et al. 2013). According to this criterion, some authors distinguish between bottom-up (voluntary) and top-down (induced) forms of cooperation. Among them, associative, contractual, networking and public-private forms are increasingly popular in Western European countries (Citroni et al. 2013: 210–211). There is also a relatively new form of IMC which comes from the shared ownership of municipalities in joint-stock companies and is therefore called the ‘corporative form’ of IMC or municipal corporations.

Citroni et al. (2013) argue that corporative forms have advantages over contracting-out and public-private partnership (PPP) because “this allows municipalities to maintain political control over the providers and guarantees a more stable framework for cooperation than PPP agreements” (Citroni et al. 2013: 230). Additionally, municipal corporations are more flexible, possess more managerial freedom and higher efficiency and have closer connections to cus-

tomers. However, over time, the management of municipal corporation may turn to profit-making orientation and public purposes could be neglected (Grossi, Reichard 2008: 613; Reichard 2002: 65). In this sense, FOCJs (especially type II) have the advantages of the corporative forms of IMC but avoid their disadvantages because zero profit (cost coverage rule) is assumed for FOCJs, which FOCJ management has to follow.

IMC forms are classified for Germany by Heinz 2007:

1. Forms of cooperation which are not institutionalised under public law (informal cooperation), such as regional conferences, networks and forums. They function simultaneously with institutionalised forms and mostly deal with the problems of regional development and urban planning.
2. Cooperative approaches under private law, where municipalities have influence proportional to their shares in the capital reflected in a voting power. The examples of such forms in Germany are associations of civil law, limited liability companies, etc.
3. Institutionalised cooperation under public law consists of different functional or territorial associations that provide single or multiple services. They include:
 - Single-purpose associations created to fulfil specific tasks. They have management bodies that are responsible for current procurements. A supreme body is an association's assembly consisting of the representatives from member municipalities. They cover many spheres of activity from technical and social infrastructure, transportation and cultural facilities to school services and management of sewage and garbage disposal.
 - Territorial cooperation such as neighbourhood associations, regional planning associations, multisectoral approaches for cooperation. These are similar to single-purpose associations, with the main difference being in the composition of the assembly. Their assemblies should include the heads of local authorities. It is only possible to establish a multisectoral association when it involves different types of activities and the creation of an assembly with the involvement of regional authorities.
4. New public authorities are different to associations because "they are territorial authorities at the local level and they dispose of their own revenues". They are usually formed via the amalgamation of municipalities or the joining together of municipalities to create a new one without destroying existing entities.
5. Territorial authorities and innovative approaches imply established, two region-wide territorial authorities: regional city and regional county.

De Peuter and Wayenberg (2007), in the application of document analysis and interviews with local representatives, classified four types of IMC cooperation in Belgium:

- the inter-local association
- the project association
- the service association

– the mandated association

The first form does not require the establishment of a legal personality with delegation municipal competencies to a newly created organisation. At least two municipalities should be involved, and other public and private companies can participate (De Peuter, Wayenberg 2007: 25). It is similar to FOCJs of type III with public and private legal bodies as members. This form is usually necessary to realise joint projects that do not require the special attention of the government.

The second form of IMC, according to De Peuter and Wayenberg (2007), is stricter because it is a special legal form where not all public and private legal bodies are allowed to join the project, only municipal companies, social service associations and the last two forms of IMC (i.e. the service association and the mandated association) are eligible. Supervision of governmental authorities is required here.

For the last two forms, a special body of representatives must be created. Representatives of municipalities jointly develop a package of documents including a business plan, a management plan and a Statute. The establishment has to be approved by the government. A service association is organised with a legal personality, but without delegation of managerial control to this association. The latter is reversed for the mandated associations (which is similar to FOCJs of type II): municipalities transfer their competences related to performing particular tasks to the mandated association (De Peuter, Wayenberg 2007: 26). For service and mandated associations, councils of municipalities must approve their activity. Democratic bodies such as a General Assembly of Members and a Board of Directors manage service and mandated associations.

The authors emphasise one disadvantage of involving private partners in inter-municipal cooperation. They point out that “participation of private companies in forms where municipalities have given them managerial control might lead to blurred municipal responsibilities and conflicts of interest” (De Peuter, Wayenberg 2007: 29). This is one of the arguments for why the thesis concentrates on FOCJs of type II with only municipalities as members.

In Finland, the forms of IMC have a relatively long history and are rather diverse (Haveri, Airaksinen 2007). They name some of them: inter-local agreement, informal consultative forums, associations, contract-based cooperation, sub-regional contract, sub-regional council or government. They all differ in terms of degree of institutionalisation, scope of activities, range of services and organisational forms. Haveri and Airaksinen (2007) have applied surveys and interviews with different officials as the methods of their research. The interview method is very frequently met in studies devoted to inter-municipal cooperation regardless of the research questions addressed. The authors mention a very important advantage of the types of IMC that become part of an administrative hierarchy (similar to suggested FOCJs). They say that if municipalities create a joint, permanently functioning organisation, to which decision-making powers and resources are delegated in order to provide one or several services, decision-making can be quick “because the organisation is able to function

without special permission from cooperating municipalities” (Haveri, Airaksinen 2007: 54).

Despite the fact that the forms and motivations of IMC are changing over time, all of them, new and old, rely on the fundamental principles of management autonomy and voluntary membership in France. Another principle is the representation of municipal members in the council of an inter-municipal organisation that is a supreme body or an executive body that consists of a president and a vice-president. The delegation of municipal functions to a created organisation is allowed for participating municipalities. However, if a function has been transferred to a joint organisation before, it cannot be fulfilled by municipalities anymore (West 2007: 70). These principles for IMC in France are very similar to those which FOCJs rely on. Several forms are briefly described in the article. Among them: single purpose association, multi-purpose association, urban community, *communauté d'agglomération* and *communauté de communes*.

Some studies distinguish between cooperation and coordination of municipalities (Fedele, Moini 2007: 123). Cooperation implies the establishment of organisational forms, while coordination is occasional and very often informal in its implementation. In Italy, the forms vary from collaborative agreements and conventions to zone plans and area pacts.

Dutch municipalities as subjects of public law use cooperative arrangements to provide public services. The legislation gives permission to cooperate not only with municipalities, but also with other public authorities and private organisations. Local governments may also cooperate under private law (Hulst, van Montfort 2007: 146).

Two forms of cooperation prevail in Spain: the *mancomunidad*, which is a pure form of inter-municipal cooperation that provides a wide range of public services and multi-functional purposes; and the *Consortia*, which incorporates public authorities from different levels of government, although some are exclusively inter-municipal (Garrido 2007: 188). On the other hand, *Consortia* is single-purpose and used for particular projects to reach concrete objectives.

In the United Kingdom, local strategic partnerships are established as single, non-statutory units where local public and private bodies and voluntary organisations can participate. Their main purpose is to provide strategic coordination in spheres where such coordination was previously lacking (Kelly 2007: 202). Another form of inter-municipal cooperation in the United Kingdom is called ‘local public service agreements’, the aim of which is to support local governments in their performance by means of making contracts between service delivery bodies and the Treasury. Nominally, local authorities are free to choose the policy areas in which to fulfil targets of local public agreements. However, in reality, local aims are secondary relative to the national aims of the government (Kelly 2007: 203). Local area agreements were arranged to promote cooperation between public service providers. They are forms of autonomous decision-making that step away from centralised management and reduce the complex bureaucracy involved in administering multiple funding streams. What makes UK inter-municipal cooperation different is the fact that municipal inter-

actions in the form of agreements prevail; no separate organisation is created, only coordinating boards with representatives from all participating parties. The UK forms are oriented not to the joint provision of single public services, but to their coordination and integration.

The formalised inter-municipal cooperation of municipalities with the establishment of a separate legal person has been comparatively studied in Slovakia, Slovenia, the Czech Republic, Poland, Germany, Iceland and Portugal by Swianiewicz and Teles (2019). The authors apply the survey method, asking their questions from IMC entities. The results of their research emphasise that IMC forms with a formalised and harder institutionalised structure (i.e. budget size, number of employed people, property, etc.) possess some advantages, such as higher satisfaction of member municipalities, more frequent spill-overs to other spheres of cooperation, more visible outcomes of activities, dynamism of entering and leaving the ‘club’ for municipalities, etc. Since forms of IMC are very diverse across countries, Swianiewicz and Teles (2019) do not suggest a new typology. Instead, they come up with a list of dimensions that must be considered when comparison between forms and countries takes place (Swianiewicz, Teles 2019: 133):

- The level of formalisation: the scale is from informal collaboration to formal contract agreements and hard, permanent separate legal entities.
- The degree of enforcement: variation from completely voluntary bottom-up initiatives to compulsory arrangements enforced by upper-tier governments.
- The purpose of creation: from single- to multi-purpose cooperation.
- The number of partners: cooperation varying from minimum two-member parties to multiple.
- The types of members: from purely inter-municipal cooperation to mixed with upper level authorities and/or private and/or public companies, voluntary and social organisations, etc.
- The spheres of cooperation: for example, water provision, public transport, cultural halls, etc. Whether municipalities are focused on joint service provision, joint investment or joint marketing or lobbying.

The forms of IMC may differ not only between countries, but also within one country (Swianiewicz, Teles 2019). However, the diversity of IMC forms is vast only at first glance; further investigation reveals that all forms of IMC can be organised into several broader groups with respect to the degree of institutionalisation, scope of activities and organisational forms (Heinz 2007: 99; Kuhlmann 2010: 3; Swianiewicz, Teles 2019: 120). Therefore, in general, for the European Union, they can be summarised as follows (IMC Toolkit Manual 2010: 13–14):

- 1) **Informal inter-municipal cooperation** takes place when it is not necessary to adopt specific legal acts for cooperation and the municipalities are not obliged to comply with decisions. At the same time, such coordination allows for the accelerated solution of many local problems, such as in the field of urban planning and environmental protection.

- 2) Many inter-municipal links are organised in a **weakly formalised form**, such as agreements or contracts for the provision of certain administrative services.
- 3) Other cooperative activities could be described as **economic units with an appropriate legal status**. They are usually established in a legal form of association based on public or private law and perform one (single) or several (multiple) public functions. Usually, municipalities delegate their functions with respect to particular public service provision to established economic units. These economic units possess a budget, legal status and management bodies. Municipalities as members form their equity capital, and their current costs are covered by membership fees.
- 4) A certain degree of financial and political autonomy is part of inter-municipal cooperation as **second-level self-governing authorities**: they have their own legal status, are strong political structures and may be authorised to levy and collect fees.
- 5) **Cooperation with other subjects of public and private law**, such as households, public and private institutions and authorities of other level of administration. Such relations are analogous to FOCJs of type III and IV.

This thesis does not tackle informal coordination between municipalities (first form of inter-municipal cooperation), inter-municipal cooperation through agreements and contracts, or cooperation with private partners in the forms of sub-contracting and public-private partnership (second and fifth types of IMC). However, features of inter-municipal cooperation in the form of FOCJs of type II coincide with the third and fourth forms of inter-municipal cooperation according to the IMC Toolkit Manual classification presented above.

This classification of IMC forms can exceptionally, under certain circumstances, be complemented by **cross-border cooperation** as the sixth form, which occurs between neighbouring countries. In practice, this form might face difficulties due to different and sometimes even contradicting legislation of bordering countries. This thesis does not address this issue. However, at the EU level, the obstacles hindering cross-border cooperation have been overcome by introducing the European Grouping of Territorial Cooperation (EGTC) as a legal instrument designed to promote cooperation at the local level.

As a form of long-term formalised cooperation, FOCJs of type II possess the advantages of inter-municipal cooperation and long-term cooperation, in particular. The literature shows the following main advantages of IMC: reduction in public spending in the provision of public services (cost reduction and economies of scale) (Niaounakis, Blank 2017; Gradus, Schoute, Dijkgraaf 2018; Baba, Asami 2020), less expensive services for consumers (Silvestre et al. 2020; Bel, Gradus 2018), the public values of service quality and cross-jurisdictional coordination (Aldag, Warner 2018) and lower transaction costs compared with the private production of public services (Bel, Fageda, Mur 2013).

FOCJs of type II have the advantages of the formalised long-term corporative forms of IMC, for example, municipalities maintain control over the servi-

ces provided, which guarantees a more stable framework for cooperation (Citroni et al. 2013). Involving private partners might lead to conflicts of interests due to the different aims of the parties (De Peuter, Wayenberg 2007). Some studies have shown that municipal corporations are more flexible, possess more managerial freedom and higher efficiency and have closer connections with customers (Grossi, Reichard 2008; Reichard 2002). Another advantage of the permanently functioning formalised IMC form is that decision-making is faster because management can decide on a daily basis without special permission from cooperating municipalities (Haveri, Airaksinen 2007).

Swianiewicz and Teles (2019) emphasised that IMC forms with a formalised and harder institutionalised structure possess some advantages, such as higher satisfaction of member municipalities, more frequent spill-overs to other spheres of cooperation, more visible outcomes of activities, dynamism of entering and leaving the 'club' for municipalities, etc.

This chapter generally concludes that there is no detailed investigation of FOCJ behaviour as an economic unit. Only a few approaches link microeconomic theory and FOCJs (Friedrich, Kaltschütz, Nam 2004; Gabbe 2008; Friedrich, Eckardt 2014; Friedrich, Chebotareva 2017; Chebotareva, Friedrich 2017). Literature devoted to the cooperation of municipalities in the provision of school services is not extensive either, only a few approaches have studied this type of service (Shaw 2012; Gillard 2018; Steiner 2003; Huber 2011; Duncombe, Yinger 2007; Longley, Sneed 2009).

The literature analysis has not revealed investigations on FOCJs applied to Eastern European and developing countries. The only example in relation to short-term cooperation, but not to FOCJs, is an examination of the effect of public-public cooperation and inter-municipal agreements on the reduction of local costs in Brazil (Silvestre et al. 2020).

Among the variety of methods applied for studying IMC, such as regression analysis (Bel, Warner 2016; Warner 2006), case studies (Hophmayer-Tokich, Kliot 2008), surveys (Swianiewicz, Teles 2019), inventory and comparative analysis (Hulst, van Montfort 2007, 2011), interviews with local officials and document analysis (Klimovský et al. 2014; De Peuter, Wayenberg 2007; Haveri, Airaksinen 2007), mathematical modelling has not received deserved attention as the one which can be applied in the development of a microeconomic theory to establish inter-municipal cooperation. This thesis fills in this gap as well.

There have been attempts to analyse the legal form in which formalised long-term types of inter-municipal cooperation can exist in different countries (e.g. Citroni et al. 2013; Heinz 2007). However, FOCJs as a form of IMC have not been approached, considering the institutional legal framework of the particular country for which it is suggested.

There is no research related to inter-municipal cooperation in Russian school education. Some authors (*Ирискина 2010; Бутова, Смирнова, Миловидова 2014; Гриценко 2001; Власова, Джек 2009; Рагозина 2009*) have investigated the economic long-term cooperation of municipalities in Russia that establish

legal company forms. These investigations are mostly descriptive and lack a theoretical microeconomic basis for developing IMC in Russia.

The first chapter of the thesis focuses on introducing the concept of Functional Overlapping Competing Jurisdictions by defining the main components and types. This is followed by an analysis of existing typologies of inter-municipal cooperation in different countries. Relations between FOCJs and existing classifications of IMC are investigated and a suitable definition of inter-municipal cooperation is given here. FOCJs of type II are chosen as the focus of the thesis as an economic formalised form of inter-municipal cooperation. The next chapter will develop a microeconomic theory for FOCJs as a basis for municipalities, FOCJ management and the decision-making of higher rank jurisdictions in various instances.

2. DETERMINATION OF FOCJ MANAGEMENT BEHAVIOUR BY MICROECONOMIC THEORY

2.1. Basic models of the establishment, current operation and competition for members of FOCJs

The first chapter draws the conclusion that FOCJs of type II can be classified as a form of inter-municipal cooperation. What the analysis in the previous chapter has also shown is that a microeconomic theory for inter-municipal cooperation in the form of FOCJs of type II does not exist, which means that there is no theoretical basis for municipalities to decide whether they will cooperate in the form of FOCJs of type II, how many of them should cooperate, the share they have to pay to the equity capital, the level of regular participation fees and contributions and how municipalities as members of FOCJs of type II should be allocated between competing FOCJs of type II. To deal with these and other practical questions when establishing FOCJs of type II in Russia, this chapter develops microeconomic models.

The author has divided the process of microeconomic modelling of FOCJs of type II into three main phases. The first phase is an establishment phase where the role of founders (municipalities) is crucial, since they have to decide which resources should be dedicated to the FOCJ of type II. The establishment phase is shorter and more permanent compared with current operation. The thesis provides more emphasis on the second phase, current operation, where managerial functions are transferred to the employed managers with particular assumptions regarding their behaviour. The third phase follows current operation or may go simultaneously with it when two (for the sake of simplicity) or more (in practice) established and operating FOCJs of type II start competing for members (municipalities) and clients. The decision of municipalities regarding which FOCJ of type II they join is based on a comparison of their costs and benefits. Figure 5 illustrates the key phases of the FOCJ of type II microeconomic theory modelling process represented by the current chapter:

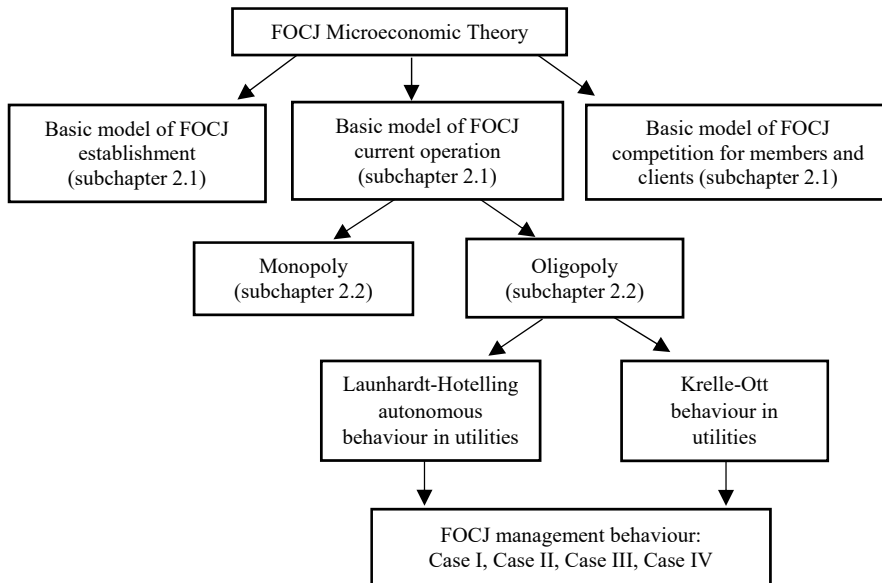


Figure 5. The phases of microeconomic modelling
Source: Compiled by the author.

The second chapter is organised in the following way. First, the author of this thesis presents basic models of three phases, extending the analysis by grants from higher rank jurisdictions (Russian regions and Federal government) and other financial means. Second, management behaviour on the current operation phase is investigated by introducing different market forms and four types of utility function of FOCJ management. The last subchapter 2.3 contains a detailed discussion on how restrictions on production factors and output; changes in production function, utility function of managers and demand function; and the structure of principal-agent relations between the members and management of FOCJs of type II affect the optimal solutions of the current operation model of FOCJs of type II.

The model of the establishment of FOCJs of type II considering higher rank jurisdictions with a non-negotiable grant

In order to establish school FOCJs of type II in Russia, municipalities that join an FOCJ of type II have to decide which resources should be dedicated to the equity capital of the FOCJ of type II. A municipality might provide funding through tax payments, credit or resources in kind, e.g. real estate. The solution of this model is an optimal share of member municipalities, which they should contribute to the equity capital and the optimal number of participants based on the comparison of the benefits and costs municipalities face as a result of co-

operation (Friedrich, Reiljan 2011; Friedrich, Eckardt 2014; Friedrich, Chebotareva 2017; Chebotareva, Friedrich 2017).

The contribution of a municipality i to the equity capital of the FOCJ of type II is e_i and $\sum e_i$ ($i=1, \dots, n$) shows the total amount of resources \bar{E} dedicated by all municipalities. In this model, each municipality participates with only **one kind of financing**. The financial contribution of other members equals $E_R = \bar{E} - e_i$. The higher share a municipality i has in the equity capital of an FOCJ of type II, the more benefits it receives because the voting power of this municipality within the FOCJ of type II might grow and more favourable solutions for this municipality might be achieved. These benefits are marked with the parameter b_i . Therefore, the benefits each participant gets are equal to $b_i * \frac{e_i}{\bar{E}}$.

The dedication of resources by a municipality to the FOCJ of type II also shows some negative effects, such as the loss of centrality of the municipality, the movement of buyers to places abroad, the higher transportation time and other unfavourable effects on the achievement of municipal goals. These are reflected by c_i . The model maximises the utility function¹⁰ of a municipality i :

$$U_i = b_i * \frac{e_i}{\bar{E}} - c_i * e_i \quad (1)$$

The differentiation with respect to the financing mode e_i in municipality i yields.

$$\frac{dU_i}{de_i} = b_i * \frac{E_R}{(E_R + e_i)^2} - c_i = 0 \quad (2)$$

After all necessary elaborations and substitutions, we get the optimality condition¹¹:

$$\frac{e_i}{\bar{E}} = 1 - \frac{c_i}{b_i} * \bar{E} \quad (10)$$

(10) is the optimal proportion of municipality i in the equity capital of the FOCJ of type II.

Municipalities are eager to participate in FOCJs of type II if they get higher benefits b_i ; then their shares of financing ($\frac{e_i}{\bar{E}}$) grow. If the costs (c_i) increase, the

¹⁰ For other possible types of utility functions, the author refers to the discussion in subchapter 2.3 devoted to the ‘Conditions with respect to utility function’.

¹¹ $(E_R + e_i)^2 = \frac{b_i}{c_i} * E_R$ (3) $E_R + e_i = \sqrt{\frac{b_i}{c_i}} * \sqrt{E_R}$ (4) $\bar{E} = \sqrt{\frac{b_i}{c_i}} * \sqrt{E_R}$ (5)

$\bar{E} = \sqrt{\frac{b_i}{c_i}} * \sqrt{\bar{E} - e_i}$ (6)

$\bar{E}^2 = \frac{b_i}{c_i} * (\bar{E} - e_i)$ (7) : \bar{E}

$\bar{E} = \frac{b_i}{c_i} * \left(\frac{\bar{E} - e_i}{\bar{E}}\right)$ (8)

$\bar{E} = \frac{b_i}{c_i} * \left(1 - \frac{e_i}{\bar{E}}\right)$ (9)

share shrinks. All shares of finance must add up to 1. Hence, the optimal number n of municipalities participating in an FOCJ of type II results from¹²:

$$n = 1 + \sum \frac{c_i}{b_i} * \bar{E} \quad (11)$$

Due to the importance of regional authorities in the participation of school financing revealed by the interviews (see Annex 4), a further step in the extension of the FOCJ establishment model is to consider a grant from the regional government (Chebotareva, Friedrich 2017b). If a higher rank government provides grant G as a lump-sum for FOCJ establishment, the total FOCJ of type II equity capital (\bar{E}) that participants have to cover is deducted by grant G . This means that establishment costs are partly covered by higher rank authorities. The equity capital which is left for participants to cover is E_1 :

$$\bar{E} - G = E_1 \quad (12)$$

In this case, the share of each municipality in the equity capital increases $\frac{e_i}{\bar{E}} = 1 - \frac{c_i}{b_i} * E_1$, which means less participants:

$$n = 1 + \sum \frac{c_i}{b_i} * E_1 \quad (13)$$

The model of the establishment of FOCJs of type II considering different means of financing

Russian member municipalities may choose several ways of financial participation i in the FOCJ of type II (Friedrich, Chebotareva 2017). The contribution of a municipality i to the equity capital of the FOCJ of type II is similar to the previous model e_i . It can consist of j types of financing $\sum_{j=1}^m e_{ij}$. The benefits a municipality achieves are related to the municipality's participation in financing the equity capital, which results in $\frac{e_{ij}}{\sum_{i=1}^n \sum_{j=1}^m e_{ij}}$. The sum $\sum_{i=1}^n e_{ij}$ are all financial means of type j of all municipalities. The financial contribution of the other municipalities equals $E_{R_{ij}} = E - e_{ij} - \sum_{m-j}^m E_j$, where $E = \sum_{i=1}^n \sum_{j=1}^m e_{ij}$ are all financial means of all financial types of all municipalities, e_{ij} is a contribution of municipality i with j type of financing, $\sum_{m-j}^m E_j$ is the financial contribution to the equity capital with the other types of financing. The benefits of municipality i increase when a municipality has a higher proportion of equity capital in an FOCJ of type II. These benefits are illustrated by parameter b_i . Therefore, the benefits develop as $b_i * \frac{e_{ij}}{E}$. Moreover, there are opportunity costs c_{ij} per financing

¹² $\sum_{i=1}^n \frac{c_i}{E} = n - E \sum_{i=1}^n \frac{c_i}{b_i}$ (where $\frac{c_i}{E} * n = 1$).

by e_{ij} , which gives $c_{ij} * e_{ij}$. The utility out of the participation by finance e_{ij} equals:

$$U_i = b_i * \frac{\sum_{j=1}^m e_{ij}}{E} - \sum_{j=1}^m c_{ij} * e_{ij} \quad (14)$$

The differentiation with respect to the financing mode e_{ij} in municipality i yields.

$$\frac{dU_i}{de_{ij}} = b_i * \frac{(E_{R_{ij}} + e_{ij} + \sum_{m-j}^m E_j - e_{ij})}{(E_{R_{ij}} + e_{ij} + \sum_{m-j}^m E_j)^2} - c_{ij} = 0 \quad (15)$$

From elaboration of terms one receives:

$$b_i * \frac{(E_{R_{ij}} + \sum_{m-j}^m E_j)}{(E_{R_{ij}} + e_{ij} + \sum_{m-j}^m E_j)^2} - c_{ij} = 0 \quad (16)$$

Substituting the following expression (17) into (16)

$$E_{R_{ij}} = E - e_{ij} - \sum_{m-j}^m E_j \quad (17)$$

leads to

$$b_i * (E - e_{ij}) = c_{ij} * E^2 \quad (18)$$

and

$$\frac{b_i}{c_{ij}} \left(1 - \frac{e_{ij}}{E}\right) = E \quad (19)$$

Resulting in the optimality condition:

$$\frac{e_{ij}}{E} = 1 - \frac{c_{ij}}{b_i} * E \quad (20)$$

(20) is the optimal proportion of one way of financing j of municipality i in the FOCJ of type II.

With higher benefits b_i of municipality i , its share of financing through j is increasing. If the opportunity costs of j are increasing, the share shrinks.

To determine total financial means, all shares of finance must add up to 1.

$$\sum_{i=1}^n \sum_{j=1}^m \frac{e_{ij}}{E} = \sum_{i=1}^n \sum_{j=1}^m \left(1 - \frac{c_{ij}}{b_i} * E\right) = 1 \quad (21)$$

$$E = \frac{n-1}{\sum_{i=1}^n \sum_{j=1}^m c_{ij}/b_i} \quad (22)$$

are the total financial means dedicated to equity capital of the FOCJ of type II (see Friedrich, Chebotareva 2017).

The model of the current operation of FOCJ of type II considering higher rank jurisdictions with a non-negotiable grant

The FOCJ of type II current operation phase follows the FOCJ of type II establishment phase. In current operation, an FOCJ of type II provides school services to the citizens of participating municipalities. The demand for school services is formed by citizens (mainly by parents with school-age children), and an FOCJ of type II reflects the supply side. The costs that occur during the process of current service provision must be covered by the member municipalities of an FOCJ of type II. Thus, the basic model of current operation is introduced to provide a contribution rule for FOCJ members. They must pay a fee that is equal to per unit costs. Demand for FOCJ of type II services also depends on the contribution to be paid. The FOCJ of type II must control cost levels because municipalities that consider costs too high can quit the FOCJ of type II. For the sake of simplicity, only the case of two variable factors – labour (L) and materials (M) – is depicted. Labour is defined as teachers, school administrative and management staff and maintenance personnel. Materials are tangible resources that are employed to provide services and can be consumed within one production period. For a school FOCJ of type II, this includes educational and methodological literature, materials for studying fine arts, modelling, natural sciences, etc. A special case of the Cobb-Douglas production function¹³ $X = L^\alpha M^\beta$ is assumed so that $\alpha = 1, \beta = 1$.

The FOCJ of type II current operation is carried out by FOCJ management that possesses a utility function related to the output (X) and labour input (L) of the relevant FOCJ of type II. For the sake of this thesis, output X reflects the number of students enrolled in a school FOCJ of type II. For more details on labour, materials, output, utility function, demand function, etc., subchapter 2.3 provides a more in-depth discussion. The author assumes that FOCJ members receive services only from the FOCJ of type II, i.e. the FOCJ of type II is a monopoly.

¹³ In the initial Cobb-Douglas function, output depends on two factors – labour L and capital K , such as $X = A * L^\alpha * K^\beta$, where A is a technological coefficient (total factor productivity), α and β are shares of labour and capital as factors of production in the volume of output, respectively.

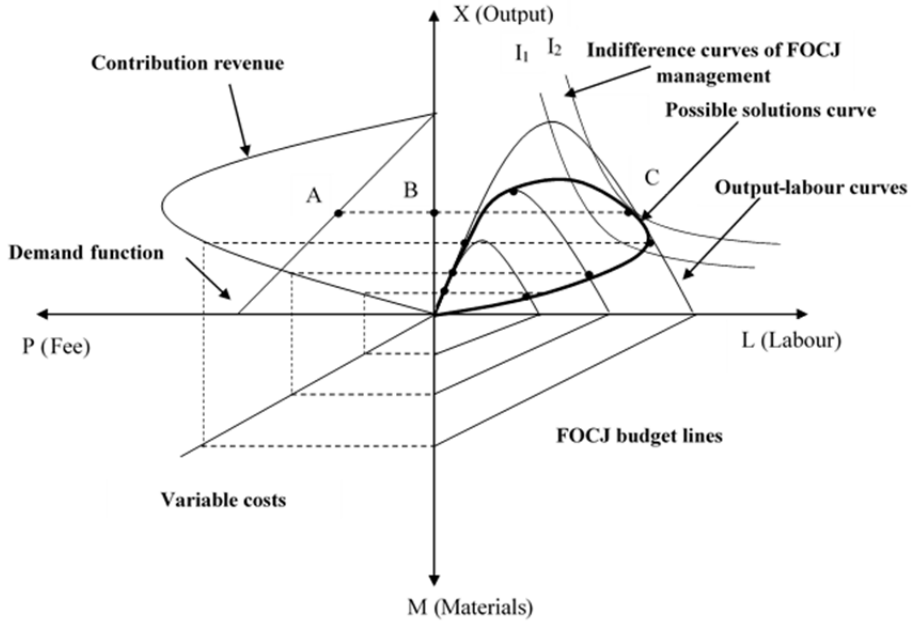


Figure 6. Optimal decision for FOCJ of type II management

Source: Compiled by the author based on Friedrich 2006; Fladung, Friedrich 2008; Friedrich, Reiljan 2011; Friedrich, Eckardt 2014; Friedrich, Chebotareva 2017; Chebotareva, Friedrich 2017.

In Figure 6, a set of output-labour curves presented in the first quadrant, which are related to the production possibilities of FOCJs of type II depending on the available budget. Budget lines are respectively illustrated in the fourth quadrant. The budget is formed by FOCJ members (municipalities) by paying participation fees. For the sake of simplicity, only two variable factors – labour and materials – are assumed. A cost coverage rule is introduced in this model, which means that budget is used only to cover labour and material costs, excluding profit since an FOCJ of type II is a non-profit-maximising firm. A variable cost function is demonstrated in the third quadrant, fixed costs (if they occur) are assumed to be covered by municipalities separately (outside the model). In the second quadrant, there is a contribution revenue or turnover curve. Each point of this curve reflects budgets of different sizes. An added-up demand function of member municipalities is also marked in the second quadrant.

FOCJ of type II service provision can be labour or material intensive. Hence, two points on output-labour curves become relevant. Connecting them yields a possible solution curve (space) in the first quadrant. Additionally, in the first quadrant, the utility function of FOCJ management dependent on output and labour input is considered and expressed through indifference curves I_1 and I_2 . An optimal solution for the model is where the highest indifference curve

touches a possible solution space (point C). Hence, an output at the point of management utility maximisation is described by B. An optimal fee that FOCJ members must pay to cover costs is shown in point A in the second quadrant.

The basic model of current operation can be described not only graphically as it is above, but also algebraically. The following assumptions are implemented:

$U = U(X, L)$ – management utility function¹⁴, which depends on X – output and L – labour input.

$P = P(X)$ – FOCJ of type II demand function; $X = f(L, M)$ – FOCJ of type II production function.¹⁵

Only two variable factors are used – labour and materials, therefore the variable cost function is formulated as $K = l*L + m*M$, where L – labour, l – factor price of labour, M – materials, m – factor price of materials. $P(X)*X = l*L + m*M$ – contribution revenue equals to total variable costs.

Utility maximization of management under the cost coverage constraint leads to the following Lagrange equation:

$$\Lambda = U(X(L, M), L) + \lambda(P(X)X - l*L - m*M), \text{ where } X = f(L, M) \quad (23)$$

$$\partial\Lambda/\partial X = U'(X) + \lambda(P'(X)*X + P) = 0 \quad (24)$$

$$\partial\Lambda/\partial L = U'(X)*X'(L) + U'(L) + \lambda(P'(X)*X'(L)*X + P*X'(L) - l) = 0 \quad (25)$$

$$\partial\Lambda/\partial M = U'(X)*X'(M) + \lambda(P'(X)*X'(M)*X + P*X'(M) - m) = 0 \quad (26)$$

$$\partial\Lambda/\partial\lambda = P(X)X - l*L - m*M = 0 \quad (27)$$

The first-order conditions reflect two optimality conditions. One concerns the equivalence of the relation of marginal utilities of marginal factor-inputs to the proportion of respective marginal profits caused by the factor contribution (28) and the other refers to the contribution rate under cost coverage (29).

$$\frac{U'(X)*X'(L) + U'(L)}{U'(X)*X'(M)} = \frac{P'(X)*X'(L)*X + P*X'(L) - l}{P'(X)*X'(M)*X + P*X'(M) - m} \quad (28)$$

$$P = \frac{l*L + m*M}{X} \quad (29)$$

¹⁴ For other possible kinds of utility functions, the author refers to the discussion in subchapter 2.3 devoted to the ‘Restrictions with respect to utility function’.

¹⁵ For other possible kinds of production functions, the author refers to the discussion in subchapter 2.3 devoted to the ‘Restrictions with respect to production function’.

Two optimality conditions are defined for point C in Figure 6 where the highest possible indifference curve touches a possible solution space, so that management utility is maximized in this point.

The model of current operation can be applicable for the analysis of how optimal solution changes under the condition that a lump-sum grant G from higher rank jurisdictions is introduced. If an FOCJ of type II receives a grant from a higher rank jurisdiction, the scope of financing of FOCJ of type II increases since turnover increases:

$$P(X) \cdot X + G = l L + m M \quad (30)$$

The first optimality condition stays the same, compared with the case without grant if G is a lump-sum grant. However, the second condition changes. The contribution fee for FOCJ members is deducted by G/X , which means that member municipalities will pay less membership fees because of the higher-rank grant (Friedrich, Chebotareva 2017; Chebotareva, Friedrich 2017):

$$P = \frac{l \cdot L + m \cdot M - G}{X} \quad (31)$$

The model of current operation considering a non-negotiable grant can be graphically illustrated by Figure 7:

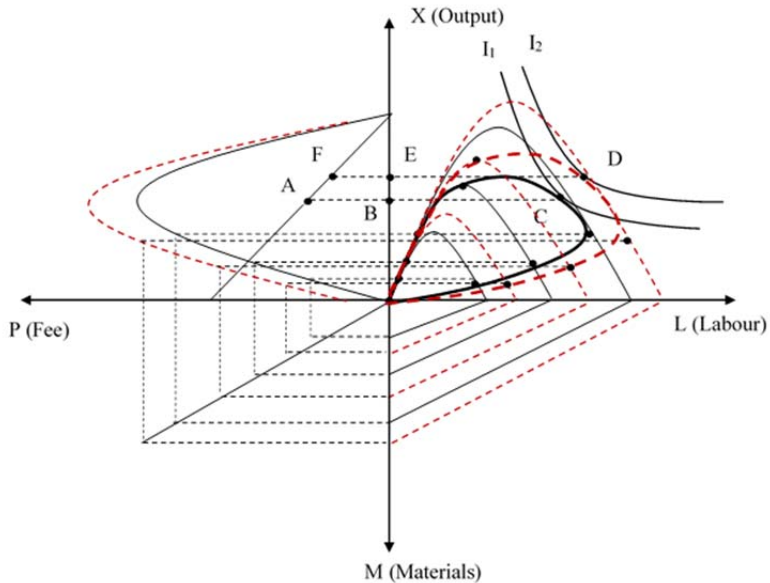


Figure 7. The model of the current operation of FOCJ of type II considering higher rank jurisdictions with a non-negotiable grant

Source: Compiled by the author based on Friedrich, Eckardt 2014; Friedrich, Chebotareva 2017; Chebotareva, Friedrich 2017.

In Figure 7, the turnover curve gets a push to the left to the size of the grant as long as there is a demand by clients (members). The budget lines move up to the right in parallel (red dotted lines in the fourth quadrant). The output-labour curve moves to the right and the solution space becomes bigger. The optimal solution moves from point C to D. The solution will be a smaller contribution (the contribution fee decreases from point A to F) and a larger service volume (from B to E). Such grants and subventions can be paid to the FOCJ of type II by a higher-level jurisdiction, other municipalities, private and public companies, or by the member municipalities (Friedrich, Chebotareva 2017).

The model of the current operation of FOCJ of type II considering different means of financing

This model is an extension of the basic model of current operation discussed above. Therefore, the assumptions stay the same. In particular, municipalities have to cover variable costs of current operation. There are two variable factors L and M and a factor finance F . Financial costs are also part of the total costs. These costs may be linked to special factor inputs in current production and treated as part of the factor prices, e.g., by special inventories, price conditions, waiting time costs, costs according to different policies of asset maintenance, etc. Some costs are due to the special financial conditions for ways of finance (Friedrich, Chebotareva 2017). Therefore, the production function is $X = f(L, M, F)$.

Special variable costs are from finance F if production time is influenced through production, procurement and delivery for which price f has to be paid. Special reserves are necessary to overcome difficulties f . The respective costs are $K_vF = (f + \hat{f}) * F$.

There are variable labour costs related to L , which are due to the amount of labour, the labour costs (price l) and that part of finance costs \hat{l} related specially to labour, such as fulfilling requirements with respect to labour guarantees, social expenses, etc. Thus, the relevant costs are $K_vL = (l + \hat{l}) * L$.

The variable costs for material and pre-services are linked to the material prices m , etc. and special financing to store and transport materials related to finance costs \hat{m} . The respective costs are $K_vM = (m + \hat{m}) * M$.

Therefore, the cost function reads as follows:

$$K_vF + K_vL + K_vM = (f + \hat{f}) * F + (l + \hat{l}) * L + (m + \hat{m}) * M \quad (32)$$

As costs should be covered through a levy, the contribution payment must equal these costs. The volume of services demanded from the FOCJ of type II depends on the contribution level.

$$P = P(X) \quad (33)$$

The amount to finance through the contribution equals:

$$P(X)*X = (f + F)*F + (1 + \hat{I})*L + (m + \eta)*M \quad (34)$$

Managements' utility function expresses the aims of FOCJ of type II depending on output and the volume of labour inputs.

$$U = U(X, L) \quad (35)$$

Management maximizes utility leading to the following Lagrange formulation:

$$\Lambda = U(X(L, M, F), L) - \lambda(P(X)*X - (f + F)*F - (1 + \hat{I})*L - (m + \eta)*M) \quad (36)$$

The first order conditions show:

$$\frac{\partial \Lambda}{\partial F} = \frac{\partial U}{\partial X} * \frac{\partial X}{\partial F} - \lambda \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial F} - (f + F) \right) = 0 \quad (37)$$

$$\frac{\partial \Lambda}{\partial L} = \frac{\partial U}{\partial X} * \frac{\partial X}{\partial L} + \frac{\partial U}{\partial L} - \lambda \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial L} - (1 + \hat{I}) \right) = 0 \quad (38)$$

$$\frac{\partial \Lambda}{\partial M} = \frac{\partial U}{\partial X} * \frac{\partial X}{\partial M} - \lambda \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial M} - (m + \eta) \right) = 0 \quad (39)$$

$$\frac{\partial \Lambda}{\partial \lambda} = P(X)*X - (f + F)*F - (1 + \hat{I})*L - (m + \eta)*M = 0 \quad (40)$$

Two basic financial optimality conditions result again. One concerns the input of production factors and implies the following financial guidelines: the relation between marginal utilities from changing finance and material marginally equals the relation of the marginal profits connected to finance and materials (41). The relation of marginal productivities equals the marginal profits that stem from the production factor variations (42).

$$\left(\frac{\partial U}{\partial X} * \frac{\partial X}{\partial F} \right) / \left(\frac{\partial U}{\partial X} * \frac{\partial X}{\partial M} \right) = \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial F} - (f + F) \right) / \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial M} - (m + \eta) \right) \quad (41)$$

$$\frac{\partial X}{\partial F} / \frac{\partial X}{\partial M} = \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial F} - (f + F) \right) / \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial M} - (m + \eta) \right) \quad (42)$$

For labour variation results: the relation between marginal utilities from changing finance and labour marginally equals the relation of the marginal profits connected to finance and labour.

$$\left(\frac{\partial U}{\partial X} * \frac{\partial X}{\partial F} \right) / \left(\frac{\partial U}{\partial X} * \frac{\partial X}{\partial L} + \frac{\partial U}{\partial L} \right) = \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial F} - (f + F) \right) / \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial L} - (1 + \hat{I}) \right)$$

(43)

The other financial optimality condition refers to the size of municipalities' fee that municipalities have to pay considering different means of financing. The contribution has to equal the average costs:

$$P = \frac{(f + \bar{f}) * F + (1 + \hat{I}) * L + (m + \hat{\eta}) * M}{X} \quad (44)$$

The finance conditions are reflected in the factor prices through F , \hat{I} , $\hat{\eta}$. If the size of finance-related factor prices changes with factor inputs because of F (F), \hat{I} (L) and, $\hat{\eta}$ (M), the optimal conditions are changing as well:

$$\frac{\partial \Lambda}{\partial F} = \frac{\partial U}{\partial X} * \frac{\partial X}{\partial F} - \lambda \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial F} - (f + \frac{\partial \bar{f}}{\partial F} * F + \bar{f}) \right) = 0 \quad (45)$$

$$\frac{\partial \Lambda}{\partial L} = \frac{\partial U}{\partial X} * \frac{\partial X}{\partial L} + \frac{\partial U}{\partial L} - \lambda \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial L} - (1 + \frac{\partial \hat{I}}{\partial L} * L + \hat{I}) \right) = 0 \quad (46)$$

$$\frac{\partial \Lambda}{\partial M} = \frac{\partial U}{\partial X} * \frac{\partial X}{\partial M} - \lambda \left(\left(\frac{\partial P}{\partial X} * X + P \right) * \frac{\partial X}{\partial M} - \left(\hat{\eta} + \frac{\partial \hat{\eta}}{\partial M} * M + \hat{\eta} \right) \right) = 0 \quad (47)$$

$$\frac{\partial \Lambda}{\partial \lambda} = P(X) * X - ((f + \bar{f}(F)) * F - (1 + \hat{I}(L)) * L - (m + \hat{\eta}(M)) * M) = 0 \quad (48)$$

A change in the financial parts of costs (factor prices) changes the relation of marginal utilities and marginal profits and therefore the inputs, outputs, and the levy (fee).

Effects of finance are demonstrated in different ways (see Figure 7). If the financing of variable costs become more expensive, that means F^*F , \hat{I}^*L , and $\hat{\eta}^*M$ grow and the budget curves shrink and move to the left at the labour or other variable factor axes. The output-labour curves shrink and the possible solution curve move inwards. The contribution increases and the service level decreases (Friedrich, Chebotareva 2017).

The model considering an active negotiating higher rank government

FOCJs of type II can also receive grants on the basis of negotiation with higher rank authorities (e.g. with regions or provinces in some countries) (Chebotareva, Friedrich 2017). By means of this grant the FOCJ of type II as well as donating higher-level jurisdictions maximize their utility. The regional government utility function depends on the X – FOCJ output and the size of conditional grant F . In the current case, the FOCJ of type II negotiates about grant F .

Therefore, the utility function¹⁶ of the higher rank jurisdiction (assume a region) is $U_R = g_{XL} * X - g_{FL} * F$ (49), where g_{XL} and g_{FL} are utility weights.

The utility of the FOCJ of type II depends on the amount of production X which in turn is implicitly influenced by the amount of the grant (F) and the grant as such, which emphasises the importance of the grant for the FOCJ of type II ($g_{FG} * F$ component):

$$U_{FOCJ} = (a - b * X)X + (a - b * X)X(F) + g_{FG} * F \quad (50)$$

where a , b – parameters, and g_{FG} – the value of one unit of grant F for the FOCJ of type II.

Both partners possess utility functions, which can be expressed with respect to the volume of services X and the grant F . For each negotiator a set of indifference curves, which gives a Pareto-optimal path of possible negotiation occurs (Friedrich, Gwiazda, Nam 2004). To determine the indifference curves of the region, the author differentiates the utility function of the region with respect to X and F :

$$dU_R = \frac{\partial U_R}{\partial X} dX + \frac{\partial U_R}{\partial F} dF = g_{XL} dX - g_{FL} dF = 0 \quad (51)$$

The author finds derivation of the utility curve of FOCJ of type II:

$$dU_G = \frac{\partial U_G}{\partial X} dX + \frac{\partial U_G}{\partial F} dF = (a - 2bX)dX + ((a - bX) \frac{\partial X}{\partial F} + g_{FG})dF = 0 \quad (52)$$

To identify Pareto solution, both sides of two equations (51) and (52) are divided over dX which results in (53) and (54):

$$g_{XL} - g_{FL} \frac{dF}{dX} = 0 \quad (53)$$

$$(a - 2bX)dX + ((a - bX) \frac{\partial X}{\partial F} + g_{FG})dF = 0 \quad (54)$$

For the sake of simplicity, in equation (54) the expression $\frac{\partial X}{\partial F}$ is substituted by

$$n: \quad \frac{\partial X}{\partial F} = n \quad (55)$$

From the equations (53) and (54) the author finds the relations $\frac{dF}{dX}$ as a condition for X_{pareto} identification:

¹⁶ For other possible kinds of utility functions, the author refers to the discussion in subchapter 2.3 devoted to the ‘Restrictions with respect to utility function’.

$$\frac{dF}{dX} = \frac{g_{XL}}{g_{FL}} \quad (56)$$

$$\frac{dF}{dX} = - \frac{a - 2bX}{(a - bX)n + g_{FG}} \quad (57)$$

In the point of indifference curves' tangency, their slopes are equal, therefore, the right parts of equations (56) and (57) must be equalised:

$$\frac{g_{XL}}{g_{FL}} = - \frac{a - 2bX}{(a - bX)n + g_{FG}} \quad (58)$$

and the Pareto solution is denoted:

$$X_{\text{Pareto}} = \frac{ag_{FL} + g_{XL}g_{FG} + ag_{XL}n}{2bg_{FL} + bg_{XL}n} \quad (59)$$

Next, Pareto optimal output (59) should be inserted into the utility functions of the region:

$$U_R = g_{XL} * \left(\frac{ag_{FL} + g_{XL}g_{FG} + ag_{XL}n}{2bg_{FL} + bg_{XL}n} \right) - g_{FL} * F \quad (60)$$

And into the utility function of the FOCJ of type II:

$$U_{\text{FOCJ}} = 2(a - b * \left(\frac{ag_{FL} + g_{XL}g_{FG} + ag_{XL}n}{2bg_{FL} + bg_{XL}n} \right)) \left(\frac{ag_{FL} + g_{XL}g_{FG} + ag_{XL}n}{2bg_{FL} + bg_{XL}n} \right) + g_{FG} * F \quad (61)$$

From the equation (61), the author isolates F :

$$F = \frac{- \frac{2(ag_{FL} - g_{XL}g_{FG})(g_{XL}g_{FG} + a(g_{FL} + g_{XL}n))}{b(2g_{FL} + g_{XL}n)^2} + U_{\text{FOCJ}}}{g_{FG}} \quad (62)$$

Then, received F (62) should be inserted in utility function of the region (60) which results in:

$$U_R = \frac{g_{XL}^3 g_{FG}^2 n + 2a^2 g_{FL}^2 (g_{FL} + g_{XL}n) + ag_{XL}g_{FG}(2g_{FL}^2 + g_{XL}g_{FL}n + g_{XL}^2 n^2) - bg_{FL}(2g_{FL} + g_{XL}n)^2 U_{\text{FOCJ}}}{bg_{FG}(2g_{FL} + g_{XL}n)^2} \quad (63)$$

Parameters of (63) can be rearranged, so that one can receive:

$$U_R = - \frac{g_{FL} U_{\text{FOCJ}}}{g_{FG}} + \frac{g_{XL}^3 g_{FG}^2 n + 2a^2 g_{FL}^2 (g_{FL} + g_{XL}n) + ag_{XL}g_{FG}(2g_{FL}^2 + g_{XL}g_{FL}n + g_{XL}^2 n^2)}{bg_{FG}(2g_{FL} + g_{XL}n)^2} \quad (64)$$

In the equation (64), the author assumes

$$\frac{g_{XL}^3 g_{FG}^2 n + 2a^2 g_{FL}^2 (g_{FL} + g_{XL} n) + a g_{XL} g_{FG} (2g_{FL}^2 + g_{XL} g_{FL} n + g_{XL}^2 n^2)}{b g_{FG} (2g_{FL} + g_{XL} n)^2} = \varphi \quad (65)$$

so that (64) can be modified:

$$U_R = - \frac{g_{FL} U_{FOCJ}}{g_{FG}} + \varphi \quad (66)$$

To find the negotiation solution, Nash product must be maximised considering the restriction (66) for the possible utility distribution between the region and the FOCJ.

$NP = (U_R - U_{Rmin}) * (U_{FOCJ} - U_{FOCJmin})$ – Nash product function, where U_{Rmin} denotes minimal utility level of higher rank jurisdiction, and $U_{FOCJmin}$ – minimal utility level of the FOCJ.

Implementing the Lagrange method, the Nash solution occurs:

$$Lag = (U_R - U_{Rmin}) * (U_{FOCJ} - U_{FOCJmin}) - \lambda (\varphi - U_R - \frac{g_{FL}}{g_{FG}} * U_{FOCJ}) \quad (67)$$

From the Lagrange function the first order conditions result:

$$\frac{\partial Lag}{\partial U_R} = U_{FOCJ} - U_{FOCJmin} + \lambda = 0, \rightarrow -\lambda = U_{FOCJ} - U_{FOCJmin} \quad (68)$$

$$\frac{\partial Lag}{\partial U_{FOCJ}} = U_R - U_{Rmin} + \lambda \frac{g_{FL}}{g_{FG}} = 0, \rightarrow -\lambda = \frac{g_{FG}}{g_{FL}} (U_R - U_{Rmin}) \quad (69)$$

$$\frac{\partial Lag}{\partial \lambda} = \varphi - U_R - \frac{g_{FL}}{g_{FG}} * U_{FOCJ} = 0 \quad (70)$$

From (68) and (69) follows that if the left sides are equal, the right sides should be equal as well:

$$U_{FOCJ} - U_{FOCJmin} = \frac{g_{FG}}{g_{FL}} (U_R - U_{Rmin}) \quad (71)$$

From (71) U_{FOCJ} should be isolated:

$$U_{FOCJ} = \frac{g_{FG}}{g_{FL}} (U_R - U_{Rmin}) + U_{FOCJmin} \quad (72)$$

And inserted in the first order condition (70):

$$\varphi - U_R - \frac{g_{FL}}{g_{FG}} * \left(\frac{g_{FG}}{g_{FL}} (U_R - U_{Rmin}) + U_{FOCJmin} \right) = 0 \quad (73)$$

Simplification of equation (73) provides the Nash utility of the region:

$$U_{RNash} = \frac{\varphi + U_{Rmin} - \frac{g_{FL}}{g_{FG}} U_{FOCJmin}}{2} \quad (74)$$

From the first order conditions (68)-(70) the same sequence of steps should be made to obtain the FOCJ Nash utility, which is

$$U_{FOCJNash} = \frac{\frac{g_{FG}}{g_{FL}} \varphi + U_{Gmin} - \frac{g_{FG}}{g_{FL}} U_{Rmin}}{2} \quad (75)$$

In order to find the solution for grant F as a result of negotiations, Nash utility of the region (74) should be inserted in the initial utility function of the region (49) instead of the initial U_R , or Nash utility of the FOCJ of type II (75) should be similarly inserted in the initial utility function of the FOCJ of type II (50) instead of U_{FOCJ} considering output (59). For the sake of simplicity, the author finds F through the regional utility function:

$$\frac{\Phi + U_{Rmin} - \frac{g_{FL}}{g_{FG}} U_{FOCJmin}}{2} = g_{XL} * \left(\frac{a g_{FL} + g_{XL} g_{FG} + a g_{XL} n}{2 b g_{FL} + b g_{XL} n} \right) - g_{FL} * F \quad (76)$$

After all possible simplifications¹⁷ and isolation of F from the formula (76), the following solution has been received:

$$F = \frac{4 g_{XL}^2 g_{FL} g_{FG}^2 + g_{XL}^3 g_{FG}^2 n - 2 a^2 g_{FL}^2 (g_{FL} + g_{XL} n) + a g_{XL} g_{FG} (2 g_{FL}^2 + 5 g_{XL} g_{FL} n + g_{XL}^2 n^2)}{2 b g_{FL} g_{FG} (2 g_{FL} + g_{XL} n)^2} + \frac{4 b g_{FL}^3 U_{FOCJmin} + 4 b g_{XL} g_{FL}^2 n U_{FOCJmin} + b g_{XL}^2 g_{FL} n^2 U_{FOCJmin} - b g_{FL} (2 g_{FL} + g_{XL} n)^2 U_{Rmin}}{2 b g_{FL} g_{FG} (2 g_{FL} + g_{XL} n)^2} \quad (77)$$

From these results, a negotiation solution is determined according to Nash for a cooperative non-zero-sum game. As long as the output is not dependent technically on F , the output gets fixed and the size of F is determined. If the evaluation of the FOCJ of type II also depends on the output increase allowed by the grant, there is a solution where output volume depends on the evaluation of the grant, the evaluation of additional output allowed by the grant and the evaluation of the negotiating partners of the output (see formula 59).

The amount of the grant F resulting from negotiations is determined by this output, the minimum utilities of the negotiators and the parameters of the evaluation functions. It is reflected by the formula (77).

From the solution obtained for F and X , we can see that with the higher grant induced, the evaluation of the additional output by the FOCJ management, the

¹⁷ Calculation of the grant size has been possible with the help of Wolfram Mathematica software.

volume of X and the size of F will increase. Formula (77) shows that if the FOCJ of type II minimal utility level grows, the grant F increases as well. However, an increase in the minimum utility of the region will affect the grant size negatively. The increase in the value of one grant unit for the FOCJ of type II (g_{FG}) positively influences the grant F . For more conclusions, additional calculations may be done.

The model of FOCJ of type II competition for members considering higher rank jurisdictions with a non-negotiable grant

The basic model of FOCJ of type II competition for members illustrates the distribution of members between two already established and competing FOCJs of type II (Friedrich, Eckardt 2014; Friedrich, Chebotareva 2017; Chebotareva, Friedrich 2017). The net-benefit of FOCJ members increases until a particular point when one additional member, who before this point took part in cost reduction, now entails declining utility for other member-participants. Hence, there is an optimal size for an FOCJ of type II. And if the size grows, it leads to congestion of the FOCJ of type II and a decrease in the quality of services provided. A net-benefit to a member results from the service and the contribution paid. For one FOCJ of type II this net-benefit is reflected in curve TL in Figure 8 in the left-hand section. The middle graph shows the situation for the competing FOCJ of type II (KP). Left of assignment G it makes no sense for possible members of the FOCJ1 to stay with FOCJ2. The same is true for possible members of FOCJ2 right of point G. Therefore, the size of FOCJ1 turns out to be N_1 and that of FOCJ2 is N_2 (Friedrich, Reiljan 2011; Friedrich, Eckardt 2014).

The two or more FOCJs of type II can also receive grants from other jurisdictions including higher rank jurisdictions (Chebotareva, Friedrich 2017). If the amount of grant is equal for both competing FOCJs of type II, then curves TL and KP move up, and the new allocation point G_1 does not change the distribution of members among FOCJs of type II. The members of both FOCJs of type II will just have higher net-benefit than before receiving the grant (see Figure 8). The members still choose that FOCJ of type II which allows the highest net-benefit.

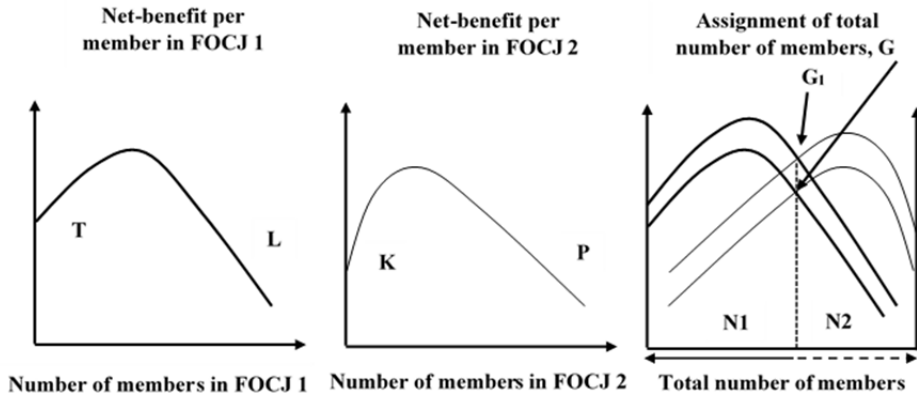


Figure 8. Distribution of FOCJ members when both FOCJs of type II receive equal grant
 Source: Compiled by the author based on Friedrich 2006; Friedrich, Eckardt 2014; Chebotareva, Friedrich 2017.

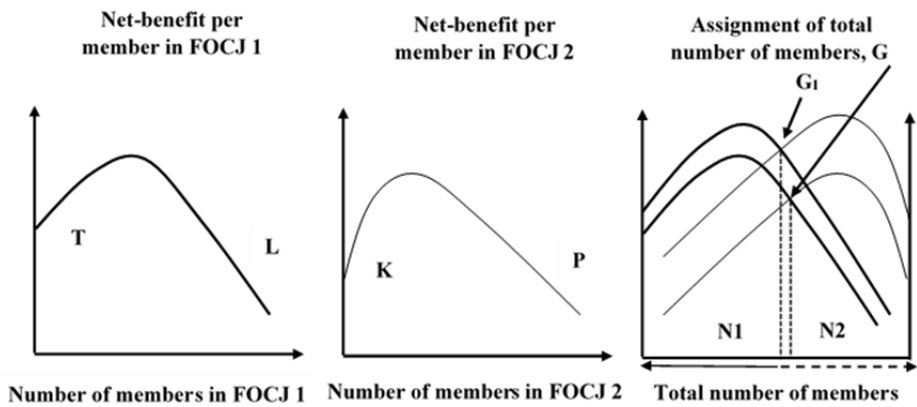


Figure 9. Distribution of FOCJ members when FOCJ2 of type II receives bigger grant
 Source: Compiled by the author based on Friedrich 2006; Friedrich, Eckardt 2014; Chebotareva, Friedrich 2017.

If one of the competing municipalities receives (for example, FOCJ2) a bigger grant, then the net-benefit curve moves up again, but with different distance. A new allocation of point G_1 appears (Figure 9). In the far-right hand picture, the crossing point of the two optimal net-benefit curves reflects the resulting allocation of members to the two FOCJs of type II. For some FOCJ1 members, FOCJ2 gives a higher net-benefit. Hence, the distribution of members between the two FOCJs of type II has changed. A similar result occurs when, for example, FOCJ2 gets a grant, but FOCJ1 does not have one. In this case, more FOCJ1 members are willing to change their service provider in favour of FOCJ2, since they will perceive higher net-benefit.

The model of FOCJ of type II competition for members considering different means of financing

The two FOCJs of type II can also apply different financial policies (Friedrich, Chebotareva 2017). For example, the first FOCJ of type II may practice financing through contributions, and the second one through a mix of fees and public debt. Now, the curve TL reflects financing by members' contributions while the curve KP refers to the mix of fees and debt financing. The different ways of FOCJ of type II financing determines the allocation point G in Figure 10.

For each financial policy, one can draw a net-benefit curve for members. The financial policies can be different or the same in the two FOCJs of type II. The members still choose that FOCJ of type II which allows the highest net-benefit. In Figure 10 in the left-hand part of the picture the two curves depicted do not cross. The potential FOCJ members decide following the higher curve. The same is true with the second FOCJ of type II. If more advantageous financial policies are available, the allocation point G results. If only less advantageous financial opportunities are possible, point M is the solution in the right section graph.

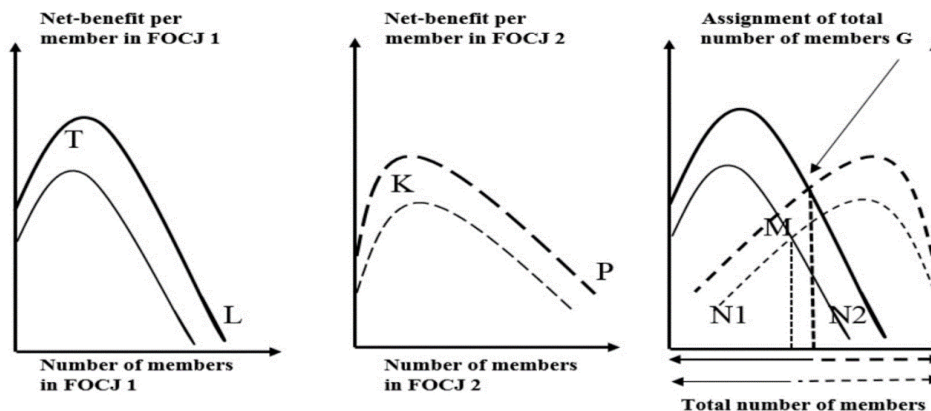


Figure 10. Distribution of FOCJ members in case of different financial policies
Source: Friedrich 2006; Friedrich, Eckardt 2014; Friedrich, Chebotareva 2017.

If many financial policies are available and the net-benefit curves cross with respect to one FOCJ of type II, then the curves between the crossing points must be compared. The curves of highest net benefit between the crossing points show the most favourable financial policy. A curve of optimal financing results for the respective FOCJ. For the other FOCJ of type II a similar construction of the optimal financing curve takes place. The optimal finance curves are transferred into the far-right hand picture. The crossing point of the two optimal curves reflects the resulting allocation of members to the two FOCJs of type II

and the related optimal financial policy (see Figure 11). A change in financing conditions will vary the net-benefit curves. In all three cases new allocation points appear.

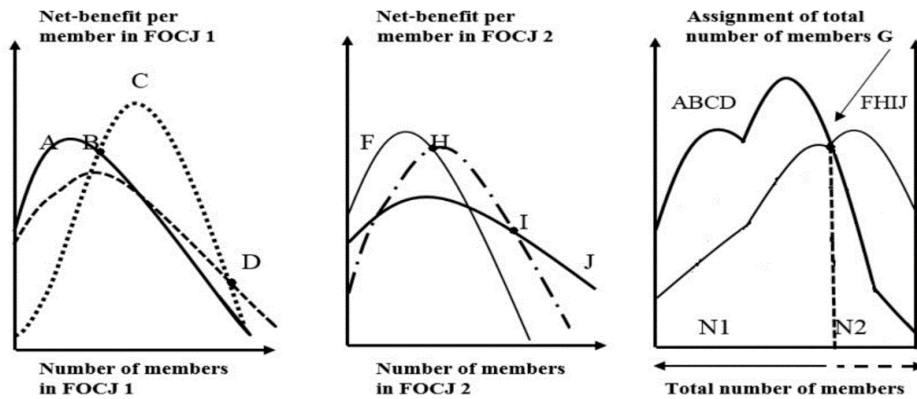


Figure 11. Distribution of FOCJ members in case of different financial policies, crossing net-benefit curves and adjustment curves ABCD and FHIJ
Source: Friedrich 2006; Friedrich, Eckardt 2014; Friedrich, Chebotareva 2017.

A given number of possible FOCJ of type II members should be allocated between two FOCJs of type II according to the following microeconomic finance FOCJ principles. If the FOCJs of type II are ordered by the net benefits per member, which stem from optimal finance of FOCJs (member sizes), the split between the two FOCJs of type II is determined by the member size of equal net benefit per member.

2.2. Modelling of FOCJ management behaviour in monopoly and oligopoly

The model of current operation of FOCJs of type II can be used for the analysis of production results considering the different behaviour of management defined by their goals. Classically, it is assumed that the management's main goal is profit maximisation (Cournot 1838; Krelle 1961). However, this is not always the case. For example, Baumol (1959) as well as other authors (Mert 2018; Zabochnik 1998; Sklivas 1987) claim that a firm maximises its sales or turnover. Due to the split of the managerial and ownership functions, management is supposed to have aims that differ from the profit maximisation of owners. The management of corporations most likely maximise sales, since this assures the higher salaries of personnel whose interests top managers aim to satisfy. Additionally, decisions on price in the company are justified by prioritising its objectives rather than following the "simple concept of profit maximisation" (Lanzillotti 1958: 939).

Williamson (1964) investigated the model of managerial discretion where he assumed that management in corporations maximise utility depending on their own objectives and not the utility of stakeholders. Hence, profit maximisation might not necessarily be an objective of management in corporations; sometimes they only want to receive the minimum level of profit, which guarantees their position (Marris 1964).

The objectives of top management may be power, influence, prestige, security, success and self-realisation as well as the formal objective of financial remuneration (Heinen 1966; Lingnau, Härtel 2014: 18). The idea that managers have their own purposes, which are different from cost minimisation, has become a reason for X-inefficiency (Leibenstein 1966).

The principal-agent problem of firms is also rooted in principals (owners) and agents' (management of a firm) difference of interests, which was discussed, for example, by Jensen and Meckling (1976); Tirole (2006); Ross (1973); Myerson (1982); etc.

The game-theoretical approach to the management utility function resulting in the Condorcet paradox is implemented in Machina (1987). The external competitive conditions of companies affect the internal incentives of management, leading them away from classical profit maximisation for strategic reasons, as in Fershtman and Judd (1987).

There is also a flow of literature devoted to the goals of public enterprises (e.g. Moore 2013; Thiemeyer 1975; Peltzman 1971; Meynhardt 2015; Bozeman 2007). The management of public enterprises should aim to achieve some public goals. However, even in public enterprises, the personal goals of management may still shape their utility function. In general, the utility function of the management of public enterprises can reflect different objectives, such as:

- personal goals (Williamson 1964, Leibenstein 1966);
- public goals operationalised by FOCJ II managers (Thiemeyer 1975; Parts 2010);
- public goals set by public bodies, e.g. assembly of FOCJ members, higher rank government (Thiemeyer 1975; Ploom, Haldma 2013; Matzembacher, Raudsaar, Mets 2019);
- operationalisation of public interests (Bozeman 2007);
- idea on the common good (*bonum commune*) in the interpretation of management (Diggs 1973);
- mission of the FOCJ (Hill, Jones, Schilling 2014);
- perception of public welfare (Graaff 1963; Bös 1981, 1986; Blankart 1980, Rees 2006);
- perception of management determined by the general ideas of good management in the sector (Rainey 1989);
- leading idea of a management concept (Skidmore 2006; Friedrich, Ukrainski, Timpman 2014);
- public value (Moore 1995, 2013), etc.

Since FOCJs of type II are public enterprises, FOCJ management may possess utility functions which include public as well as private components, such as output; labour and output; labour input; profit maximisation; labour and profit (Friedrich, Feng 2000; Feng, Friedrich 2013; Dehne, Friedrich, Nam 2009: 10–11; Friedrich, Kaltschütz, Nam 2004: 22). Similar to Friedrich, Ukrainski and Timpmann 2014, the author assumes that the management of FOCJs maximise their utility, which depends on output and labour as is shown in Table 4. The objectives of FOCJ management are linked to output and labour and reflected in the form of applied utility functions. For the discussion of the form of the utility function, turn to subchapter 2.3.

Table 4. FOCJ of type II management utility functions: four Cases

	Maximization	
	Output	Labour
Case I	+	+
Case II	+	
Case III		+
Case IV	-	+

Source: Compiled by the author.

FOCJ of type II management evaluates:

- 1) output and labour input positively $X*L^\beta$ - Case I.
- 2) only output positively $\gamma*X$ - Case II.
- 3) only labour input positively $\delta*L$ - Case III.
- 4) labour positively and output negatively $\alpha L - X + \beta$ - Case IV.

The author is modelling management behaviour on the current operation stage in monopoly as well as in oligopoly,¹⁸ considering four cases of management behaviour and looking for a Launhardt-Hotelling solution (Launhardt 1885; Hotelling 1929) and Krelle-Ott spaces (see Krelle 1961, Ott 1970).

In the model, only two FOCJs of type II are involved. Hence, for simplicity, a duopoly is under observation here. Compared with a perfect competition or monopoly, the reaction of firms to the action of a competitor is important in oligopolistic markets. Additionally, the different behavioural assumptions of duopolists result in several models for oligopolistic markets (Varian 1992: 447). They may act autonomously¹⁹ as in the Cournot model (Cournot 1838), where production volumes are used as parameters of actions (strategic variables). In

¹⁸ Oligopoly is one of the forms of market structures that is characterized by a relatively small number of competitors, who can influence the market price. Oligopoly, which has only two competitors, is called ‘duopoly’ (Varian 2010).

¹⁹ The autonomous behaviour means that if one FOCJ decides to change their service fee, they do not consider the reaction of their rival (another FOCJ).

the Cournot model, it is assumed that when a rival chooses the output to produce, they select the output which maximises their profit without considering the production plans of another duopolist (Varian 1992: 262). Autonomous behaviour is also assumed in the Bertrand model of price competition between oligopolists (Bertrand 1883) and in the Edgeworth model (Edgeworth 1925). In the Launhardt-Hotelling model, where the parameter of action is the price, autonomous behaviour is assumed as well (Launhardt 1885, Hotelling 1929, Dos Santos Ferreira 1998).

Furthermore, other behaviour leads to different oligopoly models, such as the Stackelberg leader-follower model where one firm (leader) makes a decision regarding its production volume before another (follower) (Stackelberg 2011). On the behaviour of duopolists, Bowley (1924) describes that a firm in the oligopolistic market believes that the price it chooses affects the prices selected by the rivals and takes this into consideration (Friedman 1983: 106). In the Ragnar Frisch model, it is assumed that one competitor always reacts by the same percentage to the parameter change of another competitor (Frisch 1933).

Other behaviours relate to negotiations between competitors on solutions with compensations. They may end up in the solution where they maximise joint profit and compensate profit loss for others (Krelle 1961: 284). In her thesis, the author assumes the autonomous behaviour of two FOCJs of type II, FOCJ1 and FOCJ2, which manipulate fees for their services as parameters of action.

Moreover, the oligopoly models can also be classified according to the main objectives of competitors, e.g. profit maximisation, volume (production) maximisation (Krelle 1961), revenue maximisation, utility maximisation (Friedrich 1978). Most oligopoly models deal with profit maximisation. Krelle introduced a special behaviour of competitors. The competitor reacts to the action of their rival only if the rival tries to force them into a situation where they lose profit. If a competitor is not pushed into a situation with lower profit, they do not react. This is a short description of the Krelle model under the specifications of Ott (1970), which is used in this thesis.

Developing a FOCJ of type II oligopolistic model, the author is stemming from a monopoly situation. In Figure 6 of subchapter 2.1, only one case of utility maximisation is illustrated. The management of this monopoly maximises output and labour, its utility function depends on both parameters: $U(X, L)$. However, other solutions are also possible depending on the case of management behaviour:

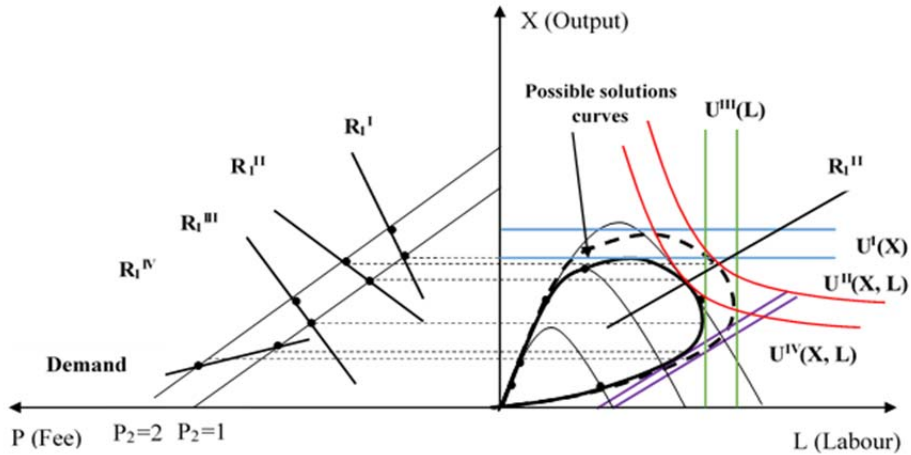


Figure 12. Utility maximization of four cases of FOCJ of type II management behaviour
 Source: Compiled by the author.

In Figure 12, the monopoly situation is transformed for the needs of oligopolistic market but illustrates the situation for only one FOCJ of type II considering four cases of management behaviour. In the first case, $U^I(X, L)$, the FOCJ management utility function depends on output X and labour input L ; they maximise both. If the indifference curves in the first quadrant are horizontal, this means that FOCJ management aims to maximise the firm output X ($U^I(X)$). The indifference curves of the third case of FOCJ management behaviour ($U^{III}(L)$) reflect the utility, which is dependent on labour, and are parallel to the output axis in Figure 12. The fourth case of management behaviour, $U^{IV}(-X, +L)$, shows that the management is willing to produce more only if it applies more labour. In other words, if the management of case four has to produce more, it is less satisfied unless it has more labour. The optimal solution can be found for all four cases where the highest indifference curve touches the space of possible solutions in the first quadrant.

In Figure 12, the higher demand curve in the second quadrant corresponds to the higher possible solution curve (dotted line in the first quadrant) related to higher costs and, as a result, higher revenue in the second quadrant, which is omitted here. The points at which the indifference lines of the second management type touch the possible solution space give a reaction line of FOCJ of type II one (R_1^{II}), which connect all of the points of management utility maximisation. This reaction line R_1^{II} is transmitted to the second quadrant with respect to a different demand level. Moreover, the demand curves of the first FOCJ of type II given the price of the second FOCJ of type II are shown in the second quadrant. The same sequence of steps can be taken for the first, third and fourth types of management, which result in reaction lines R_1^I , R_1^{III} , and R_1^{IV} in the second quadrant.

The difference of the current work from the other oligopolistic models, such as Krelle, is that the author is going to maximise the utility of FOCJ of type II, not profit. The utility approach is combined with Launhardt-Hotelling autonomous behaviour and Krelle behaviour, as is shown in Table 5. Moreover, a special case of utility maximisation related to the volume of production is introduced in the first column of Table 5. If utility is dependent on labour and output, another case appears in the second column. In the second column, there is one case where the utility increases if labour and output become larger (Case II), whereas in another case, utility is only increased if the management is compensated by higher labour (Case IV). Finally, if management utility depends only on labour, this case is marked in the third column.

Table 5. Theoretical framework of FOCJ of type II modelling

	U(X) Management of Case I	U(X, L) Management of Case II and IV	U(L) Management of Case III
Autonomous behaviour	Launhardt-Hotelling model if utility depends on output X.	Launhardt-Hotelling model if utility depends on output X and labour input L.	Launhardt-Hotelling model if utility depends on L.
Krelle behaviour	Krelle model if utility depends on output X.	Krelle model if utility depends on output X and L.	Krelle model if utility depends on L.

Source: Compiled by the author.

To sum up, the following assumptions are implemented as a basis:

- There are only two FOCJs of type II in the market and they provide heterogeneous services.
- It is a non-cooperative game.
- The costs are fully covered by FOCJ of type II in oligopoly as well as in the monopoly case.
- For the sake of simplicity, demand functions have a linear form.
- Firms select fees for their services independently.
- Consumers prefer cheaper services.
- For determining an equilibrium, it is a static model. For explaining the steps of adaptation, it is a dynamic model.
- The fee (price) is the parameter of action.
- Utility of FOCJ of type II management is maximised here.

There are two assumptions about competitors' behaviour:

- Competitors act autonomously (behaviour according to the Launhardt-Hotelling model).

- If FOCJ one changes its product price, the competitors react only if they lose utility in the new market situation after the action (behaviour according to Krelle).

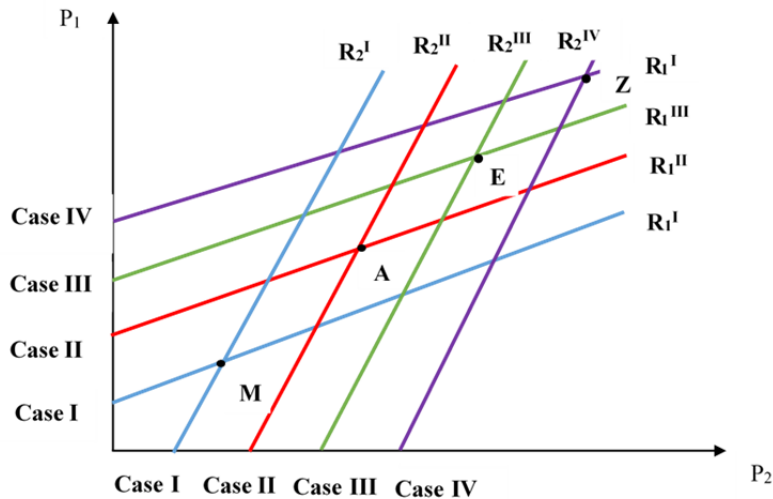


Figure 13. Reaction lines of two FOCJs of type II with respect to four cases of management behaviour

Source: Schematically compiled by the author.

The reaction line shows a combination of fees p_1 and p_2 such that each fee combination maximises utility under the other FOCJ of type II's fee choice. Graphically, the reaction lines, which have been identified in algebraic form for the cases, can be schematically illustrated in Figure 13. Hence, 16 points of intersection appear. This means that there can be interactions between FOCJs of type II with the same case of management behaviour (e.g. Case I and Case I) or with a different case of management behaviour (e.g. Case I management of the first FOCJ of type II and Case II of the second one). However, the author calculates combinations of p_1 and p_2 only with the same case of management behaviour (crossing points of reaction lines of the same colour).

Launhardt-Hotelling model in utilities

In this model, instead of isoprofit curves, isoutility curves are used since the FOCJ of type II is not interested in profit, but in maximisation of management utility under the condition of full cost coverage. Isoutilities (or equal utility curves) show the combination of FOCJ of type II fees (p_1, p_2) that guarantee a duopolist (one FOCJ of type II) the same amount of utility (moving along u_1 means that FOCJ management has equal utility in each point on u_1 curve). For a given utility achieved e.g. corresponding to point A in Figure 14, an isoutility

curve exists, which is represented by an average utility curve in the second quadrant of Figure 14. The respective (p_1, p_2) points of the utility are found by connecting the points between the demand curve and the average utility curve in the second quadrant. The isoutility curves are shown in the first quadrant of the Figure 14 result. The closer to the price axis an isoutility curve of the corresponding FOCJ of type II lies, the lower the level of equal utility it reflects. The reaction curve of the FOCJ1 of type II demonstrates its reaction on the changes in the service fee of the duopolist 2. Similarly, a set of isoutility curves and a reaction line are constructed for the second FOCJ of type II.

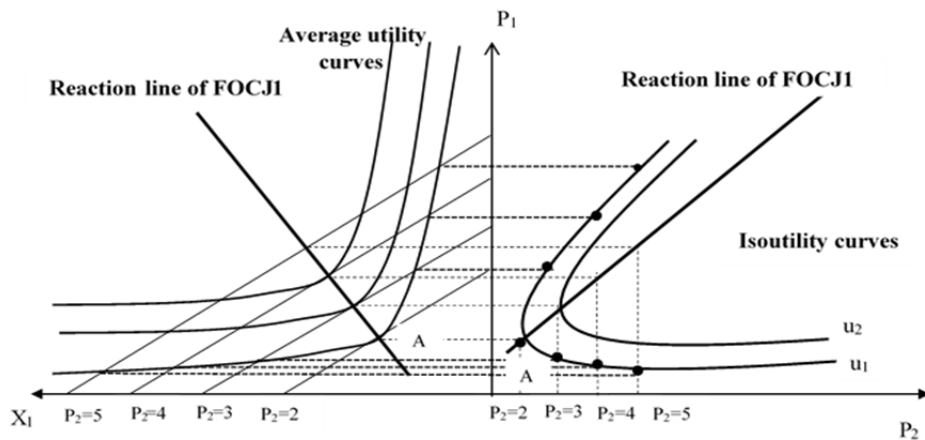


Figure 14. Isoutility and average utility curves of one FOCJ of type II
Source: Compiled by the author.

Figure 15 shows the Launhardt-Hotelling solution in prices (fees) and the referred isoutility curves. The management of both FOCJs of type II maximise their utility if they behave autonomously. In the first quadrant, isoutility curves are constructed for both FOCJs of type II, similar to Figure 14 for only one of them. The reaction lines are transmitted from the second quadrant for the first FOCJ of type II and from the fourth quadrant for the second FOCJ of type II. Point A where the reaction lines overlap gives the solution according to the autonomous behaviour of the Launhardt-Hotelling model. However, the isoutility curves overlapping in the first quadrant result in the solution area according to Krelle (see Figure 20 further on).

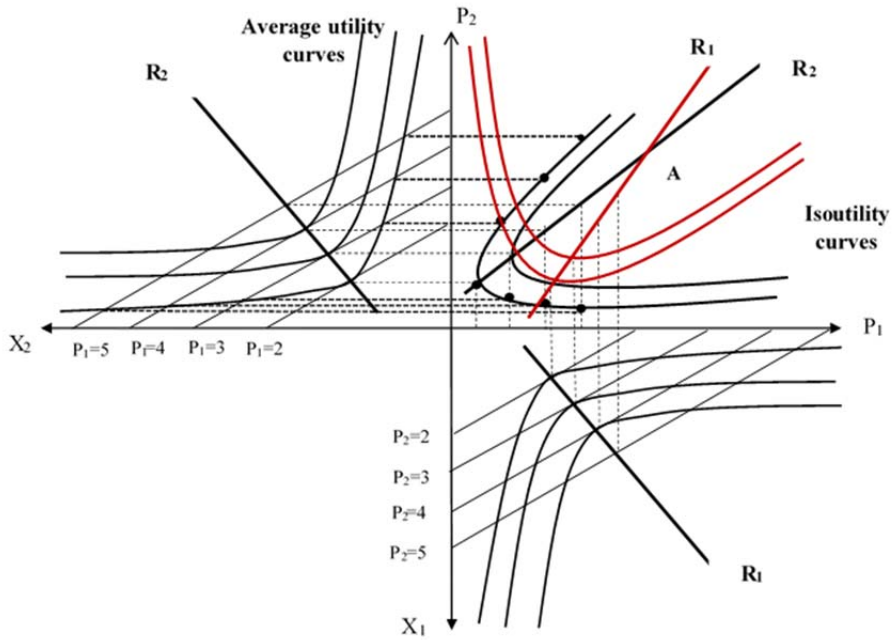


Figure 15. Isoutility and average utility curves of two FOCJs of type II
 Source: Compiled by the author.

Behind the Launhardt-Hotelling model with autonomous behaviour, the following steps of adaptation can be formulated when some dynamics become feasible.

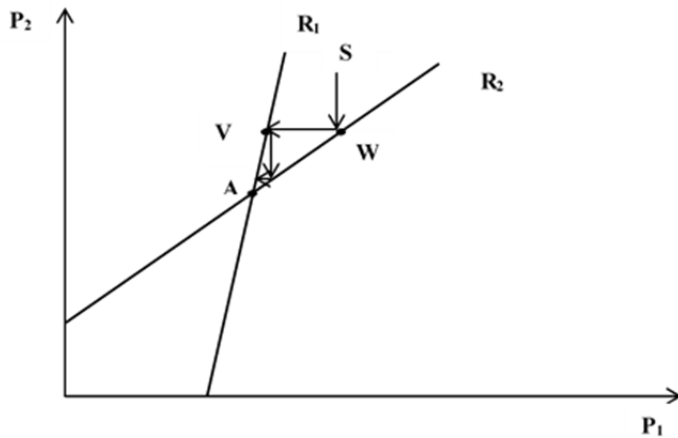


Figure 16. The process of adaptation and equilibrium identification in the Launhardt-Hotelling model
 Source: Compiled by the author.

If two FOCJs of type II have realised the fee combinations p_1, p_2 characterised by point S in Figure 16, and FOCJ2 is looking for an action to change the fee, FOCJ2 move from point S to point W to the reaction line where its utility is maximised. But then FOCJ1 reacts by moving its fee to the fee in point V to maximise its utility. Then FOCJ2 reacts by moving to its reaction line again until they reach equilibrium point A.

The implementation of the Launhardt-Hotelling model to the condition of FOCJ allows identification of FOCJ fees p_1 and p_2 where the oligopolistic market with two firms reaches its equilibrium under the condition of full cost coverage. Moreover, the combination of these fees varies depending on the case of management behaviour each FOCJ of type II possesses.

It is possible that FOCJs of type II might not reach the Launhardt-Hotelling solution, for example, for external reasons or owner interventions. If they do, they do not realise cost coverage. Hence, they might realise a profit that contradicts the initial features of the FOCJ of type II. If such situations appear, the management can try to hide the profit using an appropriate cost accounting approach, by considering the municipality's costs as the FOCJ's costs or by referring the costs of one product to another one if the FOCJ of type II produces different goods in order to equalise turnover and costs artificially. To avoid this situation, a special restriction in the institutional environment of a country must be introduced, e.g. by the rules stated in laws and Statutes.

With the Launhardt-Hotelling model, it is possible to find out how the management acts on factor markets; what happens if it changes the employment level L . Different Launhardt-Hotelling solutions for different qualities of production can be compared based on the resultant fees and utility. Moreover, this model can analyse how restrictions on factors and output, and also subsidies, can change the solution.

Krelle-Ott model in utilities

Krelle questions autonomous behaviour and introduces his assumption of oligopolist behaviour. He assumes the following behaviour of competitors: if by an external effect or market adaptation, a combination of fees p_1 and p_2 is characterised by point H results, competitor 2 decides to increase their utility by moving from point H to point N down with the fee p_2 until they reach higher isoutility curve $U = 20$. However, Ott suggests that if competitor 2 goes down with their price, then they should move further down to their utility maximising line R_2 until point G, as shown in Figure 17. Therefore, the author follows the assumptions of Krelle behaviour under Ott specifications. However, Krelle and Ott aimed to maximise not utility, but profit, and instead of isoutility curves, isoprofits were analysed.

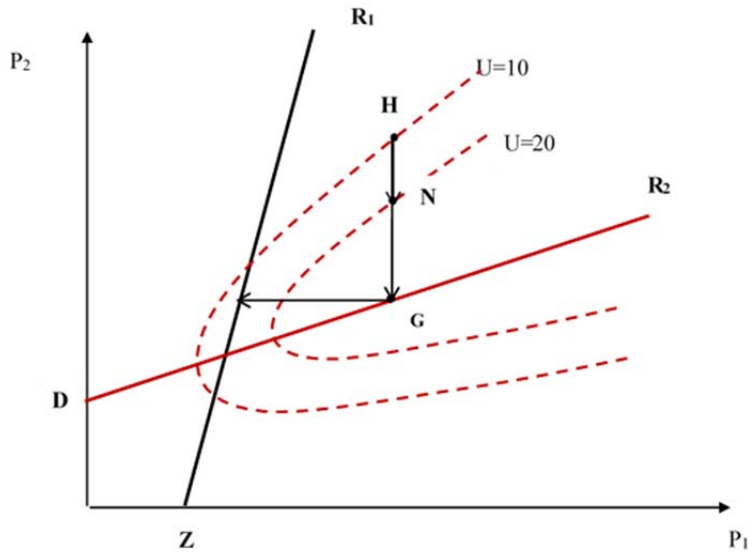


Figure 17. Krelle and Ott behavioural assumptions
Source: Compiled by the author.

If FOCJ2 of type II starts moving from point N up, where its utility according to schematics is 5 (see Figure 18) until its reaction function according to Krelle-Ott behavioural assumptions, a countermovement of FOCJ1 of type II that also moves to its own reaction line (thick black line in Figure 18) will bring FOCJ2 to a better situation with a higher utility $U = 10$ compared with the initial position in point N. If the movement of FOCJ2 starts from point Z, it again ends up in a situation with a higher utility than before initiating a movement, and there will be a similar result if it starts from point Q. However, if FOCJ2 of type II decreases its fee from point H moving towards its reaction function downwards, then the reaction of FOCJ2 will push FOCJ2 to the isocost curve with a lower level of utility as shown with the arrows from point H. The same will happen if FOCJ2 starts moving from point K increasing its fee until the maximum preferable fee is reached. Hence, there is an area in Figure 18 where FOCJ2 prefers not to move with the price at all because it will only lose. This is the area DGSTE.

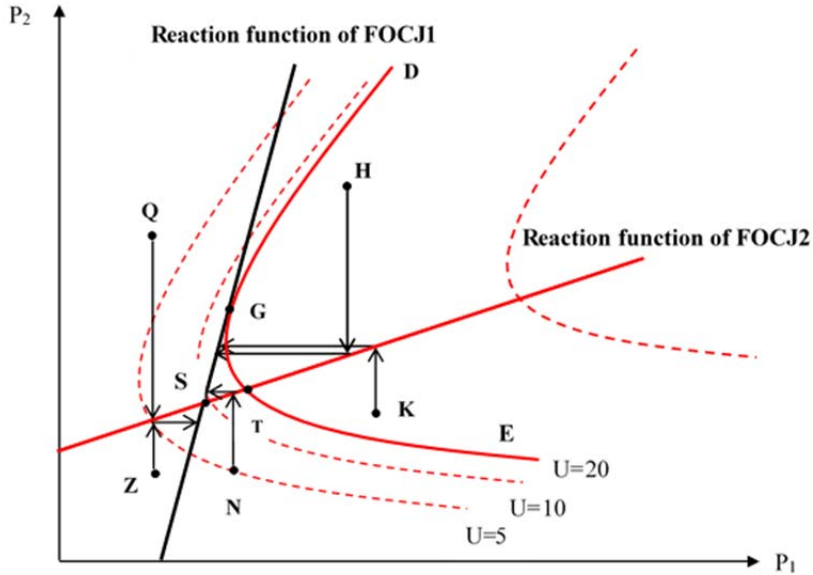


Figure 18. Schematically: the Krelle-Ott area for FOCJ2 of type II
 Source: Compiled by the author.

