ISSN 1691-3078
ISBN 978-9984-9937-8-2

ECONOMIC SCIENCE FOR RURAL DEVELOPMENT

Proceedings of the International Scientific Conference

Production and Taxes

Primary and Secondary Production and Cooperation

Finance and Taxes

№ 21

“ECONOMIC SCIENCE FOR RURAL DEVELOPMENT”

Proceedings of the
International Scientific Conference

PRODUCTION AND TAXES

1. Primary and Secondary Production and Cooperation
2. Finance and Taxes

№ 21
Jelgava
2010

TIME SCHEDULE OF THE CONFERENCE:

Preparation – September, 2009 – April, 2010
Process – April 22-23, 2010

Latvia University of Agriculture, 2010
Agricultural University of Szczecin, 2010
BA School of Business and Finance, 2010
Baltic International Academy, 2010
Daugavpils University, 2010
Fulda University of Applied Sciences, 2010
Higher School of Economics and Culture, 2010
Institute of Economics of Latvian Academy of Sciences, 2010
Institute for National Economy Research, 2010
Klaipeda University, 2010
Latvian State Institute of Agrarian Economics, 2010
Riga International School of Economics and Business Administration, 2010
Lithuanian Agricultural University, 2010
Liverpool John Moores University, 2010
Munster University of Applied Sciences, 2010
Research Institute of Biotechnology and Veterinary Medicine "Sigra", 2010
Rēzekne High School, 2010
Riga Technical University, 2010
Szent Istvan University, 2010
Tallinn University, 2010
Tallinn University of Technology, 2010
University of Agriculture in Krakow, 2010
University of Bonn, 2010
University of Latvia, 2010
University of Ljubljana, 2010
University of the Western Cape, 2010
Warsaw University of Life Sciences, 2010
West University of Timisoara, 2010

ISSN 1691-3078
ISBN 978-9984-9937-8-2

Abstracted / Indexed: AGRIS, EBSCO
http://www.llu.lv/ef/konferences.htm
www.fao.org/agris/
http://search.ebscohost.com
http://www.cabi.org

Programme Committee of International Scientific Conference

Professor **Baiba Rivža**	President of the Academy of Agricultural and Forestry Sciences of **Latvia;** academician of Latvian Academy of Sciences; foreign member of Academy of Agricultural Sciences of Russia; foreign member of the Academy Geargophily (Italy), foreign member of the Royal Swedish Academy of Agriculture and Forestry
Professor **Michael – Burkhard Piorkowsky**	Institute for Food and Resources Economics, Head of the Department of Household and Consumption Economics, University of Bonn, **Germany**
Professor **Julius Ramanauskas**	Klaipeda University, **Lithuania**
Profesor **Alina Danilovska**	Head of the Department of Economics and Economic Policy of Warsaw University of Life Sciences, Warsaw, **Poland**
Professor **Barbara Freytag-Leyer**	Department of Home Economics, Fulda University of Applied Sciences, **Germany**
Associate professor **Audrius Gargasas**	Faculty of Economy and Management, Lithuanian Agricultural University, **Lithuania**
Professor **Antoni Mickiewicz**	Head of the Department of Agrarian Business of the University of Agriculture in Szczecin, **Poland**
Professor **Irina Pilvere**	Dean of the Faculty of Economics of **Latvia** University of Agriculture
Associate professor **Aija Eglīte**	Department of Economics of the Faculty of Economics of **Latvia** University of Agriculture
Professor **Voldemārs Strīķis**	Head of the Department of Agrarian Economic Sciences of the Academy of Agricultural and Forestry Sciences of **Latvia**; foreign member of the Royal Swedish Academy of Agriculture and Forestry; foreign member of the Academy of Agricultural Sciences of Russia
Professor **Tiiu Ohvril**	Director of Studies, Institute of Economics and Social Sciences, **Estonian** University of Life Sciences
Professor **Mona Vintila**	West University of Timisoara, **Romania**

The chief facilitator and project leader – assoc. professor **Aija Eglīte**

Editorial Board

The Editorial Board of the edition of the International Scientific Conference Proceedings:

Associate professor Aija Eglīte	Latvia
Professor Barbara Freytag-Leyer	Germany
Professor Michael – Burkhard Piorkowsky	Germany
Professor Vulfs Kozlinskis	Latvia
Professor Antoni Mickiewicz	Poland
Associate professor Kaie Pappel	Estonia
Professor Julius Ramanauskas	Lithuania
Professor Veronika Buģina	Latvia
Professor Anastasija Vilciņa	Latvia
Professor Alina Danilovska	Poland
Professor Mona Vintila	Romania
Assistant professor Modrīte Pelše	Latvia

Editor – in-chief and responsible compiler of the proceedings:	Associate professor **Aija Eglīte**
Assistants to the responsible compiler:	**Zane Bulderberga** **Agnese Radžele-Šulce**

Language editor: **Gunita Mazūre**

Layout designer: **Agnese Radžele-Šulce**

Reviewers

Every article included into the Proceedings was subjected to a scientific, including international review.

All reviewers were anonymous for the authors of the articles.

The following **81** reviewers from scientific and academic institutions of **9** countries (Estonia, Germany, Hungary, Romania, Lithuania, Poland, Slovenia, South Africa, and Latvia) have written 160 reviews.

Sandris Ancāns	Mg.oec., lect. (LLU, Latvia)
Anita Auziņa	Dr.oec., assoc. prof. (LLU, Latvia)
Dzintra Atstāja	Dr.oec., assoc. prof., (BA, Latvia)
Voldemārs Bariss	Dr.phil., assoc. prof. (LLU, Latvia)
Veronika Bikse	Dr.oec., prof. (LU, Latvia)
Ligita Bite	Dr.oec., asist. prof. (LLU, Latvia)
Vera Boroņenko	Dr.oec. (DU, Latvia)
Veronika Buģina	Dr.oec., prof. (LLU, Latvia)
Judith Cornelissen	PhD, prof. (Cape Town, SouthAfrica)
Alina Danilowska	Dr.hab. (Warsaw, Poland)
Vija Dišlere	Dr.paed., assoc. prof. (LU, Latvia)
Aina Dobele	Dr.oec., assoc. prof. (LLU, Latvia)
Aija Eglīte	Dr.oec., assoc. prof. (LLU, Latvia)
Barbara Freytag-Leyer	Dr.oec., prof. (Fulda, Germany)
Hertje Funke	Dr.agr., prof. (Munster, Germany)
Ineta Geipele	Dr.oec., prof. (RTU, Latvia)
Ingūna Gulbe	Dr.oec., assoc. prof (Latvia)
Uldis Ivans	Mg.oec., assoc. prof. (LLU, Latvia)
Ingrīda Jakušonoka	Dr.oec., prof. (LLU, Latvia)
Anda Jankava	Dr.oec., prof. (LLU, Latvia)
Elita Jermolajeva	Dr.oec. assoc. prof.(DU, Latvia)
Anna Jesemčika	Mg.oec., assoc. prof. (LLU, Latvia)
Sandra Jēkabsone	Dr.oec., asist. prof. (LU, Latvia)
Helma Jirgena	Dr.oec., asist. prof. (LLU, Latvia)
Ināra Jurgena	Dr.oec., assoc. prof. (LLU, Latvia)
Gaida Kalniņa	Dr.oec., assoc. prof. (LLU, Latvia)
Arnis Kalniņš	Dr.hab.oec (Latvia)
Ingrīda Kantiķe	Mg.oec., lect. (LLU, Latvia)
Grazyna Kavmowska	Dr.hab., prof. (Szczecin, Poland)
Ilmārs Kālis	Dr.oec., assoc. prof. (LU, Latvia)
Staņislavs Keišs	Dr.oec., assoc. prof. (EKA, Latvia)
Verena Koch	PhD, assoc. prof. (Ljubljana, Slovenia)
Evija Kopeika	Dr.oec., asist. prof. (LU, Latvia)
Vulfs Kozlinskis	Dr.hab. oec., prof. (LLU, Latvia)
Maiga Krūzmētra	asist. prof. Emaritus, (LLU, Latvia)
Ivars Kudreņickis	Dr., assoc. prof. (LU, Latvia)
Jānis Ķusis	Dr.hist., assoc. prof. (LLU, Latvia)
Inguna Leibus	Dr.oec., asist. prof. (LLU, Latvia)
Evija Liepa	Dr.math, assoc. prof. (BSA, Latvia)
Ene Lind	PhD, assoc. prof. (Tallin, Estonia)
Lienīte Litavniece	Dr.oec., asist. prof. (RA, Latvia)
Gunita Mazūre	Dr.oec., assoc. prof. (LLU, Latvia)
Vladimirs Meņšikovs	Dr.sc.soc., prof. (DU, Lavia)
Antoni Mickiewicz	Dr.hab., prof. (Szczecin, Poland)
Līga Mihējeva	Dr.oec., prof. (LLU, Latvia)
Tatjana Muravska	Dr.oec., prof. (LU, Latvia)
Henrietta Nagy	PhD, asist. prof., (Budapest, Hungary)

Aina Muška	Dr.oec., asist. prof. (LLU, Latvia)
Modrīte Pelše	Dr.oec., asist. prof. (LLU, Latvia)
Irina Pilvere	Dr.oec., prof. (LLU, Latvia)
Andrejs Ponomarjovs,	Dr.oec., asist. prof. (LU, Latvia)
Artūrs Prauliņš	Dr.oec., asist. prof. (Tallin, Estonia)
Inga Pučure	PhD, lect. (LLU, Latvia)
Viktorija Raŋķevica	Dr.oec., assoc. prof. (LLU, Latvia)
Baiba Rivža	Dr.hab.oec., prof. (LLU, Latvia)
Uldis Rozevskis	Dr.oec., assoc. prof. (LU, Latvia)
Florin Alin Sava	prof. (Timisoara, Rumania)
Linda Siliņa	Dr.oec., asist. prof. (LLU, Latvia)
Jan Siekierski	Dr.hab., prof., (Cracow, Poland)
Tomaz Siudek	Dr.inz. (Warsaw, Poland)
Inta Slavinska	Dr.oec., asist. prof. (LLU, Latvia)
Teodor Skotarczak	Dr. hab, prof. (Szczecin, Poland)
Janīna Stašāne	Dr.oec., asist. prof. (DU, Latvia)
Aivars Strautnieks	Dr.oec., assoc. prof. (LLU, Latvia)
Voldemārs Strīķis	Dr.agr., prof. (LLU, Latvia)
Evelīna Špakoviča	Dr.oec., asist. prof. (LLU, Latvia)
Kazimirs Špoģis	Dr.hab.agr., prof. (LLU, Latvia)
Jānis Tupiņš	Dr.sc.ing. (LLU, Latvia)
Ilze Upīte	PhD, lect. (LLU, Latvia)
Vasilijs Ustinovs	Dr.sc.ing, (LLU, Latvia)
Ilmārs Vanags	Dr.habil.oec., (Latvia)
Jānis Vanags	Dr.oec., assoc. prof. (RTU, Latvia)
Anastasija Vilciņa	Dr.oec., prof. (LLU, Latvia)
Ināra Vīka	Dr.oec., prof. (RSEBAA, Latvia)
Dace Vīksne	Mg.paed., lect. (LLU, Latvia)
Īrija Vītola	Dr.oec., prof.(LLU Latvia)
Aldona Zawojska	Dr. (Warsaw, Poland)
Anda Zvaigzne	Dr.oec., asist. prof. (LLU, Latvia)
Andra Zvirbule - Bērziņa	Dr.oec., assoc. prof. (LLU, Latvia)
Uģis Zālītis	Dr.oec., assoc. prof. (BA, Latvia)
Jan Žukovskis	Dr. asist.prof. (Akademija, Lithuania)

Priekšvārds

Latvijas Lauksaimniecības universitātes (LLU) Ekonomikas fakultātē līdz ar ikgadējo, tradicionālo starptautisko zinātnisko konferenci „Ekonomikas zinātne lauku attīstībai" iznāk tajā prezentējamo pētījumu starptautiski recenzētie zinātniskie raksti. **Šogad konference ieiet otrajā gadu desmitā un tiek organizēta 11. reizi.** Šajā gadā konferencē piedalās zinātnieki no Eiropas un Dienvidāfrikas, kuri pārstāv ne vien ekonomikas zinātni tās apakšnozaru daudzveidībā, bet arī pētījumos ir piepulcinājuši kolēģus no sociālo un citu zinātņu nozarēm, tā apliecinot mūsdienu zinātnes starpdisciplināro un multidimensiālo attīstību. Konference ir veltīta aktuālai lauku attīstības tematikai, tādēļ ir izdoti trīs secīgi laidieni (Nr. 21., 22. un 23.). Mūsu regulāro zinātnisko rakstu pirmais laidiens iznāca 2000. gadā.

2010.gada 22. un 23.aprīļa starptautiskajā zinātniskajā konferencē piedalās un savus zinātniskos pētījumu rezultātus prezentē profesori, zinātņu doktori, asociētie profesori, docētāji, doktoranti un citi pētnieki no šādām augstskolām un zinātniski pētnieciskajām iestādēm:

- Latvijas Lauksaimniecības universitāte
- Baltijas Starptautiskā akadēmija
- Banku augstskola
- Biotehnoloģijas un veterinārmedicīnas zinātniskais institūts "Sigra"
- Daugavpils universitāte,
- Ekonomikas un Kultūras augstskola
- Fuldas Profesionālā universitāte
- Klaipēdas universitāte
- Krakovas Lauksaimniecības universitāte
- Latvijas Universitāte
- Latvijas Valsts Agrārās ekonomikas institūts
- Latvijas Zinātņu akadēmijas Ekonomikas institūts
- Lietuvas Lauksaimniecības universitāte
- Liverpūles Džona Moora Universitāte
- Ļubļanas universitāte
- Minsteres lietišķo zinātņu universitāte
- Rēzeknes Augstskola
- Rietumkeiptaunas universitāte
- Rīgas Tehniskā universitāte
- Rīgas Starptautiskā ekonomikas un biznesa administrācijas augstskola
- Szent Istav universitāte
- Ščecinas Lauksaimniecības universitāte
- Tallinas universitāte
- Tallinas tehniskā universitāte
- Timisoara Rietumu Universitāte
- Varšavas Dzīvības zinātņu universitāte

Foreword

Every year the Faculty of Economics, Latvia University of Agriculture holds the international scientific conference "Economic Science for Rural Development" and publishes internationally reviewed papers of scientific researches, which are presented at the conference. **This year the conference enters the second decade and is organised for the 11th year running.** Researchers from Europe and South Africa representing not only the science of economics in the diversity of its sub-branches have contributed to the conference this year; they have expanded their studies engaging colleagues from social and other sciences, thus confirming inter-disciplinary and multi-dimensional development of the contemporary science. The conference is dedicated to topical themes of rural development; hence the research results are published in three successive volumes (No. 21, 22 and 23). The first volume of scientific conference proceedings was published in 2000.

Professors, doctors of science, associate professors, assistant professors, PhD students, and other researchers from the following higher education and research institutions participate in the International Scientific Conference held on April 22-23, 2010 and present their results of scientific researches:

- Agricultural University of Szczecin
- BA School of Business and Finance
- Baltic International Academy
- Daugavpils University
- Fulda University of Applied Sciences
- Higher School of Economics and Culture
- Institute of Economics, Latvian Academy of Sciences
- Klaipeda University
- Latvia University of Agriculture
- Latvian State Institute of Agrarian Economics
- Lithuanian Agricultural University
- Liverpool John Moores University
- Munster University of Applied Sciences
- Research Institute of Biotechnology and Veterinary Medicine "Sigra"
- Rēzekne High School
- Riga International School of Economics and Business Administration
- Riga Technical University
- Szent Istvan University
- Tallinn University
- Tallinn University of Technology
- University of Agriculture in Krakow
- University of Latvia

Konferencei izvēlēti sekojoši aktuāli temati:
— Ražošana un sadarbība lauksaimniecības primārajā, sekundārajā sfērā
— Integrēta un ilgtspējīga attīstība
— Finanses un nodokļi
— Izglītība un zinātne laukiem;
— Resursi un ilgtspējīgs patēriņš
— Mājas ekonomika

Pirmo reizi atsevišķi pārstāvēta mājas ekonomikas un ilgtspējīga patēriņa sekcija, kuras darbības nodrošināšanā iesaistījušies pasaulē atzīti mājas ekonomikas un patēriņa ekonomikas pārstāvji ilggadīgas sadarbības partneri no Vācijas, Lielbritānijas, Igaunijas. Konferences vārds pirmo reizi izskanēja arī visā plašajā pasaulē, arī Āfrikā un Āzijā.

Starptautiskās zinātniskās konferences zinātniskuma un starptautiskiem standartiem atbilstošu zinātnisko darbu prezentēšanas nodrošināšanai veikta vispusīga iesniegto zinātnisko rakstu starptautiska un starpaugstskolu recenzēšana. Šajā nolūkā lielākā daļa zinātnisko rakstu ir angļu valodā.

Katru iesniegto zinātniskā raksta manuskriptu vērtēja (recenzēja) parasti viens autora valsts recenzents un otrs – citas valsts vai citas augstskolas recenzents. Pretrunīgu recenziju gadījumā darbs tika nodots vēl trešajam recenzentam. Recenzenti darbu autoriem bija anonīmi. Katram autoram tika nosūtīti recenzentu iebildumi vai ieteikumi. Pēc uzlabotā (galīgā) varianta un autora paskaidrojuma saņemšanas katru zinātnisko rakstu vērtēja šīs konferences zinātnisko rakstu redkolēģija.

Starptautiskās zinātniskās konferences „Ekonomikas zinātne lauku attīstībai" visi zinātniskie raksti sakārtoti trijos tematiskajos laidienos:

Nr.21. Ražošana un nodokļi:
Ražošana un sadarbība primārajā, sekundārajā sfērā
Finanses un nodokļi

Nr.22. Resursi un izglītība
Resursi
Izglītība un zinātne laukiem

Nr.23. Ilgtspēja
Integrēta un ilgtspējīga attīstība
Mājas ekonomika un ilgtspējīgs patēriņš

— University of Ljubljana
— University of the Western Cape
— Warsaw University of Life Sciences
— West University of Timisoara

The following topical themes have been chosen for the conference:
— Primary and secondary agricultural production and cooperation;
— Integrated and sustainable development;
— Finance and taxes;
— Education and research for the countryside;
— Resources and sustainable consumption;
— Home economics.

The branch of Home economics and sustainable consumption is represented for the first time in the conference thanks to the world recognised representatives and long-term cooperation partners in the sphere of home and consumption economics from Germany, the United Kingdom, and Estonia. For the first time the conference resounded on the worldwide scale, also in Africa and Asia.

The comprehensive reviewing of submitted scientific articles has been performed on international and inter-university level to ensure that only high-level scientific and methodological research results, meeting the requirements of international standards, are presented at the conference. Therefore the majority of articles are in English.

Every submitted manuscript has been reviewed by one reviewer from the author's native country or university, while the other reviewer came from another country or university. The third reviewer was chosen in the case of conflicting reviews. All reviewers were anonymous for the authors of the articles. Every author received the reviewers' objections or recommendations. After receiving the improved (final) version of the manuscript and the author's comments, the Editorial Board of the conference evaluated each article.

All the papers of the international scientific conference "Economic Science for Rural Development" are arranged into the three following thematic volumes:

No. 21 Production and Taxes:
Primary and Secondary Production and Cooperation
Finance and Taxes

Rakstu publicēšana pirms konferences sekmēs tās norisi, domu apmaiņu, rosinās diskusijas, ekonomikas zinātnieku starptautisko sadarbību. Zinātniskajos rakstos izklāstītie pētījumi un to rezultāti kļūst pieejami plašam interesentu lokam visā pasaulē.

Konferences zinātnisko rakstu kopsavilkumi angļu valodā tiek ievietoti starptautiskās datu bāzēs:

- Apvienoto Nāciju Pārtikas un lauksaimniecības organizācijas (ANO FAO) starptautiskā informācijas sistēma lauksaimniecības zinātnes un tehnoloģijā AGRIS (International Information System for the Agricultural Sciences and Technology) (www.fao.org/agris/) un speciāli akadēmiskajām augstākajām mācību iestādēm, visaptverošā zinātniskā, daudznozaru pilnu tekstu datubāzēs:
- (EBSCOHost Academic Search Complete) un
- CABI PUBLISHING datubāzēs (http://search.ebscohost.com/login.aspx?authtype=ip,uid&profile=ehost&defaultdb=lbh, kā arī
- CAB ABSTRACTS (CABA) ir bibliogrāfiskajā datubāzē http://www.cabi.org/ vai http://www.cabi.org/Default.aspx?site=170&page=1016&pid=2227

Ceram saņemt atsauksmes un priekšlikumus turpmāko zinātnisko rakstu izdevumu sagatavošanai un starptautisko zinātnisko konferenču rīkošanai.

Pateicamies visiem rakstu autoriem, recenzentiem, programmas komitejai, redkolēģijai un tehniskajam personālam.

Konferences orgkomitejas vārdā
Aija Eglīte
Latvijas Lauksaimniecības universitātes
Ekonomikas fakultātes asociētā profesore

No. 22 Resources and Education
Resources
Education and Research for the Countryside

No. 23 Sustainability
Integrated and Sustainable Development
Home Economics and Sustainable Consumption

The publishing of the Proceedings before the conference will promote exchange of opinions, discussions, and collaboration of economic scientists on the international level. The research results included into the Proceedings are available worldwide to any interested person.

The abstracts of the conference proceedings provided in English are submitted to the international databases:

- AGRIS - International Information System for the Agricultural Sciences and Technology (www.fao.org/agris/) set up by the Food and Agriculture Organisation of the United Nations (FAO UN), and especially to the databases containing full research texts set up by the academic higher education institutions:
- (EBSCOHost Academic Search Complete) and
- CABI PUBLISHING databases (http://search.ebscohost.com/login.aspx?authtype=ip,uid&profile=ehost&defaultdb=lbh as well as
- CAB ABSTRACTS (CABA), which is a bibliographical database http://www.cabi.org/ or http://www.cabi.org/Default.aspx?site=170&page=1016&pid=2227

We are open to comments and recommendations for the development of future conference proceedings and organisation of international scientific conferences.

We would like to thank all the authors, reviewers, members of the Programme Committee and the Editorial Board as well as supporting staff for their contribution organising the conference.

On behalf of the conference organisers
Aija Eglīte
Associate professor of Faculty of Economics
Latvia University of Agriculture

Content

1. Primary and Secondary Production and Cooperation

2. Finance and Tax

“ECONOMIC SCIENCE FOR RURAL DEVELOPMENT”

Proceedings of the
International Scientific Conference

PRODUCTION AND TAXES

1. Primary and Secondary Production and Cooperation

Relationships between Investment Support and Production in Latvian Agriculture

Ilze Upīte, Mg.oec., lecturer
Department of Business and Management,
Faculty of Economics,Latvia University of Agriculture

Abstract. The purpose of investment support is to promote investments in the agricultural industry. In 2007-2008, Latvian farmers have received an investment support of almost LVL 126 million for increasing the efficiency and competitiveness of farms. The lack of territorial criteria for granting support in Latvian agriculture is subject to criticism. The research sets forth a hypothesis on attracting investment support in the most active Latvian farms. Relationships between the activity of agricultural production and the attraction of investment support in Latvian regions are identified applying the method of cluster analysis to verify the hypothesis.
Key words: investment support, clusters, activity of agricultural production.

Introduction

The EU Common Agricultural Policy (CAP) shapes a framework for agricultural and rural development measures in the EU member states. Historically, the introduction of investment support was determined by the formation of structural policy within the EU CAP. Initially, physical capital support for farms and related industries was in the centre of attention to increase production efficiency and productivity. Nowadays, investments in human capital, technological modernisation and restructuring of production, reduction of production costs, introduction of new and innovative techniques, and quality in the food chain are emphasised among structural activities.

The purpose of investment support is to promote investments in the agricultural industry to increase the sector's competitiveness. The use of investment support has been analysed by several researchers (Saktiņa D., Meyers W.H., 2005, Vēveris A., Krieviņa A., 2006, Vēveris A., et al., 2007, Špoģis K., Radžele A., 2007, Upīte I., 2009b) who found that it concentrated in the most economically active regions and farms of Latvia. In Latvia, the funding of investment support is distributed across the regions according to their area of agricultural land. Latvian farms being able to prove their economic viability in accordance with the criteria set in the legislation (the Cabinet Regulations No. 1209) can apply for investment support. Saktiņa D. and Meyers W.H. (2006) believe that the lack of rinciples of territorial differentiation in granting support is the main reason for the unequal distribution of funds.

According to D. Saktiņa (2000b) the differentiation of financial support is one of the main goals in regional classification. Various types of regions, with their potential or problems, are classified by special methods of regional grouping, for instance, agriculturally specialised, industrial, or other ones having a special economic feature. Further, based on the specifics of each type of regions, the government may introduce differential distribution (direct or indirect) of funds or measures according to how critical is a problem to be solved and outline the development nature of each region in a development programme of any industry. According to D. Saktiņa's research, different classifications of rural regions are possible, and each type of rural regions differs in the significance level of achievable goals. Different or even similar goals can be defined in a development strategy of any classified region, however, the priorities of support, which promote development, might be arranged in a different sequence and the planned activities can be financed according to a different distribution of funds. D. Saktiņa regard s the following goals as the main ones:

- to increase the competitiveness of rural territories by boosting investments in the economic development;
- to provide a possibility for rural residents to enjoy the quality of life as much as urban residents do it;
- to preserve and develop the natural environment and cultural heritage;
- to retain the density of population and to prevent residents from moving to towns;
- to raise the income of agricultural enterprises;
- to diversify and create employment possibilities in proportion to jobs lost in agriculture as well as to develop the economic environment comprehensively;
- to shape landscapes, and to preserve the natural and traditional cultural life (Saktiņa D., 2000b).

It is important to identify the main reasons for territorial differentiation in attracting investment support in Latvian agriculture by taking into account the large role of investment support in modernising farms and increasing their performance efficiency. Therefore, the following **hypothesis** was set forth in the research - investment support for increasing the efficiency and competitiveness of farms is attracted by intensive Latvian farms.

The research aim is to identify relationships between the indicators of investment support for

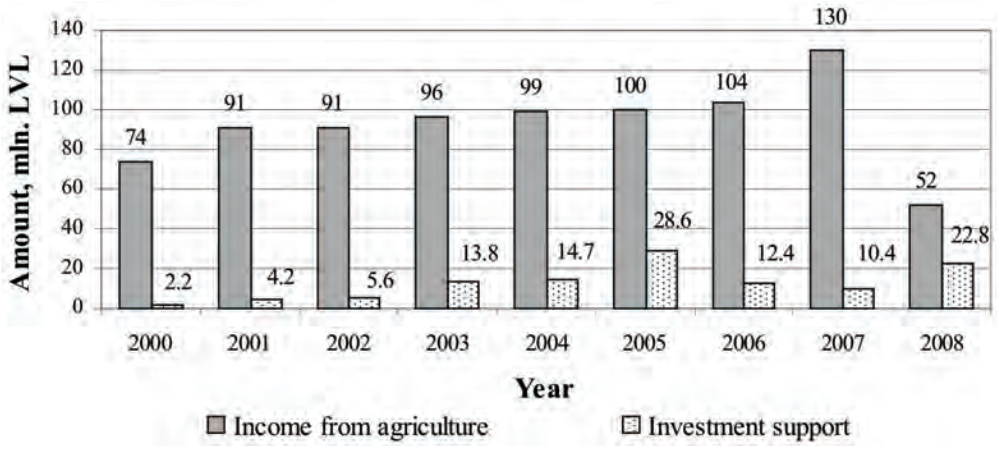
increasing the efficiency and competitiveness of farms (hereinafter – investment support) and those of agricultural production.

The following **research tasks** are set forth in relation to the research aim:

1) to ascertain the role of investment support for increasing the efficiency and competitiveness of farms in Latvian agriculture;
2) to determine the significance of indicators of agricultural production and investment support in characterising the relationships by means of factor analysis;
3) to form clusters for identifying relationships between the indicators of agricultural production and those of investment support in the regions of Latvia through the k-means cluster analysis.

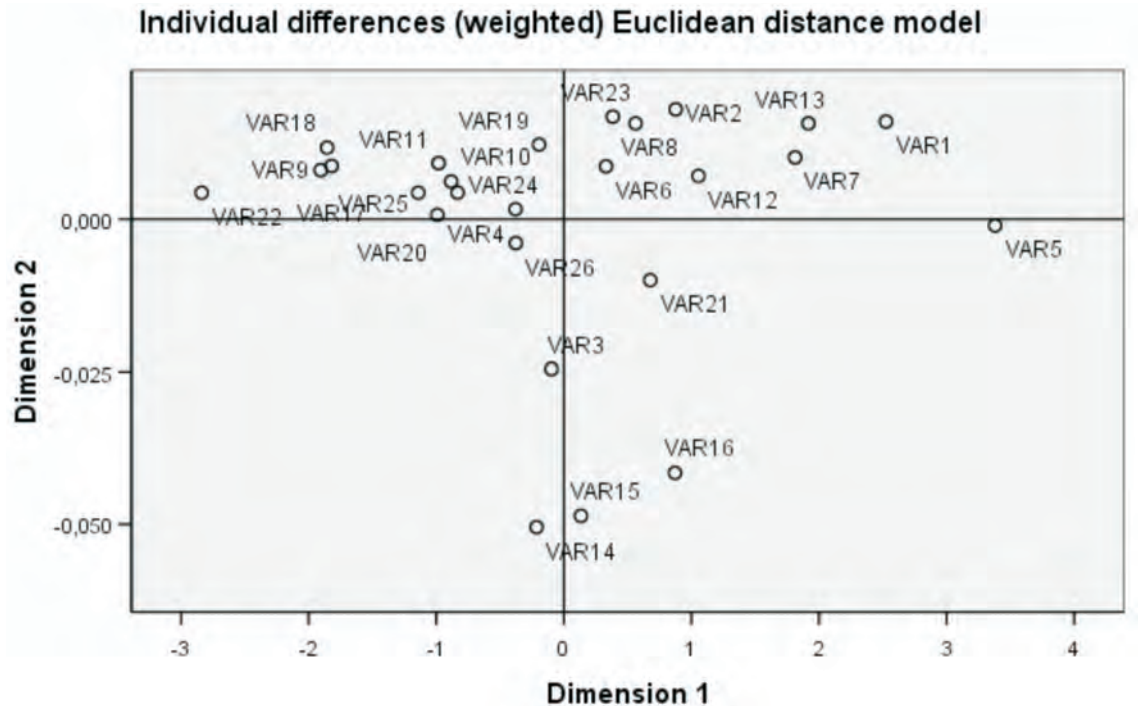
The monographic, inductive and deductive ***methods*** and the ***methods*** of analysis and synthesis were ***applied*** to perform the research tasks.

Cluster analysis was performed to identify the relationships between the intensity of attracting investment support and various indicators of agricultural production. Cluster analysis is a group of research methods, the main and primary purpose



Source: made by the author according to the RSS data

Figure 1. **Farm incomes and the investment support paid for increasing the efficiency and competitiveness of farms in 2000-2008, million LVL**



Source: made by the author according to SPSS package

Figure 2. **Derived configuration of stimuli: a model of Euclidian space**

of which is to categorise the objects and individuals that are researched into subgroups or clusters based on the comparisons of certain parameters. Each object is included only into one cluster. In case of cluster analysis, objects are grouped in a way that objects of one cluster, according to their characteristics, are similar to each other, whereas objects belonging to different clusters are diverse. A positive feature of cluster analysis is the fact that objects are categorised not only by one parameter, but by a group of parameters. Besides, there are no restrictions to objects researched in cluster analysis, which allows studying various random, in practice, data (Rivža B., et al., 1999).

K-means cluster analysis was used in forming clusters where the number of clusters can be defined by the researchers themselves. The task of k-means cluster analysis is to form a k-number of various clusters that have to be different from each other as much as possible. Cluster centres are identified at the first step of algorithm. Objects are divided into clusters according to the following principle: each object is attributed to a cluster, the centre of which has the closest distance to this object. Therefore, all objects are divided into a k-number of clusters. At the next steps, the centres of clusters, which are equal to the average values of coordinates of objects, are calculated again. Objects are regrouped, thus minimising the internal differences of objects and maximising the external differences of objects. New centres of clusters are determined and objects are regrouped until the centres of clusters become stable (Grabusts P., 2006).

Factor analysis was applied to ascertain the significance of the selected indicators in forming clusters. Factor analysis is one of the general methods of statistical analysis, the primary task of which is to define a structure in a data matrix. It is a statistical approach allowing the analysis of interrelations among a lot of variables (indicators) and characterisation of variables in common dimensions (factors). The main goal of it is to transform a large number of original variables (statistical data) into a smaller group of variables, i.e. mixed dimensions or factors, by having a small loss of information (Saktiņa D., 2000b).

Results and discussion

1. The role of investment support in Latvian agriculture

The goals of granting investment support might be various. Upīte I. (2009a) classifies investment support by source of financing, object of financing, and purpose. One of the main types of investment support – support for increasing the efficiency and competitiveness of farms, according to the classification developed by Upīte I., belongs to a group of investment support that is classified by purpose. The large impact of this investment support is proved by the fact that during 2002-2008 in Latvia, 30-40% of all the funds (SAPARD, Structural Funds in 2004-2006, and Rural Development Programme for 2007-2013) allocated for the structural changes in agriculture and fisheries under the support programmes co-financed by the EU were spent on this type of investment support.

Investment support for increasing the efficiency and competitiveness of farms has been granted to Latvian farmers since 1997. In total, Latvian farmers have received more than LVL 126 million for this purpose between 1997 and 2008, of which 65% is the investment support co-financed by the EU. The significance of investment support for increasing the efficiency and competitiveness of farms is proved if compared to the farm income (Figure 1).

The investment support for increasing the efficiency and competitiveness of farms is only one type of support available to farms, and its share in the total agricultural support was only 10.8% in 2000-2008. However, its amount equals to 3% of total income of farms in the year 2000, while in 2008 it reached even 44%. A substantial increase in the share of support in 2008 can be explained by a 60% decrease in the farm income as compared with the year 2007. On average, the amount of investment support in the period of 2000-2008 equals to 15% of farm income, which proves that it has an essential role in increasing the efficiency and competitiveness of farms.

2. Determining the significance of indicators of agricultural production and investment support using factor analysis

Both absolute and relative (per ha of agricultural land in a district) indicators will be used in forming clusters. The absolute indicators characterise the overall situation in a district; whereas the relative indicators, calculated per ha of agricultural land, exclude an impact of quantitative factors and show the objective situation in agricultural production and attracting investment support in a district. Table 1 shows a description of the indicators used in the cluster analysis.

Factor analysis is one of the possibilities to determine the significance of various variables in forming clusters. All the available indicators and the calculations show the possibility to outline four groups of factors explaining 87.5% of the data dispersion (Table 2).

The results of the factor analysis arranged in Table 2 show that the interpretation of these factors is not unambiguous. The groups of factors can be conditionally divided by specialisation in production. The main group characterising 42% of total factorial explanation (87.5%) is related to the grain output, the area of land, and the amount of support received. The second group of factors includes various indicators characterising agriculture, such as the area of agricultural land in districts, the share of agricultural land in total area, and the number of farms. However, the third and the fourth groups characterise the specialisation in producing meat and milk.

The indicators of the first two groups of factors, which explain 62.6% of the data dispersion, can be used for the formation of clusters. The second option is to integrate the most significant parameters from

Table 1

Description of the indicators used in forming clusters

Indicators	Unit of measurement	Description of indicators
Districts	-	Districts according to Latvia's administrative and territorial division till August 2009
Area of agricultural land	ha	Total area of agricultural land in a district, according to the Land Service data of the Republic of Latvia
Share of agricultural land	%	Share of agricultural land in the total area of a district, according to the Land Service data of the Republic of Latvia
Number of farms	units	Number of farms in a district, according to the CSB data
Average area of agricultural land of farms	ha	Average area of agricultural land of farms in a district, according to the CSB data
Market-oriented farms	%	Share of farms selling more than 50% of their produce in the total number of farms in a district, according to the CSB data
Grain produced	thou. t	Quantity of grain produced in a district in the period of 2000-2008, according to the CSB data
Milk produced	thou. t	Quantity of milk produced in a district in the period of 2000-2008, according to the CSB data
Meat produced	thou. t	Quantity of meat produced in a district in the period of 2000-2008, according to the CSB data
EU support received	thou. LVL	Investment support, co-financed by the EU, for increasing the efficiency and competitiveness of farms, which is received in a district in the period of 2000-2008, according to the RSS data on projects
Subsidies received	thou. LVL	National investment support subsidies received in a district in the period of 2000-2008, according to the RSS data
Grain per 1 ha of agricultural land	t ha^{-1}	Quantity of grain produced in a district in the period of 2000-2008, according to the CSB data, calculated per ha of agricultural land of a district
Milk per 1 ha of agricultural land	t ha^{-1}	Quantity of milk produced in a district in the period of 2000-2008, according to the CSB data, calculated per ha of agricultural land of a district
Meat per 1 ha of agricultural land	t ha^{-1}	Quantity of meat produced in a district in the period of 2000-2008, according to the CSB data, calculated per ha of agricultural land of a district
EU support per 1 ha of agricultural land	LVL ha^{-1}	Investment support, co-financed by the EU, received in a district in the period of 2000-2008, calculated per ha of agricultural land of a district
Subsidies per 1 ha of agricultural land	LVL ha^{-1}	National investment support subsidies received in a district in the period of 2000-2008, calculated per ha of agricultural land of a district

Source: estimated by the author according to the data of the CSB and the RSS

all the four groups. In general, the results of factor analysis show that all the selected indicators are sufficiently significant and they can be used in the further analysis.

3. Results of the cluster analysis

The approach of multidimensional scaling can be applied to predict the number of possible clusters (Figure 1). Multidimensional scaling deals with instances mapped in a multidimensional Euclidian space (in this case – two dimensional), thus offering a visual guide in data dimensions, which is based on differences and inequalities of the data.

The districts are marked in "VAR" in Figure 2. Particular clusters do not explicitly emerge, except for instances No. 14, 15, and 16 (Jelgava, Dobele, and Bauska) as well as No. 3 and No. 21 (Saldus and Tukums). One can conclude from such a configuration that the number of clusters obtained from the data is obviously random.

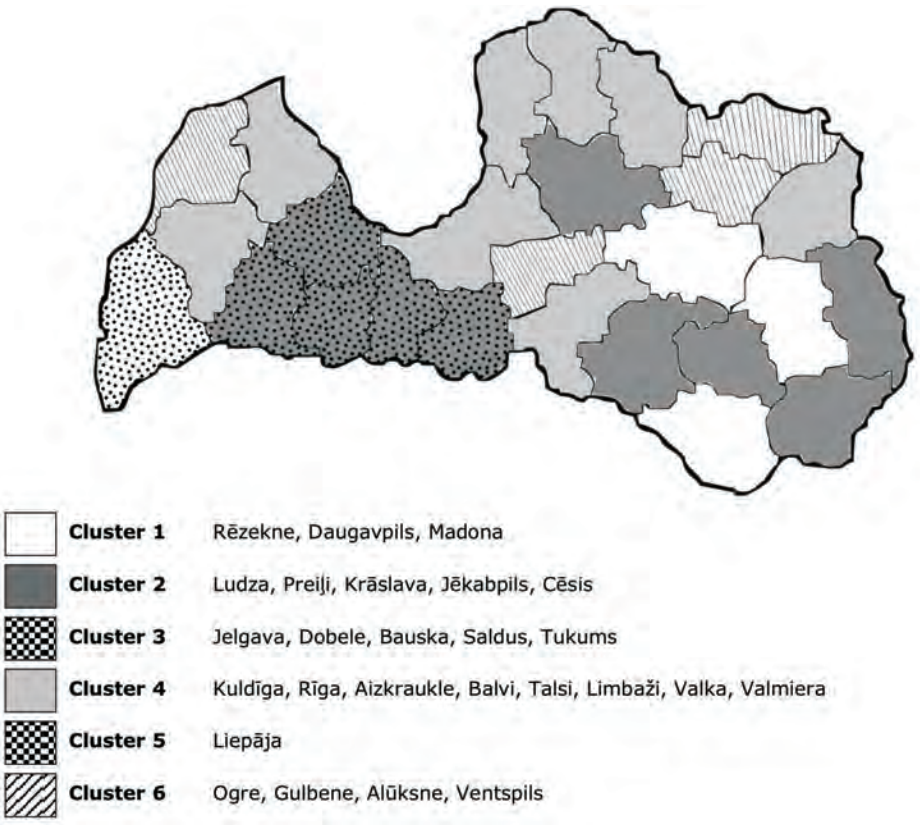
K-means cluster analysis was used in forming clusters where the number of clusters can be defined by the researchers themselves. A model of six clusters was admitted as the most optimal one, the results of which are presented in Table 3.

Table 2

Rotated Component Matrix

Indicators	Factorial burden of components			
	1	2	3	4
Share of factorial explanation, %	42.0	20.6	13.8	11.1
Districts	0.136	-0.680	-0.145	0.281
Area of agricultural land	0.076	0.919	-0.014	0.057
Share of agricultural land	0.601	0.662	-0.169	-0.047
Number of farms	-0.266	0.894	0.109	0.062
Average area of agricultural land of farms	0.719	-0.332	-0.290	0.133
Market-oriented farms	0.630	0.000	-0.137	-0.536
Grain produced	0.972	0.173	0.031	-0.040
Milk produced	0.202	0.566	-0.052	0.756
Meat produced	0.176	0.154	0.954	-0.031
EU support received	0.873	0.091	0.370	0.160
Subsidies received	0.942	0.062	0.188	0.149
Grain per 1 ha of agricultural land	0.980	0.006	0.016	-0.045
Milk per 1 ha of agricultural land	0.154	-0.304	-0.018	0.878
Meat per 1 ha of agricultural land	0.116	-0.018	0.982	0.008
EU support per 1 ha of agricultural land	0.828	-0.235	0.418	0.172
Subsidies per 1 ha of agricultural land	0.875	-0.289	0.195	0.131

Source: made by the author according to SPSS package *(Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations)*



Source: researched and made by the author

Figure 3. **Territorial location of clusters in Latvia**

The districts were rated as follows due to the comparison of indicators of agricultural production and those of investment support:

- *Group 1*: defined as ***very good*** – districts of Cluster 3 (5 districts);
- *Group 2*: defined as ***good*** – districts of Cluster 4 (8 districts);
- *Group 3*: defined as ***average*** – districts of Cluster 6 (4 districts);
- *Group 4*: defined as ***poor*** – districts of Clusters 1 and 2 (8 districts);
- *Group 5*: defined as ***extreme*** – Cluster 5 (1 district).

The best results are observed for the districts of Cluster 3, which is located in Central Latvia and includes the most appropriate agricultural land for grain farming. An extensive specialisation in grain farming is characteristic of these districts, and they have attracted, on average, twice as large support both in absolute figures and if calculated per ha of agricultural land as compared with the other districts.

High values of the indicators of agricultural production and investment support are characteristic of the districts of Cluster 4. The districts of Cluster 4 have no extensive specialisation in production.

The lowest intensity of attracting investment support and the smallest agricultural output per ha of agricultural land is characteristic of the districts of Clusters 1 and 2. If analysed by specialisation, dairy farming dominates in the districts of these clusters. The values of the indicators of agricultural production and investment support per ha of agricultural land are very similar for the districts of both clusters. One can conclude that the districts of various clusters are grouped by differences in formal features (area, and number of farms).

The districts of Cluster 6 in which the smallest absolute amounts of support are attracted and the smallest absolute quantities of agricultural products are produced cannot be evaluated unambiguously.

Table 3

Cluster centres determined by using k-means analysis with six clusters

Indicators	Clusters					
	1	2	3	4	5	6
Districts included in a cluster	Rēzekne Daugavpils Madona	Ludza Preiļi Krāslava Jēkabpils Cēsis	Saldus Jelgava Dobele Bauska Tukums	Kuldīga Rīga Aizkraukle Balvi Talsi Limbaži Valka Valmiera	Liepāja	Ogre Gulbene Alūksne Ventspils
Area of agricultural land	125068	103256	97702	82638	144642	61740
Share of agricultural land	43.9	41.5	51.3	32.2	40.3	30.1
Number of farms	7495	5281	3676	3696	5721	2706
Average area of agricultural land of farms	13.9	15.1	23.9	18.0	19.4	17.7
Market-oriented farms	24	25	28	25	27	25
Grain produced	224.47	170.00	882.89	242.73	510.30	122.46
Milk produced	353.88	287.11	317.75	263.82	383.15	194.84
Meat produced	19.44	24.27	32.72	29.03	42.53	9.61
EU support received	8509.83	7305.73	20518.63	11264.23	16229.13	6195.04
Subsidies received	861.63	750.25	1995.18	985.84	1284.95	682.97
Grain per 1 ha of agricultural land	1.80	1.64	9.12	2.93	3.53	2.04
Milk per 1 ha of agricultural land	2.83	2.80	3.27	3.21	2.65	3.14
Meat per 1 ha of agricultural land	0.16	0.23	0.33	0.36	0.29	0.16
EU support per 1 ha of agricultural land	68	71	210	137	112	101
Subsidies per 1 ha of agricultural land	6.93	7.32	20.64	11.98	8.90	11.35

Source: author's calculations using SPSS package

Table 4

Advisable support measures for agricultural and rural development in the districts of various clusters in Latvia

Cluster	Districts included in a cluster	Advisable support measures for agricultural and rural development
Cluster 3	Saldus, Jelgava, Dobele, Bauska, Tukums	Support measures for developing agricultural production are regarded as priorities
Cluster 4	Kuldīga, Rīga, Aizkraukle, Balvi, Talsi, Limbaži, Valka, Valmiera	
Cluster 6	Ogre, Gulbene, Alūksne, Ventspils	Along with support for agricultural production, significant attention has to be paid to diversifying the rural economy, afforestation, increasing economic activity in a region, thus creating new jobs in other industries
Clusters 1, 2, and 5	Rēzekne, Daugavpils, Madona, Ludza, Preiļi, Krāslava, Jēkabpils, Cēsis, Liepāja	

Source: made by the author

However, the intensities of production and attraction of support are quite high in these districts – the indicators of production and undertaking of support per ha of agricultural land prove it. These districts are located between the districts of the best clusters.

Classifications of Latvia's territory into agricultural districts have been carried out by several researchers (Saktiņa D., 2000b, Boruks A., a.o., 2000, Boruks A., 2004). Based on various formal and economic indicators characterising agricultural production, all the researchers have distinguished the territories as follows: the region of Pierīga, areas favourable for agriculture, average rural areas, and less favourable areas for agriculture. The results of cluster analysis reveal similar trends in attracting investment support. Therefore, the following support measures are advisable to promote agricultural and rural development based on adequate indicators characterising the intensity of agricultural production and that of attracting investment support (Table 4).

The districts of Cluster 3 and 4 include the most appropriate lands for agricultural production. Therefore, it is of great importance to maintain agricultural activity in these territories by such agricultural support measures as investment support, premature retirement, and support for new farmers. According to Saktiņa D. (2000a), the main attention has to be paid to supporting the specialisation and capitalisation of farms in these districts.

Agriculture plays an essential role in the districts of Clusters 1, 2, 5, and 6. However, in these regions, a much larger attention has to be paid to tackling problems of low income farms by appropriate policy measures. Therefore, various compensatory payments, support measures for diversifying the rural economy and for afforestation are of great importance in these territories.

Conclusions and recommendations

1. Investment support plays a significant role in developing Latvian farms. Investment support for increasing the efficiency and competitiveness of farms has accounted for 3-44% of total income of Latvian farms between 2000 and 2008.
2. The grouping of indicators of agricultural production and investment support, using cluster analysis, indicates strong positive relationships between the intensity of agricultural production and the attraction of investment support.
3. The highest values of indicators of agricultural production and investment support are observed in Latvia's central districts specialising in grain farming – Jelgava, Dobele, Bauska, Saldus, and Tukums.
4. It is advisable to outline two main approaches for territorial differentiation in granting investment support based on the results of cluster analysis regarding analogous indicators of agricultural production and investment support:
   - investment support for increasing the efficiency and competitiveness of farms (districts of Clusters 3 and 4);
   - increasing economic activity in other industries (districts of Clusters 1, 2, 5, and 6).

Bibliography

1. Boruks A. (2004) *Dabas apstākļi un to ietekme uz agrovidi Latvijā.* Rīga: LR VZD Poligrāfijas daļa. 166 lpp.
2. Boruks A., Krūzmētra M., Rivža B., Rivža P., Stokmane I. (2000) *Dabas un sociāli ekonomisko apstākļu mijiedarbība un ietekme uz Latvijas lauku attīstību*. Jelgava: ŪZZI tipogrāfija. 169 lpp.
3. Grabusts P. (2006) *Nosacīto likumu veidošanas metožu izpēte un izstrādāšana uz daudzdimensiju datu izlases pamata.* RTU: Datorzinātnes un informācijas tehnoloģijas fakultāte, Informācijas tehnoloģijas institūts. Promocijas darba kopsavilkums. Available at: http://www3.acadlib.lv/greydoc/Grabusta_disertacija/Grabusts_lat.doc. Access: 15 July, 2009.
4. Kārtība, kādā piešķir valsts un Eiropas Savienības atbalstu atklātu projektu iesniegumu

konkursu veidā pasākumam "Lauku saimniecību modernizācija": MK 2009.gada 20.oktobra noteikumi Nr.1209. *Latvijas Vēstnesis,* Nr. 170 (4156), 27.oktobris.
5. *Lauku atbalsta dienesta 2000.gada publiskais pārskats* (2001). LR ZM: LAD. 45 lpp.
6. *Lauku atbalsta dienesta 2001.gada publiskais pārskats* (2002). LR ZM: LAD. 41 lpp.
7. *Lauku atbalsta dienesta 2002.gada publiskais pārskats* (2003). LR ZM: LAD. 43 lpp.
8. *Lauku atbalsta dienesta 2003.gada publiskais pārskats* (2004). LR ZM: LAD. 39 lpp.
9. *Lauku atbalsta dienesta 2004.gada publiskais pārskats* (2005). LR ZM: LAD. 40 lpp.
10. *Lauku atbalsta dienesta 2005.gada publiskais pārskats* (2006). LR ZM: LAD. 36 lpp.
11. *Lauku atbalsta dienesta 2006.gada publiskais pārskats* (2007). LR ZM: LAD. 37 lpp
12. *Lauku atbalsta dienesta 2007.gada publiskais pārskats* (2008). LR ZM: LAD. 33 lpp.
13. *Lauku saimniecības Latvijā 2000.gadā* (2001). Rīga: LR CSP. 80 lpp.
14. *Lauku saimniecības Latvijā 2002.gadā* (2003). Rīga: LR CSP. 79 lpp.
15. *Lauku saimniecības Latvijā 2003.gadā* (2004). Rīga: LR CSP. 40 lpp.
16. *Lauku saimniecības Latvijā 2004.gadā* (2005). Rīga: LR CSP. 36 lpp.
17. *Lauku saimniecības Latvijā 2005.gadā* (2006). Rīga: LR CSP. 36 lpp.
18. *Lauku saimniecības Latvijā 2006.gadā* (2007). Rīga: LR CSP. 44 lpp.
19. *Lauku saimniecības Latvijā 2007.gadā* (2008). Rīga: LR CSP. 48 lpp.
20. Rivža B., Rivža P., Krūzmētra M., Ramute L. (1999) *Valsts administratīvi reģionālais iedalījums: problēmas, metodes, risinājumi.* Jelgava: LLU. BO SIA Zinātņu Akadēmijas Ekonomikas institūts. 116 lpp.
21. Saktiņa D. (2000a) *Eiropas Savienības Strukturālo fondu izmantošanas iespējas Latvijas lauku attīstībā.* Promocijas darbs. Jelgava: LLU. 193 lpp.
22. Saktiņa D. (2000b) *Latvijas lauku teritorijas klasifikācija.* Centrālās un Austrumeiropas agrārās attīstības institūts. Rīga: LVAEI. 52 lpp.
23. Saktiņa D., Meyers W.H. (2005). *Eiropas Savienības līdzfinansētās un nacionālās lauku atbalsta programmas Latvijā: gatavojoties jaunajam programmēšanas periodam*, Rīga: SIA Jelgavas tipogrāfija. 248 lpp.
24. Saktiņa D., Meyers W. H. (2006) Targeting the Disadvantaged: Can We Learn from Latvian Rural Development Experience? Proceedings of the International Scientific Conference *"Žemes Ūkio Mokslai".* Vilnius: Lietuvos mokslų akademija. Vol. No. 1, pp. 115–121.
25. Špoģis K., Radžele A. (2007). Subsidēšanas un darba ražīguma sakarības lauksaimniecības uzņēmumos Latvijā. *Economic Science for Rural Development*, Vol. No. 14, pp. 13-18.
26. Upīte I. (2009a) Investment Support for Agricultural Development in Latvia. Proceedings of the 2nd Jonas Pranas Aleksa International Science Conference *"Vision of the Modern Village"*, Siauliai, Lithuania, September 25, 2009 *(iespiešanā).*
27. Upīte I. (2009b) Results of Introducing Investment Support Measures under Programmes Co-financed by the EU in Latvia. *Rural Development 2009: Transition toward Sustainability*. Lithuanian University of Agriculture, Kaunas, Volume 4, Book 1, p.286-291.
28. Vēveris A., Krieviņa A. (2006). Lauksaimniecības sektora attīstības rezultāti 2004.gadā un tendences 2005.gadā. Ko saka LEK? *Latvijas lauksaimniecība, lauki un pārtika – ekonomikas attīstības procesi*, publikācijas 11.krājums, Rīga: LVAEI, 17.-28. lpp.
29. Vēveris A., Leimane I., Krieviņa A. (2007). Efficiency Analysis of Agricultural Sector in Latvia Compared with Other EU Member States, Based on FADN Data. *Economic Science for Rural Development*, Vol. No 12, pp. 13-19.

Innovation Coordination - its Inferred Implication on Technology Diffusion and Business Cycles

Jānis Krūmiņš
MBA, lecturer
University of Latvia

Abstract. The issues discussed in the paper originally stemmed from the author's earlier research of innovations coordination in the area of mobile web applications development where, several intrinsic peculiarities were revealed and investigated in concordance with both classic and contemporary innovation theories, importance of coordination of innovations was substantiated and the methodology of coordination of innovations developed considering the development of the mobile web applications as a plexus of interrelated innovation processes. The aim of the present study is to explore the applicability of the methodology of coordination of innovations beyond its initial scope. For this purpose the potential gains resulted from the coordination of innovations are evaluated and compared with the duration of the initial, latency phase of diffusion for several widely used important technologies. The obtained results demonstrate a crucial role of the coordination of innovations for acceleration of the diffusion of innovations in high tech areas. In order to determine the scope of coordination of innovations in a broad range of technologies, particularly in conventional areas of economy and its role among other measures aimed towards facilitation of innovations a classification based on evolution speed, interdependency level, and competition characteristics of particular areas of technology is offered.
In the light of theories of economic cycles the research results demonstrate substantial ability of coordination of innovations to soften down cyclic economic slumps due to the acceleration of important innovative processes facilitating the reorganisation of the production and economy.
Key words: innovation management, innovation coordination, diffusion of innovations, technology diffusion, business cycles.

Introduction

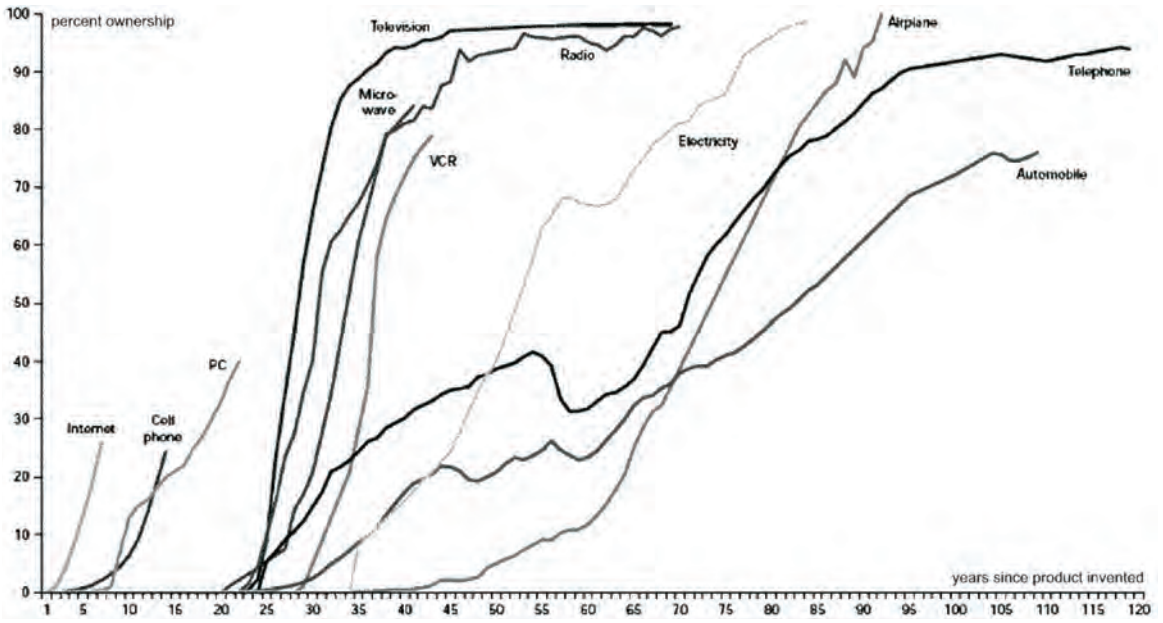
The aim of the study was to investigate ways of fostering innovations ranging from isolated ones in traditional sectors of economy to sophisticated interdependent developments in new high tech, highly competitive industries by means of coordination of interrelated innovation activities involved in the joint process. For this purpose the methodology of a product's life cycle analysis developed within the theories of diffusion of technologies was applied with special attention to the initial, latent phase of the new technology development. The research tasks include categorisation of the technologies considered based on the evaluation of both their level of interdependency and the competitive conditions in the respective sector of industry. Simultaneously various means proposed by contemporary innovation theories and policies, and aimed to boost innovations are considered and their relevancy to the respective categories of technologies are evaluated in the research.

Innovation coordination is a new branch of innovation management theory emerging and experiencing fast development in recent years. Coordination of innovations in high tech areas of economy characterised by simultaneously fast development, sophisticated plexus of many interdependent enabling and resulting technologies and products, multistage design processes of new products and, at the same time, fierce competition between rival companies helps foster the diffusion of technology at the early stages of adoption by means of facilitating the suitability and usability qualities of the resulting innovative product and shortening the delays in its development entailed by inadequacy of the new product with its environment - other, enabling technologies and products at the moment when it attain the majority of users.

The issues discussed in the paper originally stemmed from the author's earlier research of coordination of innovations in the area of mobile web applications development. Despite high expectations, mobile web so far has shown slow acceptance. Initial study of the area sized up the situation and causes of the adversity.

Mobile phones and the WWW both are undoubted technology leaders today. According to the results of the poll conducted in honour of the 25th anniversary of the CNN by the Lemelson-MIT Program and CNN (Top 25, 2005), the WWW was the most influential invention during the past 25 years and the mobile phone was the second. It may be inferred that the mobile web combining the features and capabilities of the previous two would gain even more influence and popularity. However, the reality appears sharply different. The available mobile web usage statistics indicates still a very modest popularity of the mobile web after more than 10 years from its emergence.

According to the Mobile Technology Weblog (2007) in the US there were 30 million of mobile web users in 2007, at the same time the number of desktop web users has reached 176 million or almost 6 times more.



Source: Federal Reserve Bank of Dallas, 1996

Figure 1. **The spread of products in American households**

In the UK at the same time there were 5.7 million of mobile web users versus 30 millions of desktop web users. Japan's data presented by Cameron Moll (Moll, 2007) were more optimistic – 53.6 million of mobile web users versus 53.7 million of desktop web users, however, only 12.6% of mobile web users were satisfied with service, those unsatisfied equalling to 52.1%. The range of widespread mobile applications consists of very few popular applications – e-mail, the news, search engines, and blogs.