For FOCJ1 of type II, the Krelle-Ott space can be identified following the same logic as FOCJ2 of type II. Starting from point C in Figure 19, FOCJ1 moves towards its reaction function in the direction of fee decrease because FOCJ1 wants to achieve a higher utility level. The reaction of FOCJ2, according to the Krelle-Ott assumption, will be to move to the FOCJ2 reaction line, also aiming at a higher utility. Then, FOCJ1 increases its utility from 5 to 10 and improves its position compared with the initial situation. If FOCJ1 increases the fee stemming from points R or F to its reaction line, the countermovement of FOCJ2 will bring FOCJ1 to a better position with a higher utility level. However, if FOCJ1 decreases the fee from point J, it will lose utility as a result of the FOCJ2 reaction and reach a level of utility lower than 20, which was previously higher. The same situation occurs when FOCJ1 moves from point Y to its reaction line as shown with the arrows. Hence, there is a particular area formed by the highest possible isoutily curve of FOCJ1 that touches the reaction function of FOCJ2 and the reaction line of FOCJ1, namely the AOSWB area, where FOCJ1 is not willing to move.

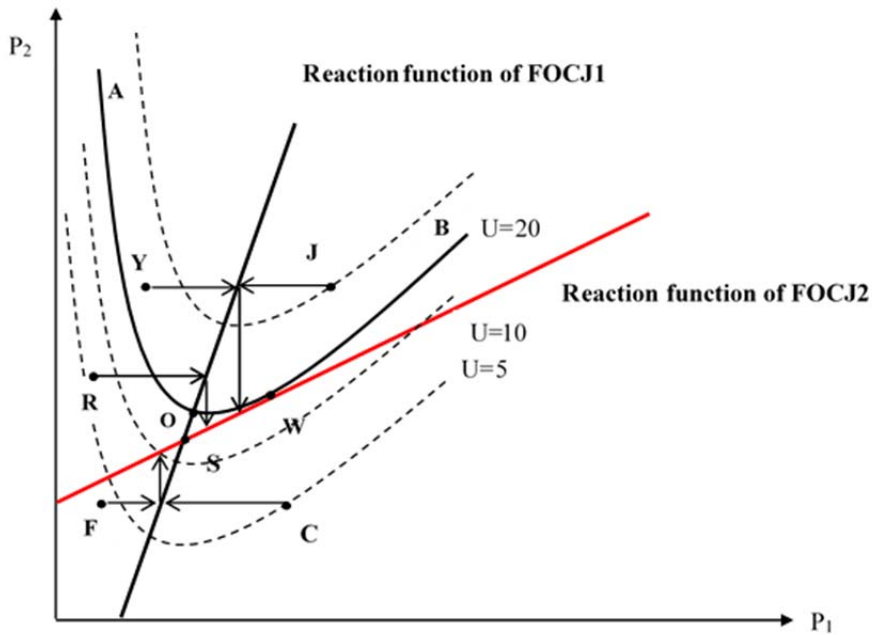


Figure 19. Schematically: the Krelle-Ott area for FOCJ1 of type II
 Source: Compiled by the author.

Therefore, there are two regions, DGSTE for FOCJ2 and AOSWB for FOCJ1, where they do not move in either the direction of fee increase or decrease. Both regions overlap, hence the area SGIW in Figure 20 where the non-fee-change regions cross appears. If the two FOCJs of type II end up by adaptation or external influences in this area, they do not react anymore. Therefore, a region of fees p_1 and p_2 where the fees are not changed by the FOCJs of type II can exist. The SGIW area is also calculated algebraically for four cases of management behaviour further in the text.

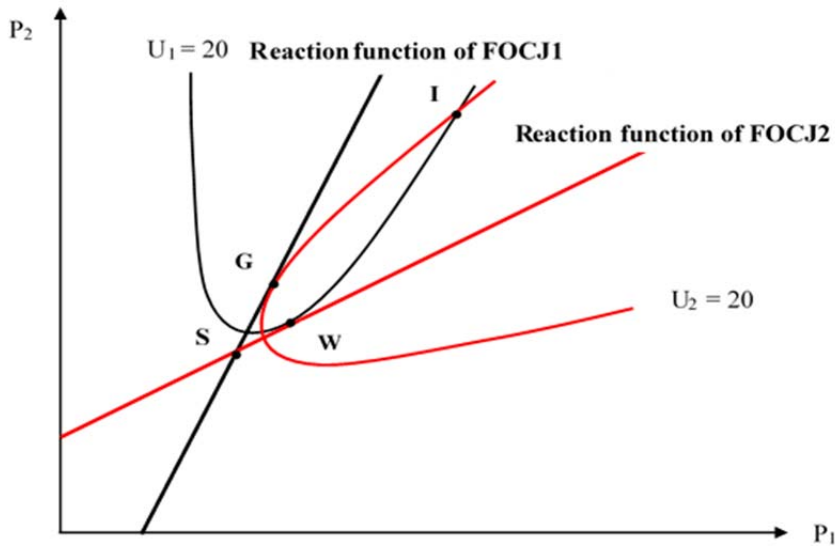


Figure 20. Solution space according to Krelle-Ott
Source: Compiled by the author.

The result of the Krelle-Ott model adaptation to FOCJs of type II shows that there is an area of fee combination p_1 and p_2 where two FOCJs of type II are not willing to move; they do not change their service fees, since the countermove of a competitor brings them into a situation with a worse utility level. The Krelle-Ott space can also move depending on the change in market parameters.

The solution of the model has been identified from the side of FOCJ management. However, principal-agent relations can also be introduced where FOCJ members are a principal and management is an agent.

General algebraic settings for four cases of management behaviour

In the thesis, the author investigates four cases with respect to the different management behaviour described not only graphically, but also mathematically. Hence, four algebraic assumptions for each case become relevant.

The first case is a basic case. In the first case, FOCJ management aims to maximise its utility depending on output X and labour input L : $U(X, L) = \gamma X^\alpha L^\beta$.

When $\beta = 0$ and $\gamma > 0$, the second case results. When $\gamma = 1$ and $\beta \in (0; +\infty)$, the first case becomes relevant. The third case occurs when $\beta = 1$ and X has a power of 0, $\gamma > 0$. The fourth case occurs when FOCJ management evaluates output negatively and labour positively such as $U(X, L) = \alpha L - X + \beta$.

The production function $X = L * M$, for the sake of simplicity, is dependent only on two variable factors: labour (L) and materials (M). For the discussion of possible production functions, see subchapter 2.3.

Demand functions²⁰ are linear for monopoly as well as for oligopoly. Index 1 of parameters denotes that the market situation for FOCJ1 of type II is described; for FOCJ2 of type II, the parameters of the models possess index 2. Functions $X_1 = a_1 - b_1 p_1 + d_1 p_2$ and $X_2 = a_2 - b_2 p_2 + d_2 p_1$ are oligopolistic demand functions of FOCJ1 and FOCJ2, respectively, where p_1 and p_2 are prices for the services of FOCJ1 and FOCJ2. $X_1 = a_1 - b_1 p_1$ and $X_2 = a_2 - b_2 p_2$ are the demand functions if FOCJ1 and FOCJ2 function in monopoly.

The Lagrange function has been constructed so that the utility of management is maximised under the restrictions of variable costs coverage by turnover, i.e. $p_1 * X_1 = L_1 * l_1 - M_1 * m_1$, where p_1 - the service fee of FOCJ1 (or further in the text, oligopolist (duopolist) 1), L_1 - amount of labour units used for service provision, l_1 - labour price, M_1 - amount of materials involved in FOCJ1 service provision, m_1 - factor price of materials, X_1 - output of FOCJ1. The other restriction of the Lagrange function is that a particular production function is used so that the production factors labour and materials are used for service provision of FOCJ1. This function is a special case of the Cobb-Douglas production²¹ function (Allen 1967: 49). Other production functions, such as the Leontief and CES production functions have not been applied for the analysis in this thesis (Allen 1967: 53, Varian 1992: 19–20).

All parameters such as $a_1, a_2, b_1, b_2, d_1, d_2, l_1, l_2, m_1, m_2, X_1, X_2, p_1, p_2$ are positive real numbers. For Case I, β_1, β_2 ; for Case II, γ_1, γ_2 ; for Case III, δ_1, δ_2 ; and for Case IV, $\alpha_1, \alpha_2, \beta_1, \beta_2$ are positive. Parameters $a_1, b_1, d_1, a_2, b_2, d_2$ and factor prices l_1, m_1, l_2, m_2 are strictly positive, p_1 and $p_2 > 0$ are strictly positive as well.

For counting the optimal solutions of the parameters labour, materials, output, utility, optimal fee for both FOCJs of type II, computer software Wolfram Mathematica has been applied. This mathematical tool is especially useful for solving differential equations and partial differential equations of higher order, which is the case for this thesis. Additionally, it is applied for mathematical manipulation and visualisation of results.

Case I: $U = X * L^\beta$

In the first case, FOCJ management aims to maximise its utility $U(X, L) = X * L^\beta$ depending on output X and labour input L . Two constraints are applied. One is a

²⁰ For the restrictions with respect to demand function, turn to subchapter 2.3.

²¹ Cobb-Douglas production function $X = AK^\alpha L^\beta$ where A is a constant coefficient and α and β are positive parameters. Here, parameter A is absorbed into X , α and β are assumed to be equal to 1. So that $\alpha + \beta > 1$ the increasing return to scale takes place.

cost coverage rule: $p^*X = Ll + Mm$. The second is a particular production function: $X = L^*M$. Hence, the following Lagrange function is written out:

$$\text{Lag} = X^*L^\beta - \lambda_1(p^*X - L^*l - M^*m) - \lambda_2(X - L^*M) \quad (78)$$

Taking partial derivatives with respect to $X, L, M, \lambda_1, \lambda_2$ gives the first order conditions:

$$\frac{\partial \text{Lag}}{\partial X} = L^\beta - p\lambda_1 - \lambda_2 = 0 \quad (79)$$

$$\frac{\partial \text{Lag}}{\partial L} = L^{-1+\beta}X^\beta + l\lambda_1 + M\lambda_2 = 0 \quad (80)$$

$$\frac{\partial \text{Lag}}{\partial M} = m\lambda_1 + L\lambda_2 = 0 \quad (81)$$

$$\frac{\partial \text{Lag}}{\partial \lambda_1} = lL + mM - pX = 0 \quad (82)$$

$$\frac{\partial \text{Lag}}{\partial \lambda_2} = LM - X = 0 \quad (83)$$

Out of the first order conditions (79)-(83), the following optimal solutions with respect to L, M, X and U can be found:

$$L = \frac{m(2+\beta)}{p(1+\beta)} \quad (84)$$

$$M = \frac{l(2+\beta)}{p} \quad (85)$$

The output X at the optimal point can be received by multiplying L and M :

$$X = L^*M = \frac{m(2+\beta)}{p(1+\beta)} * \frac{l(2+\beta)}{p} = \frac{lm(2+\beta)^2}{p^2(1+\beta)} \quad (86)$$

Hence, utility at the point of maximisation is calculated as:

$$U(X, L) = X^*L^\beta = \frac{lm(2+\beta)^2}{p^2(1+\beta)} * \left(\frac{m(2+\beta)}{p(1+\beta)} \right)^\beta = \frac{l(2+\beta) \left(\frac{m(2+\beta)}{p(1+\beta)} \right)^{1+\beta}}{p} \quad (87)$$

In the next step, production should be connected to consumption via the demand function so that all of the produced units of X are also consumed. For this, the optimal output received from the first order conditions must be equalised with the assumed demand function. Here, two cases of monopoly and oligopoly can be investigated separately:

- 1) In monopoly, the whole demand is addressed only to FOCJ1 without consideration of the FOCJ2 service fee: $X = a - b * p$.
- 2) However, in oligopoly (duopoly), FOCJ1 considers the reaction of another FOCJ2 to its price change, which is reflected in FOCJ1 and FOCJ2 demand functions as $X_1 = a_1 - b_1 p_1 + d_1 p_2$ and $X_2 = a_2 - b_2 p_2 + d_2 p_1$ respectively.

Monopoly

First, the optimal output received in formula (86) should be equal to the demand in monopoly so that everything produced must be consumed. Therefore, the production and consumption sides should be equalised:

$$\frac{\ln(2+\beta)^2}{p^{2(1+\beta)}} = a - b * p \quad (88)$$

Equation (88) has three roots with respect to p . Manipulation with parameters shows that the third solution is suitable²². However, for the analysis, the author is more focused on the numerical solution and assumes the following parameter values:

$$a = 10, b = 0.2, m = 20, l = 10, \beta = 2 \quad (89)$$

Thus, an optimal p under the assumption (89) yields 11.8188, which is, for comparison, higher than in Case II below where only output is maximised.

With $p = 11.8188$, solutions for L (formula 84), M (formula 85), X (formula 86) and U (formula 87) can be counted under the assumption (89) as well: $L = 2.25628, M = 3.38443, X = 7.63623, U = 38.8747$.

Oligopoly

In the case where management maximises output and labour, indifference curves are shown in the first quadrant of Figure 21 below. A set of possible solution spaces is presented in the first quadrant by green and red round curves. An optimal solution is where the highest indifference curve touches the possible solution space. Transferring these points to the second quadrant allows the construction of a reaction function that connects all optimal points. The reaction function (reaction line) shows the utility maximising fee of FOCJ1 under the

²² Optimal fee from the equation (88) results in three solutions. Their forms are too complicated to include them into the thesis; therefore, the author avoids analytical solutions in the text. Instead, she has made parameter manipulations with the help of Wolfram Mathematica software in order to realize, which solutions of fees are positive real numbers and suitable for the analysis. Manipulation has shown that there is only one p , which under given parameter assumption (89) guarantees positive fees.

choice of the FOCJ2's fee (p_2) (Varian 2010: 500). For each utility level $U_{const} = 10$ and $U_{const} = 5$, a set of points on the demand functions in the second quadrant become relevant. To find these points as crossing points with the demand functions, average utility curves are necessary. Average utility functions can be found by dividing constant utility by X . In the second quadrant, average utility functions are hyperbolic red and green dashed curves.

The next step would be to transfer the received $(p_1; p_2)$ combinations in the second quadrant to the system of coordinate $p_1 - p_2$ visualized in the right-hand lower corner of Figure 21. The combinations of FOCJ1 and FOCJ2 fees that guarantee a constant level of utility for FOCJ1 yield isoutility curves. The same analysis is possible for FOCJ2.

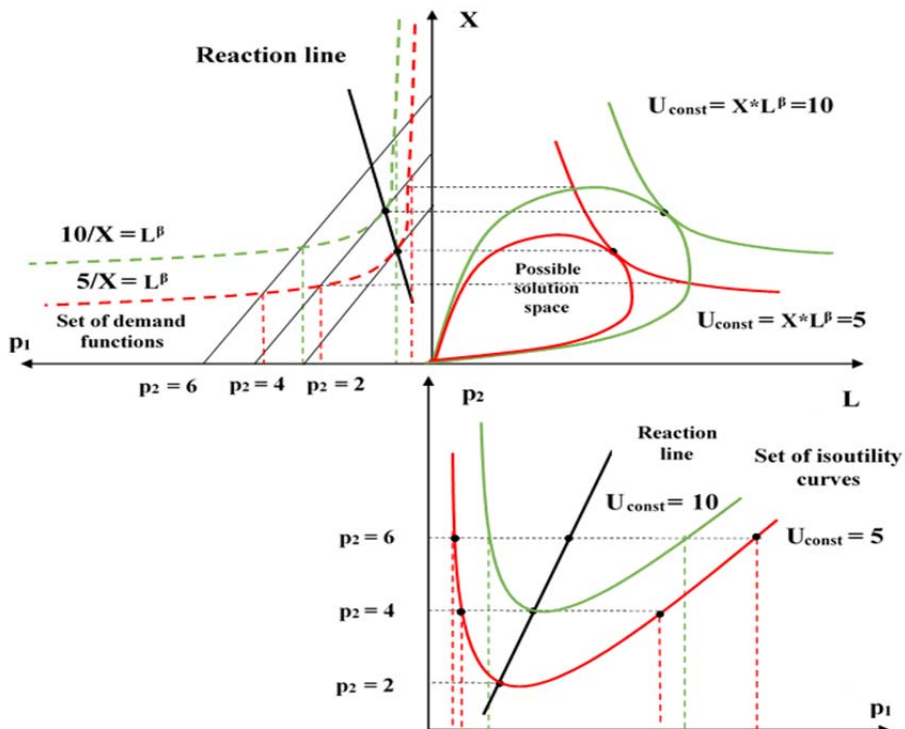


Figure 21. Schematically: steps of isoutility curve and reaction line construction when maximising output and labour input
Source: Compiled by the author.

In the case of oligopoly, the demand function of an oligopolist FOCJ1 considers a change in the fee of FOCJ2 and vice versa. Hence, according to (86) and the oligopolistic demand function, the cohesion between production and consumption will result in the system of equations (90):

$$\begin{cases} \frac{l_1 m_1 (2 + \beta_1)^2}{p_1^2 (1 + \beta_1)} = a_1 - b_1 p_1 + d_1 p_2 \\ \frac{l_2 m_2 (2 + \beta_2)^2}{p_2^2 (1 + \beta_2)} = a_2 - b_2 p_2 + d_2 p_1 \end{cases} \quad (90)$$

Solving the first equation of the system of equations (90) with respect to p_1 and the second equation with respect to p_2 provides the reaction curves of FOCJ1 and FOCJ2, respectively. The solution of the entire system of equations (90) results in the intersection of the Launhardt-Hotelling points of reaction curves²³. However, the analysis is restricted by the first quadrant of the $p_1 - p_2$ system of coordinates. Therefore, only positive real values can be solutions. The following parameter values are assumed: $a_1 = 5$, $a_2 = 3$, $b_1 = 1.5$, $b_2 = 2.5$, $d_1 = 3.5$, $d_2 = 3$, $m_1 = 10$, $m_2 = 10$, $l_1 = 8$, $l_2 = 8$, $\beta_1 = 2$, $\beta_2 = 2$, $U_{1const} = 5$, $U_{2const} = 5$, the Launhardt-Hotelling solution can be illustrated by Figure 22 and results in $p_1 = 10.579$, $p_2 = 4.19453$.

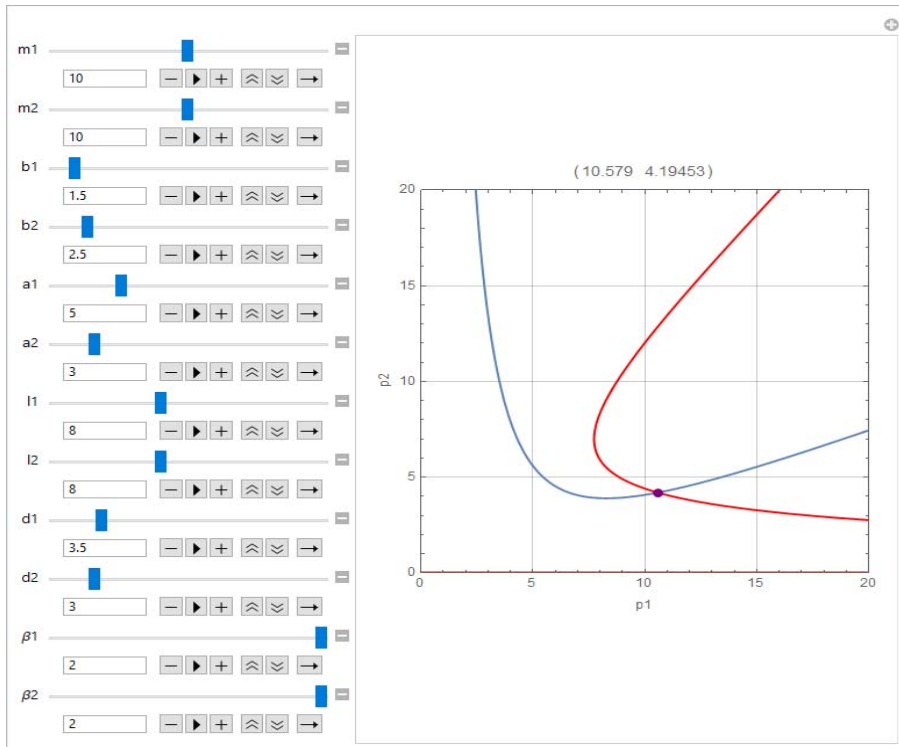


Figure 22. The Launhardt-Hotelling solution for Case I of management behaviour under particular parameter combination
Source: Compiled by the author using Wolfram Mathematica program.

²³ Sequential steps of analytical solutions can be provided on request. However, numerical solutions of all four cases are more relevant and useful for comparison.

Figure 22 demonstrates, on the right-hand side, the reaction curves of FOCJ1 (red curve) and FOCJ2 (blue curve) with the Launhardt-Hotelling solution. On the left-hand side, a tool bar shows how parameters of equations can be changed to influence the optimal solution. The moment Figure 22 captures is described by the assumed parameters.

The next step is to find the constant utility curve (isoutility curve) by dividing utility function $U = X^* L^\beta$ by demand X and fixing utility at a particular lever, for example, 5,10,15, etc. Or simply in general form at the level U_{1const} and for FOCJ2 at the level U_{2const} , such as:

$$\frac{U_{1const}}{a_1 - b_1 * p_1 + d_1 * p_2} = \left(\frac{m_1(\beta_1+2)}{p_1(\beta_1+1)} \right)^{\beta_1} \quad (91)$$

and

$$\frac{U_{2const}}{a_2 - b_2 * p_2 + d_2 * p_1} = \left(\frac{m_2(\beta_2+2)}{p_2(\beta_2+1)} \right)^{\beta_2} \quad (92)$$

The equation (91) cannot be easily solved with respect to p_1 in order to find the equal utility curve (isoutility curve) of FOCJ1. Hence, to solve (91), β_1 is assumed equal to 2. The solution of (91) then results in two branches of the FOCJ1 isoutility curve, as shown in Figure 20. However, only one branch of the equal utility curve exists in a positive quadrant²⁴:

$$p_1 = \frac{4(-2b_1m_1^2 + \sqrt{4b_1^2m_1^4 + 9m_1^2(a_1 + d_1p_2)U_{1const}})}{9U_{1const}} \quad (93)$$

The branch (93) of this isoutility curve is necessary to calculate Stackelberg point W ²⁵ as schematically shown in Figure 20 (Varian 1992: 296), where the isoutility curve of FOCJ1 touches the reaction line of FOCJ2. In point W , the steepness of the isoutility curve of FOCJ1 and the steepness of the FOCJ2 reaction line should be equal. The steepness of the isoutility curve (93) results in:

$$\frac{dp_1}{dp_2} = \frac{2d_1m_1^2}{\sqrt{4b_1^2m_1^4 + 9m_1^2(a_1 + d_1p_2)U_{1const}}} \quad (94)$$

²⁴ Another branch of FOCJ1 isoutility curve $p_1 = -\frac{4(2b_1m_1^2 + \sqrt{4b_1^2m_1^4 + 9m_1^2(a_1 + d_1p_2)U_{1const}})}{9U_{1const}}$ cannot be

considered, since $2b_1m_1^2 > 0$ and $\sqrt{4b_1^2m_1^4 + 9m_1^2(a_1 + d_1p_2)U_{1const}} \geq 0$.

²⁵ Stackelberg equilibrium is the optimum of the leader (firm 1) in a tangency point of the isoprofit curve with the reaction curve of the follower (firm 2) (Varian 1992: 296).

To obtain the steepness of FOCJ2 reaction line $\frac{dp_1}{dp_2}$, p_1 from the equation $\frac{l_2 m_2 (2 + \beta_2)^2}{p_2^2 (1 + \beta_2)} = a_2 - b_2 * p_2 + d_2 * p_1$ must be isolated:

$$p_1 = -\frac{a_2 - b_2 p_2 - \frac{l_2 m_2 (2 + \beta_2)^2}{p_2^2 (1 + \beta_2)}}{d_2} \quad (95)$$

Deriving (95) with respect to p_2 , implies (96):

$$\frac{dp_1}{dp_2} = -\frac{-b_2 + \frac{2l_2 m_2 (2 + \beta_2)^2}{p_2^3 (1 + \beta_2)}}{d_2} \quad (96)$$

In order to find the point of tangency W, (94) and (96) must be equalized:

$$\frac{2d_1 m_1^2}{\sqrt{4b_1^2 m_1^4 + 9m_1^2 (a_1 + d_1 p_2) U_{1const}}} = -\frac{-b_2 + \frac{2l_2 m_2 (2 + \beta_2)^2}{p_2^3 (1 + \beta_2)}}{d_2} \quad (97)$$

Equation (97) must be solved with respect to p_2 . As a result, seven points of tangency become relevant. Only positive p_2 can be claimed as solutions. Assuming $a_1 = 5$, $a_2 = 3$, $b_1 = 1.5$, $b_2 = 2.5$, $d_1 = 3.5$, $d_2 = 3$, $m_1 = 10$, $m_2 = 10$, $l_1 = 8$, $l_2 = 8$, $\beta_1 = 2$, $\beta_2 = 2$, $U_{1const} = 5$, $U_{2const} = 5$, one $p_2 = 4.88392$ becomes relevant. Substituting this p_2 into the reaction curve of FOCJ2 (95), the Stackelberg solution at the point of tangency yields $p_1 = 9.03246$; $p_2 = 4.88392$.

To obtain the Stackelberg solution at point G, as shown in Figure 20, the steepness of the isoutilty curve of FOCJ2 should be found (92), differentiating it with respect to p_1 . Derivative with respect to p_1 must be taken:

$$\frac{dp_2}{dp_1} = \frac{2d_2 m_2^2}{\sqrt{4b_2^2 m_2^4 + 9m_2^2 (a_2 + d_2 p_1) U_{2const}}} \quad (98)$$

From the reaction line of FOCJ1 (90) $\frac{l_1 m_1 (2 + \beta_1)^2}{p_1^2 (1 + \beta_1)} = a_1 - b_1 * p_1 + d_1 * p_2$, p_2 must be isolated:

$$p_2 = -\frac{a_1 - b_1 p_1 - \frac{l_1 m_1 (2 + \beta_1)^2}{p_1^2 (1 + \beta_1)}}{d_1} \quad (99)$$

(99) should be differentiated with respect to p_1 . Hence, the steepness of FOCJ1 is:

$$\frac{dp_2}{dp_1} = -\frac{-b_1 + \frac{2l_1 m_1 (2 + \beta_1)^2}{p_1^3 (1 + \beta_1)}}{d_1} \quad (100)$$

The steepness of the isoutilility curve of FOCJ2 and the reaction curve of FOCJ1 must be equalised in order to find p_1 at the point of tangency:

$$-\frac{-b_1 + \frac{2l_1 m_1 (2 + \beta_1)^2}{p_1^3 (1 + \beta_1)}}{d_1} = \frac{2d_2 m_2^2}{\sqrt{4b_2^2 m_2^4 + 9m_2^2 (a_2 + d_2 p_1) U_{2\text{const}}}} \quad (101)$$

Seven solutions of (101) become possible. However, only positive p_1 are solutions under parameter assumption $a_1 = 5$, $a_2 = 3$, $b_1 = 1.5$, $b_2 = 2.5$, $d_1 = 3.5$, $d_2 = 3$, $m_1 = 10$, $m_2 = 10$, $l_1 = 8$, $l_2 = 8$, $\beta_1 = 2$, $\beta_2 = 2$, $U_1 = 5$, $U_2 = 5$. The Stackelberg point $p_1 = 5.50571$; $p_2 = 4.95257$ appears by substituting p_1 received from (101) in the reaction curve of FOCJ1 (99).

In the next step, the author is looking for the crossing points of the two isoutilility curves of FOCJ1 and FOCJ2. For this, the following system of equations should be solved²⁶:

$$\begin{cases} \frac{U_{1\text{const}}}{a_1 - b_1 p_1 + d_1 p_2} = \left(\frac{m_1 (\beta_1 + 2)}{p_1 (\beta_1 + 1)} \right)^{\beta_1} \\ \frac{U_{2\text{const}}}{a_2 - b_2 p_2 + d_2 p_1} = \left(\frac{m_2 (\beta_2 + 2)}{p_2 (\beta_2 + 1)} \right)^{\beta_2} \end{cases} \quad (102)$$

The crossing points of the reaction curves and isoutilility curves can be shown in Figure 23:

²⁶ Calculations consist of several steps which are too complicated to include their detailed description into the thesis. For the sake of simplicity, the author has included only an essence of these calculations. Therefore, the one, who is interested in the complete sequence of steps, should turn to the author for their demonstration.

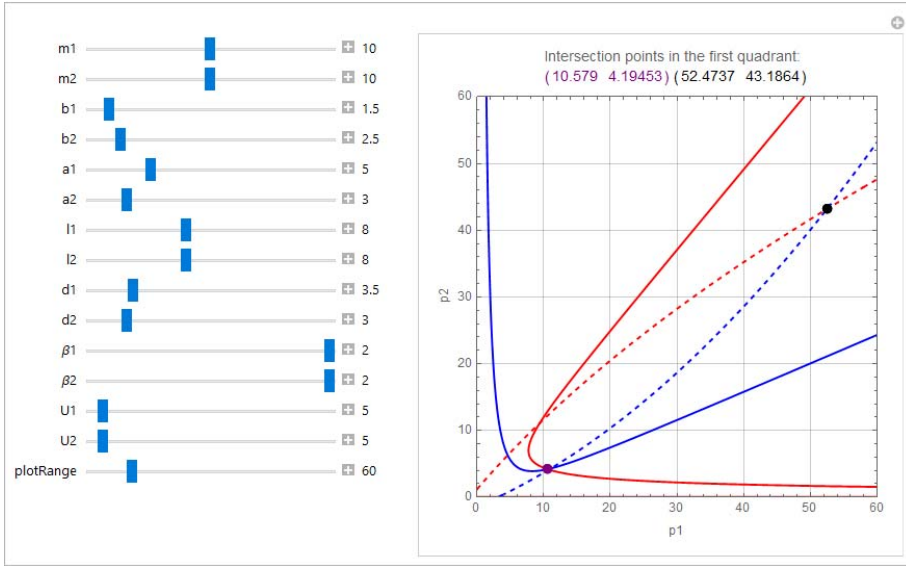


Figure 23. The Krelle-Ott area for Case I of management behaviour
Source: Compiled by the author using Wolfram Mathematica program.

Under the assumption $a_1 = 5$, $a_2 = 3$, $b_1 = 1.5$, $b_2 = 2.5$, $d_1 = 3.5$, $d_2 = 3$, $m_1 = 10$, $m_2 = 10$, $l_1 = 8$, $l_2 = 8$, $\beta_1 = 2$, $\beta_2 = 2$, $U_{1const} = 5$, $U_{2const} = 5$, there is a thick black point $p_1 = 52.4737$, $p_2 = 43.1864$ in Figure 23 where the isoutility curves of FOCJ 1 (red dotted curve) and FOCJ 2 (blue dotted curve) cross. This is also a numerical solution for the system of equations (102). Figure 23 shows the Krelle-Ott area which lies between the purple point of the Launhardt-Hotelling solution (crossing point of FOCJ 1 (red) and FOCJ 2 (blue) reaction curves), the black point of the intersection of two isoutility curves and the Stackelberg points of tangency, which are not shown in Figure 23 to avoid graphical comprehension.

Case II: $U = \gamma * X$

In Case II of FOCJ of type II management behaviour, management utility depends on how much output is produced in an FOCJ of type II. The Lagrange function under two constraints should be written out as:

$$\text{Lag} = \gamma * X - \lambda_1(p * X - L * 1 - M * m) - \lambda_2(X - L * M) \quad (103)$$

From (103) the first order conditions result:

$$\frac{\partial \text{Lag}}{\partial X} = \gamma - p\lambda_1 - \lambda_2 = 0 \quad (104)$$

$$\frac{\partial \text{Lag}}{\partial L} = l\lambda_1 + M\lambda_2 = 0 \quad (105)$$

$$\frac{\partial \text{Lag}}{\partial M} = m\lambda_1 + L\lambda_2 = 0 \quad (106)$$

$$\frac{\partial \text{Lag}}{\partial \lambda_1} = lL + mM - pX = 0 \quad (107)$$

$$\frac{\partial \text{Lag}}{\partial \lambda_2} = LM - X = 0 \quad (108)$$

From partial derivatives (104) – (108), the optimal solutions with respect to X , L , M and U can be found:

$$L = \frac{2m}{p} \quad (109)$$

$$M = \frac{2l}{p} \quad (110)$$

$$X = \frac{4lm}{p^2} \quad (111)$$

$$U = \frac{4lmy}{p^2} \quad (112)$$

The difference between the monopoly and oligopoly cases is in the demand function applied for monopoly: $X = a - b \cdot p$ and for duopoly: $X_1 = a_1 - b_1 \cdot p_1 + d_1 \cdot p_2$ and $X_2 = a_2 - b_2 \cdot p_2 + d_2 \cdot p_1$.

Monopoly

Again, the production side (111) should be equalised with consumption (demand in monopoly):

$$\frac{4lm}{p^2} = a - b \cdot p \quad (113)$$

Solving (113) with respect to p , yields three roots²⁷:

²⁷ Calculations consist of several steps which are too complicated to include their detailed description into the thesis. For the sake of simplicity, the author has included only an essence of these calculations. Therefore, the one who is interested in the complete sequence of steps, should turn to the author for their demonstration.

$$p = \frac{a + \frac{a^2}{(a^3 - 54b^2lm + 6\sqrt{3}\sqrt{b^2lm(-a^3 + 27b^2lm)})^{1/3}} + (a^3 - 54b^2lm + 6\sqrt{3}\sqrt{b^2lm(-a^3 + 27b^2lm)})^{1/3}}{3b} \quad (114)$$

$$p = \frac{2a + \frac{(-1-i\sqrt{3})a^2}{(a^3 - 54b^2lm + 6\sqrt{3}\sqrt{b^2lm(-a^3 + 27b^2lm)})^{1/3}} + i(i+\sqrt{3})(a^3 - 54b^2lm + 6\sqrt{3}\sqrt{b^2lm(-a^3 + 27b^2lm)})^{1/3}}{6b} \quad (115)$$

$$p = \frac{2a + \frac{i(i+\sqrt{3})a^2}{(a^3 - 54b^2lm + 6\sqrt{3}\sqrt{b^2lm(-a^3 + 27b^2lm)})^{1/3}} + (-1-i\sqrt{3})(a^3 - 54b^2lm + 6\sqrt{3}\sqrt{b^2lm(-a^3 + 27b^2lm)})^{1/3}}{6b} \quad (116)$$

Manipulation with parameters using the Wolfram Mathematica program for all three p values shows that solution (115) provides only negative values of p under different combinations of parameters' values. Solution (116) of the equation contains positive values of p ; however, it also implies reverse relations between factor prices l , m and service fee p so that with the increase in factor prices, the service fee decreases. This has to be the opposite – factor price increase influences the increase of p .

Solution (114) provides positive real solutions for p . If parameter a is decreasing, l , m should also decrease in order to keep the value of p real.

Therefore, for the monopoly case, the optimal fee of FOCJ1 as a monopolist can be described by the formula (114). The same optimal solution can be found for FOCJ2, FOCJ3, etc. that behave as monopolists with management maximising utility depending on output.

Under a particular parameter combination, the same as in Case I: $a = 10$, $b = 0.2$, $m = 20$, $l = 10$, optimal p for monopoly turns out to be 10.

Substitution of parameters in (109)–(112) provides the following numerical solutions of L , M , X , U : $L = 4$, $M = 2$, $X = 8$, $U = 3.2$ (if $\gamma = 0.4$), respectively.

Oligopoly (duopoly)

In the case where management maximises output, indifference curves are horizontal, as shown in Figure 24 below. A set of possible solution spaces is presented in the first quadrant by green and red circle curves. An optimal solution is where the highest indifference curve touches the possible solution space. Transferring these points to the second quadrant results in the reaction function. The reaction function (reaction line) shows the utility maximising fee of FOCJ1 under the choice of the FOCJ2's fee (p_2) (Varian 2010: 500). For each utility level $U_{const} = 10$ and $U_{const} = 5$, a set of points on the demand functions in the second quadrant becomes relevant. To find these points as crossing points with demand functions, average utility curves are necessary. Average utility functions can be found by dividing constant utility by X . In the

second quadrant, average utility functions look like horizontal red and green dashed lines. The next step would be to transfer the received $(p_1; p_2)$ combinations to the system of coordinate $p_1 - p_2$ visualised in the right-hand lower corner of Figure 24. The combinations of fees of FOCJ1 and FOCJ2 that guarantee a constant level of utility for FOCJ1 yield isoutility lines. The same analysis is valid for FOCJ2.

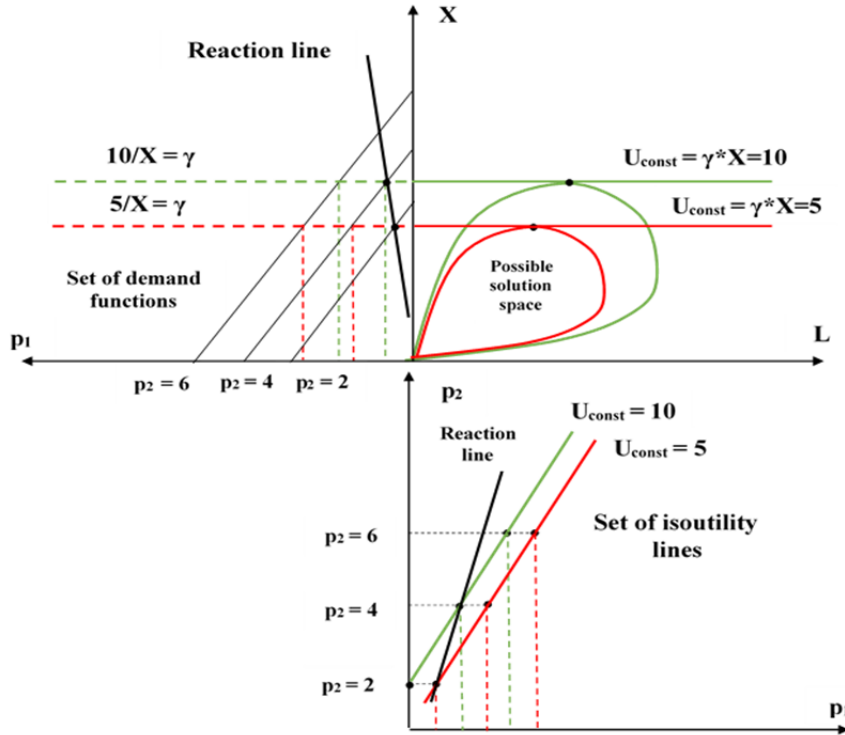


Figure 24. Schematically: steps of isoutility curve and reaction line construction when maximizing output
Source: Compiled by the author.

In duopoly, there are two service providers. Both have their demand functions considering a competitor's change in price. Hence, the following system of equations becomes relevant to find the Launhardt-Hotelling point:

$$\begin{cases} \frac{4l_1m_1}{p_1^2} = a_1 - b_1 * p_1 + d_1 * p_2 \\ \frac{4l_2m_2}{p_2^2} = a_2 - b_2 * p_2 + d_2 * p_1 \end{cases} \quad (117)$$

The solution of the first and second equation of the system of equations (117) with respect to p_1 and p_2 will result in reaction curves²⁸ for FOCJ1 and FOCJ2, respectively. However, for the purpose of the analysis, the author is interested in such combinations of $(p_1; p_2)$ which are the optimal solutions for both equations of the system (117). The crossing points of reactions curves are the Launhardt-Hotelling solution.

The system of equations (117) can be solved analytically as well as graphically, as shown in Figure 25. Figure 25 demonstrates, on the right-hand side, the reaction curves of FOCJ1 (red curve) and FOCJ2 (blue curve) with the Launhardt-Hotelling solution. On the left-hand side, a tool bar shows how parameters of equations can be changed to influence the optimal solution.

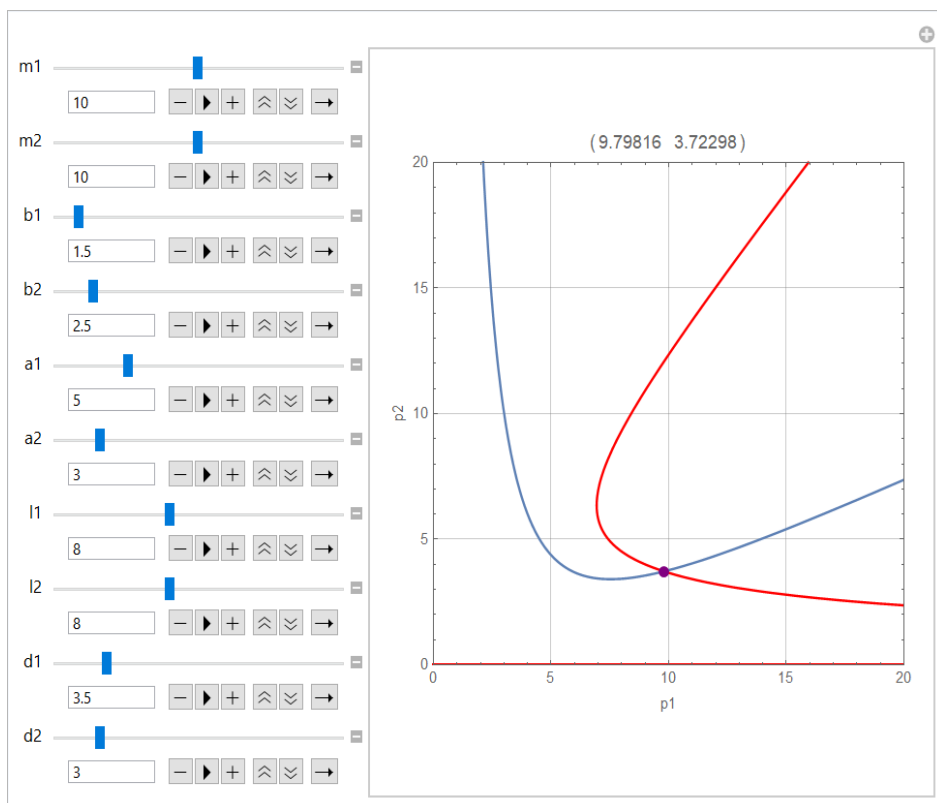


Figure 25. The Launhardt-Hotelling solution for Case II of management behaviour under particular parameter combination
Source: Compiled by the author using Wolfram Mathematica program.

²⁸ The reaction curve of FOCJ1 of type II depicts the utility maximizing fee of FOCJ1 of type II (p_1) given various believes FOCJ1 of type II might have about the fee of FOCJ2 of type II (p_2) (Varian 1992: 286, Varian 2010: 500).

It is also possible to receive a numerical solution. As the interest is only in real positive numbers, under given parameter combination (116), the solution is $p_1 = 9.79816$, $p_2 = 3.72298$:

$$a_1 = 5, a_2 = 3, b_1 = 1.5, b_2 = 2.5, d_1 = 3.5, d_2 = 3, m_1 = 10, m_2 = 10, l_1 = 8, l_2 = 8, \gamma_1 = 0.4, \gamma_2 = 0.3, U_{1const} = 5, U_{2const} = 5 \quad (118)$$

In the next step, the isoutility curves²⁹ for FOCJ1 and FOCJ2 must be constructed by dividing the utility function $U_1 = \gamma_1 * X_1$ over X_1 , and $U_2 = \gamma_2 * X_2$ over X_2 so that utility is fixed at a particular level, such as:

$$\frac{U_{1const}}{a_1 - b_1 * p_1 + d_1 * p_2} = \gamma_1 \quad \text{for FOCJ1} \quad (119)$$

and

$$\frac{U_{2const}}{a_2 - b_2 * p_2 + d_2 * p_1} = \gamma_2 \quad \text{for FOCJ2} \quad (120)$$

To find the Stackelberg points (Varian 1992: 296) where the isoutility curve of FOCJ1 (119) touches the reaction curve of FOCJ2: $\frac{4l_2m_2}{p_2^2} = a_2 - b_2 * p_2 + d_2 * p_1$, and the isoutility curve of FOCJ2 (120) touches the reaction curve of FOCJ1: $\frac{4l_1m_1}{p_1^2} = a_1 - b_1 * p_1 + d_1 * p_2$, their steepness should be equalised³⁰ so that the steepness of the reaction curve of FOCJ2 $\frac{dp_1}{dp_2} = \frac{b_2 - \frac{8l_2m_2}{p_2^3}}{d_2}$ should be equal to the steepness of the isoutility curve of FOCJ1 $\frac{dp_1}{dp_2} = \frac{d_1}{b_1}$:

$$\frac{b_2 - \frac{8l_2m_2}{p_2^3}}{d_2} = \frac{d_1}{b_1} \quad (121)$$

²⁹ Isoutility curve (in analogy to isoprofit curve with profit maximizing firms) reflects those combinations of fees p_1 and p_2 that yields a constant level of utility to a firm (Varian 2010: 501).

³⁰ Calculations consist of several steps which are too complicated to include their detailed description into the thesis. For the sake of simplicity, the author has included only an essence of these calculations. Therefore, the one, who is interested in the complete sequence of steps, should turn to the author for their demonstration.

Under assumed parameter combination (118), p_2 at the Stackelberg point receives a value of 2.60991. Substituting p_2 in the isoutility curve of FOCJ1 (119) results in $p_1 = 1.08979$.

The steepness of the isoutility curve of FOCJ2 $\frac{dp_2}{dp_1} = \frac{d_2}{b_2}$ should be equal to the steepness of FOCJ1 reaction curve $\frac{dp_2}{dp_1} = \frac{b_1 - \frac{8I_1 m_1}{p_1^3}}{d_1}$, such as:

$$\frac{b_1 - \frac{8I_1 m_1}{p_1^3}}{d_1} = \frac{d_2}{b_2} \quad (122)$$

Under parameter combination (118), another Stackelberg point is $p_1 = 3.09439$, $p_2 = 9.44601$.

To find the crossing point of the isoutility curves of FOCJ1 and FOCJ2, the author solves the following system of equations with respect to p_1 and p_2 :

$$\begin{cases} \frac{U_{1\text{const}}}{a_1 - b_1 * p_1 + d_1 * p_2} = \gamma_1 \\ \frac{U_{2\text{const}}}{a_2 - b_2 * p_2 + d_2 * p_1} = \gamma_2 \end{cases} \quad (123)$$

Hence, the analytical solution of the system of equations (123) is the following combination of parameters:

$$p_1 = -\frac{d_1 U_{2\text{const}} \gamma_1 + b_2 U_{1\text{const}} \gamma_2 - a_1 b_2 \gamma_1 \gamma_2 - a_2 d_1 \gamma_1 \gamma_2}{b_1 b_2 \gamma_1 \gamma_2 - d_1 d_2 \gamma_1 \gamma_2}, p_2 = -\frac{b_1 U_{2\text{const}} \gamma_1 + d_2 U_{1\text{const}} \gamma_2 - a_2 b_1 \gamma_1 \gamma_2 - a_1 d_2 \gamma_1 \gamma_2}{b_1 b_2 \gamma_1 \gamma_2 - d_1 d_2 \gamma_1 \gamma_2} \quad (124)$$

The numerical solution of (124) is determined by the assumption (118) and results in $p_1 = 9.8642$, $p_2 = 6.37037$.

Schematically, the crossing points of reaction curves and isoutility curves can be illustrated with the help of Figure 26:

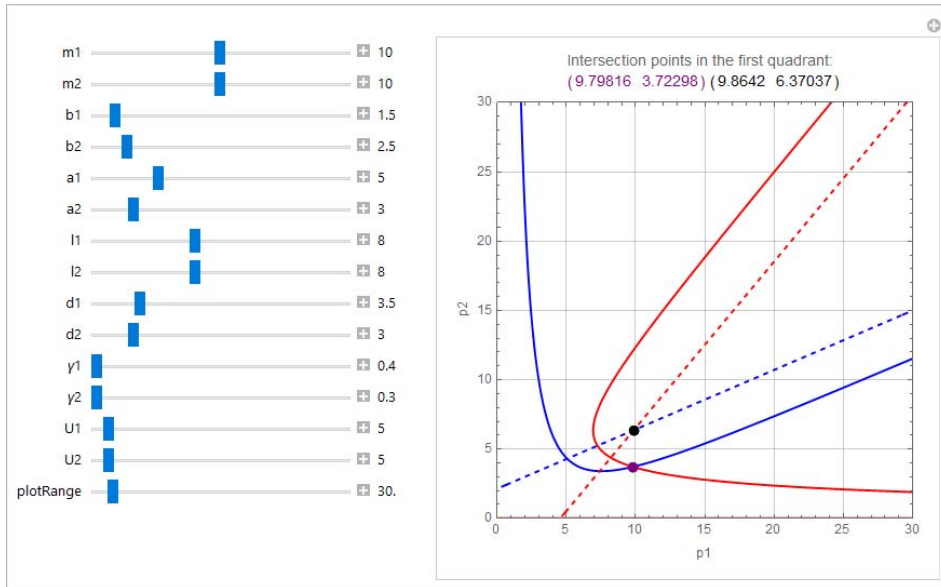


Figure 26. The Krelle-Ott area for Case II of management behaviour
Source: Compiled by the author using Wolfram Mathematica program.

In Figure 26, two points are shown. The purple one reflects the crossing point of FOCJ1 (red) and FOCJ2 (blue) reaction curves and the black one is the crossing point of the isocost curves of FOCJ1 (red dotted curve) and FOCJ2 (blue dotted curve). The area between these two points and the Stackelberg points of tangency is the Krelle-Ott area for Case II of management behaviour.

Case III: $U = \delta \cdot L$

In Case III, the utility function of FOCJ management depends on labour input, singularly considering two constraints of the cost coverage rule and special production function:

$$\text{Lag} = \delta \cdot L - \lambda_1 (p \cdot X - L \cdot l - M \cdot m) - \lambda_2 (X - L \cdot M) \quad (125)$$

Case III should be treated specially because the utility function can naturally infinitely grow. In order to find optimal solutions for labour, materials, output and fee, demand for FOCJ services should be restricted by considering a particular demand function. Technically, the consumption part expressed by the demand function must be plugged into the Lagrange function in a first step. A direct demand function $X = a - b \cdot p$ has to be reversed for monopoly so that

$$p = \frac{a - X}{b}.$$

For duopoly, from the system of equations $\begin{cases} X_1 = a_1 - b_1 * p_1 + d_1 * p_2 \\ X_2 = a_2 - b_2 * p_2 + d_2 * p_1 \end{cases}$, p_1 and p_2 have to be expressed so that:

$$\begin{cases} p_1 = \frac{a_1 + d_1 p_2 - X_1}{b_1} \\ p_2 = \frac{a_2 + d_2 p_1 - X_2}{b_2} \end{cases} \quad (126)$$

Therefore, Lagrange function for monopoly is:

$$\text{Lag} = \delta * L - \lambda_1 \left(\frac{a-X}{b} * X - L * I - M * m \right) - \lambda_2 (X - L * M) \quad (127)$$

In oligopoly, for FOCJ1:

$$\text{Lag} = \delta_1 * L_1 - \lambda_1 \left(\left(\frac{a_1 + d_1 p_2 - X_1}{b_1} \right) * X_1 - l_1 * L_1 - m_1 * M_1 \right) - \lambda_2 (X_1 - L_1 * M_1) \quad (128)$$

For FOCJ2 only the index changes:

$$\text{Lag} = \delta_2 * L_2 - \lambda_1 \left(\left(\frac{a_2 + d_2 p_1 - X_2}{b_2} \right) * X_2 - l_2 * L_2 - m_2 * M_2 \right) - \lambda_2 (X_2 - L_2 * M_2) \quad (129)$$

Next, monopoly and oligopoly situations should be analysed separately in order to find optimal solutions for labour, materials, output, utility, Launhardt-Hotelling and Krelle-Ott solutions with the given utility function of Case III.

Monopoly

The Lagrange function (127) should be differentiated to find the first order conditions (130), (132), (135), (138), (140), which are derived using Wolfram Mathematica:

$$\frac{\partial \text{Lag}}{\partial X} = - \left(\frac{a-X}{b} - \frac{X}{b} \right) \lambda_1 - \lambda_2 = 0 \quad (130)$$

From (130), λ_2 can be isolated:

$$\lambda_2 = - \frac{(a - 2X)\lambda_1}{b} \quad (131)$$

The first order condition with respect to L :

$$\frac{\partial \text{Lag}}{\partial L} = \delta + I\lambda_1 + M\lambda_2 = 0 \quad (132)$$

In formula (132), λ_2 is substituted by (131) and λ_1 is isolated:

$$\delta + I\lambda_1 + M\left(-\frac{(a-2X)\lambda_1}{b}\right) = 0 \quad (133)$$

So that, from (133), λ_1 can be expressed:

$$\lambda_1 = -\frac{b\delta}{bl - aM + 2MX} \quad (134)$$

The first order condition with respect to M :

$$\frac{\partial \text{Lag}}{\partial M} = m\lambda_1 + L\lambda_2 = 0 \quad (135)$$

From the partial derivative for M (135), by substituting λ_2 and λ_1 with (131) and (134), respectively, and $X = LM$:

$$m\left(-\frac{b\delta}{bl - aM + 2MLM}\right) + L\left(-\frac{(a-2LM)\left(\frac{b\delta}{bl - aM + 2MLM}\right)}{b}\right) = 0 \quad (136)$$

M can be isolated from (136) which results in:

$$M = \frac{aL - bm}{2L^2} \quad (137)$$

First, an optimal solution for L should be obtained from the first order condition for λ_1 :

$$\frac{\partial \text{Lag}}{\partial \lambda_1} = I\lambda_1 + mM - \frac{(a-X)\lambda_1}{b} = 0 \quad (138)$$

In formula (138), X must be substituted by LM as it comes from the first order condition for λ_2 (140) and M by formula (137):

$$I\lambda_1 + m\left(\frac{aL - bm}{2L^2}\right) - \frac{(a-L\left(\frac{aL - bm}{2L^2}\right))L\left(\frac{aL - bm}{2L^2}\right)}{b} = 0 \quad (139)$$

The first order condition with respect to λ_2 :

$$\frac{\partial \text{Lag}}{\partial \lambda_2} = LM - X = 0 \quad (140)$$

The expression (139) yields three roots of L . However, only one point is relevant since it does not contain imaginary numbers. Thus, an optimal solution for L in monopoly results:

$$L = \frac{1}{12bl} \left(a^2 + \frac{a^4 - 24ab^2lm}{(a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3})^{1/3}} + \right. \\ \left. + (a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3}) \right) \quad (141)$$

An optimal solution for M can be received from (137) by substituting L found in the previous step (141):

$$M = \frac{(6bl(-12b^2lm + a(a^2 + \frac{a^4 - 24ab^2lm}{(a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3})^{1/3}} + (a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3}))^{1/3}}{(a^2 + \frac{a^4 - 24ab^2lm}{(a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3})^{1/3}} + (a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3}))^{1/3}} \quad (142)$$

L should be multiplied by M to find X so that a general analytical solution for output in monopoly results:

$$X = \frac{a}{2} - \frac{6b^2lm}{a^2 + \frac{a^4 - 24ab^2lm}{(a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3})^{1/3}} + (a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3})^{1/3}} \quad (143)$$

By inserting the optimal solution for X into formula $p = \frac{a - X}{b}$, an optimal fee level in monopoly results:

$$p = \frac{a - \frac{a}{2} - \frac{6b^2lm}{a^2 + \frac{a^4 - 24ab^2lm}{(a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3})^{1/3}} + (a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3})^{1/3}}}{b} \quad (144)$$

After simplifications (144) has been modified as:

$$p = \frac{a}{2b} + \frac{6blm}{a^2 + \frac{a^4 - 24ab^2lm}{(a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3})^{1/3}} + (a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3})^{1/3}} \quad (145)$$

Thus, an optimal analytical solution for utility according to formula (125) is:

$$U = \delta^*L = \delta \frac{1}{12bl} \left(a^2 + \frac{a^4 - 24ab^2lm}{(a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3} + (a^6 - 36a^3b^2lm + 24(9b^4l^2m^2 + \sqrt{3}\sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})^{1/3})^{1/3}} \right) \quad (146)$$

Assuming $a = 10$, $b = 0.2$, $m = 20$, $l = 10$, $\delta = 0.2$, as in the two previous cases, monopoly fee, labour, materials, output and utility show the following numerical solutions: $p = 25.8579$, $L = 11.6569$, $M = 0.414214$, $X = 4.82843$, $U = 2.33137$.

Oligopoly

As for the two previous cases, in the third case, isoutility curves must be constructed as shown in Figure 27. In the right-hand lower corner, there are isoutility curves which have been received from the average utility functions in the second quadrant.

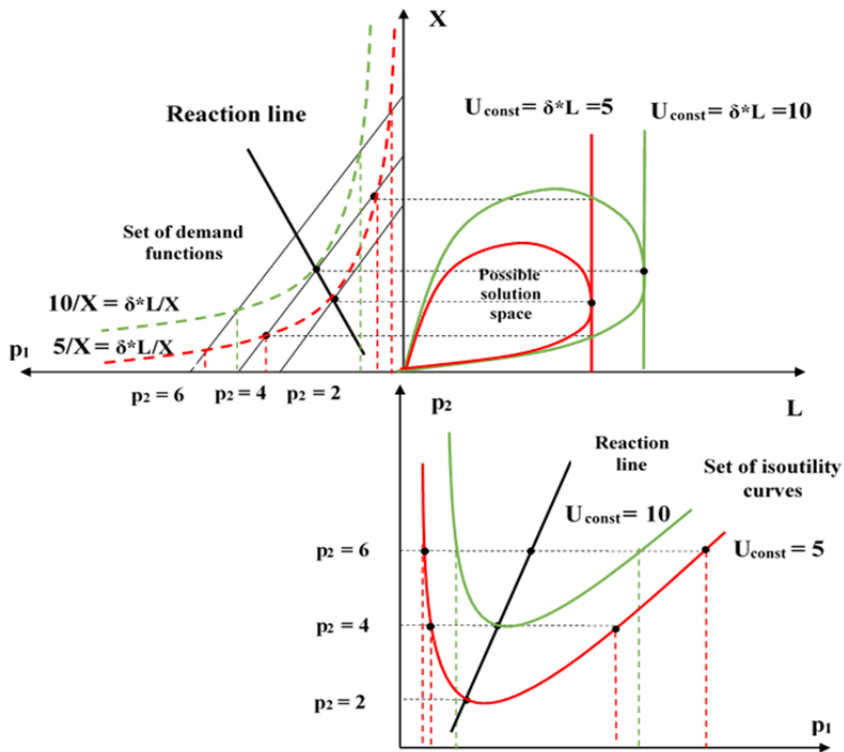


Figure 27. Schematically: steps of isoutility curve and reaction line construction when maximizing labour
Source: Compiled by the author.

In oligopoly, the analysis again starts with the identification of the first order conditions for the functions (127) and (128), sequentially. For duopolist 1, the first order conditions are:

$$\frac{\partial \text{Lag}}{\partial X_1} = - \left(\frac{a_1 + d_1 p_2 - X_1}{b_1} - \frac{X_1}{b_1} \right) \lambda_1 - \lambda_2 = 0 \quad (147)$$

$$\frac{\partial \text{Lag}}{\partial L_1} = \delta_1 + l_1 \lambda_1 + M_1 \lambda_2 = 0 \quad (148)$$

$$\frac{\partial \text{Lag}}{\partial M_1} = m_1 \lambda_1 + L_1 \lambda_2 = 0 \quad (149)$$

$$\frac{\partial \text{Lag}}{\partial \lambda_1} = l_1 L_1 + m_1 M_1 - \frac{(a_1 + d_1 p_2 - X_1) X_1}{b_1} = 0 \quad (150)$$

$$\frac{\partial \text{Lag}}{\partial \lambda_2} = L_1 M_1 - X_1 = 0 \quad (151)$$

Following the same logical steps as in monopoly above, an optimal L_1 can be received from the first order conditions by the required substitutions and simplifications. L_1 , which does not contain imaginary numbers, can be considered optimal. Only one root complies with this requirement:

$$L_1 = \frac{a_1^2 + k_1^{1/3} + 2a_1 d_1 p_2 + d_1^2 p_2^2 + \frac{(a_1 + d_1 p_2)(a_1^3 - 24b_1^2 l_1 m_1 + 3a_1^2 d_1 p_2 + 3a_1 d_1^2 p_2^2 + d_1^3 p_2^3)}{k_1^{1/3}}}{12b_1 l_1} \quad (152)$$

where

$$k_1 = a_1^6 + 216b_1^4 l_1^2 m_1^2 + 6a_1^5 d_1 p_2 + 15a_1^4 d_1^2 p_2^2 - 36b_1^2 d_1^3 l_1 m_1 p_2^3 + d_1^6 p_2^6 - 4a_1^3 (9b_1^2 l_1 m_1 - 5d_1^3 p_2^3) + 24\sqrt{3} \sqrt{-b_1^6 l_1^3 m_1^3 (a_1^3 - 27b_1^2 l_1 m_1 + 3a_1^2 d_1 p_2 + 3a_1 d_1^2 p_2^2 + d_1^3 p_2^3) - 3a_1^2 (36b_1^2 d_1 l_1 m_1 p_2 - 5d_1^4 p_2^4) + a_1 (-108b_1^2 d_1^2 l_1 m_1 p_2^2 + 6d_1^5 p_2^5)} \quad (153)$$

Similarly, M_1 can be found from the first order conditions (147)–(151). Under substitution (153), it results in:

$$M_1 = \frac{6b_1 l_1 (-12b_1^2 l_1 m_1 + (a_1 + d_1 p_2)(a_1^2 + k_1^{1/3} + 2a_1 d_1 p_2 + d_1^2 p_2^2 + \frac{(a_1 + d_1 p_2)(-24b_1^2 l_1 m_1 + (a_1 + d_1 p_2)^3)}{k_1^{1/3}}))}{(a_1^2 + k_1^{1/3} + 2a_1 d_1 p_2 + d_1^2 p_2^2 + \frac{(a_1 + d_1 p_2)(-24b_1^2 l_1 m_1 + (a_1 + d_1 p_2)^3)}{k_1^{1/3}})^2} \quad (154)$$

The optimal solution for X_1 is therefore the multiplication of L_1 and M_1 , which were found earlier under the assumption (153):

$$X_1 = \frac{1}{2}(a_1 + d_1 p_2) - \frac{6b_1^2 l_{1m_1}}{a_1^2 + k_1^{1/3} + 2a_1 d_1 p_2 + d_1^2 p_2^2 + \frac{(a_1 + d_1 p_2)(-24b_1^2 l_{1m_1} + (a_1 + d_1 p_2)^3)}{k_1^{1/3}}} \quad (155)$$

Hence, the analytical solution for the utility of duopolist 1 (FOCJ1) considering the utility function of the third type, $U_1 = \delta_1 * L_1$, is:

$$U_1 = \delta_1 * \frac{a_1^2 + k_1^{1/3} + 2a_1 d_1 p_2 + d_1^2 p_2^2 + \frac{(a_1 + d_1 p_2)(a_1^3 - 24b_1^2 l_{1m_1} + 3a_1^2 d_1 p_2 + 3a_1 d_1^2 p_2^2 + d_1^3 p_2^3)}{k_1^{1/3}}}{12b_1 l_1} \quad (156)$$

The reaction curve of FOCJ1 can be received from the system of equations (126) by plugging the optimal X_1 (155) into the first equation of the system. After simplification and under substitution (153), the reaction curve of FOCJ1 is:

$$p_1 = \frac{a_1 + d_1 p_2 + \frac{12b_1^2 l_{1m_1}}{a_1^2 + k_1^{1/3} + 2a_1 d_1 p_2 + d_1^2 p_2^2 + \frac{(a_1 + d_1 p_2)(-24b_1^2 l_{1m_1} + (a_1 + d_1 p_2)^3)}{k_1^{1/3}}}}{2b_1} \quad (157)$$

For duopolist 2 (FOCJ2), the same sequence of steps to find optimal L_2 , M_2 , X_2 , U_2 and the reaction curve p_2 must be done, stemming from the Lagrange function (129) and the first order conditions resulting from its differentiation. Since duopolist 2 has the same production and utility functions as duopolist 1, the optimal analytical solutions only differ in indexes.

Therefore, the analytical solution for labour of duopolist 2 is:

$$L_2 = \frac{a_2^2 + k_2^{1/3} + 2a_2 d_2 p_1 + d_2^2 p_1^2 + \frac{(a_2 + d_2 p_1)(a_2^3 - 24b_2^2 l_{2m_2} + 3a_2^2 d_2 p_1 + 3a_2 d_2^2 p_1^2 + d_2^3 p_1^3)}{k_2^{1/3}}}{12b_2 l_2} \quad (158)$$

The analytical solution for materials of duopolist 2 is:

$$M_2 = \frac{6b_2 l_2 (-12b_2^2 l_{2m_2} + (a_2 + d_2 p_1)(a_2^2 + k_2^{1/3} + 2a_2 d_2 p_1 + d_2^2 p_1^2 + \frac{(a_2 + d_2 p_1)(-24b_2^2 l_{2m_2} + (a_2 + d_2 p_1)^3)}{k_2^{1/3}}))}{(a_2^2 + k_2^{1/3} + 2a_2 d_2 p_1 + d_2^2 p_1^2 + \frac{(a_2 + d_2 p_1)(-24b_2^2 l_{2m_2} + (a_2 + d_2 p_1)^3)}{k_2^{1/3}})^2} \quad (159)$$

The analytical solution for output of duopolist 2 is:

$$X_2 = \frac{1}{2}(a_2 + d_2 p_1) - \frac{6b_2^2 l_{2m_2}}{a_2^2 + k_2^{1/3} + 2a_2 d_2 p_1 + d_2^2 p_1^2 + \frac{(a_2 + d_2 p_1)(-24b_2^2 l_{2m_2} + (a_2 + d_2 p_1)^3)}{k_2^{1/3}}} \quad (160)$$

The analytical solution for utility of duopolist 2 is:

$$U_2 = \delta_2^* \frac{a_2^2 + k_2^{1/3} + 2a_2 d_2 p_1 + d_2^2 p_1^2 + \frac{(a_2 + d_2 p_1)(a_2^3 - 24b_2^2 l_2 m_2 + 3a_2^2 d_2 p_1 + 3a_2 d_2^2 p_1^2 + d_2^3 p_1^3)}{k_2^{1/3}}}{12b_2 l_2} \quad (161)$$

The analytical solution for the fee level of duopolist 2 and their reaction curve is:

$$p_2 = \frac{a_2 + d_2 p_1 + \frac{12b_2^2 l_2 m_2}{a_2^2 + k_2^{1/3} + 2a_2 d_2 p_1 + d_2^2 p_1^2 + \frac{(a_2 + d_2 p_1)(-24b_2^2 l_2 m_2 + (a_2 + d_2 p_1)^3)}{k_2^{1/3}}}}{2b_2} \quad (162)$$

where

$$k_2 = a_2^6 + 216b_2^4 l_2^2 m_2^2 + 6a_2^5 d_2 p_1 + 15a_2^4 d_2^2 p_1^2 - 36b_2^2 d_2^3 l_2 m_2 p_1^3 + d_2^6 p_1^6 - 4a_2^3 (9b_2^2 l_2 m_2 - 5d_2^3 p_1^3) + 24\sqrt{3} \sqrt{-b_2^6 l_2^3 m_2^3 (a_2^3 - 27b_2^2 l_2 m_2 + 3a_2^2 d_2 p_1 + 3a_2 d_2^2 p_1^2 + d_2^3 p_1^3) - 3a_2^2 (36b_2^2 d_2 l_2 m_2 p_1 - 5d_2^4 p_1^4) + a_2(-108b_2^2 d_2^2 l_2 m_2 p_1^2 + 6d_1^5 p_1^5}} \quad (163)$$

To find the Launhardt-Hotelling solution, the following system of equations must be solved as a crossing point of two reaction curves with respect to p_1 and p_2 :

$$\begin{cases} p_1 = \frac{a_1 + d_1 p_2 + \frac{12b_1^2 l_1 m_1}{a_1^2 + k_1^{1/3} + 2a_1 d_1 p_2 + d_1^2 p_2^2 + \frac{(a_1 + d_1 p_2)(-24b_1^2 l_1 m_1 + (a_1 + d_1 p_2)^3)}{k_1^{1/3}}}}{2b_1} \\ p_2 = \frac{a_2 + d_2 p_1 + \frac{12b_2^2 l_2 m_2}{a_2^2 + k_2^{1/3} + 2a_2 d_2 p_1 + d_2^2 p_1^2 + \frac{(a_2 + d_2 p_1)(-24b_2^2 l_2 m_2 + (a_2 + d_2 p_1)^3)}{k_2^{1/3}}}}{2b_2} \end{cases} \quad (164)$$

Launhardt-Hotelling is $p_1 = 10.3332$, $p_2 = 7.18927$ under the (165) parameter combination:

$$a_1 = 5, a_2 = 3, b_1 = 1.5, b_2 = 2.5, d_1 = 3.5, d_2 = 3, m_1 = 10, m_2 = 10, l_1 = 8, l_2 = 8, \delta_1 = 0.2, \delta_2 = 0.2, U_{1const} = 5, U_{2const} = 5 \quad (165)$$

Under the given parameter combination, there is only one positive crossing point of FOCJ1 (red) and FOCJ2 (blue) reaction curves, as illustrated in Figure 28:

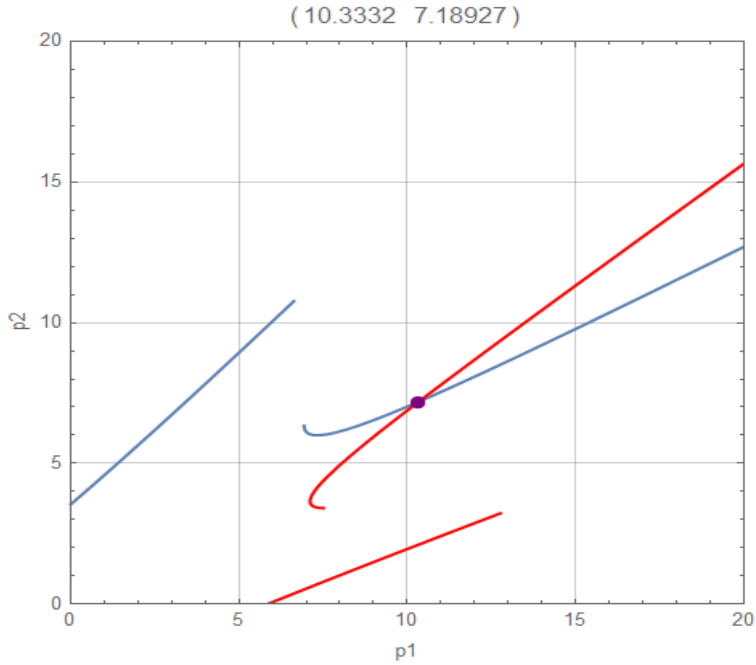


Figure 28. The Launhardt-Hotelling solution for Case III of management behaviour
Source: Compiled by the author using Wolfram Mathematica program.

To develop an isoutility curve for FOCJ1, its utility function $U_I = \delta_I * L_I$ should be divided by X_I and fixed at a particular level U_{Iconst} , as has been done in the two previous cases³¹:

$$\frac{U_{Iconst}}{a_1 - b_1 * p_1 + d_1 * p_2} = \frac{\delta_I * L_I}{\frac{1}{2}(a_1 + d_1 p_2) \frac{6b_1^2 l_1 m_1}{a_1^2 + k_1^{1/3} + 2a_1 d_1 p_2 + d_1^2 p_2^2 + \frac{(a_1 + d_1 p_2)(-24b_1^2 l_1 m_1 + (a_1 + d_1 p_2)^3)}{k_1^{1/3}}}} \quad (166)$$

In simplified form, L_I in numerator and denominator is reduced, since $X_I = L_I * M_I$:

$$\frac{U_{Iconst}}{a_1 - b_1 * p_1 + d_1 * p_2} = \frac{\delta_I (a_1^2 + k_1^{1/3} + 2a_1 d_1 p_2 + d_1^2 p_2^2 + \frac{(a_1 + d_1 p_2)(-24b_1^2 l_1 m_1 + (a_1 + d_1 p_2)^3)}{k_1^{1/3}})^2}{6b_1 l_1 (-12b_1^2 l_1 m_1 + (a_1 + d_1 p_2)(a_1^2 + k_1^{1/3} + 2a_1 d_1 p_2 + d_1^2 p_2^2 + \frac{(a_1 + d_1 p_2)(-24b_1^2 l_1 m_1 + (a_1 + d_1 p_2)^3)}{k_1^{1/3}}))} \quad (167)$$

³¹ Calculations consist of several steps which are too complicated to include their detailed description into the thesis. For the sake of simplicity, the author has included only an essence of these calculations. Therefore, the one, who is interested in the complete sequence of steps, should turn to the author for their demonstration.

The same should be done to receive an isoutility curve for FOCJ2:

$$\frac{U_{2\text{const}}}{a_2 - b_2^*p_2 + d_2^*p_1} = \frac{\delta_2^*L_2}{\frac{1}{2}(a_2+d_2p_1) - \frac{6b_2^2l_2m_2}{a_2^2+k_2^{1/3}+2a_2d_2p_1+d_2^2p_1^2+\frac{(a_2+d_2p_1)(-24b_2^2l_2m_2+(a_2+d_2p_1)^3)}{k_2^{1/3}}}} \quad (168)$$

And in simplified form:

$$\frac{U_{2\text{const}}}{a_2 - b_2^*p_2 + d_2^*p_1} = \frac{\delta_2(a_2^2+k_2^{1/3}+2a_2d_2p_1+d_2^2p_1^2+\frac{(a_2+d_2p_1)(-24b_2^2l_2m_2+(a_2+d_2p_1)^3)}{k_2^{1/3}})^2}{6b_2l_2(-12b_2^2l_2m_2+(a_2+d_2p_1)(a_2^2+k_2^{1/3}+2a_2d_2p_1+d_2^2p_1^2+\frac{(a_2+d_2p_1)(-24b_2^2l_2m_2+(a_2+d_2p_1)^3)}{k_2^{1/3}}))} \quad (169)$$

The isoutility curve of FOCJ1 and the reaction curve of FOCJ2 should have equal steepness dp_1/dp_2 at the point of their tangency. The same is true for the steepness dp_2/dp_1 of the isoutility curve of FOCJ2 and the reaction curve of FOCJ1. This is necessary to find the Stackelberg points of tangency.

When equalising the steepness of the isoutility curve of FOCJ1 and the reaction curve of FOCJ2, two Stackelberg points become relevant under the given parameters' combination: $p_1 = 2.60336$, $p_2 = 6.29225$ and $p_1 = 14.0917$, $p_2 = 9.25925$.

When the steepness of the isoutility curve of FOCJ2 and the reaction function of FOCJ1 are equal, the following Stackelberg point results in $p_1 = 10.8312$, $p_2 = 2.34085$.

In order to find the isoutility crossing point, the following system of equations must be solved:

$$\left\{ \begin{array}{l} \frac{U_{1\text{const}}}{a_1 - b_1^*p_1 + d_1^*p_2} = \frac{\delta_1^*L_1}{\frac{1}{2}(a_1+d_1p_2) - \frac{6b_1^2l_1m_1}{a_1^2+k_1^{1/3}+2a_1d_1p_2+d_1^2p_2^2+\frac{(a_1+d_1p_2)(-24b_1^2l_1m_1+(a_1+d_1p_2)^3)}{k_1^{1/3}}}} \\ \frac{U_{2\text{const}}}{a_2 - b_2^*p_2 + d_2^*p_1} = \frac{\delta_2^*L_2}{\frac{1}{2}(a_2+d_2p_1) - \frac{6b_2^2l_2m_2}{a_2^2+k_2^{1/3}+2a_2d_2p_1+d_2^2p_1^2+\frac{(a_2+d_2p_1)(-24b_2^2l_2m_2+(a_2+d_2p_1)^3)}{k_2^{1/3}}}} \end{array} \right. \quad (170)$$

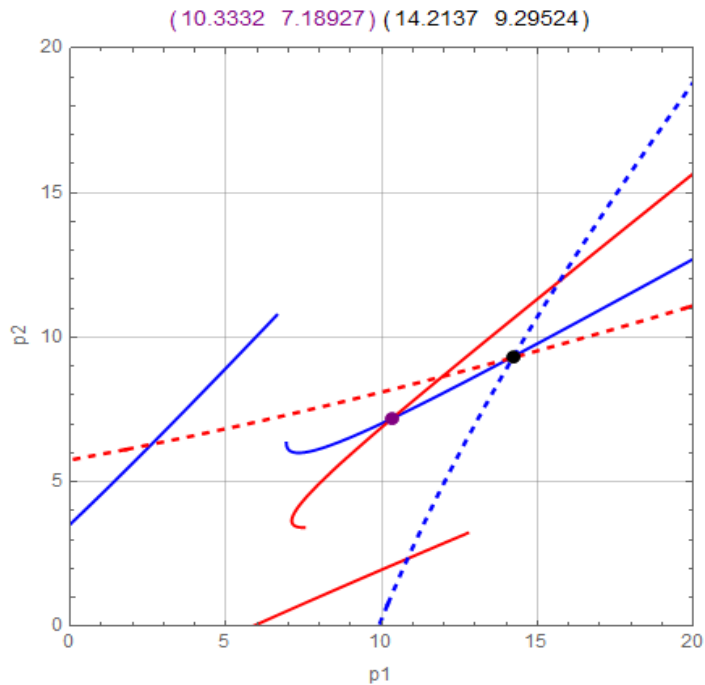


Figure 29. The Krelle-Ott area for Case III of management behaviour
 Source: Compiled by the author using Wolfram Mathematica program.

Figure 29 demonstrates the crossing point of the isoutility curves of FOCJ1 (red dotted line) and FOCJ2 (blue dotted line), which is shown by a thick black point. Under assumed parameter combination (165), this point is $p_1 = 14.2137$, $p_2 = 9.29524$ found as a solution of the (170) system of equations. The purple point is the Launhardt-Hotelling solution, thus the area located between these two points is the fee stability (Krelle-Ott) area for Case III. The Stackelberg points delineate the Krelle-Ott area as a tangency point of the FOCJ1 reaction (red) curve and the FOCJ2 isoutility curve and a tangency point of the FOCJ2 reaction (blue) curve and the FOCJ1 isoutility curve. The Stackelberg points are omitted in Figure 29 for the sake of simplicity.

Case IV: $U = \alpha \cdot L - X + \beta$

In the fourth case, management maximises the utility function, which positively depends on labour (L) and negatively on output (X) and is expressed by the formula:

$$U = \alpha \cdot L - X + \beta \quad (171)$$

The following Lagrange function is written out under two constraints:

$$\text{Lag} = \alpha * L - X + \beta - \lambda_1 * (p * X - L * l - M * m) - \lambda_2 * (X - L * M) \quad (172)$$

First order conditions with respect to $X, L, M, \lambda_1, \lambda_2$ yield:

$$\frac{\partial \text{Lag}}{\partial X} = -1 - p\lambda_1 - \lambda_2 = 0 \quad (173)$$

$$\frac{\partial \text{Lag}}{\partial L} = \alpha + l\lambda_1 + M\lambda_2 = 0 \quad (174)$$

$$\frac{\partial \text{Lag}}{\partial M} = m\lambda_1 + L\lambda_2 = 0 \quad (175)$$

$$\frac{\partial \text{Lag}}{\partial \lambda_1} = lL + mM - pX = 0 \quad (176)$$

$$\frac{\partial \text{Lag}}{\partial \lambda_2} = LM - X = 0 \quad (177)$$

From the first order conditions (173)-(177), the author has received optimal X, L, M and U :

$$L = \frac{m(1 - p\alpha + \sqrt{l(1 - p\alpha)})}{p(1 - p\alpha)} \quad (178)$$

$$M = \frac{1 + \sqrt{l(1 - p\alpha)}}{p} \quad (179)$$

$$X = -\frac{m(1 + \sqrt{l(1 - p\alpha)})(1 - p\alpha + \sqrt{l(1 - p\alpha)})}{p^2(-1 + p\alpha)} \quad (180)$$

$$U = \alpha * L - X + \beta = \alpha * \left(\frac{m(1 - p\alpha + \sqrt{l(1 - p\alpha)})}{p(1 - p\alpha)} \right) - \left(-\frac{m(1 + \sqrt{l(1 - p\alpha)})(1 - p\alpha + \sqrt{l(1 - p\alpha)})}{p^2(-1 + p\alpha)} \right) + \beta \quad (181)$$

After simplification, (181) transforms into:

$$U = \frac{-2lm + mp\alpha - 2m\sqrt{l(1 - p\alpha)} + p^2\beta}{p^2} \quad (182)$$

Monopoly

To find a solution for the optimal fee when there is only one FOCJ of type II that provides services, the author connects the production and demand side, as was done in previous cases of management behaviour:

$$-\frac{m(1 + \sqrt{l(1 - p\alpha)})(1 - p\alpha + \sqrt{l(1 - p\alpha)})}{p^2(-1 + p\alpha)} = a - b \cdot p \quad (183)$$

From the equation (183), an analytical solution for p can be found. Here, five points become possible. However, only four of them under particular parameter combination (i.e. $a = 10$, $b = 0.2$, $m = 20$, $l = 10$, $\beta = 30$, $\alpha = 0.1$) are positive. However, for comparison between cases, only $p = 10.004$ is considered.

Formulas (178)-(182) should be recalculated considering assumed parameter values and received p . The results of optimal L , M , X and U are shown in Table 7.

Oligopoly

In the case where management evaluates labour positively and output negatively, indifference curves are shown in the first quadrant of Figure 30. Again, a set of possible solution spaces is presented in the first quadrant by green and red circle curves. An optimal solution is where the highest indifference curve touches the possible solution space. Transferring these points into the second quadrant results in the reaction function. The reaction function (reaction line) shows the utility maximising fee of FOCJ1 under the choice of the FOCJ2's fee (p_2). For each utility level $U_{const} = 10$ and $U_{const} = 5$, a set of points on the demand functions in the second quadrant become relevant. To find these points as crossing points with demand functions, average utility curves are necessary. Average utility functions can be found by dividing constant utility by X . In the second quadrant, average utility functions are hyperbolic red and green dashed curves.

The next step would be to transfer the received (p_1 ; p_2) combinations in the second quadrant to the system of coordinate $p_1 - p_2$ visualised in the right-hand lower corner of Figure 30. The combinations of FOCJ1 and FOCJ2 fees that guarantee a constant level of utility for FOCJ1 yield isoutility curves. The same analysis is possible for FOCJ2.

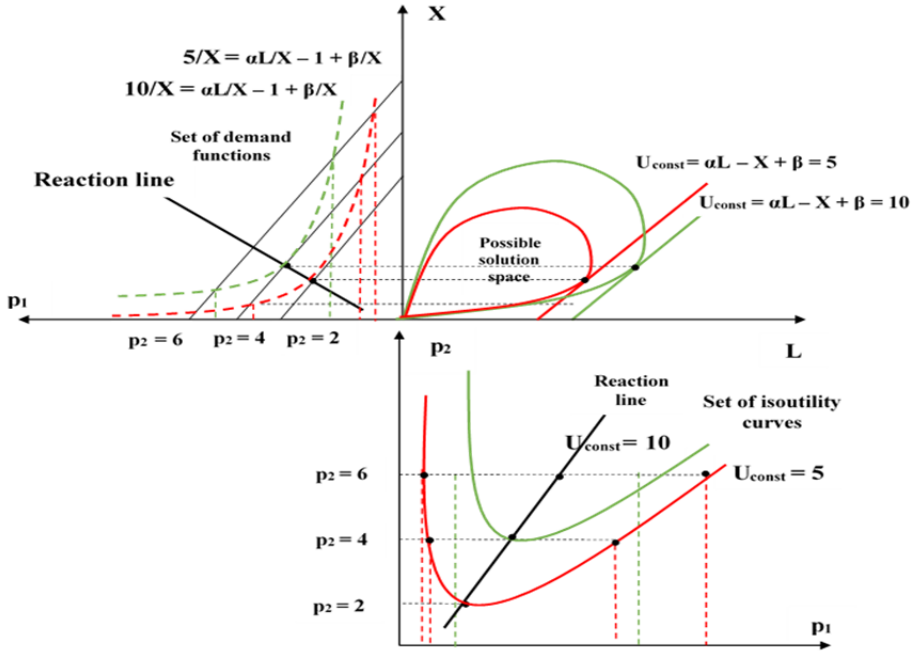


Figure 30. Schematically: steps of isutility curve and reaction line construction when maximising output under the condition that labour grows³²
Source: Compiled by the author.

Reaction curves for FOCJ1 and FOCJ2 can be found when the oligopoly demand function is equalised with the production side represented by the optimal output (180) specified for each FOCJ, such as³³:

$$\begin{cases} -\frac{m_1(l_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})(l_1 - p_1\alpha_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})}{p_1^2(-l_1 + p_1\alpha_1)} = a_1 - b_1*p_1 + d_1*p_2 \\ -\frac{m_2(l_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})(l_2 - p_2\alpha_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})}{p_2^2(-l_2 + p_2\alpha_2)} = a_2 - b_2*p_2 + d_2*p_1 \end{cases} \quad (184)$$

Isolating p_1 from the first equation and p_2 from the second equation of system of equations (184) provides reaction curves of FOCJ1 and FOCJ2, respectively.

³² How the points of the reaction line located in the second quadrant depends on the shape of the solution space in the first quadrant and the steepness of indifference curves.

³³ Calculations consist of several steps which are too complicated to include their detailed description into the thesis. For the sake of simplicity, the author has included only an essence of these calculations. Therefore, the one who is interested in the complete sequence of steps should turn to the author for their demonstration.

To find the Launhardt-Hotelling solution, the system of equations (184) must be solved with respect to p_1 and p_2 . Graphically, it is solved in Figure 31 with $p_1 = 9.79886$ and $p_2 = 3.72416$ as an equilibrium point.

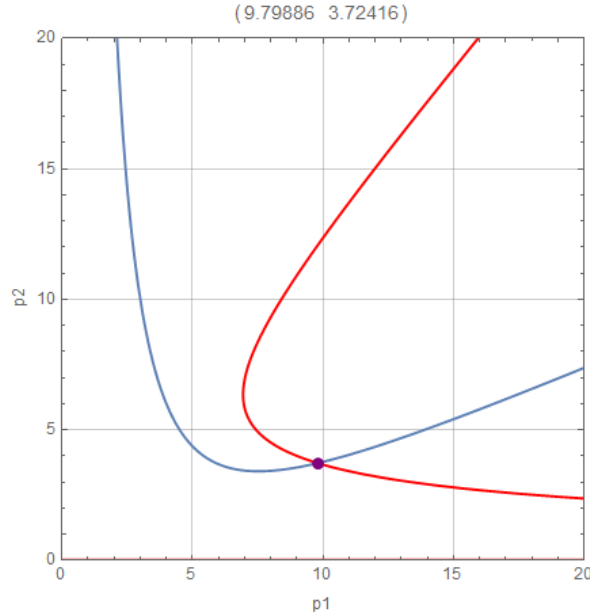


Figure 31. The Launhardt-Hotelling solution for Case IV of management behaviour
Source: Compiled by the author using Wolfram Mathematica program.

Figure 31 demonstrates, on the right-hand side, the reaction curves of FOCJ1 (red curve) and FOCJ2 (blue curve) with the Launhardt-Hotelling solution. On the left-hand side, a tool bar shows how parameters of equations can be changed to influence the optimal solution.

Next, isointility curves must be constructed for FOCJ1 and FOCJ2 as was described in previous cases. Thus, an isointility curve for FOCJ1 is:

$$\frac{U_{1const}}{a_1 - b_1 * p_1 + d_1 * p_2} = \frac{\alpha_1 * \left(\frac{m_1(l_1 - p_1\alpha_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})}{p_1(l_1 - p_1\alpha_1)} \right) - \left(\frac{m_1(l_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})(l_1 - p_1\alpha_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})}{p_1^2(-l_1 + p_1\alpha_1)} \right) + \beta_1}{\frac{m_1(l_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})(l_1 - p_1\alpha_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})}{p_1^2(-l_1 + p_1\alpha_1)}} \quad (185)$$

The isointility curve for FOCJ2 can be described as:

$$\frac{U_{2const}}{a_2 - b_2 * p_2 + d_2 * p_1} = \frac{\alpha_2 * \left(\frac{m_2(l_2 - p_2\alpha_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})}{p_2(l_2 - p_2\alpha_2)} \right) - \left(\frac{m_2(l_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})(l_2 - p_2\alpha_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})}{p_2^2(-l_2 + p_2\alpha_2)} \right) + \beta_2}{\frac{m_2(l_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})(l_2 - p_2\alpha_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})}{p_2^2(-l_2 + p_2\alpha_2)}} \quad (186)$$

The Stackelberg points where the highest possible isoutility curve of FOCJ1 touches the reaction curve of FOCJ2 should be found. For this, the author has calculated their steepness dp_1/dp_2 and equalised them.

The steepness of the isoutility curve of FOCJ2 and the reaction curve of FOCJ1 dp_2/dp_1 should be equal as well.

Under parameter combination $a_1 = 5$, $a_2 = 3$, $b_1 = 1.5$, $b_2 = 2.5$, $d_1 = 3.5$, $d_2 = 3$, $m_1 = 10$, $m_2 = 10$, $l_1 = 8$, $l_2 = 8$, $\alpha_1 = 0.1$, $\alpha_2 = 0.2$, $\beta_1 = 30$, $\beta_2 = 25$, $U_{1const} = 5$, $U_{2const} = 5$, two Stackelberg points have been identified: $p_1 = 6.94195$, $p_2 = 6.34924$ (p_1 is received by substituting p_2 in the reaction curve of FOCJ2) and $p_1 = 7.52821$, $p_2 = 3.41203$ (p_2 is received by substituting p_1 in the reaction curve of FOCJ1).

To find the crossing points of isoutility curves, the following system of equations must be solved with respect to p_1 and p_2 :

$$\left\{ \begin{array}{l} \frac{U_{1const}}{a_1 - b_1 * p_1 + d_1 * p_2} = \frac{\alpha_1 * \left(\frac{m_1(l_1 - p_1\alpha_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})}{p_1(l_1 - p_1\alpha_1)} \right) - \left(\frac{m_1(l_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})(l_1 - p_1\alpha_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})}{p_1^2(-l_1 + p_1\alpha_1)} \right) + \beta_1}{\frac{m_1(l_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})(l_1 - p_1\alpha_1 + \sqrt{l_1(l_1 - p_1\alpha_1)})}{p_1^2(-l_1 + p_1\alpha_1)}} \\ \frac{U_{2const}}{a_2 - b_2 * p_2 + d_2 * p_1} = \frac{\alpha_2 * \left(\frac{m_2(l_2 - p_2\alpha_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})}{p_2(l_2 - p_2\alpha_2)} \right) - \left(\frac{m_2(l_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})(l_2 - p_2\alpha_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})}{p_2^2(-l_2 + p_2\alpha_2)} \right) + \beta_2}{\frac{m_2(l_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})(l_2 - p_2\alpha_2 + \sqrt{l_2(l_2 - p_2\alpha_2)})}{p_2^2(-l_2 + p_2\alpha_2)}} \end{array} \right. \quad (187)$$

Under parameter combination $a_1 = 5$, $a_2 = 3$, $b_1 = 1.5$, $b_2 = 2.5$, $d_1 = 3.5$, $d_2 = 3$, $m_1 = 10$, $m_2 = 10$, $l_1 = 8$, $l_2 = 8$, $\alpha_1 = 0.1$, $\alpha_2 = 0.2$, $\beta_1 = 30$, $\beta_2 = 25$, $U_{1const} = 5$, $U_{2const} = 5$, there is a crossing point of isoutility curves of FOCJ1 (red dotted curve) and FOCJ2 (blue dotted curve), $p_1 = 11.9102$, $p_2 = 3.79144$, which is shown in Figure 32 as a black point. The purple point illustrates the Launhardt-Hotelling solution as a crossing point of FOCJ1 (red) and FOCJ2 (blue) reaction curves. The small area between these two crossing points and two Stackelberg points of tangency, which are not demonstrated in the Figure 32, is the Krelle-Ott area for Case IV of FOCJ management behaviour.

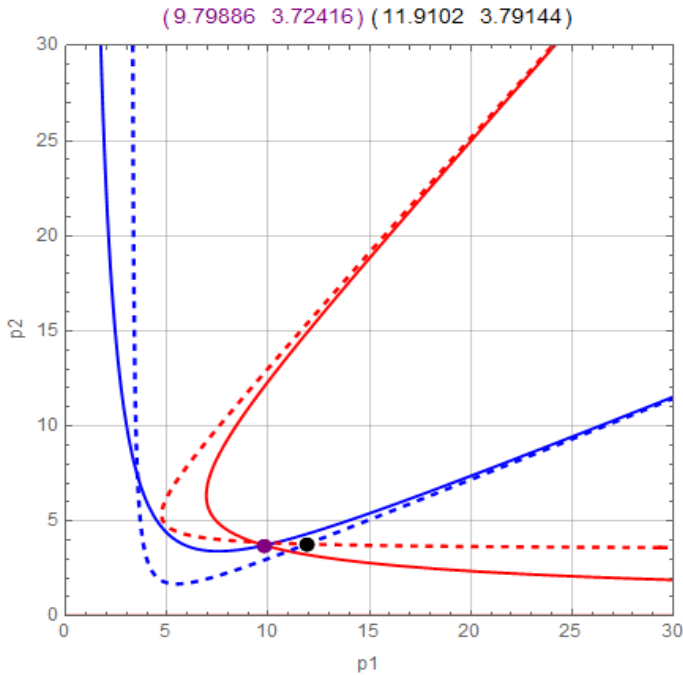


Figure 32. The Krelle-Ott area for Case IV of management behaviour
 Source: Compiled by the author using Wolfram Mathematica program.

It is necessary to note that the β coefficient included in the utility function of Case IV under the given parameter combination should be bigger than 15, otherwise the Stackelberg points become negative, which means that they exist, but only in negative quadrants $p_1 - p_2$.

In Table 6, the author has grouped the optimal analytical solutions for Case I, Case II, Case III and Case IV with respect to labour, material, output, utility and fee. For Case III, analytical solutions are found in monopoly and duopoly separately, considering the demand function already on the Lagrange stage. The analytical solutions of fees for Cases I, II and IV are not included in Table 6 because of their comprehensiveness. Instead, their numerical solutions in monopoly (see Table 7) and oligopoly (see Table 8) are demonstrated³⁴.

³⁴ The analytical solutions of p can be provided on request. The numerical solutions of p are given in Table 7 and 8 in monopoly and oligopoly, respectively.

Table 6. Four cases: analytical solutions of variables in monopoly and duopoly.*

Solutions	Case I (+X, +L)	Case II (X)	Case IV (-X, +L)
L	$\frac{m(2+\beta)}{p(1+\beta)}$	$\frac{2m}{p}$	$\frac{m(1-p\alpha+\sqrt{1(1-p\alpha)})}{p(1-p\alpha)}$
M	$\frac{l(2+\beta)}{p}$	$\frac{2l}{p}$	$\frac{l+\sqrt{l(1-p\alpha)}}{p}$
X	$\frac{lm(2+\beta)^2}{p^2(1+\beta)}$	$\frac{4lm}{p^2}$	$\frac{m(1+\sqrt{l(1-p\alpha)})(1-p\alpha+\sqrt{l(1-p\alpha)})}{p^2(-1+p\alpha)}$
U	$\frac{l(2+\beta)(\frac{m(2+\beta)}{p(1+\beta)})^{1+\beta}}{p}$	$\frac{4lmy}{p^2}$	$\frac{-2lm+mp\alpha-2m\sqrt{l(1-p\alpha)+p^2\beta}}{p^2}$
Case III (L)			
Monopoly			
L	$L = \frac{1}{12bl} \left(a^2 + \frac{a^4 - 24ab^2 lm}{(a^6 - 36a^3 b^2 lm + 24(9b^4 l^2 m^2 + \sqrt{3} \sqrt{b^6 l^3 m^3 (-a^3 + 27b^2 lm)})^{1/3}} \right)^{1/3} + (a^6 - 36a^3 b^2 lm + 24(9b^4 l^2 m^2 + \sqrt{3} \sqrt{b^6 l^3 m^3 (-a^3 + 27b^2 lm)}))^{1/3}$		
M	$M = \frac{(6bl(-12b^2 lm + a^2) + \frac{a^4 - 24ab^2 lm}{(a^6 - 36a^3 b^2 lm + 24(9b^4 l^2 m^2 + \sqrt{3} \sqrt{b^6 l^3 m^3 (-a^3 + 27b^2 lm)})^{1/3}})}{(a^6 - 36a^3 b^2 lm + 24(9b^4 l^2 m^2 + \sqrt{3} \sqrt{b^6 l^3 m^3 (-a^3 + 27b^2 lm)})^{1/3}} + (a^6 - 36a^3 b^2 lm + 24(9b^4 l^2 m^2 + \sqrt{3} \sqrt{b^6 l^3 m^3 (-a^3 + 27b^2 lm)}))^{1/3}$		
X	$X = \frac{a}{2} - \frac{a^4 - 24ab^2 lm}{(a^6 - 36a^3 b^2 lm + 24(9b^4 l^2 m^2 + \sqrt{3} \sqrt{b^6 l^3 m^3 (-a^3 + 27b^2 lm)})^{1/3}} + \frac{6b^2 lm}{(a^6 - 36a^3 b^2 lm + 24(9b^4 l^2 m^2 + \sqrt{3} \sqrt{b^6 l^3 m^3 (-a^3 + 27b^2 lm)})^{1/3}} + (a^6 - 36a^3 b^2 lm + 24(9b^4 l^2 m^2 + \sqrt{3} \sqrt{b^6 l^3 m^3 (-a^3 + 27b^2 lm)}))^{1/3}$		

U	$U = \delta \frac{1}{12b_1} \left(a^2 + \frac{a^4 - 24ab^2lm}{(a^6 - 36a^3b^2lm + 24(9b_1^2m^2 + \sqrt{3} \sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})} \right)^{1/3} + (a^6 - 36a^3b^2lm + 24(9b_1^2m^2 + \sqrt{3} \sqrt{b^6l^3m^3(-a^3 + 27b^2lm)}))^{1/3}$
p	$p = \frac{a}{2b} + \frac{a^4 - 24ab^2lm}{a^2 + \frac{a^4 - 24ab^2lm}{(a^6 - 36a^3b^2lm + 24(9b_1^2m^2 + \sqrt{3} \sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})})^{1/3} + (a^6 - 36a^3b^2lm + 24(9b_1^2m^2 + \sqrt{3} \sqrt{b^6l^3m^3(-a^3 + 27b^2lm)})})^{1/3}}$
Oligopoly	
L ₁	$L_1 = \frac{a_1^2 + k_1^{1/3} + 2a_1d_1p_2 + d_1^2 p_2^2 + (a_1 + d_1p_2)(a_1^3 - 24b_1^2l_1m_1 + 3a_1^2d_1p_2 + 3a_1d_1^2p_2^2 + d_1^3p_2^3)}{k_1^{1/3}}$
M ₁	$M_1 = \frac{6b_1l_1(-12b_1^2l_1m_1 + (a_1 + d_1p_2)(a_1^2 + k_1^{1/3} + 2a_1d_1p_2 + d_1^2 p_2^2 + (a_1 + d_1p_2)(a_1^3 - 24b_1^2l_1m_1 + 3a_1^2d_1p_2 + 3a_1d_1^2p_2^2 + d_1^3p_2^3))}{k_1^{1/3}}$
X ₁	$X_1 = \frac{1}{2} (a_1 + d_1p_2) - \frac{a_1^2 + k_1^{1/3} + 2a_1d_1p_2 + d_1^2 p_2^2 + (a_1 + d_1p_2)(a_1^3 - 24b_1^2l_1m_1 + 3a_1^2d_1p_2 + 3a_1d_1^2p_2^2 + d_1^3p_2^3)}{k_1^{1/3}}$
U ₁	$U_1 = \delta_1^* \frac{a_1^2 + k_1^{1/3} + 2a_1d_1p_2 + d_1^2 p_2^2 + (a_1 + d_1p_2)(a_1^3 - 24b_1^2l_1m_1 + 3a_1^2d_1p_2 + 3a_1d_1^2p_2^2 + d_1^3p_2^3)}{k_1^{1/3}}$
p ₁	$p_1 = \frac{a_1 + d_1p_2 + \frac{12b_1^2l_1m_1}{a_1^2 + k_1^{1/3} + 2a_1d_1p_2 + d_1^2 p_2^2 + (a_1 + d_1p_2)(a_1^3 - 24b_1^2l_1m_1 + 3a_1^2d_1p_2 + 3a_1d_1^2p_2^2 + d_1^3p_2^3)}}{2b_1}$

Source: Compiled by the author.

*Note: In the formulas, p is different for monopoly and duopoly. Demand in monopoly is $p = a/b - 1/b * X$, demand of FOCJ1 in duopoly is $p_1 = a_1/b_1 - 1/b_1 * X_1 + d_1/b_1 * p_2$, demand of FOCJ2 in duopoly is $p_2 = a_2/b_2 - 1/b_2 * X_2 + d_2/b_2 * p_1$.

For Case III: $k_1 = a_1^6 + 216b_1^4l_1^2m_1^2 + 6a_1^5d_1p_2 + 15a_1^4d_1^2p_2^2 - 36b_1^2d_1l_1m_1p_2^3 + d_1^6p_2^6 - 4a_1^3(9b_1^2l_1m_1 - 5d_1^3p_2^3) + 24\sqrt{3} \sqrt{-b_1^3l_1^3m_1^3(a_1^3 - 27b_1^2l_1m_1 + 3a_1^2d_1p_2 + 3a_1d_1^2p_2^2 + d_1^3p_2^3)} - 3a_1^2(36b_1^2d_1l_1m_1p_2 - 5d_1^4p_2^4) + a_1(-108b_1^2d_1^2l_1m_1p_2^2 + 6d_1^5p_2^5)$.

Table 7. Four cases: numerical solutions in monopoly**

Solutions	Case I (+X, +L)	Case II (X)	Case III (L)	Case IV (-X, +L)
L	2.25628	4.	11.6569	4.1066
M	3.38443	2.	0.414214	1.94789
X	7.63623	8.	4.82843	7.99921
U	38.8747	3.2	2.33137	22.4115
Monopoly fee	11.8188	10.	25.8579	10.004

Source: Compiled by the author.

**Note: $a = 10$, $b = 0.2$, $m = 20$, $l = 10$, $\beta = 2$ (Case I), $\gamma = 0.4$ (Case II), $\delta = 0.2$ (Case III), $\alpha = 0.1$ (Case IV), $\beta = 30$ (Case IV)

Table 8. Four cases: numerical solutions in oligopoly***

Solutions	Case I (+X, +L)	Case II (X)	Case III (L)	Case IV (-X, +L) ³⁵
L ₁	1.26036	2.0412	17.916	2.10995
L ₂	3.17874	5.37204	12.8425	5.5048
M ₁	3.02487	1.63296	0.818408	1.58121
M ₂	7.62897	4.29763	1.24793	4.19383
X ₁	3.81244	3.3332	14.6626	3.33628
X ₂	24.2505	23.087	16.0265	23.0862
U ₁	6.05613	1.33328	3.5832	26.8747
U ₂	245.037	6.92611	2.56849	3.01478
Launhardt-Hotelling	$p_1 = 10.579$, $p_2 = 4.19453$	$p_1 = 9.79816$, $p_2 = 3.72298$	$p_1 = 10.3332$, $p_2 = 7.18927$	$p_1 = 9.79886$, $p_2 = 3.72416$
Stackelberg points	FOCJ1 isoutility/FOCJ2 reaction curve: $p_1 = 9.03246$; $p_2 = 4.88392$.	FOCJ1 isoutility/FOCJ2 reaction curve: $p_1 = 1.08979$, $p_2 = 2.60991$	FOCJ1 isoutility/FOCJ2 reaction curve: $p_1 = 2.60336$, $p_2 = 6.29225$. $p_1 = 14.0917$, $p_2 = 9.25925$.	FOCJ1 isoutility/FOCJ2 reaction curve: $p_1 = 6.94195$, $p_2 = 6.34924$
	FOCJ2 isoutility/FOCJ1 reaction curve: $p_1 = 5.50571$; $p_2 = 4.95257$	FOCJ2 isoutility/FOCJ1 reaction curve: $p_1 = 3.09439$, $p_2 = 9.44601$	FOCJ2 isoutility/FOCJ1 reaction curve: $p_1 = 10.8312$, $p_2 = 2.34085$	FOCJ2 isoutility/FOCJ1 reaction curve: $p_1 = 7.52821$, $p_2 = 3.41203$

³⁵ The resulting solutions largely depend on the parameter combinations. Numerical solutions for labour, materials, output and fees must be positive. Therefore, not all intersections of the reaction curves and isoutility curves with particular parameter values lead to positive solutions for variables. Negative parameters are excluded, so that the range and values of parameters is limited. Additionally, from the rest of parameter values, the program may not be able to identify positive solutions of variable. Especially, at first Launhardt-Hotelling crossing point in positive values must be identified by the software. So far, specific solutions for chosen parameters have been figured out. These parameters are partly the same as in Cases I, II and III, but with special parameter values for α and β . The author also admits that there might be solutions for variables with other positive parameter values and coefficients before X , which have not been determined yet.

Solutions	Case I (+X, +L)	Case II (X)	Case III (L)	Case IV (-X, +L) ³⁵
Isoutility curves' crossing points	$p_1 = 52.4737,$ $p_2 = 43.1864$	$p_1 = 9.8642,$ $p_2 = 6.37037$	$p_1 = 14.2137,$ $p_2 = 9.29524$	$p_1 = 11.9102,$ $p_2 = 3.79144.$

Source: Compiled by the author.

***Note: $a_1 = 5, a_2 = 3, b_1 = 1.5, b_2 = 2.5, d_1 = 3.5, d_2 = 3, m_1 = 10, m_2 = 10, l_1 = 8, l_2 = 8, \beta_1 = 2, \beta_2 = 2$ (Case I), $\gamma_1 = 0.4, \gamma_2 = 0.3$ (Case II), $\delta_1 = 0.2, \delta_2 = 0.2$ (Case III), $\alpha_1 = 0.1, \alpha_2 = 0.2$ (Case IV), $\beta_1 = 30, \beta_2 = 25$ (Case IV), $U_{1const} = 5, U_{2const} = 5$. $L_1, M_1, X_1, U_1, L_2, M_2, X_2, U_2$ are calculated in Launhardt-Hotelling point.

The highest monopoly fee has been identified for the FOCJs of type II maximising labour (Case III). In oligopoly, the highest Launhardt-Hotelling combination p_1 and p_2 is also in Case III of management behaviour (see Table 8). The lowest fees are in the management maximising output (Case II) in oligopoly as well as in monopoly.

Management maximising output (Case II) shows the highest output result in monopoly. However, in duopoly, the highest output is produced by management maximising labour (Case III). This can be explained by the high proportion of labour involvement since this case of management behaviour is interested in labour. However, the total output of FOCJ1 and FOCJ2 in Case III is not much bigger compared with the other cases, which means that labour productivity is likely not high in the third case.

Management of Case IV shows relatively high output as well as utility. This can be explained by the chosen parameter combination or because they involve more labour, which they estimate positively, therefore producing more. Consequently, labour increase positively affects utility both in monopoly and oligopoly.

Management of Case I maximising output and labour obtains the highest utility in monopoly and oligopoly and shows the second highest level of output in oligopoly. In terms of fee level, management maximising output is the most preferable both in monopoly and duopoly. It shows the lowest FOCJ fees. In terms of output, again, management oriented towards output (Case II) shows the best performance in monopoly and management oriented towards output and labour (Case I) in duopoly (neglecting less productive Case III management). Therefore, Cases I and II of management behaviour are more favourable from the point of view of FOCJ members. Fees are generally higher in monopoly than in the oligopolistic market and total output is bigger in oligopoly than monopoly.

An additional result of this subchapter is that demand functions for the production factors labour and material can be derived from the optimal solutions in the formulas with respect to M and L in Table 6. Such as, for example, the labour demand function for Case I in monopoly is $L = \frac{m(2+\beta)}{(a/b-1/b*X)(1+\beta)}$, for materials, the demand function is $M = \frac{l(2+\beta)}{(a/b-1/b*X)}$. Similarly, for Case I, FOCJ1

obtains $L_1 = \frac{m_1(2+\beta_1)}{(a_1/b_1 - 1/b_1 * X_1 + d_1/b_1 * p_2)(1+\beta_1)}$ and the FOCJ1 demand function for material is $M_1 = \frac{l_1(2+\beta_1)}{(a_1/b_1 - 1/b_1 * X_1 + d_1/b_1 * p_2)}$.

For duopolist 2, the demand function for the production factors looks the same only with index 2. For the other cases of management behaviour, the factors' demand functions can be similarly derived.

The supply function of the FOCJ of type II can be obtained from the formula for the optimal X in monopoly and oligopoly (see Table 6). For example, for Case I, the FOCJ supply function is $X = \frac{lm(2+\beta)^2}{p^2(1+\beta)}$; for Case II: $X = \frac{4lm}{p^2}$, where p is different for monopoly and duopoly. A reverse demand in monopoly is $p = a/b - 1/b * X$; demand of FOCJ1 in duopoly is $p_1 = a_1/b_1 - 1/b_1 * X_1 + d_1/b_1 * p_2$; demand of FOCJ2 in duopoly is $p_2 = a_2/b_2 - 1/b_2 * X_2 + d_2/b_2 * p_1$.

For the Krelle-Ott area, numerical examples have shown that the smallest fee stability area is due to Case IV with management evaluating labour positively and output negatively. The biggest fee stability area is with Case I, where management evaluates both labour and output positively. Cases II and IV have comparable Krelle-Ott areas. Case III of management behaviour has three points where the Stackelberg equilibrium is reached. Therefore, the shape of the Krelle-Ott space is not smooth in this case.

2.3. Discussion of management decisions considering different restrictions

In the basic model of current operation (subchapter 2.1), FOCJ management is not restricted in decision-making with respect to output, labour and fee. However, they can be coordinated from inside by the Assembly of Members or from outside, for example, through the active participation of higher rank jurisdictions. Various conditions, which can be characterised by restrictions, different utility functions, production functions, conditions of demand, internal negotiation between management and members, etc. affect management decisions. How management decisions can be influenced is shown in this subchapter and the coordinating rules that must be imposed in order to regulate management behaviour are reflected in the institutional framework of FOCJs of type II (the Statute and Memorandum) in subchapter 3.4.

Restrictions with respect to labour

Sometimes school FOCJs of type II meet restrictions with respect to labour. For the needs of FOCJs of type II, labour is defined as teachers, school administrative and management staff and maintenance personnel. These restrictions can be imposed by the normative acts of municipalities or regions, the internal regulations of a school or the FOCJ Statute.

In Russia, for example, the Federal State Educational Standards (FSES) for General Education (Orders of the Ministry of Education and Science of the Russian Federation No. 373 of 6 October 2009, No. 1897 of 17 December 2010 and No. 413 of 17 May 2012) include requirements for the number of pedagogical, managerial and other employees. The number of pupils per teacher is set by each subject of the Russian Federation separately. The number of other staff of schools (administrative and management staff, educational support and junior service staff, teachers not involved in the educational process) is optimal if it is 53 percent of the number of teachers (Order of the Government of the Russian Federation No. 1313-r of 11 September 2008 (ed. from 13 July 2011) “On the realisation of the Decree of the President of the Russian Federation” from No. 607 of 28 April 2008 “On the estimation of the efficiency of the activity of local governments of city districts and municipal areas”).

In some countries, there are additional restrictions with respect to the employment cone (cone of positions). For example, in Germany. Employment cones describe the distribution of all jobs in an organisation. The position plan is dependent on personnel requirements, the budget approach and the budget plan (Eichhorn, Friedrich, Jann 2003). The employment cone is applied in public administration including school staffing. In Russia, staff schedules should be compiled in public and private companies by filling in T-3 form (*Госкомстат РФ* 2004). It is the normative document of an enterprise that formalises the structural units, staff composition and the number of employees of the organisation with indication to the amount of salary depending on the position held. The period within which a staff schedule is valid is usually one year and it should be approved by the order of the head of the organisation.

Therefore, such restrictions on staff employed in school FOCJs of type II can be considered using the FOCJ of type II model of current operation in cases where only one FOCJ provides services on the market (monopoly case) and where two or more FOCJs of type II deliver services (oligopoly). Depending on the type of management behaviour, the restrictions on labour will affect optimal solutions differently.

Assuming Case I of management behaviour depending on labour and output, restrictions with respect to labour can be shown as in Figure 33.

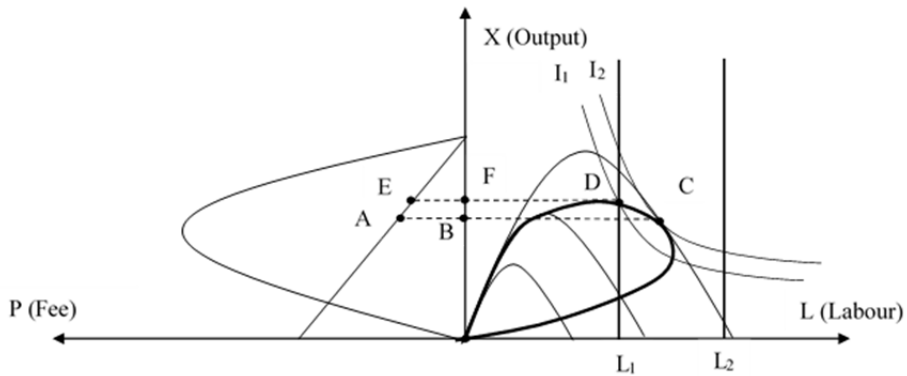


Figure 33. Restrictions on labour in Case I of management behaviour
Source: Compiled by the author.

Restrictions on labour can be rather strict or rather loose. This means that management can be forced to use no less than, for example, L_2 units of labour, or management is allowed to use no more than L_2 . In the former case, the minimum amount of labour that management can employ is L_2 . In the latter case, the restriction means that management can employ maximum L_2 . Therefore, the flexibility of the restriction affects the solution. If FOCJ management is forced by the Statute or higher ranking jurisdictions to involve no less than L_2 units of labour, the optimal solution is somewhere outside of the optimal solution space and a cost coverage rule is not possible to realise. However, if management of the first case can use only less than L_2 , they prefer to reach their optimal amount of labour at point C, which is smaller than L_2 ($L_C < L_2$).

Another situation is when the number of labour units is restricted by the statements in a Statute or by a direct order of the owners of an FOCJ of type II from the left of the optimal point, such as $L_C > L_1$. This means that FOCJ management cannot employ more than L_1 units of labour. Hence, management adopts this restriction by moving to its second best position from the management utility point of view, given labour restrictions. Graphically, this movement is shown from point C to point D in Figure 33, where FOCJ management is forced to switch to a lower utility level (from I_2 to I_1). New optimal point D corresponds to points F and E where higher output and lower fee are reached compared with the initial situation (point C).

When dealing with Case II of FOCJ management, which is maximising output, again, two restrictions relative to optimal point C appear: $L_1 < L_C$ and $L_2 > L_C$. If restrictions on labour are set so that no more than L_2 is allowed (see Figure 34), this restriction does not affect the optimal plan for FOCJs of type II. Similar to the case above, if the restriction is formulated as ‘no less than’ L_2 , there is no possible solution because the restriction is outside the optimal solution space.

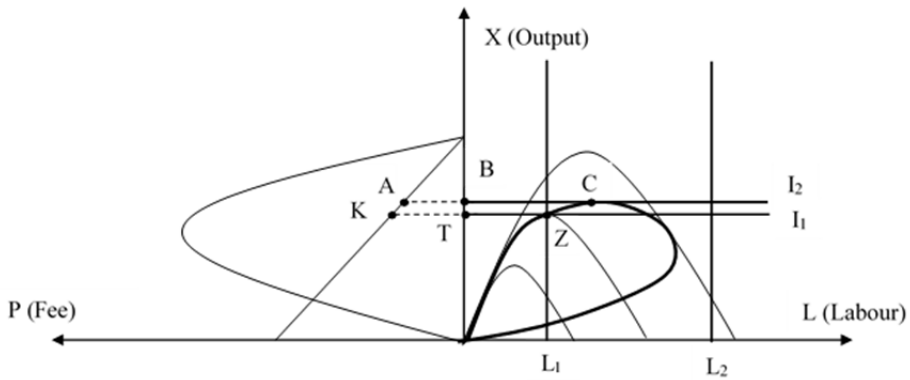


Figure 34. Restrictions on labour in Case II of management behaviour
 Source: Compiled by the author.

However, if FOCJ management is allowed to employ labour in an amount smaller than L_1 , the next preferable solution for management is at point Z. An optimal solution shifts from point C to point Z, where management loses its utility. Hence, an FOCJ produces less output (point T) collecting higher fees from their members (point K).

For the third case of FOCJ management maximising labour, only two situations are possible: L is bigger than L_2 and L is smaller than L_2 (for example, L_1 as shown in Figure 35). Labour more than L_2 is not feasible, similarly to the previous cases.

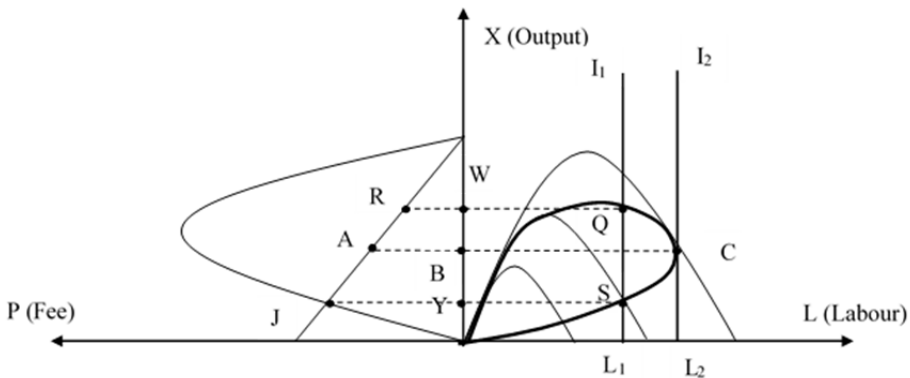


Figure 35. Restrictions on labour in Case III of management behaviour
 Source: Compiled by the author.

When labour should be not more than L_2 , FOCJ management can still reach its most preferable point C. If only labour smaller than L_1 possible, then there is a range of new optimal output solutions WY and new optimal fees RJ. FOCJ management loses its utility moving from I_2 to I_1 indifference curve, however, for FOCJ members and clients it might mean both a decrease as well as an increase in output and fees.

In the fourth case of management behaviour, indifference curves of management utility function have a positive slope to the L-axis, which means that management evaluates output positively only if they can employ more labour. Restrictions on labour in this case as well as in previous cases can be no more than L_2 and no less than L_2 (at least L_2). Restriction L_2 from the right of point C does not disturb the possibility to reach optimality C in Figure 36. However, if labour employment is restricted from the left of point C and requires less than L_1 amount of labour, the second preferable solution for FOCJ management is H.

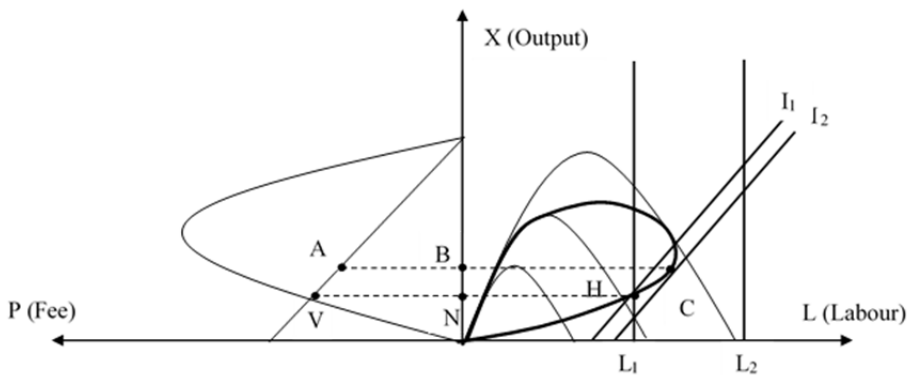


Figure 36. Restrictions on labour in Case IV of management behaviour
Source: Compiled by the author.

In point H, management experiences utility loss since they are forced to move into a situation with lower utility (I_1). At the same time, output is also decreasing (point N) and the participation fee is higher (point V) compared with the optimal case in point A.

The following general conclusions can be made when restrictions on labour are introduced:

- 1) Restrictions on labour from the right of optimal point C (more than the optimal amount of labour is allowed to be employed) do not affect an FOCJ of type II optimal plan if the restrictions are formulated as ‘no more than L_2 ’. Then, FOCJ management is free to turn to their optimal solution C.
- 2) Restrictions on labour formulated as ‘no less than L_2 ’ are not feasible.
- 3) Restrictions on labour in an amount ‘no more than L_1 ’ affect the FOCJ of type II optimal plan depending on the type of management behaviour, as shown in Table 9:

Table 9. Restrictions on labour from the left of the optimal point

	FOCJ management behaviour			
	Case I	Case II	Case III	Case IV
Utility loss	+	+	+	+
Output loss	-	+	+/-	+
Fee increase	-	+	+/-	+

Source: Compiled by the author.

In all four cases, management loses their utility regardless of the utility function. Management maximising output and labour (Case I) does not experience output loss if labour is restricted from the left of the optimal point (L_1). This can also be true for management maximising labour (Case III) since this case produces a range of new combinations – ‘output-fee’. However, for the management of Cases II and IV, maximising output and output and labour, reduction in output for FOCJ as well as a fee increase are observed. For Case III, the participation fee can be higher or lower in comparison with the optimum. Labour reduction in FOCJs of type II with the first case of management results in a fee decrease, which is positive for FOCJ members.

The same results can be achieved by conducting an analysis within the oligopolistic market structure and four cases of FOCJ management behaviour. For this, in Figures 33–36, a set of demand functions is illustrated in the second quadrant and a group of possible solution spaces is marked in the first quadrant so that the FOCJ1 reaction line can be constructed in the second quadrant.

It can be concluded that if an FOCJ of type II possesses either Case II or IV and sometimes Case III of management, any restrictions with respect to labour should be avoided. In all cases, if working hours increase, output will grow with the same amount of labour and budget, too.

Restrictions with respect to materials

FOCJ management decisions on the current operation stage can be analysed considering restrictions on materials. Again, four cases of management behaviour are assumed. In Figure 37, restrictions on materials involved in the FOCJ of type II service provision process are introduced. Materials are tangible resources that are employed to provide services. In a school FOCJ of type II sense, under ‘materials’, we can understand, for example, educational and methodological literature, materials for studying fine arts, modelling, natural sciences, etc.

Similar to the restrictions on labour, restrictions on materials are analysed for monopoly where only one FOCJ of type II delivers services. Restrictions on materials that FOCJs of type II may face can be smaller or bigger than the optimal amount of materials for FOCJs of type II in point C in Figure 37.

If management maximises labour and output, and the level of available materials is less than optimal M_{opt} , for example, M_1 , then the FOCJ management cannot produce since it does not fulfil a cost coverage rule (the solution is

somewhere outside the possible solution space). However, if an FOCJ of type II involves more materials than its optimal level from a managerial point of view, say M_2 , then the solution space is deducted and the second best point for the management under given restrictions is E, where a higher output with a lower fee is produced. Management utility is reduced in this case from I_2 to I_1 .

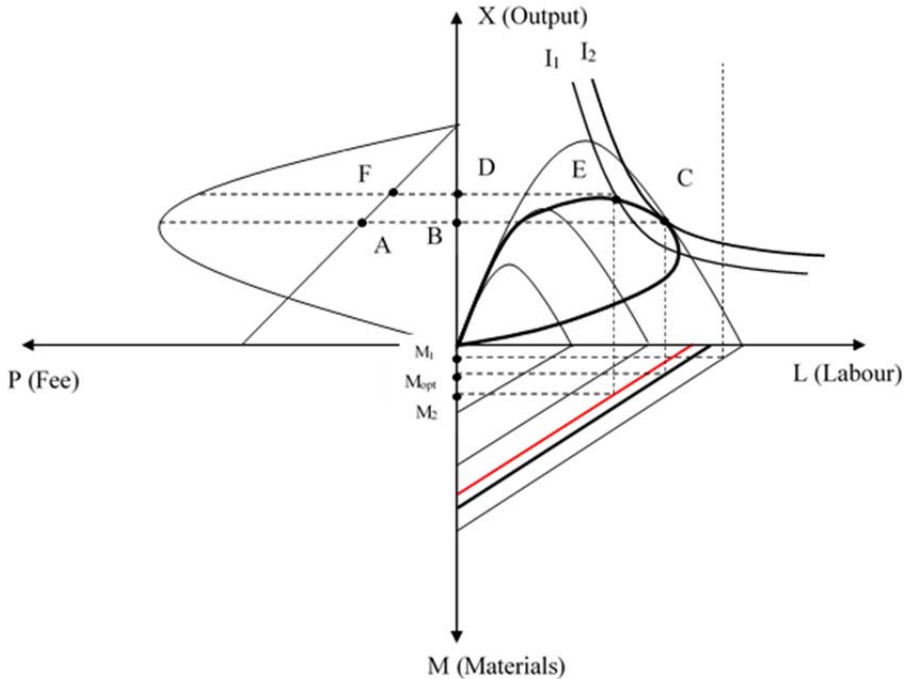


Figure 37. Restrictions on materials in Case I of management behaviour
Source: Compiled by the author.

There are two situations: 1) management is allowed to use more material resources, say, M_2 ; and 2) management is forced, for example, by the Assembly of Members, to apply more than their optimal level of materials. If the first situation occurs, FOCJ management will produce with their optimal amount of materials M_{opt} and they move to their optimum. In the second case, the solution of the model shifts from point C to point E. Each 'output-labour' combination of points on a possible solution curve is produced with a different budget. This is reflected in the second quadrant on a turnover curve and also in the fourth quadrant with respect to different budget lines.

Management of the second case maximises output. The reaction of this management to the restrictions with respect to materials is shown in Figure 38. Initially, before the restrictions are introduced, management realises their optimal solution at point C with the optimal amount of materials M_{opt} and the budget illustrated as a thick black line in the fourth quadrant of Figure 38. If

management of Case II is required to use no more than M_2 amount of materials, they prefer to move to their optimal point C with M_{opt} materials. If management is required to use more than M_2 (at least M_2), they need a higher budget (red line) than the optimum and the solution shifts from point C to point G with a lower output and a higher service fee in the first quadrant. Management experiences utility loss here, moving to a lower indifference curve I_1 . With the same budget, production can be material-intensive (point G) or labour intensive (point D). If management is required to use less than M_{opt} , then the solution shifts to point D with M_1 smaller than M_{opt} . Restrictions on materials even stricter than M_1 will result in the case where FOCJ of type II production under cost coverage is not feasible. For such production, it is required to have an unachievably big budget that is higher than the red line in the quadrant four.

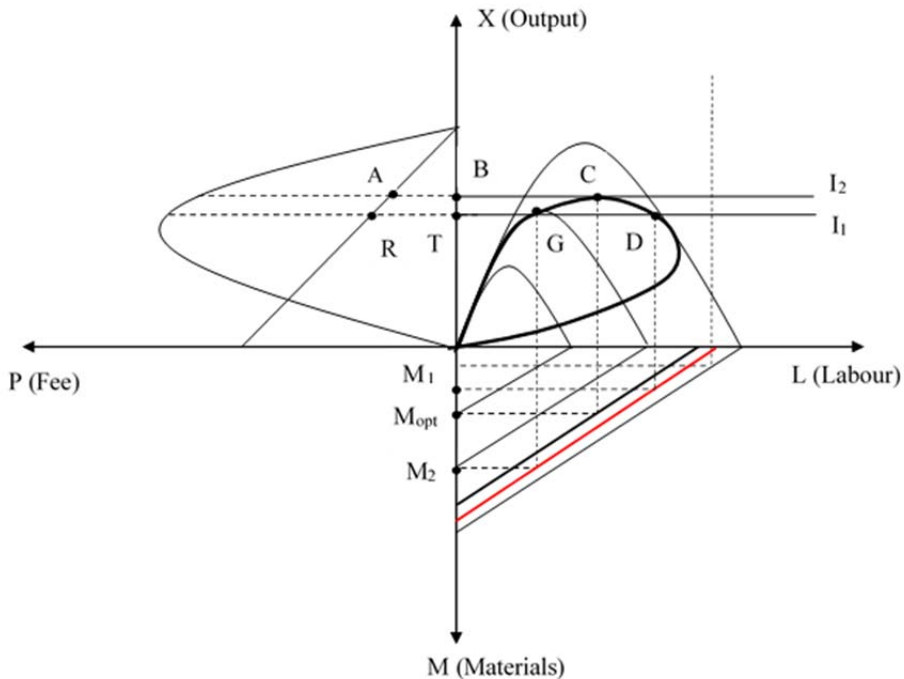


Figure 38. Restrictions on materials in Case II of management behaviour
Source: Compiled by the author.

The third case of management behaviour implies vertical indifference curves where the optimal solution is again at point C. Here, the optimal solution can be reached only with the maximum possible budget, which is represented by a thick black line in the fourth quadrant of Figure 39. An FOCJ of type II cannot afford a bigger budget, hence production is not possible if a cost coverage condition must be held.

Restrictions on materials below and above the optimal level are illustrated in Figure 39. If management maximising labour is required to use no more than M_2 , they can still produce with their optimal level of materials M_{opt} . However, if management is required to use more than M_2 , the minimum amount that they can use is M_2 . For production, they need a smaller budget (red line) than in the optimal case (thick black budget line). With the same budget, FOCJs of type II can produce more or less output (point Y or S) with the same combination of labour and materials as shown in Figure 39. Since this management case is interested in labour only, different labour productivity is the reason for the two outputs.

If management is required to use no more than M_1 materials, production is not feasible due to the cost coverage rule, which is not possible to achieve.

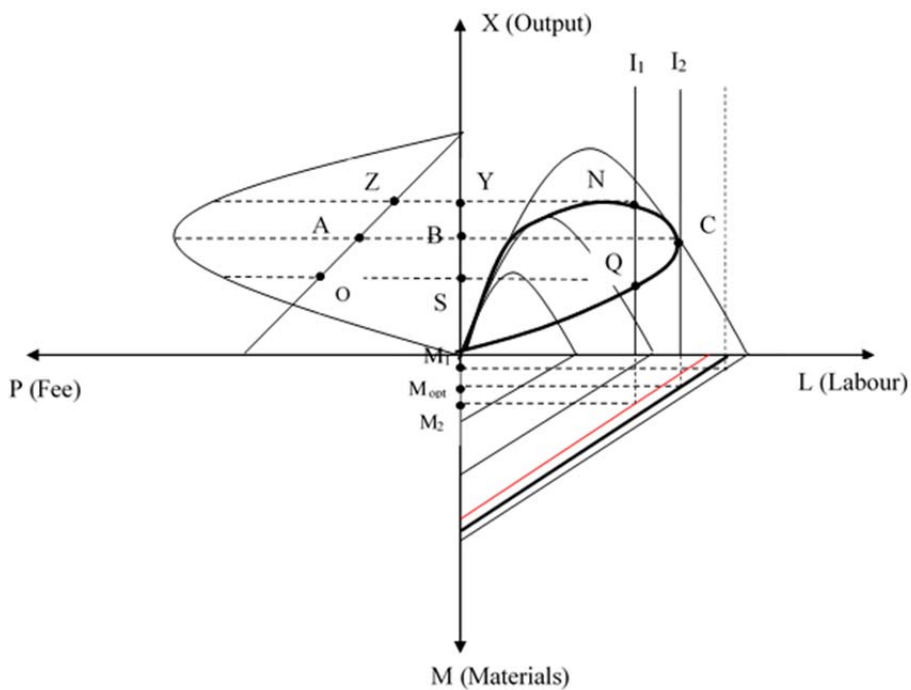


Figure 39. Restrictions on materials in Case III of management behaviour
Source: Compiled by the author.

Management may possess a utility function that depends on output and labour input, evaluating labour positively and output negatively. If more than optimal M_{opt} is required, the solution of the model moves from point C to point J (see Figure 40), where an FOCJ of type II loses output and service fees increase. If restrictions below M_{opt} are imposed, it does not affect the optimal plan of an FOCJ of type II.

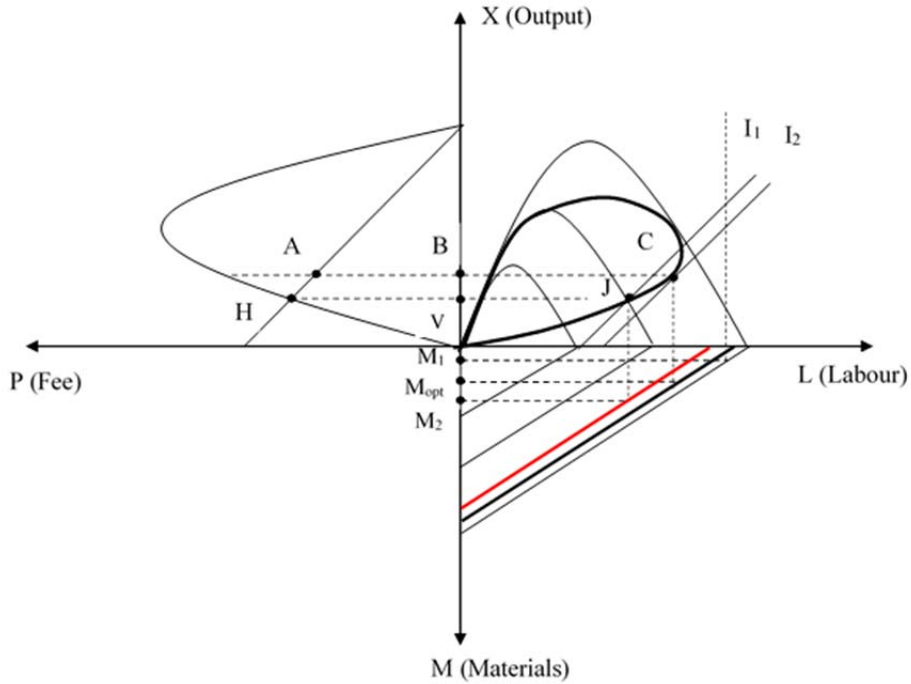


Figure 40. Restrictions on materials in Case IV of management behaviour
Source: Compiled by the author.

Therefore, the effect of restrictions on materials depending on the management case can be synthesised in Table 10, distinguishing between limitations on materials if the application of more than M_{opt} is required and if the application of less than M_{opt} is required. Restrictions on materials less than the optimal point do not affect the optimal plan of an FOCJ of type II. However, if an FOCJ of type II requires materials more than the optimal, the optimal solution shifts and loss of utility in all cases is observed, which means that FOCJ management does not like to use more material resources. This is different from the results of the labour restrictions discussed above where management does not like to use less labour since it reduces their utility.

Table 10. Restrictions on materials from above of the optimal point

	FOCJ management behaviour			
	Case I	Case II	Case III	Case IV
Utility loss	+	+	+	+
Output loss	-	+	+/-	+
Fee increase	-	+	+/-	+

Source: Compiled by the author.

Output loss and fee increase are not observed in Case I of FOCJ management behaviour. For Cases II and IV as well as for Case III in particular situations, it is recommended not to impose restrictions on materials requiring more materials than the optimal. Therefore, in the FOCJ of type II Statute, the way in which management decide on the amount of materials involved in the educational process must be set out. Materials should be linked to the produced output based on the cost coverage rule.

Restrictions with respect to real (fixed) capital

For school FOCJs of type II, real (fixed) capital means the assets that are not consumed within one production period and continuously used for a long time. Real capital for a school FOCJ of type II can be real estate, buildings and constructions, such as a school building, utility rooms, a piece of land on which a school is located, etc.

A change in the fixed capital of FOCJs of type II does not affect FOCJ turnover in the second quadrant of Figure 40, hence it does not affect budget lines in the fourth quadrant since FOCJ turnover $p \cdot X = l \cdot L + m \cdot M$ is compiled only from variable labour and materials. However, having larger fixed capital results in an upward shift of output-labour curves, which makes the production possibility curve pushed up as shown in the first quadrant (red lines).

There are three situations: 1) an FOCJ of type II possesses fixed capital which is less than it actually requires to provide its services; 2) the fixed capital of an FOCJ of type II is optimal; and 3) an FOCJ of type II possesses fixed capital which is more than it actually requires to provide its services. These situations are shown in Table 11.

Table 11. Productivity matrix of FOCJ of type II fixed capital

	Fixed capital is increased	Fixed capital is decreased
Fixed capital is smaller than optimal	Productivity ↑	Productivity ↓
Fixed capital is optimal	Productivity ↓	Productivity ↓
Fixed capital is bigger than optimal	Productivity ↓	Productivity ↑

Source: Compiled by the author.

If an FOCJ of type II possesses real capital which is smaller than its optimal size (for example, a school building is very small, not enough rooms, no sports ground for pupils, etc.), productivity³⁶ increases with the growth of fixed capital as is reflected in Figure 41 by the red curve. The initial point C here shows an optimal solution with respect to management, but not with respect to available fixed capital. Therefore, point D describes the optimal solution with respect to both management and fixed capital. If fixed capital is smaller (represented by the black bold line in the first quadrant) than FOCJ requires, and it is decreased even more, then productivity shrinks and possible solution space moves inwards (blue line). A new optimal solution with respect to management results is shown at point K.

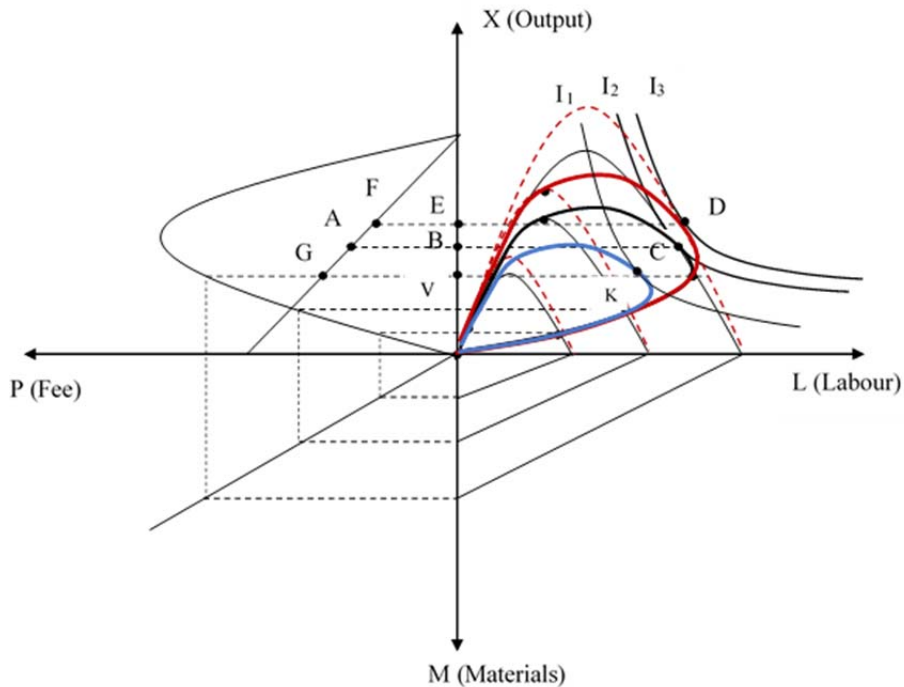


Figure 41. Restrictions on real capital in Case I of management behaviour when fixed capital is smaller than optimal
Source: Compiled by the author.

If an FOCJ of type II possesses fixed capital that is optimal, a decrease as well as an increase in fixed capital will only reduce the productivity of the FOCJ of type II, as shown in Figure 42 through solution space reduction (blue curve).

³⁶ Here, the productivity of all factors is meant: labour, materials and fixed capital hidden in the graph. This is also true for one factor since the increase of one factor influences the growth in productivity of the others.

Hence, if real capital is above or below the optimal size compared with point C where the FOCJ of type II reaches its optimality with respect to real capital and management, then the FOCJ of type II loses output and the service fee grows. This is characterised by points V and G.

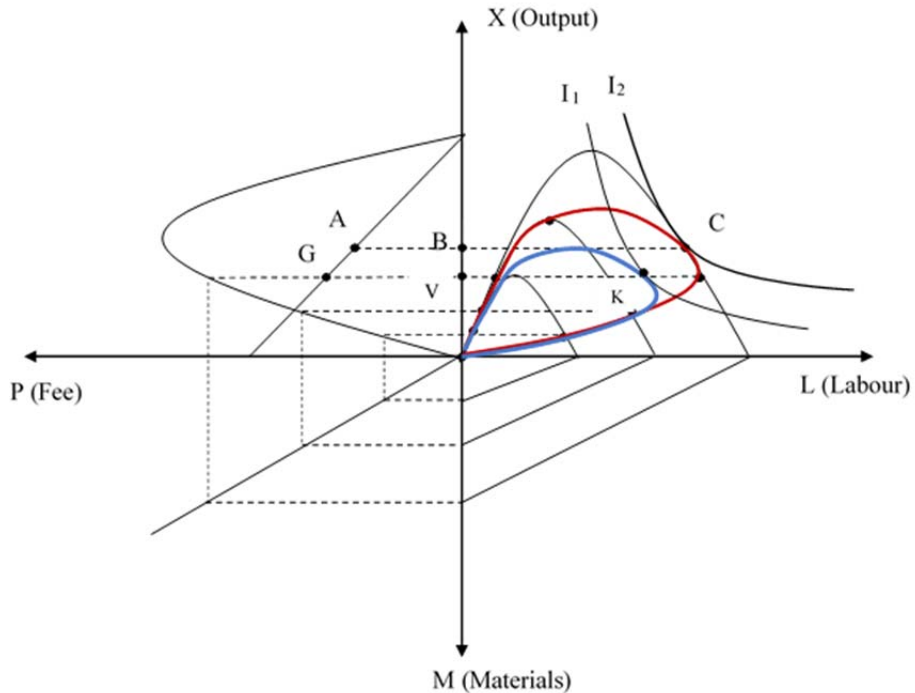


Figure 42. Restrictions on real capital in Case I of management behaviour when fixed capital is optimal
Source: Compiled by the author.

An FOCJ of type II's fixed capital can be bigger than optimal, as illustrated in Figure 43 by the thick black curve, which means that point C is an optimal solution with respect to management but not optimal with respect to the volume of fixed capital used. For example, the school building might be too big and it might take time for teachers and pupils to move from one room to another, which consumes time from the actual studying process. If fixed capital is bigger than is required and an FOCJ management makes it even bigger, productivity shrinks, which is illustrated by the reduction of possible solution space (blue curve). Then, a new optimality from a managerial point of view is reached at point K, with a smaller output and a higher fee. However, again, fixed capital is not at its optimal level at K.

If an FOCJ of type II possesses fixed capital that is over the optimal level and reduces it, for example, by moving into a new smaller building, then productivity is increased and the FOCJ of type II optimal solution is described by point D. At point D, there is an optimal solution with respect to management and fixed capital.

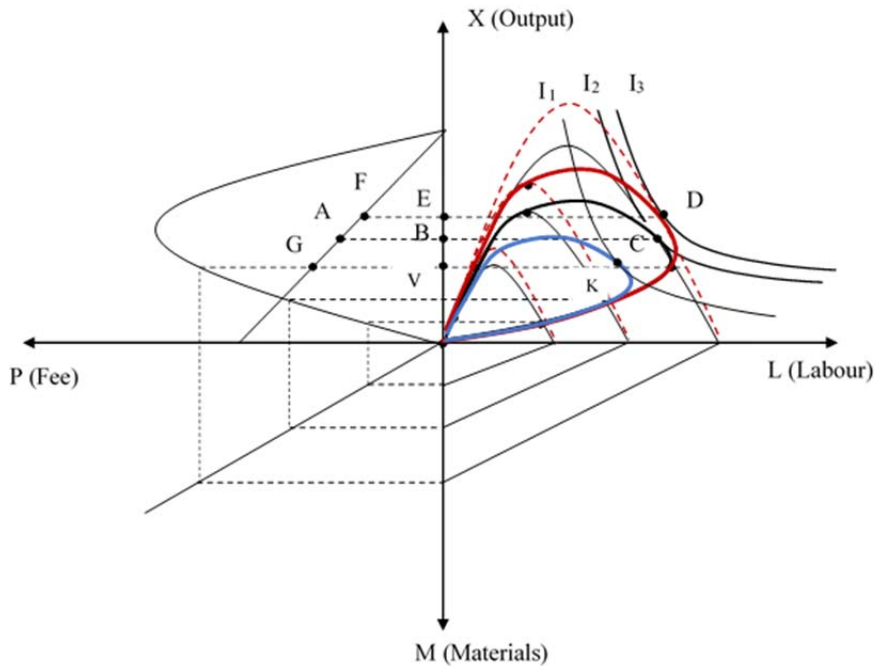


Figure 43. Restrictions on real capital in Case I of management behaviour when fixed capital is bigger than optimal
Source: Compiled by the author.

The effect of the real capital increase on the FOCJ of type II optimal solution can be additionally observed considering different cases of management behaviour. In all four cases, the parameters of the optimal plan with respect to output and fee have the same trends as in the case discussed above, where management maximises output and labour. This means that when real capital reaches the optimal level, output increases and fee decreases.

Since fixed capital can become more or less than optimal, which happens because new members join an FOCJ of type II or some members leave, there should be a rule imposed that defines the optimal amount of capital for FOCJs of type II. It could be set out in the Statute that capital stock depends on the Assembly's decision by voting or is directly linked to the amount of produced output (number of pupils).

Restrictions with respect to output

Literature devoted to the economics of education mainly defines output in the educational sector by pupils' test scores and graduation rates (Hanushek 1979: 354; Harris 2010: 127; Krueger 1999). However, some other measures of output in education exist as well. For example, student attitudes, attendance rates, college continuation and dropout rates (Hanushek 1979: 355). Enrolment rates can also measure output in education (Glewwe, Lambert 2010). For the sake of simplicity, output X reflects the number of students enrolled in school FOCJs of type II. However, the author does not exclude other possible assumptions regarding in which terms FOCJ output can be measured, for example, for the purposes of potential statistical modelling (see Soto 2002).

An FOCJ of type II might have to produce no less than the certain amount of output (educate a certain number of pupils) required by the Assembly of Members. Fulfilling this condition, FOCJ management still makes decisions based on their utility function and looks for the best solution under the imposed limitations.

In the first case of FOCJ management maximising output and labour input, an optimal solution for the current operation model is at point C with X_{opt} amount of output and a fee level at point A, as shown in Figure 44. X_3 is the maximum possible output received with minimum costs. If an FOCJ of type II Assembly of Members requires output of no less than X_1 , FOCJ management can still reach their optimum at C. If it is required to produce no more than X_1 , the next best solution from the management point of view is G, and a utility reduction from I_3 to I_1 can be noticed.

However, if a higher ranking FOCJ body sets X_2 as the minimum acceptable amount of output, the next preferable solution for FOCJ management is at B, with a fee described by point R.

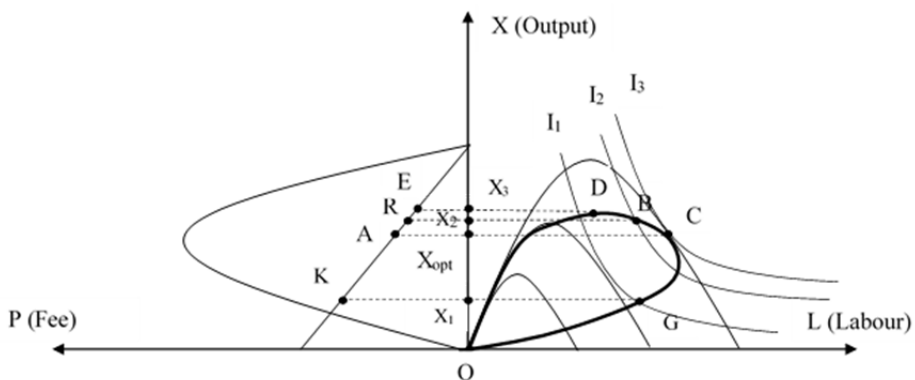


Figure 44. Restrictions on output in Case I of management behaviour
Source: Compiled by the author.

In Figure 45, restrictions on output are shown for the management maximising output. For this case of management, the most preferable solution is at D; all other solutions are less preferred. Hence, if an FOCJ of type II Assembly imposes output restrictions, this can only result in a worse solution in the sense of output and fee. However, if it is a case, and an FOCJ of type II must produce no more than X_1 , the next preferable solution for FOCJ management will be at point B or C depending on whether it is a material or labour-intensive method of production. An optimal fee results at point E, which is higher than it was initially.

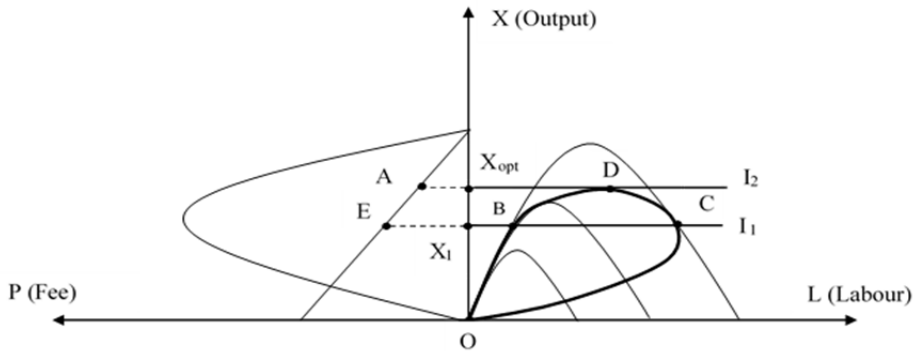


Figure 45. Restrictions on output in Case II of management behaviour
Source: Compiled by the author.

Management maximising labour achieves an optimal solution at C, where the highest possible indifference curve touches the possible solution space. X_{opt} and fee A are the parameters of the optimal plan in Figure 46. If an FOCJ of type II Assembly requires production of no less than X_1 smaller than X_{opt} , then management chooses to produce X_{opt} . If the restrictions on output are to produce no more than X_1 , the solution of the model is at point G with the high fee described by point K.

If the minimum required output is no less than X_2 , where X_3 is the maximum possible production output, then output grows from X_{opt} to X_2 and FOCJ of type II fee shrinks and defined by point R.

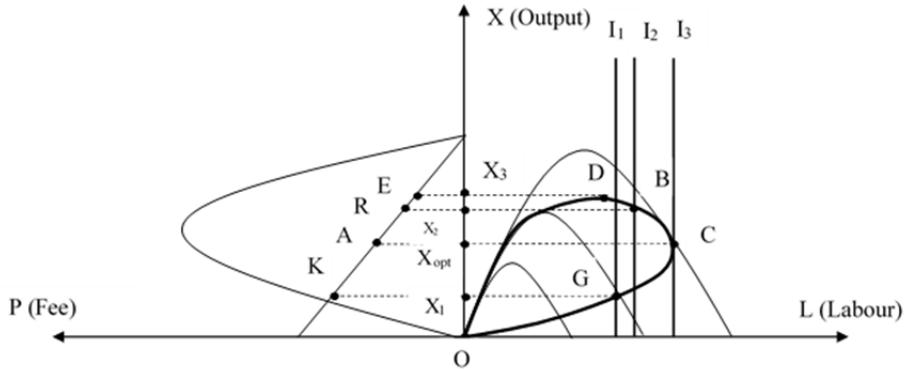


Figure 46. Restrictions on output in Case III of management behaviour
 Source: Compiled by the author.

In the fourth case of management behaviour, restrictions on output and their consequences are illustrated. This management maximises output only if they are allowed to have more labour. In Figure 47, this is shown with the positive slope of indifference curves. The minimum requirements for output, which is smaller than optimal output, such as to produce no less than X_1 , return the solution to optimal solution point C. If the restrictions are formulated so that the allowed level of production is no more than X_1 , then the next best solution for FOCJ management is at point G. With the output restricted on the level X_2 , an optimal solution lies at B, between C and the maximum possible D. The solution shifts from point C to point B where a smaller indifference curve is reached. Output X_2 is guaranteed to the FOCJ of type II Assembly, with fee R to provide the services.

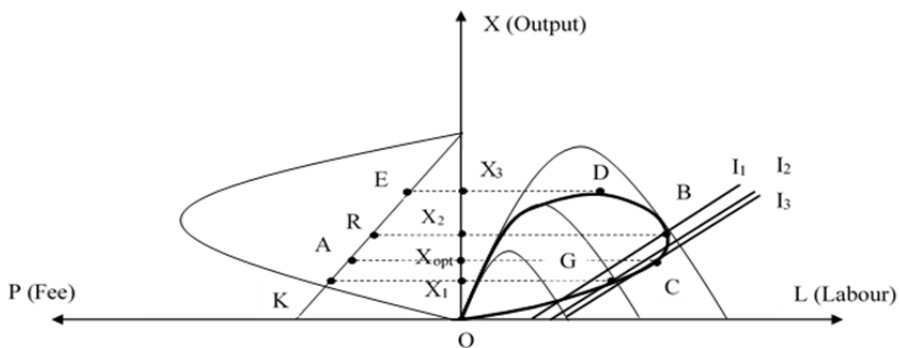


Figure 47. Restrictions on output in Case IV of management behaviour
 Source: Compiled by the author.

Table 12. Restrictions on output above the optimal point

	FOCJ management behaviour			
	Case I	Case II	Case III	Case IV
Utility loss	+	+	+	+
Output loss	-	+	-	-
Fee increase	-	+	-	-

Source: Compiled by the author.

Therefore, in all four cases of management behaviour, management experiences utility loss. In Cases I, III and IV, loss of utility takes place because management is forced to produce more than they would like to (see Table 12). In Case II, loss of utility is explained by the fact that management is forced to produce less than they prefer. In Cases I, III and IV, restrictions on output from above the optimal point decrease the FOCJ of type II service fee. In the second case, management themselves maximises output, hence any restrictions on output can only make the situation worse, with smaller output and a higher fee. Therefore, in the Statute, it is suggested to not set output restrictions with the management behaviour of Case II.

In all four cases, restrictions on output from below optimal point C do not change the optimal plan if the restrictions are formulated as ‘no less than’. There is a reduction of management utility, an output decrease and a fee increase if the restriction is formulated as ‘no more than’ X_l . Therefore, for the FOCJ of type II Statute, it is crucial to include a statement regarding the municipalities that participate in FOCJs of type II and whether children from other municipalities can attend school FOCJs of type II.

Restrictions with respect to production function

The production function selected for the mathematical formulation in this thesis is a special case of the Cobb-Douglas function: $X = L * M$, where output depends on two factors: labour and materials. In the initial Cobb-Douglas function, output depends on two factors: labour L and capital K , such as $X = A * L^\alpha * K^\beta$, where A is a technological coefficient (total factor productivity) and α and β are shares of labour and capital as factors of production in the volume of output, respectively³⁷ (Allen 1967: 49, Walters 1963: 5). The technological coefficient includes technology and human knowledge. It can be absorbed and the Cobb-Douglas production function can be rewritten as $X = L^\alpha * K^\beta$ ($\alpha > 0, \beta > 0$), which has been done for the purpose of this thesis in order to simplify algebraic

³⁷ For the purposes of current thesis, constant coefficient A is a fixed factor (fixed capital). For the sake of simplicity, this factor is hidden and appears only in the analysis of the restrictions on real capital.

computations. The substitutive relationships between production factors are assumed here.

The Cobb-Douglas function is a special case of the constant elasticity of substitution (CES) production function $X = [gL^\rho + (1-g)C^\rho]^{1/\rho}$ when the elasticity of substitution is approaching one (Allen 1967: 53, Varian 1992: 19–20). In the CES production function, X is an output, L and C are factor inputs, g is a share of factors and $\beta = \frac{1}{1-\rho}$ is the elasticity of substitution.

When the CES elasticity of substitution is approaching zero, this results in the Leontief production function. In the Leontief function, production factors are used in a fixed proportion as the factors are absolute complementarities, such as $X = \min(\frac{K}{v}, \frac{L}{u})$, where K and L are capital and labour inputs, respectively, and v and u are given constants, which are positive and defined by the existing technology (Allen 1967: 35). The output quantity reaches a limit if a production factor is not available in a sufficient quantity. The relations between factors are not substitutive here, hence in the graph (for example, Figure 46), there are no output-labour curves, only points. Therefore, under the assumed analysis, the author sorts out the production functions with factor inputs that are not substitutive.

The Tinbergen-Solow equation $P = e^{rt}L^kC^{l-k}$ with parameter e^{rt} captures exogenous technological progress over time (Humphrey 1997: 53), which this thesis is not aiming to analyse, as this additional parameter e^{rt} makes the calculus more complicated. Moreover, the microeconomic production function for a firm is assumed, not the production function on a macro-level since the author deals with FOCJs as companies/economic units providing public services.

Some earlier works devoted to production functions are not considered in the thesis either, such as Von Thünen's production function (Lloyd 1969: 21). However, Von Thünen's production function can be called a predecessor of the Cobb-Douglas production function and probably the first algebraic formulation of a particular production function: $p = h(g + k)^n$, where p is a product of a unit of labour, k is a quantity of capital per labourer, g is a positive constant, n is a constant less than one and h is also a constant, which is "the parameter that represents fertility of soil and efficiency of labour" (Lloyd 1969: 31). If parameter g is zero and both sides are multiplied by L , the following equation results: $Lp = hk^n L$, which is in fact a Cobb-Douglas function (Humphrey 1997: 53).

Preceding Cobb-Douglas, production functions were also formulated by Turgot and Wicksell. The production function of the latter algebraically looks the same as that of their successors Cobb and Douglas (Samuelson 1979). Other macroeconomic production functions such as Uzawa (1962) and Sato (1967) production functions aggregate a two-factor CES production function into a production function with n number of factors, which makes mathematical formulation much more difficult.

A huge amount of literature devoted to production functions at the micro level can be found in sources originally written in German. In comparison with the production functions applied in macroeconomic analysis, micro-level func-

tions consider the technical or engineering side of a production process. For example, the Gutenberg production function, which was the first production function developed for the industrial production and purposes of business administration (*Betriebswirtschaftslehre*). In German literature, this production function is called ‘production function of type B’. Of particular interest here within industrial management was the connection between production and the costs caused thereby. Gutenberg has divided production factors into human work, machines and materials and given the machines a central role in his considerations. He suggested that production should be analysed for each unit of machinery separately, not for a firm as such. Mathematically, in this type of production function, production quantity depends on the number of active machines, intensity and the time they operate (Albach 1980: 55). Similar to the Leontief production function, factor inputs in the Gutenberg function are only partly substitutive, hence, again, output-labour curves cannot be constructed, only points with respect to a particular budget become relevant. The highest achievable point is a solution.

Heinen has expanded and modified the Gutenberg production function. His function is known as the ‘type C production function’. Heinen distinguishes between the technical consumption function and the economic consumption function. Technical consumption functions show the quantitative relationships between factor input and the technical power of the aggregates. Economic consumption functions, on the other hand, represent the relationship between factor input and the product quantities produced by the potential factors (Fandel 1991: 119).

The production function of type D is called the ‘Kloock production function’. Here, it is assumed that the company is divided into individual sub-divisions in order to be able to take organisational and technical production conditions into consideration. The Heinen production function is extended so that “multi-stage production processes with cyclical interlacement” are taken into consideration (Fandel 1991: 181). The supply interdependencies and production relationships are described in the general form of an input-output analysis, which is the first attempt to apply the Leontief input-output tables to the theory of firm production (Fandel 1991: 182).

An input-output analysis is also applied in the production function of type E and developed by Hans-Ulrich Küpper. Among other factors, he considers time an important variable factor. Küpper refines the analysis of Kloock by looking at several periods and, in addition to procurement, production and sales points, other operational areas. Thus, further facts, such as batch production, set-up or storage of intermediate or end products, can be considered (Brecher et al. 2012: 45).

The Matthes production function (type F) is developed from the Küpper production function and supplemented by structural, process-related, social and financial constraints. The network planning technique is used for this purpose. In addition to individual production orders, financial processes are also considered. Individual processes are represented by the Heinen or Gutenberg production function (types B and C). Depending on the desired level of detaliza-

tion, entire production systems, including the associated financial flows or individual production processes, can be inspected (Brecher et al. 2012: 45–46).

All of the abovementioned production functions are not tackled in the thesis. What makes them all different is their shape with respect to the type and degree of substitutability between labour and materials as factors of production. In her thesis, the author assumes $X = L^\alpha * M^\beta$ production function, where $\alpha = 1$ and $\beta = 1$ ³⁸. However, following changes in the quality of education, the production function can change as well. Then, technological factor A may become relevant and the proportion of factors may differ so that a Cobb-Douglas general form of production function, $X = A * L^\alpha * K^\beta$, can describe production relationships. Hence, different qualities of output due to technological or any other changes are reflected by applying different production functions. The quality of education can be differentiated considering, for example, the educational approaches or concepts that are implemented, the different sets of subjects taught, the reliance of teaching technics on modern equipment and so on. In Figure 48, possible solution spaces reflect the different production functions assumed for different qualities: quality 1 and quality 2. One or several qualities are permitted by the FOCJ of type II Statute. For different qualities, optimal solutions result in point F and E, respectively.

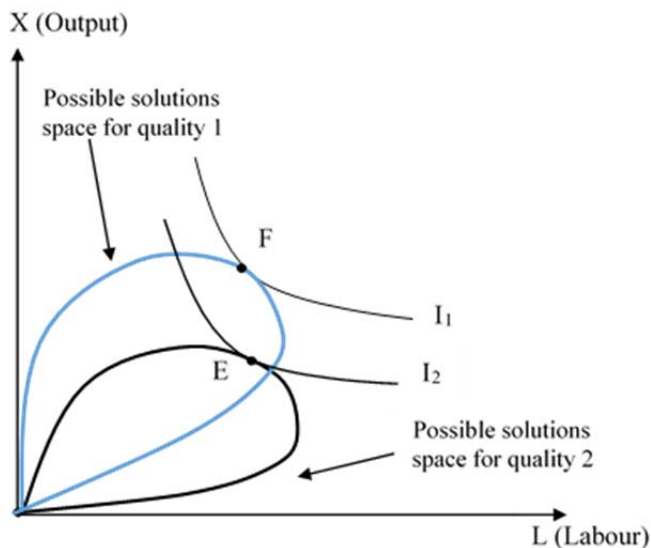


Figure 48. Optimal solutions for an FOCJ of type II with respect to different qualities
Source: Compiled by the author.

³⁸ There is an increasing return to scale if $\alpha + \beta > 1$, and decreasing returns to scale if $\alpha + \beta < 1$. In the Cobb-Douglas production function a constant return to scale is assumed very often, so that $\alpha + \beta = 1$, then a proportional coefficient for one factor is α and for the other factor is $(1 - \alpha)$ (Allen 1967: 50).

Therefore, in the FOCJ of type II Statute, it should be set out by the Assembly whether the quality of school services is equal among members and non-members of the FOCJ of type II. It should be explicitly defined by the FOCJ of type II Statute that FOCJ members get access to services of higher quality compared with non-members or that members receive a wider service package than non-members.

Restrictions with respect to utility function

The utility function of FOCJ of type II management describes which goals management evaluates the most. The goals can be defined by the values they have, beliefs and ethical norms. However, the utility function can also be imposed by the Assembly of Members or an even higher ranking jurisdiction if management is not powerful enough. Therefore, the Statute of the FOCJ of type II should define the goals an FOCJ of type II is designed to reach, and the responsibilities of management should be stated there as well, since FOCJ management cannot be constantly controlled by its principal (Assembly of Members).

In this thesis, four cases of management utility functions are assumed (more detailed descriptions in subchapter 2.2). The first case maximises output and labour input, the second case evaluates only output positively, the third case maximises labour only, the fourth case evaluates labour positively and output negatively. Within the Statute, Cases III and IV of FOCJ management should be excluded and the management utility function should be changed in the direction of the higher evaluation of X , focusing on Cases I and II.

The author assumes substitutive utility functions, such as a Cobb-Douglas special case, where labour can be substituted by output and vice-versa according to the evaluation of management³⁹ $U(X, L) = X^\alpha L^\beta$. For the fourth case, the linear utility function $U(X, L) = \alpha L - X + \beta$ represents that FOCJ management produces more only if more labour can be employed, similarly to how the consumption of ‘bads’ (see Varian 2010: 43) can be described. Loss of utility from increased production of X should be compensated by the utility gain from increased consumption of labour.

The abovementioned functions and the utility function for perfect complements (Leontief function for utilities) are just special cases of the CES utility function, as has been discussed in the section devoted to the production functions.

However, management may possess not only substitutive preferences, but also other kinds, which it is not possible to describe functionally. For example, lexicographic preferences cannot be modelled using utility function since they

³⁹ The author assumes a direct utility function describing preferences of the FOCJ of type II management regardless market prices. In contrast, an indirect utility function considers market prices (Henderson, Quandt 1980: 41).

are not continuous, and indifference curves can only be illustrated as points, not curves (Mamepueva et al. 2008: 20–21). In this case, management always prefers a set in which they get more L regardless of the number of X , and only if both sets contain the same number of L does the number of X matter. In Figure 49, points belonging to regions V , including points on the bold line above A , are preferred to A , since the sets to the right of A contain more L and the sets on the bold line above A contain the same amount of L and more X . In the area W , including the thin line down from A , there are points that are less preferred than set A (since the sets to the left of A contain less L and the sets on the thin line contain the same L but less X). But if all sets of area V are preferred to set A , and set A is preferred to all sets of area W , then there can be no sets between which and set A the consumer does not distinguish. This means that many ‘indifferent’ sets are represented by a single set A . This reasoning explains why lexicographical preferences cannot be described by continuous indifference curves.

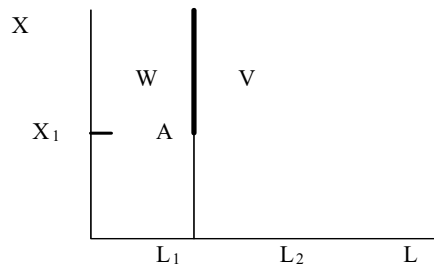


Figure 49. Lexicographic preferences
Source: Mamepueva et al. 2008: 20–21.

In other words, management prefers a combination X and L that definitely contains L , but in distinguishing between different combinations of X and L , management will prefer the combination which contains more X .

In contrast to lexicographic preferences, quasilinear preferences can be expressed by the utility function. The utility function can be represented as $U(L, X) = V(L) + X$, where $V(L)$ is a nonlinear part of the utility function and X is a linear part of the utility function. The quasilinear or ‘partially linear’ utility function is linear in X but possibly non-linear in L . The linear part describes a product consumed in relatively large quantities compared with a non-linear product, the consumption of which practically does not change or changes relatively insignificantly with the growth of the second product (Varian 1992: 164).

Management can also possess satiated preferences. Then, utility function can be represented as $U = U^* - [(X^* - X)^2 + (L^* - L)^2]$, where X and L are the consumed goods, X^* and L^* are coordinates of satiation points, i.e. volumes of

X and L that maximise management satisfaction and U^* is the maximum utility of the satiation point (Mamepueva et al. 2008: 22).

In FOCJs of type II, decisions can be made by comparing several alternatives and evaluating how well they fulfil the final goal. To this end, the utility value analysis can be applied. It is a methodology that is intended to provide rational support for decision-making on complex problems. The choice between alternatives is made based on multiple criteria selected by management or the Assembly of Members. A particular value is assigned to each criterion depending on a decision-maker. At the end, a total value for each alternative is calculated from the weighted sum of individual values per criterion. The deciding theoretical basis for utility value analysis is the additive multicriteria value function, such as: $U_i = \sum_{c=1}^C u_{ic} * w_c$, where U_i – total utility value of an alternative i ; u_{ic} – utility value for each alternative criterion; w_c – the weight of each criterion should add up to 1 (Götze, Northcott, Schuster 2008: 175–176).

In order to decide, a cost-benefit analysis allows the comparison of alternatives. In contrast to the utility value analysis, a cost-benefit analysis estimates costs and benefits in a monetary form, and management acts in favour of the alternative which gives the highest net benefits according to the formula: $NB = TB - TC$, where NB – net benefits, TB – total benefits, TC – total costs (Cellini, Kee 2015: 494).

Despite having different approaches to decision-making in an FOCJ of type II and different utility functions describing the behaviour of management that affects an FOCJ of type II optimal solution, the result depends on who is actually empowered by the FOCJ of type II Statute and Memorandum to make decisions: whether FOCJ management decides freely or the FOCJ Assembly of Members orders management or whether optimality can be achieved by means of negotiation. An FOCJ of type II Assembly can impute the utility function of management or set its goals by formulating the goals generally or more concretely. This also affects the freedom of managers' decisions. The list of an FOCJ management's rights and responsibilities should be reflected by the FOCJ of type II Statute and Memorandum.

Restrictions with respect to demand function

The demand function for an FOCJ of type II depends on the market structure within which an FOCJ of type II functions. To define a market structure, numerous criteria can be applied. The author stems from only one criterion following Stackelberg – the number of economic agents from the demand and supply side (Stackelberg 2011). Stackelberg summarises all possible market situations in the following matrix:

Table 13. Stackelberg market structure matrix

Number of economic agents (Demand side)	Number of economic agents (Supply side)		
	One	Few	Many
One	Bilateral Monopoly	Reduced Monopsony	Monopsony
Few	Reduced Monopoly	Bilateral Oligopoly	Demand Oligopoly
Many	Monopoly	Oligopoly	Free competition

Source: Compiled by the author based on Stackelberg 2011: 3.

According to the Stackelberg matrix, in this thesis, the author focuses on monopoly and duopoly as a special case of oligopoly with only two suppliers. In the context of FOCJs of type II, monopoly means that there is only one FOCJ of type II providing school services to both FOCJ members and possibly to non-members. Duopoly (oligopoly) means that there are (at least) two FOCJs of type II providing school educational services and competing with one another or with other public and private schools⁴⁰. Therefore, it is important to set out in the Statute who is allowed to demand services from an FOCJ of type II, whether there is one service consumer (meaning only member municipalities) or several (for example, FOCJ members and non-members – other municipalities, not participating school FOCJs of type II).

Clarification of demanders and suppliers in the Statute defines the market structure and influences solutions for an FOCJ of type II optimal plan, as shown graphically in Figure 50:

⁴⁰ In the thesis, it is assumed and analyzed a competition only between two FOCJs of type II. However, the analysis can be extended by considering competition between an FOCJ of type II (public law unit) and a private school, which has a profit maximization as the main goal. In this case, a new point of equilibrium results. New optimality parameters can be calculated for both agents similarly as in subchapter 2.2.

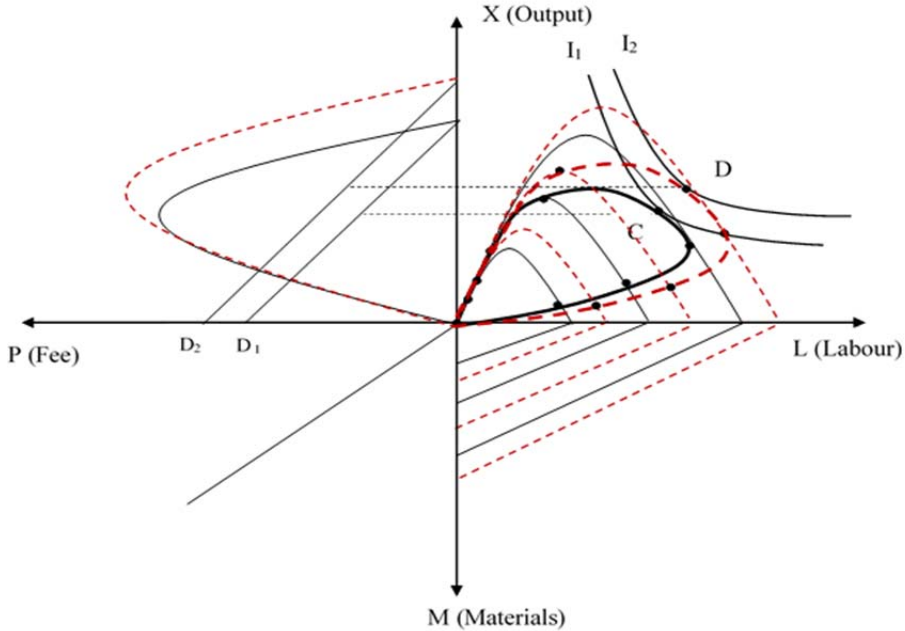


Figure 50. Optimal solutions with respect to different demand functions
Source: Compiled by the author.

In the case of monopoly, there is only one demand function D_1 : $X = a - b \cdot p$ for FOCJ1, an optimal plan is described by point C with a particular output and participation fee. In oligopoly, a set of demand curves for FOCJ1 D_1 , D_2 , etc. considering a change in another FOCJ of type II fee $-p_2$ can be reflected by the direct demand function $X_1 = a_1 - b_1 \cdot p_1 + d_1 \cdot p_2$ ⁴¹. Hence, there is a path of optimal solutions such as C, D, etc., which are possible to achieve.

For the sake of simplicity, the lineal demand function is assumed in the thesis. However, the shape can be different. For example, a kinked demand function can be considered. Initially, a kinked demand function was constructed under the assumption that if one oligopolist decreases prices, other oligopolists will follow them in order not to give up their market share. However, other oligopolists will not increase their prices if one of them initiates a price increase of their services. For this one, their demand function has a kink in the initial (market price) point so that the demand curve in the section above this point is

⁴¹ In oligopolistic market, demand cannot be unlimited. The combination of parameters $a_1 + d_1 \cdot p_2$ is responsible for the shift of demand functions to the left in parallel as shown in Figure 50. Hence, it is possible to set limitations on parameters, such as $a_1 + d_1 \cdot p_2 \leq w_1$. The Kuhn-Tucker conditions can be applied to maximization problem if both the goal function and restrictions are concave (Henderson, Quandt 1980: 386). Increase in fee p_2 , and, consequently, increase in demand continues until parameter combination $a_1 + d_1 \cdot p_2$ achieves its limit w_1 .

flatter (more elastic demand) than in the section below (less elastic demand). The consequence is that a change in costs or demand does not affect the price of a firm. This theory was originally used to explain price rigidity in the conditions of oligopoly (Sweezy 1939; Sen 2004: 100). Drakopoulos (1992: 2) attempts to explain the shape of a kinked demand function by the behaviour of customers, informational asymmetry, customer loyalty and product addiction.

An FOCJ of type II can also have a kinked demand function where the part of the demand function with lower price elasticity describes the demand of the students from the same municipality in which the school is located or from nearby municipalities so that the FOCJ of type II fee increase (decrease) will not affect their desire to attend this school too much because it is in an advantageous location. However, children from those municipalities that are relatively further from school can also participate in school FOCJs of type II. Besides the participation fee, these municipalities will additionally pay transportation costs. Thus, for this group of consumers from farther located municipalities, the demand function will be more elastic and they will be more sensitive to the school FOCJ of type II fee change. Therefore, it is important to describe in the school FOCJ of type II Statute what these municipalities are – members of the FOCJ of type II and where they are located because this information defines the demand function of the FOCJ of type II.

In general, demand for FOCJ of type II services can be created by:

- 1) parents of member municipalities and non-members (parents are demanders);
- 2) parents via municipalities (municipalities are demanders); and
- 3) municipalities and parents (both are demanders).

According to the Federal Act No. 273 “On Education in the Russian Federation”, Article 67 and the information learnt from the interviews (see Annex 4), admission to municipal schools should first be offered to those citizens who live in the territory to which said educational organisation is assigned, and in the second order, access to schools can be provided to pupils from other territories if there are free places in the school. Thus, this condition makes the demand function for Russian school services less elastic since the demanders are geographically homogeneous.

What can also affect the demand for the FOCJ of type II’s services is the level of school. Whether an FOCJ provides only primary educational services or basic or secondary (complete) education affects demand size. The elasticity of the demand function is also defined by the level of general education services: perhaps demand is less elastic for older students because they are able to withstand longer distance travel than smaller children. Therefore, this information regarding the stage of school education the school is focused on should be emphasised in the FOCJ of type II Statute as well. It is also required by law in Russia (Federal Act No. 273 “On Education in the Russian Federation”, Article 25).

Restrictions resulting from the relations between FOCJ management and members

When analysing the current operation model, it was assumed that the members (municipalities) represented by the Assembly of Members only intervene by formulating the cost coverage rule, which FOCJ management must follow. Here, management freely chooses the solution it prefers with respect to their utility function, determining an output. However, according to stipulations set out in the Statute of an FOCJ of type II, its Assembly of Members might directly influence the output and management must fulfil members' wishes by following an order. Another case is possible when members and management negotiate a solution and the output volume. In general, three situations are feasible:

- 1) An agent (management) is powerful: management makes decisions on produced output following their own preferences.
- 2) A principal (Assembly) is powerful: management is restricted by the Assembly of Members regarding the produced output, for example, by setting a minimum output requirement.
- 3) Negotiation between management and the Assembly of Members: management have their requirements with respect to the minimum utility they would like to receive and members have requirements with respect to the minimum output to be produced.

Therefore, the utility function of FOCJ of type II members is introduced into the model. The utility function of members is derived from the marginal utility function by means of FOCJ of type II demand function integration. At the point where marginal utility is zero, total utility reaches its maximum, as shown in Figure 51.

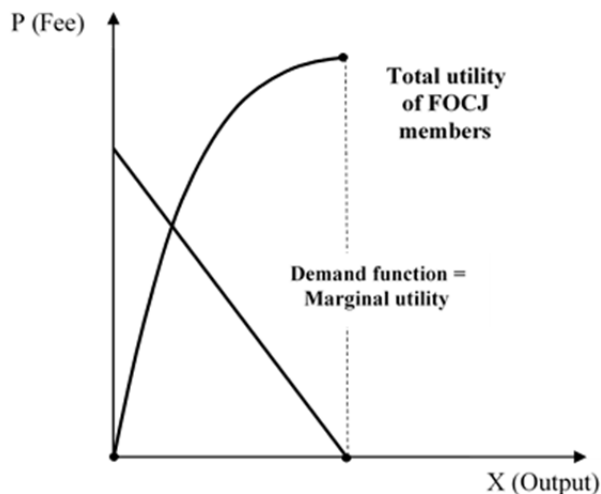


Figure 51. Construction of the utility function of FOCJ of type II members
Source: Compiled by the author.

The area under the demand function is consumer surplus which measures the utility that consumers (FOCJ of type II members) receive from services (Hicks 1942; Varian 2010: 245). The demand function basically illustrates the diminishing law of marginal utility when members are ready to pay for every additional unit of output if it is becoming cheaper. This leads to Figure 52 where, in the second quadrant, the demand function and the minimum utility function of the management are introduced. The minimum function of the management shown in this quadrant corresponds to the minimum utility indifference curve I_{min} of the management in the first quadrant. If this minimum utility is not reached, FOCJ management ceases its activities. Therefore, the solution space presented by the thick line is only available between C and E. The best solution for the management is at D, and the best solution for the members is at F where they get maximum utility. However, to reach F point is not feasible, and the next best solution for FOCJ of type II Assembly would be point C.

- 1) If the position of members is more powerful, the solution of the model is at C.
- 2) If management could decide freely, it would choose point D.
- 3) If the members and management determine the output to produce by bargaining, then they negotiate a solution between C and D.

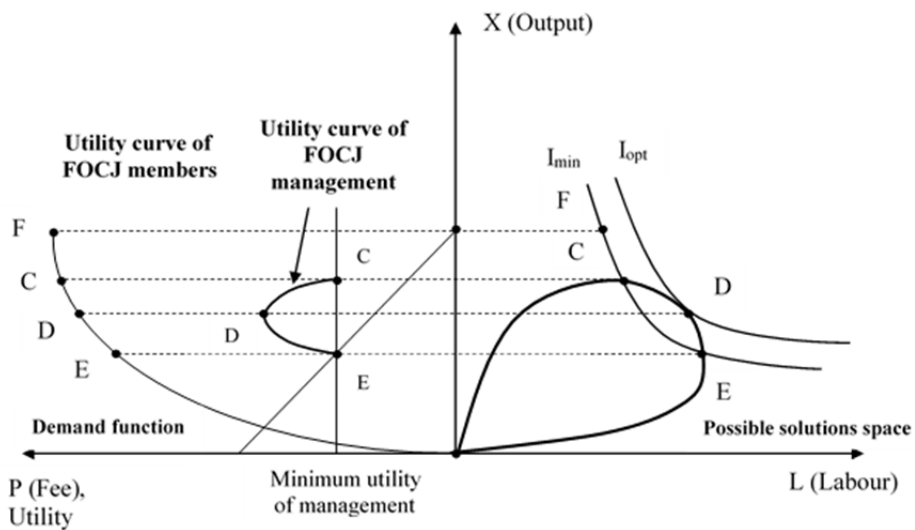


Figure 52. Internal self-administrative structures of FOCJ of type II considering the minimum utility of management
Source: Chebotareva, Friedrich 2017.

Figure 53 can also illustrate the negotiation interval from point C to D, where the vertical axis is dedicated to the utility of the members and the horizontal axis shows the utility of management. The utility transformation line CD highlights the Pareto optimal combination of utility of both partners. Applying the concept of maximising the Nash product to find a negotiation solution leads to point S (Figure 53), where the highest reachable indifference curve of the set of Nash product indifference curves can be attained.