Considerable growth of mobile web usage has begun in 2008. According to the TechWorld data (Betts, 2008), the intensity of mobile data flow in November, 2008 has increased by 463% in comparison with November, 2007. However, the increase in the number of mobile web users and applications failed to follow. According to M. Kleppmann's data (Klepmann, 2008), in the UK there were 47 million of mobile phone users in 2008, of which 75% were those not interested in technology, only 3 million of users from this group were also mobile web users. Amidst those interested in technology (25% of all mobile phone users) the proportion was considerably better – 4.4 million of mobile phone users or 23% use also the mobile web.

In other countries the situation appears to be even worse. Nielsen Mobile provides reports (Critical Mass, 2008) on mobile web usage in Quarter 1, 2008. In the US the number of mobile web users were 15.5% of total users of mobile phone, in the UK – 12.9%, Italy – 11.9%, Russia – 11.2%, Spain – 10.8%, Thailand – 10.0%, France – 9.6%, Germany – 7.4%, China – 6.8%, the Philippines – 3.4%, Singapoure – 3.0%, Brazil – 2.8%, Taiwan – 1.9%, India – 1.8%, New Zeeland – 1.8%, and Indonesia – 1.1%.

The most popular mobile web application in the US as for May, 2008 was YAHOO! Mail followed by Google Search, Weather Channel, and Google Maps, while various other e-mails, maps, news services, search engines from various other companies were at the bottom of the list (MSN Hotmail, Gmail, ESPN, AOL E-mail, MapQuest, YAHOO! Search, CNN News) (Critical Mass, 2008), (Siegler, 2008).

The above-mentioned exemplifies the current situation in the mobile web – scanty number of users and modest number of commonplace applications. Lower interest in mobile web only partially may be explained by the lack of necessary knowledge and skills among mobile phone users. The mobile device in comparison with desktop or notebook computers is nevertheless quite cumbersome in use, with small screen, humble data input and navigation capabilities. The development of mobile web application is more laborious and development expenses may exceed those of desktop web application several times, thus explaining developers' interest mainly in mass applications ensuring greater revenues (Krumins, 2005a). Of course, it does not foster interest about the mobile web among mobile phone users.

However, the present situation in mobile web may not be characterised as extraordinary. Studies of diffusion of technologies demonstrate a substantial initial period of latency for a variety of widespread important technologies – see technology diffusion curves for household products on Figure 1 (Federal Reserve Bank of Dallas, 1996).

The duration of latency as it may be seen in Figure 1 shows a substantial diversity for different products and technologies. One popular explanation of the phenomenon is that with the evolution of economy it takes less and less time for new products to spread into the population (Federal Reserve Bank of Dallas, 1996).

Table 1

Spread of products to a quarter of the population

Product	Year invented	Years to spread
Electricity	1873	46
Telephone	1876	35
Automobile	1886	55
Airplane	1903	64
Radio	1906	22
Television	1926	26
Video cassette recorder	1952	34
Microwave oven	1953	30
Personal computer	1975	16
Cellular phone	1983	13
Internet	1991	7

Source: Federal Reserve Bank of Dallas, 1996

The actual data however not always support the assumption. There are many examples on the contrary – nanotechnologies, quantum computers, artificial intelligence, human language translation, and the semantic web among them.

At the same time it may be noticed in Figure 1 that several S-curves of technology diffusion namely those for PC, cell phones, and the Internet stay markedly separated from all the others. Possible explanation of this phenomenon is the convergence of technologies (Figure 2).

However, as the existing mobile web usage statistics clearly indicates the effect of the convergence failed in the case of the mobile web.

As it is quite common also in many other high technology areas, the development of mobile technologies and devices is going on often irrespective of operating systems and applications software, even fostered by different companies and groups of developers not familiar with each other's work in progress so long as the final results are released (Krumins, 2005a). The features of mobile devices are defined usually by the level of technological capabilities currently achieved as well as manufacturing expediency considerations. On the contrary, applications development is based usually on features of devices currently achieved, at best there are some short – term forecasts carried out - usually a time series analysis and extrapolation. If the application's requirements do not comply with the existing features of devices, the development does not start at all no matter how necessary and useful it would be. Application development takes time during which device features evolve substantially, resulting in dull application not utilising all the capabilities provided by the device. The changes in user's needs and preferences defined apparently by evolving technological environment, i.e. other similar applications as well as dynamics of the new product's acceptance also are not

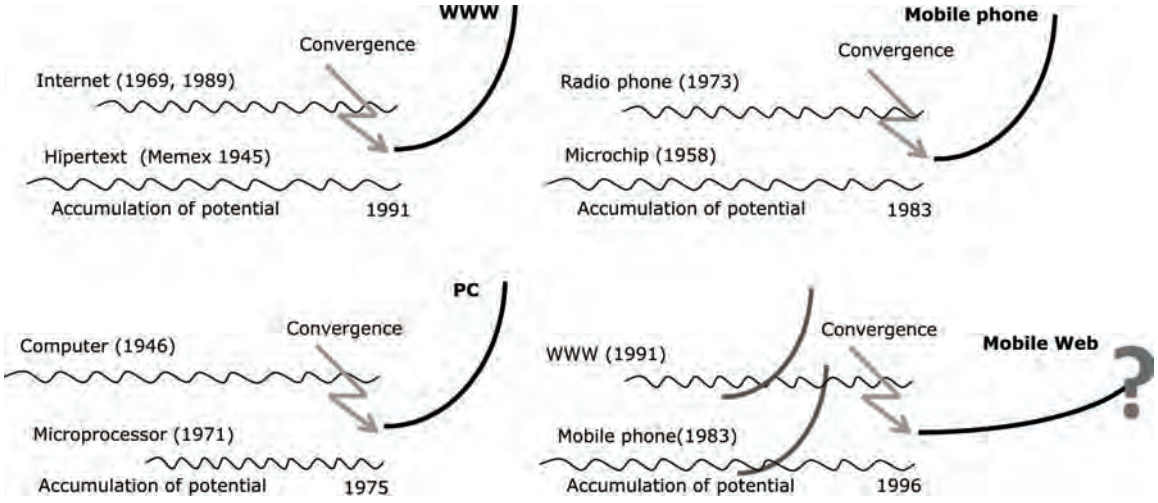


Figure 2. **Effect of convergence of technologies**

considered at all in most cases. The paradox there is: while manufacturers invest enormously in new technology development, the new features of mobile devices are left unused. On the contrary, users buy fashionable and expensive mobile phones with great computing capabilities, yet they are using them only for conversations, since no appropriate applications are arrived as well as people are not ready for such a substantial life style changes yet. As a consequence the resulting pace of development of both underlying technology and its applications is unbearably slow; often a potentially successful and important project is crushed by some alternative developing faster. A number of mobile web users remain relatively small, which means inter alias insufficient revenues and restraints of IT companies from the development of new mobile web applications, creating therefore "vicious circle" and stagnation of the whole mobile web industry.

Practical measures intended to overcome the above-mentioned adversity in the mobile applications development (Krumins, 2009a) are guided towards harmonisation of application features with the capabilities of devices at the time when the planned application reaches a majority of its users. Although several studies devoted to the management of innovations in recent years begin to show up interest in coordination issues (Thomassen, 2000; Tilson et al., 2006; Hamdouch et al., 2008; Ortt and van der Duin, 2008), these studies are devoted mostly to the mature industries and services and main concern there usually is a timing of innovative activities in a manner very much alike that in the conventional Project management. In contradistinction to that, for the purpose of stated here harmonisation of features of application with capabilities of underlying device another approach – a coordination in the space of features and characteristics at a given moment would be more suitable (Krumins, 2009a). Also a closer examination of mobile web applications development unveils specific issues of this relatively new area marking a distinction from mature industries usually considered in recent innovation studies. From here a following guess arises – is the case of mobile web applications development an unique exception or are there other (possibly – many) emerging technologies following the same rules in their development and facing similar issues? Positive answer to this question may mean a substantial macroeconomic impact due to a significant potential possessed for acceleration of the diffusion of innovations in the areas of those emerging technologies.

1. Coordination of innovations in particular high tech area - the mobile web applications development

Most of both classical (Schumpeter, 1934; Schumpeter, 1942; Drucker, 2006) and contemporary (Landry et al., 2000; Lengrand and Chatrie, 1999; (Lundvall, 1988; Lundvall, 1995; Dodgson and Bessant, 1996; Dodgson, 2000) innovation theories implicitly consider innovation as an isolated act accomplished by individual inventor or entrepreneur in statical (invariable in the course of time) technical, technological, informational, and social environment generally known throughout the community.

However, innovation processes in many high tech areas, particularly in mobile web and its applications development fail to follow those assumptions. Here several important factors substantially affecting the development of the mobile web applications have to be noted:

1. The cooperative nature of cellular networks' resources usage for both voice and data communications. Components of the mobile device essential for the mobile web, namely, the screen, keyboard, processor, and memory were conceived well before the advent of the mobile web itself and were devised actually to enable efficient and convenient voice communications (Krumins, 2005a). Along with components of the user device the mobile web shares with voice communications also all the other equipment and software constituting the cellular network. More yet, the GPRS widely used for data transmission was conceived originally as a measure enhancing the overall efficiency of time – shared GSM cellular network usage. It was accomplished by utilising of free time slots left unused by voice communications at a particular moment for data transmission purposes. Therefore data transmission in the GPRS essentially is a background process intended to smoothen the peaks of load of the cellular network. The above-mentioned leads to the conclusion that the mobile web has from the very beginning been conceived as an auxiliary service and as a supplement to the already long existing voice communications still retaining the main role in the mobile operators business. This explains although partially the recently observable sluggishness in mobile web development. Apparently, to overcome the obstacles, a special strategy and measures are necessary to develop and introduce in the project's management practice. However, the choice of options at disposal for mobile web applications developer is until recently quite limited and is in most cases preset by capabilities provided by existing mobile devices and cellular networks facilities. The developers of mobile web applications lack the ability to influence directly the evolution processes of cellular networks infrastructure and capabilities of users devices, conventional "top – down" design principles and other approaches of system engineering, and also those of innovation theories based on market push are not quite applicable here. Consequently innovations in the mobile web applications development area have to be considered subordinated anent to the innovations of underlying mobile communication infrastructure.
2. The mobile communications area develops rapidly, new models of both mobile phones and mobile – enabled pocket PCs with improved features and enhanced capabilities emerge almost continuously (GSM Arena homepage). This

process is accompanied by a dramatic increase of data transmission speed over the cellular network. To be successful, mobile application has to conform to the latest technological achievements otherwise it will be given up as outdated. The duration of development and introduction of an application practically cannot be reduced under 6-12 months and 12-36 months respectively. Over such period of time actual features of underlying mobile devices and cellular networks may change substantially. It follows from here that mobile applications development based on characteristics of mobile environment as they were at the start of design is a completely dubious effort, instead an application has to be oriented toward the mobile environment what will be eventually reached when a planned application will attain the majority of its users. Consequently, a coordination of innovations of design with those of environment is necessary premise for mobile application to be successful.

3. Fierce competition among the manufacturers of mobile devices as well as among mobile operators leads to overall secrecy about features of future products and services until those products or services are eventually released to the market. Companies thereby clearly express attitude toward competition instead of collaboration, as a consequence many of proposed efforts intended to facilitate cooperation in the area of innovations - clusters, technological networks etc. turn out to be of no value in this reality.
4. Paying regards to above-mentioned directive coordination of mobile web applications development efforts between different companies and even (because of strong independency tendencies of the departments within the company) different branches of an isolated company seem quite unlikely; thereby the only remaining option for coordination is the methodology of technology forecasting. Of course, considering the speed of development of the mobile communications uncertainty is high and substantial forecasting errors may be expected to occur.
5. Successful development of mobile web applications requires, besides coordination with ambient mobile communications infrastructure, also coordination within the mobile web area itself. It follows from the existence of several intermediate layers between mobile application and both hardware and software of underlying mobile communication system, namely the mobile devices operating system, the browser software installed, features provided by variety of style sheet, mark-up and scripting languages (XHTML, CSS, JavaScript etc.) used in mobile applications development etc. In reality, those interfaces often turn out to be the major pitfalls.

Review of contemporary innovation theories shows quite clearly that the studies of internal structure and behaviour of innovation processes in general and the coordination of innovations in particular is until recently rather deficient (Krumins, 2009a) for all that the overall conception of innovation has evolved significantly over the past forty years.

Although the importance of the cooperation and collaboration between companies involved in the development of high – tech products was acknowledged quite a long time ago (von Hippel, 1988) the causes of seemingly unexpected delays and disorderly development of the high – tech projects occurring quite often were not unveiled and approaches and methods of prevention of such adversities were not proposed.

As follows from the above-mentioned, in the mobile web applications development area the evolution of mobile communication system infrastructure characteristics during both the design and introduction phases of the project has to be taken into account considering at the same time that it is out of reach for the mobile applications developer to exert any significant influence on the course of evolution of the mobile communication's infrastructure or features of future mobile devices. For the mobile application to comply with the capabilities provided by mobile technologies it is necessary to coordinate solutions utilised in any particular mobile application project with characteristics of mobile communication's infrastructure at some moment in the future when the planned application reaches the majority of its intended users and becomes mainstream. For this purpose the designer has:

- to evaluate the duration of design and introduction phases of the project;
- to select a set of characteristics of mobile communication system and mobile devices most essential for the mobile web application design and carry out a forecast of their possible values;
- to choose the most appropriate and efficient project solutions for the ongoing design.

To accomplish the above-mentioned steps it is necessary to ascertain components of the mobile communication system whose characteristics are decisive for the choice of mobile application project solutions as well as actors involved into the design, introduction and operation phases of the project, their intentions, roles and interrelations, i.e. to set up the innovations coordination model aimed at mobile applications development projects. The model has to incorporate:

- characteristics of elements of the cellular network infrastructure – the network hardware, data transmission protocols, installed control software essential for the mobile web;
- characteristics of the mobile users device (i.e. mobile phone, pocket PC etc.) elements essential for the mobile application – screen size, processor speed, memory size, data enter and navigation features etc., characteristics of software installed in the mobile users device – the operating system, browser software, supported mark-up and scripting languages;
- type web technologies exercised in mobile applications projects – Ajax, Comet etc.

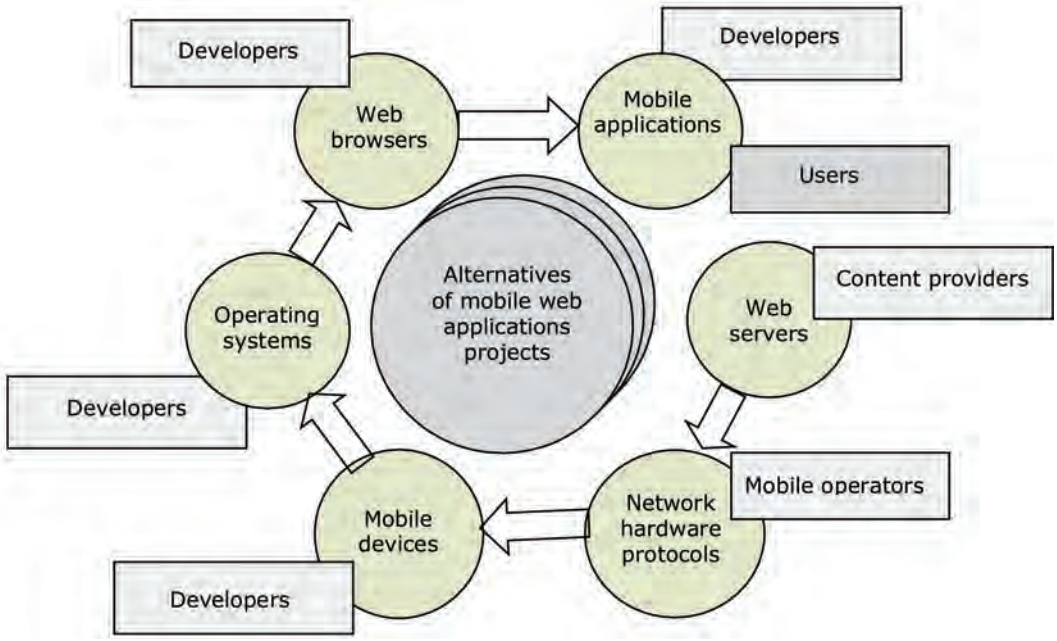


Figure 3. **Innovations coordination model for mobile web applications**

As it was said before, the model has to incorporate also the main actors involved in the development processes of the mobile web:

- manufacturers of the mobile devices;
- mobile operators;
- developers of the mobile software (i.e. operating systems, browsers, etc.);
- developers of mobile applications and providers of mobile content;
- existing and potential users of the mobile web.

All the components included in the innovations coordination model (Figure 3) except one – project solutions have to be considered as given data non-affectable for the developer of the mobile web application, however, it is quite possible to predict their evolution more or less successfully. Thereby the mobile web application developer has to take charge to choose most appropriate project solutions for the application to comply with its mobile environment at the moment in the future when the application reaches the majority of its users.

The analysis of interrelations between the actors and components in the model allows demonstrating and commenting some issues of mobile web application development:

- wide variety of models of mobile users devices with very different features;
- two categories of mobile web applications emerging: 1) the general purpose applications having wide audience equipped with very different mobile devices, the diversity their features does not allow to apply advanced technologies and solutions in this kind of mobile web applications projects, 2) specialised applications oriented toward close circle of users, in most cases equipped with advanced business class mobile devices; thereby ensuring feasibility of advanced project solutions;
- the evolution of features of the mobile device affects the mobile web applications both directly as well as through the features and capabilities of the device's operating system and browser software also determined in their turn by the features of the device;
- the mobile operating system and browser software forms an intermediate layers between the hardware (the device itself) and the mobile web application; thereby they are placed closer to the application and have accordingly greater impact on its features;
- innovations in the areas of operating systems and browser software as well as mobile applications recently have weak and delayed coordination with the evolution of mobile hardware;
- as a result a long chain of determinants of innovations is developing: cellular network equipment and protocols → features of mobile users device → capabilities of mobile operating system → features of browser software → features of mobile application, any link of this chain may cause an substantial delay of innovations;
- users have to get accustomed to the new application and it is yet another cause of delay especially for the general purpose applications;
- before the start of a new application it is necessary to prepare their enabling content – data files, databases etc., this process ensured usually by independent content providers also takes time.

After appropriate identification procedures the model serve as an instrument helping make reasoned choices of mobile applications projects alternatives as well as development of innovations coordination and management procedures.

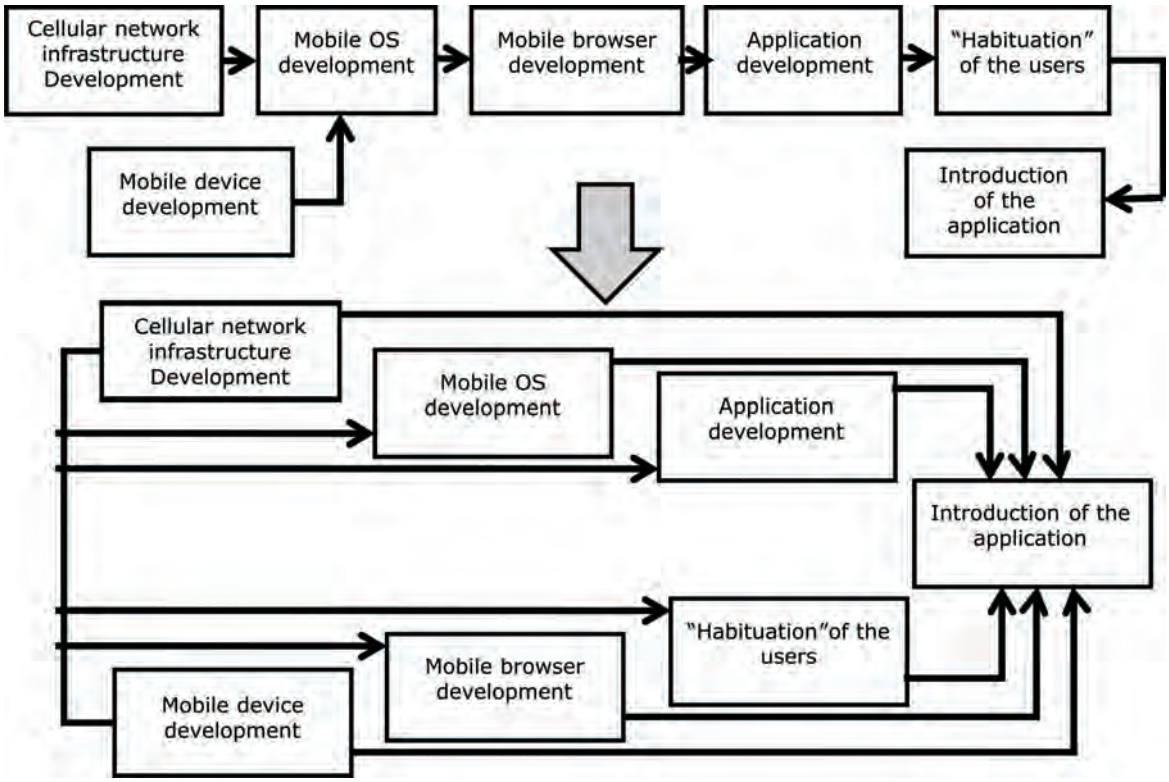


Figure 4. **Switching from sequential to parallel execution of several development and introduction phases of the project as a result of coordination of innovations**

Besides the model, the methodology of coordination of innovations embraces:

- methods of forecasting of the expected duration of development and introduction of the application;
- methods of selection of the essential features and characteristics of mobile infrastructure and devices and forecasting their expected values;
- decision making procedures aimed to ensure the choice of the most appropriate and efficient application project solution (alternative);
- project development revision and managerial practices.

2. Potential gains from the innovation coordination methodology usage

Due to the widely until recently used versioning practice in the software development - a new version of software each year, any improvement in hardware or underlying software will appear on the next stage only after a year. In the case of mobile web applications it takes:

- mobile OS development: 1 year;
- mobile browser development: 1 year;
- mobile application development: 0.5-1.5 years;
- "habituation" of the users: 0.5-1.5 years.

Total: 3-5 years.

Such delay is comparable with duration of the latency period of technology diffusion for many widespread and important technologies (Figure 1). It may be supposed that a subordinated situation similar to that of mobile web takes place for almost every new technology at early stages of its development; therefore the proposed methodology having potential to essentially accelerate innovations may appear to be applicable and useful in a wide range of emerging technologies. Improvement may be achieved in a way of simultaneous execution of several development and introduction phases of the project - Figure 4.

Both classical and contemporary theories of long economic cycles note the phenomenon of emergence of a bunch of innovations at the beginning of the downward phase of retreating cycle (Reati and Toporowski, 2004; Madison, 1991; Sterman, 1985). As it is widely recognised now that the deficit of innovations or substantial delay of their development is among the main causes of economy's downslide and crisis; and therefore proposed coordination of innovations can help ease coming crises.

Conclusions: aspects for broadening of the initial scope of the proposed methodology of coordination of innovations

Summarising the above-mentioned features of mobile web applications development the most affecting the coordination of innovations are as follows:

1) a subordinated role anent to the main infrastructure and enabling technologies,

Table 2

Classification of promotional measures for innovations

Category of innovation	Description	Measures										
		Educational	Financial	Technology parks	Clusters	Collaboration networks	Knowledge transfer	System engineering	Project management	Physical prototyping	Technology forecasting	Innovation coordination
1	Isolated innovation	+	+	+	+	+	+	0	0	+	0	0
2	Dependent on enabling innovations, cooperation	0	0	+	+	+	+	0	+	-	0	+
3	Multiple layers of enabling innovations, cooperation	0	0	+	+	+	+	++	++	-	+	+
4	Same + fast development, competition and secrecy	0	0	-	-	-	-	-	-	-	++	++

very limited ability of developers to influence directly the evolution processes of technological environment;

2) rapid evolution of the environment (enabling technologies), crucial role of coordination of innovations of design with those of environment;
3) highly competitive business environment, secrecy, lack of collaboration between involved parties;
4) directive coordination impossible, methods of technology forecasting have to be applied to ensure coordination;
5) multilevel interdependent enabling technologies, resulting in long chain of determinants of innovations;
6) wide variety of underlying devices with very different features, several categories of potential users;
7) users have to get accustomed to the particular innovative product, which causes delays;
8) certain, often time consuming preparations have to be carried out before the start of a new innovative product usage.

The most extreme case and moving toward more conventional technologies gradual easement of conditions can be considered supposing the mobile web application development. These considerations substantiate a classification of innovations based on evolution speed, interdependency level and competition characteristics of particular area of technology (Table 2):

1. Isolated inventions / innovations, emerging in a relatively stable and generally well known technological and market environment. A broad spectrum of policies and measures aimed at support of SMEs were proposed and successfully applied to foster innovations of this type.
2. Innovations dependent on other, enabling innovations and technologies, and the pace of development and competition both are moderate, not prohibiting the feasibility of cooperation and exchange of knowledge between the companies involved in the process – it is a situation inherent to many conventional technologies and areas of economy and most of the proposed until recently EC and state level innovation policies (European...) and promotional measures – research and development framework programmes, technology parks, clusters, collaboration networks etc. implicitly assume this type of innovations. Approaches of Project management may be appropriate to coordinate the efforts. However, it has to be noted that a physical prototyping often recommended as a measure for acceleration of development would rather hinder it in many cases of this type due to the imminent danger to “freeze” the design at the very beginning of the development inherent to prototyping.
3. Innovations of previous type but with many intermediate layers of enabling technologies – inherent to many high tech areas. Approaches and methods of System engineering supplemented with procedures of coordination of innovations discussed above can be successfully applied here.
4. Innovations in highly competitive, fast evolving areas of new high technologies at early stages of their evolution. Fierce competition prohibits any substantial cooperation and information

exchange. Technology forecasting and innovation coordination methodologies are the main managerial instruments here.

Bibliography

1. Betts, B. (2008). Mobile Web Use Hits an Upward Curve at Last. TechWorld, 23 December, 2008, available at http://www.networkworld.com/news/2008/122308-mobile-web-use-hits-an.html (accessed 11 November 2009).
2. Critical Mass (2008). The Worldwide State of the Mobile Web. Nielsen Mobile, July, 2008. The Nielsen Company, 2008, p. 9, available at http://www.nielsenmobile.com/documents/CriticalMass.pdf (accessed 11 November 2009).
3. Dodgson, M., Bessant, J. (1996). *Effective Innovation Policy: A New Approach*. International Thompson Business Press, London, 1996.
4. Dodgson, M. (2000). *The Management of Technological Innovation: an International and Strategic Approach*. Oxford, Oxford University Press, 2000.
5. Drucker, F. P. (2006). *Innovation and Entrepreneurship*. Collins Business, 2006.
6. Federal Reserve Bank of Dallas. 1996 Annual Report. The Economy at Light Speed. Technology and Growth in the Information Age – and Beyond.
7. GSM Arena homepage, available at: http://www.gsmarena.com (accessed 11 November 2009).
8. Hamdouch, A., Laperche, B., Munier, F. (2008). The Collective Innovation Process and the Need for Dynamic Coordination: General Presentation". - *Journal of Innovation Economics*, Vol. 2, No. 2, 2008, pp. 3-13.
9. Von Hippel, E. (1988). *The Sources of Innovation*. Oxford University Press. New York, 1988.
10. Innovation Management and the Knowledge – Driven Economy. Final Report (2004). European Commission, Directorate – General for Enterprise. Brussels – Luxembourg, 2004, available at ftp://ftp.cordis.lu/pub/innovation-policy/studies/studies_innovation_management_final_report.pdf (accessed 11 November 2009).
11. Kleppmann, M. (2008). Some Mobile Internet Usage Statistics. Yes / No / Cancel Website. February 20th, 2008, available at: http://www.yes-no-cancel.co.uk/2008/02/20/some-mobile-internet-usage-statistics/ (accessed 11 November 2009).
12. Krumins, J. (2005a). Functional Solutions of the Mobile Web and their Potentially Efficient Applications. In: *Proceedings of the University of Latvia*, Vol. 690, Management Science. University of Latvia, Riga, 2005, pp. 365-374.
13. Krumins, J. (2005b). On Mobile Virtual Communities. In: *Proceedings of the International Conference „Expanding Borders: Communities and Identities"*, University of Latvia, Riga, November 9-12, 2005.
14. Krumins, J. (2006a). Mobile Web Applications. *64th Scientific Conference of the University of Latvia, section "Computer Technologies in Entrepreneurship Management"*. University of Latvia, Riga, 2006.
15. Krumins, J. (2006b). Development of the Timetable Centred m – learning Environment. *IST4BALT Workshop: "„Towards a Knowledge Society"*. Riga Technical University, Riga, April 7th, 2006, available at http://www.balticit.com/ist4balt/ppt/Presentations2006/3%20-%20eLearning/Janis_Krumins.ppt (accessed 11 November 2009).
16. Krumins, J. (2009a). The Innovation Coordination Model for Mobile Web Applications' Projects. In: *Proceedings of the University of Latvia*, Vol. 744. Economics and Management Science. University of Latvia, Riga, 2009.
17. Krumins, J. (2009b). The Application of Mobile Web Technology for the Improvement of Passenger Transportation Efficiency. In: L. Bandevica, U. Rozevskis (eds). *Information Society's Social and Legal Problems in Latvia: Proposed Solutions*. University of Latvia, Riga, 2009, pp. 107-126.
18. Landry, R., Amara, N., Lamari, M. (2000). Does Social Capital Determine Innovation? To what Extent? *Paper for the 4th International Conference on Technology Policy and Innovation*, August 28-31, 2000, Curitiba, Brazil.
19. Lengrand, L., Chatrie, I. (1999). *Business Networks and the Knowledge – Driven Economy*. Brussels, European Commission, 1999.
20. Lundvall, B. A. (1988). Innovation as an Interactive Process: From User - producer Interaction to the National System of Innovation. In: Dosi et al. (eds). *Technical Change and Economic Theory*. Pinter Publishers, UK, 1988, pp. 349-369.
21. Lundvall, B. A. (1995). The Social Dimension of Learning Economy. Danish Research Unit for Industrial Dynamics Working Paper No. 96-1, Aalborg University, Denmark, 1995.
22. Madison, A. (1991) *Dynamic forces in capitalist development*. Oxford University Press, 1991.
23. Moll, C. (2007). Mobile Web Usage Nearly Equal PC Web in Japan. 20th September, 2007, available at http://cameronmoll.com/archives/2007/09/mobile_web_usage_nearly_equal_pc_web_in_japan/ (accessed 11 November 2009).
24. Mytelka, K. L., Smith, K. (2001). Innovation Theory and Innovation Policy: bridging the Gap. *DRUID Conference*, Aalborg, June 12-15, 2001.
25. Ortt, R. J., van der Duin, P. A. (2008). The Evolution of Innovation Management towards Contextual Innovation. *European Journal of Innovation Management*, Vol. 11, No 4, 2008, pp. 522-538.
26. Reati, A., Toporowski, J. (2004) An Economic Policy for the Fifth Long Wave". *BNL Quarterly Review*, No. 231, December, 2004, pp. 395-437.
27. Schumpeter, A. J. (1934). *The Theory of Economic Development*. Harvard University Press, Boston, MA, 1934.

28. Schumpeter, A. J. (1942). *Capitalism, Socialism and Democracy*. 6th ed., Unwin paperbacks, London: UK, Boston: MA, 1987, p. 437.
29. Siegler, MG. (2008). Mobile Web Usage Grows, and it's not Led by the iPhone – yet". *VentureBeat DigitalMedia*. July 9th, 2008, available at: http://venturebeat.com/2008/07/09/mobile-web-usage-grows-and-its-not-led-by-the-iphone-yet/ (accessed 11 November 2009).
30. Sterman, J. D. (1985). *The Economic Long Wave: Theory and Evidence*. WP-1656-85. MIT, Cambridge: MA, 1985, p.70.
31. The European Cluster Memorandum. Promoting European Innovation through Clusters: An Agenda for Policy Action. Prepared by the High Level Advisory Group on Clusters, chaired by Senator Pierre Laffite (Center for Strategy and Competitiveness, Stockholm School of Economics, Europe INNOVA Initiative of the European Commission).
32. Thomassen, M. A. (2000). The Interplay between Coordination and Interfirm Innovation Mediated by Standardisation. Danish Building Research Institute - Department of Industrial Economics and Strategy. Copenhagen Business School, Copenhagen, 2000.
33. Tilson, D., Lyytinen, K., Sorensen, C., Liebenau, J. (2006). Coordination of Technology and Diverse Organisational Actors during Service Innovation – the Case of Wireless Data Services in the United Kingdom". *Global Mobility Roundtable*. Helsinki, 2006.
34. Top 25: Innovations (2005). CNN.com, June 19th, 2005, available at http://www.cnn.com/2005/TECH/01/03/cnn25.top25.innovations/ (accessed 11 November 2009).
35. 19% of Web Use is Mobile (2007). The Mobile Technology Weblog. May 15, 2007, available at http://www.mobile-weblog.com/50226711/19_of_web_use_is_mobile.php (accessed 11 November 2009).

Ecological Farming in Poland before and after Joining the European Union

Agnieszka Borowska, PhD
Department of Economics and Economic Policy
Faculty of Economic Sciences
Warsaw University of Life Sciences
Nowoursynowska Street 166 (V / 17)
02-787 Warsaw, Poland
e-mail: Agnieszka_Borowska@ SGGW.PL

Abstract. The article presents economic and legal conditions of ecological farming development in Poland before and after joining the European Union. It shows both positive and negative changes consequential to ecological production. The article highlights strong and weak sides as well as opportunities and threats resulting from ecological farming in Poland in the next few years. The research includes the characteristics of Polish ecological farms with consideration of territorial division of the country. It describes the dynamic changes of number of farms as well as their level and territorial structure. The study provides size of plant production and animal production in ecological farms. Moreover, the report characterises the system of certification and farmland control.
Key words: ecological farming, legal regulations, supervising institutions, direct subsidies.

Introduction

Nowadays organic farming based on natural methods and means of production is generally considered as most friendly to the environment agricultural method. It is laborious and, moreover, it requires much knowledge both on a theoretical and especially practical level but as a balanced production method that avoids agricultural, veterinary, and alimentary chemistry it yields the products of the highest quality and in ever growing demand.

A more developed structure was established in 1989 – Organic Farming Producers' Association ECOLAND[1], which one year later was accepted as a member of the International Federation of Organic Agricultural Methods (IFOAM). It ought to be noticed that at end of the 1980s and the beginning of the 1990s the idea, and thus the development of organic farming was considered by many private and institutional entities as unreal and marginal economic activity. It generated little attention; it was in fact treated with slight and disregard (Sołtysiak U., 1995). The system of certification which was introduced in 1997 has played a very important role in proper and safe functioning of organic farms. Creation of certification organisation which conducts systematic controls has led to the establishment and maintenance of appropriately high standards demanded for organic production.

The process of development of organic farming in Poland has showed many similarities and at many stages of development was concurrent with similar processes in the Western Europe. The present engagement of the state in providing financial support and creating the legal framework for long term development of organic farming gives ground for optimism to all those who are already engaged or about to start their involvement in organic farming activities. Introduction of instruments of budgetary support (Kaltoft P., 1999), such as subsidies, made it possible for farmers to change their production methods from conventional to organic, even if at the beginning they are doing it with much caution.

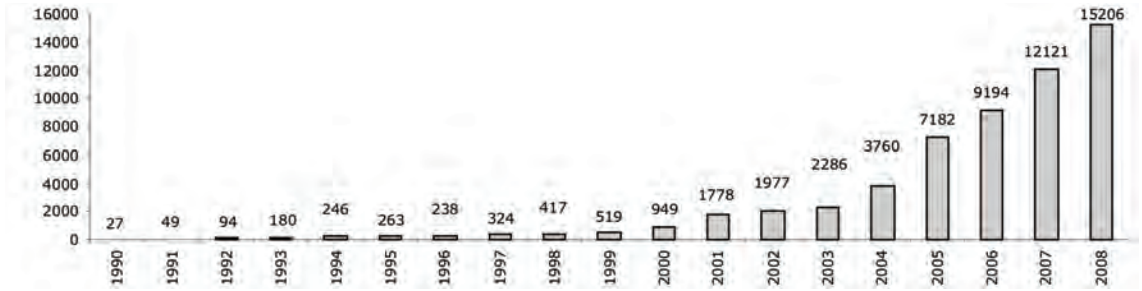
Aim, source materials and methods of analysis

The article attempts at presenting changes taking place in Polish organic farming between 1990 and 2008, with a particular focus on the period following the EU accession. Source materials for the analysis included basic literature on the subject, reports, papers, and expertise from GIHARS, GUS, IFOAM. The author has used descriptive and comparative methods. Calculations have been presented in the form of figures and tables.

Legal regulations concerning organic farming in Poland

Since January 1, 2009 the following new legislation concerning organic forming has become effective: Council Regulation No. 834/2007 of 28 June 2007 on Organic Production and Labelling of Organic Products and repealing THE *Regulation* (EEC) No. 2092/91 and THE Commission Regulation No. 889/2008 **of 5 September 2008 laying down detailed rules for the implementation of the Council Regulation (EC) No. 834/2007 on Organic**

[1] The Association was registered in Poland on September 1, 1989 and was accepted as a member of IFOAM in March 1990



*data from the Central Inspectorate of the Trading Quality of Agricultural and Edible Products – www.gijhar-s.gov.pl, Source: Environment Protection. Information and statistical reports, Warsaw GUS, 2002-2005

Figure 1. **Certified organic farms and organic farms during the period of transition from conventional farming in the period 1990-2008**

Production and Labelling of Organic Products with Regard to Organic Production, Labelling and Control, the Commission Regulation No. 1235/2008 of 8 December 2008 laying down detailed rules for implementation of the Council Regulation (EC) No 834/2007 as regards the arrangements for imports of organic products from the third countries. Also, a new Organic Farming Act of 25 June 2009 has been in force in Poland since 7 August 2009 (Journal of Laws No. 116, Item 975). This Act gives better guaranties to consumers, since actions taken by the producers at each stage of production, preparation and distribution of organic products are subject to control pursuant to the rules stipulated in the Regulation (EC) 882/2004 of the European Parliament and of the Council of 29 April 2004 on Official Controls Performed to Ensure the Verification of Compliance with Feed and Food Law, Animal Health and Animal Welfare Rules.

Control and certification system in organic forming in Poland

The Minister for Agriculture and Rural Development authorises the certification centres to control and issue certificates in respect of organic farming. Moreover, he supervises the body called Agri-Food Articles Commercial Quality Inspection, which supervises certification centres and organic production. Other supervisory institutions in respect of organic agriculture include: Commercial Inspection (in the scope of retail trade in the products, referred to in Art. 1(2)(a) or (B) of Council Regulation 834/2007), Veterinary Inspection (in the scope of products, referred to in Article 1(2)(c) of the above mentioned Regulation), State Inspection of Plant Protection and Seed Industry (Article 1(2)(d) of the above mentioned Regulation), certification centres accredited in the scope of organic farming pursuant to the standard EN 45011 or ISO 65 Manual.

The development of organic farming in Poland

The number of organic farms had increased in the period 1990-2005. Yet during the years 1995-1996 there was an opposite trend due to the lack of state financial support for organic farming and general lack of profitability caused by high costs of production in comparison with conventional farming methods, especially during the time of transformation from conventional to organic farming.

The subsidies proved to be an effective instrument stimulating the development of organic farming in Poland. Since the introduction of subsidies in 1999 farmers' interest in production based on ecological principles has clearly increased due to the provision of subsidies for the number of hectares under organic cultivation in certified farms and farms under transition fromconventional to organic farming methods. It is worth noticing that in 2000 the introduction of comparatively high subsidies in terms of Polish reality had caused an increase to 1.7 thousand organic farms in one year. This advantageous situation encouraged more farmers to change their production methods; yet the budgetary difficulties (caused by growing budgetary burden of subsidies to organic farming and financial costs of appropriate controls) forced the necessity of lowering the rates of subsidies. Lower rates had not affected farmers' resolve in any significant way. The rates of subsidies were again increased in the consecutive years. Thus it may be expected that the organic farming will show dynamic growth as long as it will be supported by economic incentives[2].

In Poland the number of certified organic farms as well as of those in the transitional period (first or second year of transition) is continuously growing. In 2005 the total number of registered farms amounted to 7183, i.e. twelve times more (by 6628 farms) than in 1999, and in 2008 it exceeded 15.2 thousand. The greatest increase of organic farms was noted between 1999 and 2000 (864 new organic farms - an increase by 155%). The EU accession also encouraged the farmers to change the profiles of their farms to organic production. The number of new organic farms has increased by 11 446, i.e. four times between 2004 and 2008. The figures below show that in the period of 2004-2008 most of organic farms were those in the transitional period (Tables 1 and 2).

[2] "Programme of Rural Development for the years 2007-2013" under Farmers Participation in Food Quality System

Table 1

The number of certified organic farms and those during transitional period by voivodships, between 2004 and 2008

Voivodships	2004			2008		
	certified organic farms	during transitional period	Total	certified organic farms	during transitional period	Total
Dolnośląskie	89	108	*197*	456	423	*879*
Kujawsko-pomorskie	58	31	*89*	158	100	*258*
Lubelskie	210	183	*393*	963	603	*1566*
Lubuskie	18	48	*66*	235	245	*480*
Łódzkie	33	38	*71*	190	124	*314*
Małopolskie	231	466	*697*	1318	782	*2100*
Mazowieckie	191	243	*434*	987	494	*1481*
Opolskie	16	10	*26*	35	27	*62*
Podkarpackie	193	237	*430*	1119	773	*1892*
Podlaskie	90	117	*207*	616	544	*1160*
Pomorskie	31	35	*66*	223	169	*392*
Śląskie	27	20	*47*	110	66	*176*
Świętokrzyskie	302	245	*547*	892	273	*1165*
Warmińsko-mazurskie	91	153	*244*	573	486	*1059*
Wielkopolskie	33	37	*70*	239	277	*516*
Zachodniopomorskie	70	106	*176*	571	825	*1396*
Poland total	1683	2077	*3760*	8685	6211	*14896*

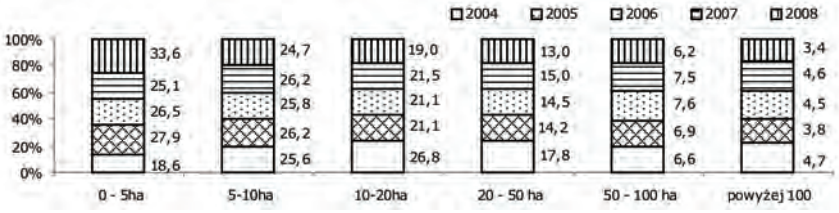
Source: Central Inspectorate of the Trading Quality of Agricultural and Edible Products

Table 2

Area of certified farms and those during transitional period by voivodships between 2004 and 2008, ha

Voivodships	2004			2008	
	certified organic farms	during transitional period Year 2	during transitional period Year 1	certified organic farms	during transitional period
Dolnośląskie	4771.9	1475.3	4184.3	16035.3	12431.2
Kujawsko-pomorskie	1221.6	211.1	497.3	3665.3	2277.3
Lubelskie	3151	778	3093.1	16986.9	9905
Lubuskie	1084.2	61	1421.7	7927.9	10278.6
Łódzkie	553.4	0	941.9	2801.8	2026.7
Małopolskie	4790.1	1649.8	3549	14839.7	7815.2
Mazowieckie	3055.8	559.5	4428.6	16567.6	11174.7
Opolskie	211	257	113.6	713.1	857.6
Podkarpackie	6121.2	1419.3	7526.8	19688.5	8982
Podlaskie	2262.5	487.5	2126.8	10991.7	9418.8
Pomorskie	1137.7	297.8	739.9	5959.4	5406.6
Śląskie	205	13.2	366	2301.3	1633.2
Świętokrzyskie	3105.7	304	2465.3	7694	3146.7
Warmińsko-mazurskie	6510.1	1274.5	5013.4	16465.6	12362.3
Wielkopolskie	1618.5	378.5	3955.1	9850.3	10566.3
Zachodniopomorskie	7015.3	1081.9	7444	26243.9	27906.8
Poland total	46817.2	10248.3	47866.7	178732.2	136189

Source: Central Inspectorate of the Trading Quality of Agricultural and Edible Products



Source: made by the author according to the Central Inspectorate of the Trading Quality of Agricultural and Edible Products

Figure 2. **The structure of organic farms in terms of their sizes in 2004-2008, %**

Table 3

The number of certified organic farms according to their size during the period of 1999-2008

Years	Number of certified organic farms according to their size, ha					
	0 - 5	5-10 ha	10-20 ha	20 - 50	50 - 100	above 100
1999	164	150	100	67	32a	
2000	289	305	193	102	60a	
2001	548	546	374	196	72	51
2002	567	534	449	275	91	61
2003	619	613	540	315	125	74
2004	699	962	1009	668	247	175
2005	2002	1879	1516	1017	496	272
2006	2434	2374	1939	1333	698	409
2007	1664	1736	1424	996	494	304
2008	2916	2147	1652	1130	542	298

a above 50 ha.

Source: until 2000: Central Inspectorate of State Purchasing and Processing of Agricultural Products, from 2001: Central Inspectorate of Trading Quality of Agricultural and Edible Products

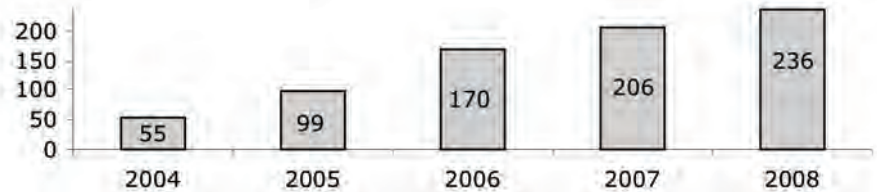
Organic farming is most popular in the following voivodships: Małopolskie, Podkarpackie, Lubelskie, Mazowieckie, Zachodniopomorskie, and Świętokrzyskie. Until present the voivodships with fewer organic farms include: Opolskie, Śląskie, Kujawsko-Pomorskie, Łódzkie, Pomorskie, and Lubuskie.

The total area of organic farms – certified and in the transitional period – is dynamically growing. In 2004 it amounted to 104 932 thousand ha (a 58% increase in comparison with 2003), which included total area of arable land amounting to 82.7 thousand ha (an increase of 60% in comparison with the preceding year). In 2008 the area of certified organic farms was approximately 178.7 thousand ha, and the area of those pending certification exceeded 136.1 thousand ha. In 2004 the voivodships with the largest area under organic cultivations were: Zachodniopomorskie (15 541 thousand ha), Podkarpackie (15 067 thousand ha), and Warmińsko-Mazurskie (12 798 thousand ha). Totally equalling to 41.3% of the country area, four years later these areas have still been dominating in Poland in terms of the area of organic production. The size of an average organic farm amounted to approximately 21.1 ha (in 2004 - 27.9 ha). It varied depending on the voivodships – in Wielkopolskie and Zachodniopomorskie located in the North-western Poland the average size amounted to almost 39.6 ha – 38.9 ha (in 2004 - 85 ha), while in Swiętokrzyskie it was below 9 ha (in 2004 - 11 ha).

In Poland the structure of organic farms in terms of their size had changed in 2008 in comparison with 2004. At the beginning the area of organic farms amounted to 5-20 ha. Totally it accounted for approximately 52.4%. In the subsequent years the structure of organic farms featured small farms, the size of which did not exceed 5 ha (increase from 18.6% to 33.6%), and the number of large farms (over 100 ha, but also those between 10 and 20 ha and 20-50 ha) decreased from 4.7% to 3.4% (Figure 2, Table 3).

In the structure of plant production the cultivations prevailing in Poland included agricultural crops, although their share in the total is getting progressively smaller. Until recently they were followed by meadows and pastures. Only few percent of organic production are orchards and vegetable gardens.

Considering various cultivations by farms which were already certified the greatest acreage used for agricultural production is located in the Northern Poland as well as in the South. Pastures and meadows are used for organic production in the South-eastern part of the country (Podkarpackie – Małopolskie),



Source: Central Inspectorate of the Trading Quality of Agricultural and Edible Products

Figure 3. **The number of organic processing plants in Poland between 2004 and 2008**

Table 4

Agri-environmental scheme, Agri-environmental payments from Package 2 "Organic Farming" within RDP 2007-2013

Agri-environmental variant	**Amount of subsidies**
2.1. Agricultural crops (with certificate of conformity)	PLN 790/ha (EUR 202.4/ha)
2.2. Agricultural crops (pending certification)	PLN 840/ha (EUR 215.2/ha)
2.3. Permanent grassland (with certificate of conformity)	PLN 260/ha (EUR 66.6/ha)
2.4. Permanent grassland (pending certification)	PLN 330/ha (EUR 84.5/ha)
2.5. Vegetable crops (with certificate of conformity)	PLN 1300/ha (EUR 333/ha)
2.6. Vegetable crops (pending certification)	PLN 1550/ha (EUR 397/ha)
2.7. Herbs (with certificate of conformity)	PLN 1050/ha (EUR 269/ha)
2.8. Herbs (pending certification)	PLN 1150/ha (EUR 294.6/ha)
2.9. Horticultural crops + berries (with certificate of conformity)	PLN 1540/ha (EUR 394.5/ha)
2.10. Horticultural crops + berries (pending certification)	PLN 1800/ha (EUR 461.1/ha)
2.11. Other horticultural crops + berries (with certificate of conformity)	PLN 650/ha (EUR 166.5/ha)
2.12. Other horticultural crops + berries (pending certification)	PLN 800/ha (EUR 204.9/ha)

Source: RDP 2007-2013

where the form of farming is determined mostly by the landscape. Orchards and berries cultivations are located mainly in Lubelskie, Mazowieckie, and Świętokrzyskie voivodships. The most popular agricultural cultivations are undoubtedly cereals, in particular rye, oat, barley, wheat and, in smaller quantities, spelt. An equally traditionally important crop is potatoes. The acreage occupied by all the plantations of black and red currants is not much greater than strawberries, oil plants, and apple orchards.

The greatest organic plantations and yields of rye are located in Opolskie voivodship. The average yield from hectare is 2.4 tons, while the country average is 2.3 tons. The lowest average yields are in Śląskie (0.5 ton/ha) and Wielkopolskie (1 ton/ha). Organic wheat is mainly cultivated in Podkarpackie. Organic barley is produced mostly in the same voivodships, where the yields are also the highest ones. The largest acreage of leguminous plants for seeds was located in Lubuskie voivodship. In Podlaskie organic farms were mainly involved in the production of strawberries and currants. Production of organic apples amounted to just a little above few thousand tons and that in spite of the fact that Poland is the major European producer of apples.

The main three types of animal production are milking cows, young feeder cattle, and pigs. One should not omit the production of sheep, goats, and rabbits. In Poland organic production levels of animals for slaughter were as follows: pork – 1 169 thousand tons, beef – 638.8 thousand tons, poultry – 9.1 thousand tons, mutton – 490 tons, rabbit carcasses – 1919 units. The annual production of eggs was at the level of approximately 190 eggs per hen, in total 8 529 million eggs. Another valuable organic product is honey. In 2004 its annual production amounted to 11.4 thousand kg.

Unfortunately the information concerning subsequent years is not available in public statistics. The increase of the number of organic farms is accompanied, especially post-2004, by the increase of the number of organic processing plants. It is a positive trend, which forecasts further development of production sector, especially in terms of increased value added of organic products which have been enjoying a growing demand in Poland. The biggest share of organic processing is represented by fruit and vegetables (approximately 25%), followed by meat (nearly 5%), and dairy products (3%) as well as cereals. The production of other food articles of organic origin, such as: beverages, spices and ready made dishes as well as sugar, chocolates,

coffee, etc., accounted for approximately 27% of general organic farming production in Poland.

Presently the market for organic products is one of the most dynamically developing sectors of food market, especially in the EU countries (Hamm U., 2001). It may be expected that also in Poland the growth indicator of organic products' share of the market will change, though it is difficult to assess by how much since a reliable system of collecting appropriate data assessing supply and demand for organic products simply does not exist.

Thanks to much wider acceptance and much more developed distribution systems the market for organic products is undergoing a dynamic growth in such highly developed countries as the United States, Japan, Canada, and the EU member states, while in other countries of the world it is rather marginal. Organic food is purchased mainly by affluent, young city dwellers, caring for healthy lifestyle and having greater than average knowledge on organic food. There is no reliable data for Poland although according to surveys its scope and worth is constantly rising. Local market is absorptive and unsaturated but its growth is hampered by the prices of organic food in comparison with its conventionally produced equivalents (by as much as 20-50%[3]). Other unfavourable factors are inadequate distribution channels, modest marketing and above all rather low level of affluence of Polish population (in 2005 an average household expenditure for food including alcoholic beverages and tobacco products amounted to approximately 26%, while in the EU-15[4] it was less than 15%). According to the available assessments, sales of organic products were conducted mainly by the farmers themselves or else through scarce wholesalers, specialised retail outlets (less than 200 in the whole territory of Poland), and supermarkets. The level of consumption of organic food in Poland varies (Szymańska J., 2003). It is the highest in the central part of the country, and the lowest in the North and South. Organic products consist mainly of plants or products of plant origin, since they are more available than the products of animal origin and are more varied. One can also observe a trend from processed to unprocessed products.

Results and discussion

Dynamic increase of the number of organic farms as well as the area of organic crops was noted in Poland especially when such actions were subsidised by the state budget. Although at the beginning, especially in the 1990s, statistic data showed an increasing number of organic farms in general (also those in the period of transformation as well as the already certified ones), no increased availability of organic food on the market was really noted, despite increasing demand. Following the EU accession, the funds intended for organic farms were earmarked within the framework of the Sectoral Operational Programme 2004-2006, and currently they originate from Rural Development Programme 2007-2013 in the framework of the agri-environmental scheme as well as a measure related to the participation of farmers in food quality schemes (the value of support amounts to PLN 996 (EUR255.1)/year for 5 years). For example, the subsidy in the framework of Package 2 "Organic Farming" amounts to (depending on a variant) between EUR 66.6 and 461.1/ha (Table 4). The support of this type of activities attracts the interest of farmers and the number of farms supported exceeds 15 thousand.

Conclusions

Further increase of the area of organic crops can be expected in Poland in the near future, which will be facilitated by the legislation on organic farming providing the framework for the activities of organic farmers. The development will also be possible thanks to the state support, the establishment of certified quality control centre supervising products and certified farms as well as the establishment of organised forms of distribution and market infrastructure for growing consumer demand for 'natural' products.

Poland offers a huge potential for further growth of organic production. It offers such major assets as, to mention just two, underused labour resources of low cost - in comparison with the Western EU member states, or pollution-free environment, not yet degraded by industry. However, apart from these assets there are also such constraints as underdeveloped sales and distribution market, insufficient marketing efforts in spreading the knowledge about organic products, their importance for health of each individual and the society as a whole, including their economic importance.

Bibliography

1. Hamm U. (2001): *Promotion Strategies and Arguments for Organic Food in European Countries*. In: Proceedings of the Conference Organic Food and Farming-Towards Partnership and Action in Europe 10-11 May, 2001, Copenhagen, Denmark, Danish Ministry of Food, Agriculture and Fisheries, pp. 187-193.
2. Kaltoft P. (1999): *Values about Nature in Organic Farming Practice and Knowledge. Sociologia Ruralis*. l 39, pp.39-53.
3. Łuczak-Bakuła W. (1995): *Handel żywności ekologiczna w opinii konsumentów*. [w:] Sołtysiak U. Rolnictwo ekologiczne-od producenta do konsumenta. Stowarzyszenie EKOLAND, Stiftung Leben&Umwelt, Warszawa.

[3] On the basis of surveys the consumers would be ready to pay for organic food no more than 10-30% in comparison with its conventional equivalent. Survey Research by Łuczak-Bakuła (1995), Runowski (1999) and others

[4] www.eurostat

4. Michelsen J. (2001): *Organic Farming in a Social Context.* In: Proceedings of the Conference Organic Food and Farming-Towards Partnership and Action in Europe 10-11 May, 2001, Copenhagen, Denmark, Danish Ministry of Food, Agriculture and Fisheries, pp. 74-79.
5. Morgan K., Murdoch J. (2000): Organic vs. Conventional Agriculture: Knowledge, Power and Innovation in the Food Chain. Geoforum, 31, pp. 159-173, ITC.
6. Runowski H. (1999): *Popyt na żywność ekologiczną*. [w:] Metera D., Bednarek A. (red.): Marketing produktów ekologicznych w północno-wschodniej Polsce. Fundacja IUCN, Polska, Warszawa.
7. Runowski H. (1999): *Stan i uwarunkowania popytu na żywność ekologiczną w Polsce.* [w:] Organizacyjno-ekonomiczne aspekty rolnictwa ekologicznego. Wydawnictwo SGGW, Warszawa
8. Runowski H. (2003): *Rolnictwo ekologiczne w Polsce na tle tendencji światowych.* Zeszyty Naukowe SGGW, Ekonomika i Organizacja Gospodarki Żywnościowej. No. 49. pp. 245-262.
9. Sołtysiak U. (1995): *Atestacja i oznakowanie produktów i gospodarstw ekologicznych w Polsce na tle sytuacji w Europie*.[w:] Radecki A., Bednarek A., Zawadzki B., Łabętowicz J. (red): Ekologiczne i integrowane rolnictwo w Polsce. Wyd. Fundacji SGGW, Warszawa, pp. 98-120.
10. Szymańska J. (2003): *Rolnictwo ekologiczne-system produkcji gwarantujący wysoką jakość spożywczą produktów rolnych*. [w:] Agrobiznes 2003. Jakośc jako podstawowy instrument konkurencyjności w agrobiznesie. Prace naukowe AE in. O. Langego weWrocławiu, Tom 2. pp.401-408.
11. The World of Organic Agriculture. Statistics and Emerging Trends, IFOAM, FiBL, za lata 2000-2008.

Use of ICT Applications in the Polish Agriculture Advisory System

PhD **Mirosława Marciniak**, PhD **Piotr Ogonowski**
Department of Systems Analysis
West Pomeranian University of Technology in Szczecin, Poland

Abstract. "e-Agriculture" is an emerging field in the intersection of agricultural informatics, agricultural development and entrepreneurship, referring to agricultural services, technology dissemination, and information delivered or enhanced through the Internet and related technologies. More specifically, it involves the conceptualisation, design, development, evaluation and application of new (innovative) ways to use the existing or emerging information and communication technologies (ICTs). The most frequently encountered e-Agriculture approach relates to improved information exchange and communication for the benefit of rural communities, farm households, and the rural service providers involved in the provision of agricultural, financial and communication services. A critical need is content development to ensure the suitability of knowledge and information for the local client needs in rural communities and agriculture societies. The government of Poland is involved in several activities aimed at bringing rural stakeholders into the mainstream of ICT development and participation in the information revolution. The aim of the paper is presentation of some ICTs application used by the Polish Agriculture Advisory System. The paper describes such issues as: the organisation of agriculture advisory system, field activities supported by Internet, and a project of the Integrated Centre of Farm Advisory System based on a virtual private network.
Key words: farm advisory system, ICT technologies, Polish Integrated Centre of Farm Advisory.

Introduction

Rural technology transfer in Poland is traditionally identified with rural advisory services, the beginning of which dates back to the 19th century. The first centres emerged in the West lands which were under the influence of Prussian culture, while other centres appeared in the South and East. Different economic and education development levels of rural areas in Poland are still observed as an effect of those circumstances. Therefore, modernisation of farms and rural areas through technology transfer has a different character regarding regional conditions. Generally technology transfer has been recognised as a means leading to the improvement of technical and economic efficiency of farms. Generally, the education and knowledge level of farmers and rural population in Poland is low. Transformation of the economy and accession to the EU highlighted the needs to improve the situation. Higher competition and rising production quality requirements stress the necessity of modernisation on Polish farms and improvement of farmers' knowledge on farm management on market economy conditions (Florianczyk Z., 2007).