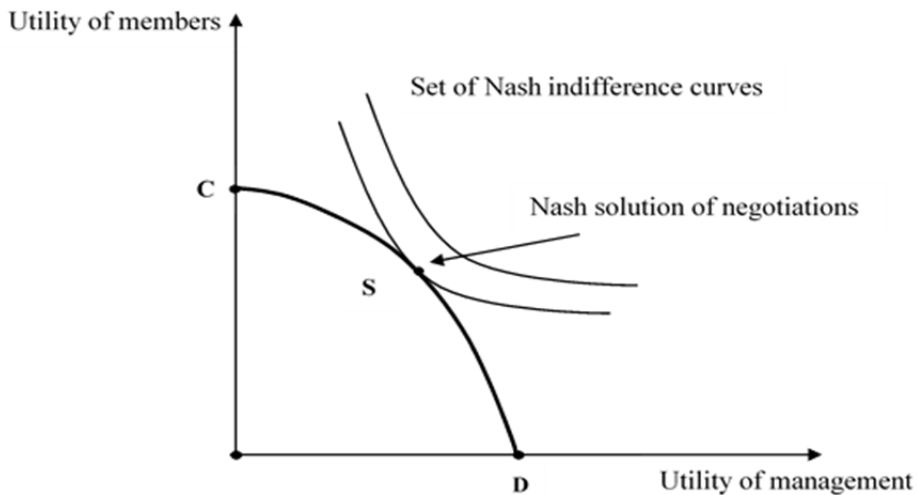


Figure 53. The Nash solution of negotiations between management and members of the FOCJ of type II
Source: Chebotareva, Friedrich 2017.

In some Statutes, according to the legal form of the FOCJ of type II, the members may, through an Assembly of Members, elect management by voting. If the minimum output necessary to be re-elected is present, then management has to fulfil this requirement of members. The election process should also consider the minimum utility of management to continue their activity within FOCJ of type II and the restriction induced by the cost coverage requirement. Therefore, an output higher than C (in Figure 54), the maximum possible, which the solution space allows, is not feasible. Restriction on output smaller than D still allows management to reach its optimal solution. In contrast, a minimum output requirement higher than D, such as G, does not allow management to reach its best situation D. The best position for management in this case is then solution G. If there are still negotiations between management and members, the negotiation corridor is between C and G.

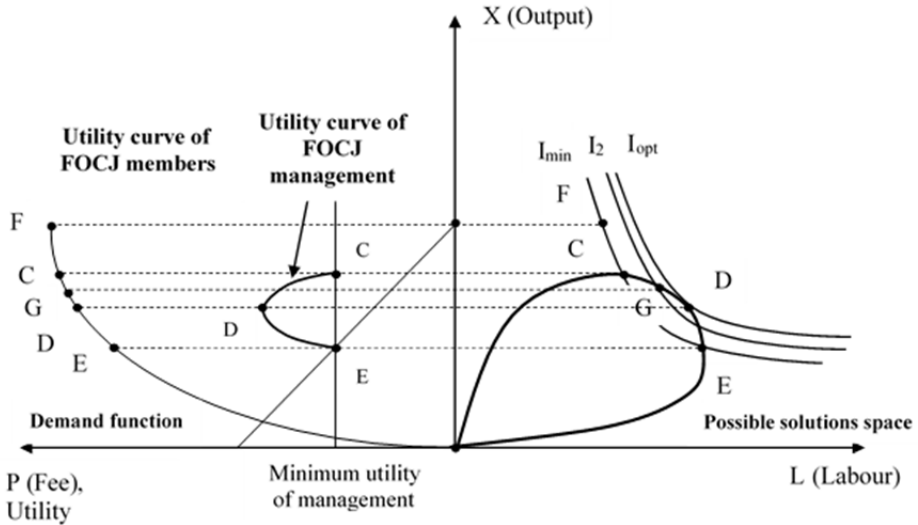


Figure 54. Internal self-administrative structures of FOCJ of type II with the minimum output and utility of management
 Source: Chebotareva, Friedrich 2017.

In Figure 55, the Nash product solution is attained at point S. In this way, a democratic structure and its effects on management can also be demonstrated.

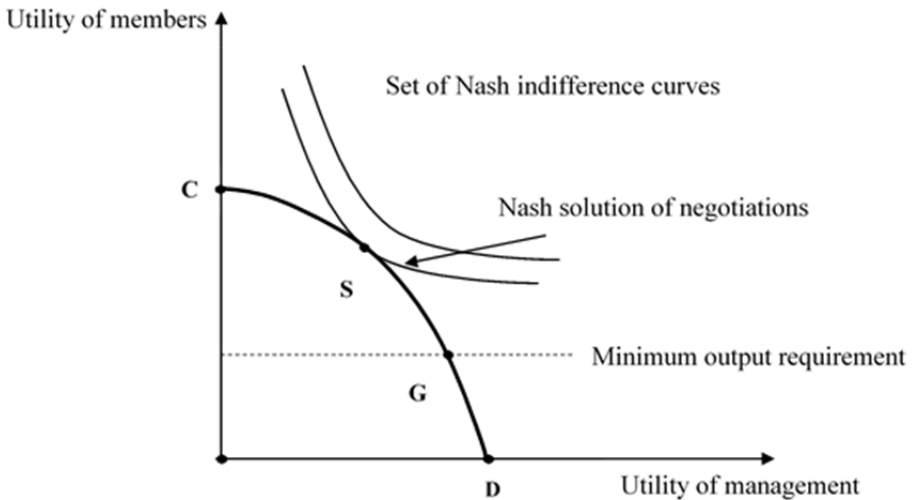


Figure 55. The Nash solution of negotiations between management and members of the FOCJ of type II with the minimum requirement to output
 Source: Chebotareva, Friedrich 2017.

In the current model, a finite cooperative game is assumed; therefore, Nash solution (equilibrium) exists. In cooperative games, players have coinciding interests when parties are able to come to a joint plan of action (Kelly 2003: 72; Nash 1953: 128). The driving force behind this game is fairness according to an arbiter. The main criticism of game theory and the Nash approach in particular is that each player knows the utility function of the other, the reality is simplified and therefore many situations are left out of the analysis (Luce, Raiffa 1957: 134). Raiffa (Luce, Raiffa 1957: 136), using the same approach of ‘arbitrated fairness’, introduces a negotiation model where utility is distributed in fixed proportions among players. If the utility is equally divided between two players, then the game ends up at the Nash solution.

Different approaches to solving the bargaining problem are shaped by a wide range of factors (driving forces)⁴². In the bargaining process of Zeuthen, the risk of conflict is emphasised as a central factor (Zeuthen 1930). The Zeuthen bargaining solution leads to the Nash equilibrium. However, Zeuthen’s reasoning is based on a more complicated “fairly plausible psychological model of the bargaining process” (Harsanyi 1956: 151).

Risk and the reaction to a risk are also driving forces in Pen’s theory of bargaining (Pen 1952), which is rooted in Zeuthen’s theory. However, Pen has additionally considered factors such as uncertainty and bargaining tactics,

⁴² Literature devoted to game theory is very rich in many aspects, especially, in consideration of factors defining results of negotiations. The author compiled the following non-exhaustive list of factors:

- Consequences of negotiation time (Bishop 1964; Hicks 1963).
- Negotiation costs (Cross 1965).
- Abilities of players to learn the behaviour of opponents (Cross 1965).
- Maximisation of added gains (Krelle 1961).
- The problem of ‘fair’ division: the central assumption is that players make ‘fair’ division by themselves, which means they are satisfied by the share they receive. Sometimes players use a mediator, but do not involve an arbiter because players know their preferences better (Steinhaus 1948: 101–104).
- Principles of payoff distribution between players, known as Shapley value and τ -value: each player gets a payoff which is equal to his average contribution of the total coalition (Osborne, Rubinstein 1994: 289–298; Tijs 1981; Branzei, Dimitrov, Tijs 2005: 28–31).
- Time of bargaining until the solution is reached. Such as, in Rubinstein bargaining model (Rubinstein 1982). The longer the bargaining is, the smaller shared pie gets because a discount factor plays a role.
- Payoffs of the game depend on the type of players. Such as, in a signalling game where one player, the transmitter, emits signals and the receiver tries to draw conclusions about the type of transmitter by observing the emitted signals (Bartholomae, Wiens 2016: 179).
- Selected strategies play a role. For example, Tit-for-tat strategy: a player, who uses the Tit-for-Tat strategy, begins the interaction with a cooperative move. Then, one Tit-for-Tat player follows the other player’s last move (Bartholomae, Wiens 2016: 156–157).
- Distribution of benefits based on minimax or maximin strategies can be applied as well (Luce, Raiffa 1957: 67).

The result of a game depends on the assumed market form and the behaviour of actors, connected to the market form.

which is the essence of the bargaining process to his mind (Saraydar 1971: 281). Both Zeuthen and Pen's solutions result in the Nash equilibrium if two bargainers have the same parameters of risk.

Sometimes, the costs of conflict lead to a solution of negotiations between parties. For example, Hicks (1963) suggests that the time of negotiation plays a role. If a conflict between the employer and employees takes a long time, a trade union must be compensated with a higher wage rate, but it is unfavourable for firms to increase a wage rate. Hence, negotiations stop when the "employer's concession curve" and the "trade union's resistance curve" cross. This is the point of the highest possible wage rate that workers can receive as a result of negotiations when the conflict can be avoided (Hicks 1963: 143).

Decisions in FOCJs of type II can be made not only based on the game-theoretical approach by means of bargaining between management and members, but also by aggregating individual preference into collective (social) preferences applying different voting rules. At least three possible situations can occur:

- 1) Decisions in FOCJs of type II are made by management, then the Association Council can vote for the alternatives.
- 2) Decisions in FOCJs of type II are made by the Assembly of Members, which means that the management utility function is imputed by members. Here, again, voting rules are applicable for decision-making in Assembly.

However, through FOCJ management, utility function social benefits can be imputed. Then, FOCJ management acts in the public interest, maximising net social benefit as done in Eerma (2014: 94).

- 3) Management considers the political aims of the FOCJ of type II Assembly of Members and therefore wishes to maximise votes so that the FOCJ Assembly of Members can be re-elected.

For the first and second situations, different voting rules can be stipulated in the FOCJ of type II Statute. One option is that decisions are made based on a consensus, which means that each voter should agree in order to reach a common decision. With this rule, a selected alternative is efficient in a Pareto sense (Hillman 2009: 161).

Another possible rule is a majority rule, where the alternative is considered elected if it gets more than half of the votes. However, majority voting can result in the cycling of alternatives, which is known as the 'Condorcet paradox'. It means that voting does not give a Condorcet winner, but an alternative which beats any other alternative in a pairwise vote (Persson, Tabellini 2000: 21). In the case of cycling, setting the agenda or the order of voting on the alternatives can determine a stable voting result.

To avoid cycling, a simple majority (plurality rule) can be applied which does not require a fifty percent threshold. The winning alternative is the one that gains the largest number of votes (Muller 2003: 147). This rule has an advantage that it helps to avoid voting cycling because the collective choice can always be made among set alternatives without implying an additional agenda.

The Borda count can be applied to make decisions in the Association Council as well as in the Assembly of Members; each voter typically has h points according to the number of alternatives, voters should distribute h points among alternatives so that the first preferred alternative gets h , the second $h-1$ and so on. The alternative which receives the maximum number of total points is the winner. With a large number of voting alternatives and voters, the Borda count can be rather complicated. In contrast, approval voting, which allows voting for (approving) any number of alternatives from the list. This requires voters to select only candidates whom they approve and not compare alternatives between one another as is done in the Borda count (Muller 2003: 156).

For the third situation, where management consider the political aims of the FOCJ of type II Assembly of Members, the multi-level administration model can be applicable in the case of the provision of school services (see Friedrich, Ukrainski, Timpmann 2014: 58). This model is based on the principal-agent model in the framework of an FOCJ of type II administrative structure consisting of three levels: FOCJ of type II Assembly of Members as a higher-level principal, FOCJ management (Association Council) as a mid-level principal and school management as an agent. In Figure 56, two schools are assumed – secondary and primary – as management of the lowest level.

It is also assumed that the Assembly possesses political aims and in order to maximise the votes of the electorate that is citizens of municipality 1 and 2, the Assembly wants to satisfy voters by maximising total budget D_n , which is used for school 1 and school 2 and for producing more output.

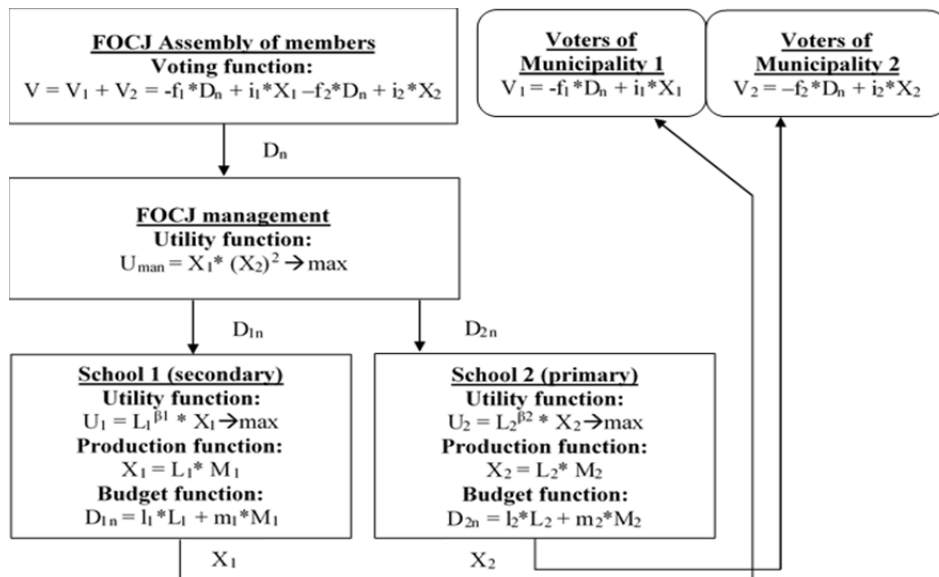


Figure 56. The multi-level administration model for school services
Source: Adopted from Friedrich, Ukrainski, Timpmann 2014: 58.

School 1 and school 2 provide educational services to those citizens who are from municipality 1 and municipality 2 in the amount of X_1 and X_2 , respectively. Voters from both municipalities have their voting functions where they positively evaluate the public services they receive $i_1 * X_1$ and $i_2 * X_2$ and negatively evaluate what they have to contribute to the budget in the form of taxes in order to receive these services ($-f_1 * D_n$ and $-f_2 * D_n$) (see Figure 55). Voting function for the FOCJ of type II Assembly consists of citizens' voting functions; therefore, the Assembly maximises: $V = V_1 + V_2 = -f_1 * D_n + i_1 * X_1 - f_2 * D_n + i_2 * X_2 \rightarrow \max$.

FOCJ management (middle level principal) should distribute the total budget D_n among schools based on the schools' production functions, $X_1 = L_1 * M_1$ and $X_2 = L_2 * M_2$, so that FOCJ management maximises their utility function depending on the output of both schools: $U_{man} = X_1 * (X_2)^2$. FOCJ management is acting in favour of the FOCJ of type II Assembly that aims to be re-elected by voters from municipality 1 and 2. The more X_1 and X_2 they get, the higher the chances that representatives of the Assembly will be elected again. This argumentation explains the form of management utility function.

At first, management of the lowest level solves an optimisation problem at each school separately by maximising utility function, $U_1 = L_1^{\beta_1} * X_1$, considering school production function $X_1 = L_1 * M_1$ and budget composition $D_{n1} = l * L_1 + m * M_1$, where L_1 and M_1 are labour and materials, respectively, and l and m are factor prices. As a result of optimisation, the following relations between budget and output for school 1 can be received⁴³:

$$X_1 = \frac{D_{1n}^2(\beta_1+1)}{l * m * (\beta_1+2)^2} \quad (188)$$

Similar to X_1 , X_2 can be found:

$$X_2 = \frac{D_{2n}^2(\beta_2+1)}{l * m * (\beta_2+2)^2} \quad (189)$$

⁴³ Settings: $U_1 = L_1^{\beta_1} * X_1$, $X_1 = L_1 * M_1$, $D_{1n} = l * L_1 + m * M_1 \rightarrow M_1 = \frac{D_{1n} - l * L_1}{m}$

Optimization problem: $U_1 = L_1^{\beta_1} * L_1 * \left(\frac{D_{1n} - l * L_1}{m}\right) = \frac{L_1^{\beta_1+1} * D_{1n}}{m} - \frac{l}{m} * L_1^{\beta_1+2} \rightarrow \max$

$\frac{dU_1}{dL_1} = \frac{l^{\beta_1} * D_{1n} * (\beta_1+1)}{m} - (\beta_1+2) * \frac{l}{m} * L_1^{\beta_1+1} = 0, \rightarrow \frac{L_1^{\beta_1} * D_{1n} * (\beta_1+1)}{m} = (\beta_1+2) * \frac{l}{m} * L_1^{\beta_1+1} \rightarrow L_1 = \frac{D_{1n}(\beta_1+1)}{l(\beta_1+2)}$

$X_1 = L_1 * M_1 = \frac{D_{1n}(\beta_1+1)}{l(\beta_1+2)} * \frac{D_{1n} - l * L_1}{m} = \frac{D_{1n}(\beta_1+1)}{l(\beta_1+2)} * \frac{D_{1n} - l * \frac{D_{1n}(\beta_1+1)}{l(\beta_1+2)}}{m}$

After simplifications:

$X_1 = \frac{D_{1n}^2(\beta_1+1)}{l * m * (\beta_1+2)^2}$

In the next step, optimal output, which was received for two schools, should be inserted into the utility function of the FOCJ management $U_{man} = X_1 * (X_2)^2$, maximising utility under the total budget constraint: $D_n = D_{1n} + D_{2n}$ (budgets for school are compiled from total budget). Hence, the following Lagrange function should be solved:

$$\text{Lag} = X_1 * X_2^2 - \lambda_1 (D_n - D_{1n} - D_{2n}) \rightarrow \max^{44} \quad (190)$$

From the Lagrange function, the algebraic relations between the budgets of two schools are $D_{2n} = 2D_{1n}$ and the relations between total budget and school budgets are $D_{1n} = \frac{1}{3}D_n$ and $D_{2n} = \frac{2}{3}D_n$, respectively.

In the last stage, in the voting function, $V = V_1 + V_2 = -f_1 * D_n + i_1 * X_1 - f_2 * D_n + i_2 * X_2$, X_1 and X_2 should be substituted with the results in formulas (188) and (189), and budgets for schools should be substituted with respect to in relation to the total budget found from FOCJ management utility maximisation so that the following voting function is received:

$$V = -f_1 * D_n + i_1 * \frac{(\frac{1}{3}D_n)^2 (\beta_1 + 1)}{1 * m * (\beta_1 + 2)^2} - f_2 * D_n + i_2 * \frac{(\frac{2}{3}D_n)^2 (\beta_2 + 1)}{1 * m * (\beta_2 + 2)^2} \quad (191)$$

$$V = -f_1 * D_n + i_1 * \frac{D_n^2 (\beta_1 + 1)}{9 * 1 * m * (\beta_1 + 2)^2} - f_2 * D_n + i_2 * \frac{4D_n^2 (\beta_2 + 1)}{9 * 1 * m * (\beta_2 + 2)^2} \quad (192)$$

Vote maximisation via differentiating to D_n for both municipalities results in an optimal budget for school service provision within an FOCJ of type II administrative structure⁴⁵:

$$D_{\text{noptimal}} = \frac{9 \ln(f_1 + f_2) (\beta_1 + 2)^2 (\beta_2 + 2)^2}{2i_1 (\beta_1 + 1) (\beta_2 + 2)^2 + 8i_2 (\beta_2 + 1) (\beta_1 + 2)^2} \quad (193)$$

$$\begin{aligned}
^{44} \text{Lag} &= \frac{D_{1n}^2 (\beta_1 + 1)}{1 * m * (\beta_1 + 2)^2} * \left(\frac{D_{2n}^2 (\beta_2 + 1)^2}{1 * m * (\beta_2 + 2)^2} \right) - \lambda_1 (D_n - D_{1n} - D_{2n}) = \frac{D_{1n}^2 (\beta_1 + 1)}{1 * m * (\beta_1 + 2)^2} * \frac{D_{2n}^4 (\beta_2 + 1)^2}{1^2 * m^2 * (\beta_2 + 2)^4} - \lambda_1 (D_n - D_{1n} - D_{2n}) \\
\frac{\partial \text{Lag}}{\partial D_{1n}} &= \frac{D_{2n}^4 (\beta_2 + 1)^2}{1^2 * m^2 * (\beta_2 + 2)^4} * \frac{2D_{1n} (\beta_1 + 1)}{1 * m * (\beta_1 + 2)^2} + \lambda_1 = 0 \rightarrow \lambda_1 = - \frac{D_{2n}^4 (\beta_2 + 1)^2}{1^2 * m^2 * (\beta_2 + 2)^4} * \frac{2D_{1n} (\beta_1 + 1)}{1 * m * (\beta_1 + 2)^2} \\
\frac{\partial \text{Lag}}{\partial D_{2n}} &= \frac{D_{1n}^2 (\beta_1 + 1)}{1 * m * (\beta_1 + 2)^2} * \frac{4D_{2n}^3 (\beta_2 + 1)^2}{1^2 * m^2 * (\beta_2 + 2)^4} + \lambda_1 = 0 \\
\frac{\partial \text{Lag}}{\partial \lambda_1} &= D_n - D_{1n} - D_{2n} = 0 \\
\frac{D_{1n}^2 (\beta_1 + 1)}{1 * m * (\beta_1 + 2)^2} * \frac{4D_{2n}^3 (\beta_2 + 1)^2}{1^2 * m^2 * (\beta_2 + 2)^4} - \frac{D_{2n}^4 (\beta_2 + 1)^2}{1^2 * m^2 * (\beta_2 + 2)^4} * \frac{2D_{1n} (\beta_1 + 1)}{1 * m * (\beta_1 + 2)^2} &= 0 \rightarrow D_{2n} = 2D_{1n} \\
D_n - D_{1n} - 2D_{1n} = 0 &\rightarrow D_{1n} = \frac{1}{3}D_n \rightarrow D_{2n} = D_n - \frac{1}{3}D_n = \frac{2}{3}D_n \\
^{45} \frac{dV}{dD_n} &= -f_1 + \frac{2i_1 (\beta_1 + 1)}{9 * 1 * m * (\beta_1 + 2)^2} D_n - f_2 + \frac{8i_2 (\beta_2 + 1)}{9 * 1 * m * (\beta_2 + 2)^2} D_n = 0
\end{aligned}$$

Depending on the voting rule set out in the FOCJ of type II Statute, the results (elected policy or person for a particular position) can differ. Additionally, the basic management concept should be reflected in the FOCJ of type II Statute via the list of top managers' responsibilities. Different management concepts contain diverse and sometimes contradicting goals, which defines management utility function.

Management concepts show the relations between managers and employees on different levels in a company; they reflect the possibility to delegate the right to make decisions to managers of the lower level inside an economic unit, such as an FOCJ. In the context of FOCJs of type II, management concepts can shape relations between FOCJ management and school directors, for example. Various management concepts are well described in Friedrich, Ukrainski and Timpmann (2014: 114–132) and rely on different leading ideas as a key element.

For example, the Harzburg management model is based on the delegation of authority and responsibility within a company. The model implies abandoning authoritarian forms of management and encouraging the management of a company to work alongside employees (Grunwald, Bernthal 1983).

Simultaneously with the Harzburg concept in Germany, management by objective concept was under development in the USA, headed by Peter Drucker. The essence of this concept is the cooperative process of goal-setting, direction selection and decision-making. An important part of goal-oriented management is measuring and comparing the current performance of employees with one another and against a set of established standards. When employees themselves are involved in the process of setting goals and determining the actions required to achieve, they are more motivated to perform their duties (Odiome 1965).

Douglas McGregor (1960) developed 'Theory X' and 'Theory Y' of management. The core idea lies in how management sees workers. According to theory X, workers have no incentives to work if there is no material stimulus and they avoid responsibility if possible. In this theory, management assumes that employees are lazy and want to avoid work. As a result, workers should be closely monitored and control systems should be developed for this purpose.

Contrary to theory X, in theory Y, management assumes that employees can be ambitious, have internal incentives and exercise self-control and self-governance. Employees are considered to enjoy their duties related to both mental and physical work. There is a chance to increase productivity by giving employees the freedom to work without being bound by the rules. Theory Y managers believe that, under favourable conditions, most people want to work well. They believe that the satisfaction of doing their job well is a powerful incentive. The theory Y manager will try to remove obstacles that prevent employees from fully realising themselves.

The successor to McGregor's XY theory was 'Theory Z' introduced by William Ouchi, whose main idea was to suggest to American companies the features of Japanese management they would benefit from (Ouchi 1981). In his opinion, the success of the Japanese management model is based not on the active implementation of modern innovative technology, but on a special

attitude towards the employee: team spirit and a corporate culture, lifelong employment and joint decision-making play a crucial role. The relationship between managers and employees is based on trust, and employees participate in the decision-making process with management (Friedrich, Ukrainski, Timpmann 2014).

In public management, there is a concept of public value (Moore 1995; Skidmore 2006). Public management should be oriented towards reaching multiple public objectives; each activity of management should create public value. This concept is similar to management by objective; however, the set of objectives focuses on a wider range of values expressed not only in a monetary way.

Some management concepts are applicable to private firms, some are suitable for public management only; however, the majority of management concepts can be practiced both in the public and private sector. For example, management by networking (Van de Walle, Groeneveld 2011). This concept describes how management of an economic unit can benefit from participating in networks and collaborating with other public or private actors (Klijn, Koppenjan, Termeer 1995). Different actors have different objectives; therefore, fulfilling the aims of actors cannot be a leading idea for this type of management.

There are many more management concepts not described in the thesis; they are different by their leading ideas and relations between components (see Friedrich, Ukrainski, Timpmann 2014: 115). However, the reason the discussion of some of them is important in the framework of this thesis is that management concepts define relations between levels of management and their responsibilities, which should be set out by the FOCJ of type II Statute in order to avoid unfavourable management approaches.

The second chapter first provides basic models of the establishment, current operation and competition for members of FOCJs of type II based on production, consumer and utility theory. Basic models are further elaborated by including an analysis of how grants and other financial means influence the initial optimal solution. In the following subchapter 2.2, more emphasis has been given to the model of current operation since the analysis of management reactions in monopoly and oligopoly is the focus here. Additionally, this subchapter included a literature analysis of the different behaviours of management defined by their goals. Thus, four cases of FOCJ management behaviour are assumed, which are mathematically expressed by management's utility functions. The novelty of this thesis also concerns the part where management behaviour is analysed with mathematical tools. Subchapter 2.3 of this chapter provides a discussion on how management decisions can be shaped by restrictions on factor inputs, changes in production function, management utility function, demand function, the negotiation process between management and members. The second chapter has also prepared a basis for avoiding unfavourable management decisions and developing institutional legal framework for FOCJ of type II management and members. The next chapter studies the possibility of applying FOCJs of type II to the empirical conditions in the provision of Russian school services.

3. APPLICATION OF FOCJs UNDER EMPIRICAL CONDITIONS IN RUSSIA

3.1. Object of empirical research and methodology

Functional Overlapping Competing Jurisdictions perform in different spheres, such as water supply, solid waste collection, cultural and educational services, fire protection, etc. as was discovered in the first chapter of the thesis. In this thesis, the FOCJ concept has been applied to school services.

In reality, school FOCJs of type II have mainly been found in Germany and Switzerland and are known as *Schulzweckverband*. *Zweckverband* is a special purpose association used as a legal form for municipal joint services provision in German-speaking countries. Practical essentialities of special purpose associations have been discovered via an interview with *Bodensee Zweckverband* management in subchapter 3.3. In Russia, such a special legal form for FOCJs of type II does not exist. Therefore, an appropriate one should be selected from existing legal forms with the help of document analysis. Additionally, it must be checked whether all Russian municipalities can freely and independently make decisions regarding cooperation in FOCJs of type II. These goals are fulfilled in subchapter 3.2. The opinion of Russian schools' decision-makers regarding the applicability of FOCJs of type II is revealed in subchapter 3.3 via interviews. Subchapter 3.4 synthesises the empirical and theoretical results reflected by the exemplary school Statute and Memorandum. The current subchapter analyses school service provision and explains the methodology of analysis of the applicability of FOCJs of type II to the provision of Russian school services.

Explaining sector choice for the implementation of FOCJs of type II requires an understanding of the Russian educational system, its administration and financing principles, focusing mainly on primary, basic and secondary (complete) general education. According to Federal Act No. 273 "On Education in the Russian Federation", the management of Russian education is based on the principles of legality and democracy, the autonomy of educational organisations, the information openness of the education system and consideration of public opinion and has a state social character.

Management of the education system includes: interacting federal executive bodies, executive authorities of the regions of the Russian Federation and local self-government bodies that administer education; strategic planning for the development of the education system; adoption and implementation of the state programmes of the Russian Federation, federal and regional programmes aimed at the development of the education system; monitoring of the education system; informational and methodological support of the activities of federal state bodies, executive authorities of the subjects of the Russian Federation, which are responsible for state administration in the field of education, and local government bodies, which are responsible for administration in the field of education; state regulation of educational activities; independent assessment of the

quality of education, public and socio-professional accreditation; training and professional development of the employees of federal state bodies and state authorities of the subjects of the Russian Federation exercising public administration in the sphere of education, local self-government bodies that carry out management in the sphere of education and heads and teachers of educational organisations (Federal Act No. 273 “On Education in the Russian Federation”, Article 89, § 1–2).

The state regulation of educational activity is aimed at establishing unified requirements for the implementation of educational activities and procedures related to the establishment and verification of compliance with these requirements by educational organisations. The state regulation of educational activities includes (Federal Act No. 273 “On Education in the Russian Federation”, Article 90):

- licensing of educational activities;
- state accreditation of educational activities; and
- state control (supervision) in the sphere of education.

In Figure 57, the author visualises a structure of Russia’s education system. It comprises general education as the first stage of education, including pre-school, primary, basic and secondary education. Educational programmes of pre-school, primary general, basic general and secondary general education are successive (Article 63, § 1). Secondary (complete) general education is compulsory in Russia (Federal Act No. 273 “On Education in the Russian Federation”, Article 66, § 5).

The second stage is professional education consisting of vocational education and higher professional education with the opportunity to obtain a Bachelor’s, Master’s and specialist degree. The next level of higher education involves the preparation of highly qualified personnel. At this stage, scientific degrees of candidate and doctor of sciences are awarded. Additional education and professional training imply life-long learning.

For the purpose of this thesis, the three stages of general education – primary, basic and secondary (complete) – are referred to as ‘school education’. Modelling inter-municipal cooperation with the help of FOCJs of type II is conducted on a school level. After completing basic general education, students either move on to the next stage of school education – secondary (complete) general education – or continue studies in a vocational professional institution.

At the end of the ninth and eleventh years, state examinations take place, after which school students receive a ‘Certificate of basic general education’ and a ‘Certificate of secondary complete general education’, respectively. The final exam after the secondary stage of school is called the ‘Unified State Exam’, which is used as an entrance examination at universities.

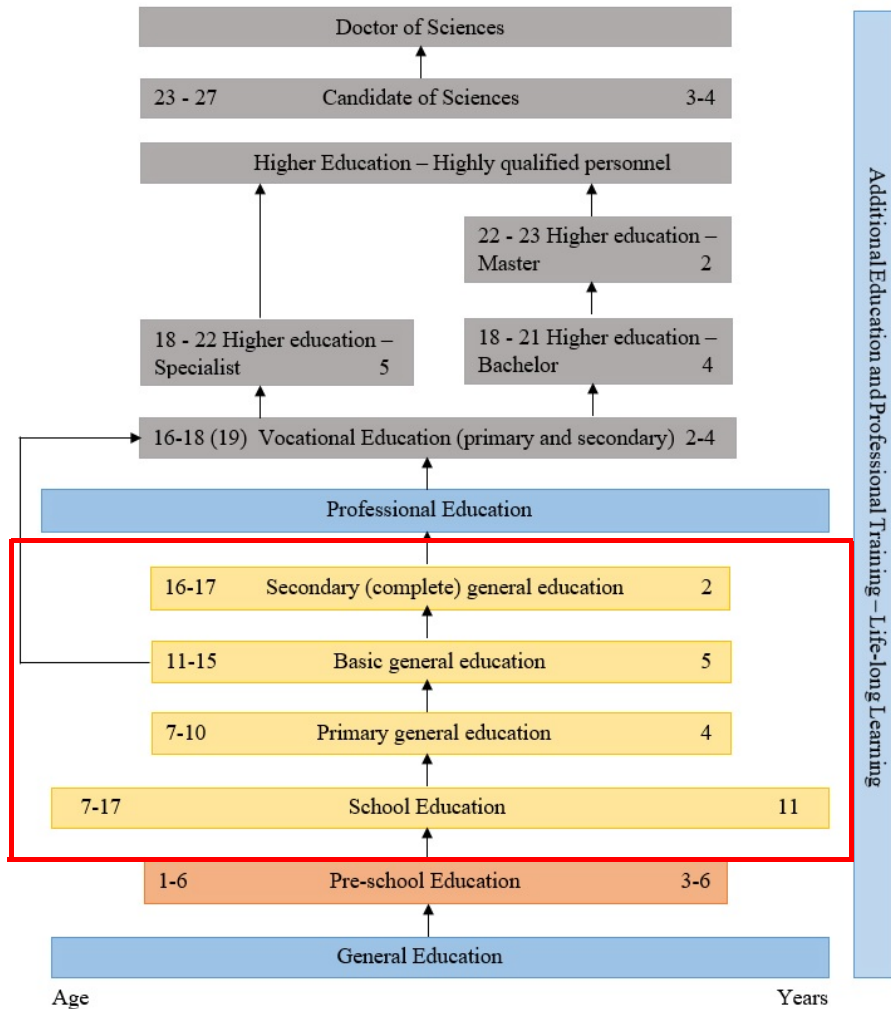


Figure 57. Education system in Russia

Source: Compiled by the author based on Federal Act No. 273 “On Education in the Russian Federation”, Article 10.

The school system in Russia involves public and private schools, gymnasiums and lyceums that can also be financed from municipal budgets and private sources. Gymnasiums and lyceums usually provide advanced education programmes and have a ‘focus’ or specialisation. Gymnasiums tend to focus on humanities and languages, and lyceums focus on natural sciences, e.g. physics and mathematics. Before Federal Act No. 273 “On Education in the Russian Federation” was issued, admission to gymnasiums and lyceums was competitive. Currently, all schools, including gymnasiums and lyceums, should ensure admission to the educational organisation for citizens who are entitled to receive

general education of an appropriate level and who are residing in the territory to which this educational organisation belongs (Federal Act No. 273 “On Education in the Russian Federation”, Article 67, § 3). However, parents may enrol their child in any school of their choice if there is a vacant place. Admission to the state or municipal educational organisation can be refused only on the grounds of the absence of free places. In the case of the absence of places in the state or municipal educational organisation, parents (legal representatives) approach the executive body of the region of the Russian Federation that exercises public administration in the field of education or a local government body that manages in the field of education (Federal Act No. 273 “On Education in the Russian Federation”, Article 67, § 3–4).

The majority of Russian schools provide general education at all three stages – primary, basic and secondary (complete). However, a number of schools provide only primary general education services until the fourth year or primary and basic school services until the ninth year. The majority of such schools are located in rural settlements, where the number of pupils is insufficient for providing school services at all stages.

Administration of the school system in Russia

According to the Constitution, Russia is a federal state and is currently divided into 85 subjects. They include oblasts, krays, republics, cities of federal significance and other entities. Subjects of the Russian Federation comprise municipalities of different forms (see Figure 58). Local self-governance is carried out across the territory of the Russian Federation by (Federal Act No. 131 “On Local Self-Governance in the Russian Federation”, Article 10):

- municipal areas (*муниципальные районы*);
- municipal and urban districts (*муниципальные и городские округа*);
- urban districts with intra-city division (*городской округ с внутригородским делением*);
- urban settlements (*городские поселения*);
- rural settlements (*сельские поселения*); and
- intra-city areas of federal cities (*внутригородских территориях городов федерального значения*).

Federal Act No. 273 “On Education in the Russian Federation”⁴⁶ specifies the responsibilities of the federation, regions and municipalities regarding school education.

⁴⁶ Administration of the school system in Russia is based on several main acts including the Constitution, Federal Act No. 273 “On Education in the Russian Federation”, regional acts, for example, Act of Voronezh Region No. 84 “On Regulation of Particular Relationships in Education in the Territory of the Voronezh Region”, etc. Different aspects, related to education, are regulated by local acts.

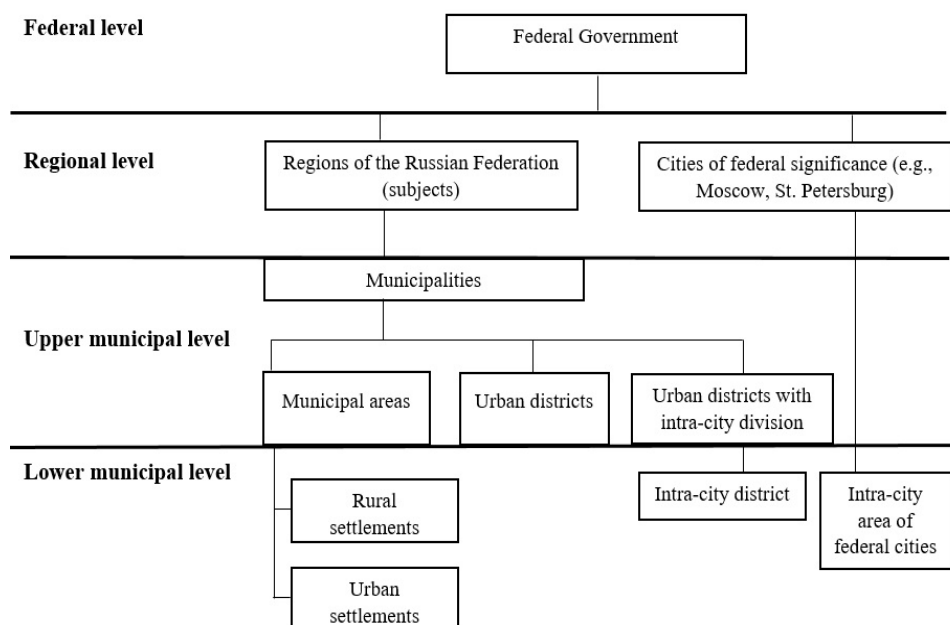


Figure 58. Federal structure and levels of municipalities in Russia

Source: Compiled by the author based on Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation”, Articles 2, 10.

At the Federal level, the Ministry of Education and Science of the Russian Federation is responsible for state policy elaboration and implementation for schools and the education system in general. The Ministry of Education also develops and approves Federal State Education Standards for all levels of education and provides the legal framework for the education system (Article 6, § 1).

Regional educational authorities are represented by Departments or Offices of Education (depending on the region) (see Figure 59). Their responsibilities are also set out in Federal Act No. 273 “On Education in the Russian Federation” and include state control over educational organisations and education offices in municipalities as well as their licensing and accreditation; elaboration and implementation of regional educational programmes considering the cultural peculiarities of the territory; financial support of school programmes through subventions from regional budgets; monitoring of education systems at a regional level; etc. (Article 7, 8).

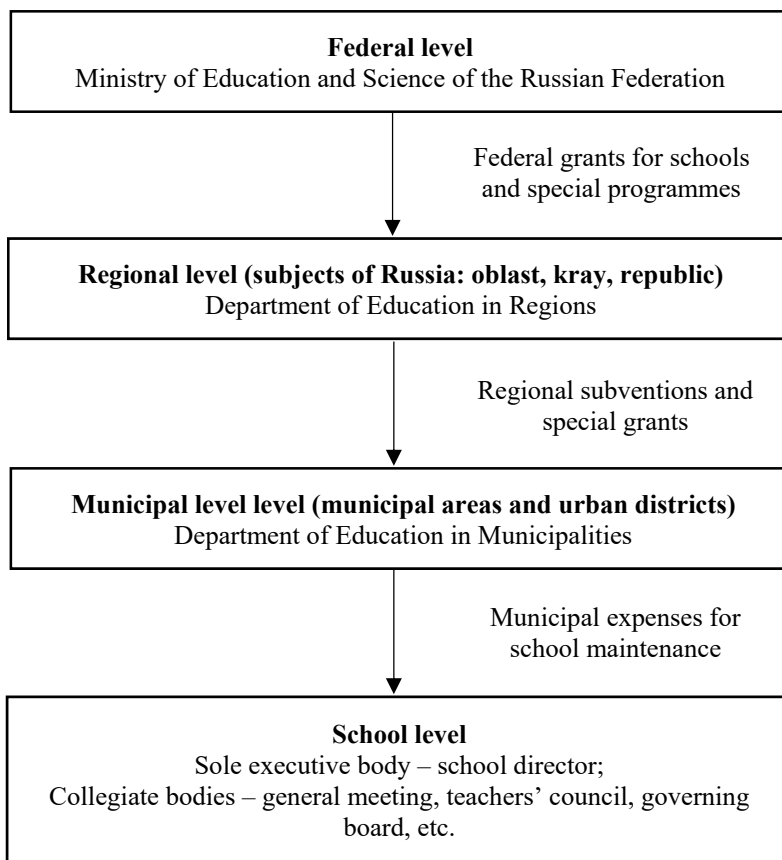


Figure 59. School administration and financing in the Russian Federation
 Source: Compiled by the author based on Federal Act No. 273 “On Education in the Russian Federation”

Municipal areas (*муниципальные районы*) and urban districts (*городские округа*) also have responsibilities regarding school service provision. Municipal authorities create appropriate study conditions for children in schools and have the right to establish, reorganise and liquidate municipal educational organisations and found municipal educational organisations. Municipal areas and urban districts are also responsible for constructing and maintaining school buildings and registering the children who reside in the territory in school (Federal Act No. 273 “On Education in the Russian Federation”, Article 9). Transportation of school pupils between municipalities should also be organised by the municipal authorities responsible for schools (Federal Act No. 273 “On Education in the Russian Federation”, Article 40, § 2). Travel time should not exceed 30 minutes one way according to paragraph 2.5 of “Requirements for the placement of general education organisations”. The other forms of municipalities, such as

rural and urban settlements, are not competent to make decisions concerning school service provision in Russian municipalities.

Municipalities relate to regions via participation in different regional programmes and competition for regional grants. Regional education departments can only frame the overall strategy of education development. Relations between municipal and regional authorities are regulated, for example, by Provision No. 191 of 13 March 2013 “On the approval of the Regulation on the Department of Education, Science and Youth Policy of the Voronezh Region”. School rectors are subordinates to the heads of education departments of municipal areas and urban districts, not to regional authorities.

Municipal authorities consider parents’ opinions in the provision of school policies, for example, opening and closing schools in a particular territory. The decision to reorganise or liquidate a municipal general education organisation located in a rural settlement should be made considering the opinions of the residents of said rural settlement (Federal Act No. 273 “On Education in the Russian Federation”, Article 22, § 12).

In the case of termination of the activities of an education organisation, the cancellation of its relevant license, the revocation of its state accreditation under the relevant educational programme or the expiry of the state accreditation period for the relevant educational programme, the founder (municipal authority) and (or) the authorised management body of the school should transfer pupils to other organisations engaged in educational activities in educational programmes at an appropriate level and focus (Federal Act No. 273 “On Education in the Russian Federation”, Article 34, § 9).

Schools have autonomy, which means independence in implementing educational, scientific, administrative, financial and economic activities and in developing and adopting local regulations in accordance with Federal Act No. 273 “On Education in the Russian Federation”, other regulatory legal acts of the Russian Federation and the Statute of the educational organisation (Federal Act No. 273 “On Education in the Russian Federation”, Article, 28).

The structural subdivisions of the educational organisation, including branches and representative offices, are not legal entities and act on the basis of the Statute of the educational organisation and the regulations on the relevant structural subdivision approved in accordance with the procedure established by the Statute of the educational organisation (Federal Act No. 273 “On Education in the Russian Federation”, Article 27, § 4).

Schools may also have various structural units that ensure the implementation of educational activities, taking into consideration the level, type and direction of educational programmes, the form of education (methodological and educational-methodical units, laboratories, design offices, training and educational production workshops, clinics, training facilities, training grounds, training and demonstration centres, educational theatres, exhibition halls, educational circus arenas, educational dance and opera studios, educational concert halls, etc.) (Federal Act No. 273 “On Education in the Russian Federation”, Article 27, § 1, 2).

Management bodies of schools consist of the sole executive body in a school, such as a director, and collegiate bodies (Federal Act No. 273 “On Education in the Russian Federation”, Article 26):

- general council
- teachers’ council
- governing board
- high school student body
- parents’ committee.

Collegiate bodies, if elected, should be set out in the school Statute.

The head of a school is appointed by the founder (Federal Act No. 273 “On Education in the Russian Federation”, Article 51, § 1). Candidates for the position of head of an educational organisation should have higher education and meet the qualification requirements specified in the qualification handbooks for the relevant positions of heads of educational organisations and (or) professional standards.

Nowadays, management of schools additionally includes student councils and employee unions in order to consider the points of view of school pupils, parents (legal representatives) of juvenile pupils and teachers (Federal Act No. 273 “On Education in the Russian Federation”, Article 26, § 6). Parents as well as teachers have the right to take part in the management of educational organisations in the form determined by the Statute of the organisation (Federal Act No. 273 “On Education in the Russian Federation”, Article 44, § 3, subsection 7; Article 47, § 3, subsection 9). Teachers are required to have professional vocational or higher education; they should meet the qualification requirements specified in the qualification guides and (or) professional standards (Federal Act No. 273 “On Education in the Russian Federation”, Article 46, § 1).

Some educational organisations (schools) implement the network form of educational programmes. This form provides an opportunity for students to learn an educational programme using the resources of several organisations that carry out educational activities, including foreign ones, and also, if necessary, using the resources of other organisations (Federal Act No. 273 “On Education in the Russian Federation”, Article 15, § 1).

The opportunity to introduce school educational districts in Russia is set out in Federal Act No. 273 “On Education in the Russian Federation” as well. A school educational district is a union of educational organisations (schools) realising educational programmes and concluding a cooperation agreement with so-called ‘basic school’, which serves as a resource centre for all members of the school district (*Ливоваров* 2015).

School education should comply with the Federal State Educational Standard (FSSES), which is elaborated for each stage separately. Federal state educational standards and federal state requirements provide the following (Federal Act No. 273 “On Education in the Russian Federation”, Article 11):

- 1) Unity of the educational space of the Russian Federation.

- 2) Continuity of the main educational programmes of primary general, basic general, secondary (complete) general, vocational and higher education.
- 3) Variability in the content of educational programmes of the corresponding level of education, the possibility to form educational programmes of different levels of complexity and orientation, considering the educational needs and abilities of students.
- 4) State guarantees on the quality of education based on the unity of mandatory requirements to the conditions for the implementation of basic educational programmes and the results of their completion.

The federal state educational standards include the following requirements (Federal Act No. 273 “On Education in the Russian Federation”, Article 11):

- 1) The structure of the main educational programmes (including the ratio of the mandatory part of the basic educational programme and the part formed by the participants of the educational process) and their scope.
- 2) The conditions for the implementation of basic educational programmes, including personnel, financial, material and technical and other conditions.
- 3) The results of learning.

Educational organisations develop educational programmes in accordance with the federal state educational standards (FSES), considering relevant exemplary basic educational programmes (Federal Act No. 273 “On Education in the Russian Federation”, Article 12, §§ 5, 7).

Financing of school education in Russia

This thesis focuses on the school level. The reason for this delineation is that different stages of Russian education are financed from different sources and budgets. It is important to consider the sources of school financing since FOCJ must be incorporated into the budget system of the Russian Federation. For example, higher education in Russia is financed from the federal budget. Regional budgets cover expenses of vocational educational institutions (Federal Act No. 273 “On Education in the Russian Federation”, Articles 6–9). Costs related to schools are split between different levels of administration. They are financed mainly from two sources: regional and municipal budgets.

Municipalities receive regional subventions which are determined by the number of children and normative standards according to the law on the regional budget⁴⁷ with respect to types of educational programme and stages of education. Normative costs of state or municipal educational services provision are determined for each level of education in accordance with the Federal State Educational Standards for each type of educational programme (Federal Act No. 273 “On Education in the Russian Federation”, Article 99, § 2). Regional subvention covers employee salaries and educational costs such as textbooks,

⁴⁷ Regions of the Russian Federation elaborate acts “On budget”. For example, *закон «О бюджете Воронежской области»*.

furniture, educational and laboratory equipment, etc. Expenditures on remuneration of pedagogical personnel of municipal general education organisations should not be lower than the level corresponding to the average salary in the respective region of the Russian Federation in which such general education organisations are located (Federal Act No. 273 “On Education in the Russian Federation”, Article 99, § 3). The maintenance of buildings and structures and utility expenses is financed from the municipal budget (Federal Act No. 273 “On Education in the Russian Federation”, Article 8, § 3).

The main principle for school financing is ‘money follows children’, meaning per capita finance. This principle attracts private schools in school service provision. Private schools as well as public schools in terms of education are financed according to the number of students. They can receive subventions from regional budgets if they have a licence and a state accredited educational programme. The only difference is that in private schools, parents may pay fees and cover maintenance costs by themselves. Private schools usually have a wider range of services (e.g. language or dance classes) and have the right to charge parents for these services.

Subventions for schools come from the regional budget to every municipality, and municipalities distribute them across schools. There are also coefficients, which are used to additionally finance schools in rural and urban areas, for schools with innovative platforms as well as for schools which implement the Federal State Educational Standards⁴⁸ (FSES) and schools with high regional rankings based on the results of regional test scores.

Some school resources can also be provided from the federal budget. For example, school buses are usually purchased through federal programmes. However, maintenance of buses is the responsibility of municipalities. Additionally, schools, municipalities and regions may apply for special federal grants. Usually, financing is provided from separate federal projects or programmes, e.g. the Federal Grant Programme of Education Development in Russia 2016–2020⁴⁹. An educational organisation has the right to acquire additional financial resources by providing commercial services and receiving voluntary contributions and/or target contributions.

For small-sized schools⁵⁰ and educational organisations located in rural areas and implementing basic general education programmes, normative costs for the provision of educational services should include the costs of educational acti-

⁴⁸ The Federal State Educational Standards are obligatory requirements to the educational programmes of primary (*начальное*), basic (*основное*) and secondary (*среднее*) general education, vocational education and higher education institutions, which have a state accreditation.

⁴⁹ *Федеральная целевая программа развития образования на 2016-2020.*

⁵⁰ Small-sized schools (*малокомплектные школы*) are educational organisations, which realise main educational programmes and located distantly from other educational organisations, have no transport access and/or small number of pupils (Federal Act No. 273 “On Education in the Russian Federation”, Article 99, § 4).

vities that do not depend on the number of pupils (Federal Act No. 273 “On Education in the Russian Federation”, Article 99, § 4).

Figure 60 shows what the administration and financing of Russian schools will look like after introducing FOCJs of type II for the provision of school services (right-hand side) in comparison with the existing system (left-hand side). The author believes that these two approaches may co-exist and develop in parallel. With the introduction of school FOCJs of type II, municipal areas and urban districts, which previously provided school services separately, are going to provide them jointly. Therefore, regional subventions and special school grants from the regional level of school administration will be transferred to a school FOCJ first and later distributed between each particular school included in the FOCJ of type II. Similarly, federal school grants will be delivered to FOCJs of type II first and later distributed between schools (see Figure 60 right-hand side). Currently, expenses related to school maintenance are covered by municipalities via municipal Departments of Education (Figure 60, left-hand side). After creating school FOCJs of type II, this task should be fulfilled by FOCJ management bodies (sole and collegiate) from the FOCJ of type II budget (Figure 60 left-hand side).

School management will mainly be conducted by FOCJs of type II. Schools as well as municipalities may transfer their responsibilities regarding school administration to the FOCJ level. This reorganisation allows schools and municipalities to reduce administration costs since all school management functions will be transferred to one level (FOCJs of type II level). A school FOCJ of type II may include one or more schools under its administration. Schools may still have some personnel that tackle everyday issues. For example, school directors and maintenance administrators, as shown in Figure 60 on the right-hand side. However, general decision-making and management of schools is moved to FOCJs of type II as well as the responsibility to cover schools’ costs. FOCJs of type II form their own budget to cover costs via regional and federal subventions and grants, municipal regular fees and other sources that should be set out by the FOCJ of type II Statute and Memorandum.

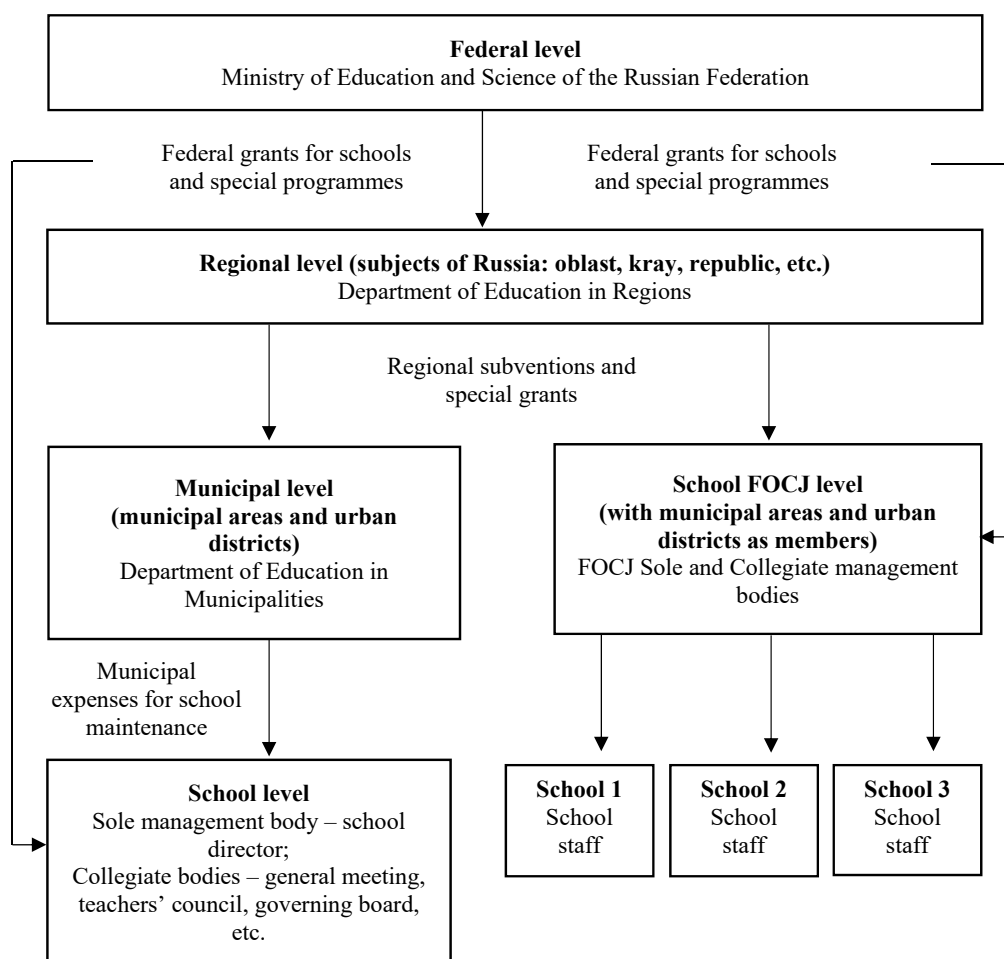


Figure 60. Currently existing versus FOCJ of type II system of school administration and financing in the Russian Federation
Source: Compiled by the author.

The FOCJ of type II Statute and Memorandum are important in demonstrating the practical applicability of FOCJs of type II to the Russian circumstance. Figure 61 shows the methodology of the elaboration of empirical results. Four methods have been applied to develop empirical results. First, literature devoted to FOCJs has provided the FOCJ definition and the characteristic features which should be the basis for the Statute and Memorandum (Chapter 1).

Second, results and conclusions from theoretical microeconomic modelling should be considered to exclude unfavourable behaviour of FOCJ management

and include optimal solutions for FOCJ member and management decision-making (Chapter 2).

Third, document analysis has been applied to develop the FOCJ of type II Statute and Memorandum based on the legal form of association (union) and considering particular Russian municipalities as possible members (subchapter 3.2).

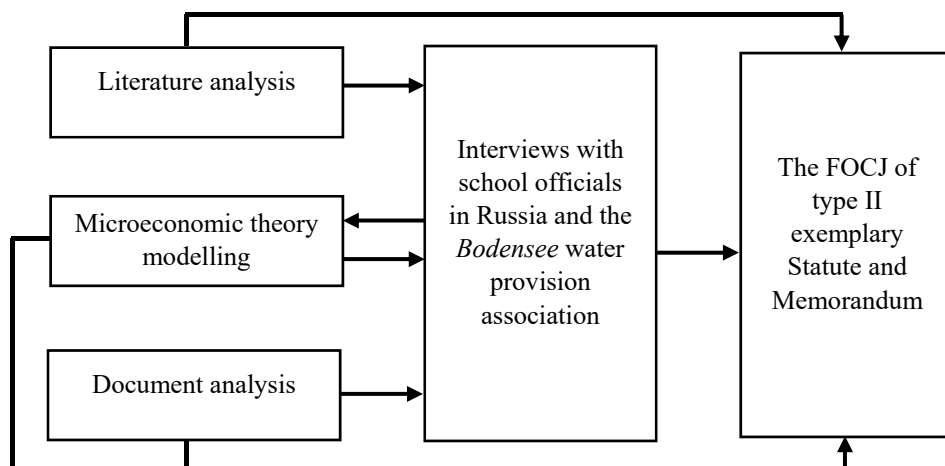


Figure 61. The methodology of the elaboration of empirical results
Source: Compiled by the author

Fourth, interviews with Russian officials responsible for school administration at municipal and regional levels, school directors and parents as well as with the *Bodensee* water provision association in Germany have been conducted (subchapter 3.3). These are necessary to gather information of practical importance for the FOCJ of type II Statute and Memorandum that cannot be received using other methods.

For the interviews, the author developed questions stemming from the literature analysis, the results of microeconomic theoretical modelling and the preliminary document analysis. The interview findings have amended the FOCJ of type II microeconomic models developed in Chapter 2.

3.2. Analysis of legal forms and municipalities suitable for school FOCJs

Literature devoted to inter-municipal cooperation in Russia mainly concludes that inter-municipal cooperation is underdeveloped (*Бутова, Пухова, Шукин* 2013; *Ладыгин* 2011; *Маркварт* 2010; *Gutnikova* 2012; *Даутов* 2018; *Гайнанов et al.* 2017). Some authors point out that uncertainties and gaps in laws

concerning inter-municipal cooperation hinder the development of inter-municipal cooperation in Russia (*Петроградская* 2011; *Урманов* 2013; *Маркварт* 2010; *Останиец* 2017). Other factors impeding inter-municipal cooperation are the lack of (1) methodological support for IMC from the state as well as from the expert community; (2) government inclusion in the cooperation process; (3) stimulus for municipalities to improve the management of municipal budgets; and (4) qualification of municipal employees (*Рагозина* 2009; *Рамазанов* 2019).

A significant amount of literature describes the forms of IMC in Russia. Classification approaches are based on several criteria, one of which is the legal forms for executing inter-municipal cooperation. Non-public companies, limited liability companies, autonomous non-commercial organisations and funds are the legal forms of inter-municipal cooperation discussed in Russian literature (*Урманов* 2013, *Арумова* 2012, *Миронова* 2017).

Some authors (*Гриценко* 2001; *Власова, Джек* 2009; *Рагозина* 2009; *Козлова, Макарова* 2018: 136) distinguish between **contractual** (short-term and long-term contracts) and **associative forms** of inter-municipal cooperation. These forms are dominant. Others (*Ирискина* 2010; *Бутова, Смирнова, Миловидова* 2014) add to this classification **economic forms** of cooperation in Russian municipalities, including commercial and non-commercial organisations in the legal forms mentioned above. Representative bodies of municipalities establish these forms of cooperation in accordance with Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation” and other federal acts of particular company forms, such as Federal Act No. 14 “On Limited Liability Companies”. Economic forms of IMC are not popular in Russia because of the following reasons: lack of collaborative traditions between municipalities (instead, there is a long tradition of a strong, centralised system of municipal management), lack of information about the forms of and legal opportunities for inter-municipal cooperation, lack of trust in civil law contracts as an effective means of public service provision, lack of financial resources and specially trained staff, etc. (*Ирискина* 2010; *Маркварт* 2010).

Public-private partnership is considered a form of cooperation of municipalities with private firms in Russia (*Frolova et al.* 2017). There can also be forms of inter-municipal cooperation without creating legal persons and delegating legal powers to them, such as consultation, working groups, joint arrangements, etc. (*Негодуйко* 2008; *Рагозина* 2009). These can be formal and informal. However, cooperation between Russian municipalities is mainly informal.

Another stream of literature is devoted to historical aspects of IMC development in Russia, including the stages before the Revolution, the Soviet period and the modern period (*Москаленко* 2016; *Лякишева, Шлегель* 2017; *Ирискина* 2010). Possible spheres of IMC are discussed in some papers, among these are common innovative projects, tourism, solid waste recycling, retraining for municipal employees (*Бутова, Смирнова, Миловидова* 2014; *Pakhalov, Saks* 2020), water provision, household waste collection and communal services (*Gutnikova* 2012).

The advantages of inter-municipal cooperation in Russia and its stages of development are discussed in literature as well. The authors emphasise the positive consequences for Russian municipalities, such as cost reduction due to economies of scale, access to a wider pool of resources and increase in service quality and, as a result, municipal budget economy (Gutnikova 2012; *Ладыгин* 2011; *Меркулов* 2020).

Тургель (2015) and Gutnikova (2012) have conducted a quantitative statistical analysis of inter-municipal development at the federal and regional levels. They conclude that inter-municipal cooperation in Russia prevails in non-commercial forms. These organisations primarily perform analytical, expert and consulting functions. Municipal areas and rural settlements are the most active municipalities in establishing commercial forms of inter-municipal cooperation.

Some authors have investigated the role of inter-municipal cooperation in the development of regional agglomerations (*Михайлова* 2010; *Бабун* 2012; *Победин* 2013; *Рождественская, Кабалинский* 2016; *Антонов* 2020). Sometimes inter-municipal cooperation is called “an alternative to municipal amalgamation” under difficult demographic conditions (*Маркварт* 2010).

Cases of cross-border cooperation show that Russia established municipal contacts primarily with the neighbouring countries of the Baltics region, Finland, Norway and Poland (Tynkkynen 2008; Anishenko, Sergunin 2012; Fedorov 2013; Zaitseva, Korneevets, Semenova 2016; *Цветкова* 2017) in tourism, migration policy, environment protection, etc.

Councils of municipalities of Russian Federation subjects are established in the form of associations. Nowadays, inter-municipal cooperation in Russia exists mainly in the form of unions and associations of municipal formations, sometimes based on the size of municipalities or territorial characteristics, such as the Association of Siberian and Far Eastern Cities of Russia, the Union of the Russian Science Cities’ Development and the Association of Small and Medium-sized Cities of Russia (Kozlova, Makarova 2018: 136). These organisations are voluntary and aimed at developing local self-government and inter-municipal cooperation. They also organise informational support for members, interactions with regional and federal authorities, exchange of experience and common preparation of projects.

The literature on inter-municipal cooperation shows that there is a lack of inter-municipal cooperation initiatives in Russia. Specifically, there are no examples of inter-municipal cooperation in the Russian education sector. Although a few authors (*Ирискина* 2010; *Бутова, Смирнова, Миловидова* 2014) have investigated the long-term economic cooperation of municipalities, these investigations are largely descriptive and lack a theoretical microeconomic basis for developing this form of cooperation in Russia.

Figure 62 summarises the possible Russian forms of inter-municipal cooperation according to the literature analysis:

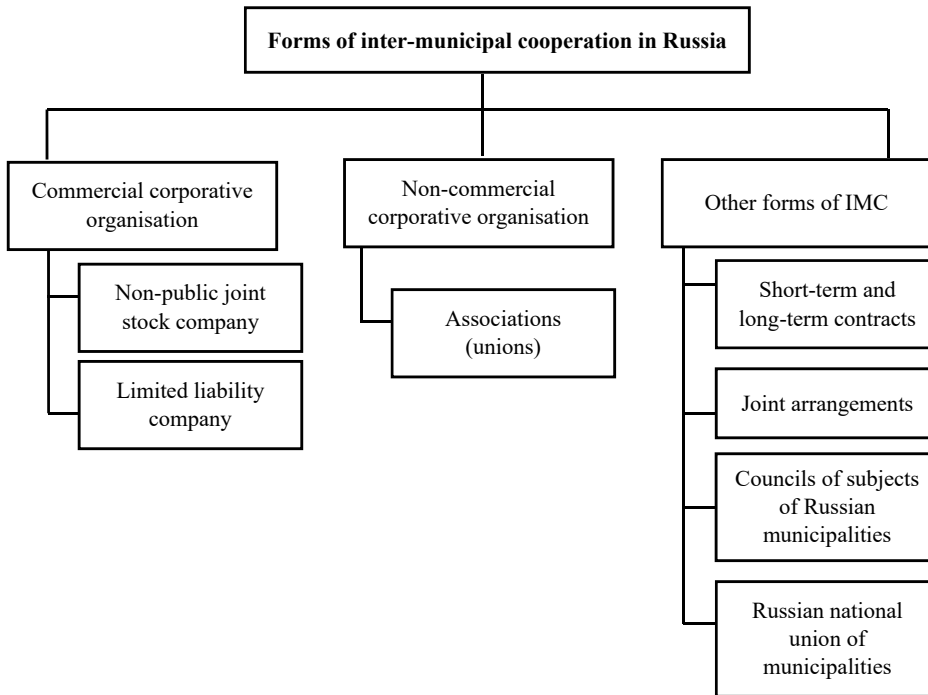


Figure 62. Legal opportunities for inter-municipal cooperation in Russia according to the literature and document analysis

Source: Compiled by the author based on Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation”, Articles 8, 68.

In order to decide which legal company form is the most appropriate for creating school FOCJs of type II in Russia, the author has not only analysed literature on IMC, but also conducted a detailed investigation matching FOCJs’ main features with legal company forms according to the Russian Civil Code.

It is important to note here that the Russian legislation system does not have a division between public and private law. The term ‘public forms of property’ is not used. Instead, there are two terms – state and municipal forms of property, which are set out in the Constitution of the Russian Federation (Винницкий 2013). Traditionally, FOCJs of type II operate, for example, in Germany in the form of special purpose public associations, *Zweckverband*. In Russia, all legal company forms (state, municipal or private) operate under the Civil Code, which is private law (see Figure 63). Therefore, it is not possible to establish

FOCJs of type II in the legal form under public law due to the lack thereof in the Russian legal system.

Furthermore, Russian state and municipal authorities enter into property relations equally with natural and legal persons (*Винницкий* 2010). This can be explained historically due to the long-standing existence of the state socialistic form of property. After the fall of the command system, state authorities have equal rights with natural and legal persons in relations with property (*Винницкий* 2010). Now, due to the increasing role of public enterprises, a special public law regime should be introduced in Russia. This law should regulate the activities of state executive bodies, executive bodies of local self-government and public enterprises (*Винницкий* 2010). The position of public enterprises should be highlighted in this public law, including FOCJs of type II which do not yet exist.

Nowadays, the Civil Code is the main legal source that regulates the economic relations of legal entities, including local self-government bodies, and persons. However, there is no special legal form for establishing **FOCJs of type I** with citizens as members in Russia. An FOCJ of type I is a special form of direct self-governance, which means municipalities without territories. There are forms of direct democracy in Russia, too, such as citizens' meetings (*сход граждан*), public hearings (*публичные слушания*). However, these are not suitable for inter-municipal cooperation because they can be applied only within one community with a restricted number of citizens (usually no more than 100 people) (Federal Act No. 131 "On the general principles of organisation of local self-governance in the Russian Federation", Article 25). Additionally, sub-chapter 1.2 has concluded that FOCJs of type I are only indirectly related to inter-municipal cooperation and **FOCJs of type II** with municipalities as members match the IMC definition.

According to Federal Act No. 131 "On the general principles of organisation of local self-governance in the Russian Federation", Article 68, municipalities can establish inter-municipal companies in two commercial legal forms – **non-public joint stock companies**⁵¹ and **limited liability companies**. Inter-municipal organisations can also be established in non-commercial forms of **autonomous non-commercial organisations** and **funds** (Article 69). Additionally, municipalities may form **associations** for their joint activities on a voluntary basis (Article 8, § 3).

The key features of these and other commercial and non-commercial legal forms, such as partnerships, productive cooperatives, unitary enterprises, consumer cooperatives, public organisations, associations and units, funds, establishments and autonomous non-commercial organisations according to the Russian Civil Code, have been compared with FOCJ characteristics in Table 14. Legal forms of companies in Russia should match the key features of FOCJs. The list

⁵¹ After the amendments to the Russian Civil Code, closed joint-stock companies were named non-public joint stock companies.

of FOCJ features has been elaborated by the author on the basis of FOCJ-related literature and comprises the following:

- functions (sectors) where a legal form could be used
- opportunities to overlap with other companies of the same legal form
- members (founders) within the legal form
- competition for members
- existence of membership
- establishment of decision-making bodies and their functions
- existence of published Statute
- democratic procedures, set out in the Statute
- the right to fix fees
- admission of members and their exit
- members' influence the Association Council
- connection of membership to service consumption

In Table 14, FOCJ features are included in columns. The rows of Table 14 contain the legal forms of companies according to Russian legislation. This table has been made by the author in order to find legal forms suitable for creating FOCJs of type II in Russia. In the description of legal forms, the author looks for those features that are important for FOCJs, especially of type II. The analysis has shown that the main difficulty is finding legal company forms that match all FOCJ features simultaneously.

The analysis starts with a **sole proprietor** who is a natural person carrying out an entrepreneurial activity without establishing a legal entity. This form is not suitable for the FOCJs of type II since membership of more than one is only feasible for inter-municipal cooperation.

In the **non-public joint stock company** shares cannot be publicly purchased. Therefore, this condition restricts membership for FOCJs of type II because members (municipalities) cannot freely quit one FOCJ and become a member of another one. As a result, there can be several non-public joint stock companies in one municipality and they can compete with one another for clients but not freely for members. In addition, members do not necessarily consume a joint stock company's services. Questions concerning service prices and member fees are not specified by the law, but prices for services can be set out in the company's establishment document (a Statute).

A **limited liability company (LLC)** may perform all legal forms of activities, except those which require licensing. It is a very crucial condition for school FOCJs of type II since educational activity should be licensed. Participants may quit and join an LLC, freely buying its shares or selling shares either to other members or to other natural or legal persons. The main body of a limited liability company is a general meeting of shareholders. The LLC's founding document is the company's Statute, where the procedure and consequences of members' termination of activity is described. Particular Statutes may also contain other legal conditions. Unlike a joint stock company, a limited liability company is not required to have a Board of Directors in Russia. There-

fore, members may govern the company themselves and at the same time produce services for internal consumption as well as for external users. Competition in LLCs is restricted by the number of participants, which may not exceed 50. It is stated in the law who may fix fees, but an LLC Statute may include details that are not discussed in the law, such as the right to fix member fees and contributions.

A **public joint stock** company compared with non-public may compete for members because shares can be publicly sold (public subscription). Still, competition for members is rather difficult since personal participation is not as important for this legal form as it is, for example, for a partnership or a cooperative, as discussed below. However, management functions are concentrated in the hands of the Board of Directors.

In Russia, **partnerships** may be established in the form of a general partnership (GP) and a limited (commandite) partnership (LP) (see Figure 63). A **limited (commandite) partnership** is a partnership in which, along with the members carrying on business activities on behalf of the partnership and liable for the partnership's obligations with their property (general partners), there are one or more members – investors (limited partners) – who bear the risk of losses related to the partnership's activities to the extent of their contributions and do not take part in the partnership's business activities. The number of commanditaires (limited partners) is restricted (see Civil Code of the Russian Federation, Article 82). Limited partners can be natural persons, legal persons and governmental units (for example, municipalities) (see Civil Code of the Russian Federation, Article 66). Members-investors can participate financially within their share, but their participation rights are limited; therefore, they do not take part in decision-making processes. Decisions in limited partnerships may be made by a majority of votes. The condition for how decisions are made must be set out in its Foundation Agreement (*учредительный договор*). Members most likely make decisions on the prices of the services provided (though information about how this is done is not specified in the law), and members can terminate their membership at any time.

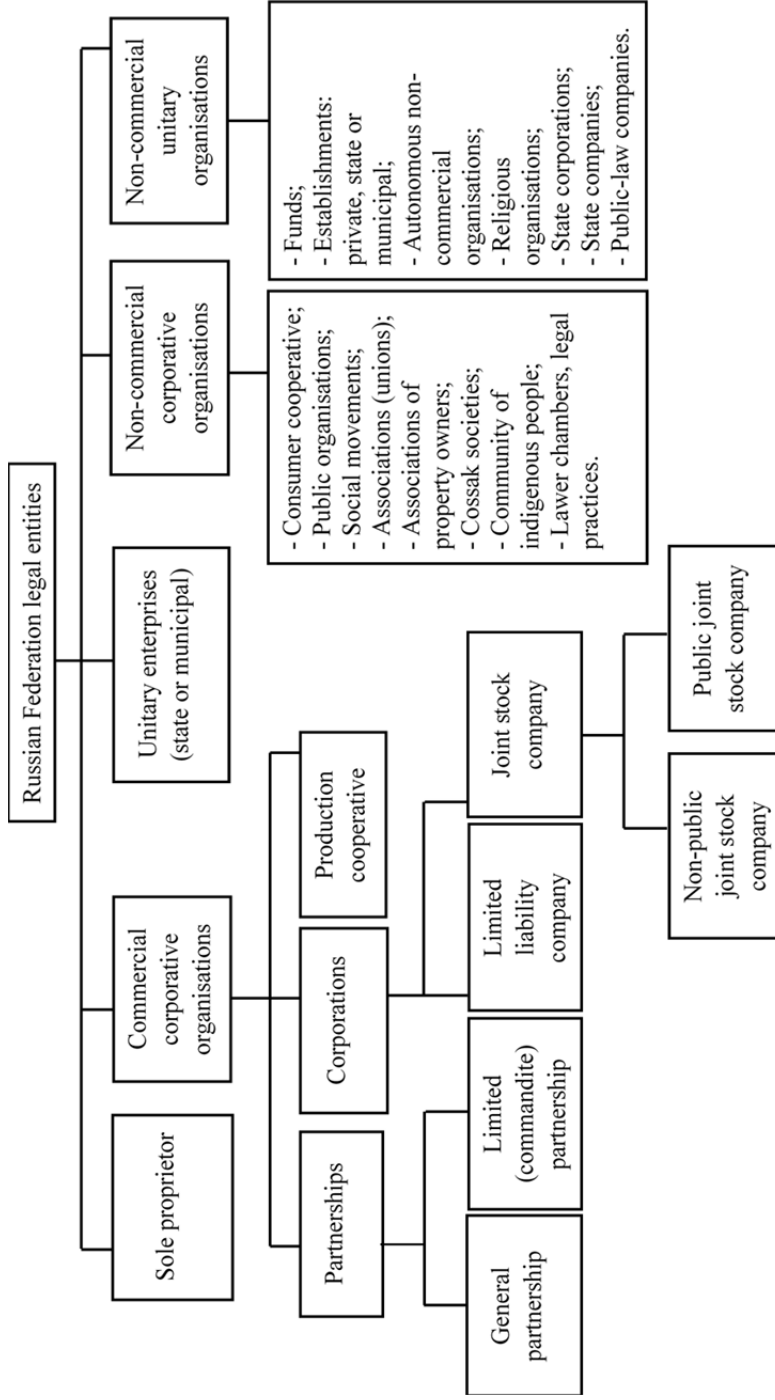


Figure 63. Legal forms of companies in the Russian Federation
Source: Friedrich, Chebotareva 2017.

Table 14. Legal forms in the Russian Federation considering the main characteristic features of FOCJs

Legal forms	FOCJ Features													
	Functions	Private companies applicable	Overlapping	Competition for members	Kind of members	More than one member	Decision-making bodies	Published Statutes	Democratic procedures	Right to fix fees and contributions	Members free enter and quit	Members influence on Board of Directors	Provision of services to members	Possible type of FOCJ
Sole proprietor	+	-	+	-	Citizens	-	-	-	-	+	-	+	+	No
General partnership	+	+	+	+	Sole proprietors and commercial organisations	+	Foundation Agreement	+	+	+	+	No Board of Directors	+	FOCJ type III
Limited (commandite) partnership	+	+	+	+	General members: Sole proprietors and commercial organisations. Members-investors: natural persons, legal persons, governmental units	+	Foundation Agreement	+	+	+	+	No Board of Directors	+	FOCJ type III and IV
Public joint stock company	+	+	+	+	Natural persons, legal persons, governmental units (e.g. municipalities)	+	General meeting of shareholders, Board of Directors	+	+	+	+	+	Not necessary	FOCJ type I, II, III, IV
Non-public joint stock company	+	+	+	-	Natural persons, legal persons, governmental units (e.g. municipalities)	+	General meeting of shareholders, Board of Directors	+	+	+	+	+	Not necessary	No
Limited liability company	+	+	+	+	Natural persons, legal persons, governmental units (e.g. municipalities)	+	General meeting of shareholders (Board of Directors is possible)	+	+	+	+	+	Not necessary	FOCJ type I, II, III, IV
Production cooperative	+	+	+	+	Natural persons; natural and legal persons	+	General meeting of members = chairperson and Board of Directors	+	+	+	+	+	+	FOCJ type I and IV

Table 14. Continuation

Legal forms	FOCJ Features											Possible type of FOCJ		
	Functions	Private companies applicable	Overlapping	Competition for members	Kind of members	Membership of more than one	Decision-making bodies	Published Statutes	Democratic procedures	Right to fix fees and contributions	Members free enter and quit		Members influence on Board of Directors	Provision of services to members
Unitary enterprises	+	+	+	-	The Russian Federation, subjects of the Russian Federation or municipalities	-	Founders can be the Russian Federation, the subject of the Russian Federation or municipality. Executive body is a director	+	-	-	-	-	?	No
Consumer cooperative	+	+	+	+	Natural persons or legal persons	+	General meeting of members, Board, Board of Directors, Audit commission	+	+	+	+	+	+	FOCJ type I and IV
Public organisations	+	+	+	+	Natural persons	+	General meeting of members, Chairman, Board of Directors	+	+	+	+	+	+	FOCJ type I
Associations (unions)	+	+	+	+	Natural persons and (or) legal persons, municipalities	+	General meeting of members, Chairman, Board of Directors	+	+	+	+	+	+	FOCJ type I, II, III, IV
Funds	+	+	+	-	Founders: Natural persons and (or) legal persons	-	High collegial body, Chairman, Board of Directors	+	+	+	+	+	?	No

Table 14. Continuation

Legal forms	FOCJ Features											Possible type of FOCJ		
	Functions	Private companies applicable	Overlapping	Competition for members	Kind of members	Membership of more than one	Decision-making bodies	Published Statutes	Democratic procedures	Right to fix fees and contributions	Members free to enter and quit		Members influence on Board of Directors	Provision of services to members
Establishments	+ non-commercial functions	+	-	-	Natural person, or legal person, or the Russian Federation, subject of the Russian Federation, a municipality - founders	only one founder	Supervisory Board, Chairman, other bodies	+	-	+ Can be fixed in Statute	-	+ No Board of Directors	?	No
Autonomous non-commercial organisations	+ different functions in non-commercial spheres	+	-	-	Founders: natural persons and (or) legal persons, the Russian Federation, subject of the Russian Federation, a municipality	-	Founders, Chairman (executive body)	+	-	Can be fixed in Statute	-	- No Board of Directors	+	No
State corporations	+	+	-	-	Central State	-	Board of Directors, Supervisory Board	- based on special acts	-	-	-	+	-	No
State companies	+	+	-	-	Central State	-	Board of Directors, Supervisory Board	+	-	-	-	+	-	No
Public law companies	+	+	-	-	Central State	-	Supervisory Board, Executive Director, Board of Directors	+	-	-	-	+	-	No

Source: Friedrich, Chebotareva 2017.

- no possibility
- + there is a possibility
- ? no information in the law

Natural persons as well as individual entrepreneurs and commercial companies can be members of the **general partnership (GP)**. GP operates on the basis of the Foundation Agreement, which includes information about the size of the capital, the amount and procedure of changes in the shares of participants, etc. All members of the general partnership take part in its management, and decisions are made by a majority vote of members. Members must participate in its activity but can terminate membership in the partnership at any time.

A **production cooperative** may be suitable for establishing either an FOCJ of type I or type IV with natural persons and natural and legal persons as members (see Table 14). Production cooperatives can be established for providing multiple services. Provision of public services is also permitted. Membership is based on personal participation. There may also be some members whose membership is not based on their labour input. Decisions are made by the general meeting of members and all legal procedures are set out in its foundation document also known as its Statute (Federal Act No. 41 “On Production Cooperatives”). A Statute must be approved by the general Assembly of Members. The executive bodies of a production cooperative are the Chairman and the Board of Directors of the cooperative; these positions are set out in its Statute. Only members of the production cooperative can be members of the Board of Directors and the Chairman. Members are free to leave the production cooperative and transfer their shares to other members.

State and municipal enterprises operate in the form of **unitary enterprises**, which do not have property rights. The Russian Federation, its subjects and its municipalities are the owners of unitary enterprise property. Unitary enterprises in Russia cannot be established on the basis of a combination of property that belongs to the Russian Federation, subjects of the Russian Federation, or municipalities (Federal Act No. 161 “On the State and Municipal Unitary Enterprises”). The specific characteristics of unitary enterprises assume the existence of a sole owner of the indivisible property. Since multiple membership is a very important criterion for an FOCJ, the legal form of unitary enterprises is not suitable for the establishment of an FOCJ of type II.

A **consumer cooperative** is a non-commercial organisation. It is based on a membership, where members can be natural persons or natural persons and legal persons. This means that only FOCJs of type I and type IV can be established in the form of a consumer cooperative. Consumer cooperatives are aimed at satisfying participants’ (members’) material and other needs by combining members’ property share contributions. Therefore, they may perform different functions. The Statute of the consumer cooperative must contain the size of share contributions made by the members as well as the structure and the order of making the share contributions. In addition, it includes the responsibility they bear for violating share contributions. The composition of management bodies and the order of their decision-making, including the issues with respect to which decisions are adopted unanimously or by a qualified majority of votes, should be set out by its Statute. The procedure for covering the losses of the cooperative should be agreed among its members.

Public organisations are voluntary organisations of natural persons aimed at satisfying their non-material needs, representing and protecting common interests. FOCJs of type II cannot be established in the form of a public organisation since only natural persons can be members. The Statute of a public organisation should include information about its name and location, the objective and purpose of its activities, the terms for entering and quitting, the competence of its bodies and the procedures for making decisions, participants' (members') property rights and obligations and the procedures for distributing any property remaining after liquidation of the organisation. Members of public organisations may use its services and are obligated to pay the membership fees and make other material contributions set out in its Statute. The general meeting of members makes decisions about membership fees. Members also have the right to leave public organisations at any time.

In **associations (unions)**, legal persons and (or) natural persons as well as municipalities can be members (e.g. the Association of Siberian and Far Eastern Cities of Russia, the Union of the Russian Science Cities' Development and the Association of Small and Medium-sized Cities of Russia). Other characteristics of associations are very similar to the one discussed above in relation to public organisations. Membership is generally voluntary but in some cases may be mandatory. An association (union) is established to represent and protect professional interests, achieve social goals, meet spiritual needs or achieve other non-commercial aims. FOCJs of types I, II, III and IV can be established as associations (unions).

Associations (unions) include non-commercial partnerships, self-regulatory organisations, employers' associations, associations of trade unions, associations of cooperatives, associations of public organisations and chambers of commerce (CC of the RF, Article 50, section 3). These forms of associations are not independent legal forms but are varieties within the legal form of associations (unions). Non-commercial partnerships are applicable for FOCJ types I, II, III and IV, while self-regulated organisations are suitable for FOCJs of types I, III and IV since they are established to fulfil only professional activities.

Funds as well as **autonomous non-commercial organisations (ANOs)** do not have membership, which means that these legal forms cannot be used for the establishment of FOCJs of type II since membership is a crucial feature of FOCJs of type II. Although founders of ANOs can be Russian municipalities, it is rather difficult to organise FOCJs in this form as no membership and democratic procedures are involved. However, if an FOCJ's Statute allows only founders, not members, then it is possible to use this legal form for FOCJs with amendments.

Establishments (*учреждения*) are usually created for providing managerial, cultural or other non-commercial functions. They can be state, municipal or private. State and municipal establishments are divided into state-owned (*казенный*), budgetary and autonomous establishments. Hence, the founder can be a natural person, a legal person or the Russian Federation, a subject of the Russian Federation or a Russian municipality. Autonomous establishments would

be a good form to create FOCJs of type II if more than one founder were allowed. However, establishments cannot have co-founders (Civil Code of the Russian Federation, Article 123.21).

A **public law company** (*публично-правовая компания*) is a unitary non-commercial organisation established by the Russian Federation that operates in the interests of the State and society⁵². Similar to a public law company, **state corporations** and **state companies** are established by the Russian Federation on the basis of a property contribution to perform social, managerial or other socially useful functions. State corporations and companies do not have membership (Federal Act No. 7 “On Non-commercial Organisations”, Article 7.1, 7.2). In general, unitary organisations are not suitable for inter-municipal cooperation in the form of FOCJs of type II since unitary enterprises do not have membership and property is indivisible, which means that it cannot be distributed between members after liquidation.

Currently, schools in Russia are functioning in one of three legal forms of establishment:

- municipal budgetary general education establishments (*муниципальные бюджетные общеобразовательные учреждения*)
- municipal state general educational establishments (*муниципальные казенные общеобразовательные учреждения*)
- private general education organisations (*частные общеобразовательные учреждения*)

Educational organisations can only be established in one of the non-commercial forms in Russia (Federal Act No. 273 “On Education in the Russian Federation”, Article 22). Therefore, in Table 15, only the company forms marked in bold are applicable for establishing FOCJs cooperation for the provision of Russian school services. However, for FOCJs of type II, there is only one legal non-commercial form which is appropriate – an association (union).

All considered legal forms are grouped in Table 15 according to FOCJ type. Black marks those legal company forms that are suitable for school FOCJs of type I, II, III and IV, respectively:

⁵² According to the Federal Act No. 236 “On public law companies in the Russian Federation and on amendments to certain legislative acts of the Russian Federation”.

Table 15. Legal forms according to FOCJ types

FOCJ type I	FOCJ type II	FOCJ type III	FOCJ type IV
Public joint stock company	Public joint stock company	General partnership	Limited (commandite) partnership
Limited liability company	Limited liability company	Limited (commandite) partnership	Public joint stock company
Production cooperative	Associations (unions)	Public joint stock company	Limited liability company
Consumer cooperative		Limited liability company	Production cooperative
Public organisations		Associations (unions)	Consumer cooperative
Associations (unions)			Associations (unions)

Source: Compiled by the author based on Civil Code of the Russian Federation and Federal Act No. 7 “On Non-commercial Organisations”.

Additionally, as discovered in subchapter 3.1, local self-government is carried out in the entire territory of the Russian Federation in the forms of urban settlements, rural settlements, municipal areas, municipal and urban districts and intra-city territories of federal cities (Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation”, Article 10, Articles 15, § 11, Article 16, § 13). However, only upper-level municipalities (see Figure 58 in subchapter 3.1): municipal areas, municipal and urban districts and urban districts with intra-city division may organise the provision of school services in municipalities. They have the authority to establish, reorganise and liquidate school educational organisations and are responsible for the maintenance of buildings and structures of municipal educational institutions and the arrangement of adjacent territories (Federal Act No. 273 “On Education in the Russian Federation”, Article 9). The other types of municipalities such as rural and urban settlements do not make decisions concerning the provision of school services in Russia.

3.3. Empirical insights for school FOCJs via interviews

There are two streamlines of interviews conducted for the purposes of this thesis, one of which investigates the special conditions related to schools in Russia. Such as how schools are financed, how they are managed at the municipal and regional level, in which juridical forms schools operate and so on. These interviews took place in one of the Russian regions.

The second category of interviews was undertaken in *Baden-Württemberg* in Germany, where an interview was conducted with the Deputy Financial

Director of *Bodensee* water provision association. The aim of this interview was to gain information about how an FOCJ of type II operates in practice, what is important to consider in its Statute, what the legal basis is for its procurement, etc. The latter interview might be limited with respect to the focus of the thesis because the author could not have asked questions related to schools. School and water provision services are quite different in terms of technical supply, required knowledge of staff, etc. However, those questions related to FOCJ management are very suitable to ask from the interviewee in Stuttgart, especially considering the more than half a century experience of *Bodensee Wasserversorgung*.

Interviews with experts in the provision of Russian school services

The author of the thesis pursued multi-faceted aims in conducting interviews in Russia. The first aim was to identify the features of FOCJs of type II as a tool for inter-municipal cooperation in the institutional environment of the provision of Russian school services. Second, since the interviewees are considered experts, they became a source of relevant information on the legal possibilities for inter-municipal cooperation in the provision of school services, the involvement of municipalities and regions in decision-making regarding cooperation, the political and economic limitations of FOCJs of type II, the service-specific conditions in Russia, the budget opportunities of the municipalities and regions for establishing such cooperation, etc. The relations between municipalities of different levels and municipalities and region with respect to school services, using one region as an example, are investigated as well. Another aim was to verify the microeconomic models represented in Chapter 2 and adjust them with respect to the conditions of the country and the sector.

For these purposes, the Voronezh region of the Russian Federation was selected to conduct interviews and gain necessary information. This region has sociodemographic problems that exist throughout Russia. In the Voronezh region during the decade from 2005–2015, 245 schools were closed (reduction in the number of schools from 1075 to 830), and 327 of the 830 schools (i.e. one-third of them) are small-sized schools (see Figure 66). This reflects the demographic problems of the decreasing population, with the number of pupils enrolled in schools declining by an average of 37.3% in the Voronezh region from 2000 to 2010 (compared with 33.6% in Russia as a whole); this number only started increasing in 2014 in the Voronezh region. However, considering that the birth rate in the region grew insignificantly and even dropped in 2016 (see Figure 65), which corresponds to the country's trend in birth rate (see Figure 3 in Introduction), the school enrolment rate will not change much in the Voronezh region and in Russia as a whole. At the same time, education and school education expenditures are increasing in current, but not fixed, prices (see Figure 64).

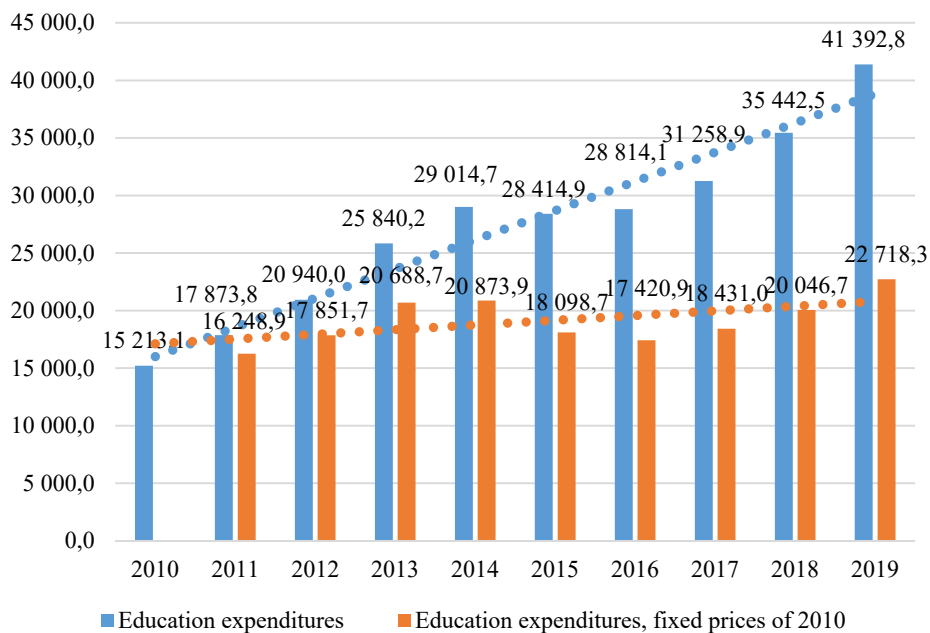


Figure 64. Education expenditures of the Voronezh region in 2010–2019, million roubles
 Source: Compiled by the author based on *Pocmam* 2020.

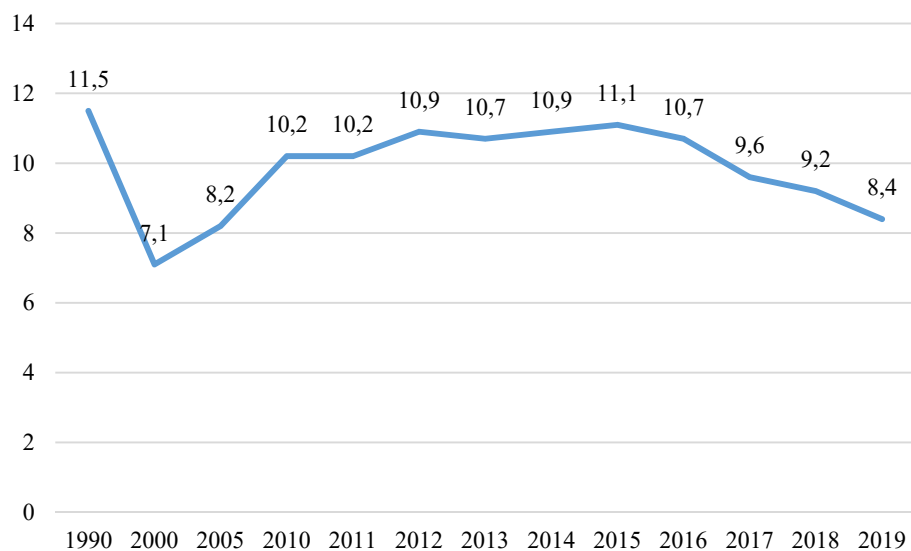


Figure 65. Birth rate (per 1000 population) in the Voronezh region, 1990–2019
 Source: Compiled by the author based on *Pocmam* 2017, 2018, 2019, 2020.

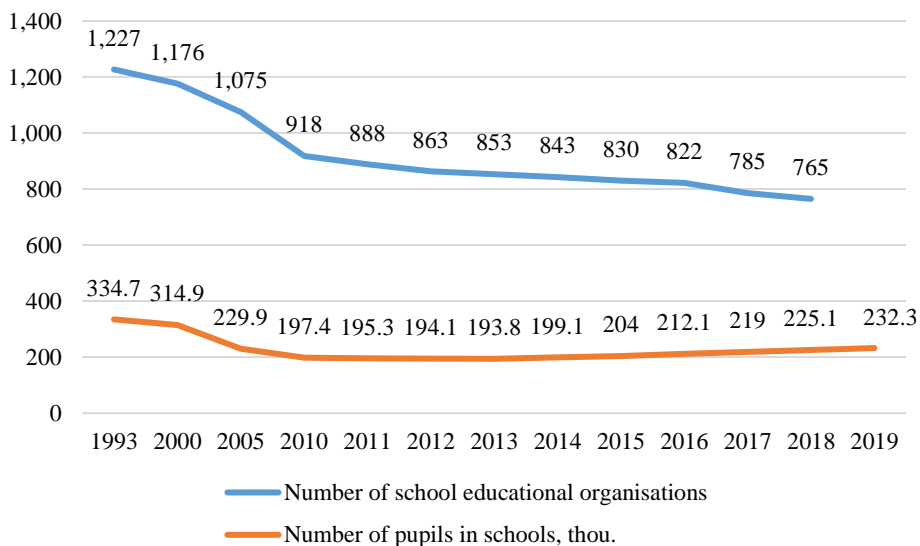


Figure 66. Overall number of school education organisations (primary, basic, secondary) and number of enrolled pupils (thou. people) in the Voronezh region (beginning of academic year)

Source: Compiled by the author based on *Росстат* 2017, 2018, 2019, 2020.

According to the Act of the Voronezh region “On administrative and territorial organisation of the Voronezh region”⁵³, the Voronezh region includes the following municipal units:

- three urban districts (Borisoglebskiy, Voronezh, Novovoronezh)
 - 31 municipal areas, including 28 urban settlements and 418 rural settlements
- Among these 34 municipalities, Khokholsky and Liskinsky municipal areas have been selected for the interviews because they have decreasing populations and can be described as rural (Russian State Statistics Service, official web-pages of Khokholsky and Liskinsky municipal areas). Interviews were conducted with authorities in local areas where schools are small and the process of school reorganisation and school network optimisation has recently taken place. Moreover, the institutional structure of municipal-regional subordination is unified in Russia and regulated by Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation” and with respect to school services administration by Federal Act No. 273 “On Education in the Russian Federation”.

Interviews were conducted within a two-month period from October to November 2017. Interviewees from Khokholsky and Liskinsky municipal areas were asked the same questions. Each interview group has their list of questions;

⁵³ Закон Воронежской области от 27.10.2006 № 87-ОЗ (ред. от 06.07.2017) «Об административно-территориальном устройстве Воронежской области».

however, the questions overlap between groups (see Annex 2). Most interviewees asked to see the questions prior to their interview; therefore, all interviewee participants were provided with the question lists in advance. Additionally, the official webpages of schools and education departments in the municipalities and region were studied before the interviews took place so that the author could collect preliminary information and gain an understanding regarding subordination and the tasks of particular people in educational departments.

The data were collected based on face-to-face, semi-structured, in-depth interviews with follow-up questions (Adams 2015; Galletta 2013; Fontana, Frey 2000; Oltmann 2016). The interviews took place in the offices of school directors and heads of regional and municipal department of education and with parents at schools.

Generally, the author has distinguished five main groups of interviewees because they are expected to be the main decision-makers in the Russian school system (see Annex 3):

- 1) representatives of parents at schools
- 2) school directors
- 3) heads of rural and urban settlements (lower rank municipalities)
- 4) heads of education department in municipal areas (higher rank municipality)
- 5) regional authorities responsible for school education development, education financing and municipal relations

The total number of interviewees is 18. The number of participants in each of the five groups (school directors; heads of education department in municipal areas (higher rank municipality); heads of rural and urban settlements (lower rank municipalities); representatives of parents' bodies at schools; regional authorities responsible for school education development, education financing and municipal relations) averaged at three. The sample is considered sufficient since the interview aims do not require the compilation of a sample for statistical analysis, but rather the use of these data for qualitative research.

Permission to record audio was asked at the beginning of each interview. Of the 18 interviews, 11 were recorded and transcribed with the help of the oTranscribe online service by the author of the thesis. The other seven interviews were analysed using hand-written notes because the participants did not give permission to be recorded. Interviews lasted between 20 and 70 minutes. Each interview began with a self-introduction of the interviewer and an explanation of the research objectives (see Annex 2). At the end of the interviews, each respondent was thanked and asked about the opportunity to be contacted again if there was a need to clarify any questions.

Among 18 interviewees, five were school directors in budgetary and state (kazennyi) establishment legal forms of schools, three were heads of rural settlements, two were Heads of Education Departments of the Khokholsky and Liskinsky municipal areas of the Voronezh region. Additionally, the author interviewed a consultant of the Department for Licensing, Supervision and Confirmation of Documents of the Department of Education of the Voronezh

region, a specialist of the pre-university education department of Voronezh State University, the chief specialist of the Voronezh Institute of Education Development, an advisor of the General Education Provision Office of the Department of Education, Science and Youth Policy of the Voronezh region, the Deputy Head of the Department of Education, Science and Youth Policy of the Voronezh region and the Head of the Office for Interaction with Municipalities of the Department for the Development of Municipalities of the Voronezh region and two interviewees were members of a parents' committee (see Annex 3).

The possible limitations are that the responses of authorities might be biased since they may want to show that they fulfil their tasks according to law and place themselves in a more favourable light. However, the principle aim of the interviews was not to identify the respondents' opinion regarding certain issues, but rather to understand how school service provision is legally and practically organised in Russia.

Interview questions have been categorised as follows (see Annex 2):

- **general issues** (see questions to school directors 1–7; questions to heads of municipal areas 1–11; questions to heads of rural settlements 1–9; questions to parents' bodies in schools 1–9; questions to the Advisor of General Education Provision Office 1–4, 13, 18, 20–21, 26; questions to the Deputy Head of the Department of Education, Science and Youth Policy of the Voronezh Region 1, 10, 12–16, 18)
- **legal issues** (see questions to school directors 8–9; questions to heads of municipal areas 22–23; questions to heads of rural settlements 10–12; questions to the Advisor of General Education Provision Office 5–6; questions to the Deputy Head of the Department of Education, Science and Youth Policy of the Voronezh Region 4)
- **financial issues** (see questions to school directors 10–13; questions to heads of municipal areas 24–28; questions to heads of rural settlements 13–17; questions to the Advisor of General Education Provision Office 7–12; questions to the Deputy Head of the Department of Education, Science and Youth Policy of the Voronezh Region 2–3, 5–6, 11)
- **issues related to teachers** (see questions to school directors 14–18; questions to heads of municipal areas 12–15)
- **issues related to school management** (see questions to school directors 19–25; questions to heads of municipal areas 16–21; questions to the Advisor of General Education Provision Office 14–17, 19, 22–25; questions to the Deputy Head of the Department of Education, Science and Youth Policy of the Voronezh Region 7–9, 17)
- **issues related to inter-municipal cooperation** (see questions to heads of municipal areas 29–30; questions to heads of rural settlements 18–20; questions to the Advisor of General Education Provision Office 27; questions to the Department of Municipal development of the Voronezh region 1–8)
- **concluding questions requiring FOCJ explanation** (see questions to school directors 26–29; questions to heads of municipal areas 31–38; ques-

tions to heads of rural settlements 21–28; questions to the Advisor of General Education Provision Office 28–34; questions to the Deputy Head of the Department of Education, Science and Youth Policy of the Voronezh Region 19–26)

For both streamlines of interviews in Russia and in Germany, interview questions are designed based on the main characteristics of FOCJs of type II obtained from the literature analysis (Chapter 1) and the basic theoretical microeconomic models developed in Chapter 2. Interview answers, in turn, have again affected the chapters of the thesis, such as Chapter 2 where amendments to the models have been included and subchapter 3.4 where the exemplary school FOCJ of type II Statute and Memorandum is developed (see Figure 67). Therefore, the methodology developed assists in contributing to the literature devoted to the FOCJ concept.

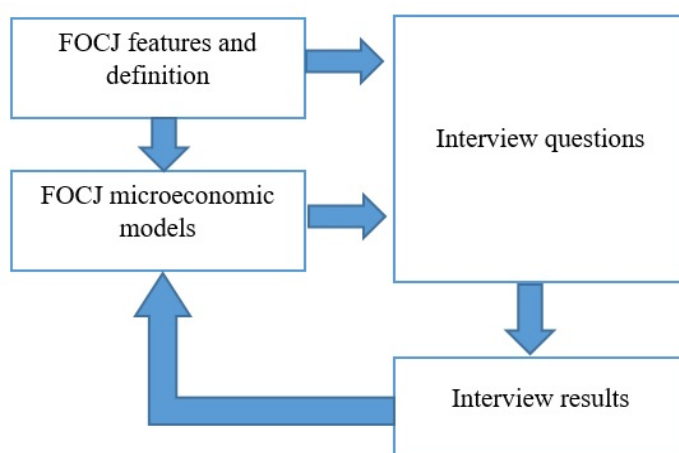


Figure 67. Design of the interview questions
Source: Compiled by the author.

Interview answers have been translated from Russian into English and systematised with respect to the groups of interviewees and categories of questions so that answers between groups can be compared (see Annex 4). In total, the author received the following answers:

1. General issues include answers from 1–10.
2. Questions related to school management and administration include answers from 11–21.
3. Questions related to teachers include answers from 22–27.
4. Questions related to parents include answers from 28–29.
5. Legal aspects include answers from 30–31.
6. Financial aspects include answers from 32–40.
7. Questions related to cooperation include answers from 41–45.

Content analysis is implemented to analyse all of the interview answers (Hsieh, Shannon 2005; Mayring 2014). However, the author discusses only the most important interview topics with respect to FOCJs of type II. Table 16 shows the relevant features and characteristics of FOCJs included in the rows. They were received from the literature analysis in Chapter 1 and from the analysis of FOCJ management behaviour in Chapter 2. In the columns, the author has included three groups of interviews which provided deeper insights into the questions and can therefore be called the “main decision-makers in the provision of Russian school services”. In Table 16, ‘X’ means that the information related to a particular FOCJ of type II feature was discovered during interviews with one or several groups of interviewees.

The text which follows Table 16 explains this Table in detail with reference to the interviewees’ answers as a direct citation from their speech (see Annex 4). In fact, the author is looking for special characteristics of FOCJs of type II in the replies.

Table 16. Relevant features and characteristics of FOCJs of type II discovered from the interviews

FOCJ of type II relevant features	School directors	Heads of education department in municipal areas	Regional authorities responsible for school education
Jurisdictions perform different functions (e.g. school services)	X	X	X
Several school FOCJs of type II overlap in the same municipal area	X	X	X
Competition between FOCJs of type II for members (municipalities) and clients (parents and children)	X	X	X
Public aims of school education		X	X
Membership of more than one (several municipalities should be members of one FOCJ of type II)		X	
Decision-making bodies and democratic procedures of FOCJs of type II	X	X	
Published Statutes	X	X	
Levy fees and contributions: users pay for services	X		
Members and clients are free to enter and quit according to FOCJ Statutes	X	X	
Members have right to vote for FOCJ managers	X	X	X

FOCJ of type II relevant features	School directors	Heads of education department in municipal areas	Regional authorities responsible for school education
Members influence decision-making bodies	X	X	
Municipalities may be asked to pay an equity capital (price) to enter FOCJs of type II	X	X	X
People with special well-grounded knowledge are needed	X		
Provision of services, such as school services, to clients (parents) and members	X	X	X
Private forms of companies should be applicable	X	X	X
Exploitation of economies of scale	X	X	X
Maximization of management utility	X		
Maximization of the utility of members		X	
Maximization of the utility of higher rank authorities			X
FOCJs of type II possess budget and financial conditions	X	X	X
FOCJs of type II possess production conditions	X	X	X
FOCJs of type II possess demand function which can be monopolistic as well as oligopolistic	X	X	
Self-financing of FOCJs of type II	X	X	X
Special restrictions related to inputs and outputs (e.g. employment cones, regional mobility of staff and transportation requirements)	X	X	X
Relations between municipal, regional and federal authorities with respect to schools		X	X
Locations with respect to school levels (primary, basic, secondary)			X
Demand risks and development, changes in factor prices, changes in techniques and quality of school subjects	X	X	

Source: Compiled by the author based on Chebotareva 2018.

The focus of the thesis is the **school services**. This sphere is regulated in Russia by Federal Act No. 273 “On Education in the Russian Federation”. The specificities of these services have been discussed with all groups of interviewees.

Functional jurisdictions **overlap and compete** with one another for clients and members. Similarly, schools in Russia compete for pupils and financing. The competitiveness of schools is confirmed through the interviews. All groups agree that there is competition between schools (see Annex 4, answer 8: “...we compete for a better position in school rankings with other schools in the Khokholsky municipal area...”).

Membership of other members (i.e. individuals and legal persons) in school services relates to the fact that teaching services can be provided from outside the school by individuals with special education and that such services are not restricted by the internal pool of teaching capabilities of the school (see Annex 4, answer 26: “*Since we don’t have it in our Statute, we cannot purchase educational services from outside...*” – school director. “*The teacher can work part-time in another general educational organisation. In this case, a civil law contract is needed...*” – representative of the regional educational department). At the same time, two conditions must be fulfilled. First, an FOCJ of type II Statute should state that a third party may provide services to schools included in the FOCJ of type II and, secondly, a civil contract must be signed between the FOCJ of type II and a legal or physical person to provide such services.

Membership of more than one municipality (several municipalities should be members of the FOCJ of type II). So far, schools belong to the municipality in which they are established (see Annex 4, answer 31: “*Since schools are currently in the legal form of state and municipal establishments, only one municipality can be a founder (Article 123.21 CC)*” – representative from the educational Department in the region).

FOCJs are usually created to achieve a better quality of education by means of employing **higher qualified personnel** and implementing new educational programmes and techniques. These all are related to the aims for which the school FOCJ of type II is created and the purposes FOCJ management is going to reach. The interviewees have provided the author with an explanation which purposes Russian schools pursue (see Annex 4, answer 3: “*The main task of the educational management body is organising in all educational institutions a high-quality level of free publicly available education. The quality of education is a priority.*” – head of educational department in a municipal area).

FOCJs of type II can **levy fees** if its Statute allows this. Today, education in Russian municipal and state schools is free of charge for parents, all expenses related to teaching are covered from the budgets of the regions and maintenance expenses by municipalities (see Annex 4, answer 34: “*Municipal schools do not charge parents, only payments for meals and personal initiatives of parents and voluntary donations, sponsorship...*” – school director). Therefore, the financial burden after the implementation of an FOCJ of type II will stay with regions and municipalities as members. Fees can be charged from parents only if it is a school of a private legal form of establishment.

One of the most important FOCJ features is that FOCJ of type II members (municipalities) and clients (parents with their children) are **free to enter and leave** school functional jurisdictions (see Annex 4, answer 8: “...*the choice of school is the right of parents. A child is enrolled in the place of residence. If there are vacant places, a child can study in another school...*” – head of educational department in a municipal area).

School FOCJs of type II may exist in the **monopolistic or oligopolistic** market. This feature relates to who is allowed to consume services from the FOCJ. As it has been learnt from the interviews, children from other municipalities can also consume school services from the municipality in which the school is located (see Annex 4, answer 8: “...*and we have some children from neighbouring settlements...*” – school director).

Usually FOCJ of type II members have some **voting rights**, such as voting for managers. Currently in Russian schools, managers – directors – are usually appointed by the school founder (municipality). This is confirmed by all interviewee groups (see Annex 4, answer 17: “*The director is appointed by the founder, municipality. There are particular requirements to the education, work experience, etc. Usually a new director is chosen from the staff members*”).

Decision-making bodies for schools are educational departments in municipalities, a sole executive body (director) and collegiate bodies in schools (see Annex 4, answer 18: “*The governing council is the most important body, it is the collegial body, combining parents, teachers, children, representatives from the village community and from the founder*” – school director). Parents must be influential since “*they are a part of a Governing Council at school and approve many decisions...*” (school director) (see Annex 4, answer 20).

School directors perceive the role of parents as very important, which is the opposite to the heads of education departments in municipalities (see Annex 4, answer 20: “*The role of parents is additional, supporting...*” – heads of educational departments), but they all agree that “*parents do not influence the election of the school director, since there are special requirements for the director position.*” However, “*parents influence through the Governing council; together with them, we approve the programme of school development, but not the educational programme*” – director of kazennyi general education school.

Educational organisations function based on a **Statute**. The Statute of the educational organisation should contain the following information (Federal Act No. 273 “On Education in the Russian Federation”, Article 25):

- 1) the type of educational organisation
- 2) the founder or founders of the educational organisation
- 3) types of educational programmes implemented, indicating the level of education and (or) orientation
- 4) the structure and competence of the management bodies of the educational organisation, the procedure for their formation and terms of office

Municipalities as founders and members may be asked **to pay an equity capital** to enter an FOCJ of type II (see Annex 4, answer 15: “*The founder of schools (municipality) is a property owner. Schools acquire the right of operative*”

management of schools' property" (CC Article 123.21). The most appropriate legal form of an association as an FOCJ of type II implies that members are obliged to participate in property formation (CC Article 123.11).

People with special **well-grounded knowledge** are needed for school FOCJs of type II. Nowadays, the requirements for teachers' qualifications are imposed by Order of Ministry of Healthcare and Social Development of the Russian Federation No. 761H "On the approval of a unified job evaluation manual for managers, experts and clerks", Section "Qualification characteristics of employees in education", subsection 2 "Positions of teaching employees" (see Annex 4, answer 22: "*Higher or professional vocational education in education or pedagogy or in the sphere of a teaching subject without requirements for work experience or higher or professional vocational education and additional professional education with respect to the specialisation of the educational organisation without requirements for work experience*").

For the school FOCJ of type II, **private legal forms** of companies must be applicable. Establishing schools also restricts private legal forms to non-commercial ones (see Annex 4, answer 31: "*Any non-commercial form can provide educational services, but it must meet the licensing requirements of the Federal Service for Supervision of Education and obtain accreditation; only in this case can educational activities be conducted*" – head of education department in municipal area). At the same time, the head of the regional educational department in the Voronezh region noted "*...the organisational and legal form of schools in the Voronezh region: municipal budgetary general education establishment, municipal state (kazennyi) general educational establishment and private general education organisations*" (see Annex 4, answer 31), which also coincides with how school directors answered this question.

Participation of several municipalities in an FOCJ of type II allows **economies of scale**. This effect is aimed to be realised in Russia through school districts created in municipalities (see Annex 4, answer 10: "*It was organised because not every school in the rural area has the necessary equipment to provide high quality services... accessibility of education for each student with rational use of material, technical, human and financial resources of educational institutions...*").

To solve the issues of small-sized schools, the network form of implementing educational programmes provides an opportunity for pupils to study educational programmes using the resources of several educational organisations (see Annex 4, answer 13: "*If a school is small, but the conditions for equipment and infrastructure should be created the same as in all large schools, a networking system with large basic schools is organised. For this purpose, there are school buses (transportation of children for laboratory work in physics and chemistry, the work of scientific societies for gifted children, joint seminars and pedagogical councils are organised*" – head of educational department in municipality).

Concerning the **utility of regional authorities**, the interview reveals that they would prefer the idea of more centralisation instead of a further decent-

ralised school system (see Annex 4, answer 45: *“We already have distant forms of learning realised through networking for those schools that do not have enough equipment or qualified teachers or teachers for specific subjects. And to my mind, there is no sense incorporating a new level of public administration”* – representative from the regional educational department). However, for school management and the heads of educational departments in municipalities the idea of inter-municipal cooperation in school service provision has found support (see Annex 4, answer 45: *“Yes, it could be a solution for small-sized schools...”* – school director. *“It would be an interesting result of cooperation if one municipality is offered the resources it does not have...”* – head of educational department in the municipal area).

Schools in Russia, similar to FOCJs of type II have their own **budgets**. School directors being the main managers administer the budget (see Annex 4, answer 36: *“The director develops the school budget. I include expenses that must be covered. I consider the previous year’s expenses, the number of children and what I plan to do next year or repair next year...”* – school director. *“The school manages its budget. Centralised or decentralised accounting service estimates the school costs”* – regional educational department).

FOCJs of type II imply **self-financing**, which means that FOCJs of type II must cover the costs of schools. As members are municipalities, their obligation is to finance school FOCJs of type II. Municipalities in Russia finance school education organisations through taxes (see Annex 4, answer 32: *“...building maintenance costs and utility costs are paid from local budgets...”*) and regional budgets’ payments (*“...for the realisation of school education programmes, municipalities allocate subventions from regional budgets, including labour costs, costs of textbooks, equipment for teaching aims... The number of subventions for each municipality is calculated based on the number of students and norms according to types of educational programme and levels of study. Subvention can be increased by the integrated coefficient in the case of victory in competition and high results based on the results of the regional ranking of schools...”* – head of educational department in the municipal area). Additionally, *“the delivery of children for lessons to schools and back is at the expense of the municipality... The maintenance of school buses is the responsibility of the municipality”* – head of municipal educational department (see Annex 4, answer 37).

For the FOCJs of type II, important information includes the sources from which **participation fees** and **equity capital** are allowed to be paid according to the Statute. Therefore, municipalities may pay an equity capital (price) and cover school costs from other sources as well (see Annex 4, answer 32: *“educational institutions are entitled to raise additional financial resources through the provision of paid additional services and other services as well as through voluntary donations and earmarked contributions from private and legal persons”* – head of municipal educational department).

Schools can gain additional financing by competing for **grants** (see Annex 4, answer 32: “...*additionally, via participation in federal and regional programmes, we may receive grants...*” – school director).

Special **transportation requirements** for pupils put restrictions on output (see Annex 4, answer 14: “*According to paragraph 2.5 of Section II "Requirements for the placement of general education organizations", for the transportation of students of general education organisations in rural areas to general education organisations and back, the travel time should not exceed 30 minutes one way*” – regional representative). There are also **special requirements for employees** in the educational sector, in particular, for teachers (see Annex 4, answer 22: “*Pedagogical higher or vocational education, teacher category: first, highest or adequacy for the position. It's difficult to receive the first or highest category since they get an additional 20 or 40% payment*” – school director).

Relations between municipal, regional and federal authorities with respect to schools are defined by “*Legal Act, Art. 7, 8, 9 "On Education in the Russian Federation", there are powers of the Federation, there are powers of the subject of the Russian Federation – this is the Voronezh region and there are powers of local self-government bodies carried out in the sphere of education, all powers are delimited by the law.*” (“*The powers of the Russian Federation in the sphere of education transferred for implementation to the state authorities of the subjects of the Russian Federation*” – regional educational department representative) (see Annex 4, answer 11).

Locations with respect to school level (primary, basic, secondary) influence FOCJ decisions whether all three stages must be together or can be split up (see Annex 4, answer 7: “*It's historically defined and also depends on the demographic situation how many children of particular ages live in this or that municipality...*” – representative from the regional educational department).

The labour factor price (teacher salary) depends on “*how many teaching hours they have, the category, additional payments for their achievements, bonuses for the combination of several positions*” – school director) (see Annex 4, answer 24). The **quality conditions of subjects** are guaranteed by the FSES (see Annex 4, answer 4: “*We implement the Federal State Educational Standards to develop our programme. New standards allow us to have specialisation in different subjects in our school*” – school director).

The author makes several important conclusions from the interviews. First, cooperation between municipalities in school service provision has not been identified. However, cooperation among schools is evident. For example, within one municipality, school districts with basic schools as technological and resource centres can be established.

Second, lower rank municipalities (urban and rural settlements) are not responsible for schools, only higher rank municipalities (municipal area and urban districts) can be members and founders of school FOCJs of type II in Russia.

Third, there are three groups of interviewees that are considered the main decision-makers of the provision of Russian school services. Among them are school directors, heads of educational departments in municipalities and educational authorities in regions. They provided deeper insights with respect to the research problems addressed in the thesis. The opinions of parents and heads of rural and urban areas are of a recommendatory character: they gave a more general understanding of their roles and tasks in the administration of the school education process. This result is also confirmed by the document analysis of the Federal Acts and Regional Regulations on education.

Fourth, Federal Act No. 273 “On Education in the Russian Federation” has delimited powers between the Federation, regions and municipalities in the questions related to general education. For example, school founders – education departments in municipalities – decide on school establishment, reorganisation and liquidation, and regional authorities in education influence schools via regional subsidies for covering schools’ variable costs. Moreover, educational expenses (labour costs, textbooks, equipment, etc.) are covered from regional budgets based on per capita financing, while building and territory maintenance are funded from the municipal budget. Private schools, similar to municipal ones, can apply for regional subsidies. However, maintenance costs must be covered by the founders of private schools. Schools may apply for many federal and regional grants and programmes aimed at general educational organisations.

Fifth, there are two legal forms of municipal schools in Russia: state (*kazennoe*) municipal establishment and budgetary municipal establishment and one private form – private educational establishments. Other non-commercial legal forms can be involved as well.

Six, parents are free to choose any school, even in neighbouring municipalities; therefore, schools compete with one another for children, funding and sometimes even teachers.

Seventh, schools have sole and collegiate internal self-administrated structures. The sole managerial body is a director who is appointed by the founder (educational department in municipality). Governing councils are collegiate bodies at schools.

An interview with *Bodensee* water provision association

Bodensee water provision association (*Bodensee Zweckverband*) is one of the biggest examples of inter-municipal cooperation in public service provision in *Baden-Württemberg*, Germany. It combines 147 municipalities, which means that *Bodensee Wasserversorgung* belongs to the FOCJ of type II with municipalities as members.

The aim of the interview was to gather information about the financial, organisational and juridical aspects of public service provision in the form of *Zweckverband*, which is in fact an FOCJ of type II inter-municipal cooperation.

This information is necessary to prepare recommendations (Statute and Memorandum) on how to establish FOCJs of type II in Russia.

Germany is one of the few countries where FOCJ of type II inter-municipal cooperation has been functioning in practice for a long time, and a special legal form of *Zweckverband* has been introduced for this purpose. Therefore, another aim was to learn from the experience of the country in which FOCJs of type II successfully exist and find out the important provisions to consider from the management point of view, the provisions the Statute and other internal documents should include, the main legal acts related to its work, how costs are covered and decisions made, the responsibilities of management bodies, etc. This explains the choice of the interviewee, who is the Deputy Financial Director of *Bodensee* water provision association.

For a qualitative analysis, the number of interviewees is sufficient if an expert is competent to answer all of the questions. This is the case here; however, the results of this interview have some limitations related to sector specificity, which is different to that which is investigated in the thesis.

The interview took place on 23 July 2018 in the *Bodensee Zweckverband* office in Stuttgart, Germany, and lasted over one hour. It has been recorded and translated from German into English with the help of German native speakers and online translating platform DeepL.

The interview questions are listed in Annex 5 of the thesis and consist of 22 items. They were compiled based on the main characteristics of FOCJs of type II obtained from the literature analysis in Chapter 1 and the basic theoretical microeconomic models developed in Chapter 2, similar to the interviews in Russia (see Figure 65). The author prepared questions in English and sent to the interviewee both English and German translated versions before the interview started (see Annex 5).

Interview answers are grouped in Annex 6. A number of useful conclusions can be made from this interview. For example, the interview revealed that municipalities, in order to cooperate, rely on the law on inter-municipal cooperation in Germany (*Gesetz über kommunale Zusammenarbeit*), and this legal act has references to other laws, including a special purpose associations law for *Baden-Württemberg* (the *Gemeindeordnung für Baden-Württemberg*) (see Annex 6, answer 4). This is different from Russia, where the legal basis for inter-municipal cooperation is not sufficiently developed at the federal as well as regional level.

The reason *Zweckverband* is a good legal form, according to the interviewee, is that it has a non-profit status, which means that the *Bodensee* association has no right to make a profit and this is marked in the Statute (see Annex 6, answer 7). This provision is in line with the cost coverage rule of the model of current operation in Chapter 2 and also reflected in the exemplary Statute for the school FOCJ of type II association for Russia.

All members of *Bodensee* water provision association follow the *principle of solidarity*, which means that they pay the same water rate as an annual fee (see Annex 6, answer 9: "*Sipplingen, which is directly at the source, pays the same*

water price as, for example, the municipality of Bad Mergentheim, which is located 200 kilometres further north”). This price is fixed to cover costs; therefore, no profit is expected.

The supreme body is an Association Assembly where all members are represented and meet once per year. In the decision-making process, the number of votes is distributed proportionally to the number of quotas of water (see Annex 6, answer 9: “Another special feature is that we have three groups of members. In group 1, for example, all members are involved with more than 1000 litres/second (“second litres”). There is only the city of Stuttgart in it. This means that the city of Stuttgart has 33% of the votes”). The decision is made by the qualified majority of votes of 75 percent. This or a similar voting process should also be defined by the FOCJ of type II Statute.

Additionally, there are other “committees under this association meeting. There is a personnel committee in which personnel matters are discussed...” (see Annex 6, answer 14). The Association Assembly approves an annual business plan (see Annex 6, answer 43: “in the business plan for the coming business year, all of the costs of the individual municipalities are included ...and this business plan is approved by 183 members”), an assets plan (investment plan) and other plans and documents of the association (see Annex 6, answer 27: “For the next years, we have investment sums between 22 and 27 million (in the business plan) per year and for the current operation we have between 75 and 80 million in budgets”).

Management is elected at Association Assembly meetings. Managing directors can decide whether they want to be public or private servants (see Annex 6, answer 20: “...here in Stuttgart, it can also be quite different. We have a second large special purpose association, the Landeswasserversorgung, which also supplies the city of Stuttgart. They still have a lot of public servants there”). This provision can be relevant for Russia, too, meaning that FOCJ of type II employees must not necessarily be public servants.

The question regarding *Bodensee* water provision association’s participation fee and equity capital formation is especially relevant. Members must contribute equity capital. Equity capital is tied to the participation quota; the shares of participation are exclusively linked to water quantities (see Annex 6, answer 32: “The water supply that the individual members have is based on this participation rate. The participation rate is based on litre per second”). The members can trade shares neither on a market nor among themselves. Here, it is important not how much a member consumes, but how much water members estimate they need in joining the *Zweckverband*. When new members join, or an existing member grows, they increase their participation quotas, which means more litres per second. However, because other communities financed for a longer time, there is a surcharge (for new members) to this capital. In addition to the 21,000 euros per 1 litre/second, there is another 16,000 euros to cover what others have already pre-financed (see Annex 6, answer 36).

It is also important to set out in the Statute what kind of competences the management, the Assembly of Members and different committees with the

Assembly of Members have (see Annex 6, answer 46: “*For example, management may decide on resolutions up to €250,000 alone. Everything over it then needs different committees’ confirmation. For example, we have a construction and procurement committee, then we have the Board of Directors and all investments over €1,000,000 are decided at the association meeting. The management decides on day-to-day business – for everything that goes beyond day-to-day business, there are various responsible committees. This is laid down in the Statute*”).

The association does not get grants from the EU or the Federation (see Annex 6, answer 39: “*Zweckverbände here in Baden-Württemberg does not receive any subsidies according to the current water law*”). However, at the same time, they do not have to pay some taxes for functioning under public law and not distributing profit among their members (see Annex 6, answer 51: “*As we have no profit-making intentions, we generally do not have to pay at least corporation tax and trade tax... The Zweckverband is taxed as a corporation under public law*”).

If additional services (usually complemented services) are provided by the school FOCJ of type II, for example, educational consultation or seminars or technical support, it should also be set out in the Statute (see Annex 6, answers 52, 53: “*It is also the case that we offer water services in addition to actual water. It is set out in our Statute... we offer services and specialists to solve technical problems. We provide operating engineers to the member municipalities*”).

The interviewee points to the advantages and disadvantages of joint public service provision (see Annex 6, answer 54: “*The biggest advantage of the Zweckverband for its members is the possibility that large, strong communities support smaller communities. For small communities, their own water supply would become much more expensive than the supply via Zweckverband... The decision-making process is slow. However, this is also the case for private corporations...*”).

Water provision association *Bodensee* introduces a two-part tariff as members’ regular payments (see Annex 6, answer 55: “*The price paid by members is made up of two elements. For their ‘participation quota’, members pay a basic price for the possible water supply. For the amount of water actually drawn, they pay a water price that depends on the amount of water drawn*”). A two-part tariff can also be introduced in school FOCJs of type II (see sub-chapter 3.4 Statute provisions related to membership fees).

The element of competition always exists, according to the interviewee, since municipalities themselves may provide water (see Annex 6, answer 57: “*Possible competitors are in particular the members themselves. Therefore, the Zweckverband must keep the water price low enough. If the self-supply becomes cheaper due to technical progress, members could supply themselves, e.g. from river water*”). There is also another Zweckverband, ‘*Landeswasserversorgung*’, which is a strong competitor for *Bodensee* water provision association.

3.4. Discussion of empirical results, recommendations for introducing school FOCJs in Russia: FOCJ Statute and Memorandum

In subchapter 2.3, the author introduced special conditions with respect to labour, materials, fixed capital, output, etc. to analyse how management react to these conditions and which decisions are consequently made. However, those decisions of management that are not preferable by FOCJ of type II members can be excluded via stipulations in the establishment documents of FOCJs of type II. Therefore, the current subchapter demonstrates how the solutions of theoretical modelling resulting from unfavourable management behaviour can, in practice, be avoided by translating economic categories into legal language. For example, upper-rank FOCJ bodies or higher ranking jurisdictions may set out some variables, such as credits, on a particular level. FOCJ members should be able to influence executive bodies to pursue public goals through requirements concerning qualities and quantities of output and the fulfilment of the cost coverage rule. On the other hand, FOCJ management should have enough freedom in decision-making to create inter-municipal cooperation that is attractive for current and potential member municipalities. For all of these and other aspects, establishment documents are especially necessary.

Additionally, the author invokes the outcomes of the interviews described (in subchapter 3.3) and the analysis of the legal forms that are suitable for the inter-municipal cooperation of FOCJs of type II in Russia (subchapter 3.2) to change unfavourable management decisions into desired ones. Therefore, the author has prepared an exemplary Statute and Memorandum in this subchapter, which is not the only way to ‘correct’ management actions. There are other ways which are not discussed in this thesis, such as special regional policy, regional subsidisation, taxation, etc. However, by introducing a special legal framework like the Statute, unfavourable management behaviour can be excluded in the long run.

As discovered in subchapter 3.2⁵⁴, Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation” determines two commercial legal forms – non-public joint stock company and limited liability company (Article 68), and two non-commercial – autonomous non-commercial organisations and funds (Article 69), which are appropriate for the cooperation of municipalities in Russia. Since the FOCJ of type II is modelled for Russian school services, educational services can be provided only by non-commercial legal entities according to Federal Act No. 273 “On Education in the Russian Federation”, Article 22. However, according to the analysis conducted in subchapter 3.2, autonomous non-commercial organisations and funds are not suitable for FOCJs of type II since they do not assume membership of their founders, and then no participation fees can be collected for the current operation activity. Hence, in order to incorporate FOCJs of type

⁵⁴ See subchapter 3.2. Here, the results of subchapter 3.2 are shortly repeated.

II into the Russian legal system, a legal form of associations (unions) should be included in Article 69 of the Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation” as a possible legal form for municipalities to cooperate⁵⁵.

The activity of associations is regulated by the Civil Code of the Russian Federation and Federal Act No. 7 “On Non-commercial Organisations”. According to Article 14, § 1 of the latter, members of an association are required to compile a **Memorandum** (*учредительный договор*) of association and a **Statute** (*устав*) approved by them. In the Memorandum of association, the members undertake to establish a non-profit organisation, determine the procedure for joint activities to establish a non-profit organisation, the conditions for the transfer its property and participation in its activities and the conditions and procedure for the withdrawal of founders (participants) from its composition.

The recommended provisions that should be included in the Statute of a non-commercial organisation are described by the Ministry of Justice of the Russian Federation. In accordance with the Article 52 of the Civil Code of the Russian Federation, legal entities act on the basis of Statutes approved by their founders (members). The Statute of a non-commercial organisation approved by its founders (members) must contain information on:

- the name;
- the legal form;
- the location;
- the procedure for managing the activities of a non-commercial organisation; and
- the subject and purpose of the non-commercial organisation’s activity.

In addition to the information that all legal entities must include in their Statutes, non-commercial organisations in accordance with Federal Act No. 7 “On Non-commercial Organisations”, Article 14, should additionally include information regarding:

- the rights and obligations of the participants (members) of a non-commercial organisation;
- the terms and procedure for the admission and withdrawal (for corporate non-commercial organizations) of members (members);
- the sources of property formation;
- the procedure for making amendments to the Statute;
- the procedure for the use of property in the case of liquidation;
- non-commercial organisation symbols: description of emblems, coats of arms, other heraldic signs, flags and anthems (if used); and

⁵⁵ In practice, Russian municipalities already cooperate in the legal form of associations and unions, such as, for example, the Association of Siberian and Far Eastern Cities of Russia, the Union of the Russian Science Cities’ Development and the Association of Small and Medium-sized Cities of Russia, etc. However, the author noticed gaps in the legal system of the Russian Federation. Thus, it is suggested to amend the Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation” by considering other legal forms for inter-municipal cooperation of Russian municipalities.

- the structure, competence, formation procedure and terms of office of the governing bodies and the procedure for making decisions and acting on behalf of the organization.

The Statute of the association (union) must additionally contain information on the procedure for decision-making by the bodies of the association (union) on the issues that are decided unanimously or by a qualified majority of votes as well as on the property rights and obligations of the members of the association (union). The Statute of a non-profit organisation may contain other provisions that do not contradict the legislation of the Russian Federation.

As mentioned earlier in the text, the current subchapter combines the results received from the analysis of the theoretical models in Chapter 2, the empirical insights obtained from the interviews (subchapter 3.3) and the analysis of legal forms suitable for the Russian school FOCJs of type II (subchapter 3.2). Table 17, on the one hand, connects the results of legal investigations, interviews and management theory results with the features of FOCJs of type II and, on the other hand, points to the regulations and stipulations set out in the proposed Memorandum and Statute.

Table 17 shows the logic of the analysis and results reflected in the establishment documents for the FOCJ. In the columns of Table 17 are the features of FOCJs of type II which are necessary to consider in the establishment documents of FOCJs of type II. In the rows, the sources of these stipulations are reflected. The sign + means that the need to include, for example, information regarding the **name and legal form** has been obtained from the analysis of legal acts. Moreover, the importance of school **location** has been discussed during the interviews and also through the analysis of legal acts. How the **goals and subject of the activity of an FOCJ of type II**, stated in the Statute, define the behaviour of management is a result of theoretical analysis, legal act analysis and interviews. Additionally, Table 17 shows whether the stipulations, received from legal acts, interviews and/or theoretical modelling are considered in the Memorandum or in the Statute or in both. Particular paragraphs of the exemplary Statute and Memorandum, which contain these stipulations, are marked in Table 17 as well.

The general difference between Statute and Memorandum is that a Statute is more detailed; it contains guidelines on how the association should work, while a Memorandum expresses an initiative of parties to establish an association. Some provisions of the Statute and Memorandum overlap, as is shown in Table 17. However, others are specific to the Statute.

Layout of FOCJ of type II features in Memorandum and Statute

Members of the association must be marked both in the Statute in § 2.1 and the Memorandum in § 1.1. Sometimes, if there are different groups of members, such as full members and associated members or members awaiting the approval of their membership, it should also be marked in the establishment

documents along with the rights and obligations of different groups. Groups of members may differ by the quality of school services provided to them or by the range of services they are allowed to consume from the FOCJ of type II. This information should be defined by the FOCJ of type II Statute as well. The exemplary Statute provided below includes a list of municipalities that have the right to get services from the FOCJ of type II on the basis of membership. Special conditions for non-member municipalities are not assumed here. However, whether children from other municipalities can attend school FOCJs of type II affects the size of the output; therefore, it should be marked in the FOCJ of type II Statute. Otherwise, only children from member municipalities can get school services from the FOCJ of type II. Moreover, clarification of consumers in the Statute defines the market structure and demand function and influences solutions for an FOCJ of type II optimal plan.

Both the Statute and Memorandum contain the **goals and subject of activity**. The non-commercial nature of school educational activity sorts out profit maximisation as a goal of the school FOCJ of type II. Instead, educational goals prevail, which is reflected in the theoretical models of Chapter 2 by management utility maximisation, not profit. Additionally, the type of management FOCJ members desire can also be defined by the goals and tasks the FOCJ Statute contains so that unfavourable Cases III and IV of FOCJ management are simply excluded by paragraphs 1.1–1.2 and 4.1 of the FOCJ of type II Statute.

The Statute should include the **competencies of executive bodies**, such as the Chairman of the Association in § 13, the Association Council in § 14, the Supervisory Board in § 15 and the Parents' Board in § 16. The competencies of management bodies described in the Statute are necessary because they bind management activities to Cases I and II of management behaviour, avoiding Cases III and IV. The competencies of FOCJ of type II executive bodies reflect the basic management concept, which, in turn, shapes relations between FOCJ management and school directors and between management of different levels.

The **rights and obligations of members** are included in both the Statute and Memorandum. However, the Statute should elaborately describe them and the Memorandum may or may not contain them. In the example below, the rights and obligations of members are marked in § 5.1–5.2 of the Memorandum and § 5-6 of the Statute. Paragraphs of the Statute devoted to members in § 2 and the Assembly of Members in § 10 show how powerful they are in relation to executive bodies, the kinds of decisions they allow FOCJ of type II executive bodies to make and what the Assembly decides independently.

It is important to set out in the Statute the rule of the **entrance and annual membership fee payment** (§ 2.8–2.9) and the sources of their payment (§ 2.11). According to the information received from the interviews and legal act analysis, regional authorities in education finance labour costs and costs of materials related to the educational process, such as acquisition of textbooks. Municipalities are responsible for the maintenance of the buildings and structures of schools and the arrangement of adjacent territories. Therefore, a two-part tariff has been introduced in § 2.9 of the Statute.

Table 17. Provisions of the school FOCJ of type II exemplary Statute and Memorandum

		Statements that should be considered by the FOCJ of type II Memorandum and Statute										
	Name and legal form	Location	Goals and subject of activity	Tasks and fields of activity	Members, groups of members	Procedure for members' admission and exit	Rights (including property rights) and obligations of members	Entrance and annual membership and fee payment	Exclusion from members	Sources of equity capital formation	Non-commercial status (cost-covering principle)	
Sources of Information	Legal Acts on Associations in Russia	+	+	+	+	+	+	+	+	+	+	
	Interviews	+	+	+	+		+	+		+	+	
	Theoretical microeconomic analysis		+	+	+	+		+			+	
Considered in	Memorandum	§ 1.1	§ 1.3	§ 1.3	§ 1.1, 4.1-4.3	§ 4.4-4.5, 4.7-4.8, 4.12	§ 5.1-5.2	§ 7.3	§ 4.9-4.11	§ 3.1-3.2		
	Statute	§ 1.1	§ 1.1-1.2	§ 4.1	§ 2	§ 2.2, 2.6-2.12, 7.6	§ 5-6	§ 2.8-2.9, 7.5	§ 2.12	§ 7.3	§ 4.4, 7.7, 8	

Source: Compiled by the author.

Table 17. Continuation

		Statements that should be considered by the FOCJ of type II Memorandum and Statute									
		Competencies of the Assembly of Members	Competencies of the executive bodies	Procedure for the Assembly of Members formation and the terms of office	Procedure for the executive bodies' formation and the terms of office	Procedure for the decision-making of the FOCJ Assembly of Members	Procedure for the decision-making of FOCJ executive bodies	Procedure for reorganisation	Procedure for property distribution remaining after the liquidation	Subsidiaries and representative offices	Procedure for amending the Statute and Memorandum
Sources of Information	Legal Acts on Associations in Russia	+	+	+	+	+	+	+	+	+	+
	Interviews	+	+			+	+	+			
	Theoretical microeconomic analysis	+	+	+	+	+	+		+		
Considered in	Memorandum				§ 6.1-6.9				§ 3.9		§ 8
	Statute	§10.3	§13.5, 14.2, 15.10, 16.5, 17, 18,19	§11.1-11.2	§13.2-13.3, 14.1, 14.4, 15.2-15.7, 16.2, 16.6	§10.4-10.7, 11.1	§14.7-14.10, 15.11, 16.9-16.12	§ 21.1-21.3	§ 8.5, 21.9	§20	§22

Source: Compiled by the author.

The **tasks and fields of activity** must be stipulated in the Statute and Memorandum since this provision relates to the demand for the services of the FOCJ of type II. Whether an FOCJ of type II provides only primary educational services or basic or secondary (complete) education influences the demand size. Therefore, the tasks and fields of activity should be emphasised in the Statute as well. This is also required by law in Russia (Federal Act No. 273 “On Education in the Russian Federation”, Article 25).

Decisions made by the General Assembly of Members as well as executive bodies are based on the **procedure of decision-making** defined in the Statute for the Assembly (§ 10.4-10.7, 11.1) and for the executive bodies (§ 14.7-14.10, 15.11, 16.9-16.12). In the exemplary Statute, there are only two voting rules applicable depending on the subject of voting – simple majority and qualified majority of two-thirds. However, other rules can be stipulated in the Statute as well. Each member of the Assembly has a number of votes proportional to the statistical number of school-age children in municipalities, as is set out in § 11.1 (interviews with *Bodensee Zweckverband*, see Annex 6).

The number of votes members have in the General Assembly can be defined not only by the number of school-age pupils in municipalities, but also by the number of pupils belonging to different school levels (primary, basic and secondary general education), the number of taught hours, the share of municipalities in equity capital, the number of inhabitants in municipalities, etc. Here, the number of school-age pupils is a criterion, which means that number of votes is directly related to output (number of pupils).

Paragraph 2.3 of the Statute provides that the decisions on the schools included in the FOCJ of type II are transferred to the FOCJ of type II supreme and executive bodies. Municipalities alone cannot decide on school educational matters once they become members of an FOCJ of type II. Other responsibilities not related to schools remain in the sphere of municipalities’ decision-making. They are regulated by Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation”, Articles 14-16.

The provision of § 2.8 defines **the rule of entrance fee payment**. It says that if a new member municipality joins the Association, it must contribute to the FOCJ of type II’s property and pay an entrance fee, which is related to the statistical number of school-age pupils in said municipality. However, the municipalities that established the Association pay their share of property based on the results of the FOCJ of type II establishment model (see chapter 2).

In § 2.9, the **rule of annual membership fee** is explained. Municipalities pay a two-part tariff (referring to interviews with *Bodensee Zweckverband*, see Annex 6). The first part is a lump-sum fee related to the maintenance of the buildings and structures of schools that finances current fixed costs. The second part is related to those variable costs not covered by the regional subsidy for schools. This part is expressed by the formula $P = \frac{l*L + m*M - G}{X}$ according to the

optimal solution of the model of current operation with a non-negotiable grant in Chapter 2. *G/X* means per-pupil subsidies from the region.

If member municipalities get grants or any other financial support from the budgets at the federal or regional level concerning the activity of the schools included in the FOCJ of type II, they are obliged to transfer these grants to the Association. It is regulated by § 6.10 of the Statute to avoid the redirection of some targeted payments, which municipalities receive for schools, for the achievement of other purposes.

The Association is a subject of taxation and social insurance fee payment. This process is due to the obligations of the Association Chairman according to § 13.5 of the Association Statute.

After the **Association liquidation**, the property contribution of members must be returned to them in the share of their participation and used by municipalities for educational, cultural, social and other statutory purposes. However, if this is not possible, municipalities may use it for other purposes not prohibited by law. This provision of § 21.9 of the Statute emphasises the priority of the non-commercial goals of the Association and is therefore also included in § 8.5.

It is required by the Civil Code of Russia for an association to form a **supreme body** that is the General Assembly of Members and a sole executive body (the Chairman). Other executive bodies are optional. The exemplary Statute additionally includes the competences of the Association Council, the Supervisory Board and the Parents' Board. Decisions of the Parents' Board have an advisory character, but they can have an influence via the Supervisory Board since representatives from the Parents' Board attend the Supervisory Board meetings, too (see § 15.2). The Parents' Boards can be organised in each school separately or one Parents' Board for all schools included in the FOCJ of type II may function. In the latter case, parent representatives from each school participate the FOCJ Parents' Board.

The **internal organisational structure** of the Association can be visualised in Figure 68:

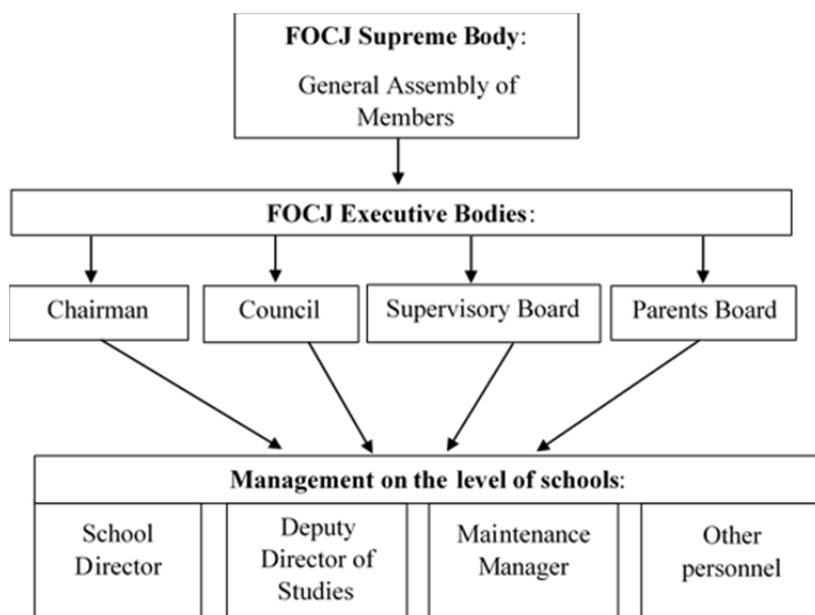


Figure 68. Organisational chart of the FOCJ of type II
Source: Compiled by the author.

In general, the management of schools included in the Association is conducted by FOCJ of type II executive bodies. However, there should be managers who solve everyday issues at the level of schools, as shown in Figure 68. Such managers are, for example, school directors, deputy directors of studies, persons responsible for the maintenance of buildings, etc. School directors might be appointed with the approval of the Chairman of the Association. If this is the case, this responsibility must be included in the list of the Chairman’s competences (§ 13.5).

The Statute includes paragraphs regarding **subsidiaries and representative offices** in § 20. However, these provisions are optional and are necessary only if, for example, they possess a unique teaching approach which can be adopted by schools in other territories.

Paragraph 2.3 of the Association Memorandum stipulates the **procedure for state registration** of the Association. The state registration of non-commercial organisations, including associations, is regulated by Article 13.1 of Federal Act No. 7 “On Non-commercial Organisations” and Federal Act No. 129 “On the state registration of legal entities and individual entrepreneurs”. Non-commercial organisations have a special registration regime, which means that the documents must first be submitted to the authorised body (Federal Registration Service) or its territorial bodies. The Federal Registration Service, in accordance with paragraph 8 of Article 13.1 of Federal Act No. 7 “On Non-Commercial Organisations”, within 14 working days, decides on registration (to

register or not) and then the tax authorities register an association in the Unified State Register of Legal Entities. The list of documents required to be delivered to the Federal Registration Service is set out in paragraph 5 of Federal Act No. 7 “On Non-commercial Organisations”. For the Association, the main documents are its Statute and Memorandum.

Next, the author delivers legal suggestions in the form of an exemplary Statute and Memorandum for a school FOCJ of type II in the Voronezh region in which her interviews took place in order to demonstrate how legal framework for FOCJs of type II can be created in practice. The interdisciplinarity of the thesis allows the consideration of the exemplary documents presented below as one of the thesis results, making it attractive for colleagues in jurisprudence, too.

Exemplary Memorandum of the Russian school FOCJ of type II in the legal form of Association

§ 1. General provisions

1.1. The members of the Association are the following legal entities⁵⁶ registered in accordance with the legislation of the Russian Federation:

- Khokholsky municipal area,
- Nizhnedevitsky municipal area,
- Repiyovsky municipal area,
- Ostrogozhsky municipal area,
- Liskinsky municipal area

hereinafter referred to as the “Members”, in accordance with the civil legislation of the Russian Federation, have entered into this Memorandum on the following:

The Members create a school association named “School Association in the southeast of the Voronezh region”, hereinafter referred to as the “Association”.

1.2. This association is registered as a legal entity by the body carrying out state registration⁵⁷, has a separate property right of ownership, has an independent balance sheet, accounts in banks, can acquire property and personal non-property rights in its own name, and can be a plaintiff and a defendant in court.

The Association carries out its activity in accordance with the Constitution of the Russian Federation, the Civil Code of the Russian Federation, the Federal Act No. 7 “On Non-Commercial Organizations”, the Federal Act No. 273 “On Education in the Russian Federation”, and other laws and regulations of the Russian Federation and the Voronezh region and its Statute.

⁵⁶ Neighbored municipalities.

⁵⁷ Based on Federal Act No. 129 “On state registration of legal entities and individual entrepreneurs”, Article 2.

1.3. The main objective of the Association's activity is a joint school service provision, in particular primary, basic and secondary educational services in accordance with the Federal Act No. 273 "On Education in the Russian Federation" and Federal State Educational Standards.

1.4. The Association is liable for its obligations with all its property. The Association is not liable for the obligations of its members.

1.5. Location of the Association: the city of Voronezh, _____ street, house_____.

1.6. The Association is established without limitation of the period of its activity.

§ 2. Statute of the Association, procedure of joint activity on creation of the Association

2.1. The Statute of the Association is the main legal act, which determines the order of organization of its activity, rights and obligations of its members, the order of the Association management, the order of reorganization and liquidation of the Association.

2.2. Compliance with the provisions of the Statute is mandatory for all members of the Association equally.

2.3. Performance of actions on state registration of the Memorandum and the Association Statute is entrusted to _____ who represents Khokholsky municipal area. Members are obliged to assist in registration of constituent documents by providing necessary information and issuing documents.

§ 3. The property of the Association

3.1. The Association owns and operates school buildings, structures, plots of land, sport facilities and equipment, inventory, monetary funds in roubles, and bonds.

3.2. The sources of formation of the Association's property in monetary and in-kind forms are:

- regular and lump-sum payments from the Members;
- voluntary property contributions and donations, including those with a specific purpose, for the implementation of specific programs of the Association;
- income from the sale of school services for those municipalities that are not FOCJ of type II members;
- grants and donations from higher level jurisdictions;
- dividends (income, interest) received on shares, bonds, other securities and deposits;
- other receipts not prohibited by law.

3.3. The rule and forms of entrance and annual membership fees' payments of the Association members is determined by § 2 of the Association Statute.

3.4. The value of the contributed property shall be assessed by the General Assembly of Members in roubles.

- 3.5. Membership fees are used to support activities provided for by the Statute. The procedure of its payment is determined by § 2.9 of the Association Statute.
- 3.6. The General Assembly of the Association approves annually the financial plan, business plan, property plan, debt plan, and other plans of the Association stated in § 10.3 of the Association Statute. The budget shall be developed on the basis of the funds at the disposal of the Association and planned revenues.
- 3.7. Implementation of the budget is organized by the Chairman of the Association. On the basis of a power of attorney issued by the Chairman, the execution of these functions may be entrusted to other management personnel of the Association.
- 3.8. The Association is liable for its obligations with the property.
- 3.9. At liquidation of the Association, the property which has remained after satisfaction of creditors is directed to the purposes it has been created for, and (or) to the municipal purposes. In case property of the liquidated Association cannot be used according to its stated purposes, the income from its disposal will be distributed to the member municipalities in the proportional share of their participation according to § 8.5 of the Association Statute.

§ 4. Membership in the Association

- 4.1. The members of the Association may be legal municipal entities that recognize its Statute and express their will to become Members of the Association in a duly established form.
- 4.2. Members of the Association are its founders, as well as new legal entities who become members.
- 4.3. Members of the Association retain their autonomy and rights as legal municipal subjects. They possess their autonomy and rights concerning those rights, which are not allocated to the school Association.
- 4.4. Admission of a new member of the Association is carried out by the General Assembly of the Association on the basis of the submitted application to the Association Council. The Chairman shall introduce the applicant at the next meeting of the Council from the date of submission of the application. The decision on admission shall be made by the General Assembly of the Association Members in accordance with the procedure established by the Association Statute, § 2.8.
- 4.5. A new member of the Association is obliged to make an entrance and annual fee in the term and in the amount established by the General Assembly of the Association in the Statute, the new member of the Association bears subsidiary responsibility according to § 2.4. of the Association Statute.
- 4.6. The rights of participation in the Association shall not be transferred to third parties.
- 4.7. A member of the Association has a right to withdraw from the Association at its own discretion after the end of the financial year.
- 4.8. A member shall withdraw from the Association by submitting a written application not later than 3 (three) months prior to the end of the respective financial year. At the same time, the Association, within three months from the

date of receipt of the application for withdrawal, shall make calculations under contracts of other obligations that it has concluded with the Association. In case of withdrawal of a member from the Association, the procedure provided for by the Statute of the Association shall apply.

4.9. A member of the Association can be excluded by the decision of the General Assembly of the Association members on the following grounds:

- performance of actions/inactions contrary to the goals and tasks fixed in the Association Statute and/or causing material damage to the Association and/or damage to its business reputation;
- violation of the provisions of the Statute;
- failure to comply with the decisions of the governing bodies of the Association, including the payment of entrance and membership fees, as well as additional property contributions.

4.10. With regard to the liability of the excluded member or the member voluntarily leaving the Association, the rules fixed in § 7.6 and § 2.4 of the Association Statute shall apply.

4.11. In case of withdrawal/exclusion of an Association member, regular membership fees are not refundable.

4.12. Upon the decision of the Association's Assembly, other municipalities may be included in the Association as its associated members. In case the Assembly of Members decides about inclusion of associated members, their rights and obligations should be determined by the Statute of the Association following the respective amendments in the Statute.

§ 5. Rights and obligations of Association's members

5.1 Members of the Association have rights:

- Members have the right to participate in making decisions regarding the Association;
- Members have the right to elect and be elected to the bodies of the Association;
- Members have the right to submit for consideration of the executive bodies of the Association proposals on the issues within their competence and to participate in the discussion of these issues;
- Members have the right to participate in voting at the General Assembly of the Association members;
- Members have the right to participate in projects and programs of the Association in the field of education, science, editorial and publishing and other activities;
- Members have the right to participate in scientific conferences, symposiums, exhibitions and other events organized by the Association;
- Members have the right to receive information on the activities of the Association and to get acquainted with its accounting, business plan, financial plan, property plan, debt plan, staff plan, project plan, etc.;

- Members have the right to appeal against decisions of the Association's bodies, which have civil legal consequences;
- Members have the right to request, on behalf of the Association, to compensate damages caused to the Association;
- Members have the right to appeal, acting on behalf of the Association, its transactions and to demand the application of the consequences of their invalidity, as well as the application of the consequences of the invalidity of insignificant transactions of the Association.
- Members have the right to quit the Association at the end of each financial year, announcing three months in advance.
- Members may have additional rights, which must be stipulated in the Statute of the Association.

5.2 Members of the Association have obligations:

- Members are obliged to participate in the formation of the Association's property of the Association in the following composition: Khokholsky, Nizhnedevitsky, Repiyovsky, Ostrogozhsky, Liskinsky municipal areas form the Association property in the proportions defined by the rule stipulated in § 2.9 of this Statute. Property of the Association includes school buildings, school lands, busses, municipal subsidies from the budgets of different levels and other forms of participation marked in § 7.3 of the Association Statute.
- Members are obliged to not to disclose confidential information about the Association's activities;
- Members are obliged to participate in decision-making according to the requirements formulated in § 10.2 of the Statute;
- Members should not harm the Association;
- Members are not expected to take any actions (inaction) that significantly complicate or make it impossible to achieve the goals for which the Association was established;
- Members are obliged to pay property shares related to their membership and annual membership fees;
- Members have to make additional contributions to the property of the Association if the Association Assembly of Members has made an appropriate decision;
- Members are obliged to provide information about the number of pupils by levels of school education and other socio-economic information, which determines the volume of the Association's services and its operation;
- Members are obliged to control licensing and accreditation of educational activity;
- Members are obliged to transfer to the Association the grants and donations which they received for conducting an activity of those schools that are included in the operations of the Association;
- Members may have additional obligations, which must be stipulated in the Statute.

§ 6. Procedure for managing the Association and control over its activities

6.1. The management bodies of the Association are as follows:

- the General Assembly of Members;
- the Chairman of the Association;
- the Association Council;
- the Supervisory Board;
- the Parents Board.

6.2. The supreme governing body of the Association is the General Assembly of Association Members (hereinafter referred to as the General Assembly).

6.3. Members of the Association take part in the General Assembly of the Association through their heads or other representative by the power of attorney. The norm of representation from each municipality-member in the Assembly of Members is 1 (one) person. Each member of the General Assembly has the number of votes proportional to the number of pupils registered on the territory of municipality that participate in the Association based on the data of Voronezh region state statistics service according to § 2.9 of the Association Statute.

6.4. To carry out the current management of the Association's activity in the period between the convocations of the General Assembly of the Association, a permanent collegial executive body – the Association Council – is elected for 5 (five) years. The Association's Council consists of a minimum of 4 (four) persons. Members of the Association's Council may be re-elected repeatedly.

6.5. The current management of the Association is carried out by the sole executive body – the Chairman of the Association – who is responsible for the goals and objectives of the Association and is accountable to the General Assembly of the Association Members. The Chairman of the Association is elected by the General Assembly from its members for a period of 5 (five) years.

6.6. To carry out the current organizational and executive activities of the Association, the Council of the Association forms the Secretariat of the Association, the number of which is determined by the General Assembly.

6.7. Competence and procedure of election of each management body is determined by the Statute of the Association.

6.8. The Association establish the Parents Board, which carries out its activities on a voluntary basis, in the manner prescribed by § 16 of the Statute of the Association.

6.9. To control the executive bodies of the Association, the General Assembly elects the Supervisory Board in accordance with the procedure established by the Association's Statute in § 15.

§ 7. Procedure of joint activity of members on creation of the Association

7.1. The members assume the responsibility for the creation of the Association and the state registration of the Association at their own expense.

7.2. After signing the present Memorandum and approval of the Association Statute by the General Assembly, all necessary documents shall be submitted to

the relevant bodies for state registration of the Association in accordance with the procedure established by Federal Act No. 129 “On state registration of legal entities and individual entrepreneurs”.

7.3. To ensure the activity of the Association, the members, who signed this agreement, shall transfer to the Association as their entrance fees in monetary and in kind form the funds in the amount of _____ roubles, within 30 (thirty) calendar days from the date of state registration of the Association.

7.4. The authorized person marked in § 2.3 of this Memorandum who performs all functions related to the state registration of the Association (Applicant) is determined by the General Assembly and reflected in the minutes of the General Assembly of Members.

§ 8. Entry into force of the Memorandum of the Association and the procedure for amending

8.1. This Memorandum has been drawn up and signed in 3 (three) identical authentic copies having equal legal force.

8.2. This Memorandum shall come into force from the date of its signing by the authorized representatives of all members.

8.3. The Memorandum may be amended or terminated by a decision of the General Assembly of Members. The decision to change or terminate the contract shall be made by a qualified majority of votes (two thirds of the total number of the Association members).

8.4. Amendments and additions to the present Memorandum come into force from the moment of their state registration in the order established by the current legislation, and become an integral part of the present constituent Memorandum.

§ 9. Details and signatures of Association members

Exemplary Statute for the Russian school FOCJ of type II in the legal form of Association (union)

§ 1. General provisions⁵⁸

1.1. The school Association carries the name “School Association in the south-east of the Voronezh region”, hereinafter referred to as the “Association”. It is a membership-based non-profit organization established to achieve the tasks

⁵⁸ This exemplary Statute for the school FOCJ of type II in Russia considers several legal Acts of the Russian Federation, such as the Civil Code of Russia, Federal Act No. 7 “On Non-commercial Organisations”, Federal Act No. 273 “On Education in the Russian Federation”. However, there are more legal acts of regional and local levels, which might regulate the investigated activity. Therefore, all details that cannot be fixed by this Statute remain the responsibility of the author.

provided in this Statute, including educational, scientific, social, cultural and other socially useful goals⁵⁹.

1.2. The Association provides primary, basic and secondary general education services in accordance with the decisions of Association General Assembly of Members, the Federal Act No. 273 “On Education in the Russian Federation”, Federal State Educational Standards and other legal acts.

1.3. The Association office is located in the city of Voronezh by the address_____.

§ 2. Members of the Association

2.1. Association members are:

- Khokholsky municipal area,
- Nizhnedevitsky municipal area,
- Repiyovsky municipal area,
- Ostrogozhsky municipal area,
- Liskinsky municipal area (further in the text - Association municipalities).

2.2. Other municipal areas and urban districts⁶⁰ may join the school Association as new members⁶¹.

2.3. Members of the Association remain their autonomy and rights as legal municipal subjects. They possess their autonomy and rights concerning those rights, which are not allocated to the school Association.

2.4. The Association is not answerable for the obligations of its members. Members of the Association bear subsidiary liability⁶² for the debts of this Association which are left to cover after satisfying creditors’ claims with the Association property⁶³. Association members bear subsidiary liability during two years after termination of their membership.

⁵⁹ Based on Federal Act No. 7 “On Non-commercial Organisations”, Article 11 “Associations (unions)”, § 5: “The name of the association (union) should contain an indication of the main subject of its activity with the words “association” or “union” included”.

⁶⁰ Municipalities are exclusively considered as members since only FOCJs of type II are investigated in the thesis.

⁶¹ Based on FA No. 7 “On Non-commercial Organisations”, Article 11, § 1 and the Civil Code of the RF, Article 123.9 § 1: “Legal entities and (or) citizens may form associations that are non-commercial organizations based on membership in order to represent and protect common including professional interests, to achieve socially useful, as well as other purposes that are not contrary to federal laws and having non-commercial nature”. “The number of founders of an association (union) cannot be less than two”.

⁶² Applicability of subsidiary responsibility is regulated by the Civil Code of the Russian Federation, Article 399, § 1: “Prior to filing claims against a person who has a subsidiary liability in accordance with the law, other legal acts or the terms of the obligation, the creditor must file a claim against the principal debtor. If the principal debtor refuses to satisfy the creditor’s claim or the creditor does not receive a response to the claim within a reasonable period of time, the claim may be brought against the person bearing subsidiary liability”.

⁶³ Based on FA No. 7 “On Non-commercial Organisations”, Article 11, Art. 399, § 3-4.

2.5. The minimum number of members of the Association is two. The number of municipal areas and urban districts of Voronezh region limit the maximum number of members of the Association.

2.6. The procedure for admission to the Association and exclusion from the membership of its members, the amount and method of payment of entrance and annual membership fees shall be specified in this Statute, which is adopted by a decision of the General Assembly by a simple majority vote of the members present at the meeting.

2.7. Admission to the Association is carried out by the Chairman of the Association in accordance with the Statute.

2.8. A new member must pay its share of property contribution (entrance fee) which is defined proportionally to the number of school-age pupils registered on the territory of the municipality that participate in the Association based on the data of Voronezh region state statistics service⁶⁴. In return, a new member receives school education services of which quality is comparable to the average level already provided to its Members.

2.9. Members of the Association must pay annual membership fees in the amount of costs which are not covered by subsidies from Voronezh region. A two-part tariff for covering annual membership fees is applicable where municipalities pay a lump-sum fee, related to maintenance of buildings and structures of schools, financing current fixed costs and those variable costs which are not covered by the region, and Voronezh region covers per-pupil variable costs⁶⁵.

2.10. Members of the Association may pay target and additional property contributions to its property. The amount and method of payment of target and additional property fees are determined by the decision of the General Assembly of the Association by a simple majority of votes of the present members of the General Assembly.

2.11. Entrance and annual membership fees can be paid in the form of:

- resources in kind (buildings, lands, equipment, etc.);
- monetary contributions;

⁶⁴ The model of the establishment of FOCJs of type II, which is introduced in chapter 2, results in the optimal share of municipalities of the FOCJ of type II equity capital ($\frac{e_i}{E} = I - \frac{c_i}{b_i} * \bar{E}$). However, if a new member joins an FOCJ of type II, the total equity capital \bar{E} grows, then the solution is not optimal anymore and a new optimal share for each municipality $\frac{e_i}{E}$ must be found. Therefore, for the sake of simplicity, for new entering members the share, that they must pay, relates to the number of school-age pupils in these municipalities.

⁶⁵ According to the model of current operation, described in chapter 2, the optimal fee that municipalities have to pay results in formula: $P = \frac{l * L + m * M - G}{X}$. Variable costs comprise expenses on labour and materials, related to realisation of educational process, covered by regional subsidies in Russia. However, some variable costs which are not related to the educational process are financed by municipalities. The model assumes that current fixed costs are covered by each municipality separately.

- municipal subsidies;
 - donations and grants from higher level jurisdictions;
 - charitable donations, etc.
- 2.12. Membership in the Association shall be terminated in cases of:
- voluntary withdrawal from the Association;
 - exceptions from the members of the Association;
 - liquidation of the Association.

2.13. A member of the Association may be excluded from its membership for failure to fulfil its statutory obligations. The decision on exclusion shall be made by the decision of the General Assembly by a qualified majority of votes (2/3 of the General Assembly of Members present at the meeting).

§ 3. Legal status of the Association

3.1. The Association in its activities shall be guided by the Constitution of the RF, Civil code of the Russian Federation, the Federal Act No. 273 “On Education in the Russian Federation”, the Federal Law No. 7 “On Non-Commercial Organizations”, other federal laws and regulations of the Russian Federation, laws and other legal acts of the Voronezh region, regulatory legal acts of local governments of the Khokholsky, Nizhnedevitsky, Repiyovsky, Ostrogozhsky, Liskinsky municipal areas, as well as this Statute.

3.2. The Association is considered to be established as a legal entity from the moment of its state registration in accordance with the procedure established by law⁶⁶.

3.3. The association is established without limitation of the period of activity.

3.4. The Association has in ownership a separate property, is responsible for its obligations with this property, may acquire and exercise property and non-property rights in its own name, bear obligations, be a plaintiff and defendant in court, enter into other legal relations.

3.5. The Association has an independent balance sheet and has the right to open settlement, currency and other accounts with banking institutions and other credit organizations in the Russian Federation in accordance with the established procedure.

3.6. The Association shall have a round seal registered in accordance with the established procedure.

3.7. Interference in the activities of the Association of state and other bodies, except those authorized by law, is not allowed.

§ 4. Tasks and field of activity

4.1. The Association has the following tasks:

- primary, basic and secondary education service provision for Anoshkinskaya, Bodejevskaya, Vladimirovskaya, Voznesenovskaya, Divnogorskay, Dobrinskaya, Drakinskaya, Yermolovskaya, Zaluzhenskaya secondary schools

⁶⁶ Civil Code of the Russian Federation, Article 51.

located in Liskinsky municipal area; Kurbatovskaya, Kuchugurovskaya secondary schools, Mikhnevskaya, Nororotaevskaya basic schools located in Nizhnedevitsky municipal area; Pobedinskaya, Ternovskaya basic schools, Pokrovskaya, Soldatskaya, Storozhevskaya, Uryvskaya secondary schools located in Ostrogozhsky municipal area; Istobinskaya, Kolbinskaya, Krasnolipevskaya, Platavskaya secondary schools located in Repiyovsky municipal area; Staronikolskaya, Kostenskaya, Oskinskaya, Yablochenskaya secondary schools located in Khokholsky municipal area in accordance with the Federal Act No. 273 “On Education in the Russian Federation” and the State Educational Standards;

- material and technical support of educational activities, equipment of premises in accordance with state and local norms and requirements, including federal state educational standards, federal state requirements, educational standards;
- organization of meals for students and employees;
- creating conditions for students to participate physical education and sports;
- assistance in the activities of pupils’ organisations and groups;
- organization of scientific and methodical work, including the organization and holding of scientific and methodical conferences and seminars;
- formation of open and publicly accessible information resources containing information on the activities of the Association, and providing access to such resources by placing them on the information and telecommunication networks, including the official website of the Association on the Internet;
- other tasks in accordance with the legislation of the Russian Federation.

4.2. The territorial scope of the Association results from the fulfilment of its task under § 4.1.

4.3. Educational activity of the Association is a subject to licensing as well as the state accreditation⁶⁷.

4.4. The Association is not oriented to profit maximization, it should follow a cost-covering principle.

§ 5. Association members’ rights⁶⁸

5.1. Members have the right to participate in making decisions regarding the Association;

5.2. Members have the right to elect and be elected to the bodies of the Association;

5.3. Members have the right to submit for consideration of the executive bodies of the Association proposals on the issues within their competence and to participate in the discussion of these issues;

⁶⁷ In accordance with Federal Act No. 99 “On licensing of certain types of activities”, Article 12, § 1, section 40. The procedure for getting licence is regulated by Article 13.

⁶⁸ Based on Civil Code of the RF, Article 123.11 “Rights and duties of an association (union) member”, § 1 and Article 65.2, § 1.

- 5.4. Members have the right to participate in voting at the General Assembly of the Association members;
- 5.5. Members have the right to participate in projects and programs of the Association in the field of education, science, editorial and publishing and other activities;
- 5.6. Members have the right to participate in scientific conferences, symposiums, exhibitions and other events organized by the Association;
- 5.7. Members have the right to receive information on the activities of the Association and to get acquainted with its accounting, business plan, financial plan, property plan, debt plan, staff plan, project plan, etc.;
- 5.8. Members have the right to appeal against decisions of the Association's bodies, which have civil legal consequences;
- 5.9. Members have the right to request, on behalf of the Association⁶⁹, to compensate damages caused to the Association⁷⁰;
- 5.10. Members have the right to appeal, acting on behalf of the Association, its transactions and to demand the application of the consequences of their invalidity, as well as the application of the consequences of the invalidity of insignificant transactions of the Association;
- 5.11. Members have the right to quit the Association in the end of each financial year announcing three months in advance;
- 5.12. Members have the right to decide on amendments in the Memorandum of the Association;
- 5.13. Members may have additional rights, which must be stipulated in this Statute.

§ 6. Association members' obligations⁷¹

- 6.1. Members are obliged to participate in the formation of the Association's property of the Association in the following composition:
Khokholsky, Nizhnedevitsky, Repiyovsky, Ostrogozhsky, Liskinsky municipal areas form the Association property in the proportions defined by the rule stipulated in § 2.8 of this Statute. Property of the Association includes school buildings, school lands, busses, subsidies from the budgets of different levels and other forms of participation marked in § 7.3 of this Statute.
- 6.2. Members are obliged to not to disclose confidential information about the Association's activities;
- 6.3. Members are obliged to participate in decision-making according to the requirements formulated in § 10.2;
- 6.4. Members should not harm the Association;

⁶⁹ Civil Code of the Russian Federation, Article 182, § 1.

⁷⁰ Civil Code of the Russian Federation, Article 53.1.

⁷¹ Based on Civil Code of the Russian Federation, Article 123.11 "Rights and duties of an association (union) member", § 2 and Article 65.2, § 4.

- 6.5. Members are not expected to take any actions (inaction) that significantly complicate or make it impossible to achieve the goals for which the Association was established.
- 6.6. Members are obliged to pay property shares related to their membership and annual membership fees;
- 6.7. Members are obliged to make additional contributions to the property of the Association if the Association Assembly of Members has made an appropriate decision.
- 6.8. Members are obliged to provide information about the number of pupils by levels of school education and other socio-economic information, which determines the volume of the Association's services and its operation.
- 6.9. Members are obliged to control licensing and accreditation of educational activity.
- 6.10. Members are obliged to transfer to the Association the grants and donations which they received for conducting an activity of those schools that are included in the operations of the Association.
- 6.11. Members may have additional obligations, which must be stipulated in this Statute.

§ 7. Property of the Association⁷²

- 7.1. The Association owns and operates school buildings, structures, plots of lands, sport facilities and equipment, inventory, monetary funds in roubles, and bonds.
- 7.2. The Association shall be liable for its obligations with the property, which may be foreclosed on under the legislation of the Russian Federation.
- 7.3. The sources of formation of the Association's property are:
- Regular and lump-sum payments from the Members, financial and resources in kind;
 - Voluntary property contributions and donations including those with a specific purpose, for the implementation of specific programs of the Association;
 - Income from the sale of school services for those municipalities that are not FOCJ members;
 - Grants and donations from higher level jurisdictions;
 - Dividends (income, interest) received on shares, bonds, other securities and deposits;
 - Other receipts not prohibited by law.
- 7.4. The property of the Association is used only for realization of the purposes and solution of the tasks provided by the Statute of the Association in § 4.1.
- 7.5. The period of regular payments from the members of the Association is the beginning of each financial year.
- 7.6. If a member leaves the Association, it receives its share of participation in the property formation deducted by its share of the Association debt.

⁷² FA No. 7 “On Non-commercial Organizations”, Article 26 “Sources of property formation of a non-commercial organization”, § 1-4.

7.7. The Association has to consider a cost-covering principle. If in the financial period the Association receives profit, it should not be distributed among the members of the Association, but must be used for the statutory purposes.

§ 8. Non-commercial status

8.1. The Association pursues exclusively and directly the non-commercial purposes defined in § 4.1 of this Statute. The Association does not pursue profit making as its purpose and does not distribute the profit among the participants according to § 7.7⁷³.

8.2. The Association may carry out income-generating activities insofar as they serve the purposes stated in § 4.1 of this Statute⁷⁴.

8.3. The budget of the Association may only be used for the statutory purposes.

8.4. The Association should not favour any person by expenditure which is not in line with the purpose of the association or by disproportionately high remuneration.

8.5. At liquidation of the Association, the property which has remained after satisfaction of creditors is directed to the purposes it has been created for, and (or) to municipal purposes. In case property of the liquidated Association cannot be used according to its stated purposes, the income from its disposal will be distributed to the member municipalities in the proportional share of their participation.

§ 9. Bodies of the Association

The bodies of the Association are

- the General Assembly of Members⁷⁵.
- the Chairman of the Association.
- the Association Council⁷⁶.
- the Supervisory Board.
- the Parents Board.

§ 10. Tasks of the General Assembly of Members

10.1. The main function of the Association's General Assembly of Members is to guarantee that the Association complies with the purposes and tasks for which it was established.

⁷³ FA No. 7 “On Non-commercial Organisations”, Article 2 “Non-commercial organisation”, § 1.

⁷⁴ Based on Civil Code of the Russian Federation, Article 50 “Commercial and non-commercial organisations”, § 4.

⁷⁵ As it is marked in FA No. 7 “On Non-commercial Organisations”, Article 29 “The supreme governing body of a non-commercial organisation”, § 1 for Associations (unions): “The supreme governing body for the association (union) in accordance with its Statute is the General Assembly of Members”.

⁷⁶ Based on Civil Code of the RF, Article 123.10, § 2: “An association (union) forms a sole executive body (chairman, president, etc.) and can form permanent collective executive bodies (council, board, presidium, committee)”.

10.2. The General Assembly shall be held at least once a year. An extraordinary General Meeting may be convened as necessary by the Chairman, the Association Council, as well as on the recommendation of the Supervisory Board or initiative group of at least 10% of the Association members.

10.3. Exclusive competence of the General Assembly of Members of the Association includes the following issues:

- the definition of priority areas of Association's activities, principles of formation and use of its property;
- the opening and closing schools, merging schools, location of new schools, types of provided educational services (primary, basic, secondary general education);
- the organisation of pupils' transportation to schools with the help of school buses;
- the election of the Chairman of the Association as well as of the Deputy Chairman of the Association from among the members of the Association Assembly;
- the exclusion of members of the Association and the admission of new members;
- the amendment of the Statute of the Association and the dissolution of the Association;
- the formation of bodies of the Association and early termination of their powers;
- to take decisions on the establishment of other legal entities, on the participation of the Association in other legal entities, on the establishment of branches and on the opening of representative offices of the Association;
- to take decisions on the budget plan, as well as to take decisions on the taking up of additional credits during the provisional budget implementation;
- the adoption of the annual financial report, business plan, financial plan, property plan, debt plan, staff plan, project plan, and their approval;
- the appointment of the auditor for the Association;
- to take decisions on loan agreements and similar legal transactions,
- the granting of planning contracts for the construction, extension or substantial modification of school facilities,
- the granting of construction contracts and services with a value of more than _____ mln. rubles,
- the appointment and dismissal of a Chairman, Council members, Supervisory Board members;
- to take decisions on participation in another FOCJ.
- to take decisions on reorganization and liquidation of the Association, appointment of the liquidation commission (liquidator) and approval of the liquidation balance sheet.

The issues referred to the exclusive competence of the General Assembly of Members of the Association may not be transferred for decision to other bodies of the Association⁷⁷.

10.4. The General Assembly of Members of the Association is authorized, if more than half of its members are present at the said meeting.

10.5. A decision of the General Assembly of an Association may be made without holding a meeting by absentee voting, except for making decisions on the issues specified in paragraph 10.3. Such voting may be conducted by exchange of documents by post, telegraph, teletype, telephone, electronic or other communication ensuring authenticity of transmitted and received messages and their documentary confirmation.

10.6. Decisions on the competence of the General Assembly (except for the issues of exclusive competence) are made by a simple majority of votes participating in the General Assembly of Members of the Association.

10.7. Decisions on issues of exclusive competence are made by a qualified majority of 2/3 of votes of its members present⁷⁸.

10.8. The Association shall not be entitled to pay remuneration to the representatives of the Members of the General Assembly of Members for the performance of their functions, except for the reimbursement of expenses directly related to participation in the work of the Assembly⁷⁹.

10.9. The General Assembly of Members may establish special purpose committees, such as a committee for educational matters, financing, projects, staff committee, etc.

§11. Composition of General Assembly of Members

11.1. Members of the Association take part in the General Assembly of the Association through their heads or other representative by the power of attorney. The norm of representation from each municipality-member in the Assembly of Members is 1 (one) person. Each member of the General Assembly has the number of votes proportional to the number of school-age pupils⁸⁰ registered on the territory of municipality that participate the Association based on the data of Voronezh region state statistics service.

11.2. General Assembly of Members is elected for 5 (five) years. The number of re-elections is not limited.

⁷⁷ Based on FA No. 7 “On Non-commercial Organisations”, Article 29 “The supreme governing body of a non-commercial organization”, § 3.

⁷⁸ Based on FA No. 7 “On Non-commercial Organisations”, Article 29 “The supreme governing body of a non-commercial organization”, § 4.

⁷⁹ Based on FA No. 7 “On Non-commercial Organisations”, Article 29 “The supreme governing body of a non-commercial organization”, § 5.

⁸⁰ The number of votes, which members have in the General Assembly, can be defined not only by the number of school-age pupils in municipalities, but can also be defined by the number of pupils, belonging to different school level (primary, basic and secondary general education), by the number of taught hours, by the share of municipalities in equity capital, by the number of inhabitants in municipalities, etc.

11.3. Compensation of The Chairman of the Association, the Deputy Chairman(s), Members of Council and Supervisory Board is regulated by the rules for the state civil service of the Russian Federation⁸¹.

§ 12. Convening of the General Assembly of Members

12.1. The Association Assembly shall be convened by the Chairman of the Association in writing or electronically, stating the agenda, place and time of the meeting. The invitation must be made so that a period of at least one-week elapses between its receipt and the day of the meeting. In urgent cases, the Chairman of the Association may reduce the period to twenty-four hours; the reduction of the period to less than three days shall be applied to cases of unavoidable necessity.

12.2. The Association General Assembly meeting must be convened at least once a year. It must also be convened if the Association Council requests it, stating the subjects to be discussed. Similarly, at the request of the Supervisory Board of the Association, certain items of deliberation shall be included in the invitation referred to § 12.1.

12.3. The Department for the Development of Municipalities of the Voronezh Region as a supervisory authority from the Voronezh region shall be timely informed by the Chairman of the Association, enclosing the agenda. Its representatives shall have the right to participate in the Assembly meeting of the Association. Upon request, they shall be given the floor.

12.4. The representative of the Department of Education, Science and Youth Policy of the Voronezh Region responsible for school matters and the school headmasters shall be invited to the meetings and have to be heard, unless the Association Assembly decides otherwise for the individual case.

12.5. The meetings of the Association Assembly shall be chaired by the Chairman of the Association or – if he is not available to do so – by the Deputy Chairman of the Association. He appoints a secretary to record the minutes, who does not have to be a member of the Association Assembly.

12.6. A record of the results of the negotiations of the Association Assembly shall be kept and signed by the Chairman of the Association and the Secretary. Copies of the minutes shall be sent to the Association Members, the Association Council, Supervisory Board and the Department for the Development of Municipalities of Voronezh Region (the supervisory authority).

§ 13. The Chairman of the Association

13.1. The Chairman of the Association is the sole executive body of the Association. The Chairman of the Association is accountable to the General Assembly of the Association and the Supervisory Board. The Chairman carries out the current management of the Association's activity in accordance with the decisions of the General Assembly and the Association Council.

⁸¹ Federal Act No. 79 “On State Civil Service of the Russian Federation”, Article 50.

13.2. The Chairman of the Association and his or her deputy shall be elected from the members of the General Assembly of Members.

13.3. When establishing the Association, the Chairman is elected at the General Assembly of the Association. The period of the Chairman's office is 5 (five) years. The number of re-elections is not limited.

13.4. The Chairman acts without a power of attorney on behalf of the Association, represents its interests in relations with public authorities and local governments, legal entities and citizens, and other persons, both in the Russian Federation and abroad, makes transactions, concludes contracts, issues powers of attorney, issues orders, carries out other legally significant and actual actions on behalf of the Association, except those referred to the competence of the General Assembly and the Association Council.

13.5. The competence of the Chairman of the Association includes the following:

- Implementation of the general management of the Association, ensuring the execution of decisions of the General Assembly, Association Committee, programs and projects of the Association;
- Making decisions on operational issues of the Association's internal activity, approval of the Association's internal documents, except for the documents, approval of which is attributed to the competence of other bodies of the Association;
- Determination and approval of the staff schedule and structure of the Association's working bodies, issuance of orders and other administrative documents on the Association's activities within the scope of its authority, issuance of instructions mandatory for all employees of the Association;
- Compliance the Association activity with Civil Code, Federal Act No. 273 "On Education in Russia", and other relevant legal acts;
- Opening of Association accounts in banking institutions, with the right of the first signing of financial documents;
- Within the scope of the powers granted to him by the General Assembly, the Chairman manages the property and funds of the Association;
- General management of the activities of the organizations created by the Association, coordination of the activities of branches and representative offices of the Association if they are created;
- Maintenance of the register of Association members, admission to the Association and registration of voluntary resignation from the Association members;
- Preparation of necessary materials and organization of the General Assembly and Association Council meetings, preparation of the annual report on the Association activities;
- Exercising other functions that do not fall within the competence of other bodies of the Association.
- Control over tax payment of the Association.

- In fulfilling his duties, the Chairman of the Association shall make use of a managing director and other auxiliary staff to be appointed or hired by the Association Assembly.

§ 14. Competence of the Association Council

14.1. The Association Council is a permanent collegial management body, carries out current management of the Association and is accountable to the General Assembly of the Association and Supervisory Board. The Association Council is elected by the General Assembly of the Association members for a period of 5 (five) years.