The public agricultural advisory service currently employs over 5600 people, of which around 3950 specialists and advisers provide services to approximately 1850 thousand holdings, thus equalling to of 470 farmers per one adviser on average. Both farmers and advisers believe that the system is not well-suited to provide services for the implementation of the Common Agriculture Policy requirements and due to the large number of farmers per adviser, only a limited number of producers have a proper quality access to the advisory services. Although the Rural Development Programme for 2007 – 2013 prescribes subsidies for advisory services under the FAS (up to EUR 1500 and not more than 80% of qualified costs), it may be expected that a large share of small holdings will not make use of the advisory assistance. The introduction of new information and communication technologies in agricultural advisory system has ensured the possibility to support farmers with the access of advisory services. The research aim is a presentation of the existing ICTs applications and description of planning information solution for the Polish Agriculture Advisory System. Research methods such as facts methods (literature study) and classical reasoning (deduction and analysis) are used in the research. The main information source was the concept for establishment of the Centre of Farm Advisory System for Polish advisory system and selected Internet sources, mainly reports on the EU research projects.

Results and discussion

The national rural advisory services in Poland have two levels: national - Central Agricultural Advisory service (pol. Centrum Doradztwa Rolniczego - CDR) and regional - consists of Agricultural Advisory Centres (pol. Ośrodek Doradztwa Rolniczego - ODR). The Central Agricultural Advisory Service is located in Brwinów (central Poland) and has three dependent branch offices located in Krakow, Poznan, and Radom. The unit is under the supervision of the Ministry of Agriculture and is financed from the national budget. The Agricultural Chambers authorities support CDR

in the process of programming its activities. The major tasks of the Agricultural Advisory Centres include the improvement of the level of agricultural incomes, enhancement of market competitiveness of agricultural holdings, supporting rural sustainable development and improvement of vocational skills of farmers and other rural inhabitants. The implementation of the Centre tasks is designed:

1) to prepare and implement the uniform policies of the agricultural advisory centres within the scope of their tasks;
2) to prepare and distribute training materials to the advisory centres;
3) to elaborate the analysis and prognosis within the scope of advisory centres;
4) to organise training courses for the advisory centres staff;
5) to introduce training courses for agricultural school teachers within the scope of rural sustainable development;
6) to establish and administer the information system and data bases for the agricultural advisory centres;
7) to organise the training courses, presentations, seminars, conferences, and other projects within the scope of agricultural and rural development and organic farming;
8) to coordinate the tasks performed by the advisory centres within the scope of organic farming;
9) to introduce the scientific research results into agricultural practice.

The major tasks of the Agricultural Advisory Centre include the improvement of agricultural income level, enhancement of market competitiveness of agricultural holdings, supporting rural sustainable development, and improvement of vocational skills of agricultural farmers and other rural inhabitants. The Agricultural Advisory Centre cooperates closely with the government administration institutions and local government bodies, farmers, research organisations, agriculture advisory centres, and other organisations and institutions working for the benefit of the agricultural and rural development.

The education activity of the Central Agricultural Advisory service is done by organisation of seminars, conferences and internet courses (standards in rural manufacturing, farm management and rural economy), intramural courses (methodology and organisation of agricultural advisers' work), training programmes (single-entry bookkeeping, organisation of agrotourism). The CDR, together with academic institutions, organises continuing education studies such as those concerned with agrotourism, agricultural management, mechanisation and other technologies of production. The publication of professional catalogues, manuals and other training materials, which are also accessible to the public via the Internet is one of the important activities of the CDR. Similarly, the CDR promotes advisory

Source: Rzepkowski R., 2007

Figure 1. **The location of the Polish Distance Advisory Study Centres**

services by organising mass events like seminars, fairs, open days, and by having a national extension information system web-site. The CDR as national unit helps other extension centres without charge improve the efficiency and quality of their services, especially those concerned with non-agricultural rural business.

The second level of the national system of rural advisory services is represented by 16 Regional (one in each voivodship) Agricultural Advisory Centres (ODR) located in all voivodships with 30 dependent district branches. The ODRs are financed from the voivodships budgets and directly take part in the implementation of development plans of their respective regions. The voivodships authorities, together with the Social Board of Agricultural Advisory services, approve the working plans of their ODR. Representatives of Agricultural Chambers advise the directors of advisory centres on the specific needs for advisory and training services on the local level. The national system of rural advice can be described as having a hierarchical structure. It prefers transfer of information from up to down. The roles of farmers and their organisations are limited to advising and giving recommendations to agricultural advisory centre directors.

Generally, the advisory and training services are free of charge. However, starting from 2007, some services - namely individual advising - are to be paid for by beneficiaries. The National system of rural advisory services activities is supported from the EU Structural Funds, which help improve quality and range of services. The education and knowledge level of farmers and rural population in Poland is low. Transformation of the economy and accession to the EU highlighted the needs for the improvement of the situation. Higher competition and rising production quality requirements stress the necessity for modernisation on Polish farms and improvement of farmers' knowledge on the farm management in market economy conditions. However, the opinion of farmers on their own technical knowledge is generally high so they demand more training related to farm management and particularly concerned with receiving support from the CAP (Florianczyk Z., 2007).

Thanks to the accession to the EU, the level of resources and the frequency of training have significantly increased. The aim of the training is to give farmers the ability to check their own holdings for all cross compliance requirements. Trained farmers can spread information and help other farmers in being compliant. It is supposed that the limit is participation of no more than 5-10% of farmers. Trainings for farmers are organised in each region by the state advisory centres on a regional level (ODR). Courses are available in each province. The training consists of a two-day long course and one-day workshop on the farm. Totally 3 244 trainings are planned in the whole Poland for a total of 90 161 farmers. By the end of December 2007, totally 1982 courses were delivered and 48 719 farmers were trained (Angilerii V., 2008).

The programme assumptions in the establishment of the Distance Advisory Study Network (DASN) appeared in 2000. The network started operation in 2004 with its first course "Quality Standards of Agricultural Production – Animal Production and Plant Production" in the framework of the Phare Programme PL0104.02 under the "National System of Advising Agriculture" (2001 - 2004). In Poland 16 Distance Advisory Study Centres (DASC), (one in each voivodeship) and the National Contact Point (NCP) was established in 1 unit on the national level (Figure 1). The tasks of DASC local services are as follows: presenting offer of planned courses, recruitment of participants, helping participants in the implementation of courses and providing of contacts, and exchange of information with the NCP. The National Centre Point is located in Brwinów, and its main tasks are the following: the co-ordination of Distance Advisory Study Network, elaboration of education materials (courses and modules for distance learning) and co-operation with institutions and organisations on the national and international level.

Each DASC and NCP are equipped with a server and local network, 20 computers with LCD monitors, software, video projector, colour printer, and copier. The office in Brwinów is equipped with Training Platform and Lotus Learning Space 5.01 software and the office in Częstochowa is equipped with post server, and corporation portal. At present the following training is being carried out: course for advisors of agri-environmental, ecological production methods - crop production, ecological production methods - livestock production and quality standards for the agricultural production-livestock production. Now, the system of education is aimed only at agricultural advisors, but in the future it will also be aimed at farmers and rural inhabitants (Rzepkowski R., 2007).

Since 2004, the provision of distance learning education course has started through the Internet. The advisor is participating on the voluntary base, though part of the advisory service requires graduating some specific courses and receiving a certificate. This is a part of the project entitled "PRACTICE-dissemination platform distance learning for advisers of rural development based on ICT technologies in Europe" and implemented in the framework of the Leonardo da Vinci's partners from Spain, Latvia, Poland, Romania, Slovakia and Hungary. The Centre Advisory Branch in Krakow represents Poland in the project. The design PRACTICE concerns improving continuing agricultural advisers, who play a crucial role in the socio-economic development of rural areas in Europe. Its essence is an adaptation of the distance tool, developed in the previous Leonardo da Vinci programme, which will create new opportunities for training consultants. The beneficiaries of the project are persons involved in advising on rural development regardless of formal employment status (advisers, state farm advisory units, local leaders, private consultants, etc.).

The Integrated Centre of Farm Advisory System

The use of information system is a precondition for the creation of a modern Farm Advisory System. As mentioned, the designing system primarily is a tool, where the data are collected, processed, and prioritised. Besides it is a communication platform between the actual and potential users. In 2006 the implementation of the project "Development of Integrated Agriculture Advisory System" (No. PL 2006/018-180.04.02) has been started, which is financed by the EU (EUR 1 000 000) and the national budget (EUR 350 000). The purpose of the project is a creating of a new Information System and its integration with the National Farm Advisory System. The system first of all shall fulfil tasks under the law and those imposed by the Common Agricultural Policy as well as it shall cover issues, which are currently important for the agricultural advisory system in Poland.

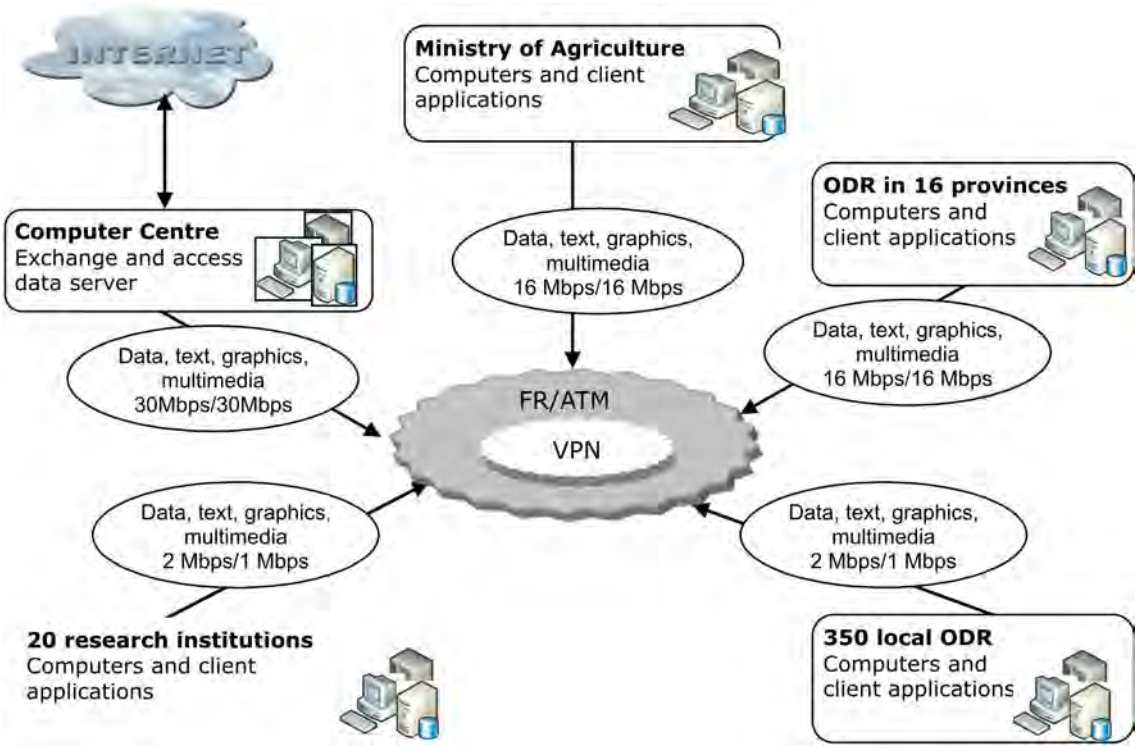
The Integrated Centre of Farm Advisory System collects the information on:

1. in the range of livestock production:
- breed, commercial types, cross breeds;
- breeding and fattening systems;
- fertility and reproduction herd;
- animal feed;
- recognition of animal diseases and prevention;
- planning terms of covering, length of fattening and sales.

2. in the range of crop production:
- type of crops and varieties of plants;
- kinds of recommended fertilisation;
- agro technique;
- diagnosis of diseases and pests of plants and methods, including integrated production;
- methods set and maintenance feed and crop.

In terms of substantive data it contains a broad information on: crop production, produce, economics of agriculture, agricultural marketing, conservation of plant health, fertilising, meteorology, cartography and maps, simulation and calculation, outlets, laws and regulations, and documentation necessary in the conduct of agricultural holdings, and training. It is important is to develop IT solutions in the following subjects to support the management of holdings: analysis of surplus production capacity, analysis on variables in each activity, analysis of production efficiency, analysis of fixed costs in holdings, efficiency of capital investment and return period, cash flows, taxes and subsidies, and simulations undertaken in additional activities for the diversification of agricultural income. At present it is available to obtain some farm diagnostic software free of charge:

- Agronom 1.0 - software used for organic and mineral fertilising plans for basic crops in the farm;
- NAW-2 - calculates doses of nitrogen, phosphorus, potassium, lime, and magnesium fertilisers (based on the chemical/physical properties of the soil and considered agro technology);
- DOPL-2 - software for fields rotation and crop succession;



Source: made by the authors according to Rusiecki P. and others, 2008

Figure 2. **The structure of the VPN used by Polish Integrated Centre of Farm Advisory System**

- ANAPASZ - software for analysing nutritional value of feedstuff;
- INFOHERB - herbicides data base;
- ZALECENIA TM v.1.1 - data base with information about all recommended pesticides.
- BITFARMA 1.0 - software to support decision for farmers. It includes the module for fertilising crops, selecting varieties and choosing pesticides. The system is able to record elements of agro technology, used fertilisers and pesticides. It calculates gross margin for each crop and field, and also generates applications for direct payments.
- KOSI - expert's support system in a wide range of services: business economics and management, different variants of farm mechanisation and holdings' models;
- DOPLATY - software tool for generating applications for area payments (SAPS).

Given the range of tasks which include designing of the information system, it is impossible to uniform the software from one source. Therefore, it will order the software, which then will be matched to the needs of users, and integrated with the rest of the system. The development and adaptation of the system will be a long-term process, since it is developed both horizontally and vertically. Horizontal direction means that the system may still increase functionally - multithreading issues of agriculture on the preparation of relevant software on many different issues. The implementation schedule may depend on many factors, like organisational, financial and technological. It is not excluded that some of the programmes would be translated into English and then transposed to Polish conditions. Other programmes may be ordered from Polish companies. Yet another group of programmes will be adjusted to the needs of the system; however all of them shall comply with the rest of the system.

The correct working of the whole system requires using safe and effective solution with a range of extensive nets, integrating the individual centres. The most optimal possibility in the context of present applied tools and technology seems to be initiating it on the base network solutions - Virtual Private Net (VPN). The project of VPN supporting the advisory system is shown in Figure 2.

The VPN solution provides a connection of individual, district and province Agricultural Advisory Centres with Computer Centre, in one large and relatively homogeneous Intranet. Many co-operating research institutions and the Ministry of Agriculture will be connected to the system. On the base of the VPN solutions it is necessary to assure the basic services used through the Internet and Intranet such as: FTP, WWW, videoconference, Instant Messenger, electronic mail, web log, and Group Communication System. The data from local Agricultural Advisory Centres will be transferred to the projected Computer Centre, mainly in compatible formats with office applications:

- text documents;
- spreadsheets;
- database;
- images and pictures;
- numerical maps;
- multimedia presentations;
- films, sound and animations;
- structural documents (html, xml).

The costs for running the VPN with the applied ICT solutions include: payments to a telecommunication operator for activities, implementation of analysis on hardware and software solutions for local centres and the co-operating institutions, possible purchase of new computers by local centres as well as the purchase and installation of a video terminal. Table 1 contains detailed calculations on the technical infrastructure for the information system implementation.

Besides the VPN costs there are several other important costs of Computer Centre, like organisational costs and costs for creating a local computer network. Organisational costs consist of:

Table 1

The calculations on preparing of the technical infrastructure for the Polish Integrated Centre of Farm Advisory System

Description	Unit price (in PLN)	Amount	Value (in PLN)
1. Virtual Private Network activation	2 000.00	1	2 000.00
2. Preparing of questionnaires	800.00	1	800.00
3. Analysis of hardware and software solution	30.00	390	11 700.00
4 Purchase of hardware equipment	3 000.00	100	300 000.00
5. Purchase of video terminals (workgroup)	18 000.00	18	324 000,00
6. Purchase of video terminals (single station)	6 000.00	350	2 100 000.00
7. Purchase of video projectors	3 000.00	18	54 000.00
8. Installation of video terminals (single station)	1 000.00	350	350 000.00
9. Installation of video terminals (workgroup)	2 000.00	18	36 000.00
Total			3 178 500.00

Source: authors' calculation according to Rusiecki P. and others, 2008

maintenance and depreciation, materials and energy, foreign service, taxes and other costs, investigation of information needs, wage costs and derivatives (approx. 45 employees), and investments. Generally the estimated costs per one function of the Centre is about PLN 600 000 gross. The annual maintenance assessment is hindered due to the difficulty of establishing possible service contracts on computers (probably within (5-10%) and the decision to continue the programme (assuming that within two years the use of software becomes stable and there is no redemption in the consecutive years). If the annual costs of IT solution equal to PLN 1 709 400 then the annual total costs of Integrated Centre of Farm Advisory System should e close to PLN 4 050 000.

Conclusions

1. Information technology is usually a modern media for organisational solutions. Building of a Computer Centre for Farm Advisory System can provide a new quality in Polish agriculture. Its creation is a final stage in the development of integrated farm advisory system as a whole organisation. The Computer Centre is one of the organisations to alter the quality of communication within the system.
2. The application of ICT technologies maintains their position, and forces the match with commonly used standards. Thus entities applying this technology become compatible with each other and facilitate the cooperation.
3. The main benefit from the development of Integrated Centre of Farm Advisory System (ICFAS) is to provide tools for the implementation of additional modules for direct support of agricultural holdings. Taking into account the possibility of introducing new provisions governing the functioning of agriculture by the European Union or the Polish government, ICFAS may become a platform for a relatively ease start of new modules for the support of the regulatory framework.
4. The important role of ICFAS may be to stimulate the economic development. It may occur by associating economic partners or facilitating the access to the latest and efficient technologies in the field of agriculture.

Bibliography

1. Angileri V. (2008) Implementation of the Farm Advisory System in Poland. JRC Scientific and Technical Reports. Institute for the Protection and Security of the Citizen, European Commission, Luxemburg, pp.14-15. Available at: http://mars.jrc.it/mars/content/download/1136/6819/file/ReqNo_JRC45383fas_in_poland_final.pdf. Access: 30 November, 2009.
2. Florianczyk Z. (2007) Rural Technology Transfer in Transition Economies in Poland. D12-3 Fourth 6-monthly report in frame: project No. 513705 Agro Economic Policy Analysis of the New Member States, the Candidate Countries and the Countries of the Western Balkan, European Commission Brussels. Available at: http://www.euroqualityfiles.net/cecap/Report%204/Section%202%20country%20report/CEECAP%20report%204%20section%202%20POLAND.pdf. Access: 4 December, 2009.
3. Rusiecki P., Stępniak C., Turek T. (2008) The Concept of the Creation of the Centre of Farm Advisory System, Ministry of Agriculture in Poland. Available at: http://www.minrol.gov.pl/FileRepozytory/FileRepozytoryMainGetItem.aspx?item_id=32385. Access: 28 November, 2009.
4. Rzepkowski R. (2007) E-learning in Polish Agriculture Advisory, presentation prep. by CDR Brwinów, Available at: http://www.efarmer.org/conference/presentations/eF_Conf_Rzepkowski.ppt. Access: 6 December, 2009.

Polish Food Sector in the European Union

Antoni Mickiewicz, PhD, professor
Head of Department of Agribusiness and Extension Service
Bartosz Mickiewicz, PhD
Head of Department of Rural Areas Development and Food Economy
Faculty of Economics
Western Pomeranian Technological University in Szczecin, Poland

Abstract. The paper presents the future directions of Polish Food sector in the European Union. It was underlined that Poland's entry into the EU resulted in an increase of agricultural incomes. According to Eurostat data, the average income obtained from agricultural activity in Poland in 2008 (as compared with 2000) grew by 90%. Poland's entry into the EU brought about an investment boom in agriculture and it accelerated farm modernisation. Preferential investment credits and the EU aid funds played a huge role in the process. Removal of trade barriers between Poland and the EU showed high price competitiveness of domestic agricultural and food products. From the moment of the accession Poland maintained a trade surplus in foreign trade of these products. During 2003-2007 export has soared by 230%, while import by approximately 125%. Other EU countries acquired an increasingly important role as Poland's trade partners. Improvements in running an agricultural activity as well as a system of direct payments granted to a hectare of land impacted a fast increase of agricultural land prices.
Key words: agriculture, rural areas, European Union, rural policy, economic and social problems.

Introduction

In February, 2009 seventy-five per cent of the Poles surveyed supported Poland's membership in the European Union (EU). Despite some slight mood swings, acceptance of Poland's membership in the EU has been systematically increasing in the past five years. The support resulted from an increasing conviction concerning the benefits gained through the accession. The changes observed most frequently referred to: freedom of movement, work place and study in other countries, improvement in the situation of agriculture and broader benefits to the Polish economy, better situation in the Polish labour market as well as the role of Poland on the international scene. Old age pensioners, sickness pensioners and farmers demonstrated relatively the smallest degree of enthusiasm to the EU. At the same time, an increased number of supporters for Poland's EU membership were observed in the abovementioned social groups in relation to 2004. In the past 5 years the largest number of the EU enthusiasts has invariably been found among managerial staff and students. The discovered effects of Poland's accession to the EU vary in scale, character, and area. The largest impact of the enlargement is particularly observed in the sphere of economic cooperation between the EU states, which stems from the fact that Poland has adopted the uniform principles governing the EU internal market. Likewise, agriculture witnessed many significant transformations due to great advances in European integration within the framework of the Common Agricultural Policy. In the areas of health care, culture and education transformations were merely of an indirect nature, resulting from e.g. opportunities provided by the Structural Funds in a particular field. Thus, membership consequences depend on the specificity of a particular area and ought to be assessed from such a perspective. Poland took advantage of the opportunity that the EU membership offered to the economic growth, simultaneously building an economy based on sound foundations and sensible macroeconomic policy.

Mutual and complete market opening did not act as a brake on the development of Polish food industry, but it provided a strong impetus to growth. The following phenomena are a proof of that:

1) in a 5 years period of Poland's EU membership export of agro-food produce rose from EUR 4.0 to 11.3 billion (2.8 times), whilst import in the sector rose from EUR 3.6 to 9.8 billion (also 2.8 times), and a surplus increased 3.3 times from EUR 0.4 to 1.5 billion;
2) trade exchange with the EU states grew even faster. Food supplies from Poland to the EU-25 in the course of 2003-2005 soared by 248%, and transport into Poland swelled by 212%;
3) the EU membership gave a new, powerful impetus to the exports of Polish agro-food produce into the EU-10/12. Increase in the trade dynamics with these countries as well as improved results were particularly noticeable in recent years, whereas trade with the EU-15 recorded a drop in the dynamics and deteriorating results;
4) trade surplus in agro-food produce has improved:
   - in total from EUR 0.4 billon in 2003 to EUR 1.5 billion in 2008,
   - with the EU–25 from EUR 0.4 billion to EUR 2.3 billion in 2008,
   - with the EU–15 from EUR 0.2 billion to EUR 0.8 billion in 2008 (during 2006-2007 – EUR 1.5 billion),

— with the EU–12 from EUR 0.2 billion to EUR 1.5 billion in 2008.

Functioning within the framework of the Common European Market has not led to flooding the Polish market with the EU imported food – a threat frequently occurring in pre-accession forecasts. Foreign trade in that period became an important factor in the development of food industry and agriculture, because – with relatively stable domestic demand – it was absorbing a substantial part of national production increase. Export share of the production sold in 2008 reached 22% in comparison with 16.5% in 2004 and 10.5% in 2000.

Materials and methods

Statistical material from reports prepared by the Central Agency for Agriculture Development and Modernisation, Agriculture Economics Institute in Warsaw and the Central Statistical Office (CSO) were used in the paper. The analysis focused especially on five issues concerning:

— the economic situation of Polish agro-business;
— financial aid to the agro-food sector from the EU budget;
— agricultural income;
— investments into and modernisations of farmsteads;
— activity diversification in rural areas.

Research results and discussion

Economic situation of the Polish agro-business after May 1, 2004

Poland's accession to the EU did not lead to profound changes on the level of production in such major areas of Polish agriculture as crops, milk, and pork. Production of root plants, potatoes and feed crops in particular, demonstrates a strong downward tendency. Following Poland's accession to the EU fruit production dropped slightly; though its current level is approximately 15% higher than during 1998-2000. Agricultural activities which recorded a production increase following the EU entry include poultry sector as well as rape crops, inter alia, on account of an increasing demand for bio-fuels.

After Poland's accession to the EU, global agriculture production in permanent prices amounted to approximately EUR 58.5 billion and it was by 2.5% higher on average than in 2001-2003. Following the EU accession animal production grew by 6.9%, while plant production fell by 1.1%. Plant production was characterised by a faster rate of increase in end and commodity production than in global production, which means that external use, both for production and consumption purposes, decreases, while marketability of production increases.

A drop in food consumption occurred only in the first year of Poland's EU membership, and it resulted mainly from a substantial rise in food and non-alcoholic drink prices. The decrease in food consumption stopped in 2005, and since 2006 a renewed demand growth for agro-food products was recorded in most markets.

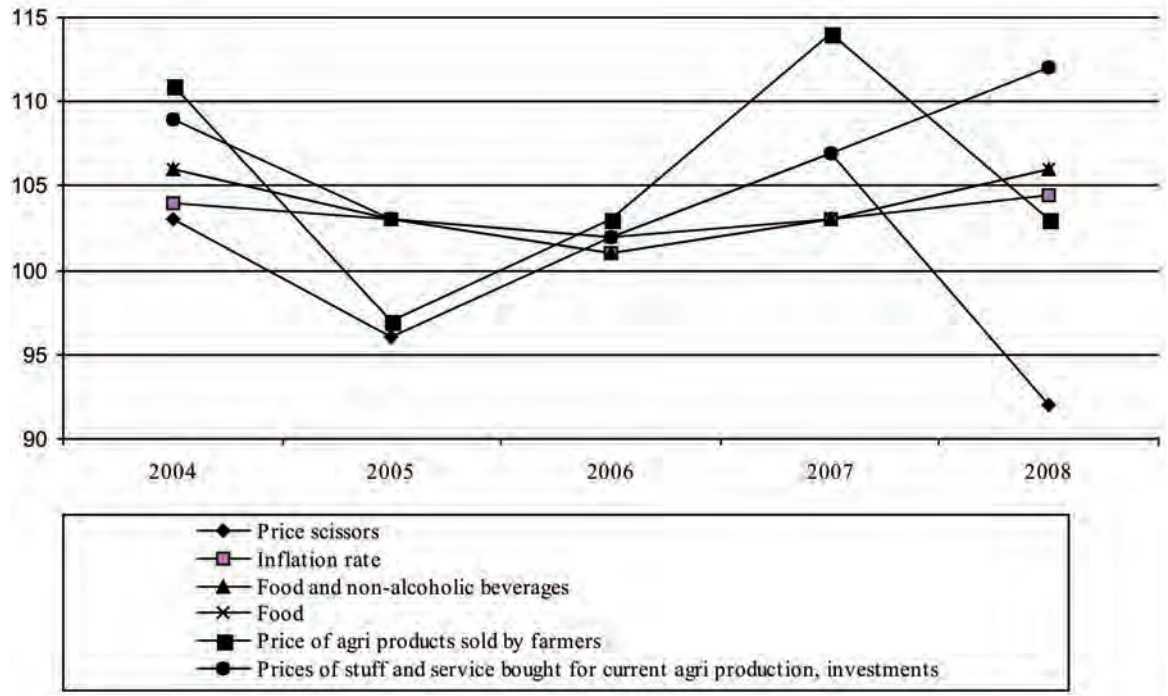
Significant income changes in Polish farmsteads took place in the period of 2003-2008. Once Poland acquired the status of a European Union member state in 2004, income of Polish farmers' has grown decidedly. Income obtained from farms during the pre-accession period rose over twofold per person employed full time (working a minimum of 2200 hours on a farm during a year). These were the subsidies that farmers received through off-market channels which impacted so positively on the income situation. In 2003 the subsidies constituted a 9.4% share in income generation, in the subsequent year the share rose to 39%. The largest share of subsidies in income generation was recorded in 2006, when subsides were of higher significance in income generation than production activity. Following the accession relative farmers' profitability improved in comparison with that of other professional groups. Although an average farmer's income calculated per person employed full time constituted 24.2% of the average net salary in the national economy in the period prior to the accession, then during the first year of Poland's membership the ratio grew over twofold, reaching the level of 56.2%. In subsequent years the relations oscillated from 43.3% in 2005 to 57.5% in 2007 – during a very good year for agriculture.

According to the estimates conducted with the Economic calculations for Agriculture, the value of Polish agricultural production (calculated according to the market prices) during 2004-2008 grew by over 18.7%, and the value of subsidies by 38.5%. Simultaneously, the value of intermediate consumption rose by 28.1%. Consequently, income per person employed full time in agriculture at the time decreased by 2.2%, while the average net salary in the national economy grew by 27.3%. Forecast assumptions and results on farmers' income, prepared by the European Commission for the period from 2005 to 2014, need to be quoted here. The forecast indicated that real income calculated per person in full employment is to rise by 32.2% in the 10 countries which joined the European Union in 2004, on condition that employment is reduced during that time (measured in the number of persons in full employment) in agriculture by 21.8%. To achieve such growth, employment in agricultural sector would need to fall by an average of 2.4% annually.

Following Poland's accession to the EU, we witnessed production boom in food industry. The value of food industry production sold has been growing at a rate of 6-7% annually since 2003. This boom is based on solid foundation, as:

— income increase is the driver for the development of domestic food and beverages market;
— food industry companies produce more for export, which is demonstrated in increasing share of export in sales.

The impact of these two growth factors of food industry production varied at particular phases of integration of Poland's economy into that of the European Union. A production boom during the period directly prior to Poland's accession into the



Source: authors' calculations according to the SCO data

Figure 1. **Price indices of agricultural, food produce and inflation rates in the period of 2004-2008 (previous year=100)**

Table 1

Selected data on salary and subsidies in the farm sector in Poland during 2003-2008

Item	Unit	Years					
		2003	2004	2005	2006	2007	2008
Average net remuneration in the national economy	PLN	17 622	18 325	19 060	19 840	21 570	23 330
Income calculated per person employed full time	PLN	4 259	10 290	8 252	9 984	12 411	10 062
Income to average salary ratio	%	24.2	56.2	43.3	50.3	57.5	43.1
Subsidies per person employed full time	PLN	402	4 009	3 882	5 198	5352	5 019
Share of subsidies in income	%	9.4	39.0	47.0	52.1	43.1	49.9

Source: calculation of Z. Floriańczyk and L. Goraj according to the macroeconomic calculations for agriculture - EAA and CSO data

Community was caused mostly by fears of inflation, which led to an increased domestic demand in late 2003 and the first months of 2004. At that time the economy recorded some increase in exports of agro-food products. Whereas price growth during the first months of 2004 caused domestic demand to fall, with simultaneous quick growth in export dynamics.

Nevertheless, this weakened domestic demand was only transitory, as under the influence of Poland's increased economic growth population remuneration increased and another domestic market boom occurred from the mid-2005.

The phenomenon was particularly noticeable in 2007. At the same time, high rate of increased agro-food exports persisted, which indeed demonstrates some downward tendencies (from nearly 30% in 2004-2006 to 18% in 2007), but it remains high.

Since the mid-2005 food processing started to develop on solid grounds, creating both permanent rise in domestic and export demand. With growth rate, food industry production rate in 2003-2004 and early-2005 oscillating significantly, from the mid-2005 onwards the growth rate of the sector stabilised at a high level (approximately 6% annually). In 2008 the growth rate in food industry slowed down to 3% annually. Growth slowdown in this industry branch was being recorded especially since May, 2008.

After the EU accession – similarly to the previous years – secondary processing, that is multi-component product manufacture, highly processed

Table 2

Public funds, co-financing "rural" programmes during 2004-2008 (estimates; public national and the EU funds paid to beneficiaries in million PLN)

Programme name	Funds paid (million PLN)
Rural Areas Development Programme 2004-2006	2 000
SOP "Restructuring and Modernisation of Food Sector and Rural Areas Development" 2004-2006	14 000
Rural Areas Development Programme 2007-2013	6 000
Total	26 000

Source: authors' research

product manufacture, recorded the highest growth rate. During 2003-2008 the production value of this type of processing (in permanent prices) rose by approximately 36%, while production growth rate only amounted to 2% per annum.

Following the EU accession financial ratios improved dramatically in the entire food sector. In the course of 2004-2007 (in comparison with 2003):

- net profitability rose twofold to approximately 4%, while ROE[1] two and half times to approximately 12-13%, to the level over twice as high as NBP's basic interest rate;
- profitability ratios grew only slightly: gross profit margin (from 2.5-3.0 to 4.5-5%), cash revenues (from approximately 5 to 7%), and operating margin (from 8.5 to 9.5%);
- burdens of financial costs levied on revenue decreased (from 2.3% to 1.2-1.3%) and so did income tax on profit from 40% to approximately 20% (main sources of improved net profitability ratios).
- As a result of a significant improvement of profitability in the years past, the following growth rate was achieved:
- four times for the net profit amount - from PLN 1.6 billion in 2003 to PLN 6.5 billion in 2007;
- equity – respectively from PLN 30.1 billion to PLN 44.8 billion (by 59%), including own active assets from PLN 5.1 billion to PLN 10.8 billion.

The above made financing of enlarged (by 41%) investment expenditure possible along with stabilisation of relative long-term debt, whose value increased similarly to equity.

After Poland's accession to the EU and during the following years no changes in entities structure took place in the food sector. There were also no mass bankruptcies (of domestic companies). The economy did not record any increased number of mergers, takeovers or consolidations of entire sectors. However, the number of industrial companies, mostly small and micro-companies fell slightly.

Financial support of agro-food sector from the EU budget

The years directly preceding Poland's membership as well as the first five years of it are a period during which agriculture and rural regions were receiving financial support from the EU budget. During 2004-2008 funds for the development of agriculture and rural regions came from four programmes of many years: a pre-accession SAPARD programme (although the implementation process of SAPARD ended in early-2004, but on account of the principle of n+2, under which projects can be carried out and settled during the year of joining the programme and two subsequent years, a significant amount of SAPARD funds was directed to rural regions already in the course of Poland's membership), Rural Areas Development Programme for 2004-2006, Sector Operational Programme "Restructuring and Modernisation of Food Sector and Rural Areas Development" (financial settlement of both programmes was concluded on December 31, 2008) as well as Rural Areas Development Programme for 2007-2013. The total amount of public funds, both national as well as the EU funds, which were distributed to rural regions during Poland's membership via these programmes can be estimated at PLN 26 billion, that is over PLN 5 billion annually.

Of all the programs listed in Table 2 only SAPARD featured a clear character of an investment programme, supporting above all infrastructure investments (roads, water mains, drainage system), modernisation of some food industry sectors, adjustment to the EU standards, modernisation of farmsteads (chiefly, purchase of farming machinery and tractors). The remaining programmes, carried out entirely in the course of Poland's membership, were of mixed nature. Apart from supporting investments in numerous branches of agro-food industry and further modernisation of farms, both in the period of 2004-2006 and during 2007-2013, substantial funds were allocated to the programmes supporting incomes (subsidising regions with unfavourable conditions) as well as social programmes (structural sickness pensions), and environment protection programmes.

Agricultural income

Poland's accession to the EU resulted in an increase of agricultural incomes. According to Eurostat data, the average income obtained from agricultural activity in Poland in 2008 (as compared with 2000) grew by 90%. However, in comparison

[1] ROE - en. Return on Equity

with 2007, there was a drop in Polish farmers' incomes by nearly 16%, which was caused by the supply-demand situation on agricultural markets. Only Latvia and Estonia recorded higher fall in incomes from among the new member states. Yet, in those countries income growth during 2000-2008 was decidedly higher and it oscillated between 186% (Latvia) and 155% (Estonia).

The volume of agricultural produce sold (less costs incurred) is not the only factor influencing agricultural incomes. Money transfers played a significant role, too. Thanks to Poland's participation in the EU and covering the sector with CAP and structural policy mechanisms, the scale of financial flows for the benefit of agriculture rose dramatically. In the entire period of 2004-2008 Poland's agriculture received EUR 10 387.321 million only in direct payments (jointly from the EU and national budgets). Despite the fact that the amounts of direct payments are gradually increasing in Poland and they are going to reach the level of direct payments received in the EU-15 only in 2013, their impact on agricultural incomes is significant. In 2008 forty-two per cent of farmers' income came from the payments, while a few years before, prior to Poland's accession to the EU, the share of payments from public funds did not exceed 10%.

Nevertheless, income growth in the sector does not mean that each farm experienced positive effects of the accession to an equal degree. Relatively the highest rise in incomes was observed in very small farmsteads. However, despite the support received from the CAP, a definite majority of farms was not and will not be able in the future to turn into entities which can ensure the level of income guaranteeing the standard of living to a farmer's family similar to that achieved outside an agricultural sector (parity of consumption level) and funds for farm growth. Only farms larger than 35 hectares (approximately 76 thousand) can be deemed to have a potential, guaranteeing both proper standard of living to a family and investment opportunities.

Investments and modernisation of farmsteads

Poland's joining the EU brought about an investment boom in agriculture and it accelerated farm modernization. Preferential investment credits and the EU aid funds played a huge role in the process.

The obligation to adapt to sanitary, hygienic and veterinary requirements with simultaneous access to funds constituted a powerful investment impulse. Bringing dairy farms to the EU quality standards posed a substantial challenge. In the mid-2003 barely 4% of farms supplying milk to dairies fulfilled the conditions of production and milk quality standards in force in the EU. Investments into modernisation of cow-houses, construction of rooms for milk storage, installation of modern systems of ventilation, lightning or cow milking were necessary. Therefore milk farms were granted a transitory period (until the end of 2006) to bring their milk up to the quality standard required.

Before Poland's accession to the EU, the standards of environment protection and animal well-being imposed on Polish farms rose substantial doubts among farmers. There were fears that costs of adjustment, estimated at EUR 1708 million, would be too high and would cause many farms to go bankrupt. Animal production farms, which, inter alia, needed to build devices for manure and liquid organic waste storage, required the highest pro-environment investments. It was estimated that the cost of adjustments per one farmstead could even reach PLN 17 thousand. Egg producing farms also needed to carry out suitable adjustments. Consequently, during the accession negotiations they were granted a transitory period (until December 31, 2009) for the modernisation or exchange of cages in which layer hens were kept, thanks to which the investment process could have been spread over a period of several years.

In a situation of low agriculture profitability the support from public fund was needed to conduct modernisation changes. Investment activities aimed at adjustment to the EU standards could already be carried out prior to the accessions itself, particularly thanks to the support received under the SAPARD programme. However, farmers showed moderate interest in the aid provided. As a result, only a limited number of animal breeding agricultural farms took advantage of the aid scheme. Most of the funds were spent on modernisation of machine park.

Following Poland's accession to the EU, funds for the adjustment to the EU standards were available under the Rural Areas Development Programme (RADP) 2004-2006. Aid could have been obtained for, inter alia, equipping farms with devices for manure storage, the investments necessary at milk farms and chicken farms. Farmers demonstrated fairly high degree of interest in that activity. In total, nearly EUR 631 million of public funds was spent on bringing farms up to the EU standards, from which 70.8 thousand farmers benefited. Under SOP Agriculture in 2004-2006 nearly 27 thousand farmers obtained direct aid to investments carried out at agricultural farms.

It was expected that direct payments would become one of the instruments which would stimulate the investment process in Poland after its entry into the EU. Although their influence on the improvement of farmers' income is unquestionable, it is still not known to what purpose were these funds mostly spent. Sub-studies indicate that a significant part of payments was allocated to expenditure relative to on-going agricultural production.

During 2004-007 investment outlays in agriculture grew by nearly 70%. Investments of farms on buildings rose from PLN 844 million to PLN 1430 million at that time. Making the funds available stimulated a demand for farming machines. In 2007 tractor deliveries soared by nearly 70% in relation to 2007, sales of cultivators rose as well (550%), combine harvesters (20%), potato planters (78%). Modernisation activities resulted in, inter alia, concentration of stock-breeding in modern farms, the share of high standard milk grew. Yet, on

the contrary, some farms, especially smaller ones, gave up production. From the season of 2004/2005 to 2008/2009 the number of milk suppliers fell from 355 thousand to 195 thousand. Nevertheless, it did not affect the total volume of milk production in Poland due to the growth of livestock population and improvement of cows' lactation yield.

Activity diversification in rural areas

During the period of transformation in the early 1990s the conditions of carrying out agricultural production in Poland deteriorated markedly. Restriction of state interventionism led to a dramatic drop in real prices for agricultural produce, and produce sales ensued with decreasing domestic demand difficulties. Unfavourable agrarian structure (dominance of small farms) limited the possibilities of improving agricultural production efficiency. Finding alternative employment would be a solution out of the situation. However, opportunities of earning a living outside of farming decreased dramatically at the same time as due to general economic conditions. Unemployment was growing; whereas farms fulfilled a role of a social buffer. It is estimated that unemployment (overt and hidden unemployment jointly) affected over 2 million people in the countryside.

The question of surplus labour force and unemployment in the countryside was one of the main problems occurring in the rural areas. Poland's entry into the EU seemed to offer a chance of improving the situation of countryside residents in the labour market. Thanks to pre-accession aid, and in particular the funds available under the SAPARD programme, Polish countryside was given a powerful impulse for developing all forms of entrepreneurship. During the entire period of the program operation PLN 45 million was spent on creation of additional income in the countryside. The activities which received support included, inter alia, services for farms, building and installation works and services, tourist and transport services. A majority of the projects carried out aimed at developing agri-tourism activities. Under the activity targeted at entrepreneurs, 2620 projects were implemented with the total amount of PLN 220 million, aimed at creation of additional job places.

Poland's economic growth after its accession to the EU had a positive impact on the labour market and it created new places of work in all Poland. Some residents of rural areas found employment in cities or emigrated to other countries. Approach to the agricultural policy changed, taking into account the issue of multi-functional development of rural areas to a greater degree. The implemented instruments of the EU structural policy provided additional support to income diversification in rural areas. SOP Agriculture had a budget exceeding PLN 300 million to back up the development of alternative sources of income in the countryside, out of which 90% was spent. The Integrated Regional Operational Programme (IROP) created opportunities for professional reorientation of the people abandoning agriculture or for support to micro-businesses. In the Rural Areas Development Program for 2007-2013 (RADP) EUR 1.37 billion is to be allocated for rural economy diversification in that entire period.

Poland's joining the EU accelerated the process of reducing the agrarian character of the Polish countryside and improving its situation in the labour market. During 2003-2007 registered unemployment in rural areas fell by over one third, a percentage of people employed in farming during that time dropped from 18.3% to 15%. In 2007 those working outside of farming in the countryside found employment in industrial processing (31.9%), commerce and repairs (17.1%) as well as the building sector (9.9%).

Although the funds from the EU budget have undoubtedly influenced the pace of the process and enabled the development of alternative sources of income, it is difficult to estimate the efficiency of all the supported projects. Still, the actions targeted at the countryside have not always been well-aimed or carried out in a manner that suited the needs. Low interest demonstrated by farmers in using individual consultancy services on choosing a new occupation or subsidising work places, where farmers would be employed, serves as a good example. At present the policy of rural areas development is implemented in Poland under the RADP 2007-2013. Yet, allocation of funds to particular activities indicates that the concept of a multi-functional development of the countryside has not gained wide support in Poland. A majority of funds have been allocated to activities related exclusively to agricultural production. This shows that the countryside policy maintains its traditional character and there is a need for a change in the approach to the idea of a sustainable growth of rural areas not so much on a strategic, but rather on implementation level.

Conclusions

1. Poland's accession to the European Union served as a boost to changes in rural areas. Instruments of the Common Agricultural Policy had a positive impact on the profitability of agricultural production and improved farmers' financial situation. In 2008 THE average income of a person employed in farming in Poland was by 90% higher than the level obtained in 2000. Income growth in the sector does not, however, mean that every farm experienced positive effects of the accession to an equal degree. Although very small farms recorded relatively higher income growth, their level still continues to deviate decidedly from the average income earned in cities and does not ensure means for investments into the farm development. Implementation of rural areas development policy accelerated the process of agricultural sector modernisation and diversification of sources of income in the countryside.

2. The accession changed the supply and demand conditions in individual agricultural markets. Global agricultural production in 2007 was by 46% higher than in 2000. Gross value added of agricultural production rose by nearly PLN 10 billion in that period (from PLN 17.7 billion to PLN 27.2 billion).
3. Improvements in running an agricultural activity as well as a system of direct payments granted to a hectare of land impacted a fast increase of agricultural land prices. In 2008 the price of one hectare of arable land traded between farmers grew by 140% in relation to the price recorded in 2003, whereas the price of one hectare of arable land sold by the Agricultural Real Estate Agency rose by 230% in the same period. Nevertheless, the fears, prevailing prior to the accession, of foreigners buying up land did not come true. Interest in purchase of farm land and forested land as well as the so-called second homes, did not rise significantly.
4. Removal of trade barriers between Poland and the EU showed high price competitiveness of domestic agricultural and food products. From the moment of the accession Poland has maintained a trade surplus in foreign trade of these products. During 2003-2007 export soared by 230%, while import by approx. 125%. Other EU countries acquired an increasingly important role as Poland's trade partners. In 2003 nearly two thirds of all agro-food exports were directed to the present EU-27 states. Four years later the share has exceeded 80%.

Bibliography

1. Kowalska A., Polski sektor żywnościowy 5 lat po akcesji. (2009) .Agencja Rynku Rolnego. Biuletyn Informacyjny Nr 6.
2. Mroczek R., Wpływ Wspólnej Polityki Rolnej w Polsce. W: Rozwój sektora rolno-spożywczego w Polsce. (2008). IERiGŻ Warszawa.
3. Poczta W. Rolnictwo. W: Polska wieś. Raport o stanie wsi. (2008.) FAPA, Warszawa.
4. Polska w Unii Europejskiej – doświadczenia pierwszego roku członkostwa. (2005) .UKIE.
5. Polska w Unii Europejskiej – raport, 5 lat, (2009). UKIE.

Choice of Tractor Aggregate Depending on the Amount of the Performed Work

Astra Asejeva, Department of Business and Management, Latvia University of Agriculture
Nikolajs Kopiks, Dainis Viesturs, Research Institute of Agriculture Machinery,
Latvia University of Agriculture; e-mail: uzc@delfi.lv

Abstract. The article deals with an issue of the choice of a tractor aggregate depending on the amount of the performed work, considering possible losses of the yield due to the deferred completion of work, in terms deviating from the optimum value, and applying the method of economic-mathematical simulation. The research results based on the data calculation show that deferred completion of the work and yield losses can be prevented by using highly-efficient aggregates. Limitations were shown on an efficient use of some ploughing and sowing tractor aggregates.
This method allows a motivated choice of an economically most efficient tractor aggregate depending on the amount of the performed work; provision of a producer of agricultural products with information on the allowed deviation of the aggregate indices from their optimum value, which do not affect the costs essentially as well as the costs connected with the prime cost of the product and the efficiency of capital investments.
Solver, a superstructure of the MS Excel, was used for the calculation of the mathematical model solving it as a task of optimising non-linear programming. The choice of ploughing and sowing tractor aggregates is given as an example.
Key words: amount of work, specific costs, tractor aggregate, economic-mathematical simulation.

Introduction

The development and competitive capacity of agricultural production depends in many ways on how justified is each producer's attitude towards the technical provision of his production unit.

Application of economic-mathematical methods for the formation of technical provision of production processes allows making a justified choice of technical means and carrying out their improvement; thus simultaneously raising technical-economic indices and the level of agricultural production as well as opening of new non-traditional ways for the solution of production tasks by applying information technologies.

Materials and methods

The research aim is to develop a model for the choice of a tractor aggregate depending on the amount of the performed work, considering possible yield losses due to the deferred completion of work, in terms deviating from the optimum value, and applying economic-mathematical methods. The offered model will allow to provide information to a producer of agricultural products how to choose the optimum variant of a tractor aggregate depending on the amount of the performed work, considering the requirements and conditions of his farm while modifying and adapting the new technologies for the cultivation of agricultural crops.

The following methods were used to solve the advanced aim: economic-mathematical models, and the method of parametric optimisation of functional dependencies reflecting the character of the investigated process [1, 2, 3, 4] as well as theoretical foundations of completing machine and tractor aggregates were used to find out functional dependencies.

Results and discussion

The authors will discuss the proposed method for the choice of a tractor aggregate depending on the amount of the performed work using an example when it is necessary to perform the operations of ploughing and sowing. It can be done using the aggregates presented in Table 1. The data on aggregates were obtained from the company "Armuss" which distributes agricultural machines. It is necessary to establish the efficiency of each aggregate, simultaneously considering possible yield losses due to the deferred optimum terms for the completion of the work. If the completion of ploughing deviates from the optimum terms, then the yield losses make – 0.0005 per unit of time (24 hours), in the case of sowing – 0.005. The values of these coefficients for the yield losses are obtained from the data in publications [5, 6, 7].

Input data: technological speed of aggregates – 8 km/h; depreciation deductions – 0.17; annual loading of the tractor – 1200 h; expected yield – 5 t/ha; price of grain – 75 LVL/t; hourly rate – 1.34 LVL; price of fuel – 0.57 LVL/kg; length of the working day – 10 h (time of the work of the aggregate during the day).

The following mathematical model for the choice of a tractor aggregate by the criterion of the reduced costs is applied, since it evaluates the possible yield losses and considers the time factor for the performance of the operations:

Table 1

Type of operation	Configuration of the aggregate		Price, LVL		Working width of the aggregate, m	Fuel consumption, kg/ha
	Tractor	Machine	Tractor	Machine		
1. Ploughing	McCormick MTX145	Kverneland EM 100 4 bodies	46700	12940	1.6	15
2. Ploughing	McCormick XTX145	Kverneland EM 100 5 bodies	48400	14830	2.0	16.5
1. Sowing	McCormick MC115	Kverneland Accord M-drill	30100	19200	3.0	6
2. Sowing	McCormick XTX145	Kverneland Accord M-drill	48400	25500	4.0	8.5

$$Z = F(T, P)$$

where

Z – the reduced costs,

T – the vector of technical parameters **{B, V, Q}** (working width of the agricultural machine, technological speed of the aggregate, fuel consumption).

P – the vector of price indices $\{C_T, \rho, C_M, C_Q, \alpha, C_U\}$ (price of the tractor, ratio of the particular operation in total annual amount of work, price of the agricultural machine, price of fuel, hourly rate for the work, price of the yield due to the possible losses).

In this case the deductions for technical repairs and maintenance are independent, they are considered in proportion with the performed work.

This model for the choice of a tractor aggregate has a feature that distinguishes it from other aggregates [3; 4] – the functional dependencies included into the price indicators cover the possible yield losses during the choice. It is important, since this indicator allows establishing a limit for the efficient use of an aggregate. Solver, a superstructure of the MS Excel, was used to calculate the mathematical model solving it as a task of optimising non-linear programming.

At the beginning the authors show variations in the specific reduced costs of the ploughing aggregates depending on the amount of the performed work; here the possible yield losses are not considered due to the deferred optimum terms for completion of the work (Figure 1).

The curves presented in Figure 1 on the variations in the specific reduced costs of the ploughing aggregates depending on the amount of the performed work show that their value diminishes with the increase of the amount of the performed work, and they have a parabolic appearance.

The values of specific reduced costs of the ploughing aggregates A1 and A2 are equal (Z_1=Z_2), when the amount of the performed work is 900 ha. It is a limit for an equally economically efficient use of these two ploughing aggregates. The specific reduced costs of these ploughing aggregates are equal after the performance of this amount of work. After that the amount of the performed work increases and the ploughing aggregate A2 becomes more efficient (Z_1> Z_2).

Figure 2 shows variations in the specific reduced costs of the ploughing aggregates depending on the amount of the performed work and considering the possible yield losses.

The calculation was done using a mathematical model for the choice of a tractor aggregate discussed in the articles [3, 4] with a distinction that it comprises a variable of the possible yield losses.

It is evident from the graph in Figure 2 that each aggregate has an optimum value of the specific reduced costs (**Z**opt) depending on the amount of the performed work – **S** and the number of days spent to perform a particular amount of work – **D**.

Thus, the optimum value of the specific reduced costs for the aggregate A1 is 22.19 LVL/ha (including the costs of the possible yield losses), the amount of the performed work is 349 ha, the number of days spent to perform the particular amount of work is 27.3 days. The following figures are obtained for the aggregate A2: **Z**opt – 22.1 LVL/ha.; S – 425 ha; and D – 26.5 days. The point $\mathbf{K}_{A1-A2}$ is the limit of equal economic efficiency of these two ploughing aggregates where the amounts of the performed work and the specific reduced costs of the ploughing aggregates A1 and A2 are $\mathbf{S_1 = S_2}$ and $\mathbf{Z_1 = Z_2}$, before the point $\mathbf{K}_{A1-A2}$ (from the beginning of the coordinates) the ploughing aggregate A1 is more efficient in contrast to A2 since ($\mathbf{Z_1 < Z_2}$). After the point $\mathbf{K}_{A1-A2}$ the ploughing aggregate A2 is more efficient in contrast to A1 ($\mathbf{Z_2 > Z_1}$).

Besides, when the specific reduced costs were determined for the ploughing aggregates A1

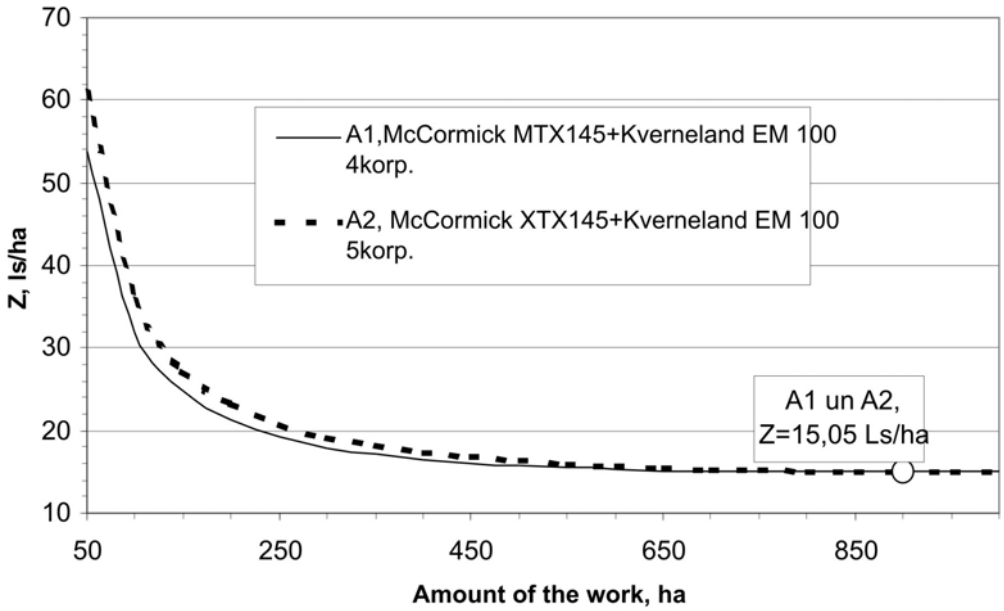


Figure 1. **Variations in the specific reduced costs of the ploughing aggregates depending on the amount of the performed work**

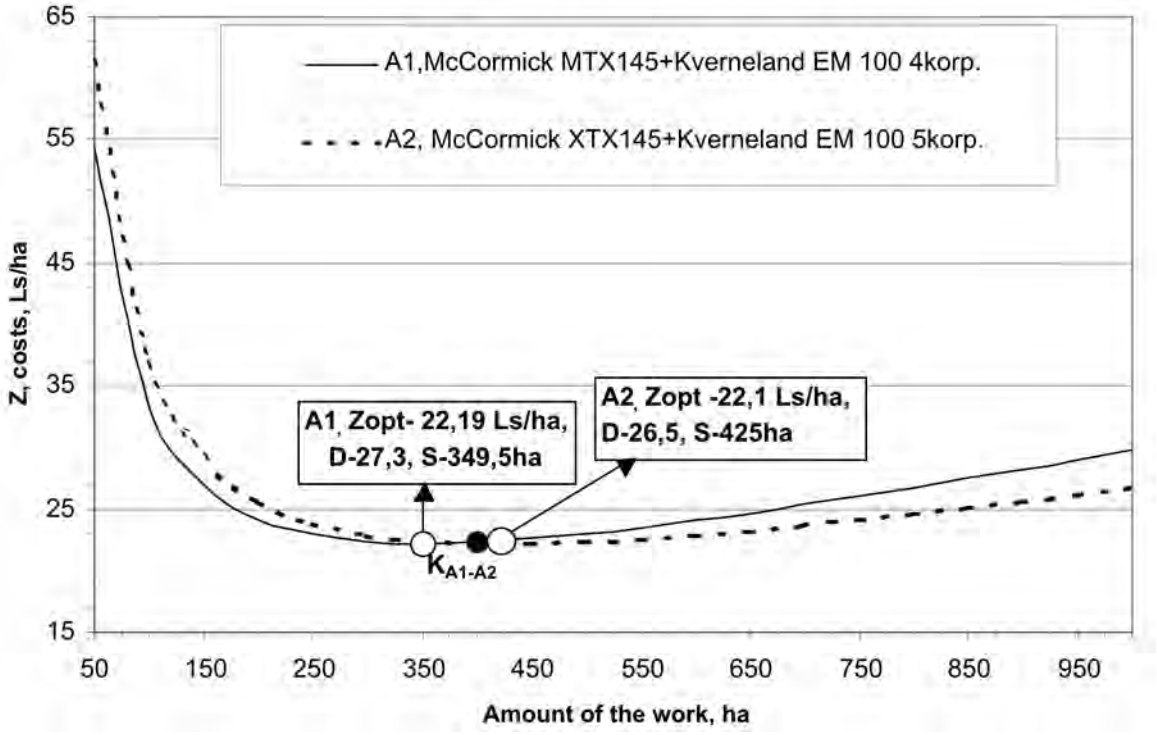


Figure 2. **Variations in the specific reduced costs of the ploughing aggregates depending on the amount of the performed work and the possible yield losses**

and A2 without considering the possible yield losses due to the deferred optimum terms for completion of the work (Figure 1), the values of the specific reduced costs of the ploughing aggregates A1 and A2 were equal for 900 ha, but when the costs due to the considered possible yield losses (Figure 2), they corresponded to 400 ha. We see that the limit of the equal economic efficiency from the use of these two ploughing aggregates has diminished almost twice, while the specific reduced costs have increased by 48%.

It is also evident from the graphs in Figures 1 and 2 that, in case the specific reduced costs are determined without taking into account the possible yield losses due to the deferred optimum terms for completion of the work, the cost of the aggregate A1 is 17.94 LVL/ha when the amount of the

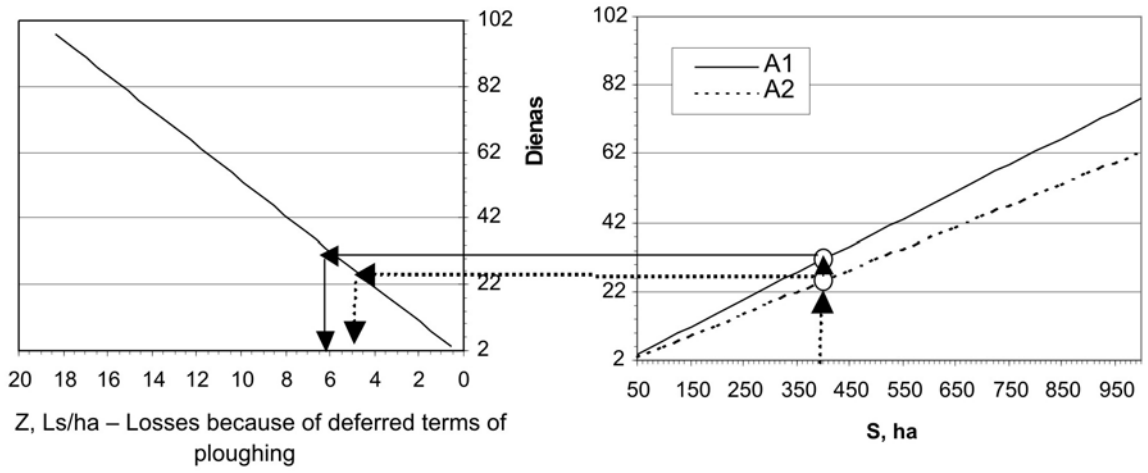


Figure 3. **Determination of the length of the performed work for the discussed ploughing aggregates and the costs of the possible yield losses depending on the amount of the performed work**

performed work equals to 300 ha; if the costs of the possible yield losses are considered, the cost of the aggregate A1 is 22.19 LVL/ha when the amount of the performed work equals to 349.5 ha. For the aggregates A2, the costs without taking into account the possible yield losses are 19.32 LVL/ha when the amount of the performed work equals to 300 ha; if the costs of the possible yield losses are considered, the costs are 26.5 LVL/ha and the amount of the performed work equals to 425 ha. The limit of the economic efficiency from the use of these aggregates, changes depending on the amount of the performed work and considering the possible yield losses.

Figure 3 reflects variations in the length of the performed work and the costs arising from the possible yield losses for the discussed ploughing aggregates depending on the amount of the performed work.

By means of the graph presented in Figure 3 it is possible to determine the number of working days and the possible yield losses depending on the amount of the performed work. The order of determination is shown by arrows in the example for the aggregates A1 and A2 and the amount of the performed work S is 425 ha. For the aggregate A1 the number of working days and the possible yield losses are higher than for the aggregate A2, the amount of the performed work remaining the same but the total costs of the aggregate A1 being higher than for A2 (Figure 2).

The data indicate that a part of the costs due to the possible yield losses arising from deferred terms of the accomplished work are considerably lower for the highly efficient aggregates (Figure 3).

Figure 4 demonstrates variations in the specific reduced costs of the sowing aggregates depending on the amount of the performed work, and considering the costs of the possible yield losses.

It is evident from the graph presented in Figure 4 that each aggregate has its limit of efficient usage. Thus, for the aggregate A1 it is S – 203.6 ha, the optimum value of the specific reduced costs **Z**opt – 36 LVL/ha, the number of working days spent to perform the particular amount of work – 8.3 days. For the aggregate A2: S – 250.3 ha; **Z**opt – 37 LVL/ha.; and D – 7.8 days. Point **K** is the limit of equal economic efficiency of these two sowing aggregates, where the amounts of the performed work and the specific reduced costs **($S_1 = S_2$** and **$Z_1 = Z_2$)** of the sowing aggregates A1 and A2 are equal. Before the point **K** (from the beginning of the coordinates) the sowing aggregate A1 is more efficient in contrast to A2 (**$Z_1 < Z_2$**). After the point **K** the sowing aggregate A2 is more efficient than A2 (**$Z_1 > Z_2$**).

If the curves of the reduced costs of the aggregates do not cross, then the aggregate with the lesser value of the specific reduced costs for the entire range of the performed work will be economically more efficient.

The data analysis indicates that for the choice of optimal aggregates it is necessary to take into account the factor of time when a definite amount of work is performed and the yield losses arising from the deferred optimum agrotechnical terms of the accomplished work.

In the example of the choice of an aggregate the value of a coefficient of the yield losses arising from deferred terms of sowing is considerably higher than of ploughing, besides, as shown in Figure 4, the curves which reflect the value of the specific reduced costs have a more expressed character of their variability. In ploughing (Figure 2), variations in the variable costs of the discussed aggregates proceed at a lesser speed than their optimum values.

Conclusions

The proposed economic-mathematical model for the choice of tractor aggregates allow to consider the possible yield losses due to the deferred completion of the work and prove the economic expediency of their timely execution.

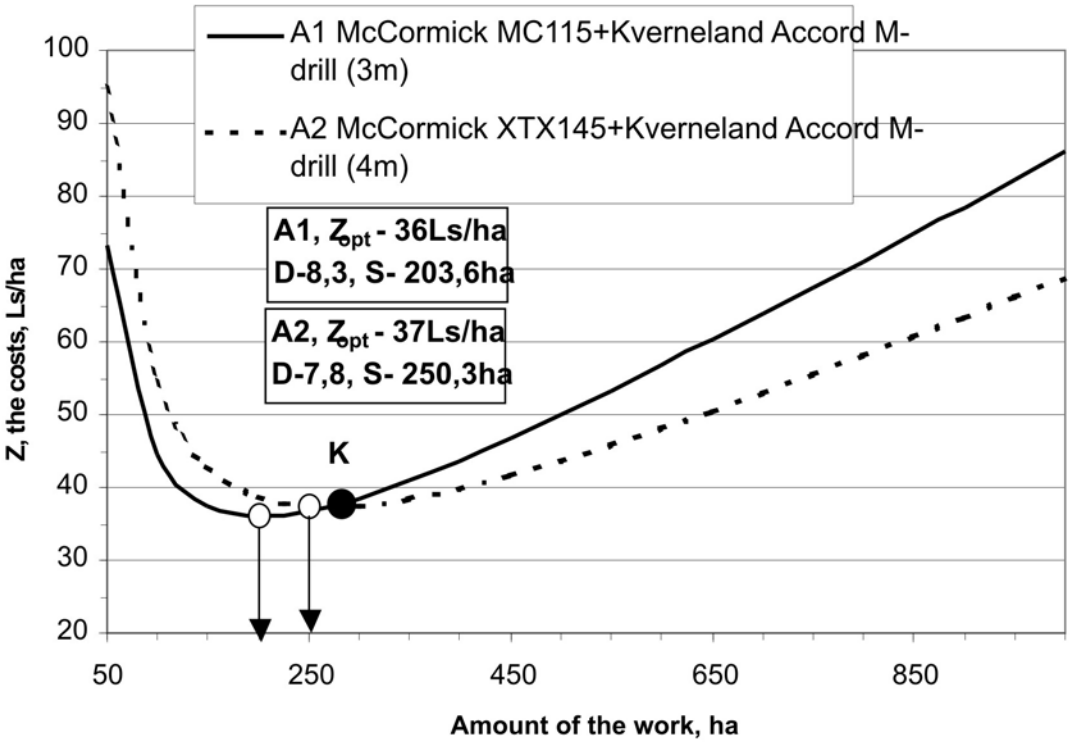


Figure 4. **Variations in the specific reduced costs of the sowing aggregates depending on the amount of the performed work and the costs of the possible yield losses**

The data analysis indicates that less possible yield losses arising from deferred terms of the accomplished work may be achieved by the use of highly efficient aggregates.

Bibliography

1. Дж. Франс, Дж. Х. М. Торили. (1987) Математические модели в сельском хозяйстве. Пер. с англ. – Москва: Агропромиздат,. 400 стр.
2. Таха, Хемди А. (2005) Введение в исследование операций 7-е издание.: Пер. с англ.- Москва.: Издательский дом «Вильямс», 912 стр.
3. A. Asejeva, N. Kopiks, D.Viesturs. (2006) Choice of an Optimum Ploughing and Sowing Aggregate for Different Amounts of Work. Proceedings of the International Scientific Conference "Economic Science for Rural Development," № 10. Jelgava. pp. 139-144.
4. A. Asejeva, N. Kopiks, D.Viesturs. (2008.) Application of Economic-Mathematical Simulation for the Choice of the Technical Support of Technologies of Agricultural Crops. Proceedings of the International Scientific Conference "Economic Science for Rural Development," № 16. Jelgava: pp. 14-19.
5. Arnolds Riekstiņš, (2008.) Laukkopība. Talsi, 61-80 lpp.
6. Ю. К. Киртбая. (1982.) Резервы в использовании машинно - тракторного парка. М.: Колос, 319 с.
7. Б. В. Павлов и др. (1982) Проектирование комплексной механизации сельскохозяйственных предприятий. М.: Колос, 288 с.

Kopsavilkums

Raksta pamatā ir pētījums par traktora agregāta izvēli atkarībā no izpildāmā darba apjoma un iespējamiem ražas zudumiem sakarā ar darbu izpildes termiņu nobīdēm no optimālajiem termiņiem, pielietojot ekonomiski-matemātisko modelēšanas metodi. Pēc pētījuma datu rezultātiem konstatēts: lai novērstu darbu izpildes termiņu pagarinājumu un ražas zudumu lietderīgi efektīvāk izmantot augstražīgākus agregātus, ņemot vērā arī atsevišķu augsnes apstrādes un sējas traktoru agregātu izmantošanas efektivitātes robežu.

Pielietojamā metode ļauj izvēlēties ekonomiski efektīvāko traktoru agregātu atkarībā no izpildāmo darbu apjoma, ievērtējot ražas zudumus darbu izpildes optimālo terminu neievērošana dēļ.

Matemātiskā modeļa aprēķinam izmantota programma MS Excel Solver, risinot to kā nelineārās programmēšanas optimizācijas uzdevumu. Kā piemērs pētīta augsnes apstrādes un sējas traktoru agregātu izvēle.

Bioeconomic Aspects of the Innovative Composition of Broiler Chicken Meat Production

Sallija Ceriņa, Mg.oec., research assistant, Research Institute of Biotechnology and Veterinary Medicine "Sigra" of Latvia University of Agriculture
Irina Pilvere, Dr.oec., professor, Faculty of Economics, Latvia University of Agriculture

Abstract. Innovative composition of broiler chicken meat, in comparison with commercial mass production, contains higher levels of omega-6 and omega-3 fatty acids and carotenoids complex which positively influence human health and prevent risk factors causing different diseases. The research aim was to evaluate the possibility to obtain broiler chicken meat of innovative composition, and to evaluate the expenses of production in bioeconomic aspects by using feed that contains an increased amount of omega-6 and omega-3 fatty acids and additives of carotenoids. Feeding trial was carried with cross ROSS 308 broiler chicken in the age from 1 to 42 days (n=300). It was concluded that the best combination in broiler chicken feed for producing innovative composition meat was 1% flax seed oil, 1% rapeseed oil, and 2% soya bean oil and 0.1% additives of carotenoids complex. Using the mentioned oil and antioxidant composition the obtained broiler chicken meat contained the amount of omega-6 fatty acids of 27.4%, omega-3 fatty acids- 8.3% and carotenoids - 0.86 mg kg^{-1}, it is by 3.9%, 3.2% and 0.24 mg kg^{-1} higher in comparison with commercial mass productions. Poultry organism metabolic processes are essential factors determining the levels of fatty acids and carotenoids in meat, therefore it is impossible to evaluate and calculate these physiological processes in organisms economically.
In trial the expenses of feed consumption per 1000 broiler chicken breeding were by 1.7% higher than commercial feed, while broiler chicken productivity was 7.9% higher, since the total income from sales of 1000 broiler chicken breeding amounted to LVL 293.47 or it was 15% higher than selling commercial mass production.
Key words: broiler chicken, vegetable oil, fatty acids, antioxidant, expenses.

Introduction

In Latvia poultry meat plays a significant role in the meat production sector. Consumers' demand for qualitative and healthy poultry meat products increases. Qualitative and healthy poultry meat is characteristic with high content of polyunsaturated fatty acids (omega-6 and omega-3), vitamins, anti-oxidants (carotenoids) and mineral substances, and low level of saturated fatty acids and cholesterol (Holub B.J., 2002, Bodnieks E., 2008). Hence the current goal for poultry meat production is not to increase the quantity of poultry output, but to increase the production of qualitative and innovative poultry products. Innovative food-stuff contains biologically active substances, which favourably influence vital functions of human body, reduce risk factors of different diseases and promote health preservation (Zariņš, Neimane, 2002). The necessity to produce innovative food products with appropriate content increases constantly. It shall be noted that the population of the world and Latvia mostly suffer from cardiovascular diseases (WHO, 2003). The shortage of omega group fatty acids (linolenic acid and linoleic acid) and antioxidants (carotenoids) in everyday food products is one of the cardiovascular diseases risk factors. Intake of omega group fatty acids and antioxidants with nutrients enables metabolism of cholesterol in human body, and averts risk factors causing cardiovascular, tumor, rheumatic, and other diseases (Aro, 2000). Fatty acids in human body are more or less subjected to oxidation processes. Free radicles, which are neutralised by antioxidants, carotenoids, selenium, vitamin E etc. originate due to the oxidation process of fatty acids. Hence, producing fatty acid-rich products, the content of antioxidants, especially carotenoids shall be increased (Surai, 2002). It shall be specified that currently studies are being carried out on the production of innovative composition broiler chicken meat. Researchers in Estonia have studied possibilities on increasing omega-6 and omega-3 fatty acids in broiler chicken and quail meat and fat (Hämmal J., etc. 2000, Tikk H., etc. 2002). Latvia has all the possibilities to develop production of innovative composition broiler chicken meat with an increased content of omega group fatty acids and antioxidants due to:

1) production of the necessary feeding stuff for production of innovative composition broiler chicken meat with an increased omega-6 and omega-3 content;
2) breeding of highly productive avian crosses;
3) annual growth tendency related to poultry consumption and production rate.

Unfortunately production of innovative composition poultry meat containing an increased omega group fatty acids and carotenoid level is not developed in Latvia. With the development of foodstuff production technologies innovative high-quality food products are supplied to the market, thus consumers may shape balanced and healthy everyday diet.

Innovative food production has attracted a pretty big attention (Mazza G., 1998) and it represents one of the growing food industry sectors in the world (Harris C., 2000). In the USA annual sales of innovative food equals to USD 50 billion due to the increase of innovative food production (Harris C., 2000). Production of innovative composition meat requires increased expenses, thus sales prices of such meat might be higher. Prices significantly differ in the UK; they are as high as the prices of poultry products obtained in the process of organic farming, which are usually twice higher than the prices of commercial products. Mainly the price difference is due to the costs of additional feeding stuff included into the avian feed (Michella S.M., 2000). Consumers believe that the price speaks on the quality of a product, while others perceive it as a symbol of social status, though some others consider that the price identifies a supplier's opinion on the value invested in a product (Upīte Ī., 2000). Consequently the prices of innovative composition poultry meat are higher than traditional content poultry meat, since the quality of innovative broiler chicken meat is higher and more favourable for human health. The price shall comply with the quality. A company working in the direct market sector (meat production) has an opportunity to set sales price of a product by means of better quality. Suppliers possess many possibilities of informing consumers on the quality and healthiness of innovative composition meat (Buģina V., 2007).

It actually determines the research topicality for the national economy of Latvia to enhance production of innovative composition broiler chicken meat containing an increased amount of omega-6 and omega-3 fatty acids, and carotenoids. Feed costs amounting to 73-76% of total costs constitute the majority of production costs related to broiler chicken meat production. An intense production of such innovative broiler chicken meat products requires an economic and scientific assessment. Therefore the following research **hypothesis** was advanced*:* production costs of innovative composition broiler chicken meat exceed production costs of commercial composition broiler chicken meat. The research **aim** is to assess economic aspects for production of innovative broiler chicken meat on trial conditions. The following **tasks** are defined to achieve the set aim:

1) to clarify the quality of available feeding stuff, doses and costs of avian feeding for the production of innovative composition meat;
2) to verify avian productivity and the quality of innovative composition broiler chicken meat as a result of practical trials;
3) to assess production costs and possible revenues of innovative composition broiler chicken meat.

Generally accepted economic research **methods** were used for the purposes of the study, like monographic method and method of comparative analysis and synthesis. Scientific literature on innovative food products and their significance in human health has been analysed (Holub B.J., 2002, Bodnieks E., 2008, Zariņš Z., Neimane L., 2002, Surai P.F.2002, Mazza G., 1998, Harris C., 2000, Michella S.M., 2000, Upīte Ī., 2000). In the summer of 2009 a feeding trial was carried with cross ROSS 308 broiler chicken (n=300) in the vivarium of Physiology Block of the Research Institute of Biotechnology and Veterinary Medicine "Sigra", Latvia University of Agriculture (Table 3). The trial with broiler chickens lasted for 42 days. Broiler chickens were divided into 2 groups: Group 1 – control and Group 2 – trial. Broiler chickens from the two groups were fed with the basic feed (BF) of the same content. Feed content for production of innovative broiler chicken meat is shown in Table 3.

Results and discussion

1. Assessment of feeding stuff and doses by the content of fatty acids and costs

The production of innovative composition broiler chicken meat, which compared with conventional composition broiler chicken meat contains an increased omega-6 (linoleic acid) and omega-3 (linolenic acid) content requires avian feed that consists of fatty acid containing feeding stuff – seed oils (flaxseed, rapeseed, soya bean). Thus the content of omega-6 and omega-3, and costs per dose were assessed in locally produced (in Latvia) rapeseed and flaxseed oils. The content of these fatty acids in imported soya bean oil frequently used in poultry farming was analysed comparatively (Table 1).

The largest omega-3 fatty acid content was observed in flaxseed oil amounting to 55%, which 6-7 times exceeds the respective figures in rapeseed oil and soya bean oil; while the largest omega-6 amount is observed in soya bean oil amounting to 54%, if calculated in per cent of total lipid amount. It is 3-4 times higher than in rapeseed oil and flaxseed oil (Table 1).

One kilogram of flaxseed oil contained most omega-3 and omega-6 fatty acids, namely, 666 g/kg,

Table 1

Content and ratio of fatty acids in vegetable oils

Parameters	Omega-3 linolenic acid, %	Omega-6 linoleic acid, %	ω-6:ω-3 ratio
Flaxseed oil	55.0	13.0	0.2 : 1
Rapeseed oil	9.0	20.0	2.8 : 1
Soya bean oil	8.0	54.0	6.8 : 1

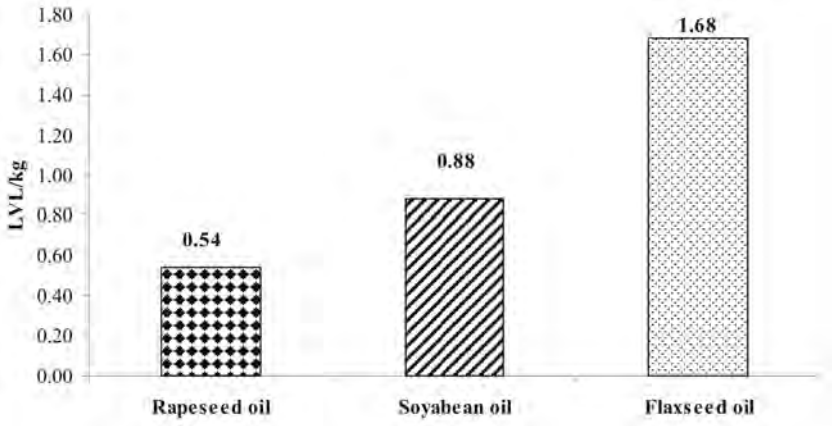
Source: made by the authors according to the trial data of the Research Institute "Sigra" (Vītiņa Ī.,et al, 2009)

Table 2

Amount (g) of linolenic acid and linoleic acid per one kg of feeding stuff

Parameters	Flaxseed oil	Rapeseed oil	Soya bean oil
omega-3 linolenic acid, g	539	88	78
omega-6 linoleic acid, g	127	245	529
Total, g	666	333	607

Source: made by the authors according to the trial data of the Research Institute "Sigra"



Source: made by the authors according to the producers' sales prices

Figure 1. **Vegetable oils sales prices of "Iecavnieks" Ltd and "Rīgas kombinētās lopbarības rūpnīca" Ltd from December 1, 2009, LVL/kg**

while the least amount was detected in rapeseed oil, so the difference is 2 times (Table 2).

One kilogram of flaxseed oil contained 539 g of omega-3 and 127 g of omega-6 fatty acids. According to the total content of omega-3 and omega-6 fatty acids (Table 2) flaxseed oil was the most valuable feeding stuff, though it was also the most expensive one (Figure 1). Total content of omega-6 and omega-3 fatty acids in flaxseed oil is 666 g/kg and its price equals to 1.68 LVL/kg.

Out of the two analysed fatty acids in the composition of innovative products exactly omega-3 fatty acid has an especial physiological significance in a human body. The majority of conventional food products contain insufficient amount of omega-3 fatty acid, while the shortage of omega-6 fatty acid is not so expressed. Hence the content of omega-3 in the used feeding stuff is of great importance, and the larger the content of omega-3 in the used feeding stuff, the greater the possibility that the obtained innovative product contains larger content of these fatty acids. Consequently according to the content of omega-3 fatty acids the soya bean oil is less valuable than flaxseed oil. Rapeseed and soya bean oils are almost equivalent according to omega-3 content, but rapeseed oil contains less content of omega-6 fatty acids (Table 2).

The prices of vegetable oils supplied by "Iecavnieks" Ltd and "Rīgas kombinētās lopbarības rūpnīca" Ltd valid from December 1, 2009 are shown in Figure 1.

Locally produced flaxseed oil and rapeseed oil as well as imported sunflower-seed oil and soya bean oil might be used for the production of innovative poultry products. The most economically profitable feeding stuff used for the production of innovative products is determined following the costs of fatty acids amount (kg) in oils, amount costs of the used doses and impact of this dose on poultry productivity and content of fatty acids in the obtained production. Therefore it is necessary to add oil blends containing both high omega-3 and omega-6 levels to feeding stuff to produce innovative broiler chicken meat.

Flaxseed oil contains the most balanced amount ratio of omega-6 and omega-3 fatty acids, i.e. 0.2:1. Consequently to produce more economically profitable innovative composition broiler chicken meat with higher content of omega-6 and omega-3 fatty acids and containing more optimum amount ration, the following oil blend shall be included into the feeding stuff fed to broilers: oil with the highest and cheapest level of omega-3 fatty acids and oil with the highest and cheapest level of omega-6 fatty acids. Out of analysed oils, a blend of rapeseed oil and flaxseed oil correspond to such a test.

The evaluated feeding stuff may be included into the poultry feed (according to the standards) only in a certain amount. The standards determine and practical poultry farming applies optimum feeding stuff doses admissible for avian organism, including also the studied oils that are allowed to add to the poultry feed in the amount of 2% - 4%.

The amount of fatty acids of feed has no proportional relation to the content of fatty acids in broiler chicken meat, as a certain transition stage of fatty acids from the amount of fatty acids in feed to

Table 3

Trial scheme for production of innovative composition broiler chicken meat (content of feed fed for chicken from 1 to 42 days of age)

Group	Feeding programme
Group 1-control	Basic feed content 4% soya bean oil
Group 2 - trial	Basic feed content 2% soya bean oil, 1% rapeseed oil , 1% flaxseed oil and 0.1% carotenoids Karotinas V

*the content complies with the standard requirements

Source: according to the unpublished data of the Research Institute "Sigra"

Table 4

Content and costs (LVL/100 kg) of full-value feed fed to broilers on average in all breeding periods

Parameters	Group 1 - control		Group 2 - trial	
	feed, kg	costs, LVL	feed, kg	costs, LVL
Wheat	34	3.74	33.9	3.73
Maize	25.5	3.83	25.5	3.83
Soya bean meal	18	5.58	18	5.58
Sunflower meal	6	0.9	6	0.90
Fish meal	3	1.86	3	1.86
Fodder yeast	6	0.9	6	0.90
Premix	0.5	0.19	0.5	0.19
Fodder chalk	3	0.18	3	0.18
Soya bean oil	4	3.52	2	1.76
Flaxseed oil	0	0	1	1.68
Rapeseed oil	0	0	1	0.54
Karotinas V (carotenoids additives)	0	0	0.1	0.86
Total:	100.0	**20.70**	100.0	**22.00**
± to control, LVL	-	x	-	**1.30**
% to control	-	x	-	**6.28**

Source: made by the authors according to the data of the Research Institute "Sigra" and calculated according to the producers' sales prices

the content of fatty acids in production output exists in an avian organism.

2. Trial results on innovative composition broiler chicken meat production, avian productivity and poultry meat quality

The difference between the trial groups is depicted in Table 3, when soya bean oil, flaxseed oil and rapeseed oil in various combinations and additive (Karotinas V) containing antioxidant carotenoids were included into the basic feed of broiler chicken. These oil blends contained high levels of omega-3 and omega-6 fatty acids.

The content of basic feed for broiler chickens of all groups is balanced in compliance with the requirements of cross ROSS 308 standards. Broilers of the control group (Group 1) were fed with basic feed containing 4% soya bean oil, while 2% soya bean oil, 1% rapeseed oil and 1% flaxseed oil, and complex additives containing antioxidants with a purpose to increase the content of omega-3 and omega-6 fatty acids, and antioxidants carotenoids in feed doses were added to the feed of Group 2 broilers (Table 3).

Productivity of broiler chickens during the trial period was evaluated by accounting:

— live weight of broilers, weighting each bird individually at the age of 7, 14, 21, 28, 35 and 42 days;
— feed consumption – weighting feed every day by groups;
— survival – dead birds were counted every day.

The analysis comprised the amount of omega-3 and omega-6 fatty acids in broiler meat of 42 days old (sales age) broiler chickens. The analysis was carried at the accredited biochemistry research laboratory of the Research Institute of Biotechnology and Veterinary Medicine "Sigra", Latvia University of Agriculture

(Registration No. LATAK-T-038-06-99-A) according to the standard LVS EN ISOIIEC 17025-2005 (Testēšanas un kalibrēšanas..., 2005) by means of a gas chromatograph (HP 6890).

The costs of feed fed to broilers ("Iecavnieks" Ltd, JSC "Dobeles Dzirnavnieks" and "Rīgas kombinētās lopbarības rūpnīca" Ltd sales prices on December 1, 2009) are calculated per 100 kg feed and shown in Table 4.

The costs of 100 kg feed fed to broilers ranged between LVL 20.70 and LVL 22.00. Mix of oils included into the feed and costs of antioxidant doses were the factors determining the amount of feed costs. Difference in feed costs is LVL 1.30 or 6.3% compared with the first - base group.

Basic parameters of broiler productivity are as follows: live weight, live weight gain, food consumption and costs.

During the trial period broiler productivity is high. The average live weight for broilers of sales age ranged between 2822 -3044 g with the live weight gain per day equalling to 66.21-71.49 g (Table 5).

Feeding the broilers with feed enriched with omega-6 and omega-3 fatty acids and carotenoids, the live weight of broilers and live weight gain per day is higher by 7.87% and 7.98% respectively than for broilers of Group 1 (control group).

Each broiler chicken during the breeding period consumed on average the following feed amount: in Group 1 - 5.40 kg and Group 2 – 5.20 kg. Feed consumption for breeding one broiler in Group 2 was by 0.20 kg less than in Group 1. As a result also feed consumption for production of 1 kg live weight was by 10.47% less than in Group 1. Feed costs (0.38 LVL/kg) for production of 1 kg live

Table 5

Productivity of a broiler chicken

Parameters	Group 1 - control	Group 2 - trial
Feeding programme	Basic feed content 4% soya bean oil	Basic feed content 2% soya bean oil, 1% rapeseed oil, 1% flaxseed oil and 0.1% additives of carotenoids Karotinas V
Broiler chicken age daily live weight, g	41.3	41.3
Broiler chicken live weight at the age of 42 days, g	2822	3044
% to control	-	7.87
Live weight gain per day, g	66.21	71.49
% to control	-	7.98
Survival, %	98	99

Source: made by the authors according to the unpublished data of the Research Institute "Sigra"

Table 6

Feed consumption and feed costs for trial broilers

Parameters	Group 1 - control	Group 2 - trial
Feeding programme	Basic feed content 4% soya bean oil	Basic feed content 2% soya bean oil, 1% rapeseed oil, 1% flaxseed oil and 0.1% additives of carotenoids Karotinas V
Feed consumption per one broiler during the breeding period, kg	5.40	5.20
Feed consumption for production of 1 kg live weight, kg	1.91	1.71
% to control	-	10.47
Feed price of 1 kg, LVL	0.207	0.220
Total feed costs for breeding one bird, LVL	1.12	1.14
% to control	-	1.79
Feed costs for production of 1 kg live weight gain, LVL	0.40	0.38
% to control	-	5.00

Source: made by the authors according to the unpublished data of the Research Institute "Sigra"

Table 7

Index of broiler chicken productivity

Parameters	Group 1 - control	Group 2 - trial
Feeding programme	Basic feed content 4% soya bean oil	Basic feed content 2% soya bean oil, 1% rapeseed oil, 1% flaxseed oil and 0.1% additives of carotenoids Karotinas V
Productivity index	344.8	419.6
± to control	x	+74.8

Source: calculated and made by the authors according to Euribrid technical information..., 1998

Table 8

Quality indices of innovative composition of broiler chicken meat

Parameters	Group 1 - control	Group 2 - trial	± to control
Feeding programme	Basic feed content 4% soya bean oil	Basic feed content 2% soya bean oil, 1% rapeseed oil, 1% flaxseed oil and 0.1% additives of carotenoids Karotinas V	
∑ omega-6 (ω-6) fatty acids, % of total lipids	23.5	27.4	+3.9
∑ omega-3 (ω-3) fatty acids, % of total lipids	5.4	8.3	+3.2
∑ (ω-6) : ∑(ω-3)	4.3 : 1	3.3 : 1	-1.0 : 1
∑ total carotenoids, mg kg^{-1} (antioxidant)	0.62	0.86	+0.24

Source: made by the authors according to the unpublished data of the Research Institute "Sigra"

weight gain were smaller than for Group 1, mainly due to the fact that broilers of Group 2 had bigger live weight gain per day.

It is significant to evaluate broiler productivity according to the calculated productivity index. The calculation of productivity index comprises several parameters – sales live weight, age of broilers, survival, and feed conversion. It is the most complete characteristics of broiler productivity and breeding economy. The index is calculated according to the formula developed for all broiler crosses; in this case for breeding of ROSS-308 broilers after the recommendations of "Euribrid B.V." (the Netherlands) company (1):

$$\text{Productivity index} = \frac{\text{Average live weight (g) x survival (\%)}}{\text{Time of breeding (in days) x feed conversion kg/kg}} : 100 \quad (1)$$

Source: made by the authors according to Euribrid technical information..., 1998

Table 7 includes the comparison of broiler productivity index in both trial groups.

Broiler productivity index ranges between 344.8 - 419.6; and it is very high productivity of trial broilers. The bigger is the productivity index, the higher is broiler productivity. If productivity index is above 205.8, then productivity is considered high according to the Euribrid standards (Euribrid technical information..., 1998).

In the trial the productivity index of Group 2 broilers exceeded the productivity index of Group 1 broilers by 74.8 points. Hence it may be concluded that the use of improved feed enriched with omega-6 and omega-3 fatty acids, and carotenoids for feeding birds has increased their productivity index by 22%.

The research aim was to produce innovative composition broiler chicken meat with an increased amount of omega-3 and omega-6 fatty acids, and antioxidant carotenoids. The obtained data are shown in Table 8.

Feeding broilers with feed of conventional composition (Group 1) broiler meat contains 23.5% of omega-6 and 5.4% of omega-3 fatty acids as calculated in per cent of total fat (according to the chemical analyses). Adding 2% of soya, 1% of rapeseed oil, 1% of flaxseed oil, and 0.1% of carotenoids additives to the feed (Group 2), the level of omega-6 fatty acids increases to 27.4% (by 3.9% more than for Group 1) and the level of omega-3 fatty acids grows up to 8.3% (by 3.2% more than for Group 1), while the content of carotenoids increases by 0.24 mg kg^{-1}.

3. Economic calculations for production of innovative composition broiler chicken meat

Total results of the experiment and the possible economic profitability for the production of innovative broiler chicken meat is shown in Table 9.

Feed costs for breeding broilers are depicted in Table 6. In poultry farms costs for broilers feed

Table 9

Revenues and expenses for growing 1000 broilers for the production of innovative composition meat (according to the average trial data)

Parameters	Group 1 - control	Group 2 - trial
Feeding programme	Basic feed content 4% soya bean oil	Basic feed content 2% soya bean oil, 1% rapeseed oil, 1% flaxseed oil and 0.1% additives of carotenoids Karotinas V
Number of birds	1000	1000
Bird survival, %	98	99
Number of grown birds	980	990
Average live weight of broilers at the age of 42 days, g	2822	3044
Total live weight of grown broilers, kg	2765.56	3013.56
Total carcass weight of broilers, kg*	2184.79	2380.71
Carcass weight, kg ±vs. Group 1	x	195.92
Price of 1 kg carcass weight, LVL	1.60	1.60
Revenues for sales of carcass weight, LVL	3495.67	3809.14
Revenues, LVL ±vs. Group 1	x	313.47
Feed costs for growing 1000 broilers, LVL	1120.00	1140.00
Other costs (excluding feed costs), LVL	523.33	523.33
Total costs, LVL	1643.33	1663.33
Difference between revenues and expenses, LVL	1852.34	2145.81
Profit, LVL ± vs. Group 1, LVL	x	293.47

Source: according to the data of the Research Institute "Sigra", 2009

*Live weight of broilers results into 79% of carcass weight (according to the standards)

consumption constitute approximately 73%-76% of total costs. Costs for food consumption and other costs related to breeding of broilers were mathematically calculated based on the mentioned fact.

Costs for the production of innovative composition meat were calculated to economically justify the developed variants of feed content enriched with fatty acids and profitability of their application (Table 9). The calculations included the productivity of trial group broilers, sales price of a broiler carcass (sales price of broiler chickens of JSC "Putnu fabrika Ķekava" is 1.60 LVL/kg (December 1, 2009), feed costs (sales prices of "Iecavnieks" Ltd and "Rīgas kombinētās lopbarības rūpnīca" Ltd, December 1, 2009), and other costs.

The figures included into Table 9 reflect one particular technology for breeding and feeding of trial broilers, resulting in production of innovative composition meat on certain trial conditions with a particular feed content and certain costs that are shown in Tables 4, 5 and 6. The costs will differ on other feeding and keeping conditions and using other feed content.

Feeding broilers with feed enriched with fatty acids the carcass weight of innovative composition broilers was 195.92 kg bigger (calculating per 1000 broilers) than the carcass weight of broilers fed with conventional composition feed (Group 1). Nevertheless the costs of new feed for breeding 1000 broilers were LVL 20 higher than in a standard variant, revenues from sales of innovative composition meat were LVL 293.47 larger (calculating per 1000 broilers) than from the sales of Group 1 broilers. These better financial results are obtained thanks to a poultry survival indicator and mainly thanks to the larger total live weight of grown broilers. It shall be noted that meat of Group 2 broilers is characteristic with the highest content of omega-3 fatty acids and the most optimum ratio of ω-6 : ω-3 fatty acids. Meat of Group 1 broilers has the highest quality and the highest broiler live weight at the age of 42 days. Thus a more valuable and healthier product is obtained even at an equal sales price of broilers, besides total producer's revenues might be 15% higher than in case of feeding standard broiler chickens.

Conclusions, proposals and recommendations

1. The research hypothesis - production costs of innovative composition broiler chicken meat exceed production costs of commercial composition broiler chicken meat - has been proved in the research. Feed costs for production of innovative composition broiler chicken meat are 6.28% higher than in a standard feeding variant, though feed consumption per 1 broiler is less.
2. Fatty acids containing feeding stuff available also in Latvia, like flaxseed oil and rapeseed oil, shall be included into the poultry feed content for the production of innovative composition broiler chicken meat.
3. Omega-3 and omega-6 fatty acids and carotenoids are the main feed parameters that shall be considered producing innovative broiler chicken meat. The largest content of omega-3 fatty acids was observed in flaxseed oil, i.e. 55%, which 6-7 times exceed the respective indicators in rapeseed oil and soya bean oil. The largest amount of omega-6 fatty acids is in soya bean, i.e. 54%, if calculated in per cent of total amount of lipids. These vegetable oils in certain ratios were used in a practical experiment.
4. It is recommended to feed broiler chickens with feed containing 2% of soya bean oil, 1% of rapeseed oil, 1% of flaxseed oil, and 0.1% of carotenoids additives to produce innovative composition broiler chicken meat containing an increased amount of omega-3 and omega-6 fatty acids and carotenoids,
5. The complex indicators of broiler chickens – productivity index is by 22% higher in the experimental group of broilers, where birds were fed with feed enriched with fatty acids and carotenoids.
6. Qualitative poultry meat healthier for human nutrition, since it contains an increased content of fatty acids and carotenoids, was also obtained as a result of an experiment.
7. Economic calculations on the possible economic profitability of broiler chicken meat production carried during the experiment lead to the conclusion that based on higher bird survival indicators and productivity, also the potential profit at presently equal poultry sales price is LVL 293.47 or 15% higher in case of innovative composition broiler chicken meat production when calculated per 1000 broilers.
8. A poultry farming company shall change neither production technology nor bird crosses to produce innovative composition broiler meat. It is necessary to popularise this idea in Latvian poultry companies to encourage them to initiate production of innovative composition broiler chicken meat containing an increased content of omega-3 and omega-6 fatty acids and antioxidant carotenoids in feed.
9. Similarly also consumers' education shall be provided on positive features related to the use of such innovative composition broiler chicken meat in diet.

Bibliography

1. Aro A. (2000) *Diet Associated Changes in Coronary Heart Disease Mortality*. No: Lopkopības produktu nekaitīgums, kvalitāte un kontroles metodes. Starptautiskās zinātniskās konferences materiāli, Sigulda 2000. gada 15. septembrī, Sigulda 31-33 lpp.
2. Buģina V. (2007) *Agrārpreču tirgus teorija (Market Theory of Agrarian Goods)*. Latvijas Lauksaimniecības universitāte, Jelgava, 93.lpp.
3. Bodnieks E.(2008) *Funkcionālās pārtikas klīniskie aspekti (Clinical Aspects of Functional Food).* No: Prezentācijas materiāls. P.Stradiņa KUS, Gastroenteroloģijas centrs, Rīga, 23. aprīlis.
4. Dobeles Dzirnavnieks, A/S. Nepublicētie dati (unpublished data), 01.12.2009.
5. *Euribrid Technical Information on Hybro Broilers*. (1998) In: Euribrid B.V., The Netherlands, p. 56.
6. Harris C. (2000) *Meat Products are Perfect as Functional Foods*. In: Meat Processing. Jan/Feb, p.19.
7. Hämmal J., Tikk V., Tikk H., Kuusik S. (2000) *On Affecting the Fatty Acids Composition of the Chicken Broilers' Fat.* In: Eigth Baltic Poultry Conference in Finland Turku, October 6, pp. 22-24.
8. Holub B.J. (2002) *Clinical Nutrition: 4. Omega – 3 Fatty Acids in Cardiovascular Carve.* In: Can. Medical. Assoc. I., pp. 608-615.
9. Iecavnieks, SIA. Nepublicētie dati (unpublished data), 01.12.2009.
10. Mazza G. ed. *Functional Foods: Biochemical and Processing Aspects*. In: Technomic Publishing Co., Inc., Lancaster – Basel, PA 1998. p.437.
11. Michella S.M. and Slaugh B.T. *Producing and Marketing a Specialty Egg.* In: Poultry Science, Vol. 79, Issue 7, 2000, pp. 975-976.
12. Putnu fabrika Ķekava, A/S. Nepublicētie dati (unpublished data), 01.12.2009.
13. Rīgas kombinētās lopbarības rūpnīca, SIA. Nepublicētie dati (unpublished data), 01.12.2009.
14. Surai P.F. (2000) *Organic Selenium and the Egg: Lessons From Nature. In:* Feed Compounder 20, pp. 16-18.
15. Testēšanas un kalibrēšanas laboratoriju kompetences vispārīgās prasības (General Requirements for Competences of Testing and Calibration Laboratories). (2005) LVS EN ISO/ IEC 17025:2005. Latvijas Valsts Standarts, 37.lpp.
16. Tikk H., Hämmal J., Tikk V., Kuusik S. (2002) *On Increasing ω-3 Fatty Acid Content in Quail Meat and Fat.* In: 10th Baltic Poultry conference Vilnius, pp. 68-72.

17. Upīte Ī. (2000) *Cenu noteikšana (Price Determination)*. No: Lauksaimniecības un pārtikas produktu mārketinga menedžments. Latvijas Lauksaimniecība universitāte, Jelgava, 125-143 lpp.
18. Zariņš Z., Neimane L. (2002) No: *Uztura mācība (Diet Studies)*. Rīga, 21-29, 99-103 lpp.
19. ZI ,,Sigra". Nepublicētie dati (unpublished data), 2009.
20. WHO (2003) *Diet, Nutrition and the Prevention of Chronic Disease*. In: WHO Technical Report Series, 916. World Health Organisation, Geneva, pp. 54-60.

Future of Beef Market in Latvia – Consumers Issues and Demand

Dina Popluga, Mg.biol., PhD student of Latvia University of Agriculture, researcher in Latvian State Institute of Agrarian Economics
Kazimirs Špoģis, Dr.habil.agr., professor of Faculty of Economics, Latvia University of Agriculture, Head of Research and Doctoral Programme of Faculty of Economics, Latvia University of Agriculture

Abstract. Consumer interests largely appear in demand for a certain product, which in this study is beef. However, consumers demand regulates or influences the production amount, dynamics, and development directions of this product. Therefore, the changing demand of consumers impacts beef production. Global tendencies show that beef production output in the past twenty years has sharply and consequently decreased in the structure of total meat production. It characterises also the structure of meat consumption. The paper focuses on factors affecting beef purchasing decisions in Latvia. The effect of socio-economic and demographic characteristics as well as other influences on preferences was estimated as they affect beef purchasing decisions. The study results showed that the majority of consumers did not like either the taste or smell; hence beef compared with pork is still relatively new food product to Latvia's consumers and some of them are not used to the flavour and taste of beef products. Also the relatively high price of beef and consumers' unfamiliarity with its cooking methods are the main limitations for beef consumption when compared with other types of meat.
Key words: beef, Latvia, consumers, demand.

Introduction

American researchers (Weaber and Miller, 2004) have pointed out that the structure of cattle industry has changed dramatically over time. It is a market dynamics driven change that requires the market participants to reduce production costs, yet at the same time maintaining or improving quality. In this context other authors (Verbeke et al., 2009; Grunert, 2006) in their studies emphasise that nowadays the quality perception of meat is one of the characteristic trends in consumer attitudes and lifestyles with regard to meat consumption. Although safety concerns have been influential in shaping consumer attitudes towards meat (McCarthy and Henson, 2005), some recent studies have put the perceived safety risk into perspective, indicating that consumers' decisions to eat meat are gradually becoming more influenced by nutrition and health considerations than by safety concerns (da Fonseca and Salay, 2008). These observations can also be related to beef consumption.

On the contrary the quantities, variety, and quality specifications for beef and their likely changes in the future are crucial to those who are involved in long-term livestock industry planning. It is imperative for the policy makers and beef market participants in Latvia to have a better understanding on the current increase of beef consumption and its likely change in the future when they are making decisions on planning and managing meat sector.

Such evaluation of the current situation encouraged to carry out the particular research and highlight the following **hypothesis**: dynamic development of beef sector in Latvia depends on the consideration of consumers' interests and needs.

The research aim was to provide a better understanding on consumer purchasing behaviour towards beef in the market of Latvia.

The following **research tasks** were defined in compliance with the set aim:

1) to characterise global beef production trends;
2) to describe meat consumption structure in regions of the world with a different social economic development level, including Latvia;
3) to investigate consumers' attitude towards beef in Latvia;
4) to develop recommendations to resolve problems hindering the development of beef market in Latvia.

The annual statistical data from the database of Food and Agriculture Organisation of the United Nations and the Central Statistical Bureau of Latvia were used as well as consumers' inquiry was carried out to meet the study tasks.

Information about consumer perceptions of beef and data on beef consumption was obtained through a consumer survey in the autumn of 2009 in Latvia. The questionnaire contained questions on weekly frequency of beef consumption, beef market outlets, purchase behaviour, product perceptions regarding different attributes, and some questions on other types of meat consumed in Latvia. Six hundred questionnaires were sent out, of which 246 were completed and valid, resulting in a response rate of 41%. A sample of 246 responses is sufficient to ensure validity in this kind of exploratory study.

This research has been supported by the European Social Fund within the project "Support for the Implementation of Doctoral Studies at Latvia

University of Agriculture" (sub-activity 1.1.2.1.2. "Support for the Implementation of Doctoral Studies").

Results and discussion

Global beef production processes influenced by consumers' interest and demand

The authors have analysed global beef production processes to better understand processes driving beef market in Latvia. Consumers' interests to large extent are exhibited in the demand for a certain product, which in the case of the present research is beef. The demand, in turn, regulates or influences the production of the respective product – production volume, its dynamics and directions of change.

Based on the above hypothesis, the analysis of production dynamics of the main types of meat – pork, poultry and beef – was performed to find out the proportion of beef over a longer period of time (1990-2007), its stability or direction of change. The analysis was performed on the common processes in Europe as well as in wider regions of the world with a

Table 1

Dynamics and structural changes of main meat types in Europe, 1990-2007

Year	Pork, thou. t	% to 1990	Poultry, thou. t	% to 1990	Beef, thou. t	% to 1990	Total, thou. t	Share of beef, %
1990	28 424	100.0	10 130	100.0	20 081	100.0	58 635	34.2
1995	24 780	87.2	8656	85.4	14 198	70.7	44 634	31.8
2000	25 424	89.4	9333	92.1	11 826	56.8	46 583	25.4
2005	24 970	87.8	10 760	106.2	11 203	55.8	46 933	23.9
2006	23 803	83.7	10 531	103.9	10 732	53.4	45 066	23.8
2007	24 201	85.1	10 994	108.5	10 721	53.4	45 916	23.3

Source: authors' calculations according to the data from FAOSTAT

Table 2

Dynamics and structural changes of main meat types in the North America, 1990-2007

Year	Pork, thou. t	% to 1990	Poultry, thou. t	% to 1990	Beef, thou. t	% to 1990	Total, thou. t	Specific weight of beef, %
1990	8089	100.0	9259	100.0	11 312	100.0	28 660	39.5
1995	9372	115.9	12 205	131.8	12 437	109.9	34 014	36.6
2000	10 389	128.4	14 847	160.3	13 451	118.9	38 687	34.8
2005	11 578	143.1	16 869	182.2	12 485	110.4	40 932	30.5
2006	11 614	143.6	16 870	182.2	12 397	109.6	40 863	30.3
2007	11 629	143.8	16 871	182.2	12 423	109.8	40 923	30.4

Source: authors' calculations according to the data from FAOSTAT

Table 3

Dynamics and structural change of main meat types in South America, 1990-2007

Year	Pork, thou. t	% to 1990	Poultry, thou. t	% to 1990	Beef, thou. t	% to 1990	Total, thou. t	Specific weight of beef, %
1990	2800	100.0	3775	100.0	9388	100.0	15 963	58.8
1995	3843	137.2	6739	178.5	10 589	112.8	21 171	50.0
2000	3730	133.2	9467	250.8	11 826	125.9	25 023	47.3
2005	4473	159.7	13 027	345.1	14 288	152.2	31 788	44.9
2006	4500	160.7	13 544	358.8	12 470	132.8	30 514	40.9
2007	4700	167.8	13 525	358.3	12 431	132.4	30 656	40.5

Source: authors' calculations according to the data from FAOSTAT

different social economic development level – in the North America and the South America to reduce the impact of short-term, not objective factors that are possible in Latvia.

Data on the production volumes of beef, pork and poultry in Europe are shown in Table 1.

The data and calculations in Table 1 also present certain changes and their trends. Production of poultry may be considered stable in Europe, as its fluctuations do not reach 10% interval over the period of 18 years. At the beginning of the analysed period, the production of pork has decreased but further on it has remained constant at a high level, reaching half of the total production of all types of meat. In contrast, the production of beef has steadily and even sharply decreased and its proportion has also constantly and significantly decreased.

Further on, a similar analysis was performed on the data about the production of main types of meat in the North America (Table 2).

As Table 2 presents, the North America among the industrially and economically developed regions displays a different structure and production of main types of meat, but the share of beef production has significantly decreased. However, if compared with Europe, the volume of produced beef in the North America is significantly higher.

Evaluating the dynamics of beef production in the North America, it may be observed that its absolute volume has increased and become stable; also the production of poultry has increased rapidly.

The analysis of meat production structure in the region of different economic development level – the South America – was performed for the purpose of comparison (Table 3).

The South America displays similar structural changes in meat production, which also characterise its consumption structure: the share of beef has significantly and constantly decreased.

The development of beef production in certain parts of Europe was analysed to evaluate the impact of regional mentality and traditions. The data are summarised in Table 4.

The data and calculations presented in Table 4 allow concluding that the direction of changes is similar in all parts of Europe, though the pace is significantly different. The most radical changes have taken place in the Eastern Europe, which may be accounted for the economic reform in the countries of the Eastern Europe.

The production of beef in the Western Europe has reduced constantly and significantly. It may be explained not only by the demand for beef on the local market but also by the impact of global processes and international market.

The research findings in relation to global beef production and consumption comply with the opinion of other researchers (Morgan, Tallard, 2006)

Table 4

Dynamics of beef production in different regions of Europe, 1990-2007

Region	Production amount	1990	1995	2000	2005	2006	2007
Europe	thou. t	20 081	14 198	11 826	11 203	10 732	10 721
	% to 1990	100	70.7	58.9	55.8	53.4	53.4
Eastern Europe	thou. t	10 668	5327	3765	3 366	3 166	3 155
	% to 1990	100	49.9	35.2	31.5	29.7	29.6
Northern Europe	thou. t	2192	2 243	1 950	1 890	1 885	1 896
	% to 1990	100	102.3	88.9	86.2	86	86.5
Southern Europe	thou. t	1 998	1 970	1 948	1 928	1 930	1 927
	% to 1990	100	98.6	97.5	96.5	96.6	96.4
Western Europe	thou. t	5299	4658	4190	4019	3750	3750
	% to 1990	100	87.9	79.1	75.8	70.8	70.8

Source: authors' calculations according to the data from FAOSTAT

Table 5

Beef balance and pork consumption in Latvia, 2002-2007

Indicators	2002	2003	2004	2005	2006	2007
Beef consumption, thou. t	23.3	27.3	27.4	22.6	20.8	22.5
Pork consumption, thou. t	60.9	66.2	66.7	71.4	74.6	78.1
Beef production, thou. t	16.0	21.2	21.6	20.4	20.7	22.8
Self-sufficiency ratio in domestic market, %	68.7	77.7	78.8	90.3	99.5	101.3

Source: authors' calculations according to the data from the Central Statistical Bureau of Latvia, 2003; 2004; 2005; 2006; 2007; 2008

who admit that the market share of beef in meat consumption has been declining on the global level.

Beef production and consumption trends in Latvia

In 2007 the total consumption of beef in Latvia has slightly increased in comparison with the previous year (Table 5). In 2005 and 2006 consumption of beef felt down due to foot and mouth disease broke out in Europe. Moreover, the decrease of beef consumption took place in all European countries (Ministry of Agriculture, Republic of Latvia, 2007).

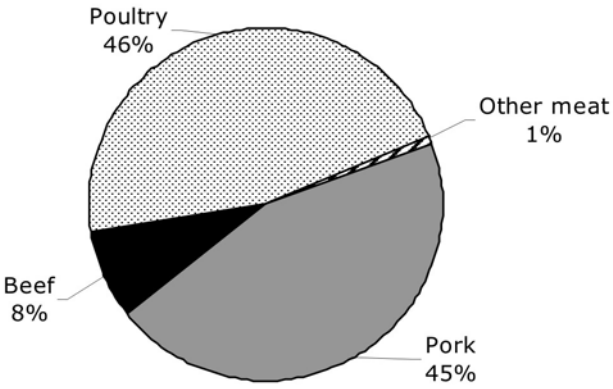
Beef production and consumption has fluctuated for the past six years; however, it has a positive trend. In 2006, the production reached 20.7 thousand t, while in 2007 beef production increased by 10% compared with the previous year, meaning that the production growth is balanced with the consumption growth which also increased in 2007.

According to the statistical data, in Latvia the consumption of beef compared with the consumption of pork is considerably lower like it is also in other regions of the world. For instance, in 2007 Latvia population consumed 3.5 times more pork than beef.

Although the research results showed that beef production and consumption amounts in the world, including Latvia, have sharply and consequently decreased; still it is very important to know the consumers' attitude towards beef. Consumers' demand regulates and influences beef production amount, dynamics and development trends.

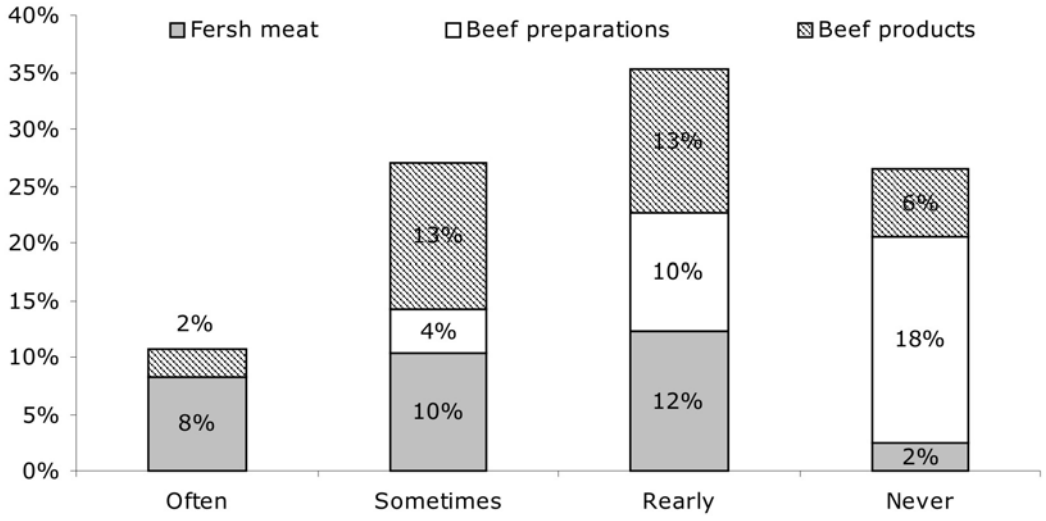
Consumers' attitude towards beef in Latvia

The Latvians perceptions towards beef arise from traditional and historical experiences as well as social and cultural understandings.



Source: authors' calculations according to the survey data

Figure 1. **Most frequently purchased types of meat among respondent consumers' (% of total)**



Source: authors' calculations according to the survey data

Figure 2. **Purchasing frequency of beef product preferences among respondent consumers' (% of total)**

A survey of Latvia population was carried out within the framework of the research to find out the consumers' interests concerning the beef consumption in Latvia. Two hundred and forty-six people were interviewed to find out the consumers' beef purchasing habits as well as consumers' opinion on facilitating beef consumption. Information on the type of most frequently purchased meat is summarised in Figure 1.

The survey results presented in Figure 1 indicate that the majority of consumers prefer poultry (46%) and pork (45%) to beef. Only 8% of all the respondents purchase beef more often than other types of meat. In total, such a structure of the consumption of main types of meat indicates that in Latvia, like in other regions of the world, poultry and pork occupy the main place in meat consumption. In addition, when asking the respondents on the main reasons for such a choice of meat , the majority (53%) replied that they liked this meat best and it was easily available (22%). However, irrespective of the fact that beef is not the most popular and most frequently purchased type of meat, 57% of the respondents buy it 1-3 times a month.

During the survey it was also found out what beef products consumers choose and how frequently (Figure 2).

The data arranged in Figure 2 indicate that 8% of the respondents often buy fresh meat, 10% buy it sometimes and 12% do it seldom. Beef preparations are sometimes bought by 4% of the respondents, seldom – by 10%, and never – by 18%. Moreover, beef products are often bought only by 2%, sometimes and seldom – by 12%, and never – by 6% of the respondents. The information summarised in Figure 2 allows concluding that the respondents prefer fresh beef, putting beef products in the second place, but semi-finished beef products are not really favoured among the consumers.

The respondents that never buy beef and its products had to give the main reasons for their choice. The question was included to find out the main factors hindering beef consumption (Figure 3).

As it can be seen in Figure 3, most of the respondents (43%) admitted that they do not like beef, while 29% responded that they did not know the reason for not buying beef. Only 16% of the respondents replied that beef was not bought due to its high price. The other reasons for not buying beef were the lack of quality and health considerations.

It has to be noted here that the reasons for rather low beef consumption, according to the researchers of Latvia (Jemeļjanovs, Šterna, 2008), should be looked for in the historically developed nutrition traditions. In the history of the country there have been periods when there was not enough food; therefore people have developed the habit that the goal of main meals is to ensure the sense of fullness. In many cases related to an increased fat level in the meals, pork is often preferred to beef.

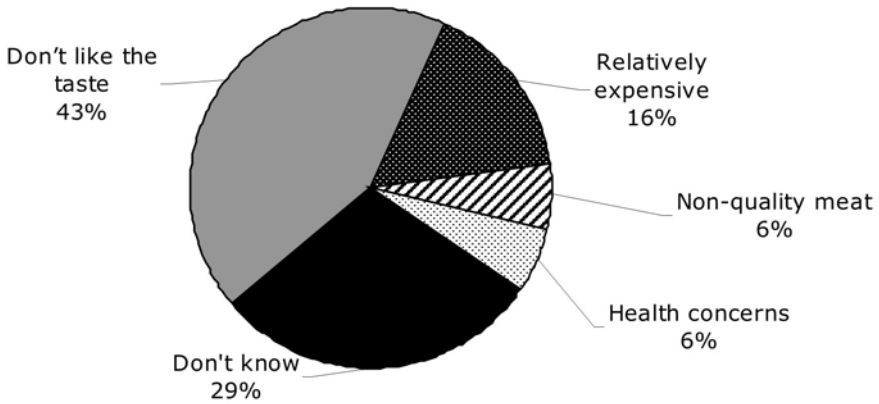
One of the possible reasons for such a choice is also the fact that beef cattle and their crossbreeds with qualitative meat are bred only over the last years. For decades consumers were offered beef received from rejected or old cows, or beef the quality of which (taste, smell, digestibility, etc.) was low.

It is also shown in Figure 4 presenting the attitude of interviewed consumers' to different quality indicators of beef and price.

As it can be seen in Figure 4, when buying beef, consumers find important its smell and taste, colour, degree of tenderness, safety, and price. However such factors as nutrition value of beef and the cooking ability are slightly less important.