14.2. The competence of the Association Council includes the resolution of all issues that do not constitute the exclusive competence of other governing bodies of the Association, such as the Chairman, The General Assembly of Members, Supervisory Board and the Parents Board⁸².

14.3. Quantitative composition of the Council is determined by the decision of the General Assembly of the Association, but may not be less than 4 (four) members.

14.4. The Association Council consists of the Chairman of the Association, the member who is an expert in education, the member who is an expert in finances and management, construction and maintenance, transportation. The deputies of the Council members to be nominated by the Association members must belong to the Association Assembly.

14.5. If a member of the Association has appointed other persons according to the Association Assembly, these persons shall also represent the member of the Association in the Association Council.

14.6. The Association Assembly for important reasons may dismiss the appointed members.

14.7. Each Council member shall have the same number of votes in the Council as the Association member represented by him in the Association Assembly.

14.8. If there is an equal number of votes while making decisions, the votes of the Chairman are decisive.

14.9. The Association Council is authorized to make decisions if more than half of the Association Council members are present at its meeting.

14.10. Decisions are made by a simple majority of votes of the Association Council members present at the meeting. The Chairman shall lead the meetings, form the agenda and organize the work of the Association Council. Meetings of the Council shall be recorded. Minutes and decisions of the Council of the Association are signed by the Chairman of the Association.

14.11. For the meetings and resolutions of the Association Council, the provisions for the Association Assembly shall apply *mutatis mutandis*.

14.12. The invitation period shall be determined in accordance with § 12 of the Association Statute.

⁸² FA No. 7 “On Non-commercial Organisations”, Article 30 “Executive bodies of a non-profit organisation”, § 2.

§ 15. Supervisory Board⁸³

15.1. Supervisory board is established to control the activities of the executive bodies of the Association.

15.2. The Supervisory Board of the Association includes members of the Association and representatives from the Parents Board. The number of members of the Supervisory Board cannot be less than 5 (five).

15.3. Members of the Supervisory Board of are elected by the General Assembly for the period until the next annual General Assembly meeting.

15.4. The members of the Supervisory Board are elected by cumulative voting: the number of votes belonging to each Association member is multiplied by the number of people to be elected to the Supervisory Board, and the member has a right to give the votes received in this way for one candidate or distribute them between two or more candidates. Candidates with the biggest number of votes are considered elected to the Supervisory Board of the Association.

15.5. People elected to the Supervisory Board of the Association can be re-elected an unlimited number of times.

15.6. The Supervisory Board of the Association elects the Head of the Supervisory Board from its members by majority of votes from total number of members of the Supervisory board.

15.7. Members of the Council of the Association cannot comprise more than $\frac{1}{4}$ (one fourth) of the Supervisory Board of the Association. The Chairman of the Association cannot simultaneously be a Chairman of the Supervisory Board.

15.8. Meetings of the Supervisory Board of the Association shall be convened as necessary, but not less than once every six months. Members of the Supervisory Board of the Association do not act on behalf of the Association with third parties.

15.9. By decision of the General Assembly, members of the Supervisory Board may be paid remuneration and/or reimbursed for expenses related to the performance of their functions as members of the Supervisory Board during the period of performance of their duties. The amount of such remunerations and compensations shall be established by the resolution of the General Assembly of Members.

15.10. The issues referred to the exclusive competence of the Supervisory Board of the Association cannot be transferred to the decision of the executive bodies of the Association. The Supervisory Board exclusive competences are:

- approval, upon submission by the executive bodies, the business plan and other plans marked in § 10.3;
- convening annual and extraordinary General Assembly of Members;
- approval of the agenda of the General Assembly of Members;
- determination of the price (monetary value) of the Association property;
- formation of committees of the Supervisory Board;

⁸³ Based on Federal Act No. 208 “On Joint Stock Companies”, Articles 64-68.

- determination of principles and approaches to risk management, internal control and internal audit of the Association;
 - approval of internal documents of the Association, except for internal documents, approval of which is referred to the competence of the General Assembly of Members, as well as other internal documents of the Association, approval of which is referred by the Statute of Association to the competence of the executive bodies of the Association;
 - approval of transactions of the sum more than _____ mln. roubles;
 - approval of credits in the sum more than _____ mln. roubles;
 - approval of the leading staff appointment;
 - initiation of claims against Association management.
 - emergency decisions in case there is no possibility to make decisions by the General Assembly of Members.
- 15.11. Decisions are made by a simple majority of votes of the Supervisory Board members present at the meeting.

§ 16. The Parents Board

16.1. The Parents Board is established to consider the opinion of parents (legal representatives) of juvenile pupils on the management of the educational institution and the adoption of local regulations affecting the rights and legitimate interests of juvenile pupils.

16.2. The Parents Board are elected from the parent committees of the schools managed by the Association annually, not later than September 15.

16.3. Composition of the Parents Board is approved by the order of the Chairman of the Association for the academic year not later than October 1 of the current year.

16.4. Members of the Parents Board may resign from the Board of Parents at his/her own request.

16.5. The tasks of the Parents Board include:

- discussing and expressing an opinion on the adoption of local regulations of the Association that affect the rights and legitimate interests of juvenile pupils;
- making proposals to improve the educational process;
- informing the parents (legal representatives) of juvenile pupils about the decisions of the Parents Board;
- assistance in carrying out school activities;
- monitoring the organization of meals provision at schools;
- assistance in organizing meetings with parents;
- assistance in creating safe conditions for the educational process, compliance with sanitary and hygienic rules and regulations;
- conducting explanatory work among the parents on compliance with the internal regulations at schools;
- coordination of the choice of disciplinary punishment/inducement of students;

- election of representatives of the parental community to the commission for the settlement of disputes between participants in educational relations;
- participation in the planning, preparation, conduct and analysis of extra-curricular activities for the schools included in the Association.
- Participation in the Supervisory Board of the Association.

16.6. The Chairman the Parents Board shall be elected by a simple majority of votes at the first meeting.

16.7. The Chairman of the Parents Board may attend meetings of management bodies of the Association about the issues within the competence of the Parents Board.

16.8. During the school year at least 3 (three) meetings of the Parents Board are held.

16.9. Decisions of the Parents Board are taken by a simple majority of votes. If the number of votes is equal, the Chairman of the Parents Board has the decisive vote.

16.10. The meeting is considered to be valid if at least 2/3 of the members of the Parents Board are present at the meeting.

16.11. Decisions of the Parents Board taken within its competence and in accordance with the law are of a recommendatory nature for the Bodies of the Association.

16.12. Decisions of the Parents Board shall be brought to the attention of the Chairman of the Association by the Chairman of the Parents Board. If a decision of the Parents Board is rejected, the explanation must be given to the Parents Board in a written form.

§ 17. Budget

17.1. The Chairman of the Association shall notify the members of the Association of the draft Budget early enough, but at least one month before the adoption of the Budget.

§ 18. Annual financial report and audit

18.1. The Chairman of the Association shall present the annual financial report to the Assembly of the Association and the Supervisory Board, which shall verify them (local audit) and then approve them. The audit may be carried out by an Audit Committee appointed from among its members by a decision of the Association Assembly or another public auditing institution.

18.2. After approval of the annual financial report, the Association Assembly shall also decide on business performance of the Association and the realisations of plan according to § 10.3.

18.3. The obligation of the Chairman of the Association to arrange a higher-rank audit according to the legal regulations remains unaffected.

§ 19. Cash management

19.1. For the management of the cash transactions, the Association sets up its own cash register, which has to be at the location of the Association Chairman.

19.2. The Chairman of the Association is responsible for organising the fulfilment of accounting.

§ 20. Subsidiaries and Representative offices

20.1. The Association has the right to establish subsidiaries and open representative offices.

20.2. A subsidiary of the Association is a separate subdivision of the Association located outside the location of the Association and performing all or part of its functions, including the functions of a representative office.

20.3. A representative office of the Association is a separate subdivision which is located outside the Association's location, represents the interests of the Association and protects them.

20.4. Subsidiaries and representative offices of the Association are not legal entities, they are provided with the property of the Association and act on the basis of the approved regulations. The property of a subsidiary or representative office shall be accounted for on a separate balance sheet and on the balance sheet of the Association.

20.5. The Association appoints the head of the subsidiaries and representative office, who acts on the basis of a power of attorney issued by the Chairman of the Association. The subsidiary and representative office shall operate on behalf of the Association that established them.

20.6. The Association is responsible for the activities of its subsidiaries.

§ 21. Reorganisation and liquidation of the Association

21.1. The Association may be voluntarily reorganised⁸⁴.

21.2. Reorganization of the Association is carried out by the decision of the General Assembly of the Association, adopted by a qualified majority of two-thirds of the votes present at the meeting. Reorganization of the Association is carried out in accordance with the Civil Code of the Russian Federation.

21.3. The Association can be reorganized into a public organization, autonomous non-commercial organization or fund by the decision of its members⁸⁵. The decision to reorganise the Association should be taken by all members who have concluded an agreement on its establishment⁸⁶.

21.4. The Association can be voluntarily liquidated⁸⁷.

21.5. Liquidation of the Association shall be carried out by the decision of the General Assembly of the Association Members, adopted by a qualified two-thirds majority of votes present at the meeting. Liquidation of the Association shall be carried out in accordance with the Civil Code of Russia.

⁸⁴ In the manner provided by Federal Act No. 7 “On Non-commercial Organisations”, Article 16 and Civil Code of the Russian Federation, Articles 57-60.

⁸⁵ Based on Civil Code of the RF, Article 123.8, § 4.

⁸⁶ Federal Act No. 7 “On Non-commercial Organisations”, Article 17, § 5.

⁸⁷ In the manner provided by Civil Code of the Russian Federation, Articles 61-64 and Federal Act No. 7 “On Non-commercial Organisations”, Articles 18-21.

21.6. The Association can be liquidated by court decision⁸⁸.

21.7. The members (participants) of Association or the body that decide on liquidation of the Association shall appoint a liquidation commission (liquidator) and establish the procedure and terms of liquidation of the Association⁸⁹. From the moment of appointment of the liquidation commission, the authority to manage the affairs of the Association shall be transferred to the commission. The liquidation commission shall act in court on behalf of the Association.

21.8. The property which has remained after satisfaction of requirements of creditors is directed to the purposes it has been created for, and (or) to the municipal purposes. In case property of the liquidated Association cannot be used according to its stated purposes, it addresses in the income of the municipalities-members in the proportional share of their participation⁹⁰.

21.9. Liquidation of the Association is considered to be completed after making an entry about it in the Unified State Register of Legal Entities⁹¹.

§ 22. Amendments to the Statute of the Association

22.1. Amendments to the Statute of the Association shall be made by decision of the General Assembly of the Association. The decision to amend the Statute shall be made by a qualified two-thirds majority of the Association members present at the meeting.

Amendments to the Statute are subject to state registration and become effective for third parties from the moment of state registration of the Statute.

The third chapter has applied FOCJ concept and microeconomic theory for FOCJs of type II to the Russian school services. By matching together FOCJ of type II characteristic features and requirements of the Russian legal forms of companies, an appropriate legal form of association (union) has been discovered as the most suitable for school FOCJs of type II. Furthermore, municipal areas and urban districts are detected as adequate levels of municipalities, which can cooperate in the form of FOCJs of type II in Russia. FOCJ of type II applicability to the Russian school services has been estimated based on the results of microeconomic modelling, document analysis and interviews with Russian school municipal and regional authorities, school directors and parents. Practical recommendations in the form of exemplary Memorandum and Statute for school FOCJs of type II in Russia conclude the third chapter.

⁸⁸ Based on Civil Code of the RF, Article 61, § 3.

⁸⁹ In accordance with Civil Code of the Russian Federation and Federal Act No. 7 “On Non-commercial Organisations”, Article 18, § 3.

⁹⁰ Federal Act No. 7 “On Non-commercial Organisations”, Article 20.

⁹¹ Federal Act No. 7 “On Non-commercial Organisations”, Article 21.

CONCLUSIONS

The author has investigated the concept of Functional Overlapping Competing Jurisdiction (FOCJs) and its applicability to enhance inter-municipal cooperation in the provision of Russian school services. In answer to the main research question, it can be concluded that an FOCJ of type II is an applicable tool for inter-municipal cooperation and the provision of school services in Russia. The applicability of functional jurisdictions to Russian school services has been verified based on the outcome of FOCJ of type II microeconomic modelling, a document analysis of Russian legislation and the results of interviews with public officials in Russian municipalities. The analysis of these three aspects has not revealed obstacles to the establishment of school FOCJs of type II in Russia.

The FOCJ concept combines four components. FOCJs perform different functions, such as school education. They overlap in the same territory, compete for members and clients and are assumed to be jurisdictions that levy fees and possess internal democratic structures (e.g. management).

We may distinguish between four types of FOCJs. They differ by members, which means that FOCJs of type I include only citizens as members who decide to establish an FOCJ for the provision of a particular service. The members of FOCJs of type II are governmental units, among them are municipalities, regions, counties, states, etc. FOCJs of type III combine public and private legal entities, whereas type IV can be called a 'mixed' type, with all possible members from first three types. This thesis investigates Functional Overlapping Competing Jurisdictions as a tool for enhancing inter-municipal cooperation between Russian municipalities; therefore, it concentrates on FOCJs of type II with municipalities as members.

After analysing the entire scope of literature devoted to the FOCJ concept, the author has gained an understanding that the literature mainly discusses FOCJs of type I, which can also be explained by the fact that, initially, this approach was introduced by Swiss scientists Frey and Eichenberger as a new form of federalism and democratic initiative in Europe. Thus, this type of FOCJ can successfully function in Switzerland, where citizens with respect to municipal service production may belong to different jurisdictions at the same time but is only questionably applicable to other federal countries, such as Russia, where the density of the population is not equal among regions. At the same time, FOCJs of type II with municipalities as members seems to be appropriate for IMC in Russia as a good alternative to the amalgamation of municipalities under the conditions of depopulation.

Among all FOCJ classification types, especially type II with municipalities as members, the features of inter-municipal cooperation align. For example, FOCJ member municipalities cooperate when they decide to jointly fulfil one or several tasks included in the scope of their competence in order to mutually benefit. Cooperation should be voluntary and involve the dedication of re-

sources from municipalities. Municipalities keep indirect control over the services provided through the FOCJ Assembly of Members.

In the general classification of IMC forms (IMC Toolkit Manual 2010), FOCJs of type II belong to formalised economic units with the appropriate legal status. Other forms of inter-municipal cooperation, such as informal cooperation of municipalities, municipal contracts and agreements, sub-contracting, public-private partnership, are less advantageous for Russia and school services since they do not have a permanent nature and therefore cannot provide long-term solutions to social-economic and demographic problems. On the other hand, formalised economic long-term IMC in the form of functional enterprises possesses undeniable advantages. For example, municipal control over the services provided (Citroni et al. 2013), following of publicly oriented purposes by municipalities (De Peuter, Wayenberg 2007), faster decision-making of management without additional coordination with municipal authorities (Haveri, Airaksinen 2007), etc.

However, the literature on IMC typologies still does not consider FOCJs as a form of formalised economic long-term inter-municipal cooperation, nor does it apply mathematical modelling to develop a microeconomic theory for establishing inter-municipal cooperation. Therefore, the author suggests including the classification of FOCJs in line with other IMC typologies, in particular considering microeconomic tools of analysis developed for FOCJs of type II.

Since FOCJs of type II are economic units with their management and other internal administrative bodies, such an Assembly of Members, modelling of FOCJ activity comprises three sequential phases: establishment, current operation and competition for members. The second phase of FOCJ establishment, current operation, is essential for the analysis since, after FOCJs are established, all managerial functions are fulfilled mainly by the executive bodies responsible for FOCJ procurement. Therefore, in order to analyse the possible reactions of FOCJ management and members if external and internal political and economic factors change, an FOCJ of type II microeconomic theory has been developed in this thesis. For example, to detect how management and members are going to react if the volume of labour and materials, factor prices, tax rates, financial support from higher rank jurisdictions, demand, etc. change. In order to fulfil this aim of the thesis, the author applies methods of microeconomic theory and mathematical modelling. In each phase, an algebraic formula for the optimisation problem maximising the utility function of members, management or higher rank authorities has been formulated.

In the basic model of FOCJ of type II establishment, the utility function of members is maximised. In order to establish an FOCJ of type II, municipalities have to dedicate financial and resources in kind to FOCJ of type II equity capital. The model determines the optimal share municipalities should contribute to the equity capital and the optimal number of FOCJ of type II participants that should form an equity capital based on the comparison of their costs and benefits. If the benefits outweigh the costs, municipalities are eager to increase their FOCJ of type II share. First, the solution is found only under the condition that

municipalities contribute with only one kind of financing (e.g. real estate, municipal land, credit, municipal budget resources). Second, an optimal solution is found in the case that municipalities participate with different financial and in-kind resources.

A lump-sum grant from a higher ranking authority, which can be, for example, a regional educational department, as discovered via interviews, can be considered in the FOCJ of type II establishment model. If municipalities receive a grant for the establishment of an FOCJ, an optimal share of their participation in the FOCJ of type II equity capital increases, not because they have to invest more, but because their participation is partly compensated by the grant. At the same time, since the shares become larger, they can involve less municipalities in this cooperation.

How management react to grants received from higher ranking jurisdictions, special financial means under monopolistic and oligopolistic market conditions, considering different types of management behaviour during the FOCJ of type II current operation phase, shows the model of FOCJ current operation. This model determines the internal combination of factor-input relations and an optimal fee level for municipalities. It implies that municipalities should cover the current costs of the FOCJ of type II by themselves via participation fee payment. The model assumes a cost coverage rule, which means that an FOCJ has no profit. The result of this model is an optimal fee tariff from the management point of view, which is characterised by two optimality conditions. The first one stipulates that the relations between marginal utility received from marginal factor input equal the proportion of marginal profit caused by the respective factor contribution. The second condition shows that the contribution fee, which municipalities regularly pay, should equal the average costs. The model is applicable in analysing how an optimal solution is changing if the utility function of management is different or output, factor prices, labour and materials are changing and what happens if an FOCJ of type II receives a non-negotiable grant. The latter case shows that if a grant is a lump-sum, the first optimality condition does not change. However, the contribution fee for municipalities gets lower and output grows.

Moreover, FOCJs of type II can also receive grants through negotiations with higher level jurisdictions during the current operation phase. The result of the model is a negotiation solution determined according to Nash for a cooperative non-zero-sum game. In this model, not only an FOCJ of type II but also a higher rank authority maximises its utility function depending on output and the size of the grant. Since output depends on the amount of the grant, there is a solution where output volume, resulting from negotiation, depends on the evaluation of the grant, the evaluation of additional output allowed by the grant and the evaluation of the negotiating partners of the output. The amount of the grant resulting from negotiation is determined by this output, the minimum utilities of the negotiators and the parameters of the evaluation functions. With the higher grant induced, evaluation of the additional output by the FOCJ management, the volume of output and the size of the grant will increase.

Different means of financing influence the optimal solution of the model of the FOCJ of type II current operation as well. In this model, special financial costs are included in total costs and considered a part of factor prices. The solution of the model provides special financial guidelines. One concerns the input of production factors: the relation between marginal utilities from changing finance and material marginally equals the relation of the marginal profits connected to finance and materials, and the relation between marginal utilities from changing finance and labour marginally equals the relation of the marginal profits connected to finance and labour. The other solution stipulates that the amount of the contribution municipalities have to pay equals average costs. If the size of finance-related factor prices depends on factor inputs, the optimal conditions are changing, which affects the input, output and fee.

How the utility function of management and different market forms influence management decision-making is shown in subchapter 2.2. The author provides analytical solutions for labour, material, output, utility and participation fee with respect to four cases of management behaviour both in monopoly and oligopoly markets. The analytical solution for the fees is rather complicated; therefore, only numerical examples have been included in this thesis under an assumed combination of parameters. The author has found Launhardt-Hotelling solutions and Krelle-Ott spaces for two FOCJs of type II under the assumption that the management of both of them have the same behaviour of management. Moreover, the analytical solutions for labour and materials make it possible to derive demand functions for labour and material production factors for each of the four cases in monopoly and oligopoly. The optimal solutions for output provide a basis for the FOCJ of type II supply functions with respect to each case of management behaviour and market forms.

By turning to the basic model of current operation, an optimal contribution fee has been found for monopoly. However, the author makes extensions and tackles oligopoly in the thesis as well. The costs are fully covered by the FOCJ of type II in oligopoly as well as in monopoly. In literature, it is mainly assumed that the management's main goal is profit, sales or turnover maximisation. Following the idea of Williamson (1964) that management in corporations maximises utility, which depends on their own objectives and not the utility of stakeholders, this thesis focuses on an FOCJ of type II as a company where management maximises their utility. Their utility may depend on many factors, such as financial remuneration, social prestige, self-realisation, realisation of public goals, etc. However, this thesis, similar to Friedrich, Ukrainski, Timpmann (2014), focuses on four separate cases where management utility function depends on both public and private goals:

- Case I: volume of labour involved in the production and output received
- Case II: output singularly
- Case III: labour singularly
- Case IV: labour positively and output negatively.

The author formulates these four cases of management behaviour algebraically.

In the Launhardt-Hotelling model, the autonomous behaviour of two FOCJs of type II, where contribution fees are the parameters of action, is assumed. Launhardt-Hotelling behaviour is combined with Krelle behaviour under the specifications of Ott. Implementation of the Launhardt-Hotelling model in the condition of FOCJs of type II allows the identification of a combination of fees p_1 and p_2 where the oligopolistic market with two firms reaches its equilibrium. Moreover, the combination of these fees varies depending on the management case each FOCJ of type II possesses. The equilibrium points are found for four cases of management behaviour algebraically. The solution according to the Krelle-Ott model is a fee stability region. If two FOCJs end up by adaptation or external influences in this area, they do not change their fees anymore. These Krelle-Ott areas have also been calculated algebraically for four cases of management behaviour. The Krelle-Ott space can also move depending on changes in market parameters.

FOCJs of type II might not reach the Launhardt-Hotelling solution, for example, for external reasons or owner interventions. If they do, they do not realise cost coverage. Hence, they might realise a profit, which contradicts the assumed cost coverage rule. If such situations occur, FOCJ management may try to hide the profit using an appropriate cost accounting approach, by considering the municipality's costs as FOCJ of type II costs or by referring costs of one service to another if the FOCJ of type II provides different services in order to equalise turnover and costs artificially. To avoid this situation, special restrictions in the institutional environment must be introduced, e.g. by the rules stated in laws and statutes. With the Launhardt-Hotelling model, the author discovers how the management acts on factor markets and what happens if the employment level changes. Moreover, with this model, the way restrictions on factors and output, and also subsidies and taxes, can change the solution can be analysed.

The highest monopoly fee has been identified by the author for FOCJs of type II maximising labour (Case III). The same is true for oligopoly at the Launhardt-Hotelling equilibrium point. FOCJs of type II with Case II of management behaviour maximising output show the highest output in monopoly. FOCJs of type II with Case I of management maximising output and labour obtain the highest total output and utility value in duopoly (neglecting the less productive Case III of management behaviour). In terms of fee level, management maximising output (Case II) shows the lowest fee both in monopoly and duopoly. Therefore, Cases I and II of management behaviour are more favourable for members of FOCJs of type II. The generally expected and confirmed result is that fees are higher in monopoly than in the oligopolistic market and output is bigger in oligopoly than in monopoly.

For the Krelle-Ott area, numerical examples have shown that the smallest area in which competitors do not change their fees is in Case IV, with management evaluating labour positively and output negatively. The biggest fee stability area is in Case I of management behaviour where management evaluates both labour and output positively. Cases II and IV have comparable Krelle-Ott

areas. Case III of management behaviour has three points where the Stackelberg equilibrium is reached. Therefore, the shape of the Krelle-Ott space is not smooth in this case.

In the basic model of FOCJ current operation, it is assumed that FOCJ members (municipalities) intervene only by formulating the cost coverage rule, which FOCJ management must follow. This means that management is free to choose the output they produce. However, according to stipulations fixed in the Statute of an FOCJ of type II, its Assembly of Members might directly influence the output, for example, by setting a minimum output requirement, and management must fulfil some of the members' orders. Another situation is possible where members and management negotiate an output volume to produce. In this case, management has requirements with respect to minimum utility that they would like to receive, and members require a minimum output to be produced.

With respect to the competition for members, the author graphically shapes a corresponding model. It shows the distribution of members between two established and competing FOCJs of type II. The solution of the basic model is an optimal size for two competing FOCJs of type II and, if the size grows, it leads to congestion of the FOCJ of type II and a decrease in the quality of services provided. This is comparable to the solution of Buchanan.

The effects of a lump-sum grant are demonstrated in the competition for members model as well. These grants can be received from higher-level authorities. They increase the net-benefit of the members of two competing FOCJs of type II. If both FOCJs of type II get an equal volume of grants, the new allocation point does not change the distribution of members among FOCJs of type II. The members of both FOCJs of type II will just have a higher net-benefit than they did before receiving the grant; they still choose the FOCJ of type II which allows the highest net-benefit. However, if one of the competing FOCJs of type II receives a bigger grant, the allocation of members changes in favour of the FOCJ of type II with a higher grant, which gives a higher net-benefit for its members. Hence, the distribution of members between the two FOCJs of type II has changed.

In the model of FOCJ competition for members, net-benefit curves may also reflect the consequences of different means of financing. The model shows that a change in financing conditions will change the net-benefit curves of FOCJs' members. There are two situations under observation here. If only one financial policy is possible for the FOCJ of type II, the optimal distribution of members will vary depending on the availability of a more advantageous policy for members. Advantageous is used in the sense of the net-benefit members receive when applying this policy. The net-benefit curves for one FOCJ of type II do not cross here. If many financial policies are available and the net-benefit curves cross with respect to one FOCJ of type II, then the curves between the crossing points must be compared. The curves of the highest net benefit between the crossing points show the most favourable financial policy for one FOCJ of type II, similar to the other one. The crossing point of the two optimal

curves reflects the resulting allocation of members to the two FOCJs of type II and the related optimal financial policy.

The empirical analysis has been undertaken applying the document analysis of Russian legal acts and the interview method. Interviews in Russia were especially valuable in obtaining information which cannot be received via literature and document analysis. They provided valuable insights into the legal possibilities for municipal cooperation, the involvement of municipalities and regions in decision-making, sector-specific conditions, the fiscal opportunities of the municipalities and regions, the relations between municipalities of different levels and the region with respect to schools. The aim of the interview with *Bodensee* water provision association was to gather information about how inter-municipal cooperation in the form of an FOCJ of type II is organised in practice: what financial, organisational and juridical aspects are important to consider in its establishment documents?

Beforehand, in order to gain a preliminary understanding, the author studied legal acts on education and local self-governance in the Russian Federation as well as the Russian Civil Code. This information, the main characteristics of FOCJs of type II obtained from the literature analysis and the results of micro-economic modelling were used to design the interview questions. In turn, the findings from the interview have been used to answer the question of whether it is possible to establish FOCJs of type II in Russia, to verify whether all reality factors of the Russian school system are considered by the FOCJ microeconomic models and to develop a Statute and Memorandum. Therefore, the methodology developed assists in contributing to the literature devoted to the FOCJ concept.

As a special sphere of activity, educational organisations can be established only in one of the non-commercial legal forms in Russia. Considering this aspect, the author has mainly focused on them. A document analysis follows an FOCJ literature analysis, which provided a list of characteristic features of FOCJs of type II. To find an appropriate legal form for FOCJs of type II in Russian legislation, these features should find reflection in the description of non-commercial legal forms of companies according to the Civil Code and other laws. The main difficulty here was finding legal forms that match all FOCJ of type II features simultaneously.

As the analysis of legal forms suitable for inter-municipal cooperation has revealed, school FOCJs of type II in Russia can be established only in the form of an association (union). Current legislation provides two non-commercial forms – autonomous non-commercial organisations and funds – which are suggested for the cooperation of municipalities in Russia. However, autonomous non-commercial organisations and funds are not suitable for FOCJs of type II because they do not assume membership of their founders and therefore no participation fees can be collected for the current operation activity. Since the thesis focuses on FOCJs of type II, there is only one non-commercial legal form of association (union) where municipalities can be members and founders, can voluntarily enter and quit, overlap and compete for members, have democratic

procedures and structures and a published statute and levy fees and contributions.

Russian legislation devoted to relationships between municipalities requires better clarification and structuring. For example, the possibility to organise IMC in a legal form of association (union) should be explicitly included in Article 69 of Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation” in one line with autonomous non-commercial organisations and funds. Furthermore, as an additional recommendation, the author finds that a special public law regime would be useful for Russia, which would regulate the activities of state and municipal authorities and public enterprises, including FOCJs of type II. This special public law regime is necessary to emphasise the exceptional role of public enterprises and show their unique rights and obligations because the Russian Civil Code does not distinguish between public and private legal forms so far.

Russia is a federal state with a federal structure, including the level of Federation, the regional level of administration (subjects of the Russian Federation) and the municipal level. The latter consists of two types of municipality: municipal areas and urban districts are upper-level municipalities; urban and rural settlements are lower-level municipalities. The right to establish, reorganise, liquidate and found schools belongs to the authorities at the municipal level. However, only upper-level municipalities, such as municipal areas, municipal and urban districts and urban districts with intra-city division may organise the provision of school services in Russian municipalities. The other types of municipalities, such as rural and urban settlements, are not competent to make decisions concerning school service provision. Upper-level municipalities are authorised to decide on the establishment, reorganisation and liquidation of school educational organisations, the maintenance of the buildings and structures of schools, the arrangement of adjacent territories, etc.

FOCJ of type II managerial bodies make decisions regarding a number of factor inputs, the size of the output produced, the preferred factor prices, the fulfilment of the cost coverage rule, the qualification of teachers, the quality of teaching materials, etc. on a regular basis. Their decisions are not always made in accordance with the priorities of FOCJ of type II member municipalities and FOCJ statutory purposes. At the same time, FOCJ management should possess enough freedom to fulfil its tasks to make an FOCJ of type II attractive so that current municipalities stay in the FOCJ of type II and new member municipalities join it. Therefore, to avoid unfavourable decisions and actions of FOCJ management and clarify its spectrum of responsibilities, there are different ways to coordinate management actions. By introducing a special legal framework, unfavourable management decisions can be reduced in the long run. For this purpose, the author has developed an exemplary school FOCJ of type II Statute and Memorandum. As a basis for these establishment documents, an association has been identified as an appropriate legal form for inter-municipal cooperation in Russia. Associations are required to have two establishment documents: Statute and Memorandum. The Statute is more detailed and contains guidelines

on how the Association should work, while the Memorandum expresses an initiative of parties to establish a joint company. The provisions of the Statute and Memorandum may overlap. This thesis complements the standard provisions of these documents with information important for FOCJs of type II, such as the results of theoretical models and the empirical insights obtained from the interviews with the representatives of school education authorities in the municipalities and region and the FOCJ-like form of inter-municipal cooperation in Germany (*Bodensee Zweckverband*).

Among the most important provisions of the Statute are the FOCJ of type II members; the goals and subject of activity; the competencies of executive bodies; the rights and obligations of members; the entrance and annual membership fee payment; the procedure of decision-making; the liquidation and re-organisation procedure; the tasks of the supreme body; the FOCJ of type II internal organisational structure; etc.

Stipulations regarding who is allowed to attend school FOCJs of type II affect the size of output; therefore, it should be marked in the FOCJ of type II Statute. Moreover, clarification of consumers in the Statute defines the market structure and the demand function and influences solutions for an FOCJ of type II optimal plan. FOCJ members can be divided into groups with respect to the quality of school services provided to them or the diversity of the services they consume from the FOCJ of type II. The question of whether children from other non-member municipalities can attend school FOCJs of type II affects the size of output. Thus, this information is crucial to define in the FOCJ of type II Statute.

The goals of an FOCJ of type II fixed in the Statute determine the case of management behaviour desired by FOCJ members so that unfavourable Cases III and IV of FOCJ management are simply excluded by the goals of the FOCJ of type II stipulated in the Statute. The tasks and fields of activity should be emphasised in the Statute as well. Whether an FOCJ of type II provides only primary educational services or basic or secondary (complete) education affects the demand size.

The paragraphs of the Statute devoted to members and the Assembly of Members show how powerful they are in relation to the executive bodies, the kinds of decisions they transfer to be made by the FOCJ of type II executive bodies and the responsibilities of the Assembly itself. Additionally, the competencies of management bodies included in the Statute are necessary because they steer management activities towards Cases I and II of management behaviour, avoiding Cases III and IV.

When municipalities become members of school FOCJs of type II, they transfer their responsibilities concerning school administration to FOCJs of type II as well as all kinds of financial support they receive for schools at the federal or regional level. Schools may also partly transfer their management bodies to the FOCJ of type II level, but they may still have some personnel that tackle everyday issues. For example, school directors and maintenance administrators. However, general decision-making and management of schools is moved to

FOCJs of type II as well as the responsibility to cover schools' costs. A school FOCJ of type II may include one or several schools under its administration. FOCJs of type II form their own budget to cover costs via regional and federal subventions and grants, municipal regular fees and other sources that should be set out by the FOCJ of type II Statute.

Provisions concerning membership and entrance fees are linked to the results of theoretical modelling and interviews. According to the information received from the analysis of interviews and legal acts, regional educational authorities finance labour costs and the costs of materials related to educational processes, such as textbooks and teachers' salaries. At the same time, municipalities are responsible for the maintenance of the buildings and structures of schools. Therefore, a mathematical solution for two-part tariffs has been adopted from the models of establishment and current operation of FOCJs of type II to be set out in the FOCJ of type II Statute. Other rules of entrance and regular fee payment as well as other sources can be imposed as well depending on the decision of the FOCJ of type II Assembly of Members.

The Statute should also contain the procedure for decision-making for FOCJ of type II bodies. The basis for the distribution of votes (such as the statistical number of school-age children in municipalities) and voting rules must be marked. The number of votes may be directly linked to output (number of pupils) or the share of a municipality in the FOCJ of type II equity capital. This shapes the results of voting and gives more way to some FOCJ of type II member municipalities.

FOCJs of type II might have subsidiaries and representative offices. In this case, information about them must be provided in the establishment documents. Usually such subsidiaries are created due to the special teaching or technological approach that can be adopted by schools not included in the FOCJ of type II.

The provision of the Statute related to the liquidation procedure emphasises the priority of the non-commercial goals of the Association because the property contribution of members must be returned to them in the share of their participation and used by municipalities for educational, cultural, social and other statutory purposes. However, if this is not possible, municipalities may use it for other purposes not prohibited by law.

How to organise permanent long-term inter-municipal cooperation with the primary aim of reducing municipal expenses for public services under the conditions of decreasing population is a topical issue in many countries. It is especially topical for Eastern European and developing countries, such as Russia, where practices of IMC are very few. This thesis provides theoretical and empirical recommendations regarding aspects that should be considered when establishing cooperation of municipalities in the form of Functional Overlapping Competing Jurisdictions of type II.

In particular, this thesis is of practical interest to the Russian policy-makers who are responsible for territorial development and municipal planning. For heads of municipal areas and urban districts initiating inter-municipal cooperation in municipalities, this thesis contains detailed guidelines on what should be

considered in school FOCJ of type II establishment documents. The FOCJ of type II Statute and Memorandum include solutions on how the shares of municipalities must be calculated and how to decide on the level of the regular participation fee, etc. In addition, municipalities might gain insights regarding the management type that should be employed for performing the current activity of an FOCJ of type II. If the aims of management cannot be revealed before they are employed, decisions can be regulated by the provisions stated in the FOCJ of type II Statute. This is useful for excluding management decisions that deviate from the statutory purposes of FOCJs of type II.

Since regional authorities provide subventions for schools to municipalities, which partially cover the municipal costs related to educational processes, regional school educational authorities might also be interested in school optimisation and cost reduction via the FOCJ of type II network.

School FOCJs of type II may focus on a particular educational level (e.g. primary or secondary general education), develop unique educational approaches and open access to technical and human resources (teachers) that single municipalities could not have done previously (Friedrich, Reiljan 2011). Basically, FOCJ of type II municipalities create a shared pool of material resources. Service receivers might gain most of this since the quality of school services is not equal everywhere in Russia. The situation is especially difficult in depopulated rural areas.

FUTURE RESEARCH

FOCJs of type II are economic units with municipalities that are founders and members. This means that the economic long-term cooperation of municipalities is under investigation in this thesis, which assumes FOCJs of types II. Other FOCJ types, such as I, III and IV, should be analysed in a similar way.

This thesis points to a broader overview of alternative forms of inter-municipal cooperation, such as joint projects, cooperation contracts, joint public enterprises, public-private partnerships, etc. in Chapter 1. Following the strengths of the long-term, formalised cooperation of municipalities suggested by the literature analysis, this thesis focuses on Functional Overlapping Competing Jurisdictions of type II as one of the more advantageous forms. However, a deeper comparative analysis of the alternative forms of inter-municipal cooperation in application to the Russian context can be a matter for further investigations. Another possible extension would be to consider the municipal reform of school centralisation as an alternative approach in dealing with depopulated municipalities.

The general advantages of FOCJs of type II are summarised in subchapter 1.2. However, a more complex approach, imbedding cost-benefit analysis or utility analysis, can be applied to uncover the advantages and disadvantages of FOCJs of type II and other types for Russia.

Investigations shown in the theoretical chapter for the FOCJ of type II can also be developed further. The author cannot conduct an *ex-post* evaluation of an FOCJ policy implementation to Russian regions because FOCJs of type II have not yet been introduced in Russia. Therefore, it is a matter of future research. This should be followed by determining the location and number of all FOCJs of type II in Russia. An equilibrium model for the FOCJs of type II using Tiebout's approach, gravity models, cluster analysis (Isard 1956), etc. can be developed as well.

It has been revealed via interviews that the Russian public officials responsible for school administration in municipalities and the management of schools, in general, positively evaluate the idea of the establishment of school FOCJs of type II. To analyse whether FOCJs of type II is an attractive concept for politicians as well, more interviews should be arranged. For example, at the regional level with representatives of Voronezh Regional Duma (Voronezh Regional Parliament).

It is not possible to include stochastic models in the thesis so far since there are no data on FOCJs of type II in Russia. However, this direction of research should not be excluded in future. In order to test the microeconomic models developed in this thesis, the first step could be to collect statistical data on FOCJs of type II in Austria, Germany, Switzerland and the United States, where FOCJs of types I and II exist. The effect of introducing FOCJs of type II on educational success can also be statistically checked for these countries.

Considering the main features of FOCJs of type II, it might be possible to identify, applying a regression analysis, which regions of Russia have more favourable conditions for inter-municipal cooperation in the form of FOCJs of type II.

Additionally, FOCJ management behaviour can be modelled assuming different types of market structure in comparison, such as monopoly, oligopoly, monopolistic competition, etc. In the oligopolistic model of current operation, the author found Launhardt-Hotelling solutions and Krelle-Ott spaces assuming that the management of two FOCJs of type II have the same case of behaviour. However, cases of FOCJ competition with different managerial behaviour can be investigated in future research.

Game-theoretical approaches and principal-agent problems, which are only partly involved in the thesis, can be developed further as well.

The empirical chapter focuses on the school level because municipalities are responsible for school educational organisations. However, other levels of education can be tackled similarly, considering the fact that regional and federal authorities are in charge of vocational and higher educational institutions, respectively. Whether FOCJ of type II inter-municipal cooperation is possible for other educational levels can also be questioned.

The applicability of FOCJs of type II to other publicly provided services (e.g. water supply, waste collection) in Russia can be checked as well. Other sectors of economy might have their own specificities, such as different production factors, different levels of governance (e.g. regional, federal authorities), other legislation and standards that regulate this sphere, etc. Additionally, a comparison of the conditions in Russia and, for example, Germany, where FOCJ of type II-like inter-municipal cooperation in the form of *Zweckverband* has existed for a long time could be conducted.

Interviews have only been conducted in one region of Russia, but a case study of other regions can similarly be tackled. The Voronezh region has been selected for the analysis because it is an illustrative example of the declining birth rate with a reduction in the number of schools and pupils. However, there are other regions experiencing a better demographic situation. An investigation of the potential for IMC in these regions could be useful for a comparison between regions. Whether rural or urban areas are more promising for the establishment of FOCJs of type II is also an open question.

The institutional part of the thesis can be developed further. For each type of FOCJ, the suitable legal forms of a company can be identified, which is partly fulfilled by this thesis. It is also necessary to check with respect to Russian legislation whether schools included in the FOCJ of type II may be legal persons or only subsidiaries with no legal personality.

As an institutional framework for the regulation of relationships between FOCJ management and members, this thesis offers an exemplary FOCJ of type II Statute and Memorandum in subchapter 3.4. These documents are applicable to Russia, but their suitability for FOCJs of type II in other countries should be investigated. There are other ways to coordinate management behaviour, such

as a special regional policy, regional subsidisation, direct orders, etc., which can be discussed as alternatives to the legal framework. Additionally, in order to avoid unfavourable decisions of FOCJ management, which can happen according to the results of Chapter 2, and to determine the rights and obligations of FOCJ of type II bodies, a Public Corporate Governance Code can be developed for school FOCJs of type II in Russia.

General adaptation measures after the establishment of an FOCJ of type II with respect to how FOCJs of type II should be financed: from federal, regional or municipal budgets, how schools should be located, whether transportation of pupils and teachers is necessary and whether a special education system should be introduced for FOCJ of type II staff and teachers could also be matters of future research. A detailed investigation into whether all of the requirements of the Russian Federal State Education Standards are considered by the FOCJ of type II Statute and Memorandum can be verified as well.

REFERENCES

- Acocella, N. (2005). *Economic Policy in the Age of Globalisation*. Cambridge, New York, Madrid: Cambridge University Press.
- Adams, W. (2015). Conducting Semi-Structured Interviews. In: *Handbook of Practical Program Evaluation* (pp. 492–506), J. S. Wholey, H. P. Hatry, K. E. Newcomer (Eds.): John Wiley & Sons.
- Albach, H. (1980). Average and Best-Practice Production Functions in German Industry. *The Journal of Industrial Economics*, 29(1), 55–70.
- Aldag, A. M., Warner, M. (2018). Cooperation, not cost savings: explaining duration of shared service agreements. *Local Government Studies*, 44(3), 350–370.
- Allen, R. G. D. (1967). *Macro-economic Theory: A Mathematical Treatment*. New York: St Martin's Press.
- Allers, M. A., De Greef, J. A. (2018). Intermunicipal cooperation, public spending and service levels. *Local Government Studies*, 44(1), 127–150.
- Andreev, A. L. (2013). On the Modernization of Education in Russia. *Russian Social Science Review*, 54 (5), 4–21.
- Anishenko, A. G., Sergunin, A. (2012) Twin cities: a new form of cross-border cooperation in the Baltic Sea Region? *Baltic Region*, 1(1), 19–27.
- Arntsen, B., Torjesen, D. O., Karlsen, T.-I. (2018). Drivers and barriers of inter-municipal cooperation in health services – the Norwegian case. *Local Government Studies*, 44(3), 371–390.
- Baba, H., Asami, Y. (2020). Municipal population size and the benefits of inter-municipal cooperation: panel data evidence from Japan. *Local Government Studies*, 46(3), 371–393.
- Bailey, S. J. (1999). *Local Government Economics: Principles and Practice*. London: Macmillan.
- Bartholomae, F. W., Popescu, A. M. (2007). The Role of Regional Competition for Demography and Regional Disparities in Germany. *Romanian Journal of Regional Science*, 1(1), 45–70.
- Bartholomae, F., Wiens, M. (2016). *Spieltheorie: Ein anwendungsorientiertes Lehrbuch*. Wiesbaden: Springer.
- Baumol, W. J. (1959). *Business Behavior, Value and Growth*. New York: Macmillan.
- Bel, G., Fageda, X. (2006). Between Privatization and Intermunicipal Cooperation: Small Municipalities, Scale Economies and Transaction Costs. *Urban Public Economics Review*, 6, 13–31.
- Bel, G., Fageda, X., Mur, M. (2013). Why Do Municipalities Cooperate to Provide Local Public Services? An Empirical Analysis. *Local Government Studies*, 39(3), 435–454.
- Bel, G., Gradus, R. (2018). Privatisation, contracting-out and inter-municipal cooperation: new developments in local public service delivery. *Local Government Studies*, 44(1), 11–21.
- Bel, G., Warner, M. E. (2015). Inter-Municipal Cooperation and Costs: Expectations and Evidence. *Public Administration*, 93(1), 52–67.
- Bel, G., Warner, M. E. (2016). Factors explaining inter-municipal cooperation in service delivery: a meta-regression analysis. *Journal of Economic Policy Reform*, 19(2), 91–115.

- Bel, G., Sebő, M. (2019). Does Inter-Municipal Cooperation Really Reduce Delivery Costs? An Empirical Evaluation of the Role of Scale Economies, Transaction Costs, and Governance Arrangements. *Urban Affairs Review*, 57(1), 153–188.
- Benz, M., Frey, B. S. (2007). Corporate Governance: What can we Learn from Public Governance? *The Academy of Management Review*, 32(1), 92–104.
- Bertrand, J. (1883). Revue de la Theorie Mathematique de la Richesse Sociale et des Recherches sur les Principes Mathematiques de la Theorie des Richesses. *Journal des Savants*, 67, 499–508.
- Björn, F. (1998). Haben Unternehmen eine Nutzenfunktion? Manager auch nicht. *Zeitschrift für Planung*, 9, 285–292.
- Bischoff, I., Wolfschütz, E. (2020). Inter-municipal cooperation in administrative tasks – the role of population dynamics and elections. *Local Government Studies*, 1–25.
- Bishop, R. L. (1964). A Zeuthen-Hicks Theory of Bargaining. *Econometrica*, 32(3), 410–417.
- Bisson, L. (2014). Cooperation between Russia and the EU in the Sphere of Migration. *Russian Politics & Law*, 52(6), 76–93.
- Blankart, Ch. B. (1980). *Ökonomie der öffentlichen Unternehmen*. München: Vahlen.
- Bolgherini, S. (2011). Local Government and Inter-Municipal Cooperation in Italy and Germany. *PIFO Politische Italien-Forschung*, 12, 1–64.
- Bondarenko, N., Borodina, D. et al. (2020). *Indicators of Education in the Russian Federation: Data Book*. Moscow: National Research University Higher School of Economics.
- Bondarenko, N., Gokhberg, L. et al. (2017). *Indicators of Education in the Russian Federation: Data Book*. Moscow: National Research University Higher School of Economics.
- Bondarenko, N., Gokhberg, L. et al. (2018). *Indicators of Education in the Russian Federation: Data Book*. Moscow: National Research University Higher School of Economics.
- Bönisch, P., Haug P., Illy, A., Schreier, L. (2011). Municipality Size and Efficiency of Local Public Services: Does Size Matter? *IWH Discussion Papers*, 18, 3–39.
- Bös, D. (1981). *Economic Theory of Public Enterprise*. Berlin, Heidelberg: Springer.
- Bös, D. (1986). *Public Enterprise Economics: Theory and Application*. Amsterdam, New York: North Holland.
- Bozeman, B. (2007). *Public values and public interest: Counterbalancing economic individualism*. Georgetown: Georgetown University press.
- Bozeman, B., Johnson, J. (2015). The Political Economy of Public Values: A Case for the Public Sphere and Progressive Opportunity. *American Review of Public Administration*, 45(1), 61–85.
- Bowley, A. L. (1924). *The Mathematical Groundwork of Economics*. Oxford: Oxford University Press.
- Brecher, Ch. et al. (2012). Integrative Production Technology for High-Wage Countries. In: *Integrative Production Technology for High-Wage Countries*, Ch. Brecher (Ed.): Springer.
- Branzei, R., Dimitrov, D., Tijjs, S. (2005). *Models in Cooperative Game Theory. Crisp, Fuzzy, and Multi-Choice Games*. Berlin, Heidelberg: Springer.
- Buchanan, J. (1965). An Economic Theory of Clubs. *Economica*, 32(125), 1–14.
- Calabrò, A., Torchia, M. (2011). Conflicts of Interest and Governance Mechanisms in Italian Local Public Utilities. *International Journal of Public Administration*, 34(7), 447–460.

- Cellini, S. R., Kee, J. E. (2015). Cost-Effectiveness and Cost-Benefit Analysis. In: *Handbook of Practical Program Evaluation* (pp. 636–673), J. S. Wholey, H. P. Hatry, K. E. Newcomer (Eds.): John Wiley & Sons.
- Chamberlin, E. (1933). *Theory of Monopolistic Competition*. Cambridge: Harvard University Press.
- Chebotareva, M. (2018). Application of Functional Overlapping Competing Jurisdictions concept to inter-municipal cooperation in the Russian school sector. *Современная экономика: проблемы и решения*, 7, 114–131.
- Chebotareva, M., Friedrich, P. (2017). Microeconomic Models of Functional Overlapping Jurisdiction (FOCJs). *Estonian Discussions on Economic Policies*, 25(1), 27–52.
- Chebotareva, M., Friedrich, P. (2020). Tax Shifting Decisions of Functional Overlapping Competing Jurisdictions' Management. In: *Decision Making in the Public Sector* (pp. 15–27), P. Eichhorn, D. Klein, J. Merk, A. Rahmel (Eds.): Jacobs-Verlag.
- Citroni, G., Lippi, A., Profeti, S. (2013). Remapping the State: Inter-Municipal Cooperation through Corporatisation and Public-Private Governance Structures. *Local Government Studies*, 39(2), 208–234.
- Civil Code of the Russian Federation. Available at: <http://www.consultant.ru> (Accessed in June 2019).
- Cobb, Ch. W., Douglas, P. H. (1928). A Theory of Production. *The American Economic Review*, 18(1), 139–165.
- Cournot, A. (1838). *Researches into the Mathematical Principles of the Theory of Wealth*. New York: Kelley.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). Thousand Oaks, California: SAGE.
- Cross, J. G. (1965). A Theory of the Bargaining Process. *The American Economic Review*, 55, 67–94.
- Debela, K. W. (2020). Local governance in Switzerland: Adequate municipal autonomy cum intergovernmental cooperation? *Cogent Social Sciences*, 6(1), 1–17.
- De Peuter, B., Wayenberg, E. (2007). Belgium: Flemish Inter-municipal Cooperation under Reform. In: *Inter-Municipal Cooperation in Europe* (pp. 23–38), R. Hulst, A. van Montfort (Eds.): Springer.
- Dehne, A., Friedrich, P., Nam, Ch. (2009). Determination of Fees for Local Services under the Consideration of Public and Management Objectives. *Zeitschrift für öffentliche und gemeinützige Unternehmen*, 32, 1–18.
- Diggs, B. J. (1973). The Common Good as Reason for Political Action. *Ethics*, 83(4), 283–293.
- Dollinger, P. (1976). *Die Hanse*. Stuttgart: Kröner.
- Dos Santos Ferreira, R. (1998). Launhardt and Hotelling. *Louvain Economic Review*, 64(1), 97–109.
- Drakopoulos, S. (1992). A Behavioural Approach to Kinked Demand Curves. *The Cyprus Journal of Economics*, 5(1), 1–14.
- Duncombe, W., Yinger, J. (2007). Does School District Consolidation Cut Costs? *Education Finance and Policy*, 2 (4), 341–375.
- Eckardt, M., Friedrich, P. (2014). European grouping of territorial cooperation (EGTC) as a legal form to realize cross border FOCJ. In: *Public Sector in Transition* (pp. 106–141), P. Friedrich, D. Greiling, T. Haldma (Eds.): University of Tartu Press.

- Eckardt, M., Gritsch, M. (2016). Governance of cross-border regional cooperation by the EGTC – An explorative analysis with a focus on Hungarian EGTCs. *Journal for Public and Non-Profit Services*, 39(1/2), 200–215.
- Edgeworth, F. Y. (1925). The pure theory of monopoly. In: *Papers relating to Political Economy* (pp. 111–142), F. Y. Edgeworth (Ed.): Macmillan.
- Eerma, D. (2014). *A bookkeeping approach to social accounting for a university faculty: the case of the University of Tartu*. Tartu: University of Tartu Press.
- Eichenberger, R., Frey, B. S. (2006). Functional, Overlapping and Competing Jurisdictions (FOCJ): A Complement and Alternative to Today’s Federalism. In: *Handbook of Fiscal Federalism* (pp. 154–181), E. Ahmad, G. Brosio (Eds.): Edward Elgar.
- Eichhorn, P., Friedrich, P. (1976). *Verwaltungsökonomie I*. Baden-Baden: Nomos.
- Eichhorn, P., Friedrich, P., Jann, W. (2003). *Verwaltungslexikon*. Baden-Baden: Nomos.
- Ellwood, S., Garcia-Lacalle, J. (2016). Examining Audit Committees in the Corporate Governance of Public Bodies. *Public Management Review*, 18(8), 1138–1162.
- Expert Commission of the German Public Corporate Governance-Modelcode (2020). *German Public Corporate Governance-Modelcode (G-PCGM)*. Available at: <https://pcg-musterkodex.de> (Accessed in January 2020).
- Fandel G. (1991). *Theory of production and Cost*. Berlin, Heidelberg: Springer.
- Fedele, M., Moini, G. (2007). Italy: The Changing Boundaries of Inter-Municipal Cooperation. In: *Inter-Municipal Cooperation in Europe* (pp. 117–138), R. Hulst, A. van Montfort (Eds.): Springer.
- Federal Act No. 7 “On Non-commercial Organisations”. Available at: <http://www.consultant.ru> (Accessed in May 2017).
- Federal Act No. 41 “On Production Cooperatives”. Available at: <http://www.consultant.ru> (Accessed in May 2017).
- Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation”. Available at: <http://www.consultant.ru> (Accessed in May 2017).
- Federal Act No. 161 “On the State and Municipal Unitary Enterprises”. Available at: <http://www.consultant.ru> (Accessed in May 2017).
- Federal Act No. 273 “On Education in the Russian Federation”. Available at: <http://www.consultant.ru> (Accessed in May 2017).
- Federal State Statistics Service (2020). *Russian Statistical Yearbook 2020*. Moscow: Rosstat. Available at: <https://eng.rosstat.gov.ru> (Accessed in May 2020).
- Fedorov, G. M. (2013). Innovations in the Baltic Sea region and network cooperation between Russia and the EU. *Baltic Region*, 1, 4–18.
- Feng, C., Friedrich, P. (2013). Basic Approaches to a Location Theory of One Public Firm. *Discussions on Estonian Economic Policy*, 21(1), 51–72.
- Fershtman, Ch., Judd, K. L. (1987). Equilibrium Incentives in Oligopoly. *The American Economic Review*, 77(5), 927–940.
- Fink, A. (2012). The Hanseatic League and the Concept of Functional Overlapping Competing Jurisdictions. *Kyklos*, 65(2), 194–217.
- Fladung, L., Friedrich, P. (2008). Finanzierung eines Wirtschaftsförderungs - FOCJ. In: *FOCJ als Mittel regionaler Kooperation* (pp. 23–47), P. Friedrich, F. Bartholomae (Eds.): Universität der Bundeswehr München.
- Fontana, A., Frey, J. H. (2000). The interview: From structured questions to negotiated text. In: *Handbook of qualitative research* (pp. 645–672), N. K. Denzin, Y. S. Lincoln (Eds.): SAGE.

- Frère, Q., Leprince, M., Paty, S. (2014). The Impact of Intermunicipal Cooperation on Local Public Spending. *Urban Studies*, 51(8), 1741–1760.
- Frey, B. S. (1999). *The New Democratic Federalism for Europe*. Cheltenham: Edward Elgar.
- Frey, B. S. (2001). A Utopia? Government without Territorial Monopoly. *The Independent Review*, 6(1), 99–112.
- Frey, B. S. (2005). Functional, Overlapping, Competing Jurisdictions: Redrawing the Geographic Borders of Administration. *European Journal of Law Reform*, 5(3/4), 543–555.
- Frey, B. S. (2009). A New Concept of European Federalism. *LSE 'Europe in Question' Discussion Paper Series*, 3, 1–24.
- Frey, B. S., Eichenberger, R. (1995). Competition among Jurisdictions: The Idea of FOCJ. In: *Competition among Institutions* (pp. 209–229), L. Gerken (Ed.): Palgrave Macmillan.
- Frey, B. S., Eichenberger, R. (1996). FOCJ: Competitive Governments for Europe. *International Review of Law and Economics*, 16(3), 315–327.
- Frey, B. S., Eichenberger, R. (1997). FOCJ: Creating a Single European Market for Governments. In: *Constitutional Law and Economics of the European Union* (pp. 195–215), D. Schmidtchen, R. Cooter (Eds.): Edward Elgar.
- Frey, B. S., Eichenberger, R. (1999). *The New Democratic Federalism for Europe: Functional Overlapping and Competing Jurisdictions*. Cheltenham, UK: Edward Elgar.
- Frey, B. S., Eichenberger, R. (2001a). Federalism with Overlapping Jurisdictions and Variable Levels of Integration: The Concept of FOCJ. In: *Regionalism in Europe: Geometries and Strategies after 2000* (pp. 3–21), J. Von Hagen, M. Widgren (Eds.): Kluwer Academic Publishers.
- Frey, B. S., Eichenberger, R. (2001b). A Proposal for Dynamic European Federalism: FOCJ. In: *Rules and Reasons: Perspectives on Constitutional Political Economy* (pp. 207–257), R. Mudambi, P. Navarra, G. Sobbrío (Eds.): Cambridge University Press.
- Frey, B. S., Eichenberger, R. (2002). Democratic Governance for a Globalized World. *Kyklos*, 55(2), 265–287.
- Friedman, J. (1983). *Oligopoly Theory*. Cambridge, New York, London, New Rochelle, Melbourne, Sydney: Cambridge University Press.
- Friedrich, P. (1978). Ausrichtung der Preisbildung öffentlicher Unternehmen am Grenzkostenpreisprinzip bei differierenden Marktformen. *Schriftenreihe der Gesellschaft für öffentliche Wirtschaft und Gemeinwirtschaft*, 16, 90–129.
- Friedrich, P. (2006). FOCJ: A New Type of Special Public Organization to Provide Health Services? In: *Liberalisierung im Gesundheitswesen, Schriftenreihe der Gesellschaft für öffentliche Wirtschaft* (pp. 133–154), G. Braun, E. Schultznieswandt (Eds.): Nomos.
- Friedrich P., Chebotareva, M. (2017). Options for Applying Functional Overlapping Competing Jurisdictions (FOCJs) for Municipal Cooperation in Russia. In: *Public Sector Entrepreneurship and the Integration of Innovative Business Models* (pp. 73–107), M. Lewandowski, B. Kozuch (Eds.): IGI Global.
- Friedrich, P., Feng, X. (2000). The Role of Public Enterprises in Regional Competition. In: *Regional Competition* (pp. 186–201), P. W. J. Batey, P. Friedrich (Eds.): Springer.

- Friedrich, P., Gwiazda, J., Nam, C. W. (2004). Strengthening Municipal Fiscal Autonomy Through Intergovernmental Transfers. In: *Urban Dynamics and Growth* (pp. 691–728), R. Capello, P. Nijkamp (Eds.): Elsevier.
- Friedrich, P., Kaltschütz, A., Nam, C. W. (2004). Significance and determination of fees for municipal finance. *CESinfo Working Paper Series*, 1357, 1–35.
- Friedrich, P., Popescu, A. M. (2006). FOCJ as Institution for Population Policy. In: *New members – new challenges for the European regional development policy* (pp. 228–242), T. Markowski, M. Turala (Eds.): Polish Academy of Sciences.
- Friedrich, P., Reiljan, J. (2011). FOCJ as model for financing the Estonian general Education. *Estonian Discussions on Economic Policy*, 19(2), 37–57.
- Friedrich, P., Ukrainski, K. (2013). Quangos as a tool of public management to promote public sector entrepreneurship. *Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen*, 43, 37–51.
- Friedrich, P., Ukrainski, K., Timpmann, K. (2014). *Teaching Public Management: Between Academic Disciplines. A Teaching Methodology for Students in Economics and Business Administration*. Tartu: Sihtasutus Archimedes.
- Frisch, R. (1933). Monopole-polypole-la notion de force dans l'économie. *Nationaløkonomisk Tidsskrift*, 71, 241–259.
- Frisch, R. (1964). *Theory of production*. Netherlands: Springer.
- Frolova, N., Danilova, S., Vasilkova, E. (2017). Public-Private Partnership as Means of State & Business Cooperation. *The European Proceedings of Social and Behavioural Sciences*, 699–704.
- Gabbe, J. (2008). *Legal Status of Cross-border Co-operation Structures – Past, Present and Prospects*. Gronau: Associations of European border regions (AEBR).
- Galletta, A. M. (2013). *Mastering the Semi-Structured Interview and Beyond: From Research Design to Analysis and Publication*. New York: NYU Press.
- Garrido, E. N. (2007). Inter-Municipal Cooperation in Spain: Dealing with Microscopic Local Government. In: *Inter-Municipal Cooperation in Europe* (pp. 169–192), R. Hulst, A. van Montfort (Eds.): Springer.
- Gillard, D. (2018). *Education in England: a history*. Available at: www.educationengland.org.uk/history (Accessed in June 2020).
- Glewwe, P., Lambert, S. (2010). Education production functions: evidence from developing countries. In: *International Encyclopedia of Education* (pp. 412–422), P. Peterson, E. Baker and B. McGaw (Eds.): Elsevier.
- Goodman, Ch. B., Leland, S. M. (2019). Do Cities and Counties Attempt to Circumvent Changes in Their Autonomy by Creating Special Districts? *American Review of Public Administration*, 49(2), 203–217.
- Götze, U., Northcott, D., Schuster, P. (2008). *Investment Appraisal: Methods and Models*. Berlin: Springer.
- Graaff, J. de V. (1963). *Theoretical Welfare Economics*. Cambridge: Cambridge University Press.
- Gradus, R., Schoute, M., Dijkgraaf, E. (2018). The effects of market concentration on costs of local public services: empirical evidence from Dutch waste collection. *Local Government Studies*, 44(1), 86–104.
- Gravelle, H., Rees, R. (2004). *Microeconomics*. London, New York, Boston, Toronto, Sydney: Pearson Education.
- Grossi, G., Reichard, Ch. (2008). Municipal corporatization in Germany and Italy. *Public Management Review*, 10 (5), 597–617.

- Grunwald, W., Bernthal, W. F. (1983). Controversy in German Management: The Harzburg Model Experience. *The Academy of Management Review*, 8(2), 233–241.
- Gutnikova Y. A. (2012). Inter-municipal cooperation as a factor promoting the economic and social development. *Economic and social changes: facts, trends, forecast*, 6(24), 198–208.
- Hanushek, E. A. (1979). Conceptual and Empirical Issues in the Estimation of Educational Production Functions. *The Journal of Human Resources*, 14(3), 351–388.
- Harris, D. N. (2010). Education Production Functions: Concepts. In: *International Encyclopedia of Education* (pp. 402–406), P. Peterson, E. Baker and B. McGaw (Eds.): Elsevier.
- Harsanyi, J. C. (1956). Approaches to the Bargaining Problem Before and After the Theory of Games: A Critical Discussion of Zeuthen's, Hicks', and Nash's Theories. *Econometrica*, 24(2), 144–157.
- Hart, D. M. (1982). Gustave de Molinari and the Anti-statist Liberal Tradition, Part III. *The Journal of Libertarian Studies*, 6(1), 83–104.
- Haveri, A., Airaksinen, J. (2007). Inter-Municipal Cooperation in Finland: Old Traditions and New Promises. In: *Inter-Municipal Cooperation in Europe* (pp. 39–66), R. Hulst, A. van Montfort (Eds.): Springer.
- Heinen, E. (1966). *Das Zielsystem der Unternehmung. Grundlagen betriebswirtschaftlicher Entscheidungen*. Wiesbaden: Gabler Verlag.
- Heinz, W. (2007). Inter-Municipal Cooperation in Germany: The Mismatch Between Existing Necessities and Suboptimal Solutions. In: *Inter-Municipal Cooperation in Europe* (pp. 91–115), R. Hulst, A. van Montfort (Eds.): Springer.
- Henderson, J. M., Quandt, R. E. (1980). *Microeconomic theory: A mathematical approach*. Singapore: McGraw-Hill.
- Hicks, J. R. (1942). Consumers' Surplus and Index-Numbers. *Review of Economic Studies*, 9(2), 126–137.
- Hicks, J. R. (1963). *The Theory of Wages* (2nd Edition). London: Macmillan.
- Hill, Ch. W. L., Jones, G. R., Schilling, M. A. (2014). *Strategic Management Theory: An Integrated Approach* (11th Edition). South-Western: Cengage Learning.
- Hillman, A. L. (2009). *Public Finance and Public Policy: Responsibilities and Limitations of Government* (2nd Edition). New York: Cambridge University Press.
- Hophmayer-Tokich, S., Kliot, N. (2008). Inter-municipal cooperation for wastewater treatment: case studies from Israel. *Journal of Environmental Management*, 86(3), 554–565.
- Hotelling, H. (1929). Stability in Competition. *The Economic Journal*, 39(153), 41–57.
- Hsieh, H.-F., Shannon, S. E. (2005). Three Approaches to Qualitative Content Analysis. *Qualitative health research*, 15(9), 1277–1288.
- Huber, S. G. (2011). School Governance in Switzerland: Tensions between New Roles and Old Traditions. *Educational Management Administration & Leadership*, 39(4), 469–485.
- Hulst, R., Montfort, A. van (2007). The Netherlands: Cooperation as the only Viable Strategy. In: *Inter-Municipal Cooperation in Europe* (pp. 139–168), R. Hulst, A. van Montfort (Eds.): Springer.
- Hulst, R., Montfort, A. van (2011). Institutional Features of Inter-Municipal Cooperation: Cooperative Arrangements and their National Contexts. *Public Policy and Administration*, 27(2), 121–144.
- Humphrey, T. M. (1997). Algebraic Production Functions and their Uses before Cobb-Douglas. *Economic Quarterly*, 83(1), 51–83.

- IMC Toolkit Manual (2010). *Inter-municipal cooperation*. Available at: <http://www.municipal-cooperation.org> (Accessed in June 2016).
- Isard, W. (1956). *Location and space economy: A General Theory Relating to Industrial Location, Market Areas, Land Use, Trade, and Urban Structure*. New York: The M.I.T. Press and Wiley.
- Jehle, G. A., Reny, P. J. (2011). *Advanced Microeconomic Theory* (3rd Edition). London, New York: Pearson.
- Jensen, M. C., Meckling, W. H. (1976). Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3(4), 305–360.
- Kelly, A. (2003). *Decision Making using Game Theory: An introduction for managers*. Cambridge: Cambridge University Press.
- Kelly, J. (2007). The Missing Ingredient: Inter-municipal Cooperation and Central-Local Relations in the UK. In: *Inter-Municipal Cooperation in Europe* (pp. 193–210), R. Hulst, A. van Montfort (Eds.): Springer.
- Klijn, E.-H., Koppenjan, J., Termeer, K. (1995). Managing Networks in the Public Sector: A Theoretical Study of Management Strategies in Policy Networks. *Public Administration*, 73(3), 437–454.
- Klimovský, D., Mejere, O., Mikolaityte, J., Pinterič, U., Saparniene, D. (2014). Inter-Municipal Cooperation in Lithuania and Slovakia: Does Size Structure Matter? *Lex localis*, 12(3), 643–658.
- Kozlova, O. A., Makarova, M. N. (2018). Inter-municipal cooperation as an institution of strategic development of territories. *Economic and Social Changes: Facts, Trends, Forecast*, 11(3), 132–144.
- Krelle, W. (1961). *Preistheorie*. Tübingen: J.C.B. Mohr (Paul Siebeck).
- Krueger, A. (1999). Experimental estimates of education production functions. *The Quarterly Journal of Economics*, 114(2), 497–532.
- Kuhlmann, S. (2010). Between the State and the Market: Assessing Impacts of Local Government Reforms in Western Europe. *Lex Localis*, 8(1), 1–21.
- Lanzillotti, R. F. (1958). Pricing Objectives in Large Companies. *The American Economic Review*, 48(5), 921–940.
- Launhardt, W. (1885). *Mathematisch Begründung der Volkswirtschaftslehre*. Leipzig: B.G. Teubner Verlag.
- Leibenstein, H. (1966). Allocative Efficiency vs. “X-Efficiency”. *The American Economic Review*, 56(3), 392–415.
- Linder, W. (2010). *Swiss Democracy: Possible Solutions to the conflict in Multicultural Societies* (3rd Edition). London: Palgrave Macmillan.
- Lingnau, V., Härtel, I. (2014). Zum Verhältnis von Unternehmenszielen und Stakeholderzielen. *Beiträge zur Controlling-Forschung*, 26, 1–33.
- Lloyd, P. J. (1969). Elementary Geometric/Arithmetic Series and Early Production Theory. *Journal of Political Economy*, 77(1), 21–34.
- Longley, C. H., Sneed, J. (2009). Effects of Federal Legislation on Wellness Policy Formation in School Districts in the United States. *Journal of the American Dietetic Association*, 109(1), 95–101.
- Luce, R. D., Raiffa, H. (1957). *Games and Decisions*. New York: Wiley & Sons.
- Machina, M. J. (1987). Choice Under Uncertainty: Problems Solved and Unsolved. *Journal of Economic Perspectives*, 1(1), 121–154.

- Mann, D., Briller, V. (2005). School Administration in Russia: Centralization Versus Decentralization. In: *Fundamental Change. International Handbook of Educational Change* (pp. 120–134), M. Fullan (Ed.): Springer.
- Marris, R. (1964). *The economic theory of managerial capitalism*. London: Macmillan.
- Matzembacher, D. E., Raudsaar, M., Mets, T. (2019). Sustainable Entrepreneurial Process: From Idea Generation to Impact Measurement. *Sustainability*, 11(21), 1–27.
- Mayring, Ph. (2014). *Qualitative content analysis: theoretical foundation, basic procedures and software solution*. Klagenfurt. Available at: <https://www.psychopen.eu> (Accessed in June 2020).
- McGregor, D. (1960). *The human side of enterprise*. New York: McGraw-Hill.
- Mert, M. (2018). What does a firm maximize? A simple explanation with regard to economic growth. *International Journal of Engineering Business Management*, 10, 1–13.
- Metis (2014). *EGTC Monitoring Report 2013. Towards the New Cohesion Policy*. Available at: <https://cor.europa.eu> (Accessed in June 2020).
- Meynhardt, T. (2015). Public Value – Turning a Conceptual Framework into a Scorecard. In: *Public Value and Public Administration* (pp. 147–169), L. Bloomberg, J. M. Bryson, B. Crasby (Eds.): Georgetown University Press.
- Miles, M. B., Huberman, A. M., Saldaña, J. (2014). *Qualitative Data Analysis. A methods sourcebook* (3rd ed.). London: SAGE.
- Mizany, K., Manatt, A. (2002). *What's So Special About Special Districts? A Citizen's Guide to Special Districts in California*. Available at: <https://www.napa.lafco.ca.gov> (Accessed in May 2020).
- Moore, M. H. (1995). *Creating Public Value: Strategic management in government*. Cambridge: Harvard University Press.
- Moore, M. H. (2013). *Recognizing Public Value*. Cambridge: Harvard University Press.
- Muller, D. C. (2003). *Public Choice III*. New York: Cambridge University Press.
- Musgrave, R. A., Musgrave, P. (1989). *Public Finance in Theory and Practice*. New York: McGraw-Hill.
- Myerson, R. (1982). Optimal Coordination Mechanisms in Generalized Principal-Agent Problems. *Journal of Mathematical Economics*, 10, 67–81.
- Nash, J. (1953). Two-Person Cooperative Games. *Econometrica*, 21(1), 128–140.
- Niaounakis, T., Blank, J. (2017). Inter-municipal cooperation, economies of scale and cost efficiency: an application of stochastic frontier analysis to Dutch municipal tax departments. *Local Government Studies*, 43(4), 533–554.
- North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.
- Odiorne, G. S. (1965). *Management by Objectives: A System of Managerial Leadership*. New York: Fearon-Pitman Publishing.
- OECD (2014). *OECD Territorial Reviews: Netherlands 2014*. Paris: OECD Publishing
- OECD (2018). *Ownership and Governance of State-Owned Enterprises: A Compendium of National Practices*. Available at: <https://www.oecd.org> (Accessed in January 2020).
- OECD (2019). *OECD Corporate Governance Factbook 2019*. Available at: <https://www.oecd.org> (Accessed in January 2020).
- Olson, M. (1969). The principle of fiscal equivalence. The division of responsibilities among different levels of government. *American Economic Review*, 59(2), 479–487.

- Oltmann, S. M. (2016). Qualitative Interviews: A Methodological Discussion of the Interviewer and Respondent Contexts. *Forum: Qualitative Social Research*, 17(2), 15.
- Osborne, M. J., Rubinstein, A. (1994). *A Course in Game Theory*. Cambridge, Massachusetts: MIT Press.
- Osterrieder, H., Bahloul, H., Wright, G., Shaffner, K., Mozur, M. (2006). Joining Forces and Resources for Sustainable Development. *Cooperation among Municipalities - A Guide for Practitioners*. Bratislava: UNDP Bratislava Regional Centre.
- Ott, A. E. (1970). *Grundzüge der Preistheorie*. Göttingen: Vandenhoeck und Rupprecht Verlag.
- Ouchi, W. G. (1981). *Theory Z*. New York: Avon Books.
- Pakhalov, A. M., Saks D. G. (2020). Networking of Small Tourist Destinations: Evidence from Russia. In: *Cultural and Tourism Innovation in the Digital Era* (pp. 381–391), V. Katsoni, T. Spyriadis (Eds.): Springer.
- Papenfuß, U., Schaefer, Ch. (2017). Beteiligungsmanagement und Public Corporate Governance: Grundsachverhalte und Reformperspektiven. *ZögU - Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen*, 40(2–3), 131–151.
- Parts, E. (2010). *Social capital, its determinants and relations with economic growth: Comparison of the Western European and Central and Eastern European countries*. Saarbrücken, Germany: LAP LAMBERT Academic Publishing.
- Peltzman, S. (1971). Pricing in Public and Private Enterprises: Electric Utilities in the United States. *Journal of Law and Economics*, 14, 109–147.
- Pen, J. (1952). A General Theory of Bargaining. *The American Economic Review*, 42(1), 24–42.
- Persson, T., Tabellini, G. (2002). *Political Economics: Explaining Economic Policy*. Cambridge: The MIT Press.
- Ploom, K., Haldma, T. (2013). Balanced performance management in the public education system: An empirical study of Estonian general education schools. *Baltic Journal of Management*, 8(2), 183–207.
- Rainey, H. G. (1989). Public management: Recent research on the political context and Managerial roles, structures and behaviours. *Journal of Management*, 15(2), 229–250.
- Rees, R. (2006). *The Economics of Public Utilities*. Cheltenham, Northampton: Edward Elgar.
- Reichard, C. (2002). Marketization of public services in Germany. *International Public Management Review*, 3(2), 63–79.
- Ross, S. (1973). The Economic Theory of Agency: The Principal's Problem. *American Economic Review*, 63(2), 134–139.
- Rubinstein, A. (1982). Perfect equilibrium in a bargaining model. *Econometrica*, 50(1), 97–109.
- Ruester, S., Zschille, M. (2010). The impact of governance structure on firm performance: An application to the German water distribution sector. *Utilities Policy*, 18(3), 154–162.
- Samuelson, P. A. (1979). Paul Douglas's Measurement of Production Functions and Marginal Productivities. *Journal of Political Economy*, 87(5), 923–939.
- Saraydar, E. (1971). A Certainty-Equivalent Model of Bargaining. *The Journal of Conflict Resolution*, 15(3), 281–297.
- Sato, K. (1967). A Two-Level Constant-Elasticity-of-Substitution Production Function. *The Review of Economic Studies*, 34(2), 201–218.

- Scholich, D. (Ed.). (2007). *German Annual of Spatial Research and Policy. Territorial Cohesion*. Berlin, Heidelberg, New York: Springer.
- Shaw, S. (2012). History of education. In: *Professional studies in primary education* (pp. 3–18), H. Cooper (Ed.): SAGE.
- Sen, D. (2004). The kinked demand curve revisited. *Economics Letters*, 84, 99–105.
- Silvestre, H. C., Marques, R. C., Dollery, B., Correia, A. M. (2020). Is cooperation cost reducing? An analysis of public-public partnerships and inter-municipal cooperation in Brazilian local government. *Local Government Studies*, 46(1), 68–90.
- Skidmore, P. (2006). *Public Value and Policing*. London: Work Foundation.
- Sklivas, S. D. (1987). The strategic choice of managerial incentives. *RAND Journal of Economics*, 18(3), 452–458.
- Slack, N. E. (1997). *Inter-Municipal Cooperation: Sharing of Expenditures and Revenues*. Toronto: ICURR Press.
- Slack, N. E., Bird, R. (2013). Merging Municipalities: Is Bigger Better? *IMFG Papers on Municipal Finance and Governance*, 14, 1–34.
- Smith, D. (2011). *Functional, Overlapping, Competing Jurisdictions among Fractionalized Agents: Medieval Spain*. Available at: <https://papers.ssrn.com> (Accessed in January 2017).
- Soto, M. (2002). Rediscovering Education in Growth Regressions. *OECD Development Centre Working Papers*, 202. Paris: OECD Publishing.
- Spennlingwimmer, T. (2017). *Der Public Corporate Governance Kodex in öffentlichen Unternehmen*. Wiesbaden: Springer.
- Spremann, K. (1987). Agent and Principal. In: *Agency Theory, Information, and Incentives* (pp. 3–38), G. Bamberg, K. Spremann (Eds.): Springer.
- Stackelberg, H. (2011). *Market structure and equilibrium*, translated by D. Bazin, L. Urch and R. Hill. Berlin, Heidelberg: Springer.
- Steiner, R. (2003). The causes, spread and effects of inter-municipal cooperation and municipal mergers in Switzerland. *Public Management Review*, 5(4), 551–571.
- Steinhaus, H. (1948). The Problem of Fair Division. *Econometrica*, 16(1), 101–104.
- Sweezy, P. M. (1939). Demand Under conditions of oligopoly. *The Journal of Political Economy*, 47(4), 568–573.
- Swianiewicz, P., Teles, F. (2019). The institutionalization of inter-municipal arrangements in Europe: findings from the unusual suspects. *Transylvanian Review of Administrative Sciences*, 57, 119–136.
- Teles, F. (2016). *Local governance and inter-municipal cooperation*. New York: Palgrave Macmillan.
- Texas Senate Research Center (2008). *Invisible Government: Special Purpose Districts in Texas*. Available at: <https://texashistory.unt.edu> (Accessed in January 2016).
- Thiemeyer, T. (1975). *Wirtschaftslehre öffentlicher Betriebe*. Reinbek bei Hamburg: Rowohlt.
- Tiebout, Ch. (1956). A Pure Theory of Local Expenditures. *Journal of Political Economy*, 64, 416–424.
- Tijs, S. (1981). Bounds for the core and the r-value. In: *Game Theory and Mathematical Economics* (pp. 123–132), O. Moeschlin, D. Pallaschke (Eds.): North-Holland Publishing Company.
- Tirole, J. (2006). *The theory of corporate finance*. Princeton, New Jersey: Princeton University Press.
- Tucker, A., de Bellis, G. P. (Eds.) (2016). *Panarchy: Political Theories of Non-Territorial States*. New York: Routledge.

- Tynkkynen, N. (2008). Experiences of environmental cooperation between the Nordic countries and Russia: Lessons learned and the way forward. In: *The new northern dimension of the European neighbourhood* (pp. 71–91), P. Aalto, H. Blakkisrud, H. Smith (Eds): CEPS.
- Walliman, N. (2001). *Your Research Project: A Step-by-Step Guide for the First time Researcher*. London: SAGE.
- Walters, A. A. (1963). Production and Cost Functions: An Econometric Survey. *Econometrica*, 31(1/2), 1–66.
- Warner, M. E. (2006). Inter-municipal Cooperation in the U.S.: A Regional Governance Solution? *Urban Public Economics Review*, 6, 221–239.
- West, K. (2007). Inter-Municipal Cooperation in France: Incentives, Instrumentality and Empty Shells. In: *Inter-Municipal Cooperation in Europe* (pp. 67–90), R. Hulst, A. van Montfort (Eds): Springer.
- Williamson, O. E. (1964). *The Economics of Discretionary Behaviour: Managerial Objectives in a Theory of the Firm*. Hoboken, New Jersey: Prentice-Hall.
- Van de Walle, S., Groeneveld, S. M. (2011). New steering instruments: Trends in public sector practice and scholarship. In: *New steering concepts in public management* (pp. 205–214), S. Groeneveld, S. Van de Walle (Eds): Emerald.
- Varian, H. R. (1992). *Microeconomic analysis* (3rd Edition). New York, London: W.W. Norton & Company.
- Varian, H. R. (2010). *Intermediate Microeconomics. A Modern Approach*. (8th Edition). New York, London: W. W. Norton & Company.
- Zabojnik, J. (1998). Sales maximization and specific human capital. *Rand Journal of Economics*, 29(4), 790–802.
- Zaitseva, Korneevets, Semenova (2016). Prospects for the Cross-Border Cooperation Between Russia and Poland in the Field of Tourism. *International journal of environmental & science education*, 11(14), 7166–7175.
- Zeuthen, F. (1930). *Problems of Monopoly and Economic Warfare*. London: Routledge.
- United Nations (2017). *World Population Prospects. The 2017 Revision: Key Findings and Advance Tables*. Available at: <https://population.un.org> (Accessed in January 2020).
- Uzawa, H. (1962). Production Functions with Constant Elasticities of Substitution. *The Review of Economic Studies*, 29(4), 291–299.
- Антонов, Е. В. (2020). Городские агломерации: подходы к выделению и делимитации. *Контуры глобальных трансформаций: политика, экономика, право*, 13(1), 180–202.
- Арумова, Е. С. (2012). *Организационные схемы и механизмы межмуниципального сотрудничества*. Краснодар: Кубанский государственный университет.
- Бабун, Р. В. (2012). Агломерация городов как объект управления. *Регион: экономика и социология*, 2(74), 239–252.
- Бутова, Т. В., Пухова, М. М., Шукин, И. А. (2013). Проблемы и перспективы становления института межмуниципального сотрудничества в России. *Управленческие науки*, 3(8), 4–15.
- Бутова, Т. В., Смирнова, А. А., Миловидова, Н. А. (2014). Межмуниципальное сотрудничество как основа обеспечения устойчивости региона. *Управленческие науки*, 3(12), 4–15.
- Винницкий, А. В. (2010). Участие публичных образований в имущественных отношениях: проблемы сбалансированности административно-правового и

- гражданско-правового регулирования. *Административное и муниципальное право*, 11, 83–91.
- Винницкий, А. В. (2013). *Публичная собственность*. Москва: Статут.
- Власова, Н. Ю., Джек, Л. Н. (2009). Перспективы развития межмуниципального сотрудничества в субъектах РФ. *Вопросы управления*, 2(9), 13–17.
- Гайнанов, Д. А., Тажитдинов, И. А., Атаева, А. Г. (2017). Межмуниципальное сотрудничество в Российской Федерации: теоретические и практические аспекты. *Экономика и предпринимательство*, 8–2 (85), 295–300.
- Госкомстат РФ (2004). *Постановление от 05.01.2004 №1 “Об утверждении унифицированных форм первичной учетной документации по учету труда и его оплаты”*. Available at: <http://www.consultant.ru> (Accessed in May 2020).
- Гохберг, Л. М., Озерова, О. К., Саутина, Е. В., Шугаль, Н. Б. (2020). *Образование в цифрах: краткий статистический сборник*. Москва: НИУ ВШЭ.
- Гриценко, Е. В. (2001). *Местное самоуправление в системе публичного управления федеративного государства. Значение опыта ФРГ для России*. Иркутск: ИГЭА.
- Даутов, Р. М. (2018). Муниципальная кооперация: цели, стимулирование, результаты, дифференциация проектов. *Научные труды центра перспективных экономических исследований*, 14, 46–56.
- Ирискина, О. В. (2010). Современные формы управления межмуниципальным сотрудничеством в Российской Федерации. *Известия Саратовского университета*, 2(10), 60–65.
- Ладыгин, В. В. (2011). Возможности создания муниципального бизнес-инкубатора с использованием механизмов межмуниципальной кооперации. *Вопросы государственного и муниципального управления*, 2, 25–38.
- Лякишева, В. Г., Шлегель, А. А. (2017). Роль межмуниципального сотрудничества в социально-экономическом развитии территории. *Экономика, профессия, бизнес*, 1(3), 41–46.
- Малков, П. В., Баранов, Э. Ф. et al. (Eds.) (2019). *Россия в цифрах 2019. Краткий статистический сборник*. Москва: Росстат. Available at: <https://www.gks.ru> (Accessed in June 2020).
- Маркварт, Э. (2010). Межмуниципальная хозяйственная кооперация как инструмент повышения эффективности предоставления муниципальных услуг. *Федерализм*, 3(59), 47–56.
- Маркварт, Э. (2016). Депопуляция – один из вызовов государственному и муниципальному управлению в современном мире. *Экономика и жизнь*, 39, 59–64.
- Маркварт, Э., Францке, Й. (2017). Территориальное реформирование местного самоуправления в Германии и России на современном этапе. *Пространственная экономика*, 3, 40–61.
- Матершева, В. В., Клинова С. П., Соловьев Б. А. (2008). *Микроэкономика – 2: учебное пособие*. Воронеж: Воронежский государственный университет.
- Меркулов, А. В. (2020). Стратегия межмуниципальной кооперации как инструмент управления локальными территориями. *Вестник Академии знаний*, 37(2), 173–178.
- Миронова, О. В. (2014). История и опыт формирования современной модели межмуниципального сотрудничества. *Вестник Астраханского государственного технического университета*, 1, 44–51.

- Миронова, О. В. (2017). Организационно-управленческие формы сотрудничества российских муниципалитетов. *Государственная власть и местное самоуправление*, 5, 17–22.
- Михайлова, М. А. (2010). Городская агломерация как новая форма межмуниципального сотрудничества. *Проблемы теории и практики управления*, 6(74), 114–117.
- Москаленко, А. Ф. (2016). Становление и развитие правовой доктрины межмуниципального сотрудничества в России. *Вестник Томского государственного университета. Право*, 1(19), 30–38.
- Мэнкью, Н. Г. (1999). *Принципы Экономикс*. СПб: Питер Ком.
- Негодуйко, А. В. (2008). *Управление межмуниципальным экономическим сотрудничеством в регионе*. Иркутск: ИПО БГУЭП.
- Нейман, фон Дж., Моргенштерн, О. (1970). *Теория игр и экономическое поведение*. Москва: Наука.
- Остапец, О. Г. (2017). Система правового регулирования межмуниципального сотрудничества в России. *Вестник Поволжского института управления*, 17(1), 56–61.
- Петроградская, А. А. (2010). Виды и формы межмуниципального сотрудничества в Российской федерации. *Вестник Самарского государственного университета*, 5(79), 256–262.
- Петроградская, А. А. (2011). *Правовое регулирование межмуниципального сотрудничества в Российской Федерации*. Саратов: Саратовский юридический институт МВД России.
- Петросян, Л. А., Зенкевич, Н. А., Шевкопляс, Е. В. (2012). *Теория игр: учебник (2-е издание)*. Санкт-Петербург: БХВ-Петербург.
- Пивоваров, А. (2015). Школьный образовательный округ как способ организации сетевого взаимодействия муниципальной системы образования. *Муниципальное образование: инновации и эксперимент*, 2, 14–33.
- Победин, А. А. (2013). Перспективы межмуниципального сотрудничества при развитии городских агломераций: опыт зарубежных стран и России. *Вестник Омского университета*, 4, 43–48.
- Рагозина, Л. Г. (2009). Правовое обеспечение и практика осуществления различных форм межмуниципальной кооперации в России и за рубежом. *Институт экономики города*. Available at: <https://urbaneconomics.ru> (Accessed in January 2020).
- Рамазанов, М. А. (2019). Правовые основы, возможности и институциональные ограничения межмуниципального сотрудничества в России. *Научный форум: Экономика и менеджмент. Сборник статей по материалам XXVI международной научно-практической конференции*, 3(26), 9–13.
- Рождественская, И. А., Кабалинский, А. И. (2016). Межмуниципальное сотрудничество в регионах России и его роль в развитии городских агломераций. *Экономика и предпринимательство*, 1(66), 387–390.
- Росстат (2017). *Регионы России. Социально-экономические показатели 2017*. Available at: <https://rosstat.gov.ru> (Accessed in May 2021).
- Росстат (2018). *Регионы России. Социально-экономические показатели 2018*. Available at: <https://rosstat.gov.ru> (Accessed in May 2021).
- Росстат (2019). *Регионы России. Социально-экономические показатели 2019*. Available at: <https://rosstat.gov.ru> (Accessed in May 2021).

- Росстат (2020). *Регионы России. Социально-экономические показатели 2020*. Available at: <https://rosstat.gov.ru> (Accessed in May 2021).
- Советов, Б. Я., Яковлев, С. А. (2001). *Моделирование систем*. Учебник для вузов (3-е издание). Москва: Высшая школа.
- Суринов, А. Е., Баранов, Э. Ф. et al. (Eds.) (2016). *Россия в цифрах 2016. Краткий статистический сборник*. Москва: Росстат. Available at: <https://www.gks.ru> (Accessed in June 2020).
- Суринов, А. Е., Баранов, Э. Ф. et al. (Eds.) (2017). *Россия в цифрах 2017. Краткий статистический сборник*. Москва: Росстат. Available at: <https://www.gks.ru> (Accessed in June 2020).
- Тургель, И. Д. (2015). Межмуниципальное сотрудничество в РФ: пространственная специфика развития и управления. *Вопросы управления*, 3(34), 196–203.
- Урманов, Д. В. (2013). Институциональные барьеры формирования и развития механизмов межмуниципального сотрудничества в России. *Региональные исследования*, 1(39), 114–121.
- Федеральная служба государственной статистики (2018). *База данных показателей муниципальных образований*. Available at: <https://www.gks.ru> (Accessed in May 2020).
- Филатова, Т. В., Воробьева, Е. С., Тарасов, И. В., Шаповаленко, Е. В. (2014). Объединение муниципальных образований: проблемы и перспективы. *Вестник университета*, 3, 100–105.
- Цветкова, О. В. (2017). Роль местного самоуправления и межмуниципального сотрудничества в развитии приграничных территорий Российской Федерации (на примере Псковской области). *Политическая экспертиза*, 13(2), 65–76.
- Шипачев, В. С. (1985). *Высшая математика. Учебник для нематематических специальностей вузов*. Москва: Высшая школа.