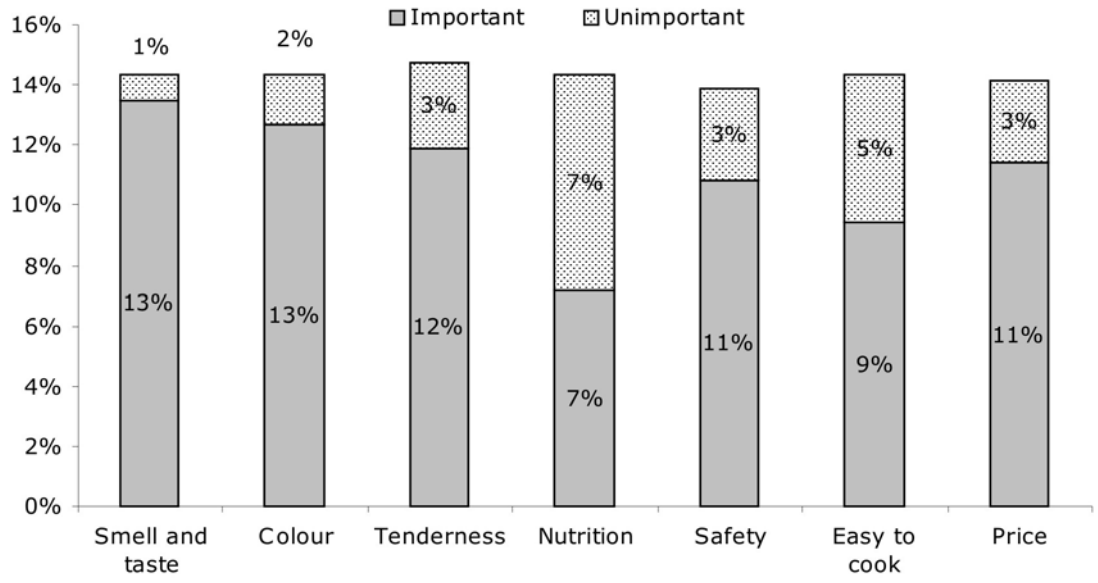
Thus, summarising the data used and analysed in this paper as well as the information gained from the survey, it is possible to conclude that in general, the consumers' choice is influenced by the following arguments:

— there is no trust in the quality of the purchased meat (possibility to purchase tough meat that has to be cooked long);



Source: authors' calculations according to the survey data

Figure 3. **Reasons for not purchasing beef among respondent consumers' (% of total)**



Source: authors' calculations according to the survey data

Figure 4. **Consumers' attitude towards beef attributes and price (% of total)**

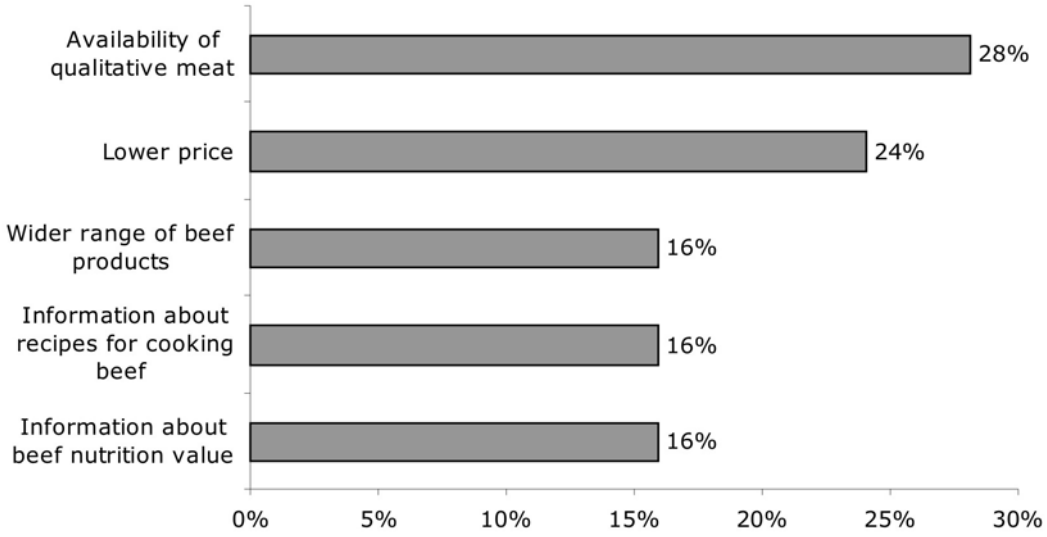
- Latvia has not developed traditions for using and cooking beef;
- society is comparatively little informed about the nutrition value of beef;
- consumers' little trust in the product due to wide scale diseases, e. g. foot and mouth disease;
- the range of beef products (incl. beef preparations) offered by the producers is comparatively lower than that of other meat products.

Irrespective of these as if negative traits, several positive tendencies should be noted;

- buyers' positive attitude towards qualitative meat gained from young stock and cattle of specialised beef cattle breeds;
- rather similar positions of beef and pork concerning the price.

As in Latvia the beef consumption level is low, respondents were also asked on possibilities to encourage them to include more beef and its products in the menu. Replies to this question are summarised in Figure 5.

As Figure 5 presents, most of the respondents (28%) would be ready to purchase beef more often



Source: authors' calculations according to the survey data

Figure 5. **Opinion of respondent consumers' on promoting beef consumption in Latvia (% of total)**

if it were qualitative, i.e. with good organoleptic attributes. Besides, when choosing to buy beef, consumers find its price important, therefore 24% of all the respondents indicated that lower price would encourage beef consumption. According to the respondents, beef consumption would be also encouraged by a wider range of beef products, more information about recipes how to cook beef, and on the nutrition value of beef.

The research results presented in this paper and the conclusions made show that consumers have the following interests:

- offering cheaper production, i.e. with lower processors' and retailers' mark-up;
- production of qualitative and safe for health beef and its products;
- offering a wider range of beef products and preparations.

Though the observance of consumers' interests increases the demand for beef and thus also production volumes as well as creates opportunities for:

- processors: to make tasty, appealing, healthy beef products and preparations;
- producers: to offer only young stock beef on the market, only beef from specialised beef cattle breeds, excluding offering cow meat to consumers.

Conclusions and recommendations

1. The production structure of types of meat and beef proportion in the total meat balance changes in all Europe as well as in other regions of the world upon the influence of consumer interests.
2. The dynamic analysis of beef consumption in Latvia allows concluding that beef consumption is not stable in Latvia. .
3. The reasons for little beef consumption should be searched for in the historically developed diet traditions. Latvia had and still has a little developed breeding of specialised beef cattle breeds, young stock meat production, while the use of rejected or old cow meat for consumption has never been appealing.
4. The traditionally low beef consumption limits the opportunities for beef production industry to expand and increase the production volume.

Recommendations:

- Attracting the European Union and/or national financial support for advertising, promotion and marketing activities of beef gained from specialised beef cattle breeds would enhance the growth of demand for high quality beef.
- Introducing special labelling for beef gained from beef cattle breeds bred in Latvia, which would offer consumers clear information about the origin of the especially valuable beef and about its quality.
- An initial step to increasing consumer demand for beef would require disseminating positive information about beef products to persuade them on the worthiness buying and developing recipes that give variety to the methods of beef preparation. Thus the focus should be made on recipes that are good for health and relatively easy to prepare.

Bibliography

5. Central Statistical Bureau of Latvia (2003) Latvijas statistikas gadagrāmata 2003/ Statistical Yearbook of Latvia 2003. Rīga: Latvijas Republikas Centrālā statistikas pārvalde, 229 lpp.
6. Central Statistical Bureau of Latvia (2004) Latvijas statistikas gadagrāmata 2003/ Statistical Yearbook of Latvia 2003. Rīga: Latvijas Republikas Centrālā statistikas pārvalde, 260 lpp.
7. Central Statistical Bureau of Latvia (2005) Latvijas statistikas gadagrāmata 2004/ Statistical Yearbook of Latvia 2004. Rīga: Latvijas Republikas Centrālā statistikas pārvalde, 260 lpp.
8. Central Statistical Bureau of Latvia (2006) Latvijas statistikas gadagrāmata 2005/ Statistical Yearbook of Latvia 2005. Rīga: Latvijas Republikas Centrālā statistikas pārvalde, 302 lpp.
9. Central Statistical Bureau of Latvia (2007) Latvijas statistikas gadagrāmata 2006/ Statistical Yearbook of Latvia 2006. Rīga: Latvijas Republikas Centrālā statistikas pārvalde, 408 lpp.
10. Central Statistical Bureau of Latvia (2008) Latvijas statistikas gadagrāmata 2007/ Statistical Yearbook of Latvia 2007. Rīga: Latvijas Republikas Centrālā statistikas pārvalde, 568 lpp.
11. FAOSTAT. Available at: http://faostat.fao.org/site/569/default.aspx#ancor, viewed on November 30, 2009.
12. Fonseca da M.C. and Salay E. (2008) Beef, Chicken and Pork Consumption and Consumer Safety and Nutritional Concerns in the City of Campinas, Brazil. *Food Control*, Volume 19, pp. 1051-1058
13. Grunert K.G. (2006) Future Trends and Consumer Lifestyles with Regard to Meat Consumption. *Meat Science*, Volume 74, pp. 149-160
14. Jemeļjanovs A., Šterna V. (2008) *Liellopu gaļa - kvalitatīvs pārtikas produkts*. Pieejams: http://www.saimnieks.lv/Lopkopiba/Govkopiba/3937. Skatīt: 2009. gada 1. decembrī
15. McCarthy M. and Henson S. (2005) Perceived Risk and Risk Reduction Strategies in the Choice of Beef by Irish Consumers. *Food Quality and Preference*, Volume 16, p. 435-445
16. Ministry of Agriculture Republic of Latvia (2007) *Agriculture and Rural Area of Latvia*. Riga: Ministry of Agriculture Republic of Latvia. 152 p.
17. Morgan N. and Tallard G. (2006) *Cattle and Beef International Commodity Profile*. Available at: http://siteresources.worldbank.org/INTAFRICA/Resources/257994-1215457178567/Cattle_and_beef_profile.pdf, viewed on November 23, 2009.

18. Verbeke W, Pérez-Cueto F.J.A., de Barcellos M.D., Krystallis A. and Grunert K.G. (2009) European Citizen and Consumer Attitudes and Preferences Regarding Beef and Pork. *Meat Science*, Volume 84, Issue 2, p. 284-292

19. Weaber D. and Miller M. (2004) An Evolving Industry. *Beef*. Available at: http://beefmagazine.com/mag/beef_evolving_industry/, viewed on November 23, 2009.

Kopsavilkums

Patērētāju intereses lielā mērā parādās pieprasījumā pēc kāda produkta, kas mūsu pētījumā ir liellopu gaļa. Savukārt pieprasījums regulē vai ietekmē attiecīgā produkta ražošanu - apjomu, to dinamiku, attīstības virzienu. Tādēļ izmaiņas patērētāju pieprasījumā ietekmē liellopu gaļas ražošanu. Globālās tendences rāda, ka kopējā gaļas ražošanas struktūra un liellopu gaļas ražošanas apjomi pēdējo divdesmit gadu periodā strauji un konsekventi samazinājušies. Šādas tendences var attiecināt arī uz gaļas patēriņa struktūru. Šajā pētījumā autori koncentrējās uz faktoriem, kas ietekmē Latvijas patērētāju lēmumu pirkt liellopu gaļu. Pētījuma rezultāti parādīja, ka lielākajai daļai no aptaujātajiem patērētājiem nepatīk liellopu gaļas smarža un garša, kas liecina par to, ka salīdzinājumā ar cūkgaļu, liellopu gaļa ir salīdzinoši jauns produkts Latvijas patērētāju ēdienkartē. Tāpat par liellopu gaļas patēriņu limitējošiem faktoriem var uzskatīt salīdzinoši augsto cenu un informācijas trūkumu par liellopu gaļas pagatavošanas receptēm.

Development Tendencies of Deer Breeding Sector in Latvia

Līga Proškina, Mg.oec., PhD student, Latvia University of Agriculture
Irina Pilvere, Dr.oec., professor, Latvia University of Agriculture

Abstract. Deer breeding is a relatively new and progressive sector in the world. Deer breeding in the world has been developed for the past 30 years, though in Latvia this period is twice shorter. However Latvia has enough land areas – both unutilised agricultural areas and forest areas, where deer breeding could be developed, thus promoting employment in rural areas and improvement of the environment and landscape. The research analyses the present situation and development tendencies in Latvian deer breeding sector. Deer breeding comprises four periods of development.
The research identifies the main regulatory enactments governing in the sector, and the key coordination and supervision institutions. It was concluded that the Wild Animals Breeding Association founded in 2000 plays a significant role in the deer breeding sector development.
In Latvia between 2004 and 2009 the number of deer farms has increased 2.3 times, thus accounting for 70 farms breeding more than 7000 deer. At the end of 2009 the total enclosed areas or enclosures in deer parks were 8873 ha and the increase of deer parks size during the period analysed has influenced the increase of the number of breeding animals. In 2009 the average animal density on one farm in Latvia was 0.8 animals per 1 ha of an enclosed area, which corresponds to the standards of extensive breeding. Applying the intensive approach of deer breeding it is possible to increase the number of deer at least 7 times in the existing enclosed areas, thus establishing a basis for future development of the sector.
Key words: deer breeding, deer parks, animals, farms.

Introduction

Unconventional animal husbandry sectors along with the generally accepted animal husbandry sectors have become more important in Latvia. Breeding of wild animals including deer breeding is one of the most perspective, potentially export capable, and boosting unconventional animal breeding sectors. Latvia is rich in agricultural and forest land resources applicable for deer breeding in parks and there is sufficiently acceptable genetic material of deer for the sector development. According to the data of the Central Statistical Bureau on the survey of rural farms structure in 2007, when the total sample comprised 58.0 thousand rural farms, the unutilised agricultural areas covered 155.1 thousand ha. According to the forest monitoring data of the State Forestry Research Institute "Silava" on April 1, 2008 the area of agricultural land overgrown with trees and shrubs covered 163.46 thousand ha and the utilised agricultural area complying with forest criteria made 142.59 thousand ha (Latvijas Lauksaimniecība un lauki, 2009). Hence it is essential to draw the unused resources into an appropriate circulation and changing economic conditions, while several conventional agricultural sectors incur losses. Therefore it is necessary to pay more attention and support to the development of unconventional sectors. Deer breeding is an alternative to a traditional animal husbandry, and it may be established as a certain market segment promoting employment in rural areas as well as ensuring tidy and beautiful environment.

In Latvia deer breeding is less popular than conventional animal husbandry. Seventy farms practised deer farming in 2009. In deer breeding animal keeping conditions are similar to wildlife. Deer live outside throughout the year and they are kept in small herds in enclosed territories or pasture-grounds; such farms are called as deer parks.

The world practice in deer breeding similar to animal husbandry applies the approach of intensive and extensive breeding. At the time being mostly the approach of extensive breeding (farming) is applied in Latvia (SDAA, 2009).

Deer breeding farms in Latvia specialise in three main spheres – breeding of pedigree breeds, meat production, and trophy animals for hunting. Not infrequently farms choose the fourth sphere of activities – tourism, which is successfully combined with the afore-mentioned spheres (SDAA, 2009; Paeglītis D. etc., 2006). Meat production is considered as the main source of income in deer breeding (Paeglītis D. etc., 2006; Tuckwell C., 2003; Fletcher J., 1989), although several authors have mentioned that trophy hunting is the most profitable activity of farms (Holst A, 2002). Thus the development of this sphere of the sector should be viewed as perspective in Latvia.

So far there have been few studies on the sector of deer breeding in Latvia, hence it is essential to ascertain the situation in the sector and its future perspectives alongside the conventional agricultural sectors. Therefore the **research aim** is to describe the situation in the sector of deer breeding in Latvia.

The **tasks** set to implement the research aim are as follows:

1) to study historical development of deer breeding in Latvia and identify development stages for deer breeding;
2) to describe regulatory enactments of the sector and responsible institutions;

3) to analyse the main characteristic indicators of the sector.

Statistical data and information provided by the State agency "Lauksaimniecības datu centrs" (Agricultural Data Centre - LDC), unpublished information of Latvian Wild Animals Breeders Association (SDAA), publications of Latvian and foreign researchers, conference materials, and interviews with sector specialists were used to complete the research tasks.

For the purpose of the study the research methods included a monographic descriptive, abstract-logical, analysis, and synthesis methods as well as graphical, data grouping, and time-series methods.

Results and discussion

1. Historical development of deer breeding sector in Latvia

Deer breeding as agricultural sector is a relatively new and progressive sector in the world. Deer breeding has been developed for the past 20-30 years in many countries of the world. In 2008-2009 the leading positions of deer breeding were held by New Zealand with 1.5-1.8 million deer (Deer Industry New Zealand, 2009), the USA – 0.26 million (Anderson D.P., 2007), Australia – 0.2 million (McRae T.B. et. al., 2006), and Canada – 0.1 million deer (Statistics Canada, 2009). In Europe deer breeding is developed in Germany (FEDFA, 2009) and the United Kingdom (BDFA, 2009), however lately deer breeding has started to develop in Poland and other countries.

The development of deer breeding in Latvia may be divided into several periods, based on the studies of some authors (G.Skriba, D.Paeglītis):

1. Historical period – wild deer appeared in the territory of Latvia approximately 8 000 years ago. The number of deer reached their maximum 5000-6000 years ago, though later they started to disappear. The development of deer breeding in the 19th century was determined by the fashion governing in Europe to arrange menageries. At the beginning of the 19th century animals were imported from Poland, the Carpathian Mountains and the Caucasus for the establishment of deer parks. Sixteen deer parks existed in Latvia between 1850 and 1900, since it was thought that deer could not survive in the wild. However during the rebellion of 1905 a large number of imported deer broke free and reproduced, so creating populations of wild animals. Wild deer population incurred damages as well as deer parks were destroyed during the two World wars. In Latvia between 1963 and 1985 deer were imported from the USSR forestries, and the newly-born deer calves from Kurzeme region forests were replaced to other regions of Latvia for a targeted deer breeding in wild (Skriba G., 1995a, 1995b, 1995c).
2. Early period – after restoration of the second independence of Latvia in 1991, entrepreneurs were interested in deer breeding for commercial purposes. The first deer parks were established in 1994.
3. Middle development period – turn of the 20th and 21st century with the largest activity in the establishment of deer parks observed for the period of 1999-2004, as 23 new deer parks started their commercial activities (Paeglītis D. etc., 2006). The year 2000 is marked as milestone in the development of deer breeding in Latvia, when Latvian Wild Animals Breeders Association was founded due to the merging of 18 supporters of deer breeding idea and existing owners of deer parks. Support aids, mainly for the construction of fences and buildings, available through the Special Accession Programme for Agriculture and Rural Development (SAPARD) essentially impacted the establishment and development of deer parks.
4. Stable development period started from 2004 with the accession of Latvia to the European Union (EU). The EU Structural Funds financing was available during this period. Consequently the number of deer parks has increased up to 70 parks compared with 2000, when approximately 30 deer parks were established in Latvia and 21 licences were issued for keeping wild animals in captivity.

In Latvia deer breeding farms are not targeted only at meat production, but they also ensure hunting and representation activities. Thus deer parks provide animals appropriate both for hunting and sightseeing - deer with large and pronged horns.

Probably the most multiform choice of deer for selection is available in Latvia (Fletcher J, 2008). Latvia is among those few countries, where animals for deer parks are imported from very many countries and territories – Germany, Poland, Belarus, Kaliningrad, the Czech Republic, Hungary, the United Kingdom, Austria, Romania, the Netherlands, and Sweden. Hence, opening broad opportunities for selection, and genetic improvement of the present breeds and development of new breeds, since the imported animals comprise both vigorous animals with large and pronged horns and more peaceful and bigger in the muscular mass animals. Thus there are possibilities to develop both excellent trophy and meat deer herds. The purchase of breed material from abroad was partly financed through the state subsidies for the period of 2005-2008 (Noteikumi par valsts atbalstu ..., 2005, 2006, 2007, 2008).

2. Regulatory enactments of the sector and participatory institutions

The hierarchy of laws and regulations in Latvia is broken down in several levels, which also refer to the sector of deer breeding:

1) laws of the Republic of Latvia;
2) the Cabinet Regulations of the Republic of Latvia;
3) regulatory enactments published by institutions/ organisations/enterprises.

By importance the regulatory enactments might be divided into two large groups – general enactments, which relate to the agricultural sector

on the whole and specific enactments, which shall be observed by the breeders of wild animals. Only the main regulatory enactments binding to entrepreneurs of the deer breeding sector are analysed hereafter.

Deer breeding farms in Latvia are included into the number of wild animal breeders. Pursuant to Section 13 of the Animal Protection Law wild animals, including deer that are kept in enclosed areas for the acquisition of products of animal origin or for the purposes of species selection shall also be considered to be agricultural animals kept for farming purposes (Dzīvnieku aizsardzības likums, 1999). Thus general regulatory enactments of animal husbandry and also several specific regulatory enactments governing breeding of wild animals are binding to deer breeding farms.

The purpose of Veterinary Medicine Law is to regulate the prevention and combating of infectious animal diseases, veterinary medical practice, the circulation of products of animal origin, veterinary control of the import and transit of animal products and products of animal origin, and determine the rights and obligations of the state and local government institutions as well as of individual entities in this field. The law prescribes that the observance of veterinary and circulation of products requirements shall be supervised and controlled by the Food and Veterinary Service (PVD) (Veterinārmedicīnas likums, 2001).

The law "On Supervision of the Handling of Food" is binding to deer breeders, since meat production is one of business sectors of deer breeding. The purpose of the law is to ensure handling of food, which is qualitative and harmless to human health, life and the environment, the elimination of risks, the promotion of trade and the protection of the interests of consumers. The law applies to the handling of all forms of food and any food undertaking and natural entity involved in it (Pārtikas aprites uzraudzības..., 1998).

The Cabinet Regulations No. 180 of April 15, 2003 "Procedure for Keeping Wild Animals Envisaged for the Use of Meat Production or Pedigree Breeding in Enclosed Territories" shall be mentioned in the group of specific enactments. The regulations prescribe the procedure for keeping wild animals envisaged for the production of meat or breeding in enclosed territories or deer parks (Dzīvnieku izcelsmes produktu..., 2003).

Products of organic farming are becoming more popular among inhabitants, as people are willing to consume food of organic origin. Animals of the deer family and the products derived therefrom may be sold with the reference "Organic farming", if the animals have been born on an organic farm and have been reared in accordance with the requirements set for organic farms. The procedure for circulation of animals of the deer family and the products derived therefrom in organic farming is prescribed by the Cabinet Regulations of the Republic of Latvia No. 1204 of October 20, 2009 "Procedure for the Circulation of Animal Products and Products Derived Therefrom, which are not Regulated by Directly Applicable Legal Acts of the European Union Regarding Organic Farming" (Dzīvnieku un no tiem…,2009).

The Ministry of Agriculture is the main institution responsible for the sector, which is also the leading state administration institution in the sectors of agriculture, forestry, and fishery (ZM nolikums, 2003). The Ministry of Agriculture is the supervisory authority for the afore-mentioned Food and Veterinary Service, which ensures the observance of veterinary and circulation of products requirements in Latvia (PVD, 2009). The Ministry of Agriculture supervises also the State agency "Lauksaimniecības datu centrs" (Agricultural Data Centre), which ensures registering of herds and animals, registering of stands and other functions based on the requirements of the Law on Breeding and other regulatory enactments (LDC, 2009b).

Nevertheless the Ministry of Agriculture delegates several functions to public organisations of the sector. Thus the Wild Animals Breeders Association, which has received the status of a pedigree animal breeding association, coordinates breeding of wild animals in enclosed territories and breeding activities. The Wild Animals Breeders Association implements the functions prescribed by the Law on Breeding – keeps the studbook of pedigree deer, certifies breeding bulls, carries out attestation of farms rearing pedigree animals as well as organises auctions of animals, import of animals, implements projects, and deals with promotion of the sector in the country (Ciltsdarba likums, 1998). In 2008 there were 5 international workshops organised on evaluation of animal value for breeding and testing of their capacity for work, which were carried out in different regions of Latvia with the participation of owners of the existing farms and other interested persons. On August 21-24 an international conference "Farm Management and Quality of Products in Deer Farming" was organised at Sigulda, where participants got acquainted with progressive farm management and production methods in the world practice enabling Latvia's deer farmers to improve production methods and thus also the quality of products and consequently improving their competitiveness on the local and European market (Latvijas Lauksaimniecība un lauki, 2009).

According to the data provided by Latvian Wild Animals Breeders Association in 2008 nine farms had prolonged the status of breeding entities, of which only 8 farms after inspections and assessment got their status prolonged as red deer breeding farms as well as they received "Certificates of Red Deer Breeding Farms" (Latvijas Lauksaimniecība un lauki, 2009).

Within the implementation of the Pedigree Breeding Programme an active work has been carried out on red deer pedigree breeding programme, identification and evaluation of breeding stags and other animals (hides, calves and young animals) on pedigree breeding farms. The Pedigree Breeding Programme for Fallow Deer for 2009 – 2013 has been developed as well as the procedure for recording of fallow deer and regulation for attestation of fallow deer breeding and breeding animal evaluation programme on breeding farms.

Table 1

Characteristic indicators on the number of deer and deer parks in Latvia for the period of 2004-2009

No.	Indicators/years	Unit of measurement	2004	2005	2006	2007	2008	2009*	2009**
1.	**Deer parks**	**number**	**30**	**41**	**46**	**48**	**52**	**54**	**70**
2.	Chain increase rate	%	x	36.7	12.2	4.3	8.3	3.8	29.6
3.	Base increase rate	%	x	36.7	53.3	60.0	73.3	80.0	133.3
4.	**Deer**	**number**	**747**	**980**	**1645**	**3187**	**4960**	**5651**	**7170**
5.	Chain increase rate	%	x	31.2	67.9	93.7	55.6	13.9	26.9
6.	Base increase rate	%	x	31.2	120.2	326.6	564.0	656.5	859.8
7.	**Average number of deer per one deer park**	**number**	**25**	**24**	**36**	**66**	**95**	**105**	**102**
8.	Chain increase rate	%	x	-4.0	49.6	85.7	43.7	9.7	-2.1
9.	Base increase rate	%	x	-4.0	43.,6	166.6	283.1	320.3	311.4

* at the beginning of 2009, ** on December 1, 2009

Source: authors' calculations according to the data of LDC 2009a and SDAA, 2009

3. Main indicators characterising the sector in Latvia

Several indicators will be analysed to characterise the deer breeding sector – number of farms, number of members joined the Wild Animals Breeders Association, number of animals and their density, area of deer parks, and other indicators. The increase rates for the mentioned indicators will be calculated to study trends of the changes in Latvia for the period of 2004-2009. The calculations are based on the time series analysis, i.e. statistical indicators in a successive weight row, which numerically display the process of changes of a phenomenon within a certain time period. Three types of time series are applied in practice:

- time series of absolute values – their levels contain absolute values;
- time series of relative values – their levels contain relative values;
- time series of mean values – their levels contain mean values (Balabka N., 2008). The present research focuses on the time series of relative values, which expressively depict the main changes, occurred in the sector of deer breeding.

According to the way of calculation, time series contain the following indicators:

- **chain indicators** – show the rate of changes from one period to another period within the analysed period;
- **base indicators** – show the final results of all changes impacted the rows levels compared with the period assumed as a base period (Balabka N., 2008).

The increase rate shows a share by which the level of respective row has increased or decreased in relation to the previously achieved level. *Legend* – $t_{m(b,ch)}$.

According to N. Balabka (2008), indicators may be calculated according to the following equations:

a) chain (%) $$t_{m(ch)}=(\Delta_{m(ch)} / Y_{m-1}) \times 100 \quad (1);$$

b) base (%) $$t_{m(b)}=(\Delta_{m(b)} / Y_{v1}) \times 100 \quad (2);$$

where

$\Delta_{m(b,ch)}$ – absolute increase, characterising the increase (decrease) of a series level within a certain time period;

y_{m-1} – previous level of a time series;

y_1 – initial (first) level of a time series.

Data and calculations included into Table 1 will be used for the solution of the third research task.

The calculations included into Table 1 allow drawing several conclusions and interpretations:

- the number of deer parks has increased 2.3 times within the analysed period, i.e. from 30 farms in 2004 up to 70 farms at the end of 2009; thus the average annual increase equals to 6.7 farms. The most rapid increase in the number of farms is observed at the beginning of the analysed period, when in 2005 the number of farms has increased by 11 units compared with 2004, while at the end of 2009 the increase accounts for 14 farms;
- in 2009 the number of deer 9.6 times exceeds the number of deer in 2006. An especially fast increase of deer was seen in 2007, when the number of deer increased almost twice compared with the previous year. The number of animals has substantially grown also in 2006 and 2008;
- annually the number of deer has increased by 1000 animals on average. The issue of large number of licences in 2004 for keeping wild animals in captivity and growing interests of entrepreneurs towards this sector explain the increase of the number of deer within the analysed

Table 2

Indicators characterising the area of deer parks and animal density in Latvia for the period of 2004-2009

No.	Indicators/years	Unit of measurement	2004	2005	2006	2007	2008	2009*	2009**
1.	**Area of deer parks**	**ha**	**1600**	**3850**	**4520**	**5615**	**7235**	**8020**	**8873**
2.	Chain increase rate	%	x	140.6	17.4	24.2	28.9	10.9	10.6
3.	Base increase rate	%	x	140.6	182.5	250.9	352.2	401.3	454.6
4.	**Average area of 1 deer park**	**ha**	**53.3**	**93.9**	**98.3**	**117.0**	**139.1**	**148.5**	**126.8**
5.	Chain increase rate	%	x	76.1	4.6	19.0	18.9	6.7	-14.7
6.	Base increase rate	%	x	76.1	84.2	119.3	160.9	178.5	137.7
7.	**Average density of deer per 1 ha**	**number**	**0.5**	**0.3**	**0.4**	**0.6**	**0.7**	**0.7**	**0.8**
8.	Chain increase rate	%	x	-45.5	43.6	55.7	21.0	2.5	14.4
9.	Base increase rate	%	x	-45.5	-21.7	21.9	47.6	51.3	73.1

* at the beginning of 2009, ** on December 1, 2009

Source: authors' calculations according to the data of LDC 2009a and SDAA, 2009

period. Besides the experience is accrued, and gradually market for venison develops as well as deer parks attract tourists;

- in general the increase rate related to the number of animals exceeds the increase rate related to the number of deer parks within the analysed period more than 6 times, thus showing the growth and intensification of the sector;
- the average number of deer per one deer park has increased more than 4 times during the period analysed and amounts to 102 deer in 2009. It means that farms expand and become more competitive. The average decrease in the number of deer per one deer park was observed in 2005 compared with the previous year and also in 2009.

Unfortunately it is impossible to provide an unequivocal assessment on the number of animals in all deer parks of Latvia due to several reasons:

- there is no single data registering system or data base, where all the data on situation in deer parks are collected and updated;
- owners of deer parks having not joined the Wild Animals Breeders Association are not willing to provide information on their economic activities. Despite the unadjusted market of deer breeding production, farms outside the Wild Animals Breeders Association consider them as rivals and disclosure of any information from their part is impossible;
- process of animal counting is hindered, thus only approximate data are available.

The ability of farms to cooperate and thus solve issues significant for the sector unitedly and efficiently is a significant growth indicator of the sector. In 2009 the Wild Animals Breeders Association united 26 members engaged in breeding of red deer, fallow deer, wild boars, moufflons, roes, chamois, rambling-horns goats, yaks, and other wild animals. Consequently 37% of farms engaged in wild animal breeding have joined the Wild Animals Breeders Association, thus representing a quite high indicator of organisation of these farms. In 2009 twenty-six deer parks with the total enclosed area of 8000 ha and 7500 wild animals of different breeds have been completely established within the Association. Out of 7500 wild animals of different breeds 66% are red deer, 12% – fallow deer, 6% – moufflons, 6% – wild boars, and 10% are animals of other breeds. Thirty completely established deer parks breeding deer operate outside the Association, however information on the number of animals and their breeds are rather controversial. Currently 14 wild animal parks are unfinished or in the process of establishment.

Deer breeding sector is a multifunctional agricultural sector, which is proved by the wide spectrum of economic activities. Out of 54 farms registered at the beginning of 2009 twelve farms are engaged in meat production, animal breeding, hunting and tourism, while six farms are engaged in meat production, animal breeding and tourism. Fourteen farms breed deer only for meat production and hunting, there are also farms specialising in animal breeding and tourism. Only few farms have narrow specialisation: 3 farms are engaged only in animal breeding, 5 farms – in meat production, 2 farms – in hunting, and 3 farms are engaged in tourism.

The number of deer in farms registered in the Wild Animals Breeders Association has increased from 800 animals in 2004 up to 5800 animals (6.7 times) at the end of 2009.

The figures on the area of deer parks and density of deer as well as the chain and base increase rates of these indicators are shown in Table 2.

According to the information included into Table 2:

- between 2004 and 2009 the area of deer parks has increased 5.4 times, i.e. more than twice

exceeding the increase rate related to the number of deer parks and 1.8 times lagging behind the increase rate related to the number of deer (Table 1);

- at the end of 2009 total enclosed areas or pasture-grounds in deer parks covered 8873 ha, of which 3160 ha were forest land areas (SDAA, 2009);
- the area of deer parks has considerably (2.4 times) increased in 2005 compared with the previous period, while a relative smooth area growth is observed for other years. The availability of the EU Structural Funds financing after Latvia's accession to the EU explain the situation;
- the increase of average area of deer parks conform to the increase rate of the number of deer parks within the analysed period (Table 1).

According to the Wild Animals Breeders Association data in 2005 the area of enclosed territories in deer parks increased sharply – 2.4 times, while the growth of number of deer was not so fast, thus deer density per one hectare decreased by 46%. The actual number of animals will increase only within the next years, since the establishment of a deer park is a time and capital consuming activity.

It is indispensable strictly to follow the well-being requirements of deer breeding to ensure high quality of venison. Enclosed areas are classified into 2 areas: intensive and extensive breeding areas (Dzīvnieku izcelsmes produktu ..., 2003).

Intensive breeding areas cover meadows and cultivated pastures with a small underwood territory, where 7 grown-up red deer or 14 grown-up fallow deer without additional feeding may be kept per one hectare of meadow in summer. The researches of the Research Institute "Sigra" show (Miculis J. etc., 2008) that according to the content of nitrogen in the excrements it is possible to keep up to 11 red deer or 22 fallow deer per one hectare.

Extensive breeding pasturing areas shall cover forest land areas with the meadow not less than 1/7 of the whole pasturing territory, where 1 red deer or 2 fallow deer are allowed to be kept per one hectare.

In Latvia deer parks are established traditionally with the approach of extensive farming. Animal density does not reach 1 animal per 1 ha of enclosed area. The density of animal number has essentially increased for the period of 2005- 2009, i.e. from 0.3 to 0.8 animals per 1 ha of enclosed area (Table 2).

Consideration of the present number of animals and area of enclosed territory leads to the conclusion that it is possible to increase the number of deer in the present enclosed areas at least 7 times applying intensive breeding approach in deer breeding sector.

Conclusions

1. Deer breeding is a relatively new and progressive sector not only in Latvia, but also in the world, which has been developing for the past 20-30 years. The leading position of deer breeding is held by New Zealand, where the number of deer 6-8 times exceeds the number of deer bred in the USA and Australia.
2. In Latvia deer breeding has developed during the past 15 years, since the first deer parks were established only in 1994. Therefore the development of deer breeding sector in Latvia may comprise 4 periods. In Latvia the sector may be considered as stable and growing from 2004.
3. In compliance with the Animal Protection Law deer that are kept in enclosed areas for the acquisition of products of animal origin or for the purposes of species selection shall also be considered to be agricultural animals kept for farming purposes. Thus general regulatory enactments of animal husbandry and also several specific regulatory enactments governing breeding of wild animals are binding to deer breeding farms.
4. The Ministry of Agriculture is the main coordinating institutions of deer breeding sector as well as of any other agricultural sector. Individual specific spheres are supervised by the Food and Veterinary Service and the Agency "Lauksaimniecības datu centrs" (Agricultural Data Centre), while the Wild Animals Breeding Association implements particular functions prescribed by the Law on Breeding.
5. At the end of 2009 there were 70 farms registered in Latvia and engaged in deer breeding in deer parks, of which 26 farms are the members of the Wild Animals Breeding Association. Total number of deer in the Wild Animals Breeding Association member farms equals to 5800 deer, totally 7170 deer have been registered in Latvia. The number of deer breeding farms has increased by 40 farms or 2.3 times between 2004 and 2009. The number of deer in the Wild Animals Breeding Association member farms has increased by 5000 animals or 6.7 times during the same period. It shows an even and targeted development of a deer breeding sector.
6. Total area of enclosed territories or pasture-grounds in deer parks at the end of 2009 covered 8873 ha, of which 3160 ha are forest land areas. The largest increase of the pasture-ground areas was observed in 2005, here the availability of the EU Structural Funds financing that mainly determined the growth of deer number of explain the situation.
7. Animal density per one farm is 0.8 animals on one hectare of enclosed area, which conforms to the requirements of extensive breeding. Applying the approach of intensive breeding it is possible to increase the number of deer at least 7 times in the existing enclosed areas. It is a future perspective for the sector development excluding additional capital investment.

Bibliography

1. Anderson D.P., Frosch B.J., Outlaw J.L. (2007) // *Economic Impact of the United States Cervid Farming Industry.* Agricultural and Food Policy Centre, Department of Agricultural

Economics, APFC Research Report 07-4, Texas A&M University, August 2007. Available at: http://www.texashuntfish.com/app/wildlife-resources/20899/Economic-Impact-of-the-United-States-Cervid-Farming-Industry;jsessionid=14829572053B7F7BC7A6CBF84E5F9841. Viewed on December 12, 2009.

2. Balabka N. (2008) Prognozēšanas iespējas uzņēmējdarbībā (Forecasting Possibilities in Business). Available at: http://www.balabka.lv/index.html/RVT/Ekonomikas%20nodalja/Uznjeemeejdarbiibas.kom.pak.maac/(7.2.teema)Prognozeeshanas_apreekjini.pdf. Viewed on: January 10, 2010.
3. *Ciltsdarba likums (*Law on Breeding). Latvijas Republikas (LR) likums. Pieņemts 02.04.1998., publicēts: Latvijas Vēstnesis, 106 (1167), 21.04.1998., spēkā ar 05.05.1998. Available at: http://www.likumi.lv/doc.php?id=47840. Viewed on: September 12, 2009.
4. Deer Industry New Zealand (2009) // Available at: http://www.deernz.org/n5.html. Viewed on: October 24, 2009.
5. *Dzīvnieku aizsardzības likums (Animal Protection Law)*. Latvijas Republikas (LR) likums. Pieņemts 09.12.1999., publicēts: Latvijas Vēstnesis, 444/445 (1904/1905), 29.12.1999. Available at: http://www.likumi.lv/doc.php?id=107353&from=off. Viewed on: September 12, 2009.
6. *Dzīvnieku izcelsmes produktu ieguvei vai sugas selekcijai izmantojamo savvaļas dzīvnieku turēšanas kārtība iežogotās platībās* (Procedure for Keeping Wild Animals Envisaged for the Use of Meat Production or Pedigree Breeding in Enclosed Territories). Latvijas Republikas Ministru kabineta (MK) 2003.gada 15.aprīļa noteikumi Nr.180. Publicēts: Latvijas Vēstnesis, 60 (2825), 17.04.2003., spēkā ar 18.04.2003. Available at: http://www.likumi.lv/doc.php?id=73996. Viewed on: September 15, 2009.
7. *Dzīvnieku un no tiem iegūto produktu aprites kārtība, kas nav regulēta Eiropas Savienības tieši piemērojamos tiesību aktos par bioloģisko lauksaimniecību (*Procedure for the Circulation of Animal Products and Products Derived Therefrom, which are not Regulated by Directly Applicable Legal Acts of the European Union Regarding Organic Farming). Latvijas Republikas Ministru kabineta (MK) 2009. gada 20.oktobra noteikumi Nr.1204. Rīga (prot. Nr.72 24.§), spēkā ar 24.10.2009. Available at: http://www.likumi.lv/doc.php?id=199560. Viewed on: October 30, 2009.
8. Fletcher J., (1989) Deer Farming in Europe. In: *Wildlife Production Systems.* Hudson R.J., Drew K.R. and Baskin L.M. (ed.). Cambridge. Cambridge University Press, 1989., pp. 323-334.
9. Fletcher J., (2008) Personīga intervija (Interview) 21.-24. 08.2008. Starptautiskā konferencē "Fermu menedžments un produkcijas kvalitāte briežkopībā" Siguldā.
10. Holst A. *Optimal Harvesting Strategies in Fallow and Red Deer Production*. Examenarbete 227. Institution for husdjursgenetik, Sveriges Lantbruksuniersitet, 2002, pp. 20-21.
11. *Latvijas Lauksaimniecība un Lauki 2009 (Latvia Agriculture and Rural Areas)*, LR Zemkopības ministrija, Rīga, 2009, 65.lpp.
12. McRae T.B., Cox RJ., Watson GK (2006) // *Situation Analysis of the Australian Venison Industry.* AFBM Journal, Volume 3, No. 1. Available at: http://www.mur.csu.edu.au/faculty/science/saws/afbmnetwork/afbmjournal/volume3/number2/AFBMJournal_v03_n02_08_TimMcRae_et_al.pdf. Viewed on: December 30, 2009.
13. Miculis J., Paeglitis D., Timbare R., Karklina V. // *Briežu ražotais kūtsmēslu daudzums un to ķīmiskais sastāvs (Amount and Content of Manure Produced by Deer)* // Starptautiska konference "Fermu menedžments un produkcijas kvalitāte briežkopībā" Sigulda, Latvija, 21.-24.08.2008., konferences materiāli.
14. *Noteikumi par valsts atbalstu lauksaimniecībai 2005.gadā un tā piešķiršanas kārtību (Regulations on State Support for Agriculture and Procedure for Granting Support in 2005)*. Latvijas Republikas Ministru kabineta (MK) 2005. gada 25.janvāra noteikumi Nr.70, Publicēts: Latvijas Vēstnesis, 27 (3185), 17.02.2005./ zaudējis spēku Available at: http://www.likumi.lv/doc.php?id=101766&from=off. Viewed on: October 7, 2009.
15. *Noteikumi par valsts atbalstu lauksaimniecībai 2006.gadā un tā piešķiršanas kārtību (Regulations on State Support for Agriculture and Procedure for Granting Support in 2006)*. Latvijas Republikas Ministru kabineta (MK) 2006. gada 3. janvāra noteikumi Nr.21, Publicēts: Latvijas Vēstnesis, 14 (3382), 24.01.2006. /zaudējis spēku. Available at: http://www.likumi.lv/doc.php?id=126343&from=off Viewed on: October 7, 2009.
16. *Noteikumi par valsts atbalstu lauksaimniecībai 2007.gadā un tā piešķiršanas kārtību (Regulations on State Support for Agriculture and Procedure for Granting Support in 2007)*. Latvijas Republikas Ministru kabineta (MK) 2007.gada 23.janvāra noteikumi Nr.78, Publicēts: Latvijas Vēstnesis, 26 (3602), 14.02.2007. Available at: http://www.likumi.lv/doc.php?id=152955&from=off. Viewed on: October 7, 2009.
17. *Noteikumi par valsts atbalstu lauksaimniecībai 2008.gadā un tā piešķiršanas kārtību (Regulations on State Support for Agriculture and Procedure for Granting Support in 2008).* Latvijas Republikas Ministru kabineta (MK) 2008.gada 22.janvāra noteikumi Nr.41, Publicēts: Latvijas Vēstnesis, 15 (3799), 29.01.2008. Available at: http://www.likumi.lv/doc.php?id=169917&from=off. Viewed on: October 7, 2009.
18. Paeglītis D., Dusalijeva I., Flečers Dž., Skriba G. // *Staltbriežu audzēšana un*

selekcija (Breeding and Selection of Red Deer). Rīga: SDAA, 2006. – 10., 30. lpp.
19. *Pārtikas aprites uzraudzības likums (*On Supervision of the Handling of Food). Latvijas Republikas (LR) likums. Pieņemts 19.02.1998., publicēts: Latvijas Vēstnesis, 60/61 (1121/1122), 06.03.1998., spēkā ar 20.03.1998. Available at: http://www.likumi.lv/doc.php?id=47184. Viewed on: October 1, 2009.
20. Pārtikas veterinārais dienests (Food and Veterinary Service) (PVD) (2009). Par PVD. Available at: http://www.pvd.gov.lv/lat/augj_izvlne/par_pvd/. Viewed on: December 12, 2009.
21. Savvaļas dzīvnieku audzētāju asociācija (Wild Animals Breeding Association) (SDAA) (2009) nepublicētā informācija.
22. Skriba G.(1995a) Staltbriežu senatne (History of Red Deer). *Medības.Makšķerēšana.Daba.* Nr.1. 22.-23. lpp.
23. Skriba G.(1995b) Staltbrieža otrreizēja atgriešanās (Second Return of Red Deer). *Medības.Makšķerēšana.Daba*. Nr.3. 7.lpp.
24. Skriba G.(1995c) Pirmie briežu dārzi Latvijā (First Deer Parks in Latvia). *Medības.Makšķerēšana. Daba*. Nr.9. 36.-40.lpp.
25. *Statistics Canada* (2009). Livestock and Aquaculture, on-line resource. Available at: http://cansim2.statcan.ca/cgi-win/cnsmcgi.pgm?Lang=E&SP_Action=Result&SP_TYP=4&SP_ID=25653&SP_Mode=2&SP_Chunk=51,25&SP_Sort=01&SP_Mode=2. Viewed on: October 13, 2009.
26. The British Deer Farmers Association (BDFA) (2009) Available at: http://www.bdfa.co.uk/deerfarminginfo.php. Viewed on: December 12, 2009.
27. The British Deer Farmers Association (BDFA), (2009) Available at: http://www.bdfa.co.uk/deerfarming/hsMtwQb4.pdf. Viewed on: October 24, 2009.
28. The Federation of European Deer Farmers Associations (FEDFA) (2009), Member states. Available at: http://www.fedfa.com/germany.htm. Viewed on: December 12, 2009.
29. Tuckwell C.(2003)// *The Deer Faming Handbook*. Australian government, Rural Industries Research and Development Corporation, RIRDC Publication No. 03/029., Canbera, 2003.
30. VA Lauksaimniecības datu centrs (Agricultural Data Centre) (LDC) (2009a), On-line resource. Available at: http://pub.ldc.gov.lv/pub_stat.php. Viewed on: December 13, 2009.
31. VA Lauksaimniecības datu centrs (Agricultural Data Centre) (LDC) (2009b), History. Available at: http://www.ldc.gov.lv/?u=lv/vesture. Viewed on: December 13, 2009.
32. *Veterinārmedicīnas likums (*Veterinary Medicine Law). Latvijas Republikas (LR) likums. Pieņemts 26.04.2001., publicēts: Latvijas Vēstnesis, 75 (2462), 16.05.2001. spēkā ar 01.07.2001. Available at: http://www.likumi.lv/doc.php?id=20436&from=off. Viewed on: December 10, 2009.
33. *Zemkopības ministrijas nolikums (Statutes of the Ministry of Agriculture)*, Latvijas Republikas Ministru kabineta (MK) 2003.gada 29.aprīļa noteikumi Nr.245, Rīga, Available at: http://www.zm.gov.lv/index.php?sadala=1635&id=1398. Viewed on: January 5, 2010.

Graudu ražošanas raksturojums ES dalībvalstīs
Characteristics of Grain Production in the EU Member States

Veronika Buģina, Dr.oec., profesore
Andis Brakmanis, Mg.oec.
Latvijas Lauksaimniecības universitāte, Ekonomikas fakultāte
e-pasts: efekon@llu.lv

Abstract. The aim of the paper is to characterise the production of grain in the EU member states. Food products made of grain are important in a human diet. The total output of grain in various regions of the world is different for the period of two years. On average, 330-350 kg of grain is produced per capita; its distribution among various countries of the world is very uneven, ranging from less than 100 kg to more than 1 ton per capita, hence an acceptable amount would be around 500 kg per capita.
The highest yields are gained in the West European countries: the Netherlands, Denmark, France, Germany, the United Kingdom, Ireland, and Belgium where yields are within a range of 6-8 t/ha.
Key words: grain yield, area, total output.

Ievads
Introduction

Graudkopība ir svarīgākā augkopības nozare, jo graudu ražošana veicina jebkuras valsts ekonomisko un politisko stabilitāti un līdz ar to arī iedzīvotāju pārticību. No graudaugiem izgatavo ne tikai maizi un maizes izstrādājumus, grausi nodrošina arī vajadzīgo piena, piena, gaļas, olu un citu produktu ražošanas apjomu, tāpēc ar graudu ražošanu nodarbojas visās pasaules valstīs, kur ir nepieciešamās zemes platības un atbilstošie agroklimatiskie apstākļi.

Graudaugu plašā audzēšana pamatojas galvenokārt uz šādām iegūstamās produkcijas priekšrocībām: pirmkārt, koncentrēts uzturvielu un mazs ūdens saturs galvenajā ražas daļā – graudos, otrkārt, iespēja graudus ilgstoši uzglabāt dabiskā veidā, treškārt, iespēja graudus transportēt lielos attālumos, ceturtkārt, visu audzēšanas, novākšanas, transportēšanas un pārstrādes darbu pilnīgas mehanizācijas iespēja.

Graudaugu pārtikas produkti cilvēku uzturā ieņem aizvien nozīmīgāku vietu. Daudzās pasaules attīstītākajās valstīs tiek pārskatīta pārtikas patēriņa bilance par labu graudaugu produktiem. Dietologi uzskata, ka cilvēku uzturā graudu produktiem (maizei, sausajām brokastīm, biezputrām, rīsiem un makaroniem) kopā ar kartupeļiem jābūt ap 40% no visām pārtikas produktu grupām.

Visizplatītākie no graudaugiem ir kvieši, rīsi un kukurūza, kas no pasaules kopējās graudaugu sējumu platības aizņem attiecīgi kvieši ap 30%, rīsi un kukurūza ap 20% katrs, savukārt pārējās labības sugas aizņem krietni vien mazāku daļu. (Lauku lapa, 2009.)

Graudu kopievākums dažādos pasaules reģionos pa gadiem ir atšķirīgs. Atšķirīgs galvenokārt mainīgu klimatisko apstākļu dēļ – postoša sausuma vai pārmērīga mitruma dēļ. Vidēji uz vienu iedzīvotāju ražo 330-350 kg graudu. Šāds rādītājs nav augsts, taču kopumā pie vienmērīga sadalījuma, tas spētu nodrošināt iedzīvotāju patēriņa vajadzību, Graudu ražošanas sadalījums starp atsevišķām pasaules valstīm ir ļoti nevienmērīgs, tas svārstās no nepilniem 100 kg līdz pat vairāk par 1 tonnu uz vienu iedzīvotāju. Pieņemams rādītājs būtu ap 500 kg uz vienu cilvēku. (Augkopība, 2004 Agricultural, 2006-2007.)

Graudu ražība pasaulē vidēji ir 2,8-2,9 tonnas no hektāra. Augstākās ražas tiek iegūtas Rietumeiropas valstīs: Nīderlandē, Dānijā, Francijā, Vācijā, Lielbritānijā, Īrijā, Beļģijā un ražība svārstās 6-8 t/ha. Savukārt viszemākās ražas ir galvenokārt Āfrikā, kur vidējā graudu raža nesasniedz 1 tonnu no hektāra, tas ir tādās valstīs, kā, piemēram, Angola, Nigērija un Sudāna. (Augkopība, 2004.)

Atšķirībā no labi apgādātās Rietumeiropas un citām attīstītajām pasaules valstīm, gandrīz ceturtā daļa planētas iedzīvotāju izjūt pārtikas trūkumu, jo nav attīstīta vietējā ražošana un ir zema šo valstu maksātspēja. Tāpēc neviena valsts, pat ar daudz nelabvēlīgākiem klimatiskajiem apstākļiem kā Latvija, nav atteikusies no lauksaimnieciskās ražošanas, kuras pamats ir graudkopība. Veikti daudzi pētījumi par graudu ražošanu atsevišķās ES valstīs, taču nepieciešams tos kopumā raksturot ES. (Augkopība, 2004.)

Darba mērķis: raksturot graudu ražošanu ES dalībvalstīs.

Izvirzītā mērķa sasniegšanai noteikti sekojoši darba uzdevumi:

1. Izanalizēt ES dalībvalstīs ražoto graudu platību, kopražu, ražību.
2. Noteikt graudu ražošanas rentabilitāti un to ietekmējošos faktorus.

Izmantotie materiāli: Pētījumā izmantoti EUROSTAT dati, „Strategie Greins" dati, Latvijas zinātnieku pētījumi, internetā publicētie materiāli.

Pielietojamās pētījuma metodes: monogrāfiskā, ekonomiski statistiskā, analīzes, indukcijas, dedukcijas.

Pētījuma objekts: Graudu ražošana ES dalībvalstīs.

Rezultāti un diskusija
Results and Discussion
Ražoto graudu platība, kopraža un ražība ES dalībvalstīs
Area, output and yield of grain in he EU member states

Lauksaimniecības tirgus veicināšanas centrs (LTVC) ziņo, ka krītošās kviešu cenas un augstās resursu izmaksas 2009. gadā ietekmē sējplatību apmēru galvenajās ražotājvalstīs – Francijā, Vācijā. Daļa zemnieku, nesaņemot apmierinošus ienākumus no 2008. gada ražas, var pievērsties citu kultūru audzēšanai. Kopējās platības saruks par 1,6% – līdz 221,7 milj.ha. LTVC gan prognozē labvēlīgus ražas apstākļus lielākajā daļā ES valstu, Krievijas rietumu daļā, Ukrainā un Āzijā. Turpretī daļā Tuvo Austrumu valstu un Ziemeļāfrikā ir pārāk liels sausums (Tomsone I., 2009.)

Graudaugu sējplatības pasaulē aizņem gandrīz pusi no visas aramzemes, no tiem kvieši 32%. (Apraksti, 2009.)

Kviešu sējumu platības 2007. gada ražai ES valstīs bija 24,7 milj. ha, t.i. par 2,8% mazāk nekā vidēji pēdējos piecos gados. (*Strategie Grains* ziņojums par ES 2008/09 ražošana gadu dati)

Ziemāju graudaugu kondīcija šobrīd tiek uzskatīta par labu Eiropas Savienībā. Joprojām pastāv bažas par kviešu ražošanas stāvokli Itālijā, Francijā un dažās graudaugu platībās arī Lielbritānijā. Attiecībā uz Apvienotās Karalistes, *Strategie Grains* uzskata, ka vasaras miežu

1.tabula/ Table 1

Graudu sējumu platība Eiropas Savienības dalībvalstīs, tūkst. ha
Areas sown with grain in the EU member states, thou. ha

Valsts/ Country	2004	2005	2006	2007	2008
Apvienotā Karaliste / United Kingdom	3129.4	2922.9	2859.1	2860.0	-
Austrija/ Austria	815.8	796.1	776.8	811.2	841.0
Beļģija/ Belgium	319.2	322.2	329.6	329.9	362.7
Bulgārija/ Bulgaria	1824.5	1719.5	1543.9	1526.6	1707.0
Čehija / Czech Republic	1609.4	1611.6	1532.0	1579.8	1558.6
Dānija/ Denmark	1490.5	1508.5	1494.0	1448.3	1497.7
Francija/ France	9328.9	9158.0	9030.8	9072.2	9661.6
Grieķija/ Greece	1233.2	1221.3	1045.7	1018.2	1165.6
Igaunija/ Estonia	261.0	282.1	280.3	292.3	309.1
Īrija/ Ireland	310.2	282.0	279.8	278.9	313.4
Itālija/ Italy	4049.1	3778.1	3575.0	3700.7	3794.3
Kipra/ Cyprus	66.4	62.1	64.5	43.6	43.2
Latvija/ Latvia	436.7	469.0	511.8	521.9	544.2
Lietuva/ Lithuania	878.5	956.1	962.9	1003.3	1022.0
Luksemburga / Luxemburg	27.9	28.5	28.8	28.5	31.2
Nīderlande/ Netherlands	222.9	221.7	219.3	222.1	243.3
Polija/ Poland	8377.3	8328.9	8381.1	8352.9	8598.8
Portugāle/ Portugal	437.2	366.8	348.1	283.9	334.5
Rumānija/ Romania	6229.1	5824.9	5072.6	5100.3	5174.4
Slovākija/ Slovakia	819.1	799.8	740.0	784.4	799.4
Slovēnija/ Slovenia	99.8	95.5	96.2	99.3	106.6
Somija/ Finland	1221.2	1187.5	1152.6	1168.4	1251.3
Spānija/ Spain	6480.1	6479.0	6198.0	6142.7	6609.3
Ungārija/ Hungary	2998.9	2930.9	2835.8	2762.4	2914.8
Vācija/ Germany	6946.9	6839.0	6702.2	6571.7	7038.5
Zviedrija/ Sweden	1116.3	1013.3	961.8	981.8	1081.5

Avots: autoru veidots pēc EUROSTAT datiem, 2009.
Source: made by the authors according to EUROSTAT data, 2009

sējplatība pieaugs par 12% līdz 692 tūkst. ha 2009. gadā, salīdzinot ar 615 tūkst. ha 2008. gadā.

Martā un aprīļa sākumā laika apstākļi ES tika sadalīti starp Austrumiem un Rietumiem. Austrumeiropas valstīm lietusgāzes izraisīja plūdus atsevišķos reģionos, kas lika atlikt plānoto pavasara kultūraugu sēšanu, kamēr Rietumos sausie apstākļi radīja labus nosacījumus vasarāju sēšanai pavasarī. Valstīs, ko skārušas lietusgāzes ES austrumos, proti, Vācija, Ungārija un Čehija ir aizkavējusies vasaras miežu sēja. *Strategie Grains* uzskata, ka no 8. aprīļa 90% no vasaras miežu platības ir apsētas un atkarībā no reģiona sējas laika pavasarī bija viena līdz divas nedēļas no optimālā laika (1.tab. dati). Tomēr, ilgstoši sausais laiks Francijā, ir radījis bažas, ka kultūraugi varētu ciest no grūtībām absorbēt slāpekli un citas minerālvielas. Kultūraugu raža Francijā, un visā ES, būs atkarīga no laika apstākļiem. (Situācija ES, 2009.)

Ir Eiropas Savienības 11 valstis, kurās analizējamā laika periodā (2004.-2008. g.) graudu sējumu platība ir visaugstākā bijusi tieši 2004. gadā, t.i., Apvienotajā Karalistē, Bulgārijā, Čehijā, Grieķijā, Itālijā, Kiprā, Portugālē Rumānijā, Slovākijā, Ungārijā, Zviedrijā, bet 13 valstīs, analizējot dinamikā, graudaugu sējumu platība ir palielinājusies. (skat. 1. tabulā)

ES graudu tirgu galvenokārt nodrošina Francija, Vācija, Polija, Spānija, Itālija, Lielbritānija un Ungārija, kuras 2007.gadā saražoja 77% no visiem ES graudiem. (2.tab. dati) Visvairāk tirgojamā graudu kultūra ir kvieši. Galvenie kviešu

2. tabula/ Table 2

Graudu kopraža Eiropas Savienības dalībvalstīs, tūkst. tonnu
Total output of grain in the EU member states, thou. t

Valsts / Country	2004	2005	2006	2007	2008
Apvienotā Karaliste / United Kingdom	22074.5	21089.7	20878.1	19354.0	-
Austrija/ Austria	5315.3	4898.3	4460.0	4757.9	5747.8
Beļģija/ Belgium	2951.0	2817.5	2741.8	2786.8	3109.1
Bulgārija/ Bulgaria	7434.7	5818.9	5511.8	3171.3	6976.0
Čehija/ Czech Republic	8783.4	7659.8	6386.1	7152.9	8369.5
Dānija/ Denmark	8963.2	9283.1	8632.3	8220.2	9041.2
Francija/ France	70381.5	63977.8	61613.2	59382.2	70377.9
Grieķija/ Greece	4330.2	4230.4	3623.1	3762.0	5042.8
Igaunija/ Estonia	608.1	760.1	619.3	879.5	862.3
Īrija/ Ireland	2523.0	1944.7	2089.8	2006.0	2353.3
Itālija/ Italy	21770.8	20092.1	18787.4	18810.5	20201.4
Kipra/ Cyprus	111.4	70.2	66.6	63.5	57.2
Latvija/ Latvia	1059.5	1314.3	1158.7	1535.2	1689.0
Lietuva/ Lithuania	2859.4	2811.1	1857.8	3017.0	3421.9
Luksemburga/ Luxemburg	179.0	160.6	161.5	148.4	190.7
Nīderlande / Netherlands	1923.3	1857.3	1749.9	1622.6	2062.6
Polija/ Poland	29635.1	26927.8	21775.9	27142.8	27664.3
Portugāle/ Portugal	1213.8	671.3	1019.8	897.5	1089.5
Rumānija/ Romania	24398.0	19331.2	15740.9	7788.6	16750.3
Slovākija/ Slovakia	3793.2	3585.3	2928.8	2793.2	4077.6
Slovēnija/ Slovenia	583.2	576.3	493.6	531.9	579.6
Somija/ Finland	3618.7	4058.3	3790.0	4137.3	4229.1
Spānija/ Spain	23965.5	13486.3	18367.5	23820.3	23269.1
Ungārija/ Hungary	16769.7	16203.0	14459.6	9643.0	16938.3
Vācija/ Germany	51097.0	45980.2	43474.8	40632.1	50104.9
Zviedrija/ Sweden	5507.8	5050.6	4128.4	5057.6	5211.3

Avots: autoru veidots pēc EUROSTAT datiem, 2009.
Source: made by the authors according to EUROSTAT data, 2009

ražotāji ES ir Francija, Vācija, Lielbritānija un Polija, kuri 2007.gadā izaudzēja 62% no ES-27 kviešiem. (Eiropas Savienības, 2008.)