APPENDICES

Annex 1. Terms and Definitions

Term	Definition (in accordance with current thesis)
Amalgamation	The merger of two or more geographically contiguous municipalities (Slack, Bird 2013: 4).
Association	A non-commercial legal company form with legal entities and/or citizens as members who are not less than two, can exit at any time and have to pay membership fees and form equity capital. Association has its Statute and internal self-administrated structures (Civil Code of the Russian Federation, Articles 123.8-123.11).
Autonomous behaviour	Autonomous behaviour means that if one FOCJ decides to change its service fee, it does not consider the reaction of the rival (another FOCJ).
Cross-border cooperation	Joint activity in public service provision of municipalities which belong to different countries.
Equilibrium	When two FOCJs reach such a combination of fees p_1 and p_2 which maximize management utility and they have no initiative to change their fees anymore. “At any fee other than an equilibrium fee, some agents’ behaviours would be infeasible, and there would therefore be a reason for their behaviour to change” (Varian 1992: 283).
Equity capital	A minimum size of the property of the legal entity which guarantees the interests of its creditors. It can be in a monetary and in-kind form.
Federal state educational standard (FSSES)	A set of obligatory requirements to the educational programmes of primary (<i>начальное</i>), basic (<i>основное</i>) and secondary (<i>среднее</i>) general education, vocational education and higher education institutions, which have state accreditation (Federal Act No. 273 “On education in the Russian Federation”, Article 2, § 6).
Functional Overlapping Competing Jurisdictions (FOCJs)	1) Public organizations which are jointly established by municipalities to provide one or several public services, overlapping and competing with other public and private units on the same territory (The definition of FOCJs in the context of the thesis is different from the one meant by Frey, Eichenberger 1999 in their initial concept). 2) Form of inter-municipal cooperation.
FOCJ management	FOCJ executive bodies who administrate and organise daily procurement. For example, a sole executive body (chairman, president, etc.) and collective executive bodies (council, board, presidium, committee etc.)

Term	Definition (in accordance with current thesis)
General education	General education in Russia includes 4 stages: <ul style="list-style-type: none"> – pre-school education that children usually receive in kindergartens; – primary general education; – basic general education; – secondary general education. The last three stages of general education pupils usually receive in schools. Therefore, the last three stages are called “school education” in this thesis.
Institutions	Formal and informal rules which shape interactions between individuals and “reduce uncertainty by providing structure” (North1990). The thesis focuses on formal institutions (e.g. legal acts of Russia, internal normative documents for FOCJs, etc.)
Inter-municipal cooperation (IMC)	“Inter-Municipal cooperation is when two or more municipalities agree to work together on any of the tasks assigned to them in order to gain mutual benefits. The term ‘inter-municipal cooperation’ is a relationship between two or several local authorities (i.e. entities at the first level of territorial administration) having a status of legal persons, endowed with competences, powers, and resources in accordance with the European Charter of Local Self-Government” (IMC Toolkit Manual 2010: 7).
Isoutility curves (or equal utility curves)	Show the combination of FOCJ fees (p_1, p_2) that guarantee to a duopolist (e.g. FOCJ1) the same (equal) utility level.
Krelle behaviour	The competitor reacts to the action of his rival if only the rival tries to force him in a situation where he loses profit (or utility). If a competitor is not pushed to a situation with lower profit, he does not react.
Krelle-Ott space	Such combinations of fees p_1 and p_2 where duopolists have no initiative to change their fees. This space (or area) results when non-fee-change regions of two FOCJs of type II intersect. For each of them this area is formed by the reaction line of one FOCJ of type II and the highest possible isoutily curve which touches the reaction function of another FOCJ of type II.
Kuhn-Tucker condition	Assumes that the constraints imposed on variables are not equations, but inequalities. Hence, one can set limitations on parameters, such as $a_1 + d_1 * p_2 \leq w_1$, so that the Kuhn-Tucker conditions can be applied for a maximization problem if an objective function and restrictions are both assumed concave (Henderson, Quandt 1980: 386). Increase in price p_2 , and consequently, an increase in demand continues until parameter combination $a_1 + d_1 * p_2$ reaches its limit w_1 .
Lagrange function	The method to find a local maximum of the goal function (utility function) under the particular constraints (the Lagrange multiplier λ) (Шуначев 1985).

Term	Definition (in accordance with current thesis)
Legal person (entity)	<p>An organization that has separate property and is liable for its obligations with its property, may acquire and exercise civil rights and bear civil obligations, and may be a plaintiff and defendant in court (Civil Code of the Russian Federation, Article 48, § 1).</p> <p>1. The Russian Federation, subjects of the Russian Federation: republics, krais, oblasts, cities of federal significance, autonomous oblast, autonomous okrugs, as well as urban and rural settlements and other municipal units shall act in relations regulated by civil legislation on an equal basis with other participants of these relations - individuals and legal entities.</p> <p>2. The rules, regulating participation of legal entities in civil law relations, should be applied to the subjects of civil law referred to in paragraph 1, unless otherwise provided by law or the specifics of these subjects (Civil Code of the Russian Federation, Article 124).</p>
Lump-sum (grant, fee, payment, etc.)	A fixed sum which does not depend on output, labour or other variables.
Management behaviour	The reaction of FOCJ of type II management to changing internal and external factors, such as decisions of FOCJ members and competitors, volume of labour and materials, factor prices, changing utility function, production function, demand, etc.
Management concept	Shows the relations between managers and employees on different levels in a company relying on different leading ideas as a key element (Friedrich, Ukrainski, Timpmann 2014). It reflects a possibility to delegate decision-making rights to managers of lower level inside economic units, such as, for example, an FOCJ. In FOCJ sense, management concepts can shape relations between FOCJ management and school directors, for example.
Memorandum	One of the establishment documents for associations where members express their readiness to establish an association, determine the procedure for joint activities, conditions for transfer of their property and withdrawal procedure (Federal Act No. 7 “On Non-commercial organisations”, Article 14, § 1).
Monopoly	A market structure which is characterized by only one firm (one public economic unit) in the industry (Varian 2010: 439).

Term	Definition (in accordance with current thesis)
Municipalities	Entities of the first level of territorial administration where a local self-governance takes place (IMC Toolkit Manual 2010: 7). In Russia, local self-governance is carried out in municipal areas (<i>муниципальные районы</i>), municipal and urban districts (<i>муниципальные и городские округа</i>), urban districts with intra-city division (<i>городской округ с внутригородским делением</i>), urban settlements (<i>городские поселения</i>), rural settlements (<i>сельские поселения</i>), intra-city areas of federal cities (<i>внутригородские территории городов федерального значения</i>) (Federal Act No. 131 “On the general principles of organisation of local self-governance in the Russian Federation”, Article 10).
Natural person (physical person)	A person who has his/her legal rights and obligations. Unlike the natural person, the legal person is often used synonymously for companies of different legal forms.
Network form	The network form for implementing educational programs (hereinafter - the network form) provides opportunities for students (pupils) to learn using resources of several organizations that carry out educational activities, including foreign organisations (Federal Act No. 273 “On Education in the Russian Federation”, Article 15, § 1).
Oligopoly	A market structure which is characterized by a small number of firms which have a strategical dependence with competitors (Varian 2010: 497, 519).
Principal-agent problem	The situation between two unequally informed actors (asymmetric information). Usually, the one who orders (principal) is less informed than the one who is supposed to implement the order (agent), therefore, the agent may use the information, which the principal does not possess, in their own interest.
Productivity	Relations between output and factor inputs. Here, the productivity of all factors is meant: labour, materials and fixed capital. In relation to one factor, productivity can be measured as well. Increase of one factor influences the growth in productivity of the others.
Public choice	The theoretical approach which attempts to apply economic methodology to the process of forming and implementing policy decisions, in particular introducing the assumption that all agents including politicians and bureaucrats act in their own interests. As a consequence of this behavioural assumption, this school underscores the inefficiency and injustice that can accompany government actions (Acocella 2005: 128).

Term	Definition (in accordance with current thesis)
Quality of education	A complex characteristic of the educational activity and training of students, expressing the degree of their compliance with federal state educational standards, requirements and (or) needs of the individual or legal entity in whose interest educational activities are carried out, including the degree of achievement of planned results within the educational program.
Quangos	Quasi-governmental organizations that are “appointed public agencies holding executive powers and discharging a small number of functions previously under control of democratically-elected politicians” (Bailey, 1999: 69).
Reaction curve (line)	FOCJ1’s reaction curve depicts utility maximizing fee of FOCJ1 (p_1) given various beliefs FOCJ1 might have about FOCJ2’s choice of fee (p_2) (Varian 1992: 286; Varian 2010: 500).
Regions	Subjects of the Russian Federation – upper level territorial units of Russia which include republics (<i>республики</i>), krays (<i>края</i>), oblasts (<i>области</i>), autonomous oblasts (<i>автономные области</i>), autonomous okrugs (<i>автономные округа</i>), cities of federal significance (<i>города федерального значения</i>). Subjects have their legislation system and Parliaments, constitutions (<i>конституции</i>) or charters (<i>уставы</i>).
School services	The thesis includes 3 levels of school education that is provided by general education schools, gymnasiums, and lyceums in Russia: 1) primary general education – age 7-10; 2) basic general education – age 11-15; 3) secondary (complete) general education – age 16-17.
Small-sized schools	Educational organizations which realise main educational programs and situated distantly from other educational organizations, they may also have no transport access and/or small number of pupils (Federal Act No. 273 “On Education in the Russian Federation”, Article 99, § 4).
Statute	A legal document that regulate FOCJs of type II’s activities and should be approved by FOCJ founders. It should include a set of provisions and rules concerning the legal status, organizational form, structure of an FOCJ, forms of activities, the order of relations with legal entities, individuals and state bodies, as well as determine the rights and responsibilities of FOCJ members.
Stackelberg equilibrium	Occurs when the reaction curve of one FOCJ touches the isoutility curve of the other FOCJ.
Subsidiary liability	Additional liability imposed, for example, on the members of association in conditions when the main defendant (the association) is unable to pay the debt. Generally, subsidiary liability is regulated by the Civil Code of the Russian Federation, Article 399.

Term	Definition (in accordance with current thesis)
The European Grouping of Territorial Cooperation (EGTC)	A European Union legal instrument designed to promote cooperation at local level. It was established on 5 July 2006 on the basis of EU Regulation 1082/2006.
Tool	FOCJ of type II is suggested by the thesis as an instrument which enhances inter-municipal cooperation in Russia.
Unfavourable management decisions	Decisions of FOCJ management can be unfavourable from the members (municipalities) point of view. Management by their decisions may create such undesirable situations which can lead to bankruptcy of FOCJs and non-fulfilment of public goals. Management can act not in interests of members, but, for example, in their own interests (see Williamson 1964; Heinen 1966; Lingnau, Härtel 2014; etc.)
Utility function of management	Mathematical reflection of FOCJ of type II management's preferences.
Wolfram Mathematica (Mathematica)	Programming package which belongs to 'Wolfram Research' company and is used for mathematical, engineering, technical purposes, computer simulation and visualization.
<i>Zweckverband</i>	A legal form of special purpose associations for local authorities in Germany and German-speaking countries. It is frequently used for inter-municipal cooperation.

Source: Compiled by the author.

Annex 2. Guidelines for the interviews in Russia

Introduction: explaining research aims and asking for consent.

Questions for school directors

General issues:

1. How is the number of pupils changing in your school? What are the trends?
2. What is the process of enrolment? Is it related to place of residence?
3. Is there competition between schools in the municipal area? Can parents choose between different schools for their children, e.g. located in neighbouring municipalities?
4. What is your teaching program?
5. Is a kindergarten related to your school?
6. Is it possible to receive teaching services from other schools, private firms, etc.?
7. How far can children and teachers be transported?

Legal issues:

8. What are the most important legal acts for school organisation? Are there some regional and municipal peculiarities, e.g. special rules and regulations of the region, the statutes of municipalities?
9. In which legal forms can schools be established? Is it possible to change the legal form of a school?

Financial issues:

10. How is your school financed? Where do the main resources come from?
11. What is the role of the school in making of budget plan?
12. Are there special problems related to financing?
13. Do parents contribute to school financing?

Issues related to teachers:

14. What are the requirements for teachers' qualification and education?
15. What are the criteria for good teaching results?
16. How is teachers' income related to their positions (ranks)? How can teachers improve their income?
17. Is it difficult to attract teachers to your school (staffing problem)?
18. Is there a Codex of Professional Ethics for teachers?

Issues related to school management:

19. How is the director appointed to his/her position?
20. Are there hierarchical relationships between a school director and municipal or regional authorities?
21. How do parents influence the election of the director? The election of members of other school administrative bodies?
22. What are the decision-making bodies at your school? Who appoints or elects them? What decisions do they make?
23. What is the role of a parent committee in management of your school (e.g. Parents council, etc.)?

24. What happens to the director of a liquidated school if schools merge?
25. Do local authorities consider the opinions of parents regarding school policies, school liquidation or reorganization?

Concluding questions requiring FOCJ explanation:

26. Do you think schools should merge if there are not enough children in each school? How and who does decide on this?
27. Could an FOCJ, in your opinion, be a solution? Would you be interested in this kind of cooperation? Which role would school directors and municipalities play in such a cooperation?
28. Do you know similar attempts of school cooperation in Russia?
29. Do you want to add anything?

Questions for the Heads of Education Departments of the municipal areas of the Voronezh region

General issues:

1. Which achievements of schools in your municipal area are you proud of?
2. Could you tell me about difficulties related to general education and schools in your municipal area?
3. What do you aim to achieve by providing school services? (e.g., better quality of education, higher budgets, increased number of pupils, higher income of teachers, etc.)
4. What are your relations with the province (regional authorities) regarding school education? What is the role of the province?
5. Are there many small-sized schools (i.e., with a small number of pupils) in your municipality? How do you work with such schools?
6. Which powers does a municipality have with respect to location, finance, educational content and transportation of pupils?
7. Do municipal authorities influence school managers and school management bodies? What is the legal framework to do so?
8. Do local authorities consider opinion of parents when create municipal policies, open or close schools?
9. Is there school competition within your municipal area and with other municipalities? For what do they compete?
10. Does a political situation in municipality influence school management?
11. Why have school educational districts been created? What is the role of these districts?

Issues related to teachers:

12. What are the requirements for qualification and education of teachers?
13. What are the criteria for good teaching results (their productivity)?
14. How is the income of teachers related to their positions (ranks/categories)?
How can teachers influence their income?
15. Is there a Codex of Professional Ethics for teachers?

Issues related to school management:

16. How is a director appointed to his/her position?
17. Are the hierarchical relationships between school directors and municipal or regional authorities?
18. How do parents influence the election of a director? The election of other school administrative bodies?
19. What are the decision-making bodies at your school? Who appoints or elects members of these bodies? Which decisions do they make?
20. What is the role of the committee of parents in school management (e.g. Parents' council, etc.)?
21. What happens to the director of a liquidated school if schools merge?

Legal issues:

22. What are the normative acts that you consider to organise school services provision in your municipal area?
23. Is it possible to change legal form of a school, e.g. from municipal to non-commercial form of company?

Financial issues:

24. How do you finance your schools? Which expenses does the municipality cover and which are covered by other jurisdictions?
25. Does the municipality pay for transportation of pupils or teachers? Should these expenses be covered by parents, rural settlement or the municipal area?
26. Do municipal settlements in your municipal area compete with each other for school money/grants?
27. Is a municipality responsible for financing, maintaining and repairing school buildings? Is it possible that municipalities sell school buildings which are not used?
28. Can you increase investments and expenses related to schools?

Inter-municipal cooperation issues:

29. Do you cooperate with other municipalities in your area? Regarding what? What are the legal normative acts that you use to regulate this cooperation?
30. Are municipalities authorised to close schools in order to establish inter-municipal cooperation concerning school services provision?

Concluding questions requiring FOCJ explanation:

31. Do you feel that optimization of school system in your municipal area is necessary?
32. Would you appreciate an FOCJ solution because of possible cost savings or other advantages? Are you interested in school FOCJs in your municipal area?
33. What are the effects of school budget reallocation to FOCJ? Would the municipality lose financial means, e.g. grants, which an FOCJ might not get? Can funds from other jurisdictions (e.g. regions) be paid to FOCJs under private law?
34. Would your municipality be able to transfer budgetary funds or property to an FOCJ? Is it legally possible?
35. Would an FOCJ be taxed?
36. Should an FOCJ be responsible for one school or several schools?

37. Do you know about similar attempts of inter-municipal cooperation in Russia?
38. Do you know about special grants that support cooperation in the school services provision in Russia?

Questions for the Heads of rural settlements

General issues:

1. Which achievements of schools in your settlement are you proud of?
2. Could you tell me about difficulties related to general education and schools in your settlement?
3. What are your relations with the municipal area and province (regional authorities) regarding school education? What are their roles in school education?
4. Which powers do settlement authorities have with respect to location, finance, teaching program and transportation of pupils?
5. Do municipal authorities influence school managers and school management bodies? What is the legal framework for this?
6. Do you have small-sized schools (i.e., with a small number of children) in your settlement? How do you organise the work of such schools?
7. Do local authorities consider opinion of parents when create municipal policies, open or close schools?
8. Is there school competition within your municipal area and with other municipalities? For what do they compete?
9. Does a political situation in municipality influence school management?

Legal issues:

10. What are the normative acts that you consider to organise school services provision in your settlement?
11. Is it possible to change legal form of a school, e.g. from municipal to non-commercial form of company?

Financial issues:

12. How do you finance your schools? Which expenses does the municipality cover and which are covered by other jurisdictions?
13. Are there expenses for transportation of pupils or teachers? Are these expenses covered by parents, rural settlement or municipal area?
14. Do rural settlements compete with each other for school money/grants?
15. Is a municipality responsible for financing, maintaining and repairing school buildings? Is it possible that municipalities sell school buildings which are not used?
16. Can you increase investments and expenses related to schools?

Inter-municipal cooperation issues:

17. Do you cooperate with other municipalities in your area? Regarding what? What are the legal normative acts that you use to regulate this cooperation?

18. Would you try to improve the financial situation of municipality through cooperation with other municipalities regarding school management? What is the legal framework for this?
19. Are municipalities authorised to close schools in order to establish inter-municipal cooperation concerning school services provision?

Concluding questions requiring FOCJ explanation:

20. Do you feel that optimization of school system in your settlement is necessary?
21. Would you appreciate an FOCJ solution because of possible cost savings or other advantages? Are you interested in school FOCJs in your municipal area?
22. What are the effects of school budget reallocation to FOCJ? Would the municipality lose financial means, e.g. grants, which an FOCJ might not get? Can funds from other jurisdictions (e.g. regions) be paid to FOCJs under private law?
23. Would your municipality be able to transfer budgetary funds or property to an FOCJ? Is it legally possible?
24. Would an FOCJ be taxed?
25. Should an FOCJ be responsible for one school or several schools?
26. Do you know about similar attempts of inter-municipal cooperation in Russia?
27. Do you want to add something? Did I cover everything which might have influence?

Questions for the representatives of parents' committees

1. What is the role of parents in school management?
2. Can parents influence the decision of school management?
3. Do you know how parents can influence the election of a school director? Election of other school management bodies?
4. Do local authorities consider the opinion of parents when they develop school policies or in case of school liquidation or reorganisation?
5. Can parents choose a school where their child will go, e.g. the school which is located in neighbouring municipalities? Are there any normative acts regulating this question?
6. Do you have an opportunity to drive your child to another school? Would you agree that your child will be transported to school by bus?
7. How do parents financially support schools? What kind of expenses must parents cover?
8. Are there schools in your municipal area where you would like your child study? Why? What are the criteria of your ideal school?
9. Would you support cooperation of municipalities regarding school services provision if it increases the quality of education?

**Questions for the advisor of the General Education Provision
Office of the Department of Education, Science and Youth Policy
of the Voronezh region**

1. What are the achievements in school education you are proud of in the Voronezh region?
2. What do you aim to achieve by providing school services? (e.g. better quality of education, higher budgets, higher number of educated pupils, higher teacher incomes, etc.)
3. What kind of difficulties related to school education do you have in your region? What are the difficulties in rural areas?
4. Are there many small-sized schools (i.e. with small numbers of pupils) in the region? How do you work with such schools?
5. What are the most important legal acts for organisation of school services provision? Are there some regional and municipal peculiarities, e.g. special rules and regulations of the region, the statutes of municipalities, etc.?
6. In which legal forms schools are established? Can they be established in one of the private non-commercial forms?
7. What is the situation with school financing in your region?
8. How schools are financed in your region? Which expenses are covered by municipalities and other jurisdictions?
9. Are there differences in financing public and private schools?
10. Is there a principle of allocation of school subsidies to municipalities?
11. Are there opportunities to increase school financing?
12. Who is responsible for the management of school budgets?
13. Is there competition between schools in the region? What are they competing for?
14. Are municipalities independent in decision-making regarding school education? What is the role of the region in relations to municipalities?
15. What is the role of federal government with respect to schools, educational policy and school education financing?
16. Do regional authorities influence school management? What is the legal framework for this?
17. Do regional authorities consider parents' opinion when they create regional policies, for example, to establish or liquidate a school? How?
18. Does political situation in the region influence school management?
19. Who makes decisions regarding school abolishment? Can municipalities independently decide on school liquidation in order to participate inter-municipal cooperation?
20. Is it possible to receive teaching services from other schools, private firms, etc.?
21. Are kindergartens related to schools? Is it a separate educational level?
22. What is the longest distance where children and teachers can be transported?
23. How is a school director appointed to his/her position?

24. What are the hierarchical relations between school director and municipal and regional authorities?
25. How do parents influence the election of directors?
26. In your opinion, should schools merge if there are not enough children there? How and who decides regarding this question?

Questions requiring FOCJ explanation:

27. Is school optimization necessary in your region and with rural settlements? Are the locations for school FOCJs available?
28. Would you appreciate FOCJ solution because of possible cost savings or other advantages?
29. Is it possible to redistribute financial means from other jurisdictions to FOCJ institutions of private law?
30. Would the region transfer budget means or property to FOCJs? Is it legally possible?
31. What are the effects of budget reallocation on FOCJ? Does a municipality lose financial means when establish an FOCJ, e.g. grants which an FOCJ might not get?
32. Should an FOCJ be taxed?
33. Are there special grants to enhance cooperation of municipalities with respect to schools?
34. Do you know similar attempts of school inter-municipal cooperation in the Voronezh region or Russia?

Questions for the Deputy Head of the Department of Education, Science and Youth Policy of the Voronezh region

1. Could you, please, tell about the dynamics and plans of school development in the region?
2. What is the situation with school financing in the Voronezh region?
3. How schools are financed in your region? Which expenses are covered by municipalities and other jurisdictions?
4. In which legal forms schools are established? Can they be established in one of the private non-commercial forms?
5. Is it possible to increase financing of school education in the region?
6. Is there any principle of how school subsidies are allocated to municipalities?
7. What is the role of the region in planning of school location?
8. How should schools be located in municipalities with respect to school stage (primary, secondary, etc.) and education content?
9. Do the regional educational authorities influence school management bodies?
10. How does political situation in the region influence school management?
11. Could you tell about the budgeting process of schools? Who manages the school budget?

12. What kind of difficulties related to school education do you have in your region? What are the difficulties in rural areas?
13. Does a school reform should be linked to territorial reform?
14. Could you tell what the region is going to plan if a fertility rate grows next 10 years?
15. In your opinion, should schools merge if there are not enough children there? How and who decides regarding this question?
16. How should municipalities be compensated if schools are abolished?
17. What instruments the region possesses to influence municipalities?
18. Is a school optimization necessary in your region? In which municipalities inter-municipal cooperation potentially can be used for school services provision?

Questions requiring FOCJ explanation:

19. Would you appreciate FOCJ solution because of possible cost savings or other advantages? Are you interested in school FOCJs in the region?
20. Is it possible to redirect financial means from other jurisdictions to FOCJ institutions of private law?
21. Would the region allocate budget means or property to an FOCJ? Is it legally possible?
22. What are the effects of budget reallocation on FOCJs? Does a municipality lose financial means when establishes an FOCJ, e.g. grants which an FOCJ might not get?
23. Should an FOCJ be taxed?
24. In your opinion, can functional cooperation of municipalities be a potential solution to the difficulties which exist in school services provision? Are you interested in this form of cooperation? What would be the role of school directors and municipalities?
25. Are there special grants to enhance cooperation of municipalities with respect to schools?
26. Do you know similar attempts of school inter-municipal cooperation in the Voronezh region or Russia?

**Questions for the Head of the Office for Interaction with
Municipalities of the Department for the Development of
Municipalities of the Voronezh region**

1. Is there cooperation between municipalities or rural/urban settlements in the region? Regarding which services do they cooperate?
2. What are the legal normative acts to regulate this cooperation? Should municipal cooperation be approved by the regional/federal authorities?
3. Are there special grants to enhance school inter-municipal cooperation?
4. Would you try to improve the financial situation of the region through supporting cooperation of municipalities regarding school services provision? What is the legal framework to do so?

Questions requiring FOCJ explanation:

5. What do you think about establishing school FOCJs in the Voronezh region?
6. Should school FOCJs be responsible for several or for only one school?
7. Do you know similar attempts of inter-municipal cooperation in Russia?
8. Do you implement any regulations regarding participation of municipal areas of the Voronezh region in inter-municipal cooperation? What legal characteristics these regulations possess? Are they mandatory or advisory?
9. Does the region have a right legally influence municipalities to sign a cooperation contract or establish FOCJs?

Annex 3. Overview of interviews with experts in the provision of Russian school services⁹²

№	Position	Date and duration	Comments
1	Director of municipal budgetary general education establishment, gymnasium No. 2, Voronezh	09.10.2017 45min.	Interview transcription
2	Consultant of the Department for Licensing, Supervision and Confirmation of Documents of the Department of Education of the Voronezh region	18.10.2017 37 min.	Interview notes
3	Specialist of the pre-university education department of Voronezh State University	19.10.2017 30 min.	Interview notes
4	Head of Novogremyachenskoe rural settlement, Khokholsky municipal area	23.10.2017 29 min.	Interview transcription
5	Director of municipal (kazennyi) general education establishment “Novogremyachenskaya general education school”	23.10.2017 41 min.	Interview transcription
6	Head of Gremyachenskoe rural settlement, Khokholsky municipal area	26.10.2017 63 min.	Interview transcription
7	Director of municipal (kazennyi) general education establishment “Gremyachenskaya general education school”	26.10.2017 60 min.	Interview transcription
8	Chief specialist of the Voronezh Institute of Education Development	30.10.2017 15 min.	Interview notes
9	Advisor of the General Education Provision Office of the Department of Education, Science and Youth Policy of the Voronezh region	31.10.2017 48 min.	Interview transcription
10	Member of a parents’ committee in Novogremyachenskaya school	31.10.2017 22 min.	Interview notes
11	Head of Kostenskoe rural settlement, Khokholsky municipal area	01.11.2017 27 min.	Interview transcription

⁹² The interview transcriptions and notes can be received on request.

№	Position	Date and duration	Comments
12	Head of Education Department of the Khokholsky municipal area	01.11.2017 52 min.	Interview transcription
13	Deputy Head of the Department of Education, Science and Youth Policy of the Voronezh region	09.11.2017 58 min.	Interview transcription
14	Head of Education Departments of the Liskinsky municipal areas	13.11.2017 70 min.	Interview transcription
15	Head of the Office for Interaction with Municipalities of the Department for the Development of Municipalities of the Voronezh region	04.12.2017 25 min.	Interview notes
16	Director of municipal budgetary general education establishment "Khokholsky lyceum"	05.12.2017 46 min.	Interview transcription
17	Member of a parents' committee in Khokholsky lyceum	05.12.2017 30 min.	Interview notes
18	Director of municipal budgetary general education establishment "Kostenskaya general education school"	05.12.2017 21 min.	Interview notes

Source: Compiled by the author.

Annex 4. Translated interview responses with respect to the groups of interviewees⁹³

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
1. General questions						
1.	What are your achievements in school services provision?	-	"Winners of regional, federal competitions, especially in sports..."	<ul style="list-style-type: none"> - Schools-leaders - innovative platforms - Winners of the competition as best teachers within the framework of the national priority project "Education" since 2006 -Winners of federal grants for teachers, regional grants - Winners of federal and regional competitions for school children - High results of the Unified State Examination" 	-	<p>"High positions of schools in ranking, e.g. "Best 5000 schools of Russia". In 2016/2017 three Voronezh schools were in the list:</p> <ol style="list-style-type: none"> 1. Municipal budget general education establishment Gymnasium No. 9 (Voronezh) 2. Municipal budget general education establishment Lyceum No. 7 (Voronezh) 3. Municipal budget general education establishment Lyceum No. 5 (Voronezh)" <p>"The main difficulty is that the majority of school buildings were built in the last century, and they require capital reconstructions and renovation"</p>
2.	Could you, please, tell about difficulties related to general education and schools?	-	"Financing difficulties..."	<ul style="list-style-type: none"> - Aging of teaching staff at the periphery due to the lack of programs to attract young specialists to the countryside and to remote areas - Certain categories of parents do not understand the responsibility for the upbringing and development of children - Explanation to parents with the introduction of new projects such as 'Dnevnik.ru' and the portal 'State Service' - Attraction of extra budgetary funds" 	-	
3.	What do you aim to achieve by providing school services?	-		<p>"The main task of the municipal management is organizing in all educational institutions a high-quality level of free, publicly available school services provision. The quality of education is a priority"</p>	-	<p>"According to Article 43 of the Constitution of the Russian Federation:</p> <ol style="list-style-type: none"> 1) Everyone has a right to receive education. 2) Accessible, cost-free pre-school, school, and vocational education in state or municipal educational institutions and

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
4.	What is the school educational program at your educational unit?	"We implement Federal State educational standards to develop our program. New standards allow us to have specialization in different subjects at our school"	-	-	-	enterprises is guaranteed. 3) Secondary general education is compulsory. Parents ensure that children receive secondary general education"
5.	If at the moment the birth rate is low and some schools are abolished, and after 10 years the situation is reverse, how do you address the need to re-open schools?	-	-	-	-	"In this case the Department of Economic Development conducts analysis how each rural/urban settlement develops. It cannot be that now the village is dying out, and then it suddenly begins growing in terms of population. It is influenced by a complex of factors, it might happen that there are plans for construction of some kind of enterprises, which create jobs. Therefore, in principle, the tendencies are understandable for us and clear for decision-making. Since the budget is compiled for every three years, this already allows us to plan a regional targeted investment program, which aims at building a school or kindergarten in this municipality. To plan 10 years ahead is difficult, but medium-term planning is naturally possible"
6.	How kindergartens are related to schools?	"Kindergartens were subdivisions of schools until 2011. Now they are separate legal persons,	-	-	-	"After kindergartens children go to schools. They are not connected directly, but pre-school and primary school education programs are coherent and

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
		<p>since they became bigger and have 100 children. Children may get pre-school education at home. It's not required to study first in kindergarten and then go to schools"</p>				<p>successive. Parents are free to choose between home and kindergarten pre-school education"</p>
7.	<p>How should schools be located in municipalities, depending on a school level (e.g. primary, basic, secondary)?</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>It's historically defined and it also depends on the demographic situation, on how many children of particular age live in this or that municipality.</p>
8.	<p>Is there school competition within your municipal area/region and with other municipalities? For what do they compete? Can parents choose between schools, for example, located in neighbouring municipalities?</p>	<p>"We compete for better position in school ranking with other schools in Khokholsky municipal area. We first take children who live on the territory attached to our school, but parents have a right to choose another school if there are vacant places in these schools. And we have some children from neighbouring settlements"</p>	<p>"I think we compete on everything, sometimes even for teachers..."</p>	<p>"They compete for the position in ranking. There are qualitative indicators: Olympiads of different levels, participation in competitions, passing the exams of the 9th and 11th grades, teachers' participation in various competitions including getting grants and attestation of teachers - all of these are qualitative indicators. The rating does not imply that schools are compared with each other, schools are compared with themselves from the last year. Last year I had such indicators, this year I have such ... And I can see how many points the school has received and whether it improved its result or not. School additional funding is linked to qualitative indicators. For example, if a school is included in the list of the best schools of the Voronezh region, it receives additional funding. The choice of school is the right of parents. A child is enrolled at school related to the place of residence, if there are vacant places, a child can study at another school"</p>	<p>"I think we can, but it is so inconvenient, yes, it would be so inconvenient, no no... I would never think about it, I don't want even to drive my child to another part of our town"</p>	<p>"The question is for schools' founders (i.e. education departments in municipalities)"</p>

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
9.	Should the school reform be linked to territorial reform?	-	-	-	-	"What I can say is that every region defines its education policy with different accents on different issues. Moreover, some regions are subsidised, some are donors, so in a way it affects a school system of each region. I do not think that territorial affiliation will affect educational component, since there are federal educational standards in all regions. However, financial situations of regions are different"
10.	Why did you establish school districts?	-	-	<p>"Municipal territory was divided into districts, and there are basic schools which work with the other schools of the same district. It was organized, because not every school in the rural area has necessary equipment to provide high quality educational services. The purposes of their creation:</p> <ul style="list-style-type: none"> - ensuring the maximum possible accessibility of education for each student with rational use of material, technical, human and financial resources of educational institutions - formation and development of unified educational environment - formation of organisational mechanism for development and self-development of the educational system - improving management of the educational system" 	-	-
2. Questions related to school management and administration						
11.	What are the hierarchical relations between municipalities and the	-	-	"Federal act No. 273 "On Education in the Russian Federation" has divided powers, there are powers of the Federation, there are	-	"The powers of the regions of the Russian Federation in the sphere of education and the powers of local self-government

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
	region regarding school education? What is the role of the region?			<p>powers of the subject of the Russian Federation - this is the Voronezh region and there are powers of local self-government bodies carried out in education, all powers are delimited by law.</p> <p>The role of the region is significant. Municipalities are active participants in competitions and projects to receive grants for education (i.e. we have successful experience in various priority areas, which are determined by the Education Department).</p> <p>Timely and high-quality execution of agreements between the Education Department and the municipality, e.g., construction of new and reconstruction of old facilities.</p> <p>Joint activities with the region to support children with disabilities. For example, the project called "Accessible Environment"</p>		<p>bodies of municipal areas and urban districts to address issues of local importance in the sphere of education are defined by Article 8, 9 of the Federal Act No. 273 "On Education in the Russian Federation"</p>
12.	What is the role of federal authorities in school administration, educational policy, financing?	-	-	-	-	<p>"The powers of the Russian Federation concerning education transferred for implementation to authorities of the subjects of the Russian Federation. It is defined by Article 7 of the Federal Act No. 273 "On Education in the Russian Federation"</p>
13.	Are there many small-sized schools in your municipality/region? How do you work with such schools?	-	<p>"We had such a problem two years ago, now we have 15-16 children per class, up to 20"</p>	<p>Both municipal areas have small-sized schools: 5 in Khokholsky municipal area and 9 in Liskinsky municipal area.</p> <p>"If a school is small, the conditions for equipment, infrastructure should be the same as in large schools. A networking system with large basic schools is organized. For this purpose, transportation of children for laboratory works in physics, chemistry, etc.,</p>	-	<p>"On the territory of the Voronezh region, educational activities are conducted in 431 small-sized schools. Work in such schools is organized similar to all other schools of the region"</p>

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
14.	Which powers do municipalities possess with respect to school location, finance, teaching program, transportation of pupils, etc.? Does political situation of the municipality influence school management?	"Children can be transported to the distance not less than 2 km and not more than 30 km..."	"These questions are due to municipal areas, the Education Departments"	the work of scientific societies for gifted children, joint seminars and pedagogical councils are organised. Distance learning is implemented. The decision to liquidate a small-sized school should be made considering the citizens meeting, parents and the founder, without an agreement with citizens such decisions should not be made" "Federal Act No. 273 "On Education in the Russian Federation" defines the powers of the municipality and it is fixed in the school statute. If there is a demand for school places, there are some federal programs aimed at building new schools. Transportation of children is regulated by the Decree of the Government of the Russian Federation No. 1177 of December 17, 2013 (Edited on December 23, 2017) "On approval of Rules for organized transportation of a group of children by buses"	-	"According to § 2.5, Section II, "Requirements for placement of general education organizations", for transportation of students of general educational organizations in rural areas to general educational organizations and back, the travel time should not exceed 30 minutes one way... Political situation does not influence school system, at least I do not see it"
15.	Do municipal/regional authorities influence school management bodies? What is the legal framework for this?	"Municipal authorities influence dramatically, they control everything, check educational program, study plan, etc. Regional authorities may also check, they deliver policy" (<i>directors of state (kazennyi) municipal schools</i>)	"We just support each other, not officially, of course, but in everyday issues..."	"The founders of educational organizations are local authorities. In all municipal areas, not only in ours, the administration is delegated to the Education Department, and we are the founders of all school educational organizations. We monitor all educational activities in accordance with the law. The sole executive body is a director, who carries out current management of the educational organisation. Local normative acts of the school are approved by the order of director, except for the cases when collegial bodies participate in such approval. The bodies of collegiate management of the	-	"We do not influence directors, we work directly with Education Departments in municipalities, delivering them a strategy and determining the policy in school education. There is a vertical power structure, we do not have the right to say directly and issue our order, we can just recommend something to municipalities. It's fixed by Regulations of the Department of Education, Science and Youth Policy of the Voronezh region, approved by the resolution of the Government of the Voronezh Region No. 191 "On the approval of the regulations

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
				<p>school are:</p> <ul style="list-style-type: none"> - General meeting of school employees - Pedagogical Council - The school's governing board - Board of high school students - Parents' committee. <p>The General meeting of employees is a permanently operating supreme body of collegial management"</p>		<p>on the Department of Education, Science and Youth Policy of the Voronezh region" and regulations on the Education Departments of municipal areas, urban districts of the Voronezh region"</p> <p>"Founders of schools (municipalities) are property owners. Schools acquire the right of operative management of schools' property according to CC of the RF, Article 123.21"</p>
16.	Do local/regional authorities consider the opinion of parents when they create municipal policies or open/abolish schools?	"Yes, of course, yes, there were such cases, parents defended several schools... But if there is no economic sense to have this small school, we try to persuade parents that it will be better for children to study in a bigger school"	"Of course, it's our direct responsibility to listen to people and consider their opinion"	<p>"Yes, they do. Considering the opinion of parents, capital repairs of school No. 12 have been carried out.</p> <p>Another example is construction of sports grounds in rural areas (on the territory of Lisyay, Vysokino, Nizhneikoretzkaya, Tresorukovo and other schools).</p> <p>The network of secondary schools in rural settlements of municipal area has been preserved. There are no abolished schools already for many years"</p>	<p>"I don't know too much about it, but as much as I understand, local authorities give money, and by this, they are influential.</p> <p>They ask parents, but usually the decision has made already, and we have to accept it.</p> <p>Additionally, usually if a school is going to be closed, then it is really better for children"</p>	<p>"The decision to reorganize or liquidate a municipal general education organisation located in a rural settlement is not allowed without taking into account the opinion of the inhabitants of a given rural settlement (Federal Act "On education in the RF", Article 22, § 12)"</p>
17.	How is a director appointed to his/her position?	"Municipal area appoints school directors. They consider education, work experience, teaching category, and other characteristics including management education"	-	"Director is appointed by the founder, municipality. There are particular requirements to the education, work experience, etc. Usually a new director is chosen from the staff members"	-	"School director is appointed to the position by the school's founder"
18.	What are other governing bodies at schools? What decisions do they make?	"Teachers' council, The governing council. The governing council is the	-	See question 7. There are school boards, governing councils and there is a general meeting. Governing council is the most	"We have also governing body at our school where besides	-

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
		most important body, it is a collegiate body, combining parents, teachers, children, representatives from the village community and founders. It helps to attract sponsors and funds, it is rather helpful..."		common form.	teachers and local authorities, parents also participate. And according to the statute, parents, who are members of governing bodies, should come to approve some documents of schools, but everything is already prepared when we gather..."	
19.	How do parents influence the election of a school director?	"I do not know such cases that parents influence"	-	"Parents do not influence this process since there are special requirements for the position of director"	"We have our director since my child came to this school, probably she was appointed"	"No, they do not influence"
20.	What is the role of parents in school management?	"Parents influence through the governing council, we together with them approve the program of school development, but not educational program" <i>(directors of municipal (kazennyi) schools)</i> . "The role of parents is great, they are part of the governing council and approve many decisions" <i>(director of a municipal budgetary school)</i>	-	"The role of parents is additional, supporting"	"Yes, we meet... We have special meetings for the parents' committee, and we discuss different things that are related to school issues, sometimes headmaster says what problems the school has and if our help is needed. Sometimes parents come with some issues and we discuss"	-
21.	If two schools are merged, what happens to	"Teachers of an abolished school are registered in	-	"This question is regulated by labour legislation, but so far we have not had	-	-

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
	the director of an abolished school?	Unemployment Office, and usually municipal authorities help them to find a job”		problems with this question that someone could not find a job”		
3. Questions related to teachers 22. Are there requirements to qualification and education of teachers?		<p>“Pedagogical higher or vocational education, teacher category: first, highest or adequacy for the position. It’s difficult to receive first or highest category since they get additional 20 or 40% payment”</p>		<p>“There is a competency catalogue which is imposed by the Order of Ministry of Healthcare and Social Development of the Russian Federation No. 761n “On approval of unified job evaluation for managers, experts and clerks”, section “Qualification characteristics of employees in education”, subsection 3 “Positions of teaching employees”: Higher or professional vocational education in education or pedagogy or in a sphere of teaching subject without requirements to work experience; or higher or professional vocational education and additional professional education with respect to the specialization of educational organization without requirements to work experience”</p>	-	-
23.	What are the criteria for good teaching (teachers’ productivity)?	<p>“It’s exactly reflected in teacher’s category. If a person has the highest category, then it shows that they have achievements of their students, their own achievements, etc.”</p>		<p>“The most influential performance indicators for teachers are:</p> <ul style="list-style-type: none"> – positive dynamics of students results in learning outcomes of educational programs – identification and development of students’ capabilities, their participation in competitions, festivals, etc., students’ individual progress – organization of extracurricular activities (i.e. project participation aimed at creation of comfortable and safe educational environment, social activities, students’ creative work, etc.) 	-	-

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
24.	How can teachers influence their income? How can they increase it?	“Their income depends on how many teaching hours they have, their category, additional payments for achievements, bonuses for combining jobs, etc.”	-	<ul style="list-style-type: none"> - active participation in teaching unions, professional competitions, distribution of teaching experience via public speaking - elaboration of methodological material for educational process - development and implementation of new digital educational resources and information telecommunication technologies - using personal web-page (blog) - publications in the official periodicals - creating conditions for dealing with different categories of pupils (i.e. gifted children, orphaned children, disabled children, etc.)” 	-	-
25.	Is there a problem of teacher recruitment in your school? Is there a shortage of staff in the school?	“No, we do not have problems with teachers, the only thing is the English language teachers, it is not always possible to attract them to schools in rural areas”	-	<ul style="list-style-type: none"> - “1) By improving category (higher or first category), their work experience 2) By means of participation in annual professional competitions of different level and receiving grants for winners (e.g. municipal, regional and national competition for teachers “Teacher of the Year”) 3) Besides, teachers can receive monthly or quarterly additional payments from school inducement fund in case of high results in professional activities. Amount and conditions are determined by the local normative acts of a school!” 	-	-

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
26.	Is it possible to outsource teaching services, for example, from other schools or private companies?	"Since we do not have it in our school statute, we cannot outsource educational services from outside"	-	-	-	"The teacher can work part-time in another general education organisation. In this case, a civil law contract is drawn up..."
27.	Is there a code of professional ethics for teachers?	"It is a part of the employment contract in our school, you can find it on our website"	-	"Teacher's code of professional ethics is developed in every educational organisation based on provisions of the Constitution, Federal Act No. 273 "On Education in the Russian Federation", Decree of the President No. 597 "On Actions to Implementation of National Social Policy", Letter of Ministry of Education and Science of the Russian Federation No. 09-148 b "Recommendations on organisation of actions aimed at development and implementation of Code of Professional Ethics by teaching community", some other acts"	-	-
4. Questions related to parents						
28.	Could you name schools where you would like that your children study? What are your criteria for good schools?	-	-	-	"I do not have experience with other schools and also I am quite satisfied with our school. I think, it is a good school if my child after graduation has a choice. Another important criterion is the atmosphere at school, whether it is friendly or very tiring. A school should not be the place where you are scared to go"	-

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
29.	Do you have an opportunity to drive your child to school? What if a bus is organised for this purpose?	-	-	-	"I just simply do not have time to drive my child to school. It is difficult to say, it is so multifaceted. I have never had such a need..."	-
5. Legal aspects						
30.	Could you tell what normative acts do you apply for organisation of school services provision?	"Federal Act No. 273 "On Education in the Russian Federation" first of all, local normative regulations of schools, school statute and educational program for three stages of school education, working program, etc."	"This question is for Education Departments in municipal areas"	"The Constitution of the Russian Federation, Federal Act No. 273 "On Education in the Russian Federation", Act of the Voronezh Region No. 84 "On regulation of particular relationships in the Voronezh region", etc. "Program for the development of education for 5 years". Different aspects are regulated by different acts. Schools have their local documents: statutes, regulations on compensation, regulations on the governing council, etc."	-	"The Constitution of the Russian Federation, Federal Act No. 273 "On Education in the Russian Federation", Act of the Voronezh Region No. 84 "On regulation of particular relationships in the Voronezh region", other normative legal acts of the Russian Federation and Voronezh region"
31.	Is it possible to change the legal form of schools? What is the current situation with respect to the legal form?	"Schools of Gremyachiye and Novogremyachiye are in a legal form of state (kazennyi) municipal establishment. It is possible for us to become a budgetary municipal establishment, but it is, on the other hand, very dangerous, since budgetary establishments have to raise funds for maintenance additionally by themselves, for example, if they provide fee-based services or have	-	"Schools in non-commercial legal forms can provide educational services, but at the same time it is necessary to obtain license and accreditation, only in this case any non-commercial legal form can provide educational services". "Nowadays schools in Russia are in legal forms of budgetary, autonomous, or state (kazennyi) establishments, and also private establishments. Schools can be autonomous, but in this case, they have to finance their activities by providing fee-based services"	-	"Organisational and legal forms of schools in the Voronezh region: 1) municipal budgetary general education establishment 2) municipal state (kazennyi) general educational establishment 3) private general education organisations" In the form of establishments schools cannot have more than one founder (according to Article 123.21 of the CC of the RF).

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
6. Financial aspects	32. How do you finance your schools? Which expenses are covered by municipalities and other jurisdictions?	"We have subventions and the budget of municipal area. Additionally, we may receive grants via participation in federal and regional programs"	"This question is better to address to school directors or Heads of Education Departments in municipal areas, I'm not dealing with this issue"	"According to Article 8, § 3 of the Federal Act No. 273 "On Education in the RF", for realization of school educational programs municipalities allocate subventions from regional budgets, including labour costs, costs of textbooks, equipment for teaching aims, except building maintenance costs and utility costs which are covered from local budgets. The number of subventions for each municipality is calculated based on the number of pupils and norms according to the educational programs and levels of study. Subventions can be increased by the integrated coefficient if school results are high based on regional ranking of schools. Federal targeted programs (e.g. "Accessible Environment", "Promoting the creation of new places in general education organisations in the regions of the Russian Federation") are financed from the federal budget. Educational institutions may raise additional financial resources via fee-based services provision as well as via voluntary donations and earmarked contributions from private and legal persons"	-	"The powers of authorities of RF regions in education include the provision of subventions to local budgets, including labour costs, costs of textbooks and other teaching costs (except for building maintenance and utilities) in accordance with the standards determined by the government bodies of the regions of the Russian Federation (see the legal act on the regional budget for the current year and planning period). The powers of local self-government bodies of municipal areas and urban districts include: 1) organisation of free pre-school, primary, basic and secondary general educational services provision in municipal educational organisations (with exception of the financial support for the implementation of basic general education programs in accordance with federal state educational standards) 2) maintenance of the buildings and structures of municipal educational organisations, arrangement of their territories. Federal budget resources are allocated within the project called "Modernisation

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
						<p>of general education".</p> <p>Our regional subventions are directed from the regional budget to each municipality. Municipalities distribute them among educational organisations. Estimated expenses are determined by municipal areas as founders for each particular educational organisation. In some municipalities, there are centralised accounting departments, some schools have an accountant as a staff member depending on the approach that municipalities choose.</p> <p>There are also coefficients that relate to urban and rural areas, coefficients related to schools that are innovative platforms. The regional legal act No. 68 "On inter-budgetary transfers" determines the subventions' transferring procedure and each municipality distributes these funds between educational organisations. As a result, schools are in different situations, because each educational organisation has its own staffing structure (<i>штатное расписание</i>), regulations on compensations (<i>положение об оплате труда</i>), the proportion of stimulating payments in each organisation may differ as well".</p>
33.	Could you explain the differences in financing private and public schools?	-	-	-	-	<p>There are no differences. Municipal schools and private educational organisations are financed in accordance with the standards (norms). Private schools are financed only if they have a license for educational activities. The only difference is that private schools may</p>

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
34.	How do parents financially support schools?	"Municipal schools do not charge parents, only payments for meals, personal initiatives of parents and voluntary donations, sponsorship"	-	-	"Our school is state-financed and usually they do not ask from us, but in reality, yes, we want best for our children and sometimes collect money for curtains or tickets to go to theatre"	charge fees, which is not a case with (municipal) public schools. So, the region finances private schools by the means of subventions per pupil and schools' maintenance must be covered by their owners"
35.	Is there a principle of how school finances are allocated to municipalities by the region?	-	-	-	-	"Municipalities are financed in accordance with the standards, according to the legal act on the regional budget"
36.	Who manages school budgets? What is the process of school budgeting?	"We make a plan of expected costs for the authority in municipal area" (<i>directors of municipal kazennyi schools</i>). "School budget is compiled by the director. I include that expenses, which should be covered, I consider previous year expenses, the number of children and what I plan to do or repair next year. The procedure is the	-	-	-	"A school manages its budget. Centralised or decentralized accounting service estimates the costs of schools"

List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
37. Are there costs associated with transportation of children or teachers? How should these costs be covered?	<p>following: the project of a budget is combined by the director – it should be confirmed by the accounting office of the school, the board of education of the urban district of Voronezh and the board of fiscal policy. Afterwards, approved and corrected budget plan should be confirmed by the board of fiscal policy again (for 3 years)⁷ (<i>director of a municipal budgetary school</i>).</p>	-	<p>“The maintenance of school buses belongs to responsibilities of municipalities. Parents can pay for extra activities that are not related to the main learning process. Transportation of children for lessons to schools and back is covered by municipalities. If parents want to use a school bus to go to excursion, they can pay for gasoline themselves or attract sponsorship funds”</p>	-	-
38. Do municipalities compete for subsidies or other kind of additional financing for schools?	-	-	<p>“Schools compete with each other for additional funding from the regional budget based on ranking. Federal Act No. 273 “On education in the RF”, Article 99 provides that small-sized schools have the right to receive subsidies regardless of the number of pupils. They are financed by the order of the founder regardless the number of pupils. Their expenses related to maintenance of property, teaching staff and educational activities should be compensated”</p>	-	-

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
39.	How should old school buildings be maintained and repaired? Can municipalities sell school buildings which are not used?	-	-	"In accordance with the Federal Act No. 273 "On Education in the Russian Federation", Article 9, § 5, the maintenance of school buildings and structures belongs to the authority of municipalities"	-	-
40.	Is it possible if the municipality or region will increase school financing?	-	-	"70% of the municipal budget of the Liskinsky municipal area goes specifically to education. I believe, this is a fairly large sector"	-	"If budget allocation for education will be increased... And we are planning to increase school financing since we expect the increase in teachers' salaries until the average level of the region. Hence, subventions will increase as well"
7.	Questions related to cooperation					
41.	Do you cooperate with other municipalities regarding schools? Is there any long-term cooperation? Do you know any attempts to create inter-municipal cooperation in the provision of school services in the Voronezh region or in Russia?	"We do not have it, I do not know ... We have network e-learning between schools"	"Nothing comes to my head, probably not..."	"No ... I do not think we have it in our region... This very term of "cooperation" is unusual for us. We just do not know such a thing... What we have is inter-municipal competitions, conferences in a framework of network cooperation, something like this... The question is more to the districts that participated in programs of reorganisation of rural schools, since they were the first which faced the problem of ensuring the quality of education regardless of location. In Liskinsky district there are basic schools and schools, which are innovative platforms. They are responsible for the development of education in schools which belong to this school districts, they become leaders within their own territory. As a result of this established practice, each participant of the network interaction has already accumulated its own methods of using resources and ways of working, its own concept of cooperation. The normative	-	"I'm not eligible to say, because we have the Voronezh Institute of Education Development, they might tell you about this. I know only the forms of coordination of municipal joint efforts, such as distant learning and networking of schools"

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
42.	Do you think schools should be abolished if they have small number of children? Who decides to abolish schools?	"Where it is necessary schools should be merged considering distance and quality of roads and also climate conditions... Optimisation is necessary, since children suffer, they should develop in an appropriate environment with computers, labs, etc."	-	acts (agreements on interaction, the curriculum) have been developed"	-	"Of course, because this affects the distribution of salary funds for teachers and other staff. We have different stages of school network optimisation. First, it may become a branch of another bigger school and second – liquidation. School branch has its pluses since administrative staff is located only in the main school (which cuts administrative costs for the region). These optimisation processes are going on to a greater extent in rural areas. The decision to abolish a school should be made by founder (administration of municipal areas/urban districts). The decision regarding reorganisation or liquidation of a municipal general education organisation located in a rural settlement is not allowed without considering the opinion of citizens of this rural settlement (Article 22, § 12)"
43.	How can municipalities be compensated for school liquidation? Do they need compensation in this case?	-	-	-	-	"No, we do not have such a mechanism, because in any case those children who live in every municipality must receive school educational services (it is guaranteed by the Constitution). We anyway have to organise this process. Thus, to close a school, which is needed, is not possible, but to close a school with three children if there is another bigger school nearby is essential"
44.	Are there special grants that support inter-municipal cooperation in	-	-	"As being educational organisations, schools may receive grants from different levels of administration, but I have heard about	-	"I cannot say about cooperation grants, but we have grants for schools and general education organisations. For

	List of questions	School directors	Heads of rural settlements	Heads of Education Departments of the municipal areas	Members of parents' committees	Representatives of the Department of Education, Science and Youth Policy of the Voronezh region
45.	<p>education?</p> <p>What do you think about creation of school FOCJs if it reduces costs or provides other advantages? (<i>explanation of FOCJs for this question is required</i>).</p>	<p>"Yes, it could be a solution for small-sized schools. For example, robotics is very actual, we have only one set of robots and children already learnt it, so I cannot buy another one – it is so expensive, but cooperation with other schools would help..."</p>	<p>"My personal opinion – it would be useful, but this question is not for me..."</p>	<p>cooperation grants in our region"</p> <p>"It would be interesting if, as a result of cooperation, one of the municipalities received access to resources which it has not possessed before"</p> <p>"The idea is rather interesting, but needs to be investigated more from the legal point of view...And then, if it is a new legal person, schools will become branches, not legal persons anymore? It is difficult..."</p>	<p>"I have never thought about it. I cannot imagine how it is possible. If I do not have to drive my child and she can go by herself... but it still takes more time to go to school, isn't it?... I think, it depends on how big the benefits are and how old the child is. It is so multifaceted..."</p>	<p>example, from federal programs and also from regional for renovation, so schools can apply for these grants which are given for concrete purposes"</p> <p>To my mind, existing system of vertical power allows us to realise those tasks which are addressed by the educational policy. Municipalities must allocate funds to this intermediate administrative unit, and whether it is necessary – it is a question! We have already distant forms of learning which are realised through networking for those schools that do not have enough equipment or qualified teachers or teachers for specific subjects. And to my mind, there is no sense to incorporate a new level of public administration.</p> <p>On the federal level there is an opposite idea now. They want to transfer powers of school founders from municipal to regional level.</p>

In the Table '-', means that the question has not been asked from this group of interviewees.
Source: Compiled by the author.

Annex 5. Guidelines for the interview with Bodensee water provision association

Introduction: explaining research aims and asking for consent.

The list of questions:

1. How did the idea to establish *Bodensee Zweckerband* come up? What was the reason for that? *Warum und wie wurde der Bodensee Zweckverband gegründet?* What is the legal form of water provision association *Bodensee*? *Welche Rechtsform besitzt der Bodenseewasserverband?*
2. What are the most important legal acts that *Bodensee Zweckverband* is relying on? Are there some regional (Land level), municipal regulations and legal peculiarities in the Statutes of municipalities? *Welche sind die wichtigsten Gesetze für den Bodenseewasserverband? Welche Gesetze des Landes und welche Satzungen der Gemeinden sind relevant?* Which special, sector-related laws are relevant? *Welche Spezialgesetze und Landes sowie Gemeindeplanungen sind relevant?*
3. Are there any alternatives for the legal form of *Zweckverband*? *Welche anderen Rechtsformen wären ebenfalls vorteilhaft?*
4. How is *Bodensee Zweckverband* financed? Does it have profit? *Wie wird der Bodenseewasserverband finanziert? Ist er profitabel?*
5. Could you tell about the budgeting process of *Bodensee Zweckverband*, e.g. with respect to investments, production costs? Who manages the budget? *Wie wird der Budgetierungs- und Finanzierungsprozess des Bodenseewasserverbandes gestaltet? (z.B. Investitionen, Kosten der laufenden Produktion)?*
6. How was the equity capital formed? Are the shares of all municipalities equal? Where is this issue regulated, e.g. in the Statues? Which organs of the *Bodenseewasserverband* make decisions? *Wie wurde das Eigenkapital aufgebracht? Sind die Eigenkapitalanteile für alle Gemeinden gleich? Wie wird der Eigenkapitalanteil bestimmt? Wo ist diese Frage geregelt, z.B. in der Satzung? Welche Organe des Bodenseewasserverbandes entscheiden?*
7. How is cooperation of municipalities realised apart from financial participation? Do they participate only financially? *Wie gestaltet sich die Zusammenarbeit mit den Gemeinden außerhalb der Finanzierungsbeteiligung?*
8. How do you control costs in order not to make them too high? *Wie erfolgt die Kostenkontrolle, um übermäßige Kosten zu vermeiden.*
9. How is the management of *Bodensee Zweckverband* appointed to their positions? *Wie wird das Management des Bodenseewasserverbandes bestimmt, ausgewählt und eingestellt?*
10. What are the relations between *Bodensee* management, municipalities and *Land* authorities? *Wie gestalten sich die Beziehungen zu den Gemeinden?*
11. What is the role of municipalities in the association? What are their main economic and political objectives? *Welchen Einfluss nehmen die Ge-*

meinden auf den Zweckverband. Was sind deren wichtigsten ökonomischen und politischen Ziele?

12. What is the role of *Land* in inter-municipal cooperation with *Bodensee* and how is it coordinated by the *Land* authorities? What is the legal framework for that? *Welche Rolle spielt das Land in der kommunalen Zusammenarbeit mit dem Zweckverband und welche Kooordination erfolgt über Landesbehörden?*
13. What is the role of the Federal government and the EU? *Welche Rolle spielen Eingriffe und Vorgaben des Bundes und der EU?*
14. How do municipalities influence election of *Bodensee* administrative bodies? *Wie beeinflussen die Gemeinden die Besetzung der Organe und der Organisationseinheiten des Zweckverbandes?*
15. What are, in your opinion, advantages and disadvantages of public services provision through inter-municipal cooperation in the form of *Zweckverband*? Are there any difficulties? *Welche Vorteile und Nachteile entstehen für Gemeinden bei der Bereitstellung von öffentlichen Leistungen mittels eines Zweckverbandes? Treten Schwierigkeiten auf?*
16. Could you, please, share *Bodensee Zweckverband* establishment documents with me (Statute, for example)? *Darf ich Einsicht in die Gründungsdokumente, in die Satzung und grundlegende Abmachungen mit den Gemeinden nehmen?*
17. Does *Bodensee Zweckverband* have competitors in water services provision, e.g. through own activities of municipalities? *Besitzt der Bodensee-wasserverband Konkurrenten bei der Wasserversorgung, z.B. durch kommunale Eigenversorgung?*
18. Does *Bodensee Zweckverband* receive any grants from the *Land*, Federation or EU? *Erhält der Bodensee Zweckverband Zuweisungen, Zuschüsse vom Land, Bund und von der EU?*
19. What are advantages and disadvantages of *Zweckverband* in terms of financial conditions which can be achieved on financial markets? *Welche Vor- und Nachteile besitzt der Zweckverband hinsichtlich seiner Finanzierungsbedingungen an Kapitalmärkten?*
20. Is *Bodensee Zweckverband* taxed as a regular private company (as *Betrieb gewerblicher Art*) or has it a special taxation regime concerning tax exemptions, tax rates, etc.? *Wie wird der Bodenseezweckverband besteuert als privates Unternehmen, als Betrieb gewerblicher Art oder bestehen eigene steuerliche Regelungen, z..B. Steuerfreiheiten, spezielle Steuersätze usw.*
21. Are the employees of water provision association *Bodensee* public officials or do they have usual contracts like in private enterprises? *Sind Ihre Mitarbeiter Beamte oder Angestellte wie in privaten Unternehmen?*
22. For what kind of public services should *Zweckverband* legal form be used? *Für welche Arten der Bereitstellung öffentlicher Leistungen sollte man Zweckverbände benutzen?*

Annex 6. Bodensee water provision association: interview answers

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
1.	1. How did the idea to establish water provision association <i>Bodensee</i> come up? What was the reason for that?	O.K. (Kann ich auf Deutsch antworten? Das wäre mir lieb. Mit den Fachbegriffen tue ich mich ein bisschen schwerer). Anfang der 50er Jahre gab es 13 Städte und Gemeinden, die Schwierigkeiten hatten (genug) Trinkwasser für ihre Bürger bereit zu stellen. Darunter war auch die Stadt Stuttgart. Diese 13 Kommunen haben sich Gedanken gemacht, wie sie Trinkwasser in die Regionen bringen können. Eine der Ideen war, das Trinkwasser am Bodensee zu gewinnen, aufzubereiten und dann über die Leitungen in Baden-Württemberg zu verteilen.	O.K. (Can I answer in German? I would appreciate that. I have difficulties with technical terms). In the early 1950s, there were 13 cities and municipalities that had difficulties providing (enough) drinking water for their citizens. The city of Stuttgart was among them. These 13 municipalities thought how they could bring drinking water to the regions. One of the ideas was to obtain drinking water from Lake Constance, purify it and then distribute it through the pipelines in <i>Baden-Württemberg</i> .
2.	So, the lack of resources was the motivation, stimulus?	Es herrschte wirklich Trinkwassermangel hier. Zum einen konnten die Bürger nicht ausreichend mit Trinkwasser versorgt werden und zum anderen hätte die Industrie nicht so stark wachsen können ohne die Wasserversorgung vom Bodensee.	There was really a shortage of drinking water here. On the one hand, the citizens could not be supplied sufficiently with drinking water and, on the other hand, the industry could not have grown so strongly without the water supply from Lake Constance.
3.	2. Could you tell me, what kind of laws do you usually rely on? Are there some regional (Land level), municipal regulations and legal peculiarities in the Statutes of municipalities? Maybe European level?	Less European level! Im Wesentlichen gibt es für die Zweckverbände das Gesetz über kommunale Zusammenarbeit . Das ist die Grundlage für alle Zweckverbände.	Less European level! Essentially, there is the law on municipal cooperation for the special-purpose associations. This is the basis for all special-purpose associations.

⁹⁴ The interview has been translated from German into English.

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
4.	Is it like the law devoted to <i>Zweckverband</i> or association...?	Nein, hier geht es im Wesentlichen um Zweckverbandsrecht, aber dieses Gesetz über kommunale Zusammenarbeit verweist dann auf andere Gesetze, wie zum Beispiel die Gemeindeordnung für Baden-Württemberg , die für Zweckverbände genauso wie Kommunen gilt. In unserem Fall wird unser Betrieb nach dem Handelsgesetzbuch bilanziert (nicht kameralistisch), was ein Bundesgesetz ist. Alle anderen Gesetze sind Ländergesetze. Was für uns auch noch wichtig ist - das steht auch im Gesetz über Kommunale Zusammenarbeit drin: Wenn der Zweckverband zum Beispiel den Wirtschaftsbetrieb nach dem Handelsgesetzbuch regelt, dann gilt auch wieder das Eigenbetriebsrecht .	No, this is essentially about special-purpose associations, but this law on inter-municipal cooperation refers to other laws, such as the <i>Gemeindeordnung für Baden-Württemberg</i> , which is applied to special-purpose associations just like municipalities. In our case, our operation is accounted for the Commercial Code (not cameralistic), which is a federal law. All other laws are state laws. What is also important for us - this is also in the law on municipal cooperation: if, for example, <i>Zweckverband</i> regulates business operations in accordance with the German Commercial Code, then the <i>Eigenbetriebsrecht</i> (law on municipally operated enterprises) is also applied.
5-6.	3. Are there any alternatives for the legal form of <i>Zweckverband</i> ?	Man hat sich damals für den Zweckverband entschieden, weil... (Ich sag mal so) in der Satzung steht, dass der Zweckverband keine Gewinnerzielungsabsicht besitzt...	At that time, they chose the special purpose association because... (I will put it this way) it says in the Statute that the <i>Zweckverband</i> has no intention of making profit...
7.		Der zweite wesentliche Gedanke war der Solidaritätsgedanke . (und ich gehe davon aus – Ich kenne heute die alten Fördermitglieder nicht mehr so gut... Meine Vermutung ist zum einen - Keine Gewinnerzielungsabsicht Und zum Zweiten dieser - Solidaritätsgedanke , der vor allem in unserem Zweckverband vorherrscht.	...and the second essential thought was the idea of solidarity (and I assume it - I do not know the old supporting members so well anymore), but my guess is, on the one hand, no intention to make a profit. On the other hand, the idea of solidarity, which prevails above all in our special-purpose association.

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
8.	4. So, you do not have profit. The profit is zero, you just cover costs, right?	In unserer Satzung steht: Wir haben keine Gewinnerzielungsabsicht . Im Wesentlichen versuchen wir, ein Nullergebnis zu bekommen. Das schaffen wir dahingehend, dass wir Aufwendungen haben und exakt diese Aufwendungen auf unseren Preis umlegen. Das heißt, wenn ich 70 Millionen Aufwendungen habe und lege diese auf den Preis um, bleibt unter dem Strich – Aufwand minus Ertrag – nichts mehr übrig.	Our Statute says: we have no profit motive. Essentially, we try to achieve a zero result. We achieve this by having expenses and allocating exactly these expenses to our price. That means that if I have 70 million in expenses and allocate them to the price, there is nothing left on the bottom line - expenses minus income.
9.		Um vielleicht diesen Solidaritätsgedanken zu veranschaulichen, habe ich hier unser Leitungsnetz (zeigt Karte der Wasserversorgung). Das sind insgesamt 1700 Kilometer Leitungen. Hier ist der Bodensee. Hier ist die Fassung in Sipplingen. Und das Wasser wird bis nach Bad Mergentheim, das ist das nördliche Ende von Baden-Württemberg, geleitet. Das heißt, komplett Baden-Württemberg in dieser Süd-Nordachse wird von uns versorgt. Die Gemeinde Sipplingen , die direkt an der Fassung (an der Quelle) gelegen ist, bezahlt denselben Wasserpreis wie die Gemeinde Bad Mergentheim , die sich 200 Kilometer weiter nördlich befindet.	To perhaps illustrate this idea of solidarity, I have here our network of pipes (shows map of water supply). That is a total of 1700 kilometres of pipelines. Here is Lake Constance. Here is the water extraction in Sipplingen. And the water will be piped up to <i>Bad Mergentheim</i> , which is the northern end of <i>Baden-Württemberg</i> . That means <i>Baden-Wuerttemberg</i> in this south-north axis is completely supplied by us. The municipality of Sipplingen, which is located directly at the intake (at the source), pays the same water price as the municipality of <i>Bad Mergentheim</i> , which is located 200 kilometres further north.
10.	7. Is it possible that municipalities participate also in kind, like with pipes, or labour (workforce)?	Wenig, wir haben 183 Mitglieder . Davon sind (glaube ich) 147 Städte und Gemeinden und der Rest sind andere Zweckverbände, kleinere Zweckverbände, die von uns das Wasser beziehen und die das Wasser dann an ihre Mitglieder weiterverteilen.	Not much, we have 183 members. Of these (I think) 147 are cities and municipalities and the rest are other special-purpose associations, smaller special-purpose associations that purchase water from us and then distribute the water to their members.

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
11.	14. How do municipalities influence election of <i>Bodensee</i> administrative bodies?	<p>Nein, im Endeffekt ist das so: Wir haben Gremien. Unser oberstes Gremium ist die so genannte Verbandsversammlung. Dort sitzen alle Mitglieder drin (in diesem Gremium).</p> <p>Bei den Stimmrechten. Wenn es um Abstimmungen geht. Da wird nämlich unterschieden zwischen den großen Mitgliedern, die viele Beteiligungsquoten gezeichnet haben, und den kleineren Mitgliedern, die geringere Beteiligungsquoten besitzen, dementsprechend sind die Stimmen verteilt. Was dann noch eine Besonderheit ist: Wir haben drei Gruppen an Mitgliedern. In der Gruppe 1 sind zum Beispiel alle Mitglieder erfasst, die eine Beteiligung von größer 1000 Liter/Sekunde ("Sekundenliter") aufweisen. In dieser Gruppe ist nur die Stadt Stuttgart. Das bedeutet aber, dass die Stadt Stuttgart (und dann ist es wieder so aufgeteilt) 33 % der Stimmen, also ein Drittel der Stimmen innehat. Das heißt, die Stadt Stuttgart kann oder könnte (dies ist in der Vergangenheit ganz selten vorgekommen), Beschlüsse auch blockieren.</p> <p>Also die Verbandsversammlung ist das oberste Gremium, diese tagt aber nur einmal im Jahr.</p>	<p>The bottom line is that we have committees. Our highest body is so-called Association Assembly. All members sit there (in this body). When it comes to voting, a distinction is made between the large members, who have subscribed to many participation quotas, and the smaller members, who have fewer participation quotas, and the votes are distributed accordingly. Another special feature is that we have three groups of members. Group 1, for example, includes all members who have a participation rate of more than 1000 litres/second ("seconds litres"). Only the city of Stuttgart is in this group. But this means that the city of Stuttgart (and then it is divided up again like this) holds 33 % of votes, i.e. one third of the votes. This means that the city of Stuttgart can or could (this has happened very rarely in the past) also block decisions.</p>
12.			<p>The Association Assembly is the supreme body, but it only meets once a year.</p>
13.	9. How is the management of <i>Bodensee Zweckverband</i> appointed to their positions?	<p>Unsere Aufbauorganisation weist eine Geschäftsleitung auf. Sie besteht aus einem kaufmännischen Geschäftsführer und einem technischen Geschäftsführer. Diese zwei Personen werden von den Gremien ausgewählt.</p>	<p>Our organisational structure has a management board. It consists of a commercial managing director and a technical managing director. These two people are selected by the committees.</p>

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
14.		Ja, insbesondere zur Vorbereitung haben wir unter dieser Versammlung noch andere Gremien. Es existieren ein Personalausschuss , in dem Personaldinge vorberaten werden, und auch ein Verwaltungsrat mit 25 Mitglieder, "in dem dann eigentlich auch die Musik spielt."	Specially for preliminary consultations, we have other bodies under this Association Assembly. There is a personnel committee, in which personnel matters are discussed in advance, and also an administrative board with 25 members, "in which the music actually plays."
15.		Die beiden Geschäftsführer werden von dem Gremium - Versammlung tatsächlich bestellt. Alle anderen Stellen sind nachgeordnet. Ich bin (eigentlich) Leiter des Finanz- und Rechnungswesens . Es gibt noch zwei Stellvertreter für die Geschäftsführer : Einen kaufmännischen Stellvertreter (praktisch bewältige ich seine Aufgaben in Personalunion) und dann habe ich noch einen technischen Kollegen , der diese Stellvertretung übernimmt. Das ist so bis zu einer bestimmten Entgeltgruppe . In unserem Unternehmen handelt es sich um die Entgeltgruppe II nach dem Tarifvertrag .	The two managing directors are actually appointed by the body - Association Assembly. All other positions are subordinate. I am (actually) the head of finance and accounting. There are two deputies for the managing directors: a commercial deputy (in practice, I manage his tasks in personal union) and then I have another technical colleague who takes over this deputy position. In our company it is a pay group II according to the collective agreement.
16.		Die Stellen werden öffentlich ausgeschrieben. Es gibt Bewerber. Die Bewerber werden intern ausgesucht. Wir haben eine Personalabteilung . Ab einer bestimmten Entgeltgruppe müssen diese Bewerber dem Personalausschuss vorgestellt werden. Ansonsten wird über nachrangige Stellen seitens der Geschäftsleitung beziehungsweise mittels des Personalausschusses... (entschieden).	The positions are advertised publicly. There are applicants. The applicants are selected internally. We have a human resources department. Above a certain pay grade, these applicants have to be presented to the personnel committee. Otherwise, subordinate positions are decided by the management...

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
17.		Wir haben einen Tarifvertrag, das ist bei uns der Tarifvertrag für Versorgungsbetriebe . Er weist verschiedene Entgeltgruppen auf. Ab der Endgeldgruppe 11 . (Aber das ist eine Festlegung die jetzt für unseren Verband gilt.) ist es bei uns notwendig, dass nach der Auswahl zumindest (zwei) Personen dem Personalausschuss vorgestellt werden, der dann im Wesentlichen auf Empfehlung der jeweiligen Fachabteilung das O.K. gibt.	We have a collective agreement which has different pay groups. Starting from the pay groups 11 (But this is a stipulation which is valid for our association now), it is necessary that after selection, at least (two) people are presented to the personnel committee, which then gives the OK, following the recommendation of the respective specialist department.
18.	21. Are the employees of water provision association <i>Bodensee</i> public officials or do they have usual contracts like in private enterprises?	Das ist ganz unterschiedlich, je nachdem wie der jeweilige Zweckverband organisiert ist: Bei uns ist es wirklich so: Die beiden Geschäftsführer haben ein Wahlrecht: Sie können entweder Beamte auf Zeit werden oder sie können Angestellte mit einem außertariflichen Vertrag sein.	That is quite different, depending on how the respective special-purpose association is organised. In our case it is like this: the two managing directors have a right to choose. They can either become temporary civil servants or they can be employees with a non-tariff contract.
19.		Wir haben insgesamt 320 Mitarbeiter. Die zwei Geschäftsführer haben das Wahlrecht. Die anderen sind alle Angestellte nach Tarifvertrag.	We employ a total of 320 employees. The two managing directors have a right to choose. The others are all employees according to the collective agreement.
20.		Dass es aber auch ganz anders gehandhabt werden kann, das sehen wir hier in Stuttgart. Wir haben hier in Stuttgart mit der Landeswasserversorgung einen zweiten großen Zweckverband , der unter Anderem auch die Stadt Stuttgart versorgt. Dieser Zweckverband ist etwas anders aufgestellt. Dort gibt es noch sehr viele Beamte.	But we can see here in Stuttgart that it can also be handled quite differently. Here in Stuttgart we have a second large special-purpose association, the <i>Landeswasserversorgung</i> , which also supplies the city of Stuttgart. This special-purpose association is organised somewhat differently. They still have a lot of civil servants there.

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
21.		Bei der Landeswasserversorgung ist dies historisch bedingt. Der Bodenseezeitverband existiert seit 1954 und die Landeswasserversorgung seit 1918 oder 1920. Die Landeswasserversorgung war damals ein Landesbetrieb.	This is historically due to the state water supply. The <i>Bodenseezeitverband</i> has existed since 1954 and the <i>Landeswasserversorgung</i> since 1918 or 1920. The <i>Landeswasserversorgung</i> was a <i>Landesbetrieb</i> (state company) that time.
22.		Es gibt einfach keine Gründe dafür, in unserem Zweckverband viele Beamte einzustellen.	There are simply no reasons for employing many civil servants in our special purpose association.
23.	5. Could you tell about the budgeting process of <i>Bodensee Zweckverband</i> ?	Hier habe ich einen Wirtschaftsplan des Jahres 2017 (exemplarisch). (Jener von 2018 sieht genauso aus. Die Zahlen sind verschieden). Budgetiert wird jährlich und diese Budgets werden in diesem Wirtschaftsplan niedergeschrieben. Dieser Wirtschaftsplan gilt für das betreffende Planjahr, in dem vorliegenden Fall für das Planjahr 2017. Momentan sind wir gerade dabei, den Wirtschaftsplan für 2019 zu erstellen. Er beinhaltet die Budgetvorgaben für das entsprechende Geschäftsjahr.	Here I have a business plan of the year 2017 (exemplary). (The one for 2018 looks the same, but the figures are different). Budgeting is done annually and these budgets are written down in this business plan. This economic plan is valid for the respective planning year, in this case for the planning year 2017. At the moment, we are in the process of preparing the economic plan for 2019. It contains the budget targets for the corresponding financial year.
24.		Der Wirtschaftsplan wird hier im Haus erstellt und muss dann mit den Gremien abgestimmt und freigegeben werden.	The business plan is drawn up in-house and must then be coordinated and approved with the committees (organs).
25.	Is this business plan public, available for everyone?	Es wird durch unsere Gremien beschlossen in einer nicht öffentlichen Sitzung. Allerdings bekommen diesen Wirtschaftsplan alle 183 Mitglieder zugeschickt, nachdem er von der Verbandsversammlung beschlossen wurde. Das bedeutet, die Mitglieder können sich über seinen Inhalt informieren.	It is decided by our committees in a non-public meeting. However, this economic plan is sent to all 183 members after it has been decided by the Association Assembly. This means that the members can inform themselves about its content.

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
26.	16. Could you, please, share it with me?	<p>Ja dies können wir machen. Im Endeffekt ist der Wirtschaftsplan wie folgt aufgebaut. (zeigt Wirtschaftsplan 2017). Vorne werden die Beschlüsse aufgeführt und weiter hinten sieht man, wie die Planung tatsächlich von Statten geht. Das werden Planungsckdaten vermittelt. Wir sprechen zum einen vom so genannten Erfolgsplan - da wird der jährliche Betrieb abgebildet. Da finden Sie im Aufwandsbereich rund 75 Millionen (Euro), die in den Aufwand fließen oder die zunächst einmal budgetiert werden. Sprich alles, was sich im Erfolgsplan abspielt, wird im Jahresabschluss in der Gewinn- und Verlustrechnung abgebildet. Daneben haben wir noch einen Vermögensplan. Im Vermögensplan sind die gesamten Investitionen abgebildet. Zum Beispiel erscheinen hier die Investitionen des Förder- und Aufbereitungsbetriebs in Sipplingen unterteilt (dann nach Wassergewinnung, was passiert im Seepumpwerk (wir haben hier eine Nummer). Hier ist vermerkt, was tatsächlich zu realisieren ist. (So ist der ganze Plan aufgebaut). Es wurden heuer für das Jahr etwa 19,8 Millionen (Euro) vorgesehen.</p>	<p>Yes, we can do this. In the end, the economic plan is structured as follows (shows economic plan 2017). The resolutions are listed at the front and further on you can see how the planning is actually done. This is what is conveyed by the key planning data. On the one hand, we are talking about the so-called profit plan - this is where the annual operations are shown. There you will find about 75 million (euros) in the expense area, which flow into expenses or initially budgeted. In other words, everything that happens in the profit plan is shown in the profit and loss account of the annual financial statement. In addition, we have an asset plan. The asset plan shows all the investments. For example, the investments of the extraction and treatment plant in Sipplingen are shown here, subdivided (then) into water extraction, what happens in the lake pumping station (we have a number here). Here it is noted what is actually to be realised (this is how the whole plan is structured). About 19.8 million (euros) have been planned for this year.</p>
27.		<p>Wir haben für die nächsten Jahre Investitionssummen zwischen 22 und 27 Millionen (im Wirtschaftsplan) stehen (pro Jahr) und für den laufenden Betrieb haben wir zwischen 75 und 80 Millionen an Budgets.</p>	<p>For the next few years we have investment sums of between 22 and 27 million (in the economic plan) per year and we have budgets of between 75 and 80 million for current operations.</p>

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
28.	Are you allowed to take bank credits?	Mmmh. (bestätigend). Also es war in der Vergangenheit so. Wir haben vor 10-15 Jahren... Ein gutes Beispiel sind Leitungen: Die Leitungen haben eine Haltbarkeit zwischen 50 und 70 Jahren. Das beinhaltet, in den ersten 50 Jahren passiert relativ wenig.	Mmmh. (confirming). So, the pipes have a lifespan between 50 and 70 years. In this time (the first 50 years) there is not much to invest. <i>Note: he does not directly respond to the question and tells an example of bigger investments for renewing the pipes after their lifespan of 50-70 years.</i>
29.		Zwischenzeitlich ist der Verband 60 Jahre alt. Dies bedeutet: Vor allem für die Erneuerung wird viel investiert . Wir haben nicht viele Erweiterungsinvestitionen . Sie sehen das hier (zeigt Karte des Versorgungsnetzwerks). Das Versorgungsgebiet liegt weitgehen fest. Dort gibt es andere Verbände und den anderen Zweckverband, der Wasser in diesem Teil von Baden-Württemberg verteilt. Zudem besteht hier im Nord-Osten noch ein Zweckverband. Deshalb entwickelt sich unser Versorgungsgebiet dort nicht in die Breite. Wir haben jetzt in den vergangenen Jahren das eine oder andere Neumitglied bekommen, aber es sind kurze Leitungsabschnitt, die tatsächlich verlegt werden müssen. The company manages it.	In the meantime, the association is 60-year-old. This means that a lot is invested, especially in renewal. We do not have a lot of expansion investments. You can see that here (shows map of the supply network). The supply area is largely fixed. There are other associations and the other special-purpose association that distributes water in this part of <i>Baden-Württemberg</i> . In addition, there is another special-purpose association here in the north-east. That is why our supply area is not expanding. In the past few years, we have gained one or two new members, but these are short sections of pipeline that actually have to be installed.
30.	5. How is the budget managed?		
31.	6. How was the equity capital formed?	(Ja, also da ist es so). Die Mitglieder, also ursprünglich mal die 13 (Gründungs-) Mitglieder und alle weiteren, müssen Eigenkapital einbringen. Das funktioniert so, das Eigenkapital an die Beteiligungquote (gebunden ist) (Das wird jetzt wahrscheinlich eine Herausforderung für sie das zu übersetzen).	(Yes, equity capital formation occurs in the following way). The members, originally the 13 members-founders and all others, must contribute to the equity capital. This is done in such a way that the equity capital is tied to the participation quota (This will probably be a challenge for you now to translate it).

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
32.		<p>Ich versuch' s mal so einfach wie möglich zu erklären: Der Wasserbezug, den die einzelnen Mitglieder haben, orientiert sich bei uns an dieser Beteiligungsquote (Ich mach' s ganz einfach) Die Beteiligungsquote geht nach "Sekundenliter" – Ein "Sekundenliter" bedeutet einen Liter pro Sekunde. Dies sind auf das Jahr hochgerechnet dann ein paar Tausend Kubikmeter (1 Liter/sec * 60 * 60 * 24 * 365 sec) / (1000 l/m³) = 31 536 m³). Für den Betrag bezahlen sie. Wenn jetzt Ein Mitglied sagt: "Ich möchte gern diesen einen Sekundenliter". So steht das hier im Wirtschaftsplan verzeichnet (zeigt Seite im Wirtschaftsplan). Dann sind das 21 000 Euro, die dieses Mitglied, wenn es neu dazukommt oder höher zeichnen möchte, zu bezahlen hat. Dieser Betrag fließt dann ins Eigenkapital. Jetzt gehen wir von den 13 ursprünglichen (Mitgliedern) aus: Da hat die Stadt Stuttgart (glaub ich) damals 1000 Sekundenliter gezeichnet. Da war der Preis noch nicht bei 21 000 Euro, sondern bei umgerechnet 12 800 Euro.</p>	<p>I will try to explain it as simple as possible: the water supply that the individual members have is based on this participation rate (I make it very simple). The participation rate is based on "seconds litre" - a "seconds litre" means one litre per second. Extrapolated to the year it is a few thousand cubic meters then ((1 liter/sec * 60 * 60 * 24 * 365 sec)/(1000 l/m³) = 31 536 m³). The municipalities pay for that. If now someone says: "I would like this one second litre", then it will be included in the business plan here (shows page in the business plan). Then, this member has to pay 21 000 Euro, if he wants to receive more water. This amount flows into the equity capital. Now we consider 13 original members. I think the city of Stuttgart subscribed for 1,000 second litres at that time. The price was not at 21 000 euro but at 12 800 Euro converted from DM to Euros.</p>
33.		<p>(Diese Menge entspricht) ... nicht unbedingt jener, die ein Mitglied konsumiert, sondern: Sie müssen im Zeitpunkt x, wenn sie dem Zweckverband beitreten wollen, entscheiden, wieviel Wasser sie benötigen. (Volumen). Ob sie das dann tatsächlich ausschöpfen (ist eine andere Frage). Es gibt Mitglieder mit einem hohen Sicherheitsdenken, die sagen: "Eine Auslastung von mehr als 70 % möchte ich nicht".</p>	<p>(This quantity corresponds to) ... not necessarily what a member consumes, but they must decide at a time x, if they want to join <i>Zweckverband</i>, how much water they need (volume). Whether or not they will actually make use of it is another question. There are members with a high security thinking who say: "I do not want a utilisation of more than 70 %".</p>

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
34-35.		Da geht es nur um das Eigenkapital. Also die ursprünglichen 13 Mitglieder haben das Eigenkapital zu Beginn finanziert. Dann sind relativ schnell andere Kommunen dazugekommen. Diese haben gemerkt: Es funktioniert – Das Wasser hat eine entsprechende Qualität. Und so hatte der Verband in den 70er Jahren deutlich mehr als 13 Mitglieder. Inzwischen sind wir 180!	It is all about equity. So, the original 13 members financed the equity capital at the beginning. Then other municipalities joined relatively quickly. They noticed that it works - the water has the right quality. And so, in the 1970s, the association had considerably more than 13 members. In the meantime, we have 180!
36.	What happens if new participants come?	Wenn neue Mitglieder dazukommen, oder auch ein bestehendes Mitglied wächst, etwa infolge des Wachstums der Industrie, oder neuer Bürger. Dann kommen diese Mitglieder auf uns zu und sagen: "Ich brauche weitere Beteiligungquoten ", das heißt weitere Sekundenliter, die sie zu zeichnen und für die sie zu bezahlen haben. Jetzt im Moment zahlen sie die 21 000 Euro, die ins Eigenkapital fließen. Und zu Ihrer Frage: Weil andere Gemeinden die schon länger dabei sind (ja) vorfinanziert haben, gibt es noch einen Zuschlag (für neue Mitglieder) zu diesem Kapital. Zusätzlich zu den 21 000 Euro kommen nochmal 16 000 Euro dazu, die das abdecken sollen, was andere schon vorfinanziert haben.	When new members join, or even an existing member grows, for example, as a result of the growth of industry, or new citizens. Then, these members approach us and say: "I need more participation quotas", which means more 'second litres' that they have to subscribe to and pay for. Right now, they are paying 21,000 euros that go into equity capital. And to your question: because other municipalities that have been in the project for a long time (yes), there is a supplement (for new members) to this capital. In addition to the 21,000 euros, another 16,000 euros are added to cover what others have already pre-financed.
37.		Es gab noch die Frage, ob das Land (Baden-Württemberg) sich am Zweckverband beteiligt hat. Antwort: Zu Beginn ja, aber seit dem nicht mehr.	There was also the question of whether the Land (<i>Baden-Württemberg</i>) had participated in the <i>Zweckverband</i> . Answer: at the beginning yes, but since then no more.
38.	18. Does <i>Bodensee Zweckverband</i> receive any grants from the Land, Federation or EU??	Nein, weder von der EU, noch vom BUND (Deutschland)	No, neither from the EU, nor from <i>Bund</i> (Germany).

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
39.		<p>Ich bin mir nicht sicher, ob diese Aussage auf alle Bundesländer übertragbar ist. Bei uns ist es (tatsächlich) so: Zweckverbände erhalten hier in Baden-Württemberg nach dem aktuellen Wasserrecht keine Zuschüsse. Kommunen, die zum Beispiel auf Eigenwasser setzen, z.B. eigene Brunnen wieder in Stand setzen, können Zuschüsse vom Land bekommen.</p>	<p>I am not sure whether this statement can be applied to all federal states. In our state it is (in fact) like this: here in <i>Baden-Württemberg</i>, special-purpose associations do not receive any subsidies under the current water law. Municipalities that, for example, rely on their own water, e.g. repair their own wells, can receive subsidies from the state.</p>
40.	<p>Is there a real danger, that public water supply could once become a part of a big private company, which sells more expensive water? Note: question from the translator.</p>	<p>Wir haben hier das große Glück, dass die Bürger in dieser Sache relativ sensibel sind. Wenn es Bestrebungen in diese Richtung gäbe, würde es nach meiner Einschätzung Widerstand aus der Bürgerschaft hervorrufen. Weiterhin verfolgen unsere Mitglieder, zum Beispiel die Politiker, welche in den Kommunen das Sagen haben, keine Verkaufsbestrebungen.</p>	<p>We are very fortunate here that the citizens are relatively sensitive to this issue. If there were efforts in this direction, I believe it would provoke resistance from the citizens. Furthermore, our members, for example, the politicians who call the shots in the municipalities, do not pursue any sales efforts.</p>
41.	<p>Is it in the Statute that the sale of the special purpose association is excluded? Note: question from the translator.</p>	<p>Nicht direkt. Wenn wir jetzt einen Beschluss bekommen würden, dass der Zweckverband verkauft werden müsste, wäre das möglich, aber es gibt keine Bestrebungen zum Verkauf.</p>	<p>Not directly. If we were to get a decision now that the special-purpose association had to be sold, that would be possible, but there are no intentions to sell. There are some examples where cities sold their water supply system to a company. As a consequence, the water-quality dropped down and the water price has increased.</p>
42.		<p>Und selbst wenn der Preis nicht steigt, wird die Qualität leiden. Wir arbeiten hier sehr wirtschaftlich, aber, wenn wir jetzt Gewinn machen wollten, dann müssten wir entweder die Preise erhöhen, oder den Service reduzieren.</p>	<p>And even if the price does not go up, the quality will suffer. We work very economically here, but if we wanted to make a profit now, we would either have to increase the prices or reduce the service.</p>

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
43.	8. How do you control costs in order not to make them too high?	Im Wesentlichen dokumentieren wir das bereits im Wirtschaftsplan . Im Wirtschaftsplan für das kommende Geschäftsjahr, stehen alle Kosten, welche auf die einzelnen Kommunen zukommen. Diesen Wirtschaftsplan beschließen diese 183 Mitglieder, damit beschließen sie eigentlich den Preis der im nächsten Jahr auf sie zukommt.	Essentially, we already document this in the economic plan. The economic plan for the coming business year contains all the costs that will be incurred by the individual municipalities. These 183 members decide on this economic plan, and in doing so they actually decide on the price they will have to pay next year.
44.	Should all the members decide and validate? Note: question from the translator.	Ja. Es kann durchaus sein, dass in einer Sitzung, wo über den Wirtschaftsplan beraten wird, Anregungen oder Änderungsvorschläge vorgebracht werden. Dann geht man nochmal drüber... Nach Mehrheit.	Yes, it may well be that in a meeting where the economic plan is being discussed, there are still suggestions or proposals for changes. Then you go over it again... By majority.
45.	Is it a consensus-based voting or does the majority decide? Note: question from the translator.		