Pēc EUROSTAT (Eiropas Komisijas Statistikas aģentūra) prognozēm un autoru pētījumiem, graudu kopraža 2008. gadā ES pieaugusi apmēram par 10 % un sasniegusi 284,2 miljonus tonnas, salīdzinot ar 2007. gadu, kviešu kopraža pieauga apmēram par 10 %, sasniedzot 123,7 miljonus tonnu, savukārt kukurūzas kopraža pieaug par 17,6 %, sasniedzot 56,7 miljonus tonnu. (Elste A., 2008.)

Kvieši, mieži un graudu kukurūza ir galvenās labības, ko audzē Eiropas Savienībā.

Četrās galvenās valstīs saražo dažādus graudus, kas veido vairāk nekā 60% no ES saražotā daudzuma (2.tab.) Rudziem, rudzu maisījumam un rīsiem, šī daļa ir vairāk nekā 80%. Francija un Vācija, divi galvenie kviešu ražotāji, tās ir arī atbildīgas par vairāk kā 40% no ES ražotā. Graudaugu ražošanai palielinoties par gandrīz 40 % laika posmā no 2006. gada līdz 2007. gadam, Spānija kļuva par lielāko miežu ražotāju un saražoja 20 % no ES saražotā daudzuma. Francija un Itālija, kā divi galvenie kukurūzu ražotāji, spēj saražot vairāk nekā 50% no ES daudzuma. Ungārija un Rumānija joprojām pārstāv trešo un ceturto lielāko ražotāju grupu, kukurūzas ražošanā, attiecīgi par 51 % un 56 % no ES. Vācija un Polija saražo gandrīz 80 % no ES rudzu kopapjoma.

Tikai 8 valstis ražo rīsus Eiropas Savienībā, viena no tām ir Itālija, kas veido vairāk nekā 50 % no kopējās ES rīsu ražošanas.

2007. gada ražošanas līmenis attiecībā uz ES dalībvalstīm par graudu kultūrām ir ļoti līdzīgs. Tomēr, graudu ražošana pa gadiem ir diezgan nestabila, piemēram, 2003. gadā sausuma periods un ļoti labs gads graudaugiem 2004. gadā. Kviešu, miežu un graudu kukurūzas ražošanas apjoms samazinājās par 16%, 5% un 13% no 2002. līdz 2003. gadam. 2004. gadā šie līmeņi pieauga attiecīgi par 34%, 15 % un 37 %, visaugstākais kāpums kopš 2001. gada. Miežu ražošana samazinājās gandrīz par 2 % no 2001. līdz 2007. gadam, bet palielinājās par 3 % laika posmā starp 2006. un 2007. gadu.

Graudu kukurūzas ražošana samazinājās par gandrīz 20% no 2001. līdz 2007. gadam un par 14% laika posmā starp 2006 un 2007. gadu. (Agricultural statistics, 2008.)

2. tabulas datiem sakarības ir līdzīgas ar 1. tabulas datiem par 2004. gadu, salīdzinot tos ar 2008. gadu. Graudu kopražas 2004. gadā vislielākās ir bijušas tajās valstīs, kur vislielākās sējumu platības, izņemot Grieķiju, Slovākiju un Ungāriju.

Strategie Grains pēdējais ziņojums par ES 2008/09 ražošanas gadu, kā arī prognozes par 2009/10 ražošanas gadu, joprojām ir samērā nemainīgas.

2008/09 sezonā kviešu ražošana joprojām ir 140 milj. tonnu salīdzinot ar 112 milj. tonnu 2007. gadā. Miežu ražošanā ir redzams neliels kāpums 65.6 milj. tonnu salīdzinot ar 35 milj. tonnu 2007. gadā, un kukurūzas ražošana arī pietuvojusies 62,3 milj. tonnu robežai, salīdzinot ar 48 milj. tonnu 2007. gadā. Tātad kopējais ES graudu ražošanas skaitlis 2008. gadā ir 312 milj. tonnas graudu salīdzinot ar 256 milj. tonnu 2007. gadā. (2. tab.)

Prognozes par 2009/10. gada sezonas graudu ražošanas apjomiem neatšķiras no iepriekšējām aplēsēm, kviešu ražošanas apjoms ir 130.6 milj. tonnu, līdz ar to samazināsies par 9.4 milj. tonnu salīdzinot ar 2008/09. gada sezonu. Miežu ražošanas prognoze šobrīd ir 62.9 milj. tonnu un kukurūzas ražošanas prognoze ir 58.6 milj. tonnu 2009/10 sezonā. Graudu ražošanas aplēses ir nemainīgas salīdzinot ar iepriekšējiem mēnešiem, bet laika apstākļi šobrīd un arī nākotnē, būs noteicošais ražas rādītājs Eiropas Savienībā. (Apraksti, 2009.)

Graudu kopievākums dažādos pasaules reģionos pa gadiem ir atšķirīgs, galvenokārt, mainīgu klimatisko apstākļu – postoša sausuma vai pārliecīga mitruma dēļ. (Apraksti, 2009.)

ES-27 2007. gadā bija mazākā kviešu raža. Pēc ASV Lauksaimniecības ministrijas (USDA) datiem, ES-27 2007./2008. gada kviešu ražas 2007. gada oktobrī, salīdzinot ar septembri, samazinājās par 0,2% (līdz 120,757 miljoniem tonnu). Tas ir par 3,2% mazāk kā 2006./2007. gadā. Iemesls – nelabvēlīgi laika apstākļi, kuru dēļ vidējā kviešu ražība ES valstīs veido 4,89 t/ha, tā ir pati mazākā ražība kopš 2003./2004. gada, kad sausuma dēļ ražība bija samazinājusies līdz 4,55 tonnām no hektāra.

Pēc Francijas tirgus analītiķu aģentūras „Strategie Grains" oktobra prognozes datiem, ES 2007./2008. gada mīksto kviešu ražas prognoze samazināta par 1,7% (līdz 112,7 milj. t), t.i., par četriem procentiem mazāk kā 2006./2007. gadā. (Saulgrieze A., 2007.) ASV Lauksaimniecības ministrija globālo kviešu tirgu 2009. gadā rēķina 682 miljonu tonnu apmērā (2008. gadā 611 milj. t), bet 2009. gada patēriņu lēš 652,4 miljonu tonnu apmērā, par 1,5 milj. tonnu mazāku nekā 2009. gadā. 2008. gada rudenī labas ražas lauksaimnieki ir vākuši visās Eiropas valstīs (2.tab. dati). Tiesa gan, tāpat kā Latvijā, ļoti liels bijis lopbarības graudu īpatsvars, kas priecē lopkopjus. Eksperti teic, ka 2009. gadā Ukrainā kopā (ja būs kaut cik apmierinoši dabas apstākļi), visticamāk, izdošoties nokult tikpat daudz labības, cik 2008. gadā, proti, 1,6 miljonus tonnu. Graudaugu ražība pasaulē vidēji ir 2,8-2,9 t/ha. (Apraksti, 2009.) Pēc EUROSTAT datiem, vidējās graudu ražības ES dalībvalstīs ir nedaudz samazinājušās:

- vidējā kviešu ražība ES ir 5,66 t/ha
- vidējā miežu ražība ES ir 4,52 t/ha
- vidējā kukurūzas ražība ES ir 8,59 t/ha

Analizējot ES valstu graudu ražību datus no 2004. gada līdz 2008. gadam, jāsecina, ka, lielākoties, lielāki tie ir 2004. gadā un 2008. gadā (3. tabulas dati). Visintensīvākās graudu ražotājas ir Beļģija, Īrija, Nīderlande, Apvienotā Karaliste, Francija, Vācija, kuru ražība svārstās no 6,8 t/ha līdz 9,2 t/ha. Viszemākās ražības ir Igaunijā, Kiprā, Latvijā, Lietuvā, analizējamos gados tās svārstās no 1,0 t/ha līdz 3,4 t/ha. (3.tabulas dati)

Daudzās Eiropas valstīs graudu ražība 2007. gadā bija mazāka kā 2006. gadā. Vācijā, 2007. gadā vidējā kviešu ražība valstī ir 6,74 t/ha (2006. gadā bija

3. tabula/Table 3

Graudu ražība Eiropas Savienības dalībvalstīs, tonnās
Yield of grain in the EU member states, t

Valsts / Country	2004	2005	2006	2007	2008
Apvienotā Karaliste / United Kingdom	7,0	7,2	7,3	6,8	-
Austrija/ Austria	6,5	6,2	5,7	5,9	6,8
Beļģija/ Belgium	9,2	8,8	8,3	8,5	8,6
Bulgārija/ Bulgaria	4,1	3,4	3,6	2,1	4,1
Čehija /Czech Republic	5,5	4,8	4,2	4,5	5,4
Dānija/ Denmark	6,0	6,2	5,8	5,7	6,0
Francija/ France	7,5	7,0	6,8	6,6	7,3
Grieķija/ Greece	3,5	3,5	3,5	3,7	4,3
Igaunija/ Estonia	2,3	2,7	2,2	3,0	2,8
Īrija/ Ireland	8,1	6,9	7,5	7,2	7,5
Itālija/ Italy	5,3	5,3	5,3	5,1	5,3
Kipra/ Cyprus	1,7	1,1	1,0	1,5	1,3
Latvija/ Latvia	2,4	2,8	2,3	2,9	3,1
Lietuva/ Lithuania	3,2	2,9	1,9	3,0	3,4
Luksemburga/ Luxemburg	6,4	5,6	5,6	5,2	6,1
Nīderlande/Netherlands	8,6	8,4	8,0	7,3	8,5
Polija/ Poland	3,5	3,2	2,6	3,3	3,2
Portugāle/ Portugal	2,8	1,8	2,9	3,2	3,3
Rumānija/ Romania	3,9	3,3	3,1	1,5	3,2
Slovākija/ Slovakia	4,6	4,5	4,0	3,6	5,1
Slovēnija/ Slovenia	5,8	6,0	5,1	5,4	5,4
Somija/ Finland	3,0	3,4	3,3	3,5	3,4
Spānija/ Spain	3,7	2,1	3,0	3,9	3,5
Ungārija/ Hungary	5,6	5,5	5,1	3,5	5,8
Vācija/ Germany	7,4	6,7	6,5	6,2	7,1
Zviedrija/ Sweden	4,9	5,0	4,3	5,2	4,8

Avots: autoru veidots pēc EUROSTAT datiem, 2009.
Source: made by the authors according to EUROSTAT data, 2009

7,21 t/ha), bet raža – 20,965 milj. t (2006. gadā – 22,366 milj. t). Ziemas miežu ražība 2007. gadā ir 5,86 t/ha, bet vasaras miežiem – 4,3 t/ha. Kopējā miežu raža veido 10,480 milj. t, t.i., par 12,4% mazāk nekā 2006. gadā. Tritikāles raža par 7,7% mazāka, un tā ir 2,065 milj. t. (Saulgrieze A., 2007.)

Arī jaunajā pasaulē – Amerikas kontinentā – ražas varētu būt zemākas, nekā cerēts. 2009. gada slikto laika apstākļu dēļ Argentīna jau samazinājusi sojas ražības prognozes, ja laika apstākļi neuzlabosies, nāksies rēķināties ar zemāku kviešu ražu. (Graudiņš U., 2008.)

HRW FOB *Gulf* cena ir samazinājusies par 3.75% no 246$/t uz 238$/t, bet SRW FOB *Gulf* cena samazinājās par 3.6% no 195$/t uz 188$/t.

2009. gada 25. februāris (Melnās jūras baseina valstis) – *feed* FOB $140/t, salīdzinot iepriekšējā nedēļā reģistrēto cenu, tā ir samazinājusies par 6.6%.

2009. gada 25. februāris (*Rouenas* osta, Francija) Kviešu cena €142/t, salīdzinot ar iepriekšējo nedēļu tā ir samazinājusies par 3%, miežu cena €115/t, salīdzinot ar iepriekšējo nedēļu tā ir samazinājusies par 2.5%.

Var pievienoties EK, kas uzskata, ka visreprezentatīvākā cena ES ir Francijas FOB cena, jo Francijas ostās (īpaši *Rouenas* ostā) ir lielākie graudu tirdzniecības apjomi.

LIFFE – *London International Financial Futures Exchange* (Lielbritānija);

MATIF – *The International French Futures and Options Exchange* (Francija);

CBOT - *The Chicago Board of Trade* (ASV).

Starptautiskās organizācijas OECD – FAO prognozes par graudu cenām. Konkrēti 2009. gadā ražas sezonā kviešu tonnas cena būs vidēji 119,6 lati. Starptautiskie pētījumi liecina, ka nekas labāks nav sagaidāms arī turpmākajos gados. Berlīnes Humbolta universitātes pētījums liecina, ka ES kviešu cenas nākamo desmit gadu laikā palielināsies vidēji par 1,4% salīdzinājumā ar 2003.-2005. gada līmeni. OECD – FAO prognozes rāda, ka no 2009./2010. gada līdz 2017./2018. gada sezonai kviešu cena turēsies stabilā 103 Ls/t līmenī. (Tomsone I., 2008.)

2009. gada otrajā pusē un nākamā gada sākumā situācija pasaules graudu tirgos cenas ziņā būs labāka. Iemesls – Eiropa 2009. gadā piedzīvo kārtīgu ziemu. Tā, piemēram, gaisa temperatūra Vācijā dažas dienas nokritās pat līdz mīnus 20 grādiem, līdz ar to pamatīgi būs cietuši ziemāju sējumi. Turklāt Eiropas veco valstu lauksaimnieki parasti nerēķinās ar lielu salu ziemā, tādēļ būtībā neizmanto sala izturīgas šķirnes.

Globālajā graudu bilancē 2009. gadā piedāvājums būs lielāks nekā pieprasījums, arī ievērojams cenu palielinājums salīdzinājumā ar pašreizējo cenu nav gaidāms, tomēr ir jāņem vērā iespējamā nelabvēlīgo laika apstākļu ietekme uz graudu cenu.

2009. gada 25. februāris (ASV) – eksporta kviešu cenas pārsvarā stabilas.

Vērtējot situāciju 2009. gada janvāra beigās un februāra sākumā, var teikt, ka kviešu iepirkuma cenas ir stabilas, lai gan joprojām pietiekami mazas (93 Ls/t). Pašreizējos ekonomiskajos apstākļos pieprasījums pēc graudiem un to piedāvājums pasaulē ir ļoti mainīgs.

Graudu cenu pirmais lielais kāpums tika novērots jau 2007.gada sākumā. Tas izskaidrojams ar sliktām graudaugu ražām Ukrainā, Ungārijā, Rumānijā, Bulgārijā, ASV, Austrālijā, kā arī ar to, ka liela daļa graudu tiek izmantota bioenerģijas ražošanai. (Graudiņš U., 2008,)

2008. gada aprīlī pārtikas kviešu cenas salīdzinājumā ar 2007. gada aprīli palielinājušās par 70%. Savukārt lopbarības miežu vidējā cena 2008. gada aprīlī attiecībā pret 2007. gada aprīli pieaugusi par 54%. (Elste A., 2008.)

Tāpat arī lauksaimniekiem graudu ražošanas un darbaspēka izmaksas ir divas reizes augstākas, salīdzinot ar situāciju pirms trim – četriem gadiem. (Graudiņš U., 2008.)

Graudu ražošanas rentabilitāte un to ietekmējošie faktori
Profitability of grain production and factors impacting profitability

Lauksaimniecībā nodarbinātie ir pilnīgi nepieciešama iedzīvotāju sastāvdaļa – gan tur, kur šai nozarē strādājošo ir maz, gan arī tur, kur to skaits sasniedz pat pusi no visiem iedzīvotājiem.

Moderna lauksaimniecība ir nozare, kas netieši sagādā darbu citām saimniekošanas nozarēm, dodot pasūtījumu un nodarbinātību lielam skaitam konstruktoru, mašīnbūvniecības speciālistu, traktoru, kombainu un citu lauksaimniecības mašīnu un inventāra konstruktoru un celtnieku, graudu kalšu un elevatoru projektētāju un celtnieku, minerālmēslu ražotāju, augu aizsardzības līdzekļu un mājlopu ārstniecības līdzekļu ražotāju, selekcionāru un sēklkopju un visbeidzot daudzu tirdzniecības uzņēmumu darbinieku. Pie tā vel nāk klāt daudzi primāro lauksaimniecības uzņēmumu produkcijas veida pārstrādātāji, labības, piena un gaļas produktu ražotāji, konditori, dzērienu izgatavotāji, pārtikas rūpniecības darbinieki un atkal – tirgotāji.

Lauksaimnieciskajā ražošanā ir svarīgi aprēķināt ne tikai visvairāk iespējamo iegūstamās augkopības un lopkopības produkciju daudzumu, bet arī izmaksas šīs produkcijas ražošanai, kā arī sagaidāmo peļņu. Izmaksas ražošanai katrai saimniecībai ir individuālas un atkarīgas no saimniecības vadītāja spējām un prasmes organizēt ražošanu, izmantot esošos resursus, piesaistīt resursus no ārienes.

Var pievienoties A. Borukam, ka tās ir ļoti stipri atkarīgas arī no ražošanā izlietoto rūpnieciskas izcelsmes izejvielu, enerģētikas un degvielas, kā arī lauksaimniecības mašīnu un inventāra tirgus cenām un no valsts pasākumiem šo cenu regulēšanā. Labības ražošana, ietver arī patēriņu, importu un eksportu, cenas un pašizmaksu. (Boruks A.,1999.)

Pateicoties 2007. gada lieliskajai ražai un augstajām graudu cenām valstī, graudu īpatsvars saimniecībās palielinājies no 51% līdz 66% no kopējās pārdotās produkcijas vērtības. Diemžēl vienas graudu tonnas ražošanas pašizmaksa ir pārāk augsta – 2005. un 2006. gadā tā bija augstāka nekā graudu realizācijas cena un tikai pērn, pateicoties labajai ražai un netipiski augstajai iepirkuma cenai, tā pārsniedza pašizmaksu un bija 90,4 lati par tonnu. Tiesa, ne visās – mazajās saimniecībās (Pētījumi liecina, ka ES mazo lauku saimniecības ir ar platību mazāku nekā 5 ha) ražošanas izmaksas joprojām bija ļoti augstas: 130 lati par tonnu graudu. Var pievienoties ZM secinājumam, ka nelielās saimniecībās graudu ražošana joprojām nav un, ņemot vērā augošās izmaksas par degvielu un minerālmēsliem, nebūs rentabla. (Tomsone I., 2008.)

ZM secina, ka mazajās un vidējās saimniecībās starpību starp graudu ražošanas pašizmaksu un realizācijas cenu nosedz atbalsta maksājumi. Tie bija 17% no kopējiem graudu ražošanas ieņēmumiem. Atbalsta maksājumi, kas pieejami saimniecībās, rēķinot vidēji uz vienu tonnu graudu, 2005. gadā bijā 23,7 lati, 2006. gadā – 37,2 lati, bet 2008. gadā – 24,6 lati. Atbalsta apjoms bija vidēji par 14% zemāks, jo tās galvenokārt izvietojušās Zemgalē un Pierīgā, kur netiek maksāts mazāk labvēlīgo apvidu atbalsts. Tā kā tuvākajos divos gados šis atbalsta veids tiek būtiski samazināts, paredzams, ka graudu ražošana mazajās saimniecībās būs ar pārmēru lielu mīnusa zīmi.

Vērtējot graudu ražošanas rentabilitāti, ZM konstatē, ka 2007. gadā, ņemot vērā saimniecību peļņu un saimnieciskās darbības izmaksas, tā bija vidēji 21,1%, kas ir labs rādītājs. Taču, izvērtējot

rentabilitāti pēc saimniecību lieluma, nākas konstatēt, ka mazajās saimniecībās rentabilitāte bija – 8,4%, tātad ražošana rada zaudējumus. Visaugstākā rentabilitāte – 27% līdz 28% – bija vidēja lieluma saimniecībās.

Autori mazajām saimniecībām ieteiktu palielināt ražošanas apjomus un samazināt izmaksas. Kā zināms, praktiski šo ieteikumu īstenot ir ļoti grūti. Izeja varētu būt iesaistīšanās lauksaimniecības pakalpojumu kooperatīvos.

Latvijā 2008. gada sākumā bija 29 atzītas lauksaimniecības pakalpojumu graudkopības kooperatīvās sabiedrības. Lielākoties šīs kooperatīvās sabiedrības nodarbojas ar savu biedru saimniecībās saražotās augkopības (graudi, rapsis) produkcijas uzglabāšanu, pirmapstrādi, realizāciju un biedru centralizētu apgādi ar ražošanai nepieciešamajām izejvielām – minerālmēsliem, augu aizsardzības līdzekļiem, kā arī sniedz konsultācijas u.c. pakalpojumus.

Graudkopības kooperatīvi ik gadu paplašina savu darbību, veicinot lauksaimnieku savstarpējo sadarbību. Šie kooperatīvi apvieno gan lielos zemniekus, kuri apsaimnieko līdz 6000-7000 ha zemes, gan mazos – ar 15 hektāriem. Graudkopības kooperatīvi daļu savas saražotās un iepirktās graudu un rapša produkcijas izveda uz ES dalībvalstīm. Tā trīs kooperatīvi laikā no 2005. līdz 2007.gadam izveda produkciju vidēji 17,6% apjomā no to neto apgrozījuma vērtības, pie tam lielākais no kooperatīviem vidēji katru gadu pat 39,5%. Šajā rakstā kooperatīvi tika analizēti grupās pēc lielākā neto apgrozījuma – kopā trīs un septiņi nozīmīgākie, ņemot vērā pieejamos finansiālās darbības rādītājus. Graudkopības kooperatīvu vidū nozīmīgāko vietu ieņem trīs, kuri apvieno lielāko graudu ražotāju skaitu un kuru neto apgrozījums 2007.gadā kopā bija 96,5% no kopējā graudu kooperatīvu neto apgrozījuma. Šo trīs kooperatīvu neto apgrozījums 2007.gadā, salīdzinot ar iepriekšējo gadu, pieauga par 17,4 milj. Ls jeb 48,6%. To veicināja arī izteiktais graudu un rapša cenu pieaugums 2007.gadā. Apskatīto septiņu kooperatīvu peļņa pēdējā gada laikā palielinājusies no 493,4 tūkst. Ls uz 1593,6 tūkst. Ls jeb 3,2 reizes. (ZM Zino_ skatīts 01.04.2009.)

Ekspertu vērtējums par minimālo graudaugu platību, kas varētu būt ekonomiski pamatota produkcijas ražošanai, nav vienprātīgs, bet, pieņemot, ka tirgū 50 t graudu spēj piegādāt tikai tās saimniecības, kuras apsēj vismaz 20 ha graudaugu, 2009. gadā šādas saimniecības Latvijā bija 3735, tas ir, 12% no kopējā graudu audzētāju saimniecību skaita. (Zute S., 2008.)

Pārtikai graudi audzēti vairāk nekā lopbarībai – no visa labības apjoma aptuveni 60%. Rentablāk ir audzēt pārtikai, jo pārtikas graudiem ir augstākā cena. Protams, ir savi nosacījumi un kvalitātes rādītāji, ko pieprasa pārstrādes uzņēmumi, lai no graudiem varētu saražot maizi. Lopbarības graudiem kvalitātes prasības nav tik augstas, toties cena ir zemāka. Jāteic, ka daudzas lopkopības saimniecības vai nu iepērk gatavu produkciju, vai audzē tās pašas. Ir tādas, kas ne tikai pašas audzē, bet pašas arī no graudiem sagatavo lopbarību. Daļa saimniecību gan dod priekšroku gatavai produkcijai, jo, lai audzētu un novāktu graudus, vajadzīga īpaša tehnika. (Orupe A., 2008.)

2008. gadā ir tendence, ka lielās saimniecības vairāk specializējas uz vienu lauksaimniecības nozari, jo saprot, ka vairākas attīstīt ir ļoti grūti. Katrai sēšanai/stādīšanai un novākšanai vajadzīga sava tehnoloģija un tehnika. Ja audzē, kartupeļus, šai kultūrai vajadzīga cita tehnika, glabāšana, bet graudiem ir savs cikls – novākšana, tīrīšana, žāvēšana, uzglabāšana. Ir jau, protams, saimniecības, kas audzē dažādus lauksaimniecības kultūraugus, bet tās galvenokārt ir pašpatēriņa saimniecības, kas neorientējas uz tirgu vai arī tirgū pārdodamā produkcijas daļa ir neliela.

Autori uzskata, ka, lai konkurētu tirgū, saimniecībai jābūt pietiekami lielai. Tikai tad var pazemināt graudaugu pašizmaksu un piedāvāt savu produkciju par konkurētspējīgu cenu. Uzskata, ka rentablai preču produkcijas graudu ražošanai graudaugu platība nevar būt mazāka par 50 ha. 2006. gadā saimniecību, kurā šī platība bija mazāka, bija 42896. Šobrīd arvien izteiktāk saimniecības iet plašumā, nevis tiek dibinātas jaunas. Šobrīd zemniekiem ir problēma – ja ir vairāk zemes (ap 2000 ha un vairāk), tā bieži vien nav vienuviet – un atrodas ne tikai vienā rajonā, bet divos vai pat trijos. Tās īpašniekiem jāpatērē gandrīz diena, lai šos laukus apbraukātu. Tas, protams, sarežģī darba organizāciju un tehnikas pārvietošanu. Lai no tā izvairītos, lauksaimnieki cenšas laukus, kas ir tālāk, sev pietuvināt, kā arī iznomāt uz ilgāku laiku. Ja iznomāšana ir uz garāku termiņu, zemnieks var ieguldīt lielāku kapitālu konkrētajā zemes gabalā, piemēram, to mēslojot vai meliorējot.

Runājot par diskutablo graudu izmantošanu degvielas ražošanai, ES tomēr ir mērķis – aizstāt fosilo degvielu ar atjaunojamiem resursiem. Un katra valsts tiek mudināta saražot daļu degvielas vai enerģijas tieši bioloģiskajā variantā, kas ļautu nenoplicināt arvien sarūkošos naftas krājumus. Pagaidām nav bažu, ka graudi varētu pietrūkt tāpēc, ka daļa tiek izmantota iepriekšminētajam nolūkam.

Visai sarežģīta situācija ir minerālmēslu iegādes ziņā, jo kopējā izmaksu struktūrā tie ir galvenā izdevumu sastāvdaļa, pēc tam seko degviela. Diemžēl Latvijā minerālmēslus neražo, tā kā mūsu lauksaimnieki ir atkarīgi no ražotājiem. Savukārt ražotājiem mūsu tirgus ir ļoti mazs, viņiem ir izdevīgāk pārdot savu produkciju lielākiem „noņēmējiem". Taču katrā lietā ir arī sava pozitīvā puse – lai gan svarīgi ir iedot augam visas vajadzīgās barības vielas, tomēr minerālmēslu augstā cena lauksaimniekam liek parēķināt, cik lielu devu dot, un novērtēt, cik katram laukam tā vajadzīga, jo ir gan bagātīgāka, gan trūcīgāka augsne – un tām vajadzīgs atšķirīgs minerālmēslu daudzums. Šajā ziņā laimētāji ir tie, kas nodarbojas arī ar lopkopību, jo tad ir iespēja lauku mēslošanā izmantot organiskos mēslus. Taču tādēļ nevar teikt – mums vajag saimniecības tikai ar lopkopību, jo sākt ar to nodarboties nav nemaz tik viegli.

Eksperti norāda – nelielu cerību stariņu dod degvielas cenas kritums, kas gan pēc dažām nedēļām būs apstājies. Kritušas arī nepamatoti augstās minerālmēslu cenas (slāpeklim, ja uzreiz var

norēķināties, par 50%), tomēr ziemāju sējas laikā izmantots dārgais mēslojums, kas palielinās nākamā gada ražas izmaksas. (Graudiņš U., 2008.)

Nozares dzīvotspēju nosaka ne tikai zināšanas ekonomikā un mārketingā, bet arī zināšanas agronomijā. Saimniecību speciālistiem, izvēloties konkrētai situācijai optimālo audzēšanas paņēmienu, jāņem vērā augsne, tās auglība, šķirnes, sēklas kvalitāte, augu maiņa, sējas laiks un paņēmieni, mēslojums, tā devas un daudzi citi kritēriji.

Secinājumi
Conclusions

1. ES graudu tirgu galvenokārt nodrošina Francija, Vācija, Polija, Spānija, Itālija, Lielbritānija un Ungārija, kuras 2007.gadā saražoja 77% no visiem ES graudiem.
2. Visintensīvākās graudu ražotājas ir Beļģija, Īrija, Nīderlande, Apvienotā Karaliste, Francija, Vācija, kur ražība svārstās no 6,8 t/ha līdz 9,2 t/ha.
3. Graudu tirgus cena parasti veidojas galvenajās pasaules tirdzniecību ietekmētajās biržās, kurās labība tiek pirkta un pārdota lielās partijās. Pārtikas graudi Latvijā tiek audzēti vairāk nekā lopbarības graudi – no visa labības apjoma aptuveni 60 % ir pārtikas graudi.
4. 2008. gadā rentablāk ir audzēt pārtikai, jo pārtikas graudiem ir augstāka cena, nekā lopbarības graudiem.

Priekšlikumi
Proposals

Lai samazinātu graudu ražošanas pašizmaksu:

1. Saimniecībām jāveic izejmateriālu samazināšana uz minerālmēslu rēķina, ko iespējams panākt ar regulāru augšņu agroķīmisko analīžu veikšanu un agroķīmisko materiālu izpēti;
2. Saimniecībām ir jāmeklē alternatīvos mēslošanas līdzekļus visiem saimniekošanas līmeņiem. Kā labus piemērus var minēt putnu mēslus un dūņu kompostu, jo gan putnu fabrikas, gan attīrīšanas iekārtu uzņēmumi labprāt sadarbojas ar lauksaimniekiem, tas ir saistīts ar neseno minerālmēslu cenu kāpumu 2008. gada augusta mēnesī;
3. Jāveicina vairāku saimniecību kooperācija jaunas un jaudīgas tehnikas izmantošanā, kas samazinās tehnikas amortizācijas izmaksas, kā arī palielinātu ražīgumu un novērstu novecojušās tehnikas remonta izdevumus, tas ir saistīts ar ierobežotiem naudas resursiem;
4. Saimniecībām ir jāizvērtē attālumus starp laukiem un saimniecību. Saimniekiem jāiemaina tālākie saimniecības lauki pret tuvāk esošajiem laukiem ar kaimiņu saimniecībām, līdz ar to samazinot degvielas izmaksas uz lielo pārbraucienu rēķina, tas ir saistīts ar augstās degvielas cenu;
5. Viens no pirmajiem uzdevumiem lauksaimniekiem saistībā ar tiešo atbalsta maksājumu un platību maksājumu saņemšanu ir, noskaidrot uz kāda veida maksājumiem tie var pretendēt un, kāda veida likumdošanas aktus lauksaimniekiem ir jāievēro.

Izmantotā literatūra
Bibliography

1. Agricultural Statistics 2008 edition Main results 2006 – 2007 [on-line resource]: [viewed on 08.04.2009.]. Available at: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-ED-08-001/EN/KS-ED-08-001-EN.PDF
2. Apraksti – SIA Latvijas Šķirnes Sēklas [tiešsaiste]: [skatīts 01.04.2009.]. Pieejams: http://www.seklas.lv/index.php?id=300
3. Augkopība (2004). A. Ružas red. Jelgava: LLU, 374 lpp. ISBN 9984-596-72-9
4. Boruks A. (1999) Lauksaimniecības reģionālā specializācija un teritoriālais izvietojums Latvijā. Rīga: Grāmatvedis, 168 lpp. ISBN 9984-9110-3-9
5. Boruks A. u.c. (1999) Graudi: daudzumi, izmaksas, cenas. Rīga: LLU Skrīveru zinātnes centrs, 202 lpp. ISBN 9984-19-082-X

Eiropas Savienības lauksaimniecības un lauku attīstības politikas sagaidāmās pārmaiņas – perspektīvais novērtējums Latvijai un Baltijas valstīm, 2008.: Atskaite par zinātnisko pētījumu [tiešsaiste]: [skatīts 01.04.2009.]. Pieejams: http://www.lvaei.lv/upload/Galazinojums_Baltijas_proj_1dec2008_LVAEI.pdf

6. Elste A. Ziņo par situāciju graudkopībā. (2008) Agropols, Nr.16, 2.lpp.
7. Graudiņš U. (2008) Pārbaudījums graudu audzētājiem. Latvijas Avīze, Nr.241 (4.sept.), 14.lpp. ISSN 1407-78996
8. Lauku lapa [tiešsaiste]: [skatīts 01.04.2009.]. Pieejams: http://www.llkc.lv/upload_file/400907/10.03.2009(1).pdf
9. Orupe A. (2008) Graudkopība iet plašumā. Cik ilgi?: 2008, Nedēļa, Nr.35/36 (25.aug.), 28.-30.lpp. ISSN 1691-1938
10. Par situāciju graudkopības nozarē: informatīvais ziņojums [tiešsaiste]: Zemkopības ministrija [skatīts 01.04.2009.]. Pieejams: http://www.zm.gov.lv
11. Saulgrieze A. (2007) Graudu un rapšu tirgus. Lauku Biznesa laikraksts, Nr.18, (12. maijs), 17 lpp. ISSN 1691-2381
12. Saulgrieze A. (2007) Graudu un rapšu tirgus. Lauku Biznesa laikraksts, Nr.17, (28. aprīlis), 12 lpp. ISSN 1691-2381
13. Situāciju ES graudkopības nozarē [tiešsaiste]: [skatīts 01.04.2009.]. Pieejams: http://www.hgca.com/content.output/3946/3946/Markets/Market%20News/EU%20Crop%20Estimates.mspx
14. Tomsone I. (2008) Graudkopība – izmaksas aug, cenas krīt. Latvijas Avīze, Nr.220 (14.aug.), 15.lpp. ISSN 1691-1229
15. Tomsone I. (2009) Raža kompensē zemo cenu. Latvijas Avīze, Nr.48 (19.febr.), 11.lpp. ISSN 1691-1229
16. Zute S. (2009) Ziemas kviešu kvalitātes vērtējums. AgroTops, Nr.2, 26.-28. lpp. ISSN 1407-5164

Changes of Level and Variability of Wheat Production in the EU Member States for the Period of 1961-2008

Paweł Kobus, PhD, Faculty of Economics, Warsaw University of Life Sciences

Abstract. The paper presents an analysis of the wheat yields variability in the EU member states. The research aim is to compare the average level and variability of wheat yield and production of the EU member states. Particular attention is paid to the following issue: the relationship between the average level of yield and its variability.
The data from two sources Eurostat (Eurostat 2009) and FAOSTAT (UNdata 2009) are used in the research. These sources allowed covering the time period from 1961 to 2008. The time series were divided into three periods: 1961-1976, 1977-1992, and 1993-2008 to assess the changes of yield level.
The average shares of wheat production area in the current EU member states were calculated for each time period. It was found out that there exists a tendency to increase wheat production area in the Northern part of Europe and decrease in the Southern part. The expected values and standard deviations for the wheat yields were also estimated for the time period.
While the average yields have increased in all 27 countries, the most impressive changes have taken place in Ireland and Belgium with the increase over 40 dt. The highest yields were observed in the West-northern part of the EU, while the lowest yields – in the Southern part of the EU and some recent EU member states, i.e. Estonia, Latvia, and Romania.
The analysis of relation between the average yields and standard deviations carried out separately for each country allowed drawing a conclusion that there exists a positive relationship between the yields level and their variability, at least on the country level.
Key words: wheat production, production risk, production variability, EU.

Introduction

The whole agricultural sector and cultivation of crops in particular is burdened by high risk. Price changes of inputs and products during the long production cycle are the first source of this risk. The second source is the production risk due to the weather impact on the yield level. The influence of the weather on production level is a factor distinguishing agriculture from all other sectors of the economy.

Weather patterns are very diverse across the EU member states, the same can be said about soil conditions and technology. It makes necessary for the crop production risk analysis to be precise; at the least each country should be investigated separately. However in the previous studies of the author (Kobus P., 2009) it was shown that even such a uniform country as Poland cannot be treated as homogeneous in terms of wheat production risk.

Environmental conditions, especially the weather conditions can change dramatically from year to year, though for moderately long time periods it remains the same on average. On the contrary the human depending factors, like better technologies, new varieties, higher inputs especially fertilisers etc., typically are slowly improved from year to year, with the exception of a drastic change in the economic situation; therefore a change requires long time to be evident on the country level. The present paper pays a special consideration to obtain a long time series (48 years).

The main research aim is to compare the average level and variability of wheat yield and production of the EU member states. Particular attention is paid to the following issue: the relationship between the average level of yield and its variability. It can be interpreted as a question about the relation between the changes of yields resulting from the weather conditions and the changes of yields resulting from the human depending factors.

Data

The data used in the analysis comes from two sources Eurostat (Eurostat, 2009) and FAOSTAT (UNdata, 2009). The source of the first choice was Eurostat, though complete time series of production area, production quantity, and yields of wheat were available only for 7 countries, i.e. Belgium, Denmark, Ireland, France, Italy, Luxembourg (Grand-Duché), and the Netherlands. The FAO data were used to overcome this problem and fill the information gaps.

The question of reliability and conformity of the data always arises when combining data from two or more sources. Usually the most reliable data are to be found in the national offices of statistics, but it may be difficult to obtain such data from several countries. However, Eurostat also contains official data and is considered as reliable source. The reliability of FAO data was checked by comparison of the repeated observations with Eurostat data (Table 1).

Although some imparity in the data was observed (in about 5% of cases larger than 2%)

Table 1

Conformity of Eurostat and FAO data

Disparity size	Area		Yield		Production	
	Number of cases	Share	Number of cases	Share	Number of cases	Share
<-4%	17	2.4%	6	0.9%	6	0.9%
-4.0% – -2.0%	16	2.3%	7	1.0%	5	0.7%
-2.0% – -0.5%	31	4.5%	24	3.5%	31	4.5%
-0.5% – 0.5%	606	87.2%	628	90.4%	589	84.7%
0.5% – 2.0%	16	2.3%	11	1.6%	28	4.0%
2.0% – 4.0%	4	0.6%	4	0.6%	13	1.9%
>4%	5	0.7%	15	2.2%	23	3.3%

Source: author's calculations according to the Eurostat and FAO data

Table 2

Structure of wheat production area in the current EU member states, 1961-2008

Country	Average share of total area of wheat production (in percent)				Changes between periods, Period 1 = 100	
	In Period 1 (1961-1976)	In Period 2 (1976-1992)	In Period 3 (1993-2008)	In 2008	In Period 2	In Period 3
Austria	1.15	1.23	1.06	1.12	107	92
Belgium	0.84	0.83	0.80	0.85	99	96
Bulgaria	4.31	4.56	4.46	4.19	106	104
Cyprus	0.27	0.04	0.02	0.02	14	8
Czech Republic	-	-	3.22	3.03	-	-
Denmark	0.47	1.28	2.51	2.41	272	533
Estonia	-	-	0.26	0.41	-	-
Finland	0.90	0.57	0.61	0.83	63	67
France	16.50	20.20	19.63	20.71	122	119
Germany	8.36	10.19	11.05	12.12	122	132
Greece	4.23	4.09	3.22	2.48	97	76
Hungary	4.92	5.30	4.26	4.26	108	87
Ireland	0.32	0.27	0.34	0.40	83	104
Italy	16.42	13.14	8.91	8.63	80	54
Latvia	-	-	0.65	0.97	-	-
Lithuania	-	-	1.34	1.52	-	-
Luxembourg	0.06	0.03	0.04	0.06	57	72
Malta	0.01	0.01	0.01	0.01	101	152
Netherlands	0.57	0.55	0.52	0.59	98	91
Poland	7.24	8.09	9.37	8.59	112	129
Portugal	2.34	1.31	0.73	0.33	56	31
Romania	10.90	9.46	8.35	7.96	87	77
Slovakia	-	-	1.52	1.41	-	-
Slovenia	-	-	0.14	0.13	-	-
Spain	15.05	10.25	8.24	7.79	68	55
Sweden	1.11	1.25	1.35	1.36	112	121
United Kingdom	4.04	7.37	7.39	7.84	183	183

Source: author's calculations according to the Eurostat and FAO data

the author decided to use the FAO data to fill the gaps in Eurostat data.

The combination of data from the two sources allowed obtaining time series with the year 1961 as the starting point for all but six countries, whose territories were defined during the system transformation started in Poland in 1989. The following aspects were analysed for all the countries: wheat production area in thousand ha, production quantity in thousand tones, and yield in dt/ha.

The present study analyses total values for wheat together with common wheat, spelt or durum wheat species, winter or spring varieties.

Research methods

The time series are divided into three periods: 1961-1976, 1977-1992 and 1993-2008. Standard deviations (1) and variation coefficients (2) will be calculated for each period average values.

$$S_x = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2} \quad (1)$$

where:

S_x – estimator of the standard deviation σ_x of variable X,

$\bar{x}$ – sample mean,

n – sample size,

x_i – ith observation of variable X.

Contrary to the standard deviation, which is expressed in the same units as the variable considered; the coefficient of variation, expressed in percents, is a relative measure with the average value as the reference point:

$$V_x = \frac{S_x}{\bar{x}} \quad (2)$$

As it was mentioned, special attention is paid to the relationship between the average level of yield and its variability. It is a simplification, but one may say that if there is no relation the values of standard deviations are roughly the same, regardless of the average level. On the contrary, the values of variation coefficient are roughly the same in case of the linear relationship.

In case of the yield trend, the variability measured without taking it into consideration is overestimated (Kobus P., 2009). The amount of the bias is proportional to the strength of the trend. Let us define the trend as a function of time which explains the conditional expected value:

$$E(X \mid T = t) = f(t) \quad (3)$$

where:

t – time moment,

$E(X \mid T = t)$ – expected yield in time moment t.

The function $f(t)$ could take any form but in short time series it is usually safe to use the simplest linear form for it approximation:

$$f(t) = \beta_0 + \beta_1 t \quad (4)$$

The equation for calculation of the standard deviation estimator becomes:

$$S_x = \sqrt{\frac{1}{n-2}\sum_{t=1}^{n}(x_t - \hat{x}_{(t)})^2} \quad (5)$$

where:

x_t – observation of yield in time moment t.

$\hat{x}_{(t)}$ – estimate of $f(t)$.

Both equations (1) and (5) are equations for unbiased estimator of standard deviations in the case of normal distribution of the variable observed. The change in the denominator from *n-1* to *n-2* is the consequence of numbers of parameters in the subtracted part.

The issue of expected value is more complicated. If measures which use the expected value or its estimate are thought of as indicators of the production risk in the next year, i.e. in time moment *n+1*, the estimated trend function shall be used for calculation of the $E(X \mid T = n+1)$ estimator instead of a simple average:

$$\hat{x}_{(n+1)} = \hat{\beta}_0 + \hat{\beta}_1(n+1) \quad (6)$$

where $\hat{\beta}_0$ and $\hat{\beta}_1$ are least squares estimators of β_0 and β_1.

But if it should be used as an estimate of the expected yield in the middle of time series it takes the following form:

$$\hat{x}_{(\bar{t})} = \hat{\beta}_0 + \hat{\beta}_1(\bar{t}) = \left(\bar{x} - \hat{\beta}_1(\bar{t})\right) + \hat{\beta}_1(\bar{t}) = \bar{x} \quad (7)$$

As it was shown in the equation (7), in case of a linear trend, instead of calculating the value of the estimated trend in the central moment in time series it is possible to use the average value of the variable observed. Consequently, calculating variation coefficient (2) for the time period, with taking the yield trend into consideration, the only change would be in replacing estimator of standard deviation from the equation (1) with the estimator from the equation (5).

Results and discussion

Production of wheat in the current EU member states

The average area of wheat production in the current EU member states has changed from 24.7 million hectares in Period 1 to 23.5 in Period 2 and 25.8 million hectares in Period 3. The increase of average area in Period 3 is due to the fact that 6 countries were not included in the previous periods (1.8 million hectares).

Although it is not obvious when analysing only the average figures presented in Table 2, the changes of wheat production area in several EU member states

Table 3

The average wheat yield in the current EU member states, 1961-2008

Country	Average values of wheat yield (in dt)				Changes between periods, Period 1=100	
	In Period 1 (1961-1976)	In Period 2 (1976-1992)	In Period 3 (1993-2008)	In 2008	In Period 2	In Period 3
Austria	31.6	45.3	50.4	56.9	143	160
Belgium	40.9	58.5	81.1	86.8	143	198
Bulgaria	27.2	38.8	29.5	41.7	142	108
Cyprus	9.9	15.3	19.7	5.5	154	199
Czech Republic	-	-	46.9	57.7	-	-
Denmark	45.0	61.6	71.5	78.6	137	159
Estonia	-	-	23.0	31.8	-	-
Finland	22.2	27.9	35.0	35.9	126	158
France	35.6	56.2	69.0	71.0	158	194
Germany	38.2	55.4	72.5	80.9	145	190
Greece	18.2	25.7	23.1	29.5	141	127
Hungary	26.2	45.9	39.6	49.8	175	151
Ireland	38.5	66.2	85.5	90.6	172	222
Italy	23.0	28.3	33.4	38.7	123	145
Latvia	-	-	27.9	38.6	-	-
Lithuania	-	-	31.2	42.7	-	-
Luxembourg	27.0	43.9	59.6	66.6	163	221
Malta	17.3	36.2	38.3	45.2	208	221
Netherlands	46.6	70.4	83.1	87.3	151	178
Poland	24.2	33.4	35.9	40.7	138	148
Portugal	10.3	13.2	15.2	23.0	128	148
Romania	18.5	27.3	25.5	34.0	148	138
Slovakia	-	-	40.7	48.7	-	-
Slovenia	-	-	41.8	45.4	-	-
Spain	12.5	21.0	26.3	32.5	167	209
Sweden	39.7	50.6	59.1	61.1	128	149
United Kingdom	41.3	62.9	77.3	82.8	152	187

Source: author's calculations according to the Eurostat and FAO data

are closely related to the CAP[1]. Introduction of the CAP in Period 1 resulted in increasing wheat area in France and Germany, and after joining the European Community in 1973 in Denmark, Ireland, and the United Kingdom. Then, again, the sharp increase of the area was stopped by the MacSharry reforms, which reduced the levels of support for cereals by 29%, created 'set-aside' payments to withdraw land from the production and, most importantly, began the 'de-coupling' of income support from the production support.

France has the biggest share in production area (20%) followed by six other countries, i.e. Germany, Poland, Italy, Romania, Spain, and the United Kingdom. Together, these seven countries account for 73% of average wheat production area in the years of 1993-2008. Italy and in the United Kingdom experienced the most remarkable changes in shares in these analysed countries. In the case of Italy it was a decrease from 16.5% to 8.9%, and in the case of the United Kingdom it was an increase from 4.0% to 7.4%.

It may be observed that there exists a tendency to increase wheat production area in the Northern part of Europe and decrease it in the Southern part, without any substantial change in the overall production area.

The average yields have increased in all 27 countries contrary to the production area. However, the most impressive changes have taken place in Ireland and Belgium accounting for an increase over 40 dt. The highest yields are observed in the West-northern part of the EU, i.e. Belgium, Denmark, France, Germany, Ireland, the Netherlands, and the United Kingdom. The lowest yields were observed in the Southern part of the EU, i.e. Cyprus, Greece, Portugal, Spain, and some recent EU member states, i.e. Estonia, Latvia, and Romania.

It is evident that an increase of average yields was higher between Period 2 and Period 1 than between Period 3 and Period 2. The relatively small increase is due to the MacSharry reforms in the countries where agriculture was a beneficiary of

[1] Common Agricultural Policy

Table 4

Estimates of the basic measures of cereals yield variability in the current EU member states

Country	1961-1976		1977-1992		1993-2008	
	Standard deviation, dt	Coefficient of variation	Standard deviation, dt	Coefficient of variation	Standard deviation, dt	Coefficient of variation
Austria	5.5	17.5%	6.1	13.5%	4.4	8.8%
Belgium	6.0	14.7%	8.4	14.4%	5.9	7.2%
Bulgaria	7.6	28.0%	5.5	14.1%	5.5	18.7%
Cyprus	3.8	38.5%	4.8	31.4%	6.1	31.2%
Czech Republic	-	-	-	-	5.1	10.9%
Denmark	4.1	9.0%	8.6	13.9%	3.5	4.8%
Estonia	-	-	-	-	5.6	24.2%
Finland	4.6	20.6%	5.4	19.5%	4.5	12.8%
France	6.6	18.5%	7.5	13.4%	4.4	6.4%
Germany	5.1	13.3%	6.8	12.3%	4.9	6.8%
Greece	3.7	20.4%	3.9	15.2%	3.1	13.4%
Hungary	7.3	27.8%	6.1	13.3%	6.8	17.2%
Ireland	4.9	12.7%	12.1	18.4%	7.9	9.2%
Italy	2.5	11.0%	3.4	12.0%	3.4	10.2%
Latvia	-	-	-	-	5.6	20.0%
Lithuania	-	-	-	-	6.8	21.9%
Luxembourg	5.0	18.6%	8.9	20.3%	4.7	7.8%
Malta	4.7	27.1%	4.0	11.0%	5.6	14.5%
Netherlands	5.1	10.9%	7.9	11.3%	5.1	6.2%
Poland	4.3	17.8%	4.2	12.6%	3.4	9.5%
Portugal	2.7	26.7%	3.9	29.3%	5.1	33.2%
Romania	4.6	24.7%	4.3	15.6%	6.2	24.5%
Slovakia	-	-	-	-	5.6	13.8%
Slovenia	-	-	-	-	5.3	12.8%
Spain	2.1	16.7%	4.7	22.7%	5.7	21.9%
Sweden	6.9	17.3%	7.0	13.8%	2.9	4.9%
United Kingdom	3.5	8.6%	7.7	12.3%	3.7	4.8%

Source: author's calculations according to the Eurostat and FAO data

the CAP. In most of the remaining countries it is the effect of economy transformation. For example, the first years of economy transformation in Poland resulted in over 20% decrease of the average wheat yield. Nevertheless, on average wheat yields have been increasing from period to period in almost all countries. The values of standard deviation should also be increasing if variability of yields is proportional to its level.

The highest yield variability measured by standard deviations was observed in Ireland, Belgium, and Lithuania, while the lowest one in Italy, Greece, and Portugal. On the contrary, the highest yield variability measured by coefficient of variation was observed in Cyprus, Portugal, and Estonia, while the lowest one in Denmark, the Netherlands, and the United Kingdom.

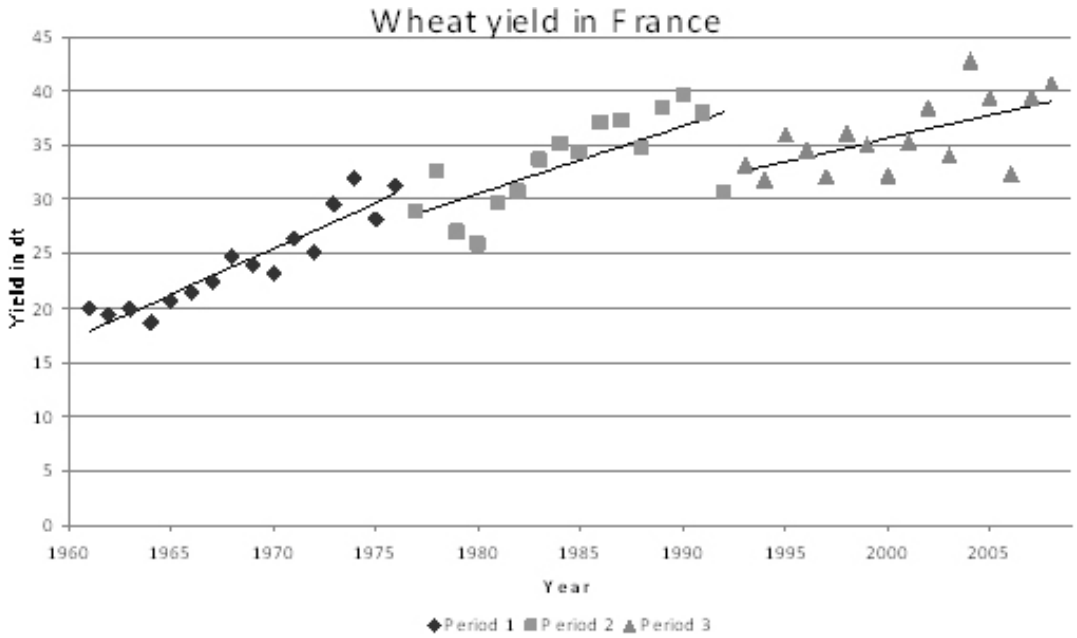
The problem is that all those measures were calculated with the assumptions of the observations independence. It is not necessarily true. A typical situation is rather that an ascending trend could be observed over time (Figure 1).

This trend can be explained by the biological progress and technological advancement. Estimates of variability measures are more or less biased upward depending on the trend strength. The amount of bias can be measured by the determination coefficient. If the determination coefficient equals 78%, like for Austria in the years of 1961-1976, it means that the trend explains 78% of the yield variability.

The values of slope coefficients presented in Table 5 confirm that trends observed in Period 3 are less steep than in the previous periods. It is quite safe to conclude that it is also a result of the MacSharry reforms and economy transformation. It means that these reforms have not only induced severe decrease of inputs, but also caused much slower progress.

The high values of determination coefficients presented in Table 4 indicate that the comparison of variability based on values from Table 4 can be misleading. Values presented in Table 6 are in some cases notably lower and in some cases almost the same as in Table 4. Therefore, the change is not systematic and the analysis of Table 5 will lead to different conclusions.

The observed yield variability is very diverse across the EU countries. There are several possible



Source: author's calculations according to the Eurostat and FAO data

Figure 1. **Wheat yield in France for the period of 1961-2008**

Table 5

Estimates of the trend slope coefficients and coefficients of determination

Country	1961-1976		1977-1992		1993-2008	
	$\hat{\beta}_1$	R^2	$\hat{\beta}_1$	R^2	$\hat{\beta}_1$	R^2
Austria	1.02	78%	1.07	70%	0.23	6%
Belgium	0.73	33%	1.37	60%	0.68	31%
Bulgaria	1.46	84%	0.07	0%	0.48	17%
Cyprus	0.06	1%	0.63	39%	-1.00	61%
Czech Republic	-	-	-	-	0.58	29%
Denmark	0.62	52%	1.26	49%	0.11	2%
Estonia	-	-	-	-	0.87	56%
Finland	0.91	90%	0.53	22%	-0.02	0%
France	1.16	70%	1.39	78%	0.08	1%
Germany	0.88	68%	1.30	82%	0.46	20%
Greece	0.71	82%	0.14	3%	-0.14	4%
Hungary	1.42	86%	0.69	29%	0.37	7%
Ireland	0.75	54%	2.17	72%	0.96	34%
Italy	0.49	84%	0.53	54%	0.20	8%
Latvia	-	-	-	-	1.04	79%
Lithuania	-	-	-	-	1.10	59%
Luxembourg	0.28	7%	1.64	76%	0.37	14%
Malta	0.74	56%	0.28	11%	0.88	57%
Netherlands	0.78	54%	1.32	63%	-0.07	0%
Poland	0.85	88%	0.62	50%	0.43	36%
Portugal	0.43	56%	0.64	61%	0.16	2%
Romania	0.78	66%	0.19	5%	0.08	0%
Slovakia	-	-	-	-	-0.08	1%
Slovenia	-	-	-	-	0.49	19%
Spain	0.37	69%	0.62	38%	0.62	26%
Sweden	1.10	59%	1.11	58%	0.22	13%
United Kingdom	0.32	19%	1.23	58%	0.26	11%

Source: author's calculations according to the Eurostat and FAO data

Table 6

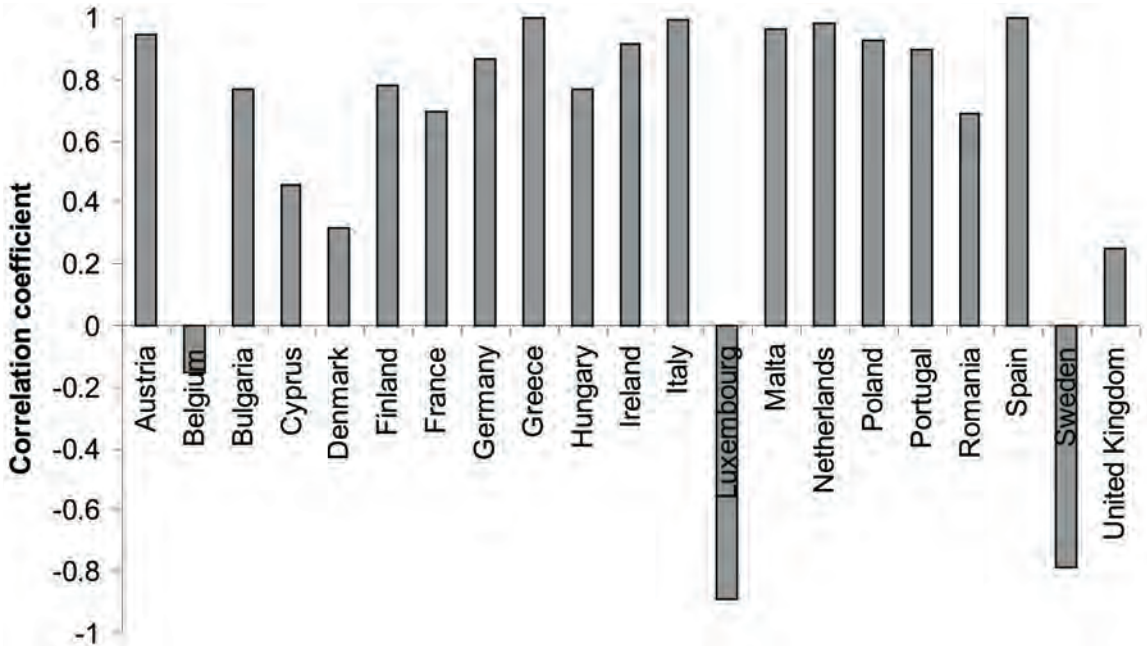
Estimates of the basic measures of cereals yield variability in the current EU member states, after trend elimination

Country	1961-1976		1977-1992		1993-2008	
	Standard deviation, dt	Coefficient of variation	Standard deviation, dt	Coefficient of variation	Standard deviation, dt	Coefficient of variation
Austria	2.7	8.6%	3.5	7.7%	4.5	8.9%
Belgium	5.1	12.5%	5.5	9.4%	5.1	6.2%
Bulgaria	3.2	11.7%	5.6	14.6%	5.2	17.6%
Cyprus	3.9	39.7%	3.9	25.3%	4.0	20.3%
Czech Republic	-	-	-	-	4.4	9.5%
Denmark	2.9	6.4%	6.4	10.3%	3.6	5.0%
Estonia	-	-	-	-	3.8	16.6%
Finland	1.5	6.8%	5.0	17.8%	4.6	13.3%
France	3.8	10.6%	3.6	6.4%	4.6	6.6%
Germany	3.0	7.9%	3.0	5.4%	4.6	6.3%
Greece	1.6	8.9%	4.0	15.5%	3.1	13.5%
Hungary	2.8	10.6%	5.3	11.6%	6.8	17.2%
Ireland	3.4	8.9%	6.6	10.0%	6.6	7.8%
Italy	1.0	4.5%	2.4	8.5%	3.4	10.1%
Latvia	-	-	-	-	2.6	9.4%
Lithuania	-	-	-	-	4.5	14.5%
Luxembourg	5.0	18.6%	4.5	10.2%	4.5	7.5%
Malta	3.2	18.6%	3.9	10.7%	3.8	9.8%
Netherlands	3.6	7.7%	5.0	7.1%	5.3	6.4%
Poland	1.6	6.5%	3.1	9.2%	2.8	7.8%
Portugal	1.9	18.4%	2.5	18.9%	5.2	34.0%
Romania	2.8	14.9%	4.3	15.8%	6.4	25.3%
Slovakia	-	-	-	-	5.8	14.3%
Slovenia	-	-	-	-	5.0	11.9%
Spain	1.2	9.6%	3.9	18.4%	5.1	19.5%
Sweden	4.6	11.5%	4.7	9.3%	2.8	4.7%
United Kingdom	3.3	8.0%	5.2	8.2%	3.6	4.6%

Source: author's calculations according to the Eurostat and FAO data

sources of this diversity: different weather conditions, soil, and technology. It quite safe to assume that the weather conditions, although very changeable from year to year, are typical of the geographic region and their irregularity is characteristic of each country. The same can be said about soil conditions, it is a country attribute. These two factors can contribute to the differences of yields variability between different countries but not to the differences between time periods in the same country. The remaining two sources, technology and yield levels, can contribute to the diversity of yields variability between countries and also between different time periods in the same country. There is also one artificial factor influencing the differences of yield variability between countries, which can obscure the effect of the above mentioned factors, it is the size of the production area. The data analysed consist of yearly national average yields of wheat. Only if yields on every field in the whole country were linearly related to the yields on all other fields with the correlation coefficient equalled to 1, the year to year variability of average country yield would be the same as variability on any specific field in that country. In all other cases the year to year variability of the average country yield is reduced. The degree of such reduction is the function of values of the correlation coefficient calculated for yields from different fields. The lower is the correlation coefficient the bigger is the reduction. Maximum reduction is achieved for the correlation coefficient equalling to 1. Thus, typically, the bigger is country and production area the higher is the chance of not correlated or negatively correlated yields.

As it was mentioned in the introduction, besides the comparisons of yield levels and their variability, this paper is dedicated to the issue on the relationship between the average level of yield and its variability. This issue needs further clarification. The higher yields can be the results of advantageous environmental conditions and/or human depending factors, like better technologies, new varieties, higher inputs especially fertilisers etc. These human depending factors, typically, are slowly improved from year to year, with the exception of a drastic change in the economic situation; therefore a change requires long time to be evident on the country level. On the contrary, the environmental conditions, especially the weather may change dramatically from



Source: author's calculations according to the Eurostat and FAO data

Figure 2. **Correlation coefficients between the average yields and standard deviations**

year to year. Though on average it may remain the same for moderately long time periods, certainly for very long time periods the climatic change is possible, yet it is a different time scale. The question on the relation between the average yield level and its variability can be interpreted as a question on the relation between the changes of yields resulting from weather conditions and changes of yields resulting from human depending factors.

The comparison of yields variability across all countries will not allow answering that question, as it is hard to distinguish between the influence of human depending factors and environmental conditions on yields variability. On the contrary, an analysis of the relation between variability and average yields separately in each country can give an answer whether the improvement of human depending factors affects only the average yield or also its variability.

Each of the correlation coefficients presented in Figure 2 is calculated using only 3 points. For example, for Austria it was: (31.6, 2.7), (45.3, 3.5), (50.4, 4.5), where 31.6 was the average yield for the years of 1961-1976 and standard deviation of 2.7 for the years of 1961-1976. The use of only 3 points for calculating correlation coefficient is usually not recommended because its value may be highly affected by randomness. In the case of 2-dimensional normal distribution a critical value for lack of the correlation hypothesis on the significance level of 0.1 is equal to 0.9877. Although in the analysed case the data do not follow the 2-dimensional normal distribution; this value shows how cautiously even high values of correlation coefficient for such short series should be treated. Nevertheless the probability of observing 18 or more positive values of the correlation coefficient in total number of 21, in the case of the independency of standard deviations and average values, equals only to 0.074%. It means that there exists a positive relationship between the yields level and their variability. One of the consequences of this fact is that the time series for assessing yield variability should not be to long or one would risk underestimation of yield variability in case of increasing trend of average yields. The question how long it can be remains open.

The prediction of yields and their variability in the year 2009 only for the last 16 years were used in the paper.

The values of production standard deviations are very dependent on the production area, therefore the highest values are observed for France, Germany, and the United Kingdom. However, values of variation coefficient in these 3 countries are lowest ones.

To calculate an estimate of expected total harvest of all cereals in the year n+1, it is sufficient to sum products of areas and predicted yields for individual countries, which in this case gives the result of 140.76 million tons. But the calculation of standard deviation estimate is much more complicated. Let us assume that the yields of wheat follow multidimensional normal distribution:

$$X \sim N_{27}(\mu, \Sigma) \qquad (8)$$

where:

X – vector of wheat yields in individual countries,

μ – vector of expected yields in individual countries,

Σ – covariance matrix of yields in individual countries.

Table 7

Prediction of the yields and production in 2009

Country	Yield, dt/ha	Area, thousand ha (year 2008)	Crop, thousand t	St. dev, thousand t	Coefficient of variation
Austria	52.3	296.8	1553.5	133	8.5%
Belgium	86.9	224.1	1947.4	113	5.8%
Bulgaria	33.6	1111.5	3736.3	579	15.5%
Cyprus	11.1	5.3	5.9	2	35.9%
Czech Republic	51.8	802.3	4153.9	357	8.6%
Denmark	72.5	638.2	4624.4	227	4.9%
Estonia	30.4	107.6	327.1	41	12.6%
Finland	34.8	219.6	765.0	102	13.3%
France	69.6	5492.5	38248.4	2503	6.5%
Germany	76.5	3213.5	24568.0	1470	6.0%
Greece	22.0	657.1	1444.0	206	14.3%
Hungary	42.7	1130.2	4829.9	771	16.0%
Ireland	93.6	104.9	981.9	70	7.1%
Italy	35.1	2289.1	8025.0	773	9.6%
Latvia	36.7	256.6	942.9	67	7.2%
Lithuania	40.6	403.5	1637.6	182	11.1%
Luxembourg	62.7	14.6	91.6	7	7.1%
Malta	45.8	2.1	9.6	1	8.2%
Netherlands	82.5	156.5	1291.8	83	6.4%
Poland	39.5	2278	9001.5	638	7.1%
Portugal	16.6	88.3	146.7	46	31.1%
Romania	26.2	2110.3	5524.8	1359	24.6%
Slovakia	40.0	373.7	1493.0	217	14.5%
Slovenia	46.0	35.3	162.4	17	10.8%
Spain	31.5	2067	6515.2	1056	16.2%
Sweden	60.9	360.5	2196.2	101	4.6%
United Kingdom	79.5	2080	16536.5	745	4.5%

Source: author's calculations according to the Eurostat and FAO data

In that case total harvest of wheat can be regarded as linear function of individual countries yields multiplied by area:

$$Y = \mathbf{a}X \tag{9}$$

where:

$\mathbf{a}$ – vector of individual countries in wheat production areas.

Linear function of multidimensional normal distribution follows one dimensional normal distribution:

$$Y \sim N\left(\mathbf{a}\mu, \mathbf{a}\Sigma\mathbf{a}^{\mathrm{T}}\right) \tag{10}$$

In consequence the estimate of total harvest standard deviation in the year n+1 follows the equation:

$$S_Y = \sqrt{a\hat{\Sigma}a^T} \tag{11}$$

where:

$\hat{\Sigma}$ – an estimate of the covariance matrix of individual countries yields.

Due to its size the matrix $\hat{\Sigma}$ is not presented. The estimated value for the production standard deviation equals to 7.21 million tons. Comparing it with the predicted expected wheat production of 140.76 million tons gives the variation coefficient equalling to 5.1%. This low value is an effect of relatively low values of correlation coefficients for wheat yields in different countries, in many cases even negative.

Thanks to that effect the total supply of wheat in the EU is more stable than in almost all countries separately. The unfortunate, for farmers producing wheat, consequence is that it undoes natural hedging mechanism.

Conclusions

- It may be observed that there exists a tendency to increase wheat production area in the Northern part of Europe and decrease it in the Southern part, without substantial changes in the overall production area.
- The average yields have increased in all 27 countries. The most impressive changes have taken place in Ireland and Belgium

with the increase over 40 dt. The highest yields are observed in the West-northern part of the EU, i.e. Belgium, Denmark, France, Germany, Ireland, the Netherlands, and the United Kingdom. The lowest yields were observed in the Southern part of the EU, i.e. Cyprus, Greece, Portugal, Spain, and some recent EU member states, i.e. Estonia, Latvia, and Romania.

- The lower pace with which yields have been increasing in the past 16 years is due the MacSharry reforms in countries where agriculture was a beneficiary of the CAP and in most of the remaining countries it is the effect of the economy transformation.
- There exists a positive relationship between the yields level and their variability

Bibliography

1. Kobus P. (2009) Wheat Yields Variability in Poland at NUTS 2 Level in the Context of Production Risk. Scientific Journal Warsaw University of Life Sciences - SGGW. *Problems of World Agriculture*. 2008, Vol. 6 (21), pp. 32-39.
2. Eurostat (2009), Statistical Office of the European Communities. Available at: http://ec.europa.eu/eurostat. Accessed December 2009.
3. UNdata (2009), a data access system to UN databases Available at: http://data.un.org/. Accessed December 2009.

Graudu ražošanas ekonomika Latvijā
The Economy of Grain Production in Latvia

Veronika Buģina, Dr.oec., profesore, **Andis Brakmanis,** Mg.oec.
Latvijas Lauksaimniecības universitāte, Ekonomikas fakultāte
e-pasts: efekon@llu.lv

Abstract. The research aim is to perform an economic evaluation of grain production in Latvia.
In Latvia almost a third of the area was sown with winter wheat (30%), while only a 2% smaller area (28%) was sown with spring barley in 2008. Spring wheat, oats, and mixed grains occupy 14%, 12%, and 10% respectively of total area sown with grains.
In 2008 the total output of grains equalled to 1089 thousand tons in Latvia.
The average yield of winter grains has increased from 3.59 tons per hectare in 2007 to 4.00 tons per hectare in 2008. Latvian grain producers can fully meet the domestic market demand for grain.
The average purchase prices of grains have decreased from LVL 123.83 per ton in 2007 to LVL 100.06 per ton in 2008. Calculations of the profitability for production of winter wheat show that it is possible to gain profit also at the average yields of winter wheat in Latvia by increasing an area sown with winter wheat to 33.79 ha. However, the rate of profitability rises 8% at a winter wheat yield of 1 ton above the average yield in Latvia,
Key words: grain, production, economy, area, yield, output.

Ievads
Introduction

Kopējās graudaugu platības pēdējo gadu laikā pastāvīgi nedaudz palielinās, tomēr kopumā nepārsniedzot pēdējo 10 gadu caurmēru. Palielinās ražošanas koncentrācija. Kopumā pēdējo 5 gadu laikā graudaugus ražojošo saimniecību skaits samazinājies par trešdaļu. Palielinās tikai to saimniecību skaits, kurās graudaugu platības ir lielākas par 100 ha. Tirgus koncentrāciju lielā mērā veicina pastāvīgi pieaugošās ražošanas izmaksas, kā arī nepieciešamība nodrošināt atbilstošu kvalitāti.

Ražošanas izmaksas katrai saimniecībai ir individuālas un atkarīgas no saimniecības vadītāja spējām un prasmes organizēt ražošanu, izmantot esošos resursus, piesaistīt resursus no ārienes.

Latvijā ir veikti dažādi pētījumi par graudaugu ražošanu, kā arī tiem nepieciešamo ražošanas resursu izmaksām. Šie pētījumi ir veikti par laika periodu no Latvijas neatkarības atgūšanas līdz deviņdesmito gadu beigām. Pētījumus par graudkopības nozari sniedz Zemkopības ministrijas izstrādātie informatīvie ziņojumi, kuros ir atspoguļotas ziņas par sējumu platībām, kopražu un ražību valsts mērogā.

Pētījumus par dažādu kultūraugu, tai skaitā par graudaugu ražošanu un izmaksām veicis Latvijas lauku konsultāciju un izglītības centrs.

Datus, kurus Latvijas lauku un izglītības centrs iekļāvis apkopotajos pētījumos, ir ieguvis no savā paspārnē esošajām saimniecībām. Latvijas Valsts agrārās ekonomikas institūts par savu noteiktu saimniecību skaitu ir veicis pētījumus par dažādiem kultūraugiem, tai skaitā par atsevišķiem graudaugiem.

Plašākus pētījumus par graudu ražošanu un izmaksām veicis A. Boruks darbos „Graudi: daudzumi, izmaksas, cenas", „Zemkopības pamati Latgalē". Šajos darbos A. Boruks ar daudziem citiem zinātniekiem ir pētījuši (modelējuši) graudu ražošanu, izmaksas un cenas pirms iestāšanās Eiropas Savienībā.

Līdz ar to radās nepieciešamība izpētīt intensīvās graudu ražošanas un izmaksu problēmas Latvijā pēdējo trīs gadu laikā, un salīdzināt tās ar ekstensīvās graudu ražošanas un izmaksu problēmām Latvijā.

Darba mērķis: veikt graudu ražošanas ekonomisko izvērtējumu Latvijā.

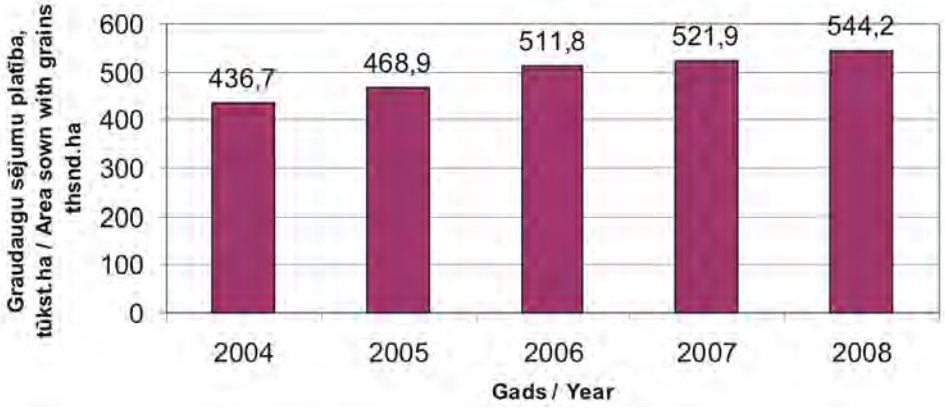
Izvirzītā mērķa sasniegšanai noteikti sekojoši **darba uzdevumi**:

1. Izanalizēt graudu sējumu platības Latvijā;
2. Izvērtēt graudu kopražu;
3. Salīdzināt graudu eksportu un importu;
4. Izanalizēt graudu realizāciju Latvijā;
5. Noteikt saimniekošanas līmeņus graudiem;
6. Izvērtēt graudu ražošanas ekonomiskos rādītājus.

Izmantotie materiāli: pētāmā darba izmantotie materiāli ir Latvijas Republikas lauksaimniecības un lauku attīstības likums. Zemkopības ministrijas izstrādātie informatīvie ziņojumi „Par situāciju graudkopības nozarē." Galvenie izziņas avoti ir Latvijas zinātnieku darbi (A. Boruks, 1999., 1996., V. Strīķis, 1999.). Lauku saimniecības darba ekonomiskās analīzes rezultāti (2005., 2006., 2007.), Bruto seguma aprēķins zemnieku saimniecībai (2006., 2007.). Lauku izmēģinājumi un demonstrējumi (2006., 2007.). Analītiskie raksti no Latvijā izdotiem izdevumiem (Latvijas Avīze, Agropols, Saimnieks LV).

Pielietojamās pētījuma metodes: monogrāfiskā, statistiskās analīzes (grupēšana), modelēšanas metode.

Pētījuma objekts: graudu ražošana Latvijā.



Avots: autoru veidots pēc CSP datiem, 2009.
Source: made by the authors according to the data of the CSB, 2009

1. att. **Latvijas graudu sējumu platība, tūkst. ha**
Figre 1. **Area sown with grain in Latvia, thou. ha**

Rezultāti un diskusija
Results and discussion
1. Graudu sējumu platības Latvijā
1. Areas sown with grain in Latvia

Graudkopība ir viena no svarīgākajām Latvijas lauksaimniecības nozarēm, kas pēdējo piecu gadu laikā ir palielinājusies gan kopražu, gan platību ziņā (Orupe A., 2008.).

Labības lauku platības Latvijā piecu gadu laikā ir palielinājušās par 17.9%. Graudi lauksaimniecības ražošanas galaproduktu struktūrā ieņem otru nozīmīgāko vietu, pēdējo trīs gadu laikā nodrošinot 20 līdz 27% no kopējās saražotās lauksaimniecības produkcijas vērtības (Zute S., 2008.).

Specializēto graudu saimniecību Latvijā ir maz, daudzas nodarbojas arī ar lopkopību. Autori uzskata, ka ir vairāki faktori, kas veicina nozares paplašināšanos. Viens no tādiem ir 2007. gada graudu cena, kas pamudināja zemniekus 2009. gadā iesēt vēl vairāk labības, cerot, ka maksa par to saglabāsies iepriekšējā gada apjomā. Otra tendence – enerģijas augu maksājumi, ko joprojām finansē ES. Trešais, tīri Latvijai specifisks faktors – cukura nozares likvidācija. Daudzi lauksaimnieki, kas darbojās šajā nozarē, cukurbiešu vietā iesēja graudus. Līdz ar to pieauga graudaugu platības un kopražas. Tās gan kāpj ne tikai tāpēc, ka pieaug platības, bet arī pateicoties modernajām tehnoloģijām (Orupe A., 2008.).

Graudu kultūru sējumu kopplatība Latvijā katru gadu palielinās (1. att. dati), 2007. gadā reģistrēti jau 521.9 tūkst. ha (salīdzinājumā ar iepriekšējo gadu +2%). Visvairāk tiek audzēti kvieši (43% no graudaugu sējplatības) un mieži (27.7%). Pēdējos gados ievērojami palielinājušās arī auzu un rudzu platības (2007. gadā attiecīgi 62.4 un 57.6 tūkst. ha). Savu vietu graudaugu struktūrā ieņem tritikāle, griķi, pākšaugi un to mistri (2007. gadā attiecīgi 12.4, 10.0 un 7.5 tūkst. ha) (Zute S., 2008.).

Pēdējo gadu laikā graudu platībām ir tendence pakāpeniski palielināties. Salīdzinot ar 2004. gadu līdz 2008. gadam graudu platības ir pieaugušas par 25% (1. att. dati).

2008. gadā gandrīz trešdaļa no apsētajām platībām ir ziemas kvieši (30%), tikai par 2% mazāk (28%) no visām platībām aizņem vasaras mieži. Savukārt vasaras kvieši, auzas un mistrs aizņem attiecīgi – 14%, 12% un 10% no kopējās apsētās graudu platības (Elste A., 2008.).

Latvijā, Eiropā un pasaulē ir vērojama rapša platību palielināšanās. To speciālisti skaidro ar rapša plašajām pielietošanas iespējām, kā arī pieaugošo rapša pārstrādi, lai iegūtu bioenerģiju (Elste A., 2008.).

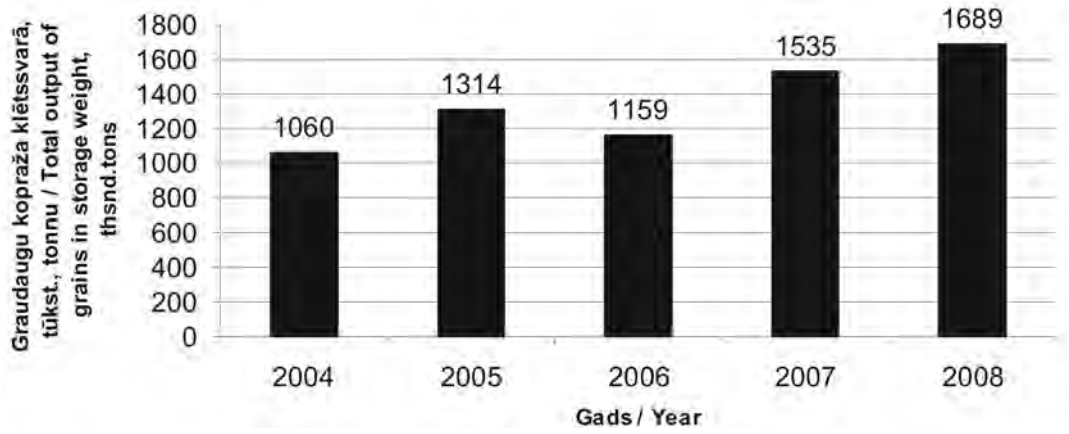
Centrālās statistikas pārvaldes (CSP) dati par lauksaimniecības kultūru sējumu platībām liecina, ka 2008. gadā ar graudaugiem apsētās platības sastāda 544.2 tūkst. ha (1. att.), kas ir par 4.3% vairāk nekā 2007. gadā.

Graudaugu sējumu īpatsvars sējumu kopplatībā palielinājies no 46.3% 2007. gadā līdz 49.0% 2008. gadā (Orupe A., 2008.).

2007. gadā graudi aizņēma 522 tūkstošus hektāru (1. att.), kas no kopējās ES graudaugu platības sastādīja 0.92%. Savukārt Latvijas graudu kopraža no ES kopražas veidoja 0.63%. Latvija starp pārējām ES valstīm ieņem 20. vietu šajā ziņā. Augušas ne tikai platības un kopraža, bet palielinājies arī eksporta un importa apjoms. Kā liecina statistika, graudu eksports uz ES, salīdzinot ar 2006. gadu, palielinājās gandrīz četras reizes, savukārt uz trešajām valstīm – graudu eksports palielinājies par 39%. Tāpat audzis graudu imports no trešajām valstīm un ES – attiecīgi – septiņas reizes no trešajām valstīm un 36 reizes no ES salīdzinot ar 2006. gadu (Orupe A., 2008.).

2008. gadā iegūti 1.7 milj. tonnu graudu (2. att.), kas veido kopievākuma pieaugumu par 154.2 tūkst. tonnu jeb par 10% vairāk kā 2007. gadā. Graudu vidējā ražība palielinājusies no 2.94 tonnām no 1 ha 2007. gadā līdz 3.10 tonnām 2008. gadā (1. tab.).

Graudu ieguves apjoma ievērojamo pieaugumu ietekmējusi augstā ziemāju kultūru, īpaši ziemas kviešu ražība. Ziemāju graudaugu vidējā ražība palielinājusies no 3.59 tonnām no 1 ha 2007. gadā līdz 4.00 tonnām no hektāra 2008. gadā, tai skaitā ziemas kviešiem – no 3.78 tonnām līdz



Avots: autoru veidots pēc CSP datiem, 2009.
Source: made by the authors according to the data of the CSB, 2009

2. att. **Latvijas graudu kopraža klētssvarā, tūkst. tonnu**
Figure2. **Total output of grain in Latvia in storage weight, thou. tons**

1. tabula/Table 1

Latvijas lauksaimniecības kultūru vidējā ražība no 1 ha, tonnas
The average yield of agricultural crops in Latvia per ha, tons

Lauksaimniecības kultūra / Agricultural crops	2006	2007	2008
Graudi/Grain	2.26	2.94	3.10
Ziemāji/Winter grain	2.89	3.59	4.00
tai skaitā: kvieši/incl. wheat	3.03	3.78	4.35
rudzi/rye	2.73	3.14	3.30
tritikāle/triticale	-	3.05	2.54
Vasarāji/Spring grain	1.82	2.41	2.34
tai skaitā: kvieši/incl. wheat	2.18	3.14	2.88
mieži/ barley	1.99	2.36	2.24
auzas/ oats	1.46	2.09	2.14

Avots: autoru veidots pēc CSP datiem, 2009.
Source: made by the authors according to the data of the CSB, 2009

4.35 tonnām (1. tab.). Graudu kopievākums no ziemāju kultūrām 2008. gadā pieaudzis par 158.4 tūkst. tonnu jeb par 18.8% vairāk salīdzinot ar 2007. gadu, tai skaitā ziemas kviešu – par 138.2 tūkst. tonnu jeb par 22.9%, salīdzinot ar 2007. gadu.

Vasarāju kultūru graudu kopražu 2008. gadā ietekmējuši nelabvēlīgie laika apstākļi. Pieaugot sējumu platībām par 2.4%, ievākts par 4.2 tūkst. tonnu jeb par 0.6% mazāk vasarāju graudu nekā 2007. gadā. Vidējā vasarāju ražība no 1 ha samazinājusies no 2.41 tonnas 2007. gadā līdz 2.34 tonnām 2008. gadā (1. tab.) (Par l/s kultūru sējumu platībām, 2009.).

2. Graudu kopraža Latvijā
2. Total output of grain in Latvia

Apsētās graudaugu platības pēdējo trīs gadu laikā valstī ir nodrošinājušas no 1.159 līdz 1.689 milj.t graudu kopievākumu (2. att.). Latvijas graudu audzētāji pilnībā var nodrošināt pašpatēriņam nepieciešamo graudu daudzumu, kas, pēc 2006./2007. gada datiem, veido aptuveni 1 milj.t graudu. No šī daudzuma līdz 50% izlieto lopbarībai, ap 30% pārtikas produktu ražošanai un ap 12% sēklai. Rūpnieciskai pārstrādei (spirta, iesala u.c. produktu ražošanai) patērē ap 80 tūkst.t graudu.

Graudkopība ir viena no nozīmīgākajām lauksaimniecības preču produkcijas ražošanas nozarēm Latvijā. 2008. gadā graudu kopraža Latvijā bija 1 639 000 tonnu, kas pateicoties klimatiskajiem apstākļiem, tehnoloģijas un ražošanas attīstībai bijusi augstākā pēdējos 18 gados (1990. gadā tā sasniedza 1 590 000 tonnu) (2. att.).

Graudu kopraža 2007. gadā ir pieaugusi par 32% salīdzinot ar 2006. gadu. 2006. gada straujais graudu kopražas samazinājums par 11.8% pret 2005. gadu ir skaidrojams ar nelabvēlīgajiem laika apstākļiem, tas ir, liela daļa ziemāju izsala un izslīka, savukārt vasarāji sausajā vasarā izdega. 2008. gadā graudu kopraža 1.7 milj.t un ražība 3.1 t salīdzinot ar 2007. gadu palielinājusies attiecīgi par

10% un 5% (2. att.). Šāda situācija tiek skaidrota ar ieilgušo sausuma periodu 2008. gada jūnija sākumā, jo vasarāju nobriešanas periodā Baltijas jūras reģionā bija nepietiekošs nokrišņu daudzums (Elste A., 2008.).

2008. gadā iegūti 1.7 miljoni tonnu graudu, kas veido kopievākuma pieaugumu par 154.2 tūkstošiem tonnu jeb par 10% salīdzinot ar 2007. gadu (2. att.).

3. Graudu eksports un imports
3. Export and import of grain

Aug gan graudu eksports, gan graudu imports. Iestājoties ES, eksports un imports faktiski attiecināms tikai uz tirdzniecību ar trešajām valstīm. Daļa Latvijā izaudzēto graudu tiek pārdoti uz ārvalstīm, bet Latvijā tiek ievesti citi. Esam izaudzējuši vairāk graudus nekā patērējam – aptuveni 5-10% graudu (Orupe A., 2008.).

Lielākais graudu ievedums no ES – 27 bijis 2005. gadā, kad Latvijā tika ievests 129 tūkst. t graudu 11.3 milj. Ls vērtībā, no kuriem 89% graudu tika ievesti no Lietuvas. Importa pieaugums 2007. gadā un 2008. gada pirmajā ceturksnī, salīdzinot ar iepriekšējiem gadiem, skaidrojams ar graudu straujo cenu kāpumu pasaulē, līdz ar to arī Latvijā. Graudu imports un ievedums pa gadiem ir ļoti svārstīgs. ES valstis, kuras Latvijā ieved graudus, ik gadu ir vienas un tās pašas – Lietuva, Igaunija, Grieķija, Beļģija, Zviedrija, Vācija un citas dalībvalstis, kuru ievestie daudzumi ir maznozīmīgi (ZM, 2009.).

Kā liecina 2. tabulas dati, graudu eksports no 2004./2005. gada līdz 2007./2008. gadam pieaudzis no 175 tūkst. t līdz 505.6 tūkst. t, t.i., 2.9 reizes. Visvairāk eksportēti kvieši. No 2004./2005. gada līdz 2007./2008. gadam kviešu eksports samazinājies no 80% līdz 60% no kopējā graudu eksporta. Salīdzinot kviešu eksportu pa gadiem no 2004./2005. gada līdz 2007./2008. gadam, tas pieaudzis no 139.5 tūkst.t līdz 301.6 tūkst.t, jeb 2.2 reizes.

Miežu eksports no 2005./2006. gada līdz 2007./2008. gadam nav mainījies un sastāda 71 līdz 73 tūkst.t. Auzu eksports no kopējiem graudiem sastāda analizējamā laika periodā no 1% līdz 4%.

Graudu imports analizējamā laika periodā svārstās no 97.3 tūkst.t līdz 228.5 tūkst.t, t.i., 2008. gadā pieaug 2.4 reizes, salīdzinot ar 2004./2005. gadu. Kvieši visvairāk importēti 2005./2006. gadā. Rudzi un mieži visvairāk importēti 2007./2008. gadā sastādot 21% un 20% no kopējā graudu daudzuma. Auzu importa īpatsvars svārstās ap 1% (2. tab. dati).

Graudu eksporta pieauguma tendence skaidrojama ar ražotāju vēlmi graudus realizēt par augstāku cenu. Patērētie graudi Latvijā 2007. gadā bija tikai 2/3 no visas graudu kopražas. 2007. gadā graudu eksports salīdzinājumā ar 2006. gadu palielinājās trīs reizes, bet graudu izvedums uz citām ES – 27 valstīm palielinājās par 4% (ZM, 2009.).

4. Graudu realizācija Latvijā
4. Sales of grain in Latvia

2008. gadā kopumā tika iepirktas 578.0 tūkst. tonnas graudu, kas ir par 115.1 tūkst. tonnu jeb 16.6% mazāk nekā iepriekšējā gadā. Kviešu iepirkuma apjoms sarucis par 10.1 tūkst. tonnu jeb 2.7%, tai skaitā pārtikas kviešu – par 65.7 tūkst. tonnu jeb 28.0%. Arī pārtikas kviešu īpatsvars visu iepirkto kviešu kopapjomā samazinājies no 63.1% 2007. gadā līdz 46.7% 2008. gadā. Rudzu iepirkts par 42.7 tūkst. tonnu jeb 27.8% mazāk nekā 2007. gadā, tai skaitā pārtikas rudzu – par 38.5 tūkst.

2. tabula/Table 2

Graudu eksports un imports Latvijā, tūkst.t
Export and Import of grain in Latvia, thou. t

Graudi	2004/2005		2005/2006		2006/2007		2007/2008	
	Eksports Export	Imports Import	Eksports Export	Imports Import	Eksports Export	Imports Import	Eksports Export	Imports Import
Graudi / Grain	175.0	97.3	502.6	159.6	298.5	120.6	505.6	228.5
Kvieši / Wheat	139.5	51.6	419.3	136.7	192.8	25.3	304.6	64.6
Rudzi / Rye	11.2	3.1	5.9	4.8	16.4	6.4	107.8	48.6
Mieži / Barley	18.0	26.3	72.3	1.2	72.5	41.8	71.2	46.4
Auzas / Oats	3.4	2.6	3.3	2.9	11.9	3.6	13.9	2.6
Pārējie graudaugi/ Other cereals	2.9	13.7	1.8	14.0	2.0	27.6	5.2	50.5

Avots: autoru veidots pēc CSP datiem, 2009.
Source: made by the authors according to the data of the CSB, 2009

tonnu jeb 33.4% mazāk (Par lauksaimniecību..., 2009.).

Graudkopība ir viena no nozīmīgākajām lauksaimniecības preču produkcijas ražošanas nozarēm Latvijā – 2007. gadā tā bija 27.7% no kopējās lauksaimniecības preču vērtības bāzes cenās. Salīdzinājumā ar 2006. gadu, tā ir pieaugusi par 7% (ZM, 2009.).

Gaidītais cenu pieaugums graudiem 2009. gada sākumā nenotika. 2008. gadā tie graudu audzētāji, kas 2007. gada ražu pieturēja līdz ziemai, guva necerētu peļņu, jo pasaules biržās cena uzkāpa pat līdz 180-190 latiem par tonnu kviešu. 2009. gada sākumā cerētais cenas kāpums nav sagaidīts. Tieši pretēji – 2008. gada augustā un septembrī cena bija augstāka nekā 2009. gadā. Tas ir, augustā par labas kvalitātes kviešiem graudaudzētāji varēja saņemt vidēji 120 latus par tonnu, 2009. gada sākumā – no 85 līdz 100 latiem par tonnu (Tomsone I., 2009.).

Latvijā 2008. gada rudenī izaugusi ļoti laba graudu raža, tomēr kulšanai nepiemērotie dabas apstākļi, izmaksu kāpums un cenu kritums neļaus saimniekiem gūt cerētos naudas ienākumus.

Pasaules biržās noticis straujš graudu cenas kritums. Tas nozīmē, ka arī Latvijā vismaz tuvākajā laikā uz cenas kāpumu nevar cerēt. 2009. gadā pārtikas kviešus Latvijā pērk par 110-130 latiem tonnā, bet lopbarības graudus – par 80-90 latiem tonnā. 2008. gadā pircēji maksāja attiecīgi 140-170 un 120-130 latus par tonnu (Graudiņš U., 2008, 4. sept.).

2008. gadā, pazeminoties graudu iepirkuma cenām un vienlaikus paaugstinoties ražošanas izmaksām, varētu rasties krīzes situācija graudu ražošanas sektorā, jo graudu ražošanas pašizmaksa būs būtiski augstāka par tirgū piedāvāto cenu un saimniecības varētu ciest zaudējumus (Tomsone I., 2008.).

2008. gadā vidējās graudu cenas kviešiem bija aptuveni 120, bet rudziem – aptuveni 90 lati par tonnu. Cena, protams, ir atkarīga no graudu kvalitātes. 2008. gadā vidējā graudu iepirkuma cena par tonnu kviešu ir 100 lati, un tā ir loģiska pēctecība uz pasaulē notiekošo. Mēs sekojam pasaules cenu tendencēm, jo cenas krītas ne tikai Latvijā un Baltijā, bet arī Eiropā un Āzijā (Graudiņš U., 2008, 11. dec.). Pēc autoru vērtējuma miltu un maizes cenas tuvākajā nākotnē būtiski nekritīsies, jo kāps ražošanas izmaksas, piemēram, maksa par elektroenerģiju.

Pēc LVAEI tirgus veicināšanas centra datiem 2008. gada janvārī pārtikas kviešu cenas salīdzinājumā ar 2007. un 2006. gada janvāri ir palielinājušās attiecīgi par 70% un 111%, lopbarības kviešiem – par 42% un 108% un lopbarības miežiem – par 32% un 93% (ZM, 2009.).

Ievērojami pieaugušas arī graudu vidējās iepirkuma cenas – no 73.33 Ls par tonnu 2006. gadā līdz 123.83 Ls par tonnu 2007. gadā, tai skaitā kviešu – no 77.83 Ls līdz 132.11 par tonnu, no tiem pārtikas – no 81.50 Ls līdz 140.55 Ls par tonnu, rudzu – no 66.75 Ls līdz 114.93 Ls par tonnu, no tiem pārtikas – no 68.21 Ls līdz 118.99 Ls par tonnu (Par lauksaimniecības kultūru sējumu..., 2009.).

Bet samazinājušās graudu vidējās iepirkuma cenas – no Ls 123.83 par tonnu 2007. gadā līdz Ls 100.06 par tonnu 2008. gadā, tai skaitā kviešu – no Ls 132.11 līdz Ls 108.76 par tonnu, no tiem pārtikas – no Ls 140.55 līdz Ls 125.42 par tonnu, rudzu – no Ls 114.93 līdz Ls 83.79 par tonnu, no tiem pārtikas – no Ls 118.99 līdz Ls 89.32 par tonnu graudu (Par lauksaimniecības kultūru sējumu..., 2009., Tomsone I., 2009.).

2008. gadā kopumā iepirkts 578 tūkstoši tonnu graudu, kas ir par 115.1 tūkst. tonnu jeb 16.6% mazāk nekā 2007. gadā. Tātad – zemnieki ražu tomēr pietur līdz 2009. gadam.

Graudu audzētājiem, jo īpaši Zemgalē, zemo cenu kompensējusi 2008. gada labā raža. Grūti klāsies tiem, kas 2008. gadā, saņemot labus ienākumus no 2007. gada ražas, investēja kaltēs un noliktavās. 2009. gada zemās graudu cenas lielai daļai valsts graudu audzētāju pārmēru lielus zaudējumus neradīs, jo lielākā daļa ražas pārdota vēl 2008. gadā, kad cena bija augsta (Tomsone I., 2009.).

Apkopotie dati par graudu iepirkumu labības pieņemšanas un pārstrādes uzņēmumos un uzņēmējsabiedrībās liecina, ka 2006. gadā iepirkts par 64.9 tūkst. tonnu jeb par 12.1% mazāk graudu nekā iepriekšējā gadā. Kviešu iepirkuma apjoms samazinājies par 64.6 tūkst. tonnu, tai skaitā pārtikas kviešu – par 30.8 tūkst. tonnu. Nelabvēlīgie laika apstākļi nav ietekmējuši graudu kvalitāti. Pārtikas kviešu īpatsvars visu iepirkto kviešu kopapjomā 2006. gadā pieaudzis līdz 60.5% (2005. gadā – 40.6%). 2006. gadā iepirkts par 26.0 tūkst. tonnu vairāk rudzu nekā iepriekšējā gadā. Pārtikas rudzu īpatsvars iepirkto rudzu kopapjomā pieaudzis līdz 80.1% (2005. gadā – 20.0%). Ievērojami pieaugušas graudu vidējās iepirkuma cenas – no 59.80 Ls par tonnu 2005. gadā līdz 73.33 Ls par tonnu 2006. gadā, tai skaitā pārtikas kviešu – no 70.34 Ls līdz 81.50 Ls par tonnu, pārtikas rudzu – no 60.90 Ls līdz 68.21 Ls par tonnu graudu (Par lauksaimniecības kultūru sējumu..., 2009.).

2007. gadu graudkopībā autori var vērtēt kā audzētājiem labvēlīgu, jo laika apstākļi ražas izaudzēšanai bija labi. Varbūt ne visu ražu izdevās novākt, īpaši tos laukus, kuru kulšana iekavējās septembrī. Bet pieprasījums pēc graudiem bija liels un arī iepirkuma cenas augstākas nekā citus gadus. Satuvinājās pārtikas un lopbarības graudu cenas. Tas patika graudu audzētājiem, bet darīja rūpes graudu patērētājiem, īpaši lopkopības nozarē. Graudu kvalitāte, kas parasti ir galvenais kritērijs, realizējot graudus noteiktam izmantošanas mērķim, vairs nebija būtiskākais nosacījums veiksmīgai graudu pārdošanai (Zute S. Ziemas..., 2008.).

2008. gadā graudu raža bija laba visā pasaulē, tajā skaitā Eiropā. Ņemot vērā iepriekšējās ražas sezonas pieredzi, daudzi Eiropas zemnieki graudus pieturēja, cerot uz augstu cenu ziemā. Taču piedāvājums šobrīd ir pārāk liels, līdz ar to – cena nekāpj. Korekcijas veic arī globālā finanšu un ekonomikas krīze. Tātad – pieprasījums pēc graudiem mazinās (Tomsone I., 2009.).

2008. gada aprīlī cenas salīdzinājumā ar 2007. gada aprīli palielinājušās par 70%, savukārt, salīdzinot ar 2005. gadu tās pieaugušas par 184%. Lopbarības miežu vidējā cena 2008. gada aprīlī attiecībā pret 2007. gada aprīli un 2005. gada aprīli attiecīgi pieaugusi par 54% un 152%. 2008. gada cenu samazināšanos maijā un jūnijā var skaidrot ar 2007./2008. tirdzniecības gada beigām, kad pirms jaunās ražas tiek pārdoti saglabājušies krājumi ar nolūku atbrīvot graudu noliktavas jaunajai ražai (ZM, 2009.).

Eksperti teic, ka saimnieku glabātavās Latvijā 2008. gadā ir vairāk nekā puse no 2008. gada ļoti bagātās ražas, kuru gan visos novados nevarēja novākt. Tā kā Latvijā ražojam vismaz divas reizes vairāk graudu, nekā vajadzīgs pašu patēriņam, tad graudu audzētāju naudas ienākumi lielā mērā ir atkarīgi no cenas pasaules tirgos. 2008. gadā mazāk nekā citus gadus Rīgas, Ventspils un Liepājas ostās kuģos krauj Latvijā audzēto labību, tomēr kopējais eksporta daudzums esot mazāks nekā agrāk. Atšķirībā no Rietumeiropas zemniekiem Latvija eksporta tirgū iesaistījās jau 2008. gada ražas vākšanas laikā un tāpēc esam ieguvēji. Ungārijā, Čehijā, Austrijā un Slovākijā labību jau pārdod intervencē. Iespējams, Latvijā cena tik zemu nekritīsies. Latvijas pārstrādes uzņēmumi krājumus visai sezonai parasti pērk rudenī, tāpēc esam atkarīgi no eksporta tirgiem. 2008. gada beigās pārtikas graudu cena ir, sākot no 80 latiem par tonnu. Pie šādas cenas ir apdraudēta daudzu saimniecību pastāvēšana. 2007. gada labās cenas radīja ilūziju, ka tās būs tādas pašas arī turpmāk. 2008. gada beigās lopbarības graudu tonnu varēja pārdot par 60-65 latiem. Tas ir daudz, daudz mazāk nekā labības audzēšanā ieguldītā nauda. Vēl jāņem vērā, ka saimnieku stāvokli pasliktina 2007. gada notikusī vieglprātīgā naudas aizņemšanās, tehnikas un iekārtu pirkšana līzingā. 2008. gadā parādus ir grūti atmaksāt, daudzām lielajām saimniecībām ir maksātnespējas pazīmes (Graudiņš U., 2008. g. 11. dec.).

Pēc autoru domām graudu cenas kritums miltu un maizes cenas neietekmē. Pēdējos mēnešos pasaules tirgos vērojamais graudu cenu kritums ļoti sāpīgi skar lauku saimniekus arī Latvijā. Maizes un miltu pircēji cenas kritumu nejutīs, jo produktu ražošanā izmanto 2007. gada rudenī par dārgu cenu pirktos graudus.

Tā kā 2008. gadā ražas novākšanas laikā graudu cenas bija vismaz par trešdaļu zemākas nekā 2007. gadā, tad pēc autoru domām lētākiem jābūt arī miltiem un to produktiem. Miltu tirgus eksperti teic, ka cena tiešām kritusies, tomēr mazāk nekā graudu cena. Proti, kviešu miltiem par 15-20, bet rudzu miltiem – par 25 procentiem. Milti patiešām ir lētāki, bet ir kāpušas citas izmaksas, tostarp maksa par elektrību, gāzi, darbinieku algas. Salīdzinot 2008. gada ražošanas izmaksas ar tām, kas būs 2009. gadā, maizes cena labākajā gadījumā paliks šā 2008. gada līmenī. Proti, maize varētu maksāt lētāk, ja miltu ražotāji pārdotu mums miltus, kas malti no 2008. gada beigās nopērkamajiem lētajiem graudiem. Graudu pārstrādātāji 2007. gada rudenī pirka graudus par dārgu cenu un negrib ciest zaudējumus. Varētu, protams, jaukt malšanā kopā dārgos graudus ar 2008. gada beigās nopērkamajiem graudiem, bet dzirnavniekiem tas noteikti rada neērtības, vajadzīga papildu naudas aizņemšanās bankā, bet procenti ir augsti (Graudiņš U., 2008. g. 11. dec.).

Konkrētas prognozes ZM savā ziņojumā neizsaka, vien norādot – graudu cenas šā 2008. gada pirmajā ceturksnī pieauga par 60% salīdzinājumā ar 2007. gada šādu pašu laika posmu, bet graudu pārstrādes produktu cenas kāpa par trešdaļu mazāk. Var pievienoties speciālistu viedoklim, ka miltu cena nav noteicošā, kas veicina maizes cenas kāpumu, noteicošās ir energoresursu cenas un darbaspēka izmaksas (Tomsone I., 2008.).

5. Saimniekošanas līmeņi
5. Levels of farm management

Lai arī Latvija ir relatīvi neliela valsts, tajā vienmēr novērojamas dažādu graudaugu diezgan lielas ražības līmeņu atšķirības. Līdz ar to zinātne pašreiz nespēj dot atbildi uz to, kāda būs konkrētā vidējā ražība, izmaksas un ražošanas pašizmaksa pie absolūti visiem ražošanas veidiem (Boruks A., Matisāns E., 1999.).

Vadoties no šī principa, darba izstrādes procesā tiek aplūkotas dažādas saimniekošanas līmeņu klases (Boruks A., Matisāns E., 1999.).

„ A ” – līmenis, ietver saimniecības, kas pielieto pilnu agrotehnisko pasākumu kompleksu, kas atbilst zemkopības sistēmā ietvertajiem norādījumiem, un izpilda darbus pareizajos agrotehniskajos termiņos. Šis līmenis atbilst tuvākajā laikā esošam progresīvam, perspektīvam saimniekošanas līmenim, kad darbi tiek veikti atbilstoši esošai ražošanas tehnoloģijai, augšņu mēslošana notiek atbilstoši ražām un tiek aprēķināta pilna amortizācija jaunas tehnikas iegādei un meliorācijai, kā arī atskaitījumi vispārējām ražošanas un saimniekošanas izmaksām (Boruks A., Matisāns E., 1999.).

„ B ” – līmenis dots saimniecībām, kuras pašreizējo finansiālo apstākļu dēļ spiestas pielietot esošo agrotehniku, ne vienmēr spēj veikt darbus optimālos termiņos, pielieto visas nepieciešamās minerālmēslu devas un ņem vērā vispārējās ražošanas un saimniecības izmaksas.

„ C ” – līmenis saimniecībām, kas pašreiz nespēj pildīt visas agrotehniskās prasības, bet veic visus darbus optimālajos termiņos un pielieto samazinātas minerālmēslu un pesticīdu devas.

„ D ” – saimniekošanas līmenis saimniecībām, kas nespēj pildīt visas agrotehniskās prasības optimālajos termiņos, izmantojot minimālās mēslošanas un pesticīdu devas.

Ņemot vērā vidējo graudaugu ražības līmeni Latvijā, pamatojoties uz LR Centrālās statistikas pārvaldes datiem, autori ir izveidojuši katram konkrētam saimniekošanas līmenim piemērotu ražību. Latvijas vidējais ražības līmenis ir pieņemts kā „B” saimniekošanas līmenis, attiecīgi ar lielāku ražību ir „A” līmenis un ar zemāku ražību „C” un pat „D” – līmenis. Vidēja ražība ziemas miežiem Latvijā laika posmā no 2004. gada līdz 2007. gadam ir 3.26 t/ha.

6. Ekonomisko rādītāju izvērtējums graudu ražošanā

6. Analysis of economic indicators in grain production

Ziemas kviešu ekonomisko rādītāju aprēķins tiks veikts ar šādiem nosacījumiem: tiks izmantots vidējais „B" saimniekošanas līmenis – saimniecībām, kuras pašreizējo finansiālo apstākļu dēļ spiestas pielietot esošo agrotehniku, ne vienmēr spēj veikt darbus optimālos termiņos, taču pielieto visas nepieciešamās minerālmēslu devas, un veic vispārējās ražošanas un saimniecības izmaksas.

Galvenokārt šo izvēli pamatojam ar vidējo graudu ražības līmeni Latvijā. Paredzamā ziemas kviešu ražība saimniekošanas līmenim „A" vidējā ražība 5.42 t/ha, saimniekošanas līmenim „B" vidējā ražība 4.42 t/ha, saimniekošanas līmenim „C" vidējā ražība 3.42 t/ha un saimniekošanas līmenim „D" vidējā ražība 2.42 t/ha.

Ziemas kviešu ražošanas datu analīze uz vienu hektāru: norāda, ka pie straujā izejmateriālu cenu kāpuma 2008. gadā, kopējās izmaksas arī ir augstas (skat. 3. tab.). Puse no kopējām izmaksām ziemas kviešu ražošanā ir izejmateriāli, galvenokārt minerālmēsli un augu aizsardzības līdzekļi.

Ziemas kviešu ražošanas datu aprēķini uz vienu hektāru norāda, ka 2008. gadā kopējie ieņēmumi nepārsniedz izmaksas (skat. 3. tab.).

Kopējie ieņēmumi saimniekošanas līmeņos mainās pēc iegūtās vidējās ražas uz vienu hektāru. Kopējo ieņēmumu aprēķini ir veikti pamatojoties uz 2008. gada vidējās iepirkuma cenas Latvijā, kas ir 105 Ls/t, pie nosacījuma, ka saimniecībām ir izdevies izaudzēt kvalitatīvus pārtikas ziemas kviešus. Atbalsta maksājumi uz vienu hektāru sastāda 103.27 Ls, tai skaitā vienotais maksājums, papildus valsts tiešais maksājums, atdalītais papildus valsts tiešais maksājums un agrovides pasākumi. Pārējos ieņēmumus saimniecības iegūst, sniedzot pakalpojumus, kas neattiecas uz tiešo lauksaimniecības ražošanu.

Ziemas kviešu pašizmaksas aprēķins norāda uz to, ka saimniecības, kuras ar ieguldītajiem līdzekļiem spējušas izaudzēt lielāku ražu, ir spējušas samazināt arī saražoto ziemas kviešu vienas tonnas pašizmaksu (skat. 3. tab.).

Peļņas vai zaudējumu aprēķins visiem saimniekošanas līmeņiem uz vienu hektāru ir negatīvs, pie nosacījuma, ka saimniecībai ir izdevies izaudzēt un novākt kvalitatīvus pārtikas ziemas kviešus (skat. 3. tab.).

Viena hektāra apstrādājamās platības zaudējumi ir būtiski, jo ražošanas procesā gan papildus iegūtie līdzekļi, gan subsīdijas nespēj nosegt ražošanas izmaksas, līdz ar to radot zaudējumus augstākām ražām 70 Ls un zemākām ražām 170 Ls, pie dotās šādas ražības uz viena ha un graudu iepirkuma cenas.

Apgrozījuma rentabilitāte raksturo pārdošanas ienesīgumu. Pēc šī rādītāja var spriest par to, kādu peļņu dod katra neto apgrozījuma vienības lats (skat. 3. tab.).

Ziemas miežu ekonomisko rādītāju aprēķins tiks veikts ar šādiem nosacījumiem: tiks izmantots vidējais „B" saimniekošanas līmenis – saimniecības, kuras pašreizējo finansiālo apstākļu dēļ spiestas pielietot esošo agrotehniku, ne vienmēr spēj veikt darbus optimālos termiņos, taču pielieto visas nepieciešamās minerālmēslu devas, un veic vispārējās ražošanas un saimniecības izmaksas.

Galvenokārt šo izvēli pamatojam ar vidējo graudu ražības līmeni Latvijā. Paredzamā ziemas miežu ražība saimniekošanas līmenim „A" vidējā ražība 4.26 t/ha, saimniekošanas līmenim „B" vidējā ražība 3.26 t/ha, saimniekošanas līmenim „C" vidējā ražība 2.26 t/ha un saimniekošanas līmenim „D" vidējā ražība 1.26 t/ha.

Ziemas miežu ražošanas datu aprēķini norāda, ka straujais izejmateriālu cenu kāpums 2008. gadā, ir radījis augstas izmaksas (skat. 4. tab.).

Puse no kopējām izmaksām ziemas miežu ražošanā ir izejmateriāli, galvenokārt minerālmēsli sēkla un augu aizsardzības līdzekļi. Ziemas miežu audzēšanas tehnoloģija ir ļoti līdzīga ziemas kviešu audzēšanas tehnoloģijai.

Aprēķini norāda, ka 2008. gadā kopējie ieņēmumi saimniekošanas līmenim „A" ir 445.98 Ls/ha, saimniekošanas līmenim „B" ir 369.48 Ls/ha, saimniekošanas līmenim „C" ir 292.98 Ls/ha un saimniekošanas līmenim „D" ir 216.48 Ls/ha.

Kopējie ieņēmumi saimniekošanas līmeņos mainās pēc iegūtās vidējās ražas uz vienu hektāru. Kopējo ieņēmumu aprēķini ir veikti pamatojoties uz 2008. gada vidējās iepirkuma cenas Latvijā, kas ir 76.5 Ls/t, pie nosacījuma, ka saimniecībām ir izdevies izaudzēt kvalitatīvus alus ziemas miežus. Atbalsta maksājumi uz vienu hektāru ir 103.27 Ls, tai skaitā vienotais maksājums, papildus valsts tiešais maksājums, atdalītais papildus valsts tiešais maksājums un agrovides pasākumi. Pārējos ieņēmumus saimniecības iegūst, sniedzot pakalpojumus, kas neattiecas uz tiešo lauksaimniecības ražošanu. Kopējo ieņēmumu līmeni ziemas miežiem skatīt 4. tabulā.

Pašizmaksas aprēķins norāda, ka saimniecības, kuras ar ieguldītajiem līdzekļiem spējušas izaudzēt lielāku ražu, ir spējušas samazināt arī saražoto ziemas miežu vienas tonnas pašizmaksu. Salīdzinot saimniekošanas līmeņus autori secina, ka ziemas miežu pašizmaksa skatāma 4. tabulā.

Peļņas vai zaudējumu aprēķins visiem saimniekošanas līmeņiem uz vienu hektāru ir negatīvs, pie nosacījuma, ka saimniecībai ir izdevies izaudzēt un novākt kvalitatīvus pārtikas ziemas kviešus. Visiem saimniekošanas līmeņiem, apstrādājot vienu hektāru ziemas kviešu saimniecības ar lielāku ražību radās mazāki zaudējumi (skat. 4. tab.).

Viena hektāra apstrādājamās platības zaudējumi ir būtiski, jo ražošanas procesā gan papildus iegūtie līdzekļi, gan subsīdijas nespēj nosegt ražošanas izmaksas, līdz ar to radot zaudējumus augstākām ražām 115 Ls un zemākām ražām 211 Ls, pie šādas ražības uz viena ha un graudu iepirkuma cenas.

3. tabula/Table 3

Ekonomiskie rādītāji ziemas kviešiem visiem saimniekošanas līmeņiem
Economic indicators of winter wheat for all levels of farm management

Ekonomiskie rādītāji Economic indicators	Ražība, t/ha / Yield, t/ha			
	5.42	4.42	3.42	2.42
1. Kopējās izmaksas, LVL/ha / Total costs, LVL/ha	758.65	701.14	614.27	546.55
2. Kopējie ieņēmumi, LVL/ha / Total revenues, LVL/ha	689.19	584.19	479.19	374.19
3. Pašizmaksa, LVL/t / Prime cost, LVL/t	139.97	158.63	179.61	225.85
4. Peļņa vai zaudējumi, LVL/ha / Profit or loss, LVL/ha	-69.45	-116.94	-135.08	-172.35
5. Apgrozījuma rentabilitāte, % / Turnover profitability, %	-33	-51	-71	-115

Avots: autoru veidots pēc LTVC datiem, 2009.
Source: made by the authors according to the data of the AMPC, 2009

4. tabula/Table 4

Ekonomiskie rādītāji ziemas miežiem visiem saimniekošanas līmeņiem
Economic indicators of winter barley for all levels of farm management

Ekonomiskie rādītāji Economic indicators	Ražība, t/ha / Yield, t/ha			
	4.26	3.26	2.26	1.26
1. Kopējās izmaksas, LVL/ha / Total costs, LVL/ha	561.64	529.01	473.55	427.44
2. Kopējie ieņēmumi, LVL/ha / Total revenues, LVL/ha	445.98	369.48	292.98	216.48
3. Pašizmaksa, LVL/t / Prime cost, LVL/t	131.84	162.27	209.53	339.24
4. Peļņa vai zaudējumi, LVL/ha / Profit or loss, LVL/ha	-115.66	-159.53	-180.57	-210.96
5. Apgrozījuma rentabilitāte, % / Turnover profitability, %	-72	-112	-174	-343

Avots: autoru veidots pēc LTVC datiem, 2009.
Source: made by the authors according to the data of the AMPC, 2009

Apgrozījuma rentabilitāti raksturo pārdošanas ienesīgums. Salīdzinot saimniekošanas līmeņus autori secina, ka ziemas miežu rentabilitāte ir negatīva (skat. 4. tab.). Nevienam no saimniekošanas līmeņiem nav izdevies iegūt pozitīvu rentabilitāti pie šādas ražas uz vienu hektāru.

Rentabilitātes paaugstināšanai (4. tab.) nepieciešams izvērtēt izejmateriālu un darbaspēka nepieciešamību. Ražošanas rādītāju pašizmaksas samazināšanai, nepieciešams vērst uzmanību ne tikai uz izejmateriālu izmaksu samazināšanu, bet arī tehnikas ražības paaugstināšanu, kā arī uz apstrādājamo platību:

- visiem saimniekošanas līmeņiem nepieciešams izvērtēt minerālmēslu attiecību starp kūltūraugam nepieciešamo un augsnē esošo minerālmēslu daudzumu;
- minerālmēslu cenu kāpums, pie visiem saimniekošanas līmeņiem liek meklēt alternatīvos mēslošanas līdzekļus;
- vairāku saimniecību kooperācija jaunas un jaudīgas tehnikas izmantošanā, kas samazinātu tehnikas amortizācijas izmaksas, kā arī palielinātu ražīgumu un novērstu novecojušās tehnikas remonta izdevumus;
- augstās degvielas cenas visu līmeņu saimniecībās liek izvērtēt attālumus starp laukiem un saimniecību.

Secinājumi
Conclusions

1. 2008. gadā gandrīz trešdaļa no apsētajām platībām Latvijā ir ziemas kvieši (30%), tikai par 2% mazāk (28%) no visām platībām aizņem vasaras mieži. Savukārt vasaras kvieši, auzas un mistrs aizņem attiecīgi - 14%, 12% un 10% no kopējās apsētās graudu platības.
2. 2008. gadā graudaugu kopraža Latvijā bija 1 689 000 tonnu. 2007. gadā graudu kopraža Latvijā bija 1 535 000 tonnu, kas pateicoties klimatiskajiem apstākļiem, tehnoloģijas un ražošanas attīstībai bijusi augstākā pēdējos 17 gados.
3. Ziemāju graudu vidējā ražība palielinājusies no 3.59 tonnām no 1 ha 2007. gadā līdz

4.00 tonnām no hektāra 2008. gadā, tai skaitā ziemas kviešiem – no 3.78 tonnām līdz 4.35 tonnām.

4. Latvijas graudu audzētāji pilnībā var nodrošināt pašpatēriņam nepieciešamo graudu daudzumu, kas, pēc 2006./2007. gada datiem, veido aptuveni 1 milj. t graudu. Latvija laika posmā no 2006. gada līdz 2008. gadam nodrošina sevi ar nepieciešamo graudu daudzumu. 15% no Latvijas graudu kopražas tiek saražots virs pašnodrošinājuma, līdz ar to radot iespēju tos eksportēt.
5. Graudu ražošanas problēmas ir zemā ražība un iepirkuma cena. Vidējā ziemas kviešu ražība Latvijā laika posmā no 2004. gada līdz 2007. gadam ir 4.42 tonnas no hektāra. Vidējā ziemas miežu ražība Latvijā laika posmā no 2004. gadam līdz 2007. gadam ir 3.26 tonnas no hektāra
6. Ziemas miežu apgrozījuma rentabilitātes aprēķins atspoguļo to, ka paaugstinot apstrādājamo platību līdz 28.70 ha un paaugstinot vidējo ziemas miežu ražību par vienu tonnu, vidējās ziemas miežu ražības Latvijā iespējams izaudzēt rentablus ziemas kviešus.

Priekšlikumi
Proposals

1. Lai nodrošinātu bezzaudējumu punktu ziemas kviešu apgrozījuma rentabilitātei pie vidējās Latvijas ražības 4.42 t/ha saimniecībām jāapstrādā 28.70 ha lielā platībā.
2. Saimniecībām jāizaudzē ziemas kviešus par vienu tonnu vairāk nekā pie vidējā ražības līmeņa Latvijā, rentabilitāte paaugstināsies par 8%.
3. Lai nodrošinātu ziemas miežu pozitīvu apgrozījuma rentabilitāti saimniecībām ir jāpalielina apstrādājamo platību līdz 28.70 ha un jāpaaugstina vidējo ziemas miežu ražību par vienu tonnu līdz 4.26 t/ha robežai, kas ir lielāka par vidējo ziemas miežu ražību Latvijā.