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
46.	10. I would like to talk about the relationships between <i>Bodensee</i> management, municipalities and Land authorities.	Die Beziehungen zwischen Geschäftsleitung und Mitglieder finden über die Gremien des Zweckverbandes statt. Es ist nicht so, dass zur Zeit Mitgliedsgemeinden auf das Tagesgeschäft einen Einfluss haben. Es steht auch in der Satzung, dass das Tagesgeschäft der Geschäftsführung obliegt. In den Gremien, haben natürlich die Mitglieder Mitspracherecht, bzw. beschließen auch. Im Tagesgeschäft findet das in dieser Weise nicht statt. Wir haben natürlich weitere Organisationsdokumente, wo ganz klar beschrrieben ist, was die Geschäftsleitung darf. Z. B. Beschlüsse bis 250.000 € darf die Geschäftsleitung herbeiführen (allein entscheiden). Alle Entscheidungen die darüber hinaus gehen, benötigen dann wieder Zustimmungen verschiedener Gremien. Wir haben z. B. einen Bau- und Vergabeausschuss , ferner haben wir den Verwaltungsrat und alle Investitionen über 1.000.000 € werden über die Verbandsversammlung beschlossen. Da gibt es schon eine Staffelfung, daraus folgt, die Geschäftsleitung entscheidet im Tagesgeschäft – für alles was über das Tagesgeschäft hinausgeht, gibt es verschiedene zuständige Gremien. So ist es in der Satzung festgelegt.	The relationship between management and members takes place through the bodies of the special purpose association. It is not the case that member municipalities currently have any influence on the day-to-day business. The Statute also states that the day-to-day business is the responsibility of the management. In the committees, of course, the members have a say and also make decisions. This is not the case in day-to-day business. Of course, we have other organisational documents that clearly describe what the management is allowed to do. For example, the management is allowed to make decisions up to 250,000 € (decide alone). All decisions above this amount require the approval of various committees. We have, for example, a building and award committee, we also have the board of directors and all investments over € 1,000,000 are decided by the Association Assembly. There is already a hierarchy, which means that the management decides on the day-to-day business - for everything that goes beyond day-to-day business, there are different responsible bodies. That is how it is laid down in the Statute.

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
47.		<p>Man kann schon sagen, dass es Kommunen oder Städte gibt, die mehr oder weniger Einfluss besitzen, weil, wie ich anfangs schon vermerkt habe: Je nachdem wie die im Etat gezeichnete Beteiligungsquote ausfällt, ist der Einfluss natürlich deutlich größer. Wenn es sich um grundlegende Dinge handelt, wird man sich im Vorfeld (und über das Gremium) mit einem großen Mitglied, wie der Stadt Stuttgart, durchaus auch mal vorher austauschen.</p>	<p>It is fair to say that there are municipalities or cities that have more or less influence because, as I said in the beginning, depending on the participation rate signed in the budget, the influence is of course much greater. When it comes to fundamental issues, you will have to exchange ideas with a large member, such as the city of Stuttgart, in advance (and via the committee).</p>
48.	<p>11. What is the role of municipalities in the association? What are their main economic and political objectives?</p>	<p>Das ist eine Besonderheit. Gründe dem Zweckverband beizutreten, sind die Versorgung der Bürger und vor allem der Industrie mit Wasser. Insbesondere der mittlere Neckarraum oder auch die Schwäbische Alb waren damals wirklich Wassermangelgebiete. Sie waren auf dieses Fernwasser angewiesen und sind es auch heute noch. Die Stadt Stuttgart besitzt kaum Eigenwasservorkommen. Ohne dieses Wasser, d. h. der Bodenseewasserversorgung und der Landeswasserversorgung, wäre diese wirtschaftliche Entwicklung hier im mittleren Neckarraum nicht möglich gewesen.</p>	<p>That is a special feature. The reasons for joining the special-purpose association are to supply the citizens and especially the industry with water. Especially the central Neckar region or the Swabian Alb were really water shortage areas at that time. They were dependent on this long-distance water and still are today. The city of Stuttgart has hardly any of its own water resources. Without this water, i.e. the Lake Constance water supply and the state water supply, this economic development here in the central Neckar region would not have been possible.</p>

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
49.		<p>Also wenn wir nochmal die Karte anschauen.... Da sind Städte wie die Stadt Stuttgart, die zu 100% Wasser beziehen und vertreiben. Einige Gemeinden haben zwar Eigenwasser, dessen Menge aber nicht ausreichend ist. Aus diesem Grunde beziehen sie noch zusätzlich Bodenseewasser. Es gibt auch andere Gemeinden, die zwar genug Wasser haben, welches jedoch sehr hart ist, das heißt, einen hohen Kalkgehalt besitzt. Diese Gemeinden mischen dann ihr hartes Eigenwasser mit dem weicheren Bodenseewasser. Das Bodenseewasser ist mit einer Wasserhärte von 8.9° (Deutsche Härte) relativ weich. Auf der Schwäbischen Alb kommen durchaus mal 22-23° Wasserhärte vor. Wenn man das, z. B. 50/50, mischt, so kommt man auf ein besseres Verhältnis (Wasserhärte).</p>	<p>So, if we look at the map again... There are cities like the city of Stuttgart that purchase and distribute 100% water. Some municipalities have their own water, but its quantity is not sufficient. For this reason, they also purchase water from Lake Constance. There are also other municipalities that have enough water, but it is very hard, i.e. it has a high lime content. These communities then mix their own hard water with the softer Lake Constance water. Lake Constance water is relatively soft with a water hardness of 8.9° (German hardness). On the Swabian Alb, water hardness can sometimes reach 22-23°. If you mix the two, e.g. 50/50, you get a better ratio (water hardness).</p>
50.		<p>Die Ökonomie hat natürlich schon... (einen großen Einfluss, spielt eine große Rolle). Je teurer wir werden würden und je billiger das Eigenwasser wäre, hätten die Kommunen Chancen auf Eigenwasserversorgung. Die Aufbereitung des Eigenwassers ist kostenaufwändig, da eventuell eine Nano- oder Ultrafiltrationsanlage benötigt wird. Das Bodenseewasser ist sehr sauber und hat an sich bereits Trinkwasserqualität, wenn es zum ersten Mal an das Tageslicht kommt. Wir bereites das Wasser dennoch nochmals auf. Die Kommunen benötigen einen teilweise deutlich höheren Aufwand für die Wasseraufbereitung und dieser macht das Wasser teurer. Wenn aber unser Wasser heute teurer werden würde, könnten die Kommunen ihren Konsum anpassen und zum Beispiel mehr Eigenwasser nutzen.</p>	<p>Of course, the economy already has... (a big influence, plays a big role). The more expensive our water would become and the cheaper our own water of the municipalities would be, the more chances that municipalities would have to provide water themselves. The treatment of the own municipal water is costly, since a nano- or ultrafiltration plant may be needed. Lake Constance water is very clean and already has drinking water quality when it first comes to light. However, we treat the water again. Some municipalities would have higher expenditures with the water purification and that makes the own water provision more expensive. But if our water would become more expensive, the municipalities could already adapt their consumption and, for example, use more of their own water, for example.</p>

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
51.	15. What are, in your opinion, advantages and disadvantages of public services provision through inter-municipal cooperation in the form of <i>Zweckverband</i> ?	Dadurch, dass wir keine Gewinnerzielungsabsicht haben, fällt bei uns in der Regel zumindest keine Körperschaftsteuer und keine Gewerbesteuer an. Man könnte sagen, wenn beispielsweise das Wasser gleichmäßig in Baden-Württemberg verteilt wäre, dann würden nicht nur in Stuttgart und Sipplingen die 300 Mitarbeiter sein, dann würde sich die Mitarbeiterzahl verteilen und die Mitarbeiter wären vor Ort bei den Kommunen. An der Gesamtzahl der Beschäftigten würde sich nicht viel ändern.	Because we do not have the intention of making a profit, we generally do not have to pay corporation tax or trade tax. You could say that if, for example, the water was evenly distributed in <i>Baden-Württemberg</i> , then the 300 employees would not only be in Stuttgart and Sipplingen, then the number of employees would be distributed among municipalities. The total number of employees would not change much.
52.		Wir bieten neben dem eigentlichen Wasser auch Wasserdienstleistungen an. In unserer Satzung steht: Der Zweckverband unterstützt die Mitglieder.	In addition to actual water provision we offer water services. According to our Statute, the <i>Zweckverband</i> provides such services.
53.		Da kleinere Gemeinden Schwierigkeiten haben, Fachkräfte der Wasserversorgung zu finden und zu bezahlen, bieten wir Serviceleistungen und Spezialisten für Wassertechnikprobleme an. Wir stellen den Mitgliedsgemeinden Betriebsingenieure zur Verfügung.	As smaller communities have difficulties finding and paying water supply professionals, we provide services and specialists for water engineering problems. We provide operating engineers to the member municipalities.

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
54.		<p>Der größte Vorteil des Zweckverbandes für seine Mitglieder besteht in den Möglichkeiten, dass die großen starken Gemeinden die kleineren Gemeinden unterstützen. Für die kleinen Gemeinden würde die eigene Wasserversorgung viel teurer als die zentrale Versorgung seitens des Zweckverbandes. Über den Zweckverband wird zwischen den Gemeinden Solidarität hergestellt. Die Entscheidungsfindung im Zweckverband benötigt jedoch öfters mehr Zeit. So werden Investitionen im Wirtschaftsplan des Zweckverbandes für das folgende Jahr erfasst. Änderungen dieses Planes, die im nächsten Jahr erfolgen, erfordern die Zustimmung zweier Gremien. Deshalb ist der Entscheidungsprozess langsam. Allerdings ist dies bei privaten Kapitalgesellschaften, z.B. Aktiengesellschaft, GmbH, ebenfalls der Fall.</p>	<p>The biggest advantage of the special-purpose association for its members is the possibility for the large strong municipalities to support the smaller municipalities. For small municipalities, their own water supply would be much more expensive than the central supply from the special-purpose association. Solidarity is established between municipalities through the special-purpose association. However, decision-making in the special-purpose association often takes more time. For example, investments are recorded in the business plan of the special-purpose association for the following year. Changes to this plan that take place in the next year require the approval of two committees. Therefore, the decision-making process is slow. However, this is also the case with private corporations, e.g. public limited company, limited liability company.</p>
55.		<p>Der Preis, den die Mitglieder bezahlen, setzt sich aus zwei Elementen zusammen. Die Mitglieder bezahlen für ihre "Beteiligungsquote" einen Grundpreis für den möglichen Wasserbezug. Für die tatsächlich bezogene Wassermenge bezahlen sie einen bezugsmengenabhängigen Wasserpreis (ähnlich wie ein Arbeitspreis).</p>	<p>The price paid by the members is made up of two elements. The members pay a basic price for their "participation quota" for the possible water withdrawal. For the amount of water actually drawn, they pay a water price that depends on the draw-off rate (similar to an energy price).</p>

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
56.		<p>Würden alle Mitglieder ihre Beteiligungsquote gleich ausnützen, dann wäre der Preis für alle Mitglieder gleich. Bei einigen Mitgliedern liegt die Auslastung der Bezugsquote bei über 90%, andere Mitglieder erreichen nur eine Auslastung zwischen 20% und 90%. Bei einer 100% Auslastung wäre der gesamte Wasserpreis pro Mengeneinheit am günstigsten. Falls die Mitglieder über ihre Beteiligungsquote (Kapazitätsmenge) hinaus Wasser beziehen, werden Zuschläge erhoben. Die durchschnittliche Kapazitätsauslastung liegt bei 53%.</p>	<p>If all members utilised their participation quota equally, then the price would be the same for all members. For some members, the utilisation of the purchase quota is over 90%, while other members only achieve a utilisation of between 20% and 90%. At 100% utilisation, the total water price per unit of volume would be the cheapest. If members draw water in excess of their participation quota (capacity quantity), surcharges are levied. The average capacity utilisation is 53%.</p>
57.	<p>17. Does <i>Bodensee Zweckverband</i> have competitors in water services provision, e.g. through own activities of municipalities?</p>	<p>Mögliche Konkurrenten sind insbesondere die Mitglieder selbst. Eigenwasser wird von manchen Gemeinden selbst angeboten. Deshalb muss der Zweckverband den Wasserpreis niedrig genug halten. Falls die Eigenversorgung aufgrund des technischen Fortschritts kostengünstiger wird, könnten sich Mitglieder selbst versorgen, z.B. aus Flusswasser. Ein Konkurrent ist die „Landeswasserversorgung“. Für einige Mitglieder ist auch die Versorgung seitens der Landeswasserversorgung möglich, z.B. betrifft dies die Stadt Stuttgart. Es handelt sich ebenfalls um einen großen Zweckverband.</p>	<p>Possible competitors are in particular the members themselves. Own water is offered by some municipalities directly. Therefore, the special-purpose association has to keep the water price low enough. If self-supply becomes cheaper due to technical progress, members could supply themselves, e.g. from river water. One competitor is the „Landeswasserversorgung“. For some members, supply from the <i>Landeswasserversorgung</i> is also possible, e.g. this concerns the city of Stuttgart. It is also a large special-purpose association.</p>
58.		<p>Die Mitglieder unseres Zweckverbandes (Bodenseewasserversorgung) sind gleichzeitig Eigentümer und Kunden. Eine Beteiligung kostet 21000 Euro je Sekundemlter. Ohne Mitgliedschaft gibt es kein Wasser. Die Anteile werden nicht an der Börse gehandelt. Die Mitglieder können die Anteile weder auf einem Markt noch untereinander handeln. Die Variabilität der Anteile ist ausschließlich mit Wassermengen verknüpft.</p>	<p>The members of our special purpose association (<i>Bodenseewasserversorgung</i>) are both owners and customers. A share costs 21000 euros per second litre. Without membership there is no water. The shares are not traded on the stock exchange. The members cannot trade the shares on a market or among themselves. The variability of the shares is exclusively linked to water quantities.</p>

Answer	Interviewer (Mariia Chebotareva)	Interviewee (German original answers)	Interviewee (English translation)
59.	20. Is <i>Bodensee Zweckverband</i> taxed as a regular private company (as <i>Betrieb gewerblicher Art</i>) or has it a special taxation regime concerning tax exemptions, tax rates, etc.?	Eine Besteuerung über die Körperschaftsteuer erfolgt jedoch bei Gewinnerzielung. Gewinne werden thesauriert (nicht ausgeschüttet). Gewerbesteuerzahlungen entfallen, da keine dauernde Gewinnerzielungsabsicht existiert. Grundsätzlich bestehen keine ausdrücklichen Steuervorteile, da der Zweckverband nicht "gemeinwirtschaftlich" ist. Der Zweckverband wird als Körperschaft des öffentlichen Rechts besteuert.	Taxation via corporation tax takes place when profits are made. Profits are retained (not distributed). Business tax payments are omitted as there is no permanent intention to make a profit. In principle, there are no explicit tax advantages, as the special-purpose association is not "public service". The <i>Zweckverband</i> is taxed as a corporation under public law.
60.	22. For what kind of public services should <i>Zweckverband</i> legal form be used?	Für weitere Dienstleistungen wird der Zweckverband Bodensee-Wasserversorgung benutzt. 5% des Umsatzes fallen auf diese Dienstleistungen, die restlichen 95 % entfallen auf die Wasserversorgung. Es gibt weitere kommunale Zweckverbände, wie die Landeswasserversorgung für den Wasserbezug. Weitere kommunale Zweckverbände gibt es vor allen Dingen im Bereich der Bauhöfe. Zweckverbände übernehmen Aufgaben, die einzelne Gemeinden allein nicht bewältigen können und die der kommunalen Zusammenarbeit bedürfen. Ansonsten erledigen die Gemeinden wirtschaftliche Aufgaben mit Hilfe von Eigenbetrieben und Kapitalgesellschaften.	<i>Zweckverband Bodensee-Wasserversorgung</i> is used for the following services: 5% of the turnover is accounted for other services, the remaining 95% is for water supply. There are other municipal special-purpose associations, such as the <i>Landeswasserversorgung</i> for water supply. Other municipal special-purpose associations exist primarily in the area of building yards. Special-purpose associations take on tasks that individual municipalities cannot handle alone and that require inter-municipal cooperation. Otherwise, the municipalities carry out economic tasks with the help of their own businesses and corporations.

Source: Compiled by the author.

SUMMARY IN ESTONIAN

Funktsionaalsed, kattuvad ja konkureerivad jurisdiktsioonid (FKKJ-id) võimaliku vahendina Venemaa omavalitsustevaheliseks koostööks kooliteenuste pakkumisel

Uurimuse motivatsioon ja aktuaalsus

Demograafilised probleemid ja sündimuse langus mõjutavad Venemaa omavalitsusi ja regioone. ÜRO andmeil väheneb Venemaa rahvaarv 143,9 miljonilt 2017. aastal 132,7 miljonini 2050. aastal (World population prospects 2017: 26). Selle tagajärjel kahaneb ka omavalitsuste arv. Selle probleemi lahendamisega seotud debatid Venemaal on suunatud peamiselt territoriaalsetele reformidele: maa- ja linnaasulate kaotamine, ümbernimetamine ja väikeste maa-asulate liitmine suuremateks (*Макварт, Францке* 2017). Arutus kerkib paljudes valdkondades esile tsentraliseerimisküsimus, muuhulgas näiteks koolihariduses, mille jaoks on osa eksperte pakkunud välja idee viia koolide haldamine regionaalsele tasandile (Mann, Briller 2005, Andreev 2013). Teised kinnitavad aga, et omavalitsuste suurendamine pole tingimata ainuke ega parim lahendus ning avalike teenuste tsentraliseerimist saab vältida (*Макварт, Францке* 2017; *Филатова et al.* 2014; *Маркварт* 2010). Seega pakutakse siinses lõputöös välja alternatiivne lähenemine Venemaa rahvaarvu vähenemise tagajärgede lahendamisele omavalitsustevahelise koostöö abil. Üks nimetatud tagajärgedest on tarbijate nõudluse vähenemine munitsipaalteenuste – vee ja elektri, ühistranspordi ja kooliteenuste – järele (*Маркварт* 2016).

Samuti viib sündimuse vähenemine kooliealiste laste arvu kahanemiseni, mida on seni kompenseerinud eelnevate aastate väike sündimuse kasv. Samas on aga ilmselge kalduvus iga-aastasele koolide sulgemisele ja seda kinnitab statistika: koolide arv on kahanenud aastatel 2010 kuni 2018 umbes 10 000 võrra. Samal ajal on kooliealiste laste arvu vähenemise tõttu üha raskem pakuda kvaliteetset haridust (iseäranis maapiirkondades), sest koolide rahastamine sõltub otseselt registreeritud õpilaste arvust. Hästi rahastatud koolid saavad palgata paremate kutseoskustega õpetajaid ning neil on piisavalt õppematerjale ja tehnilisi vahendeid. Vaatamata üleüldisele positiivsele dünaamikale Venemaa hariduse rahastamisel jooksevhindades vähenevad riigi kulud reaalhindades. Säärastes oludes võimaldaks Venemaa omavalitsustevaheline koostöö vähendada koolide tegevusega seotud kulusid ja saavutada mastaabisäästu (Bel, Sebõ 2019; Baba, Asami 2020 jne.).

Omavalitsustevahelist koostööd reguleeritakse enamjaolt föderalseadusega nr 131 „Venemaa Föderatsiooni kohalike omavalitsuste töö korraldamise üldpõhimõtted“. Toetudes nimetatud seadusele ja kirjandusele, võib esile tõsta kolm võimalikku õiguslikku vormi omavalitsustevaheliseks koostööks Venemaal:

- assotsiatiivsed vormid (ühingud, liidud);
- lepingulised vormid (lühi- ja pikaajalised lepingud);
- majanduslikud vormid (aktsiaseltsid, mittekaubanduslikud organisatsioonid jne) (*Ирискина* 2010; *Петроградская* 2010; *Миронова* 2014).

Assotsiatiivsed ja lepingulised vormid arenevad kiiresti, samas kui Venemaa omavalitsuste majanduslikud koostöövormid on arengus maha jäänud (*Бутова, Пухова, Щукин* 2013; *Бутова, Смирнова, Миловидова* 2014). Üks võimalik pikaajalise majandusliku koostöö vorm on funktsionaalsed, kattuvad ja konkureerivad jurisdiktsioonid (nn *FOCJ*-mudel, edaspidi FKKJ-id). Autor pakub FKKJ-id välja alternatiivina omavalitsuste liitmisele ja koolide tsentraliseeritud haldamisele ning võimalusena, mille abil vältida Venemaa koolihariduse kvaliteedi langust.

Siinne lõputöö põhineb funktsionaalsete, kattuvate ja konkureerivate jurisdiktsioonide (FKKJ-ide) mõistel, mille pakkusid algselt välja Bruno S. Frey ja Reiner Eichenberger (Frey, 1997, 1999, 2001, 2005; Frey, Eichenberger 1995, 1996, 1997, 1999, 2001a, 2001b, 2002, 2006). Lõputöös määratleb autor FKKJ-e kui majanduslikke üksusi, mitte poliitilisi institutsioone, millena Frey ja Eichenberger need algselt välja töötasid.

Kirjanduses eristatakse FKKJ-ide neli tüüpi (nt Eckardt, Friedrich 2014). Neid liigitatakse liikmesusega seotud kriteeriumide alusel (kes on FKKJ-ide liikmed). Kui liikmed on füüsilised isikud, on tegemist I tüüpi FKKJ-iga. Kui liikmed on valitsusüksused (nt omavalitsused), moodustuvad II tüüpi FKKJ-id. III tüüpi FKKJ-id hõlmavad riiklikke ja eraõiguslikke üksusi ning IV tüüpi alla kuuluvad kõik ülejäänud tüüpide juures nimetatud liikmed. Siinses lõputöös keskendutakse II tüüpi FKKJ-idele, mille liikmed on omavalitsused, mis tähendab, et tähelepanu keskmes on FKKJ-id omavalitsustevahelise koostöö vormina.

Käesolev doktoritöö on interdistsiplinaarse lähenemisega toetudes peamiselt majandusteadusele, kuid annab oma panuse ka õigusteadusesse, pakkudes juriidilisi soovitusi FKKJ-ide rakendamiseks Venemaal.

Siinse lõputöö teema on väga oluline, sest see aitab vastata küsimusele, kas FKKJ-idel põhinev koostöö on Venemaal võimalik sealhulgas millistel institutsioonilistel tingimustel või mitte. Kirjanduses ei käsitleta FKKJ-i eraldi juriidilise isikuna, millel on oma juhtkond, kõrgeimad organid ning tootmis- ja nõudlusfunktsioonid kooliteenuste pakkumisel (ainult osaliselt allikas: Friedrich, Reiljan 2011). Samas on aga ülioluline töötada FKKJ-ide jaoks välja mikromajanduslik teooria, mis on seni puudulik, et analüüsida võimalikke muutusi FKKJ-i juhtkonna käitumises väliste ja sisemiste, poliitiliste ja majanduslike tegurite varieerumisel.

Siinse lõputöö raames määratletakse FKKJ-i juhtkonda kui täitevorganit, mis haldab ja korraldab jurisdiktsiooni igapäevaseid hanketoiminguid. Näiteks võib see olla üksik täitevorgan (esimees, president jne) või kollektiivne täitevorgan (nõukogu, juhatus, presiidium, komisjon jne). FKKJ-i täitevorganid langetavad iga päev otsuseid, mis on seotud liikmemaksu ning sisendtegurite koguse ja kvaliteediga jne. Seega kujutab FKKJ-i juhtkonna käitumine endast haldusorganite reaktsiooni muutuvatele sisemistele ja välistele teguritele, näiteks FKKJ-i

asutajate (omavalitsuste) ja konkurentide otsustele, töötajate ja materjalide hulga, ressurssihindadele, maksumääradele, kõrgema astme jurisdiktsioonide rahalisele abile, muutuval kasulikkusfunktsioonile, tootmisfunktsioonile, nõudlusele jne. Juhtide reaktsioonide arvestamine on äärmiselt oluline, sest pärast FKKJ-i asutamist delegeeritakse igapäevased hanketoimingud jurisdiktsiooni palgatud juhtkonnale. FKKJ-i juhtkonna käitumisega seotud oletusi väljendatakse matemaatilisel nelja FKKJ-i juhtkonna kasulikkusfunktsioonide näitel lõputöö alapeatükis 2.2.

Uurimisobjektina võtab autor vaatluse alla Venemaa kooliteenused. Valitud uurimisobjekti aktuaalsust on põhjendatud eespool. Siinses lõputöös välja töötatud mikromajandusliku teooria kohaldatavus teistele majandussektoritele (mitte üksnes Venemaal) tuleb välja selgitada edaspidises uurimistöös.

Eesmärk, peamine uurimisküsimus ja -ülesanded

Siinses lõputöös vastab autor **peamisele uurimisküsimusele**: kas FKKJ-id on Venemaal kooliteenuste pakkumisel sobiv omavalitsustevahelise koostöö vahend, kui võtta arvesse FKKJ-i juhtkonna käitumist?

Et teha järeldus II tüüpi funktsionaalsete, kattuvate ja konkureerivate jurisdiktsioonide **kohaldatavuse** kohta Venemaa omavalitsustevahelise koostöö osas kooliteenuste pakkumisel, võtab autor arvesse järgmist:

- mikromajandusliku modelleerimise tulemusi, millega tuvastatakse juhtkonna soovitud käitumine, et vältida kooli II tüüpi FKKJ-ide väärjuhtimist. See tähendab juhtkonna otsuseid, mis ei vasta omavalitsuste ehk liikmete soovidele, ei täida eesmärke, milleks FKKJ tuleks luua. Seega pole võimalik rääkida FKKJ-i kohaldatavusest kooliteenuste pakkumisele Venemaal, kui FKKJ-i juhtkond kaldub oma tegevuses FKKJ-i põhikirjas esile tõstetud eesmärkidest kõrvale;
- juriidiliste dokumentide analüüsi, mille abil otsida kõige sobivamat õigusliku vormi, mis peaks olema kooskõlas FKKJ-i tunnusjoonte ja haridustegevuse mittekaubanduslike nõuetega;
- intervjuusid Venemaa riigiametnikega, kes vastutavad koolide haldamise eest omavalitsuste ja regioonide tasemel, ning koolidirektorite ja lapsevanematega.

Doktoritöö **eesmärk** on töötada välja teoreetilised mikromajanduslikud mudelid FKKJ-i juhtkonna otsustamisprotsessi jaoks ning põhikiri kooli II tüüpi FKKJ-idele Venemaal. Teoreetilised mudelid hõlmavad FKKJ-i asutamisaasta, hetke-tegevuse faasi ja konkureerimist liikmete nimel ning FKKJ-i juhtkonna ja liikmete käitumise analüüsi monopoli ja oligopoli korral. Välja pakutud mudelid saab võtta aluseks II tüüpi FKKJ-idel põhinevale omavalitsustevahelisele koostööle, võttes arvesse teatud riigi institutsioonilisi eriomadusi.

Nimetatud eesmärgi saavutamiseks püstitas autor järgmised **uurimisülesanded (UÜ)**:

- UÜ 1: määratleda FKKJ-ide peamised tunnused ja tüübid;
- UÜ 2: analüüsida ja süstematiseerida FKKJ-e ja omavalitsustevahelise koostöö alternatiivseid vorme teaduskirjanduse põhjal;
- UÜ 3: koostada mikromajanduslik põhimudel II tüüpi FKKJ-i asutamise kohta, võttes arvesse kõrgema astme jurisdiktsioonide toetusi ja erilisi rahalisi vahendeid;
- UÜ 4: formuleerida mikromajanduslik põhimudel II tüüpi FKKJ-i hetketegevuse kohta, võttes arvesse kõrgema astme jurisdiktsioonide toetusi, erilisi rahalisi vahendeid ja eri tüüpi juhtimiskäitumist monopolistlikes ja oligopolistlikes turutingimustes;
- UÜ 5: formuleerida mikromajanduslik põhimudel II tüüpi FKKJ-i liikmete nimel konkureerimise kohta, võttes arvesse kõrgema astme jurisdiktsioonide toetusi ja erilisi rahalisi vahendeid;
- UÜ 6: teha kindlaks õiguslikud vormid, millena II tüüpi FKKJ-id võivad Venemaal esineda ja mida saaks kasutada omavalitsustevahelises koostöös kooliteenuste pakkumisel;
- UÜ 7: selgitada, millist tüüpi omavalitsused saavad Venemaal teha vabalt ja sõltumatult otsuseid seoses II tüüpi FKKJ-idel põhineva koostööga;
- UÜ 8: töötada välja koolide II tüüpi FKKJ-ide põhikiri ja memorandum, võttes aluseks sobiva õigusliku ettevõtlusvormi (ühingu).

Doktoritöö uudsus

Siinne lõputöö täiendab olemasolevat teaduskirjandust ja täidab vähemalt neli lünka teemavaldkonna senises käsitluses. Esiteks pole II tüüpi FKKJ-i kui majanduslikku üksust põhjalikult uuritud. Kõik varasemad analüüsid keskenduvad FKKJ-idele kui peamiselt poliitilistele vahenditele ning kirjeldavad seega I tüüpi FKKJ-i. Vaid vähestes lähenemisviisides võetakse tähelepanu alla II tüüpi FKKJ-id majanduslike üksustena ning nende juhtkonna käitumist analüüsitakse majandusteooria põhjal (Friedrich, Kaltschütz, Nam 2004; Gabbe 2008; Friedrich, Eckardt 2014; Friedrich, Chebotareva 2017; Chebotareva, Friedrich 2017; Chebotareva, Friedrich 2020). Käesolevas doktoritöös töötatakse välja mikromajanduslik teooria II tüüpi FKKJ-ide kohta, mis on aluseks omavalitsuste, FKKJ-i juhtkonna ja kõrgema astme jurisdiktsioonide otsustusprotsessis.

Teiseks tehakse siinses lõputöös esimene katse kohaldada FKKJ-i kontseptsiooni Ida-Euroopa riikidele ja arenguriikidele, näiteks Venemaale. Varasemad autorid on võtnud vaatluse alla peamiselt Ameerika Ühendriikide ja Lääne-Euroopa (Šveits, Saksamaa jne) näited ning FKKJ-idele sarnased omavalitsustevahelise koostöö vormid nendes riikides (Steiner 2003; Huber 2011; Duncombe, Yinger 2007; Longley, Sneed 2009).

Kolmandaks pole seni uuritud omavalitsustevahelist koostööd Venemaa koolihariduses. Mõned autorid (*Ирискина* 2010; *Бутова, Смирнова, Миловидова* 2014; *Гриценко* 2001; *Власова, Джек* 2009; *Рагозина* 2009) on uurinud pikaajalist majanduslikku koostööd omavalitsuste vahel, kes on asutanud äri-

ühingu õiguslikud vormid, kuid mitte FKKJ-id. Need uuringud on enamjaolt kirjeldavad ja neil puudub teoreetiline mikromajanduslik alus II tüüpi FKKJ-ide väljatöötamiseks Venemaal.

Neljandaks pole FKKJ-ide koostöövormi varem analüüsitud konkreetse riigi institutsioonilises õigusraamistikus, mille puhul on FKKJ-e soovitatud. Seega on analüüsist välja jäetud hulk väga olulisi tegureid ja neid ei ole arvestatud FKKJ-ide asjakohasusega seotud soovitustes.

Kuna II tüüpi FKKJ-i käsitatakse riikliku majandusüksusena, täiendab sinne lõputöö ka avaliku sektori äriühingute juhtimisega seotud kirjandust (nt Papenfuß, Schaefer 2017; Ellwood, Garcia-Lacalle 2016; OECD 2018; Bozeman, Johnson 2015; Benz, Frey 2007; Calabrò, Torchia. 2011 jne). Avaliku sektori äriühingute juhtimise eesmärk on ühest küljest avaliku sektori organisatsioonide tõhususe, tootlikkuse ja jätkusuutlikkuse parandamine riiklike ülesannete täitmisel ning teisest küljest üldsuse heaolu suurendamine ja avalikkuse huvide teenimise tagamine (Expert Commission of the German Public Corporate Governance-Modelcode 2020). Esimest osa sellest eesmärgist täidab palgatud juhtkond, teist järelevalvet teostavad omavalitsusasutused. Munitsipaaltegevuste vastutustundlikuks haldamiseks ja järelevalveks saab välja töötada spetsiaalse reguleeriva raamistiku avaliku sektori äriühingute juhtimise eeskirjade kujul (OECD 2019; Spennlingwimmer 2017). Seda soovitatakse ka kooli II tüüpi FKKJ-ide puhul.

Käesolev doktoritöö on ainulaadne ka omavalitsustevahelise koostöö uurimiseks kasutatavate meetodite kombinatsiooni poolest. Kvalitatiivsed (dokumendianalüüs ja intervjuud kohalike ametnikega) ja kvantitatiivsed lähenemisviisid (mikromajanduslik ja matemaatiline modelleerimine) täiendavad teineteist. Omavalitsustevahelise koostöö uurimisel kasutatud meetodite seas pole matemaatiline modelleerimine saanud tähelepanu, mida see meetodina väärrib ja mida saab kaasata mikromajandusliku teooria väljatöötamiseks omavalitsustevahelise koostöö algatamisel. Siinne lõputöö täidab ka selle lünga.

Metodoloogia ja analüüsietapid

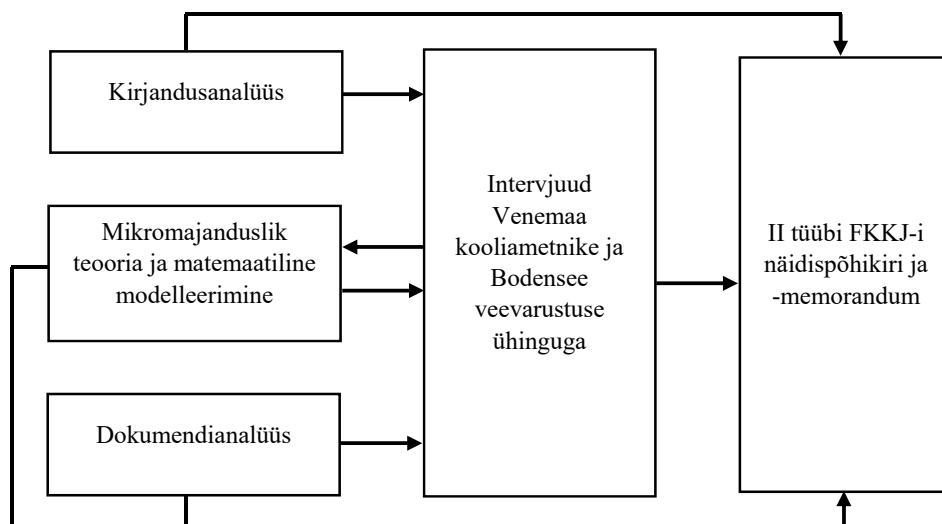
Töö interdistsiplinaarsuse tagavad erinevad rakendatud analüüsimeetodid, alates matemaatilisest modelleerimisest ja kirjandusanalüüsist kuni õigusaktide ja intervjuude analüüsini. Täpsemalt on uurimismetodoloogia töötatud välja uurimisülesannete ja lõputöö eesmärgi järgi, võttes aluseks **kirjandusanalüüsi**.

Esiteks uuris autor kirjandust, kus käsitletakse FKKJ-i ja II tüüpi FKKJ-idega sarnaseid omavalitsustevahelise koostöö vorme peamiselt seoses kooliharidusega eri riikides. FKKJ-e käsitlevas kirjanduses on esitatud FKKJ-i määratlus ja tunnusjooned, mis peaks olema põhikirja ja memorandumi aluseks (1. peatükk). Joonisel 1 on näha metodoloogia empiirilise osa arendamiseks.

Teiseks rakendatakse tulenevalt uurimislüngast **mikromajandusliku teooria ja matemaatilise modelleerimise** meetodit ja kasutatakse tarkvara Wolfram Mathematica, et analüüsida FKKJ-ide juhtkonna käitumist, võttes arvesse kõr-

gema astme jurisdiktsioonide (föderaalsed või piirkondlikud ametiasutused) tähtsust seoses toetuste ja muu finantsabi, ressursihindade ja maksumääradega ning muutustega nõudluses, juhtimislaadi kasulikkusfunktsioonis jne. Teoreetilise mikromajandusliku modelleerimise tulemuste ja järelduste põhjal on võimalik välistada FKKJ-i juhtkonna ebasoodsat käitumist ja rakendada optimaalseid lahendusi FKKJ-i liikmete ja juhtkonna otsustusprotsessis (2. peatükk).

Mikromajanduslike mudelite väljatöötamiseks on teises peatükis analüüsitud oligopolistlikku turu mudeleid (Stackelberg 2011; Krelle 1961; Gravelle, Rees 2004). Arvesse on võetud ka riigirahandusega seotud kirjandust (Musgrave, Musgrave 1989; Olson 1969), sest FKKJ-id on riiklikud üksused ning nende asutamisel ja hetketegevuses tuleks rakendada riigirahanduse põhimõtteid. FKKJ-i käsitlevat kirjandust on analüüsitud, võttes eelduseks, et FKKJ-id on avalik-õiguslikud majanduslikud üksused, mis toimivad omavalitsustevahelise koostöö vahendina. Venemaa omavalitsustevahelist koostööd käsitlev kirjandus on lisaks võetud vaatluse alla kolmandas peatükis.



Joonis 1. Metodoloogia empiirilise osa arendamiseks

Allikas: autori koostatud

Kolmandaks on kasutatud **dokumendianalüüsi**, et töötada välja II tüüpi FKKJ-ide põhikiri ja memorandum ning anda soovitusi, kuidas asutada Venemaal FKKJ-e ühingu (liidu) vormis, kusjuures Venemaa teatud tüüpi omavalitsusi vaadatakse kui võimalikke liikmeid (alapeatükk 3.2). Uurimise alla võeti föderaalneadus nr 131 „Venemaa Föderatsiooni kohalike omavalitsuste töö korraldamise üldpõhimõtted“, Venemaa Föderatsiooni tsiviilseadustik ja äriühingute õiguslikke vorme käsitlevad õigusaktid. Kooliteenuseid ei saa korraldada

FKKJ-i abil, ilma et võetaks arvesse Venemaa Föderatsiooni föderaalset nr 273 „Haridus Venemaa Föderatsioonis”, eelarvekoodi, regionaal- ja munitsiipaaltasandi hariduseeskirju ning sarnaseid dokumente. Dokumendianalüüsi abil on kindlaks määratud sobivad õiguslikud vormid ja see, kuidas need sobivad FKKJ-i peamiste tunnustega. FKKJ-ide koostööks sobivaid Venemaa omavalitsusi analüüsiti samuti õigusaktide uurimise põhjal.

Neljandaks tehti **intervjuud** Venemaa ametnikega, kes vastutavad koolide haldamise eest munitsipaal- ja regionaaltasandil, koolidirektorite ja lapsevanematega ning Bodensee veevarustuse ühingu Saksamaal (alapeatükk 3.3). Neid on vaja, et koguda II tüüpi FKKJ-i põhikirja ja memorandumiga jaoks praktilise tähtsusega teavet, mida pole võimalik teiste meetoditega saada.

Venemaal Voroneži piirkonnas tehtud intervjuud on vajalikud, et saada teavet koolide rahastamise, haldamise vms olukorra kohta ning mõista, kas II tüüpi FKKJ-ide tunnused on Venemaa koolisüsteemi jaoks sobilikud. Saksamaa Bodensee veevarustuse ühingu (*Bodensee-Wasserversorgung*) tehti intervjuu, et mõista, kuidas hallatakse praktikas ühikut, mis teeb omavalitsustevahelist koostööd. Autori eesmärk on selgitada välja, millega arvestamine on Bodensee veevarustuse ühingu juhtkonna jaoks nende tööprotsessis ja asutamisdokumentides oluline.

Intervjuude jaoks koostas autor küsimused kirjandusanalüüsi, mikromajandusliku teoreetilise modelleerimise tulemuste ja esialgse dokumendianalüüsi põhjal. Intervjuude tulemuste alusel on muudetud teises peatükis välja töötatud II tüüpi FKKJ-i mikromajanduslikke mudelid.

Lõputöö ülesehitus

Lõputöö koosneb kolmest peatükist. Esimeses peatükis esitatakse kirjanduse ülevaade, milles keskendutakse FKKJ-i mõistele alates selle esialgsest määratlusest föderalistliku poliitilise vormina kuni hiljutiste määratlusteni: II tüüpi FKKJ kui majanduslik üksus. Alapeatükis 1.1 võetakse vaatluse alla ka see, millistes sektorites ja valdkondades saab kohaldada funktsionaalseid jurisdiktsioone ning milliseid FKKJ-idele sarnaseid omavalitsustevahelise koostöö vorme leidub eri riikides. Alapeatükis 1.2 on toodud termini „omavalitsustevaheline koostöö“ määratlus siinse lõputöö raames. Siinkohal esitatakse üldised märkused omavalitsustevahelise koostöö eri vormide kohta. Alapeatükis 1.2 tõstetakse esile ka seosed II tüüpi FKKJ-ide ja omavalitsustevahelise koostöö määratluste vahel.

Teine peatükk aitab kaasa mikromajandusliku teooria väljatöötamisele II tüüpi FKKJ-ide juhtkonna ja liikmete otsustusprotsessi jaoks. Autor töötab välja II tüüpi FKKJ-i majandustegevuse kolme faasi mudelid mikroökonomika teooriat ja matemaatilise modelleerimise meetodeid kasutades. Alapeatükis 1.2 arutatakse optimaalseid lahendusi mudelite loomiseks II tüüpi FKKJ-i asutamise, hetketegevuse ja liikmete nimel konkureerimise kohta, võttes arvesse rahalisi vahendeid ja kõrgema astme jurisdiktsioonide toetusi. Alapeatükis 2.2 näida-

takse, kuidas II tüüpi FKKJ-i hetketegevuse mudeli optimaalne lahendus sõltub juhtkonna kasulikkusfunktsioonist ja turuvormidest. See, kuidas muutused sisendtegurites, tootmisfunktsioonis, juhtkonna kasulikkusfunktsioonis, nõudlusfunktsioonis ning juhtkonna ja liikmete läbirääkimisprotsessis määravad juhtkonna otsuseid ning kuidas vältida juhtkonna ebasoodsaid otsuseid, on võetud vaatluse alla vastavalt alapeatükkides 2.3 ja 3.4.

Kolmas peatükk on empiiriline ning seal kohaldatakse II tüüpi FKKJ-i kui omavalitsustevahelise koostöö vormi Venemaa kooliharidusele. Alg-, põhi- ja keskharidust (täielikku üldharidust) uuritakse seoses rahastusallikate, halduse ja peamiste otsuseid tegevate organitega (alapeatükk 3.1). Alapeatükis 3.2 otsib autor dokumendianalüüsi abil II tüüpi FKKJ-ide koostööle sobivat õiguslikku vormi ja vastavat omavalitsuste tüüpi, võttes arvesse sektori eriomadusi Venemaal (kooliteenuste mittekaubanduslikku olemust ja kooliteenuste pakkumise eest vastutajaid).

Alapeatükis 3.3 esitatud intervjuerimismeetod on ülioluline teabe kogumisel tingimuste kohta, mida on vaja II tüüpi FKKJ-ide asutamiseks Venemaa kooliteenuste jaoks, ning annab kasulikke vihjeid selle kohta, kuidas II tüüpi FKKJ-id toimivad Saksamaal õigusliku vormina, mida nimetatakse *Zweckverband*'iks. Lisaks on alapeatükkide 3.1 kuni 3.3 ja teise peatüki tulemuste abil töötatud välja soovitud Venemaa II tüüpi FKKJ-i koolijurisdiktsioonide memorandumi ja põhikirja kujul. Näidissätted on esitatud alapeatükis 3.4. Töö lõpus on toodud üldised järeldused II tüüpi FKKJ-i kohaldatavuse kohta Venemaa kooliteenustes ja võimalikud suunad edaspidiseks uurimistööks.

Teoreetilised ja empiirilised tulemused

Autor uuris funktsionaalsete, kattuvate ja konkureerivate jurisdiktsioonide (FKKJ-ide) mõistet ja selle kohaldatavust omavalitsustevahelise koostöö edendamisele kooliteenuste pakkumise valdkonnas Venemaal. Vastusena peamisele uurimisküsimusele võib öelda, et II tüüpi FKKJ on sobiv vahend omavalitsustevahelise koostöö ja kooliteenuste pakkumise jaoks Venemaal. Funktsionaalsete jurisdiktsioonide kohaldatavust Venemaa kooliteenustele kinnitati II tüüpi FKKJ-i mikromajandusliku modelleerimise, Venemaa õigusaktide analüüsi ja Venemaa omavalitsuste ametnikega tehtud intervjuude tulemustega. Kõigi kolme nimetatud aspekti analüüsist ei ilmnenud takistusi II tüüpi FKKJ-ide asutamiseks Venemaal.

FKKJ-i mõiste hõlmab nelja komponenti. FKKJ-id täidavad mitmeid funktsioone, näiteks koolihariduse vallas. Nad kattuvad ühel territooriumil, võistlevad liikmete ja klientide nimel ning eeldatakse, et FKKJ-ides nõutakse tasusid ja neis on demokraatlikud sisestruktuurid (nt juhtkond).

Võib eristada nelja tüüpi FKKJ-e. Need erinevad liikmete poolest, mis tähendab, et I tüüpi FKKJ-i kuuluvad liikmetena vaid kodanikud, kes otsustavad asutada FKKJ-i teatud teenuse pakkumiseks. II tüüpi FKKJ-ide liikmed on valitsusüksused, sealhulgas omavalitsused, regioonid, maakonnad, osariigid jne.

III tüüpi FKKJ-id hõlmavad riiklikke ja eraõiguslikke üksusi, samas kui IV tüüpi võib nimetada segatüübiks, kuhu võivad kuuluda kõigi kolme esimese tüüpi võimalikud liikmed. Lõputöös uuritakse funktsionaalseid, kattuvaid ja konkureerivaid jurisdiktsioone kui vahendit, mille abil edendada Venemaa omavalitsustevahelist koostööd, mistõttu keskendutakse II tüüpi FKKJ-idele, kelle liikmed on omavalitsused.

Omavalitsustevahelise koostöö üldklassifikatsioonis (IMC Toolkit Manual 2010) kuuluvad II tüüpi FKKJ-id asjakohase õigusliku staatusega ametlike majandusüksuste alla. Muud omavalitsustevahelise koostöö vormid, nagu omavalitsustevaheline mitteametlik koostöö, munitsipaalpepingud, allhanked ning avaliku ja erasektori partnerlus, ei ole Venemaa kooliteenuste puhul niivõrd kasulikud, sest need pole oma olemuselt püsivad ega paku seega pikaajalisi lahendusi sotsiaalmajanduslikele ja demograafilistele probleemidele.

Kuna II tüüpi FKKJ-id on majandusüksused, millel on oma juhtkond ja muud sisemised haldusorganid, nagu liikmete kogu, koosneb FKKJ-i tegevuse modelleerimine kolmest järjestikusest faasist: asutamine, hetketegevus ja konkureerimine liikmete nimel. Teine faas ehk FKKJ-i hetketegevus on analüüsi jaoks ülioluline, sest pärast FKKJ-ide asutamist täidavad kõiki juhtimisülesandeid peamiselt täitevorganid, kes vastutavad FKKJ-i hanketoimingute eest. Et analüüsida FKKJ-i juhtkonna ja liikmete võimalikke reaktsioone, kui välised ja sisemised poliitilised ja majanduslikud tegurid muutuvad, on lõputöös töötatud välja II tüüpi FKKJ-i mikromajanduslik teooria.

II tüüpi FKKJ-i asutamise baasudelil maksimeeritakse liikmete kasulikkusfunktsioon. II tüüpi FKKJ-i asutamiseks peavad omavalitsused suunama rahalisi ja mitterahalisi vahendeid II tüüpi FKKJ-i omakapitali. Mudelis määratakse kindlaks optimaalne osa, mille omavalitsused peaksid panustama omakapitali, ja II tüüpi FKKJ-i omakapitali moodustavate osaliste optimaalne arv, võttes aluseks nende kulude ja tulude võrdluse. Kui tulud ületavad kulusid, soovivad omavalitsused innukalt suurendada oma osa II tüüpi FKKJ-is. Esiteks leitakse lahendus vaid tingimusel, et omavalitsused panustavad vaid üht liiki rahastamisvahendiga (nt kinnisvara, munitsipaalmaa, laen, omavalitsuse eelarvevahendid jne). Teiseks leitakse optimaalne lahendus juhaks, kui omavalitsused osalevad erinevate rahaliste ja mitterahaliste ressurssidega.

II tüüpi FKKJ-i asutamismudelil võib arvesse võtta ühekordset toetust kõrgema astme ametiasutuselt, milleks võib olla näiteks piirkondlik haridusosakond, nagu on selgunud intervjuudest. Kui omavalitsused saavad FKKJ-i asutamiseks toetuse, suureneb nende omakapitali panustatav optimaalne osa, mitte seetõttu, et nad peavad rohkem investeerima, vaid tänu sellele, et nende osaluse kompenseerib osaliselt toetus. Samas võivad nad omavalitsusi vähemal määral koostöösse kaasata, kuna nende osa on muutunud suuremaks.

FKKJ-i hetketegevuse mudelilt on näha, kuidas juhtkond reageerib kõrgema astme jurisdiktsioonidelt saadud toetustele ning erilistele rahalistele vahenditele monopolistlikes ja oligopolistlikes turutingimustes, ning arvesse on võetud juhtkonna erinevat käitumist II tüüpi FKKJ-i hetketegevuse faasis. Selles mudelis määratakse kindlaks sisendtegurite suhete kombinatsioon ja omavalitsustelt

nõutava tasu optimaalne määr. Osutatud on sellele, et omavalitsused peaksid katma II tüüpi FKKJ-i kulud makstes osalustasu. Mudelis on võetud aluseks kulude katmise reegel, mis tähendab, et FKKJ-il ei ole kasumit. Nimetatud mudeli tulemuseks on optimaalne tasumäär juhtkonna vaatepunktist, mida iseloomustab kaks optimaalsuse tingimust. Esimese kohaselt on marginaalse sisendteguri põhjal saadud marginaalsete kasude suhe võrdne osaga marginaalset kasumist, mille on tekitanud vastava teguri panus. Teiseks tingimuseks on see, et tasu, mida omavalitsused maksavad regulaarselt, peaks olema võrdne keskmiste kuludega. Mudeli abil saab analüüsida, kuidas optimaalne lahendus muutub, kui juhtkonna kasulikkusfunktsioon on erinev ning väljund, ressursihinnad, tööjõud ja materjalid muutuvad, ja mis juhtub, kui II tüüpi FKKJ saab mittekaubeldava toetuse. Viimasel juhul on näha, et kui toetus on ühekordne, ei muutu esimene optimaalsuse tingimus. Omavalitsuste osalustasu aga väheneb ja väljund suureneb.

II tüüpi FKKJ-id võivad saada hetketegevuse faasis toetusi ka kõrgema astme jurisdiktsioonidega läbirääkimiste teel. Mudeli tulemuseks on läbirääkimiste lahendus, mille määrab Nashi järgi kindlaks kooperatiivne nullsummamäng. Sõltuvalt väljundist ja toetuse suurusest maksimeerib selle mudeli puhul oma kasulikkusfunktsiooni nii II tüüpi FKKJ kui ka kõrgema astme ametiasutus. Kuna väljund sõltub toetuse suurusest, on üheks lahenduseks see, kui väljundmaht, mis tuleneb läbirääkimistest, sõltub hinnangust, mis antakse toetusele – lisaväljundile, mis saab võimalikuks tänu toetusele, ning väljundiga seoses läbi rääkivatele partneritele. Nimetatud väljund määrab läbirääkimiste tulemusel saadud toetuse suuruse läbirääkijate minimaalsete kasude ja hindamisfunktsioonide parameetrite abil. Suurema toetuse korral tõuseb FKKJ-i juhtkonna hinnang lisaväljundile ning kasvab väljundmaht ja toetuse suurus.

Ka erinevad rahastamisvahendid mõjutavad II tüüpi FKKJ-i hetketegevuse mudeli optimaalset lahendust. Selles mudelis lisatakse erilised kulud kogukuludele ja loetakse osaks ressursihindadest. Mudeli lahendus pakub spetsiaalseid finantssuuniseid. Üks on seotud tootmistegurite sisendiga: rahastuse ja materjali muudatustega seotud marginaalsete kasude suhe on marginaalselt võrdne rahastuse ja materjaliga seotud marginaalsete kasumite suhtega ning rahastuse ja tööjõu muudatustega seotud marginaalsete kasude suhe on marginaalselt võrdne rahastuse ja tööjõuga seotud marginaalsete kasumite suhtega. Teise lahenduse kohaselt on tasu, mida omavalitsused peavad maksma, võrdne keskmiste kuludega. Kui rahastusega seotud ressursihindade suurus sõltub sisendteguritest, muutuvad optimaalsed tingimused, mis mõjutab sisendeid, väljundeid ja tasu.

Alapeatükis 2.2 on näidatud, kuidas juhtkonna kasulikkusfunktsioon ja erinevad turuvormid mõjutavad juhtkonna otsustusprotsessi. Autor pakub analüütilisi lahendusi tööjõu, materjali, väljundi, kasulikkuse ja osalustasu jaoks seoses nelja juhtumiga, mis käsitlevad juhtkonna käitumist monopolistlikel ja oligopolistlikel turgudel. Analüütiline lahendus tasude jaoks on küllaltki keeruline, mistõttu on lõputõesse lisatud vaid arvulised näited, mis tulenevad parameetrite eeldatavast kombinatsioonist. Autor leidis Launhardti-Hotellingi ja Krelle-Otti mudeli põhjal lahendused kahele II tüüpi FKKJ-ile, võttes eeldu-

seks, et nende juhtkondade juhtimiskäitumine on ühesugune. Lisaks võimaldavad tööjõu ja materjaliga seotud analüütilised lahendused tuletada tööjõu ja materjali tootmistegurite nõudlusfunktsioone kõigi nelja juhtumi puhul monopoli ja oligopoli tingimustes. Väljundi optimaalsed lahendused on aluseks II tüübi FKKJ-i tarnefunktsioonidele, mis on seotud iga juhtimiskäitumise avaldumisvormi ja turuvormidega.

Võttes aluseks hetketegevuse baasmudeli, leiti monopoli jaoks optimaalne osalustasu. Autor laiendab aga teemavaldkonda ja käsitleb siinses lõputöös ka oligopoli. Nii oligopoli kui ka monopoli puhul katab II tüübi FKKJ kulud täielikult. Kirjanduses eeldatakse peamiselt, et juhtkonna peaesmärk on kasumi, müügi või käibe maksimeerimine. Järgides Williamsoni (1964) ideed, mille kohaselt maksimeerivad äriühingute juhtkonnad kasulikkust, mis lähtub nende enda eesmärkidest, mitte kasulikkusest sidusrühmade jaoks, keskendutakse siinses lõputöös II tüübi FKKJ-ile kui äriühingule, mille juhtkond maksimeerib oma kasulikkust. Nagu Friedrich *et al.* (2014), keskendub lõputöö neljale eri juhtumile, mille puhul juhtkonna kasulikkusfunktsioon sõltub avalikest ja isiklikest eesmärkidest:

- juhtum I: tootmisse kaasatud tööjõu maht ja saadud väljund;
- juhtum II: väljund eraldi;
- juhtum III: tööjõud eraldi;
- juhtum IV: tööjõud positiivselt ja väljund negatiivselt.

Autor formuleerib nimetatud nelja juhtimiskäitumise juhtumi algebra abil. Launhardti-Hotellingi mudelis võetakse eelduseks kahe II tüübi FKKJ-i autonoomne käitumine, mille puhul on osalustasud tegevuse parameetrid. Launhardti-Hotellingi mudelil põhinev käitumine kombineeritakse Krelle omaga, mida on täpsustanud Ott. Launhardti-Hotellingi mudeli rakendamine II tüübi FKKJ-i tingimuste puhul võimaldab tuvastada sellise tasude kombinatsiooni p_1 ja p_2 , mille puhul kahe äriühinguga oligopolistlik turg saavutab tasakaalu. Lisaks varieerub nimetatud tasude kombinatsioon olenevalt iga II tüübi FKKJ-i juhtkonna tüübist. Nelja juhtumi puhul leitakse tasakaalupunktid algebra abil. Krelle-Otti mudeli järgi on lahendus tasude stabiilsuspiirkond. Kui kaks FKKJ-i satuvad kohandamise või välismõjude tõttu sellesse piirkonda, ei muuda nad enam oma tasusid. Need Krelle-Otti piirkonnad on samuti arvutatud algebra abil kõigi nelja juhtimiskäitumise juhtumi puhul. Krelle ruum võib sõltuvalt turuparameetrite muutustest ka liikuda.

Autor tegi kindlaks suurima monopoolse tasu II tüübi FKKJ-i tööjõu maksimeerimise eest (juhtum III). Sama kehtib oligopoli puhul Launhardti-Hotellingi tasakaalupunkti kohta. II tüübi FKKJ-id, kes kuuluvad juhtimiskäitumise II juhtumi alla ja maksimeerivad väljundit, saavutavad monopolis suurima väljundi. II tüübi FKKJ-id, kes kuuluvad I juhtumi alla ning maksimeerivad väljundit ja tööjõudu, saavutavad duopoli korral suurima koguväljundi ja kasulikkuse väärtuse (jättes vähem tootliku III juhtimiskäitumise juhtumi tähelepanuta). Väljundit maksimeeriva juhtkonna (juhtum II) puhul on nii monopolis kui ka duopolis madalaim tasu. Seega on II tüübi FKKJ-i liikmete jaoks juhtimiskäitumise juhtumid I ja II soodsamad. Üldistele ootustele vastav ja kinnitatud tulemus on

see, et tasud on monopolis suuremad kui oligopolistlikul turul ning väljund on oligopolis suurem kui monopolis.

Krelle-Otti piirkonna puhul on arvuliste näitajate põhjal näha, et väikseim piirkond, kus konkurendid ei muuda tasusid, on IV juhtumi korral, kus juhtkond annab töäjõule positiivse ja väljundile negatiivse hinnangu. Suurim tasu stabiilsuspiirkond on I juhtimiskäitumise juhtumi korral, kus juhtkond annab nii tööjõule kui ka väljundile positiivse hinnangu. Juhtumitel II ja IV on võrreldavad Krelle-Otti piirkonnad. Juhtimiskäitumise III juhtumi korral saavutatakse kolmes punktis Stackelbergi tasakaal. Seega pole sel juhul Krelle-Otti ruum ühetasase kujuga.

Autor on graafiliselt kujutanud liikmete nimel konkureerimise mudelit. Sellel on näha liikmete jaotumine kahe asutatud ja konkureeriva II tüüpi FKKJ-i vahel. Baasumudeli lahendus on kahe konkureeriva II tüüpi FKKJ-i optimaalne suurus ning kui see suurus kasvab, põhjustab see II tüüpi FKKJ-i ülekoormatust ja langetab pakutavate teenuste kvaliteeti. See on võrreldav Buchanani lahendusega.

Ühekordse toetuse mõju on näha ka liikmete nimel konkureerimise mudelilt. Neid toetusi võib saada kõrgema astme ametiasutustelt. Need suurendavad kahe konkureeriva II tüüpi FKKJ-i liikmete puhastulu. Kui mõlemad II tüüpi FKKJ-id saavad toetusi ühesugusel määral, ei muuda uus jagamiskoht liikmete jaotumist II tüüpi FKKJ-ide vahel. Mõlema II tüüpi FKKJ-i liikmed saavad lihtsalt suuremat puhastulu kui enne toetuse saamist ning valivad ikka II tüüpi FKKJ-i, mis võimaldab suurimat puhastulu. Kui üks konkureerivatest II tüüpi FKKJ-idest saab aga suurema toetuse, muutub liikmete jaotus suurema toetuse saanud FKKJ-i kasuks, mis annab selle liikmetele suurema puhastulu. Seega on liikmete jaotumine kahe II tüüpi FKKJ-i vahel muutunud.

Puhastulu kõverad FKKJ-i liikmete nimel konkureerimise mudelis võivad osutada ka eri rahastamisvahendite mõjudele. Mudelilt on näha, et muutus rahastamistingimustes muudab FKKJ-ide liikmete puhastulu kõveraid. Siinkohal on vaatluse all kaks olukorda. Kui II tüüpi FKKJ-i puhul on võimalik vaid üks rahastusstrateegia, varieerub liikmete jaotus olenevalt sellest, kui võrd kättesaadav on soodsam strateegia liikmete jaoks. Soodsama all on mõeldud puhastulu, mille liikmed saavad seda strateegiat rakendades. Ühe II tüüpi FKKJ-i puhastulu kõverad siin ei ristu. Kui saadaval on hulk rahastusstrateegiaid ja puhastulu kõverad ristuvad ühe II tüüpi FKKJ-i puhul, tuleb võrrelda ristumiskohtadevahelisi kõveraid. Kõrgeima puhastulu kõverad, mis asuvad ristumiskohtade vahel, näitavad kõige eelistatumat rahastamisstrateegiat nii ühe kui ka teise II tüüpi FKKJ-i puhul. Kahe optimaalse kõvera ristumiskoht viitab sellest tulenevale liikmete jaotumisele kahe II tüüpi FKKJ-i vahel ja sellega seotud optimaalsele rahastusstrateegiale.

Empiiriline analüüs viidi läbi Venemaa õigusaktide analüüsimise ja intervjuude abil. Venemaal tehtud intervjuud olid iseäranis väärtuslikud sellise teabe hankimisel, mida kirjanduse ja dokumendianalüüsi abil ei saa. Need aitasid paremini mõista omavalitsustevahelise koostöö õiguslikke võimalusi, omavalitsuste ja regioonide kaasamist otsustusprotsessi, sektoritele omaseid tingi-

musi, omavalitsuste ja regioonide eelarvepoliitilisi võimalusi ning regiooni ja eri tasandi omavalitsuste vahelisi suhteid seoses koolidega. Bodensee veevarustuse ühingu tehtud intervjuu eesmärk oli koguda teavet selle kohta, kuidas omavalitsustevahelist koostööd II tüüpi FKKJ-ide kujul praktikas korraldatakse ning milliste rahaliste, korralduslike ja juriidiliste aspektidega arvestamine on asutamisdokumentides oluline.

Enne seda uuris autor esialgse ülevaate saamiseks Venemaa Föderatsiooni hariduse ja kohaliku omavalitsemisega seotud õigusakte ning tsiviilseadustikku. Seda teavet, II tüüpi FKKJ-ide tunnusjooni, mis selgitati välja kirjandusanalüüsi abil, ja mikromajandusliku modelleerimise tulemusi kasutati intervjuuküsimuste koostamiseks. Intervjuude tulemusi kasutati omakorda selleks, et vastata küsimusele, kas Venemaal on võimalik II tüüpi FKKJ-i asutada, et kontrollida, kas Venemaa koolisüsteemi kõiki tegelikke tegureid on FKKJ-i mikromajanduslikes mudelites arvesse võetud; ning töötada välja põhikiri ja memorandum. Seega täiendab väljatöötatud metodoloogia FKKJ-i mõistet käsitlevat kirjandust.

Nagu selgus omavalitsustevahelise koostöö jaoks sobilike õiguslike vormide analüüsist, saab Venemaal asutada II tüüpi FKKJ-i koolijurisdiiktsioone vaid ühingu (liidu) kujul. Kehtivates õigusaktides on kaks mittekaubanduslikku vormi – autonoomsed mittekaubanduslikud organisatsioonid ja fondid –, mida soovitatakse omavalitsustevaheliseks koostööks Venemaal. Autonoomsed mittekaubanduslikud organisatsioonid ja fondid pole aga II tüüpi FKKJ-ide jaoks sobilikud, sest nad ei eelda asutajate liikmesust, mistõttu ei saa hetketegevuse jaoks osalustasu koguda. Kuna siinses lõputöös keskendutakse II tüüpi FKKJ-idele, leidub vaid üks mittekaubandusliku ühingu (liidu) õiguslik vorm, mille puhul omavalitsused saavad olla liikmed ja asutajad, vabatahtlikult liituda ja lahkuda, kattuda ja liikmete nimel konkureerida, seada sisse demokraatlikud toimingud ja struktuurid, avaldada põhikirja ning nõuda tasusid ja panuseid.

Omavalitsuste tasandi ametiasutustel on õigus koole asutada, ümber korraldada ja sulgeda. Venemaal tohivad aga kooliteenuste pakkumist korraldada ainult kõrgema astme omavalitsused, nagu munitsipaal- ja linnapiirkonnad ning linnasisese jaotusega linnaringkonnad. Omavalitsuste teised tasandid, nagu maa- ja linnaasulad, ei ole kooliteenuste pakkumisega seotud otsuste tegemiseks pädevad. Kõrgema taseme omavalitsused on volitatud langetama otsuseid seoses haridusasutuste asutamise, ümberkorralduse ja sulgemisega ning koolihoonete ja -rajatiste hooldamise, külgnevate territooriumide korrastamisega jne.

FKKJ-i juhtkonna tegevust saab kooskõlastada mitmel moel, et vältida nende ebasoodsaid otsuseid ja tegevusi ning selgitada nende kohustusi. Ebasoodsaid otsuseid saab pikas perspektiivis vähendada, kui seada sisse eriline õigusraamistik. Sel eesmärgil on autor välja töötanud II tüüpi FKKJ-i näidispõhikirja ja -memorandumi. Asutamisdokumentide jaoks on kindlaks tehtud, et ühing on sobilik õiguslik vorm omavalitsustevahelise koostöö jaoks Venemaal. Ühingutel peab olema kaks asutamisdokumenti: põhikiri ja memorandum. Põhikiri on üksikasjalikum ja sisaldab suuniseid selle kohta, kuidas ühing peaks toimima, samas kui memorandumis väljendatakse poolte initsiatiivi ühissettevõtte asutamiseks. Põhikirja ja memorandumi sätted võivad kattuda. Siinses lõputöös

täiendatakse nimetatud dokumentide standardsätteid teabega, mis on II tüübi FKKJ-ide jaoks oluline, näiteks teoreetiliste mudelite tulemused, omavalitsuste ja regioonide haridusametuste esindajatega tehtud intervjuudest saadud empiirilised teadmised ning FKKJ-iga sarnane omavalitsustevahelise koostöö vorm Saksamaal (*Bodensee Zweckverband*).

Põhikirja kõige olulisemate sätete seas on II tüübi FKKJ-i liikmed, eesmärgid ja tegevusala, täitevorganite pädevus, liikmete õigused ja kohustused, liitumine ja iga-aastane liikmemaks, otsustamisprotsess, likvideerimise ja ümberkorralduste kord, kõrgeima organi ülesanded, II tüübi FKKJ-i organisatsiooniline struktuur jne.

Eritingimused selle kohta, kellel on lubatud II tüübi FKKJ-i koolides käia, mõjutavad väljundi suurust ning tuleks seega põhikirja lisada. Samuti määrab tarbijate väljaselgitamine põhikirjas turu struktuuri ja nõudlusfunktsiooni ning mõjutab II tüübi FKKJ-i optimaalse planeerimise lahendusi. FKKJ-i liikmed saab jagada rühmadesse neile pakutava kooliteenuste kvaliteedi või nende tarbitavate teenuste mitmekesisuse alusel. See, kas lapsed, kes on pärit omavalitsustest, kes pole liikmed, tohivad II tüübi FKKJ-i koolides käia, mõjutab väljundi suurust. Seega on äärmiselt oluline nimetatud teave II tüübi FKKJ-i põhikirja lisada.

II tüübi FKKJ-i põhikirjaga ettenähtud eesmärgid määravad liikmete soovitud juhtimiskäitumise tüübi, mistõttu nimetatud eesmärgid välistavad ebasoodsad juhtumid III ja IV. Põhikirjas tuleks rõhutada ka ülesandeid ja tegevusvaldkondi. See, kas II tüübi FKKJ pakub üksnes alg-, põhi-, või keskharidust, mõjutab nõudluse suurust.

Põhikirja lõigetest, mis käsitlevad liikmeid ja liikmete kogu, on näha, kui võimukad nad on võrreldes täitevorganitega, milliste otsuste tegemise nad annavad II tüübi FKKJ-i täitevorganitele üle ja mille eest vastutab liikmete kogu. Samuti on vajalik juhtorganite pädevuse lisamine põhikirja, sest nii piiritletakse juhtkonna tegevus juhtimiskäitumise juhtumitega I ja II ning välditakse juhtumeid III ja IV.

Liikmesust ja liitumistasu käsitlevad sätted on seotud teoreetilise modelleerimise ja intervjuude tulemustega. Intervjuude ja õigusaktide analüüsi käigus saadud teabe kohaselt katavad piirkondlikud haridusametused haridusvaldkonna tööjõu ja materjalide kuld, näiteks õpikud ja õpetajate palgad. Samas vastutavad omavalitsused koolihoonete ja -rajatiste hooldamise eest. Seega võeti II tüübi FKKJ-i asutamise ja hetketegevuse mudelitest kasutusele matemaatiline lahendus kaheosalistele tariifidele, et need põhikirjas kindlaks määrata. Liikmete kogu otsusega saab kehtestada ka muid liitumise ja regulaarsete tasudega seotud eeskirju ning nende muid allikaid.

Põhikiri peaks hõlmama ka II tüübi FKKJ-ide organite otsustusprotsessi. Häälte jaotumise alus (näiteks omavalitsuste kooliealiste laste statistiline arv) ja hääletamiseskirjad tuleb ära kirjeldada. Häälte arv võib olla otseselt seotud väljundiga (õpilaste arv) või omavalitsuse osaga II tüübi FKKJ-i omakapitalis. See kujundab hääletuste tulemusi ja annab osale liikmetest rohkem mõjuvõimu.

Põhikirja sättes, mis on seotud likvideerimiskorraga, rõhutatakse ühingu mittekaubanduslikke eesmärke, sest liikmete varaline panus tuleb neile tagastada vastavalt nende osalusele ning omavalitsused peavad seda kasutama hariduslikel, kultuurilistel, sotsiaalsetel ja muudel põhikirjajärgsetel eesmärkidel. Kui see pole aga võimalik, võivad omavalitsused kasutada seda teistel eesmärkidel, mis pole seadusega keelatud.

Siinne lõputöö võib pakkuda praktilist huvi Venemaa poliitikakujundajatele, kes vastutavad territoriaalse arengu ja munitsipaalplaneerimise eest. Omavalitsustevahelist koostööd algatavate omavalitsuste ja linnapiirkondade juhtide jaoks on siinses lõputöös üksikasjalikud juhised, mida II tüüpi FKKJ-i koolijurisdiktsioonide asutamisdokumentides arvesse võtta. II tüüpi FKKJ-i põhikirjas ja memorandumis on juba esitatud lahendused sellele, kuidas arvestada omavalitsuste osa, kuidas määrata regulaarse osaluse tasu jne. Lisaks võib see aidata omavalitsustel mõista, millist juhtimisviisi tuleks II tüüpi FKKJ-i tegevuses kasutada. Kui juhtkonna eesmärke ei saa avalikustada enne nende töölevõtmist, võib nende otsuseid reguleerida II tüüpi FKKJ-i põhikirja sätetega. Selle abil saab välistada juhtkonna otsused, mis kalduvad kõrvale II tüüpi FKKJ-i põhikirjajärgsetest eesmärkidest.

Kuna piirkondlikud ametiasutused pakuvad omavalitsuste koolidele toetusi, mis katavad osaliselt omavalitsuste haridustegevusega seotud kulud, võib piirkondlikele haridusasutustele huvi pakkuda ka koolisüsteemi optimeerimine ja kulude vähendamine II tüüpi FKKJ-võrgustiku abil.

Kooli II tüüpi FKKJ-id saavad keskenduda teatud haridustasemele (nt alg- või keskkaridusele), töötada välja ainulaadseid lähenemisviise haridusele ning tagada juurdepääsu tehnilistele ja inimressurssidele (õpetajad), mis polnud varem mõnede omavalitsuste jaoks võimalik. Sisuliselt loovad II tüüpi FKKJ-i omavalitsused ühise ressursireservi. Nii võivad teenuse kasutajad sellest kõige rohkem kasu saada, sest kooliteenuste kvaliteet pole Venemaal ühtlane. Olukord on eriti keeruline vähenenud rahvaarvuga maapiirkondades.

CURRICULUM VITAE

Name Mariia Chebotareva
Date of birth July 10, 1991
E-mail mariia.chebotareva@ut.ee
Address Delta Centre, Narva Rd 18-4013, 51009 Tartu, Estonia

Education

2017–2021 PhD candidate in Economics, Chair of Public Economics and Policy, School of Economics and Business Administration, University of Tartu (Estonia)
2015–2017 Visiting PhD student, Chair of Public Economics and Policy, School of Economics and Business Administration, University of Tartu
2014–2018 PhD candidate in Economics, Chair of Economic Theory and International Economics, Faculty of Economics, Voronezh State University (Russia)
2012–2015 Bachelor of Linguistics (diploma with honours), Faculty of Romano-Germanic Philology, Voronezh State University
2013–2014 Exchange undergraduate student, Faculty of Economics and Business Administration, University of Tartu
2012–2014 Master of Economics (diploma with honours), Faculty of Economics, Voronezh State University
2008–2012 Bachelor of Economics (diploma with honours), Faculty of Economics, Voronezh State University
2004–2008 Gymnasium No. 2 (with honours – gold medal), Voronezh

Professional experience

2021 Research Specialist, project ‘Improving Estonian Internal Security Social Campaigns through Neuroscience’ (14.10.2020–30.11.2021), University of Tartu
2019 Specialist, INTERREG, project Plan4Blue ‘Maritime Spatial Planning for Sustainable Blue Economies’, University of Tartu
2018 Research Internship in Decision Sciences, Department of Economics, University of Konstanz (Germany)
2016 – ... Teaching assistant, School of Economics and Business Administration, University of Tartu
2015 Teaching assistant, Faculty of Economics, Voronezh State University
2014 Marketing assistant, EFKO Group of companies, Voronezh

Language skills

Native language Russian
Other language(s) English (fluent), German (basic), French (basic)

Major research fields

- Microeconomics Theory
- Institutional Economics
- Public Economics
- Economic Policy
- International Economics

Honours and Awards

- 2015–2017 Erasmus Mundus ‘Aurora II’ Doctoral Research Grant
- 2014 Oxford Russia Fund scholarship for PhD students
- 2013 Russian Federation President Scholarship
- 2011–2012 Oxford Russia Fund scholarship
- 2008–2014 Russian Federation state scholarship

Conferences, Seminars and Workshops

- 2020 8th Dialogue on Social Market Economy ‘The Role of Higher Education in Different Economic Systems’, Tartu (Estonia)
- 2019 Final conference of maritime spatial planning project Plan4Blue, Helsinki (Finland)
- 2019 The 20th International Scientific Conference ‘Quantitative Methods in Economics’, Warsaw University of Life Sciences – SGGW, Warsaw (Poland)
- 2018 SHU-UT High Impact Research Seminar, Shanghai University, School of Economics, Shanghai (China)
- 2018 2nd Tongji-UT Economics Seminar, Tongji University, Shanghai (China).
- 2018 Inaugural Nordic International Business and Export Marketing Conference, Tallinn (Estonia)
- 2018 Summer school ‘Digital Methods in Humanities and Social Sciences’, Tartu (Estonia)
- 2017 Workshop ‘Innovation and the State’ by Prof. Dan Breznits (Munk School of Global Affairs, University of Toronto), Tallinn (Estonia)
- 2017 PhD Summer School in Economics, Management, Governments and Politics, Political Science, Law and Public Administration, Saka Manor (Estonia)
- 2017 Estonian Economic Association Conference, Tallinn (Estonia)
- 2017 Russian Summer School on Institutional Analysis, Higher School of Economics, Moscow (Russia)
- 2017 Academic writing winter school, Nelijärve (Estonia)
- 2017 Tongji University and University of Tartu Summer School in Economics, Tartu (Estonia)
- 2017 Mini-course ‘Introduction to the Economics of Non-Renewable Resources’ by Julien Xavier Daubanes (University of Copenhagen), Tartu (Estonia)
- 2016 International conference ‘Economic development of Russia: a growth driver or a challenge generator’, Sochi (Russia)

ELULOOKIRJELDUS

Nimi Mariia Chebotareva
Sünniaeg 10. juuli 1991
Email mariia.chebotareva@ut.ee
Aadress Delta, Narva mnt 18-4013, 51009 Tartu, Eesti

Haridus

2017–... Majandusteaduskonna doktorant, Tartu Ülikool
2015–2017 Külalisuurija, Tartu Ülikool
2014–2018 Majandusteaduskonna doktorant, Voroneži Ülikool (Venemaa)
2012–2015 Keeleteaduste bakalaureus (*summa cum laude*), Voroneži Ülikool
2013–2014 Vahetusüliõpilane, Tartu Ülikool
2012–2014 Majandusteaduse magister (*summa cum laude*), Voroneži Ülikool
2008–2012 Majandusteaduse bakalaureus (*summa cum laude*), Voroneži Ülikool
2004–2008 Gümnaasium 2, Voronež

Töökogemus

2021 Uuringuspetsialist, 'Eesti siseturvalisuse teavituskampaaniate tõhustamine neurouuringute abil' projekt, Tartu Ülikool
2019 Spetsialist, 'Mereruumi planeerimine sinimajanduse edendamiseks' projekt, Tartu Ülikool
2018 Otsustusteaduste teaduspraktika, Konstanzi Ülikooli majandusteaduskond (Saksamaa)
2016 – ... Õppeassistent, Tartu Ülikooli majandusteaduskond
2015 Õppeassistent, Voroneži Ülikooli majandusteaduskond
2014 EFKO kontserni turundusassistent, Voronež (Venemaa)

Keelteoskus

Vene keel (emakeel), inglise keel (väga hea), prantsuse keel (algteadmised), saksa keel (algteadmised)

Peamised uurimisvaldkonnad

- Mikroökonomika teooria
- Institutsiooniökonomika
- Avaliku sektori ökonomika
- Majanduspoliitika
- Rahvusvaheline majandus

Auhinnad ja stipendiumid

2015–2017 Erasmus Munduse "Aurora II" doktoranditoetus
2014 Oxford Russia Fundi stipendium doktorantidele
2013 Venemaa Föderatsiooni presidendi stipendium

- 2011–2012 Oxford Russia Fundi stipendium
2008–2014 Venemaa Föderatsiooni riiklik stipendium

Konverentsid ja seminarid

- 2020 8. dialoog sotsiaalse turumajanduse teemal “Kõrghariduse roll erinevates majandussüsteemides”, Tartu (Eesti)
- 2019 Mereala ruumilise planeerimise projekti Plan4Blue lõppkonverents, Helsingi (Soome)
- 2019 20. rahvusvaheline teaduskonverents “Kvantitatiivsed meetodid majanduses”, Varssavi Maaülikool - SGGW, Varssavi (Poola)
- 2018 SHU-UT uurimisseminar, Shanghai Ülikool, majandusteaduskond, Shanghai (Hiina)
- 2018 2. Tongji-TÜ majandusseminar, Tongji Ülikool, Shanghai (Hiina)
- 2018 Põhjamaade rahvusvaheline äri- ja eksporditurunduse konverents, Tallinn (Eesti)
- 2018 Suvekool “Digital Methods in Humanities and Social Sciences”, Tartu (Eesti)
- 2017 Töötuba “Innovatsioon ja riik”, autor prof Dan Breznits, Tallinn (Eesti)
- 2017 Majandusteaduse, juhtimise, poliitoloogia, riigiteaduste, õiguse ja avaliku halduse doktorantide suvekool, Saka mõis (Eesti)
- 2017 Eesti Majandusteaduse Seltsi aastakonverents, Tallinn (Eesti)
- 2017 Institutsiooniökonomika suvekool, Moskva Majanduskõrgkool, (Venemaa)
- 2017 Akadeemilise kirjutamise talvekool, Nelijärve (Eesti)
- 2017 Tongji Ülikool ja Tartu Ülikooli majandusteaduse suvekool, Tartu (Eesti)
- 2017 Minikursus “Sissejuhatus taastumatute ressursside majandusse”, autor Julien Xavier Daubanes (Kopenhaageni Ülikool), Tartu (Eesti)
- 2016 Rahvusvaheline konverents “Venemaa majandusareng: kasvumootor või väljakutse tekitaja”, Sotši (Venemaa)

DISSERTATIONES RERUM OECONOMICARUM UNIVERSITATIS TARTUENSIS

1. **Олев Раю.** Экономическая ответственность и ее использование в хозяйственном механизме. Tartu, 1994. Kaitstud 20.05.1991.
2. **Janno Reiljan.** Majanduslike otsuste analüütiline alus (teooria, metodoloogia, meetodika ja meetodid). Tartu, 1994. Kaitstud 18.06.1991.
3. **Robert W. McGee.** The theory and practice of public finance: some lessons from the USA experience with advice for former socialist countries. Tartu, 1994. Kaitstud 21.06.1994.
4. **Maaja Vadi.** Organisatsioonikultuur ja väärtused ning nende vahelised seosed (Eesti näitel). Tartu, 2000. Kaitstud 08.06.2000.
5. **Raul Eamets.** Reallocation of labour during transition disequilibrium and policy issues: The case of Estonia. Tartu, 2001. Kaitstud 27.06.2001.
6. **Kaia Philips.** The changes in valuation of human capital during the transition process in Estonia. Tartu, 2001. Kaitstud 10.01.2002.
7. **Tõnu Roolaht.** The internationalization of Estonian companies: an exploratory study of relationship aspects. Tartu, 2002. Kaitstud 18.11.2002.
8. **Tiia Vissak.** The internationalization of foreign-owned enterprises in Estonia: An extended network perspective. Tartu, 2003. Kaitstud 18.06.2003.
9. **Anneli Kaasa.** Sissetulekute ebavõrdsuse mõjurite analüüs struktuurse modelleerimise meetodil. Tartu, 2004. Kaitstud 15.09.2004.
10. **Ruth Alas.** Organisational changes during the transition in Estonia: Major influencing behavioural factors. Tartu, 2004. Kaitstud 22.12.2004.
11. **Ele Reiljan.** Reasons for de-internationalization: An analysis of Estonian manufacturing companies. Tartu, 2004. Kaitstud 25.01.2005.
12. **Janek Uiboupin.** Foreign banks in Central and Eastern European markets: their entry and influence on the banking sector, Tartu, 2005. Kaitstud 29.06.2005.
13. **Jaan Masso.** Labour Reallocation in Transition Countries: Efficiency, Restructuring and Institutions, Tartu, 2005. Kaitstud 7.11.2005.
14. **Katrin Männik.** The Impact of the Autonomy on the Performance in a Multinational Corporation's Subsidiary in Transition Countries, Tartu, 2006. Kaitstud 29.03.2006.
15. **Andres Vesilind.** A methodology for earning excess returns in global debt and currency markets with a diversified portfolio of quantitative active investment models, Tartu, 2007. Kaitstud 13.06.2007.
16. **Rebekka Vedina.** The diversity of individual values and its role for organisations in the context of changes, Tartu, 2007. Kaitstud 16.11.2007.
17. **Priit Sander.** Essays on factors influencing financing decisions of companies: risk, corporate control and taxation aspects, Tartu, 2007. Kaitstud 19.12.2007.
18. **Kadri Ukrainski.** Sources of knowledge used in innovation: an example of Estonian wood industries. Tartu, 2008. Kaitstud 22.04.2008.

19. **Kristjan-Olari Leping.** Heterogeneity of human capital and its valuation in the labour market. Tartu, 2008. Kaitstud 14.05.2008.
20. **Kadri Männasoo.** Essays on financial fragility – evidence from the corporate and banking sectors in Central and Eastern Europe. Tartu, 2008. Kaitstud 26.05.2008.
21. **Made Torokoff.** Patterns of learning organisation – Estonian experiences. Tartu, 2008. Kaitstud 30.06.2008.
22. **Helena Rozeik.** Changes in ownership structures, their determinants and role in the restructuring of enterprises during transition: evidence from Estonia. Tartu, 2008. Kaitstud 31.10.2008.
23. **Jaanika Meriküll.** Technological change and labour demand. Tartu, 2009. Kaitstud 19.05.2009.
24. **Anne Aidla.** The impact of individual and organisational factors on academic performance in estonian general educational schools. Tartu, 2009. Kaitstud 18.06.2009.
25. **Alexander Gofman.** Experimentation-Based Product Development in Mature Food Categories: Advancing Conjoint Analysis Approach. Tartu, 2009. Kaitstud 21.09.2009.
26. **Anne Reino.** Manifestations of organizational culture based on the example of Estonian organizations. Tartu, 2009. Kaitstud 06.11.2009.
27. **Krista Jaakson.** Management by values: the analysis of influencing aspects and its theoretical and practical implications. Tartu, 2009. Kaitstud 12.11.2009.
28. **Eve Parts.** Social capital, its determinants and effects on economic growth: comparison of the Western European and Central-Eastern European countries. Tartu, 2009. Kaitstud 18.12.2009.
29. **Egle Tafenau.** Welfare effects of regional policy in the constructed capital model. Tartu, 2010. Kaitstud 22.03.2010.
30. **Epp Kallaste.** Employee workplace representation: an analysis of selected determinants. Tartu, 2010. Kaitstud 21.06.2010.
31. **Danel Tuusis.** Interest rate influence on the behavior of economic subjects. Tartu, 2010. Kaitstud 22.10.2010.
32. **Elina Kallas.** Emotional intelligence, organizational culture and their relationship based on the example of Estonian service organizations. Tartu, 2010. Kaitstud 17.11.2010.
33. **Dorel Tamm.** Alignment between the factors of the innovation process and public sector innovation support measures: an analysis of Estonian dairy processors and biotechnology enterprises. Tartu, 2010. Kaitstud 16.12.2010.
34. **Rasmus Kattai.** The links between private sector indebtedness and banking sector vulnerability: An Estonian case study. Tartu, 2010. Kaitstud 17.01.2011.
35. **Kurmet Kivipõld.** Organizational Leadership Capability and its evaluation based on the example of Estonian service organizations. Tartu, 2011. Kaitstud 4.05.2011.

36. **Janno Järve.** Downward Nominal Wage Rigidity in the Estonian Private Sector. Tartu, 2011. Kaitstud 21.06.2011.
37. **Kristina Toming.** The impact of integration with the European Union on the international competitiveness of the food processing industry in Estonia. Tartu, 2011. Kaitstud 21.06.2011.
38. **Andrus Kotri.** Customer experience evoking and management in services. Tartu, 2011. Kaitstud 26.08.2011.
39. **Andres Kuusik.** Segmentation of repeat visitors using passive mobile positioning data: customer loyalty based approach. Kaitstud 31.08.2011.
40. **Tuuli Pärenson.** Social impact evaluation in social enterprises in Estonia: need, readiness and practices. Kaitstud 21.09.2011.
41. **Indrek Saar.** Optimal alcohol taxation in Estonia. Kaitstud 25.11.2011.
42. **Kertu Lääts.** Management accounting change in a dynamic economic environment based on examples from business and public sector organizations. Tartu, 2011, 250 p.
43. **Reelika Irs.** Teacher performance appraisal and remuneration aspects of performance management on the example of Estonian general educational schools. Tartu, 2012, 322 p.
44. **Anne Lauringson.** The Impact of the Generosity of Unemployment Benefits on Estonian Labour Market Outcomes in a Period of Crisis. Tartu, 2012, 268 p.
45. **Peeter Peda.** The relationship between governance and performance in water services provision in Estonian municipalities. Tartu, 2012, 326 p.
46. **Andres Kuusk.** Financial contagion during times of crisis: a meta-analysis based approach with special emphasis on CEE economies. Tartu, 2012, 211 p.
47. **Kerly Espenberg.** Inequalities on the labour market in Estonia during the Great Recession. Tartu, 2013, 312 p.
48. **Xiaotian Zhang.** Internationalization processes of Chinese firms: The role of knowledge. Tartu, 2013, 274 p.
49. **Helen Poltimäe.** The distributional and behavioural effects of Estonian environmental taxes. Tartu, 2014, 141 p.
50. **Eneli Kindsiko.** Organisational Control in University Management: A Multiparadigm Approach on the Example of the University of Tartu. Tartu, 2014, 211 p.
51. **Diana Eerma.** A Bookkeeping approach to social accounting for a university faculty: The case of the University of Tartu. Tartu, 2014, 293 p.
52. **Kaia Kask.** Public sector real estate asset management models and their evaluation. Tartu, 2014, 264 p.
53. **Ott Pärna.** Managerial and contextual factors influencing innovation in information technology-based public sector services: an exploratory cross-national study. Tartu, 2014, 410 p.
54. **Merle Tambur.** Workplace bullying in Estonian organizations: The prevalence and causes. Tartu, 2015, 210 p.

55. **Sten Anspal.** Essays on gender wage inequality in the Estonian labour market. Tartu 2015, 195 p.
56. **Oliver Lukason.** Characteristics of firm failure processes in an international context. Tartu 2016, 180 p.
57. **Marko Viiding.** Role of electricity price in competitiveness of the manufacturing industry in liberalised electricity markets: the case of NordPool. Tartu 2016, 188 p.
58. **Bianka Plüschke-Altöf.** Images of the Periphery Impeding Rural Development? Discursive Peripheralization of Rural Areas in Post-Socialist Estonia. Tartu 2017, 237 p.
59. **Tarmo Puolokainen.** Public Agencies' Performance Benchmarking in the Case of Demand Uncertainty with an Application to Estonian, Finnish and Swedish Fire and Rescue Services. Tartu 2018, 247 p.
60. **Karin Sakowski.** The Role of National-Institutional Context in Organisations and in Organisational Innovation: The Case of Western and Central and Eastern European Countries. Tartu 2018, 135 p.
61. **Maryna Tverdostup.** Human capital and labour market disparities. Tartu 2018, 248 p.
62. **Bradley James Loewen.** Towards territorial cohesion? Path dependence and path innovation of regional policy in Central and Eastern Europe. Tartu 2018, 232 p.
63. **Kärt Rõigas.** University-industry cooperation in the context of the national innovation system. Tartu 2018, 208 p.
64. **Tatyana Tsukanova.** Insights into the Export Behavior of SMEs from Emerging Economies: Evidence from Russia and China. Tartu 2019, 251 p.
65. **Gerdien Margreth Grootens.** Leadership of peripheral places: a comparative study of leadership processes in Estonian and Dutch peripheral places. Tartu 2019, 186 p.
66. **Tõnis Tänav.** Dynamics of firm innovation strategies: relationship with public sector support. Tartu 2020, 280 p.
67. **Gaygysyz Ashyrov.** Essays on firm-level corruption. Tartu 2020, 193 p.
68. **Tõnis Eerme.** Big Science as innovation intermediaries – micro- and meso-level effects from the collaboration with the European Space Agency. Tartu 2020, 173 p.
69. **Isaac Nana Akuffo.** The relationship between authentic leadership competences and nepotism, favouritism, and cronyism – the case of the Ghanaian banking sector. Tartu 2020, 147 p.
70. **Virgo Süsi.** Corporate governance and performance of private SMEs. Tartu 2021, 130 p.