Izmantotā literatūra
Bibliography

1. Boruks A. u.c. (1999) Graudi: daudzumi, izmaksas, cenas. Rīga: LLU Skrīveru zinātnes centrs, 202 lpp. ISBN 9984-19-082-x
2. Boruks A., Matisāns E., Noviks G., Viesturs D., Siliņš G. (1999) Zemkopības pamati Latgalē. Poligrāfists, 346 lpp. ISBN 9984-9408-0-2
3. Elste A. (2008) Ziņo par situāciju graudkopībā: Agropols, Nr.16, 2.lpp. ISSN 1407-8996
4. Graudiņš U. (2008) Graudu audzētāji nepadodas krīzei. Latvijas Avīze, Nr.338 (11.dec.), 13.lpp. ISSN 1691-1229
5. Graudiņš U. (2008) Pārbaudījums graudu audzētājiem: Latvijas Avīze Nr.241 (4.sept.), 14.lpp. ISSN 1691-1229
6. (28) Latvijas graudaugu iepirkuma cenas [tiešsaiste]: Lauksaimniecības tirgus veicināšanas centrs [skatīts 01.04.2009.]. Pieejams: http://www.ltvc.lv
7. Latvijas lauksaimniecība 2008. gadā: Īss statistisko datu krājums. Rīga: LR CSP, 2009., 36 lpp. ISBN 978-9984-06-364-5; ISSN 1407-0685
8. Latvijas vidējās izejvielu cenas iepirkuma cenas [tiešsaiste]: Lauksaimniecības tirgus veicināšanas centrs [skatīts 01.04.2009.]. Pieejams: http://www.ltvc.lv
9. Orupe A. (2008) Graudkopība iet plašumā. Cik ilgi? Nedēļa Nr.35/36 (25.aug.), 28.-30.lpp. ISSN 1691-1938
10. Par lauksaimniecības kultūru sējumu platībām, kopražu un vidējo ražību [tiešsaiste]: LR CSP [skatīts 01.04.2009.]. Pieejams: http://www.csb.gov.lv/csp/events/5568
11. Par lauksaimniecības kultūru sējumu platībām, kopražu un vidējo ražību [tiešsaiste]: CSP [skatīts 01.04.2009.]. Pieejams: http://www.csb.lv/csp/events/csp/events/9446
12. Tomsone I. (2008) Graudkopība - izmaksas aug, cenas krīt. Latvijas Avīze, Nr.220 (14.aug.), 15.lpp. ISSN 1691-1229
13. Tomsone I. (2009) Raža kompensē zemo cenu. Latvijas Avīze, Nr.48 (19.febr.), 11.lpp. ISSN 1691-1229
14. Par situāciju graudkopības nozarē: informatīvais ziņojums [tiešsaiste]: [skatīts 01.04.2009.]. Pieejams: http://www.zm.gov.lv
15. Zute S. (2008) Graudkopība ražotāju un zinātnieku skatījumā. Latvijas Avīze, Nr.37 (7.febr.), 16.lpp. ISSN 1691-1229
16. Zute S. (2009) Ziemas kviešu kvalitātes vērtējums. Agro Tops, Nr.2, 26.-28. lpp. ISSN 1407-5164

Variability of Cereals Yields in Poland in the Period of 1968-2008

Paweł Kobus, PhD, **Ludwik Wicki,** PhD
Faculty of Economics, Warsaw University of Life Sciences

Abstract. The research aim is to evaluate the variability of cereals production in Poland. The data from the official statistics of the Central Statistical Office for the period of 1968-2008 are used in the research. The analysis regards eight main cereal species cultivated in Poland.
The standard deviation and coefficient of variation were used to evaluate the variability. It was concluded that the yields of cereals in Poland display rather low variability. The analysis stresses an important conclusion that lower variability of yields is characterised for low-intensive cereals as rye, in comparison with higher variability for high-intensive cereals as wheat.
More precise estimation of cereals production variability can be achieved if the yields trends are taken into considerations in the analysis. Ignoring ascending yields trend can lead to the underestimation of predicted production level and overestimation of production variability.
For 2009 total harvest forecast is 25863.1 thousand tons with the standard deviation of 2058.1 thousand tons and the coefficient of variation of 8.0%.
Key words: cereals production, production risk, production variability, yield trend, Poland.

Introduction

Risk has always been a part of an agricultural activity; however farming has changed essentially over the past years. Today, it is an activity with new rules and new risks. Many factors are forcing the producers to make risky, but potentially profitable decisions regarding their businesses. These factors include an increased global competition, rapid changes in a structure of production agriculture, new technology, and more volatile weather patterns (USDA, 1997).

Agriculture production implies an expected outcome or yield. Deviations of outcomes from those which are expected pose risks to an ability to achieve goals. The major sources of production risks are: weather, pests, diseases, the interaction of technology, and other farm practices. Production risk together with price risk is common to all farmers, and incomes from agricultural production mostly depend on those two sources of risk (Wicka, 2009). Additionally, on farm level, the production risk sources can be divided as dependent and independent on farmers' decisions (Wicka, 2008).

Since Poland is a not an important world player in cereals production, it is impossible to reach the natural hedge between yield and price. The price-yield relationship, measured by the price-yield correlation, tends to be strongest in areas where yields are closely related to the world production and where the area's production normally accounts for a significant share of the world production (Dismukes, Coble, 2007).

The main causes of crop loss in cereals production are drought and heat, followed by the excessive moisture (USDA, 1997). Frost and freeze due to warmer winters observed in the past two decades in Poland have become less important factors. Drought in spring-summer period is the main reason of yield losses, and only sometimes (once during the past 20 years) followed by hard winter conditions (Krasowicz et al., 2009).

The selected risk management strategies are enterprise diversification, crop insurance, contract production, and new technologies (Harwood et al. 2000). The main stream of research deliberation is to answer the question how risky is the production of small grain crops (cereals). It is well known that diversification of production may include different crops or different types of the same crop (such a winter and spring wheat). It is necessary to know the degree of correlation between certain crop yield and yields of other crops as well as species characterised by higher and lower yield variability to achieve the benefits from crop structure diversification.

The research aim is to evaluate the variability of cereals production in Poland. The tasks set were threefold: 1) comparison of yields variability in two periods 1968-1991 and 1992-2008 (before and after the economy transition), 2) comparison of variability estimates: first assuming independency of observation and second assuming linear trend of yields; 3) prediction of cereals production in Poland and its variability.

Data and methods

The data used in the analysis are taken from the official statistics of the Central Statistical Office of Poland (CSO). The data on yields and production area were collected for the following cereals: winter wheat, spring wheat, winter barley, spring barley, rye, oat, winter triticale, spring triticale, and mixed grains. All data were collected for the period of 1968-2008.

The following measures of variability were used in the research: standard deviation and coefficient of variation.

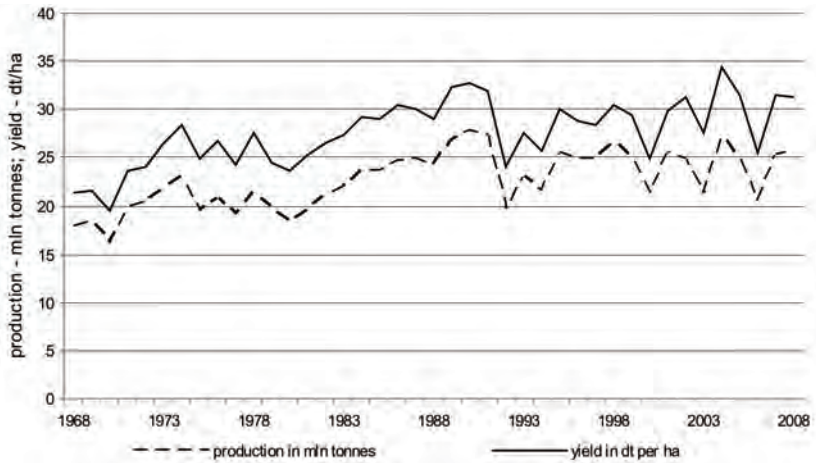
Table 1

Structure of area of cereals production in Poland in the period of 1968-2008

Species	Share of total area of cereals production (in percent)			Change between Period 1 and 2 (1968-1991=100)
	average in Period 1 (1968-1991)	average in Period 2 (1992-2008)	in 2008	
Winter wheat	19.2	22.4	23.5	117
Spring wheat	4.5	6.7	4.2	149
Winter barley	1.2	1.8	2.1	148
Spring barley	13.1	11.7	12.6	89
Rye	38.4	22.9	17.0	60
Oat	12.9	7.0	6.7	54
Winter triticale	–*	9.4	14.9	–
Spring triticale	–*	1.1	1.3	–
Mixed grains	9.3	17.0	17.6	183

* Triticale appears in production in 1986

Source: authors' calculations according to the CSO data of Poland



Source: authors' calculations according to the CSO data of Poland

Figure 1. **Cereals yield and production in Poland in the period of 1968-2008**

The paper includes assumptions that the production of cereals in Poland is developed on comparable environmental conditions (climate and soil) and the yields are subject of variability in the whole country. The results of performed analysis could thus represent the average variability of yields in Poland. In particular regions it could however diverge from the obtained results (Kobus 2009). One could expect that the obtained variability for the country might be lower than it is observed on a particular farm. Nonetheless the obtained prediction should be considered as accurate if the average values for the country were considered. The analysis of variability of yields of particular provinces could result in more precise prediction; however they required collection of additional data with long data series, which are difficult to be obtained due to the administrative reform of Poland.

Production of cereals in Poland

In 2008 the cereals in Poland were produced on the area of 8.2 million hectares, thus accounting for 74% in the structure of sowings. The production area varied from 7.7 to 8.7 million hectares in different years. Wheat and rye cover the biggest share in the sowing structure in the first period (1968-1990). A remarkable decrease of sowings of rye and oat was observed after the year 1991. Their share in sowings has decreased by 50%. The importance of winter wheat and mixed grains has risen up accordingly. It is estimated that significant changes in sowing area in Poland would not be observed in the near future (Grabiński, Podolska, 2009).

The production area of cereals has not changed in Poland significantly over the past 40 years. However, the yields have varied significantly, thus directly influencing the harvests. Figure 1 shows the yields and harvests of cereals in Poland for the period of 1968-2008. One could observe significant variations of yields in the analysed years. The level of production was strongly correlated with the yields. The experts forecast that the observed variability would not change in the coming years (Grabiński, Podolska, 2009). It is possible to cut down the variability of yields through introduction of new varieties, which are more resistant to stress conditions (Wicki, 2001). The average harvests of cereals in Poland

Table 2

Average yield of cereals in Poland in the period of 1968-2008

Species	Average yield in dt per 1 ha		Yield in 2008 in dt per 1 ha	Change between Period 1 and 2 (1968-1991=100)
	In Period 1 (1968-1991)	in Period 2 (1992-2008)		
Winter wheat	32.12	37.32	42.80	116
Spring wheat	28.16	29.29	29.10	104
Winter barley	32.02	34.71	40.00	108
Spring barley	29.08	28.91	28.30	99
Rye	23.31	23.12	24.70	99
Oat	24.68	23.49	22.90	95
Winter triticale	–	31.26	34.30	–
Spring triticale	–	25.46	24.00	–
Mixed grains	26.57	26.18	25.40	99

Source: authors' calculations according to the CSO data of Poland

vary from 22 to 27 million tones in the past decade. The production has grown continuously from 17 to 27 million tones in the first part of analysed period (1968-1990).

Domestic demand for grain has fluctuated for years in the range of 26-28 million tones. Cyclical fluctuations of pig stocks and growing poultry production are the main factors causing the changes in domestic level of grain consumption in specific marketing years. Demand for grain for human consumption has been stable and amounted to 5.7-5.8 million tones. The turnover of Polish foreign trade is influenced, first of all, by the size of domestic production and also by the prices on foreign markets. The net import or export, in the volume measure, was observed depending on the year.

Table 2 presents the yields of cereals in Poland in the period of 1968-2008. The average yields were not high and amounted to 26.2 dt/ha in the first period and 28.9 dt/ha accordingly in the second period. The highest yields were obtained in the production of winter wheat, winter barley and winter triticale. The lowest yields were noted in case of extensive cereals – rye and oat. The increase of yields was observed only for winter and spring wheat and winter barley. The average yields calculated for all cereals were almost stable, which resulted from different direction of trends of yields of particular species as well as from a rapid decrease of inputs at the early 1990s (the beginning of economy transition). The yields of spring cereals are lower by 4-6 dt/ha on average compared with winter cereals, which is often due to unfavourable weather conditions during spring.

Although the yields of cereals in Poland vary by regions many authors argue that this fact is connected with the differences in organisation of farms, and only partly due to the environmental conditions (Krasowicz, 2009). Thus it results from risk factors depending on a farmer, and has stable characteristics – not changing over the time or changing according to the trend.

Methods and results

One of the simplest ways of measuring crop variability is to use the unbiased standard deviation estimator (1):

$$S_x = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2} \qquad (1)$$

where:

S_x – estimator of the standard deviation σ_x of variable X,

$\bar{x}$ – sample mean,

n – sample size,

x_i – ith observation of variable X.

As a measure of variability the standard deviation is insensitive to the average value of yield. But for some applications it is better to use relative measure of variability - the coefficient of variation (2) with average as the reference point:

$$V_x = \frac{S_x}{\bar{x}} \qquad (2)$$

The coefficient of variation, contrary to the standard deviation, is expressed in percents of the average yield. For an example $S_x = 10$ dt for an average yield of 30 dt gives $V_x = 33\%$, while for an average yield of 70 dt it gives $V_x = 14\%$.

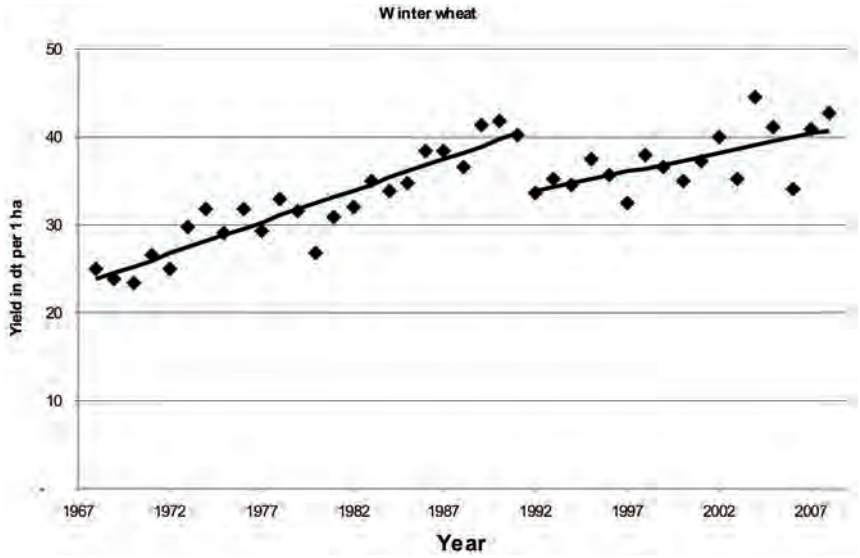
Values of standard deviations and coefficients of variation of cereals yields in Poland are presented in Table 3. The average yields for particular species are presented in Table 2, so it is possible to compare the calculated standard deviations with the average yield. The coefficient of variation for yield only in one case has exceeded 20%, and it has not exceeded 12% in the period of 1992-2008. It means that cereals yield

Table 3

Estimates of basic measures for cereals yield variability in Poland

Species	1968–1991		1992–2008	
	Standard deviation, dt	Coefficient of variation	Standard deviation, dt	Coefficient of variation
Winter wheat	5.51	17.2%	3.46	9.3%
Spring wheat	3.51	12.5%	3.09	10.5%
Winter barley	6.75	21.1%	3.94	11.4%
Spring barley	3.13	10.8%	3.23	11.2%
Rye	2.75	11.8%	2.27	9.8%
Oat	2.42	9.8%	2.77	11.8%
Winter triticale	-	-	2.79	8.9%
Spring triticale	-	-	3.04	11.9%
Mixed	3.81	14.3%	2.96	11.3%

Source: authors' calculations according to the CSO data of Poland



Source: authors' calculations according to the CSO data of Poland

Figure 2. **Winter wheat yield in the period of 1968-2008**

variability in Poland is low. The variability under 20% is considered as low (Harwood et al., 1999).

Standard deviations and coefficients of variation presented in Table 3 were calculated with the assumption that each observation of yield is independent. It is not necessarily true. A typical situation is rather that an ascending trend could be observed over the time (Figure 2).

This trend can be explained by the biological progress and technological advancement. In such cases measures of variability calculated without paying attention to the existing trend will be biased upward and suggest a higher variability than it is in reality. The amount of the bias is proportional to the strength of the trend. If a trend is week it can be treated as negligible but in case of a clear trend it should be taken into account. There are two issues to be addressed: the standard deviation and the expected value.

Let us define the trend as a function of time which explains the conditional expected value:

$$E(X \mid T = t) = f(t) \tag{3}$$

where:

t – time moment (t=0 for the year 1967),

$E(X \mid T = t)$ – expected yield in time moment t.

The function $f(t)$ could take any form but in short time series it is usually safe to use the simplest linear form:

$$f(t) = \beta_0 + \beta_1 t \tag{4}$$

The equation for calculation of the standard deviation estimator changes to:

$$S_x = \sqrt{\frac{1}{n-2}\sum_{t=1}^{n}(x_t - \hat{x}_{(t)})^2} \quad (5)$$

where:

x_t – observation of yield in time moment t.

$\hat{x}_{(t)}$ – estimate of $f(t)$.

The issue of expected value is more complicated. If measures which use the expected value or its estimate are thought of as indicators of production risk in the next year, i.e. in time moment $n+1$, the estimated trend function must be used for calculation of the $E(X \mid T = n+1)$ estimator instead of a simple average:

$$\hat{x}_{(n+1)} = \hat{\beta}_0 + \hat{\beta}_1(n+1) \quad (6)$$

where $\hat{\beta}_0$ and $\hat{\beta}_1$ are least squares estimators of β_0 and β_1.

Comparing estimates of the slope for two analysed periods it is evident that the average increases of yields are much lower in the second period. It is probably due to very high increase of production inputs, mainly fertilisers, and improvement of technology during the decades of the 1970s and 1980s. After a rapid decrease of inputs, again mainly fertilisers, gradual improvement of technology, e.g. plant protection has been observed at the beginning of the 1990s (economic transformation period). The rate of technology improvement and inputs increase depends on production profitability.

The comparison of Tables 3 and 5 confirms that a bigger reduction of standard deviation values after trend elimination is characteristic to cases with steeper trend lines. It suggests that when coefficient β is close to zero the approach to estimation of yield variation, which takes into consideration trend of yields would neither improve nor worsen the approach, which does not pay any attention to the possible trend of yields. The next part of the paper considers only the second time period, i.e. the years between 1992 and 2008.

The correlation matrix presented in Table 6 is calculated based on the residuals obtained separately

Table 4

Estimates of trends parameters

Species	1968–1991		1992–2008	
	Intercept	Slope	Intercept	Slope
Winter wheat	23.10	0.721	23.06	0.432
Spring wheat	23.55	0.369	22.67	0.201
Winter barley	21.03	0.879	23.76	0.332
Spring barley	24.85	0.339	21.45	0.226
Rye	19.74	0.286	19.70	0.104
Oat	21.64	0.243	20.67	0.086
Winter triticale	–	–	22.84	0.253
Spring triticale	–	–	22.26	0.097
Mixed	21.49	0.406	23.31	0.087

Source: authors' calculations according to the CSO data of Poland

Table 5

Estimates of basic measures for cereals yield variability in Poland, after trend elimination

Species	1968–1991		1992–2008	
	Standard deviation, dt	Coefficient of variation	Standard deviation, dt	Coefficient of variation
Winter wheat	2.14	6.7%	2.77	7.4%
Spring wheat	2.40	8.5%	3.01	10.3%
Winter barley	2.69	8.4%	3.69	10.6%
Spring barley	2.07	7.1%	3.12	10.8%
Rye	1.91	8.2%	2.28	9.9%
Oat	1.74	7.1%	2.83	12.0%
Winter triticale	–	–	2.56	8.2%
Spring triticale	–	–	3.10	12.2%
Mixed	2.56	9.6%	3.02	11.5%

Source: authors' calculations according to the CSO data of Poland

for each species by subtracting trend values from the observed yields. It may be observed that particularly high correlation coefficients are characteristic for species within groups of winter or spring crops, but are moderately lower between species from different groups.

To calculate the estimate of expected total harvest of all cereals in the year n+1 it is sufficient to sum products of area and predicted yields for individual cereals. The calculation of standard deviation estimate is much more complicated. Let us assume that yields of cereals follow multidimensional normal distribution:

$$X \sim N_9(\mu, \Sigma) \quad (7)$$

where:

X – vector of individual cereals yields,

μ – vector of individual cereals expected yields,

Σ – covariance matrix of individual cereals yields.

In that case total harvest of cereals can be regarded as linear function of individual cereals yields multiplied by area:

$$Y = \mathbf{a}X \quad (8)$$

where:

$\mathbf{a}$ – vector of individual cereals areas.

Linear function of multidimensional normal distribution follows one dimensional normal distribution:

$$Y \sim N(\mathbf{a}\mu, \mathbf{a}\Sigma\mathbf{a}^{\mathrm{T}}) \quad (9)$$

In consequence the estimate of total harvest standard deviation in the year n+1 follows the equation:

$$S_Y = \sqrt{a\hat{\Sigma}a^T} \quad (10)$$

where:

$\hat{\Sigma}$ – estimate of covariance matrix of individual cereals yields.

For example: total harvest prediction for the year 2009 is 25863.1 thousand tons, standard deviation – 2058.1 thousand tons and coefficient of variation is 8.0%.

Table 6

Estimate of correlation matrix for cereals yields in Poland, after trend elimination

Species	Winter wheat	Spring wheat	Winter barley	Spring barley	Rye	Oat	Winter triticale	Spring triticale	Mixed
Winter wheat	1.000	0.605	0.709	0.577	0.797	0.546	0.840	0.560	0.534
Spring wheat	0.605	1.000	0.343	0.984	0.876	0.976	0.826	0.975	0.972
Winter barley	0.709	0.343	1.000	0.349	0.641	0.376	0.724	0.394	0.396
Spring barley	0.577	0.984	0.349	1.000	0.869	0.983	0.819	0.980	0.976
Rye	0.797	0.876	0.641	0.869	1.000	0.875	0.940	0.877	0.875
Oat	0.546	0.976	0.376	0.983	0.875	1.000	0.830	0.979	0.991
Winter triticale	0.840	0.826	0.724	0.819	0.940	0.830	1.000	0.838	0.838
Spring triticale	0.560	0.975	0.394	0.980	0.877	0.979	0.838	1.000	0.985
Mixed	0.534	0.972	0.396	0.976	0.875	0.991	0.838	0.985	1.000

Source: authors' calculations according to the CSO data of Poland

Table 7

Prediction of yields and production in the year 2009

Species	Yield, dt/ha	Area, thou. ha	Crop, thou. t	St. dev, thou. t	Coefficient of variation
Winter wheat	41.21	1933.0	7966.6	535.1	6.7%
Spring wheat	31.10	345.0	1072.9	103.9	9.7%
Winter barley	37.69	175.8	662.7	64.9	9.8%
Spring barley	30.95	1030.7	3189.9	321.6	10.1%
Rye	24.05	1396.5	3358.8	318.8	9.5%
Oat	24.26	550.6	1336.0	155.8	11.7%
Winter triticale	33.46	1224.8	4098.0	313.3	7.6%
Spring triticale	26.32	108.7	286.1	33.7	11.8%
Mixed	26.95	1444.0	3892.2	436.3	11.2%

Source: authors' calculations according to the CSO data of Poland

If one would calculate estimates for total harvest without paying attention to the existing yields trends and correlation of yields it would lead to the underestimation of expected yield (24224.1 thousand tons) and overestimation of standard deviation (2448.4 thousand tons), and consequently to much higher coefficient of variation (10.1%).

Conclusions

Comparing simply variability of cereals yields in the first (1968-1991) and the second (1992-2008) period one can observe much higher variability in the first period than in the second one. For example, the variation coefficient for individual species ranges between 9.8% and 21.1%; while in the second period it ranges between 8.9% and 11.9% (Table 3). However, such observation is an excessive simplification. The observed higher variability results from much steeper trends in the first period. The comparison of variability after the trend elimination suggests rather opposite conclusion, i.e. in the first period variability of yields was lower than in the second period. The variation coefficient for individual crops takes value from 6.7% to 9.6% for the first period; while for the second period it is between 7.4% and 12.2% (Table 5).

Among analysed cereals the winter barley is characterised with the highest variability of yields (measured by standard deviation). In the first period it amounted to 6.75 dt/ha, while in the second period – to 3.94 dt/ha. High variability of yields was also observed for winter and spring wheat, and low for rye. The important conclusion derived from the performed analysis stresses that low variability of yields is characteristic for low-intensive cereals as rye compared with high – intensive cereals as wheat.

It might mean that intensive production by more advanced technology is more sensitive to the weather conditions. Thus, the reason of yield variability could be seen in the falls of production technology, which are more visible on the unfavourable weather conditions such as drought, intensive rains, etc.

Some conclusions with regard to the utility of the method of variability measure can be made on the basis of this research:

- more precise estimation of cereals production variability can be produced if the yields trends are taken into consideration;
- ignoring yields trend (if ascending) can lead to the underestimation of predicted production level and overestimation of production variability;
- it is essential to consider correlations between particular species yields in prediction of total cereals harvests variability. It allows predicting the current area of particular cereals production.

Bibliography

1. Dismukes R., Coble K. (2007) *Managing Risk with Revenue Insurance*. Volume 5, special issue, Economic Research Service, USDA. Washington DC. pp. 6-11.
2. Grabiński J., Podolska G. (2009) Stan aktualny i perspektywy zmian w produkcji zbóż w Polsce In: *Kierunki zmian w produkcji roślinnej w Polsce do roku 2020.* Studia i raporty IUNG – PIB nr 14. IUNG Puławy. pp. 55-70.
3. Harwood J. et al. (2000) Farmers Sharpen Tools to Confront Business Risks. *Agricultural Outlook Reprint*. February 2000. ERS USDA. pp. 1-5.
4. Kobus P. (2009) Wheat Yields Variability in Poland at NUTS 2 Level in the Context of Production Risk. Scientific Journal Warsaw University of Life Sciences - SGGW. *Problems of World Agriculture*. 2008, Vol. 6 (21), pp. 32-39.
5. Kopiński J.(2006) Zróżnicowanie nawożenia jako miara intensywności produkcji roślinnej w regionach. *Wieś Jutra*, 2006, 6 (95), pp. 15-17.
6. Krasowicz S. (2009) Regionalne zróżnicowanie zmian w rolnictwie polskim. in: *Wybrane elementy regionalnego zróżnicowania rolnictwa w Polsce*. Studia i raporty IUNG – PIB nr 15. IUNG Puławy, pp. 9-36.
7. Krasowicz S., Stuczyński T., Doroszewski A. (2009) Produkcja roślinna w Polsce na tle warunków przyrodniczych i ekonomiczno-organizacyjnych. In: *Kierunki zmian w produkcji roślinnej w Polsce do roku 2020*. Studia i raporty IUNG – PIB nr 14. IUNG Puławy, pp. 27-54.
8. USDA (1997) Introduction to Risk Management. USDA, December 1997. pp. 6-8.
9. Wicka A. (2008) Ubezpieczenia rolnicze źródłem osiągania przewagi konkurencyjnej gospodarstw rolnych.. *Roczniki Naukowe SERIA*. t X, z.1, pp. 438-443.
10. Wicka A. (2009) Znaczenie instytucji ubezpieczeniowych w agrobiznesie (Role of Insurance Institutions in Agribusiness). *Roczniki Naukowe SERIA*. t XI, z.5, pp. 333-338.
11. Wicki L. (2001) Postęp biologiczny w produkcji roślinnej – znaczenie, tempo, formy kreowania i upowszechniania. In: *Procesy dostosowawcze produkcji roślinnej w Polsce w kontekście integracji z Unią Europejską*. SGGW Warszawa 2001, pp. 118-142.

Milk Price Distribution and Factors in Value Adding Chain

Agnese Krieviņa, PhD student, Latvia University of Agriculture;
assistant researcher, economist, Latvian State Institute of Agrarian Economics

Abstract. The paper deals with establishing of the main milk price factors and the evaluation of distribution of the milk price among the actors of Latvian dairy supply chain. The evaluation of distribution of milk price is based upon the calculation of margins. The analysis of development of the margins shows the increasing bargaining power of retailers, in contrast to small bargaining power of farmers in relation to processors, especially at the time of falling prices and demand by the market. The available data indicate on reasons for concern both for liquid milk and cheese in terms of sharing the value added because the margins have shown a great fluctuation. Considering the main factors affecting the price, generally more concentrated farms is one of the preconditions for receiving higher price and better conditions for delivered milk. Concentration and vertical integration are also instruments that can help improve the sustainability of the supply chain and increase the value added that is achieved by higher entrepreneurial efficiency at each value adding stage.
Key words: the value added, dairy sector, the supply chain, milk price, margins.

Introduction

Dairy sector is one of the main agri-food sectors in Latvia, accounting for almost ¼ of total agricultural goods output and 20% of total output in food industry (EAA, CSB of Latvia, 2009).

Currently both the primary milk production and processing sectors are characterised by low value added per employee in Latvia compared with other European Union (EU) countries. The value added per employee in the primary sector in Latvia in 2007 was 3.7 times below the level observed in the EU on average (FADN, 2009). The value added created per employee in Latvian dairy processing sector lags behind the EU-15 average indicator almost 4.5 times (Eurostat, 2009).

The value added, i.e. the additional value created is determined by price (also product subsidies), production volume, and intermediate consumption of goods and services used in the production process. It is the amount of money that can be used for compensation of the labour force (and other owners of the production factors) and for further modernisation and development of the sector. To ensure the competitiveness of each stage of the supply chain that determines competitiveness of the whole supply chain, the price as the main instrument linking various markets should be efficiently distributed among the actors of the supply chain. Both producers of raw milk and processors (also retailers) have to compete in terms of labour force by providing competitive salaries, and the whole chain has to compete on the market by delivering competitive products that can be fostered by available money for new investments in the development.

Recent developments in dairy sector with the sharp increase in milk farm-gate prices followed by considerable decline contrary to small decrease in consumer prices have indicated on malfunction in the supply chain regarding sharing the value added along the sector. The efficient sharing of price is not only the precondition for sustainability of the supply chain, it could also help increase the value added that is achieved by higher entrepreneurial efficiency at each value adding stage.

It has been defined at the Community level that ensuring the supply chain, which is well functioning should remain a key priority of the EU, in order to protect both consumers, with lower food prices and actors along the chain, through value added growth across sectors and sustainable sharing of profits (EC, 2009).

The **research aim** is to reveal the main factors determining milk price received and to evaluate the distribution of milk price among the actors of Latvian dairy supply chain.

The following tasks were set to achieve the research aim: 1) to explore the structure of Latvian dairy supply chain; 2) to analyse the relationships between raw milk producers – processors, with the view of establishing the main factors affecting farm-gate price in Latvia; and 3) to calculate and evaluate the development of margins of each value adding sector along the supply chain in Latvia as well as to compare the results with other EU countries.

The evaluation of distribution of milk price is based upon the calculation of margins. The calculation of margin indicates the share of retail price going to each sector along the supply chain: farmer, processing and retail trade as well as government taxes (Niemi, Jansik, 2006). The concept of marketing margin was developed to measure the gap between producer prices and the prices paid by the consumer, and it represents the costs for all assembling, processing, transporting, marketing and retailing added to the farm products as well valuations for risk and expectations on how markets will evolve (Agra CEAS Consulting, 2007). The calculated margins are gross margins that correspond to the output prices minus the costs of agricultural (farm-fate prices) and food (ex-factory prices) inputs; therefore an increase in margins does not necessarily imply an increase in the value added and profit.

These margins have been examined on many occasions, often in response to concern at a time of sharp movements in farm-gate or retail prices (Niemi, Jansik, 2006).

To make the comparison of margins with the main milk producing countries in the EU, the data were available for the United Kingdom (UK) and France.

Methods of statistical analysis and logically constructive analysis were employed in data analysis. The interviews of the sector experts were also carried out during October-December, 2009.

The conversion factors in margin calculation were used as suggested by Agra CEAS Consulting methodology (Agra CEAS Consulting, 2007). The margins can be expressed both in absolute and relative terms.

The paper has been supported by the European Social Fund within the project "Support for the Implementation of Doctoral Studies at Latvia University of Agriculture" (sub-activity 1.1.2.1.2. Support for the Implementation of Doctoral Studies), Agreement No. 2009/0180/1DP/1.1.2.1.2/09/IPIA/VIAA/017, Contract No. 04.4-08/EF2.D2.03.

Results and discussion

1. Latvian dairy supply chain structure

Milk production structure can be considered very fragmented in Latvia. According to the data of the Central Statistical Bureau of Latvia, in 2008 there were 35.5 thousand farms with dairy cows that produced 832.1 thousand tonnes of milk, i.e. 23.5 tonnes per farm. The share of farms with 1-2 dairy cows constituted 71.8% of all dairy farms and they concentrated 18.9% of all dairy cows. About 1/3 of these farms are not market participants, since only 51.9% of all dairy farms in Latvia have milk quota.

The data from the Agricultural Data Centre show that the average quota per farm was 40.4 tonnes of milk in the quota year 2008/2009. According to the traded volumes of milk, only 1.1% of all farms have the annual milk deliveries above 500 tonnes (~30% of total marketed milk).

There are 30 milk producer cooperatives in the sector, which collect about 1/3 of milk delivered (LLKA, 2009). Only about 15% of all dairy farms are the members of milk producer cooperatives in Latvia. The average milk delivery volumes per cooperative constituted 7.0 thousand tonnes in the quota year 2008/2009, though the sector is dominated by 2 large cooperatives, which collect almost half of total milk intake by the cooperatives. The milk collected by the cooperatives is mainly exported to Lithuanian dairy industry.

Two thirds of milk is delivered directly to milk processing companies. The total milk intake by Latvian cooperatives and dairies was 633.8 thousand tonnes in 2008. According to the latest figures, there are 49 dairies in Latvia, though only 30 of them purchased milk in the quota year 2008/2009 (LLKA, 2009). About 70% of total milk intake is concentrated by 5 largest milk processing companies. Dairy industry is fragmented in Latvia as compared with other EU countries and also neighbouring country Lithuania. Though, the concentration of industry is larger than at the raw milk production stage.

There are about 1 973 retailers operating in non-specialised retail store with the predominance of food sector in Latvia, though the two biggest retail chains account for almost half of total retail sales (Pančenko et al., 2008). The share of 10 biggest retailers is about 64%. The tendency has been towards higher concentration in the sector in recent years. The share of 4 largest retailers is 76% if considering the concentration of supermarkets. Consequently the dairy industry faces more concentrated retail sector. The positions of industry are also weakened relative to retail sector due to low specialisation.

The agricultural sector, which is more fragmented, less organised and with non-differentiated products, is often perceived as facing an unbalanced bargaining power against the rest of the chain, although the development of producer groups can improve the situation (EC, 2009). The market structure in Latvia generally indicates on large bargaining power of retailers and small power of farmers, although the development of cooperation that could be observed since 2004 has significantly improved the situation in relation to farm sector concentration and bargaining power.

2. Relationship in the supply chain - pricing systems and factors

Milk contracts with the most important element – milk price – is the main medium by which the milk processors and producers communicate to each other. It could be fully agreed with the UK Milk Development Council point of view that milk contracts should be negotiated on partnership basis between farmers and processors with both sides recognising they need the other to be profitable and efficient. Processors need farmers not only to be efficient, but also profitable that in turn is basis for sustaining long-term efficiency. Farmers also need processors to be efficient and profitable that allows receiving higher milk price and sustaining a long-term competitiveness of the supply chain.

According to the Council, the most important items in milk contracts for farmers is a stable and/or predictable price, if it is not possible – clear factors affecting their milk price, security and frequency of payment, a milk price that allows them to invest sustainably in their business, period of contract (security of having milk picked up), clear contract (understanding what processors want), and sufficient notice of changes.

The most important contract items for processors include: obtaining a secure supply of milk (both short and long-term), obtaining a supply of milk that matches their needs (quality, profile, volume, flexibility), obtaining supply of milk at a competitive price, business minded farmers that will meet all necessary standards, and that they can work with (Milk Development Council, 2005).

According to the information provided by the sector experts, contracts between farmers and processors are mainly signed for each quota year in Latvia. In some cases, the practice is also that

contracts cover a shorter period of time. At the same time the agreements of unlimited duration can also be found in the sector. Processor pledges to collect milk from the farmer in the period.

Open-end contracts, contracts for a year with an automatic prolongation as well as contracts covering a shorter period of time are widespread practice that regulates relationships between farmers and cooperatives in Latvia.

The contract envisages the main principles of pricing, but the updated price adjustment protocols are usually used to set the level of milk price during collaboration period. The endurance of protocols is undefined (replaced by the next updated protocol).

Many authors agree that generally the price a farmer receives for milk should be directly related to the reward that can be gained from the market (e.g., Milk Development Council, 2005; Shalloo, Dillon, 2006; Breen et al., 2003). The primary objective of any milk pricing scheme should be that the price paid for milk reflects as accurately as possible the amount and value of products that can be made from it as well as the transport and processing costs incurred (Breen et al., 2003).

In practice there are different milk pricing systems and schemes that processors use trying to achieve their business objectives.

By summarising the applied milk pricing systems in Latvia, the main factors that affect milk price received by farmers are as follows: the development of milk market that reflects the price ceiling processors can pay per a definite standardised milk kg; bonuses or deductions for milk that is above or below the set standard milk in terms of milk constituents and quality (bacteria and somatic cell count); transport costs that already include delivered volume factor, or transport costs and delivery volume as separate factors; and also operational costs for cooperative administration.

The stimuli used by each processor differ. Some processors do not provide bonuses for milk that is above the quality standards set by the national legislation. Sometimes it is not economically approvable to pay in addition for extra quality due to small volumes of such milk, which do not provide critical mass for reasonable processing.

There are varied ways how processors and cooperatives incorporate transport costs in milk price in Latvia: equal transport costs per kg of milk deducted for all farms; transport costs incurred till the full milk truck shared among the supplying farms; fixed rates per kg of milk depending on the milk collection routes (higher rate for routes serving small farms); equal fixed costs per collection time etc. The share of transport costs covered by farmers also differs among the processors.

There are different payment periods for delivered milk applied in the sector, assumingly with the most widespread being payments made twice a month. It is known that the payment period is also used to reward farmers according to the delivery volumes and distance in order to stimulate more efficient milk collection network (shorter payment period for near-by farms with large delivery volumes). At the same time it has also been suggested that in the case of small farms some processors are taking advantage of the fragmented production structure as they can stipulate very low price.

Evidence of some cases show that sometimes farmers can be rewarded for dedicated milk supply.

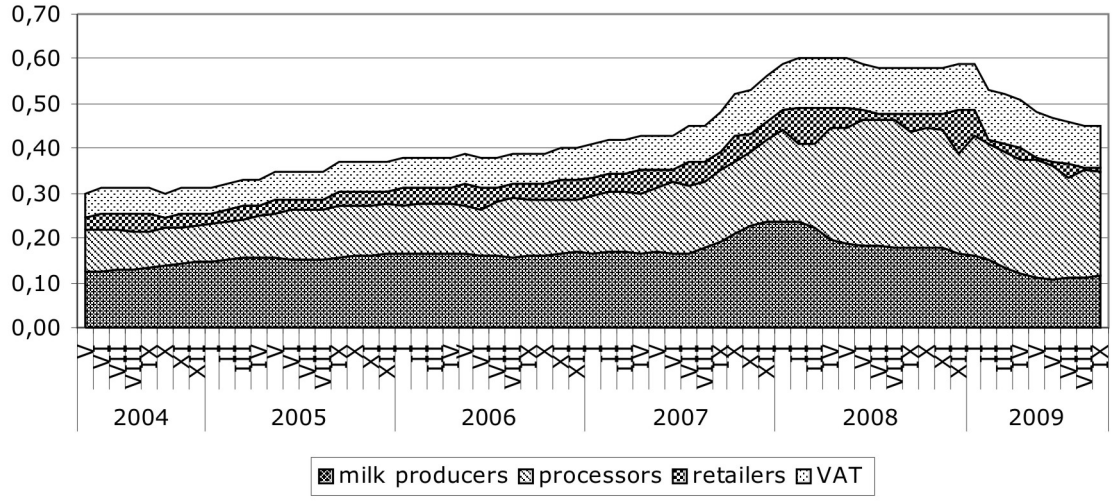
Despite application of certain pricing system, the setting of price levels is determined also by subjective factors that include bargaining power of farmers. The relative bargaining power can be expressed already on the standard price level offered to all dairy farmers and also on the individual farm/supplier level.

Considering the main factors affecting the price, generally more concentrated farms are one of the preconditions for receiving higher price and better conditions for delivered milk, and consequently for increasing the value added generated by the sector. But it has to be noted that there is a room for improvement of pricing systems in Latvia so that they better reflect the actual gains from the market. It would improve the efficiency and the value added generated by the industry and sustainability of the whole supply chain.

3. Prices and margins in the dairy supply chain

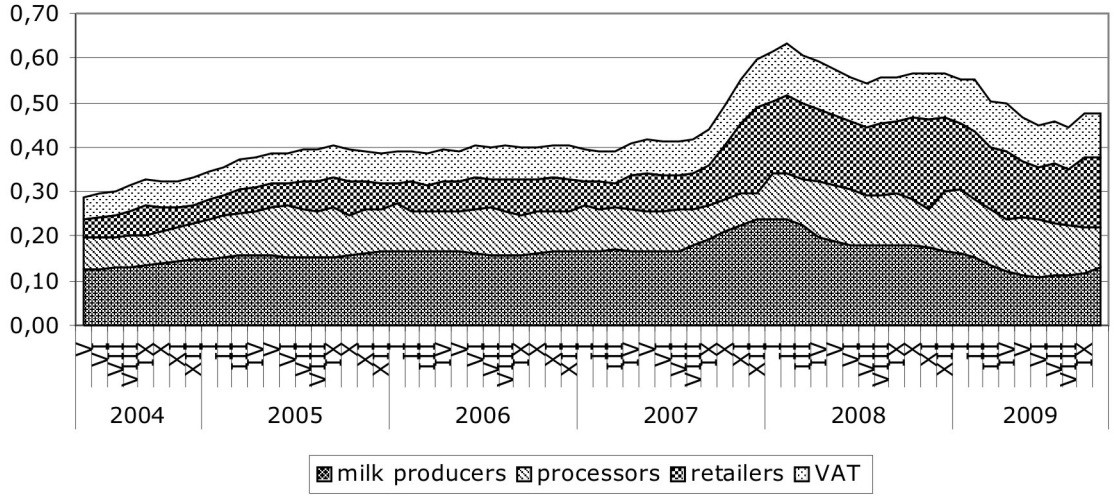
Raw milk prices have experienced dramatic changes in Latvia after joining the EU in May, 2004. Contrary to the average decline that could be observed in the EU in line with the dairy market reform, the average raw milk price in Latvia increased significantly. Considering that milk prices in Latvia were among the lowest in the EU at the time of the accession, the rise in prices was part of the price convergence process. Due to the coincidence of such factors as drop in production in the most important milk production regions coupled with growing demand for dairy products in the developing countries, world milk prices surged in 2007. The EU and Latvian milk prices followed the world milk prices: the considerable rise of Latvian milk prices started in August, 2007, and by the end of the year the prices had increased by 42%. After a spike, milk prices have been falling both in the EU and Latvia, and the average milk price in Latvia has returned to the pre-accession level. The considerable decline of milk prices on the world markets was connected with the increase in milk supply combined with drop in demand caused by worsening of the economic situation. As world dairy markets show the signs of the recovery since August, 2009, Latvian milk prices have also risen for the first time in almost two years. In comparison with the situation in 2007, the transmission of the trends in milk prices from the world and the EU market to Latvian milk prices seems to be faster in the current case that could be connected with the decrease in availability of raw milk resources.

The majority of raw milk produced in Latvia goes for the production of cheese and liquid milk (although at considerably lower level than for cheese). These products have also the largest share in the turnover among the processed milk products. Currently semi-hard cheese types – Krievijas (Tilsiter type) and Holandes (Edam type) – are the most popular



Source: made by the author according to the data of the CSB of Latvia, 2004-2009; Latvian Dairy Committee, 2004-2009

Figure 1. **Prices and margins for liquid milk in Latvia in 2004-2009, LVL/kg**



Source: author's calculations according to the data of the CSB of Latvia, 2004-2009; Agricultural Market Promotion Centre, 2004-2009

Figure 2. **Prices and margins for cheese (Tilsite type (Krievijas)) in Latvia in 2004-2009, LVL/kg**

cheese types among the local consumers in Latvia. About half of the produced cheese was exported in 2008, where Cheddar is the main exported cheese.

The available data on liquid milk and cheese (Tilsiter type (Krievijas)) producer and retail prices in Latvia show that generally these prices have followed the trend of raw milk prices, however, with different magnitude in changes.

Figure 1 shows that contrary to falling raw milk prices, liquid milk processors' margins in absolute terms have considerably increased during 2008-2009 (increase by 64% versus the average margin in 2007). At some points retailer margins have also been higher in 2008 than previously observed. At the same time, very low retail margins could also be observed in 2009. Considering falling retail sales, different discount activities have been widespread, with liquid milk being sold even below ex-factory price as it serves as one of the indicative products based on which consumers perceive price level. Processors' margins indicate that processors were more intensively using liquid milk to ensure cash-flow in the period of recession.

According to Figure 2 it can be seen that cheese processors' margins contrary to raw milk prices were squeezed during milk price surge period in Latvia in 2007. Afterwards, however, processors' margins returned to the previous levels or at some point even increased. There has been considerable increase in retail margins of cheese in Latvia from the second half of 2007. Although retail prices of cheese have been falling since the beginning of 2008, the retailer margin is still more than 2 times the level that could be observed at the end of 2007.

According to the study conducted by the EU Commission, the comparison of developments of the

marketing margins in other EU countries in recent years shows that generally retail prices increased in line with the increase in raw milk prices but were rather reluctant to decrease when prices for raw milk came down.

Milk processors' margins for liquid milk in France have also increased after the surge in milk prices (from 37% of retail price in Quarter 1, 2007 to 52% in Quarter 2, 2009), with decreasing retail margins (from 24% to 17%) and the share of farm-gate price (France AgriMer, 2009). The shares of margins of industry and retail sector for cheese have been comparatively stable in France in recent years (producers – 34%, processors – 31%, retailers – 31%, and VAT – 5.2% at the beginning of 2009).

The available evidence from the UK shows that liquid milk margins of industry increased during price surge in 2007, mainly at the expense of retail sector, with the following decrease in favour of milk producers; but at the first half of 2009, the share of raw milk price and margins was close to the distribution observed in the period before price surge (producers – 35%, processors – 36%, and retailers – 29%). It has been suggested that liquid milk is the main dairy product where the largest retailers have made arrangements to secure the sustainability of the supply chain (DairyCo, 2009). Due to decreasing, but still relatively high milk prices, the margins of industry for cheese were under pressure in 2008 (though after the period of increased margins at the time of milk price surge), while retailer margins tended to increase.

At the end of 2006 the prices of raw milk in Latvia have almost reached the level observed in the UK. Liquid milk price distribution in Latvia between the different actors of the supply chain at that time was as follows: milk producers – 42%, processors – 30%, retailers – 10%, and VAT – 18%. Compared with the situation in the UK, due to lower absolute final product price, the share of producer price in Latvia was higher, and the processors' margin – lower. The total margin associated with retail sales was close to the indicator in the UK. It has to be mentioned, however, that due to a higher VAT in Latvia, the margin going to retailers was considerably lower. The mark-up by industry was 69% above the raw milk price in Latvia; the retailers charged in addition 10% plus another 18% VAT (34% in total). The corresponding indicators in the UK were 100% and 39% respectively. From 2008 onwards the share of raw milk price in the total final price has decreased to 26% in September, 2009. At the same time the processors' margin has considerably increased reaching 52%, with the ex-factory price 3 times the raw milk producer price. By the end of the period concerned the difference between the raw milk prices in Latvia and the UK has increased again, the price in the UK being about 63% higher.

The distribution of cheese price between the different actors of the supply chain at the end of 2006 was as follows: milk producers – 42%, processors – 22%, retailers – 18%, and VAT – 18%. Like in the case of liquid milk, from 2008 there was negative tendency towards the share of producer price that was achieved by retailers capturing increasing share of the product final price. In September, 2009 producers accounted only for 24% of final product price, processors – 22%, retailers – 33%, and VAT – 21%. At the end of 2006, the processors added to the raw milk price LVL 0.09 per kg, compared with LVL 0.11, but retailers increased ex-factory price by LVL 0.07 and LVL 0.16 per kg respectively.

It can be agreed that generally marketing margins tend to vary due to such factors as changing costs of providing services as well as the introduction of new technologies and changes in the quantity of the products marketed (Agra CEAS Consulting, 2007). However, the increase in retailer margins considerably surpasses the inflation figures over the period.

The available data indicate on reasons for concern for liquid milk in terms of sharing the value added because the margins have shown a great fluctuation. It can also be concluded that at the time of falling demand and lower milk price, the processors have had and employed increasing bargaining power versus farmers. The reasons for concern also exist in relation to cheese. The case of cheese has shown that there is pressure on processors when milk prices are rising as there are possibilities to export raw milk to Lithuanian dairy processors that is done by cooperatives. It has to be mentioned that the development of cooperation has had a great role in achieving the rapid increase in the average raw milk price and maintaining its level in Latvia. According to the information from the sector, by the recovery of the world dairy market the processors have started to feel the pressure again at the end of 2009. It has been noted on raw milk deficit due to the falling number of dairy farms and malnutrition of animals by the financially suffering farms. The case of cheese has highlighted the problems connected with the retail sector. Following the surge in milk prices, the retailers increased cheese price even more significantly but were rather reluctant to decrease it, though it in turn could increase the volumes demanded. Considering the increasing concentration of the retail sector and competition caused by dairy imports as well as competition among the local producers that generally are not specialised, retailers could employ higher bargaining power. Although the retailers were having very low margins for liquid milk at some points in 2009, the high absolute margin for cheese was more than enough to compensate for that.

Interviews with milk processors have highlighted concerns in relation to increasing farm-gate price for milk and the decreasing purchasing power of customers due to economic crisis that prevents from increasing final product prices. However, the presented analysis of the available data suggests that there are still reserves in the chain in relation to the efficient sharing of the value added.

Conclusions

The market structure of dairy supply chain in Latvia generally indicates on large bargaining power

of retailers and small power of farmers, although the development of cooperation has significantly improved the situation. The analysis of development of the margins confirmed the increasing bargaining power of retailers and small bargaining power of farmers, especially at the time of falling prices and demand by the market. The processors' margins for milk also indicate that processors were more intensively using liquid milk to ensure cash-flow in the period of recession.

The available data indicate on reasons for concern both for liquid milk and cheese in terms of sharing the value added, since the margins have shown a great fluctuation. After a price surge experienced in 2007, there has been a negative tendency towards the share of farm-gate price both for liquid milk and cheese that in the case of cheese was achieved by retailers capturing increasing share of the product final price. Although the retailers were having very low margins for liquid milk at some points in 2009, the high absolute margin for cheese was more than enough to compensate for that. Considering falling retail sales, different discount activities have been widespread, with liquid milk being sold even below ex-factory price as it serves as one of the indicative products based on which consumers perceive price level.

The main factors affecting milk price received by farmers in Latvia are as follows: the development of milk market, which reflects the price ceiling that processors can pay per definite standardised milk kg; bonuses or deductions for milk being above or below the set standard milk in terms of milk constituents and quality (bacteria and somatic cell count); transport costs that already include delivered volume factor or transport costs and delivery volume as separate factors; and also operational costs for cooperative administration.

Considering the factors affecting milk price, the farms have to become more concentrated to receive a higher price. Concentration and vertical integration are also instruments that can help improve the bargaining power. At the same time it has to be mentioned that the number of processing enterprises is already large in Latvia, by establishing additional one, the competitiveness in the industry will increase that in turn will further weaken the bargaining power in relation to the retailers.

As customers are becoming more concerned about such factors as sustainability and traceability, and they want to support the local farmers who at the same time are also connected with the concerns of the environment and lower food miles versus imported products, the experience from other countries show that retailers are initiating the development of dedicated supply chains. The chains address the economic sustainability of the farmers and can also protect processors margins (Begg, 2007). This initiative could help ensure more sustainable sharing of the value added in Latvia.

Bibliography

1. Agra CEAS Consulting (2007) The gap between producer prices and the price paid by the consumers. Available at: http://www.ceasc.com/Images/Content/2326%20Report.pdf. Viewed: November, 12, 2009.
2. Begg J. (2007) Implications for Farmers and the Dairy Industry of Product and Supply Chain Innovation. *International Management Forum Milk 2007*, Riga, May 31-June 1, 2007.
3. Breen J., Wallace M., Crosse S., O'Callaghan D. (2003) A New Direction for the Payment of Milk: Technological and Seasonality Considerations in Multiple Component Milk Pricing of Milk (Liquid and Manufacturing) for a Diversifying Dairy Industry. Available at: http://www.teagasc.ie/research/reports/dairyproduction/4844/eopr-4844.pdf. Viewed: November 23, 2009.
4. Central Statistical Bureau of Latvia public database on industry statistics. Available at: http://data.csb.gov.lv/DATABASE/rupnbuvn/Ikgadējie%20statistikas%20dati/Rūpniecība/Rūpniecība.asp. Viewed: November 7, 2009.
5. DairyCo (2009) Ensuring a Sustainable Dairy Supply Chain. Available at: http://www.dairyco.net/media/91674/ensuring_a_sustainable_dairy_supply_chain_march_2009.pdf. Viewed: November 26, 2009.
6. European Commission (2009) Analysis of Price Transmission along the Food Supply Chain in the EU. Available at: http://ec.europa.eu/economy_finance/publications/publication16067_en.pdf. Viewed: November 9, 2009.
7. Eurostat public database on industry statistics. Available at: http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database. Viewed: November 7, 2009.
8. FADN public database. Available at: http://ec.europa.eu/agriculture/rica/database/database.cfm. Viewed: December, 11, 2009.
9. France AgriMer (2009) Observatoire des prix et des marges. Filiere Laitiere. Available at: http://agriculture.gouv.fr/sections/presse5022/communiques/publication-resultats/downloadFile/FichierAttache_2_f0/2009-07-29%20lait_data_V4.pdf?nocache=1134040585.85. Viewed: December 12, 2009.
10. Lauksaimniecības datu centrs (2009) Īss pārskats par pieciem kvotas gadiem. Available at: http://www.ldc.gov.lv/v/lv/piena_kvotas/informativais_materials/pieci_kvotas_gadi.pdf. Viewed: November 20, 2009.
11. Latvijas Lauksaimniecības kooperatīvu asociācija (2009) Līgumattiecības starp piena ražotājiem un pārstrādes uzņēmumiem. Available at: http://llka.lv/attachments/342_Atbildes_uz_jautajumiem_piens.doc. Viewed: November 20, 2009.
12. Milk Development Council (2005) Raw Milk Contracts and Relationships. Available at: http://www.dairyco.org.uk/library/market-information/milk-prices--contracts/raw-milk-contracts-and-relationships-(d).aspx. Viewed: November 29, 2009.
13. Niemi J., Jansik C. (2006) Price Formation and Margin Behaviour in the Finnish Food Markets.

Available at: http://ms.emu.ee/orb.aw/class=file/action=preview/id=224600/Niemi_Jansik.pdf. Viewed: December 11, 2009.
14. Pančenko Ē., Jasjko D., Ivanova T. (2008) Visaptverošs pētījums par konkurences apstākļiem un situāciju mazumtirdzniecības sektorā nespecializētajos veikalos. Available at: http://www.kp.gov.lv/uploaded_files/petijumi/konkurence_mazumtirdznieciba.pdf. Viewed: November 10, 2009.
15. Shalloo L., Dillon P. (2006) A Comparison of Three Milk Payment Systems and their Effect on Milk Price and Overall Milk Receipts. Available at: http://www.agresearchforum.com/publicationsarf/2006/Page%20035.pdf. Viewed: November 28, 2009.
16. Unpublished information from the Agricultural Market Promotion Centre.
17. Unpublished information from the Central Statistical Bureau of Latvia.
18. Unpublished information from the Economic Accounts for Agriculture.
19. Unpublished information from the Latvian Dairy Committee.

Piena ražošanas saimniecību rentabilitāte un to noteicošie faktori Latvijā
Profitability and Factors Determining Profitability of Latvian Dairy Farms

Armands Vēveris
LU doktorants, Latvijas Valsts Agrārās ekonomikas institūta pētnieks
armands@lvaei.lv

Abstract. Milk production has traditionally been the main Latvian agricultural sub-sector. Due to low market prices in the past two years, the sector experiences very hard times, and therefore it is necessary to increase the production efficiency to reach the cost level, which is not above the level observed in other EU countries. Thus the paper analyses milk production cost structure in dairy specialisation farms in Latvia compared with the production costs and profitability indicators in other EU countries.
The cost analysis shows that during the period of 2004-2007, when significant investments were made in the sector, the main objective of investments was not to reduce the production costs per unit, as farms considered additional rise in prices and the state support. Therefore milk production costs per produced unit have increased considerably and relative competitiveness of Latvian dairy sector has decreased during recent years.
Regarding the urgent necessity to reach the production cost level per unit in Latvia which is not above the EU level and especially the level in the neighbouring countries, it is recommended to give the priority to the projects that envisage increase in resource utilisation efficiency consequently facilitating the increase in the sector competitiveness when planning the investment activities in the sector. The previous state policy goals to promote large and specialised farms could be revised, since such farms are not flexible on the changing market conditions.
The methods of economic analysis are used in the research.
The research has been supported by the European Social Fund within the project "Support for the Implementation of Doctoral Studies at the University of Latvia", Agreement No. 2009/0138/1DP/1.1.2.1.2/09/IPIA/VIAA/004.
Atslēgas vārdi: piena lopkopība, cena, izmaksas, efektivitāte.
Key words: dairy farming, price, costs, efficiency.

Ievads
Introduction

Piena lopkopība Latvijā ir viena no nozīmīgākajām tradicionālajām Latvijas lauksaimniecības nozarēm. Piena īpatsvars lauksaimniecības preču produkcijas vērtībā Latvijā veido ap 25% (Vēveris, Krieviņa, 2008). Taču, ieskaitot pavadošās nozares, piena lopkopības loma ir vēl lielāka. Piena lopkopībā Latvijā tiek izmantoti ap 840 tūkst. hektāru jeb ap 50% no faktiski izmantotās lauksaimniecības zemes, un tā (kopā ar piena govīm paredzētās lopbarības audzēšanu un govju izaudzēšanu), saskaņā ar aprēķiniem veido ap 50% no lauksaimniecībā radītās pievienotās vērtības Latvijā. Savukārt piensaimniecības īpatsvars Latvijas IKP ir stabilizējies aptuveni 2% līmenī, kas vērtējams kā ļoti augsts rādītājs. Īpaši liela nozīme piensaimniecībai ir nodarbinātībā – pēdējos gados nozarē ieguldītā darba apjoms stabilizējies, un sasniedz 40 tūkst. pilna laika nodarbināto lauksaimniecībā un 4 tūkst. nodarbināto pārstrādē. Tas kopā veido vairāk kā 5% no kopējā nodarbinātības līmeņa valstī. Pie tam atzīstami, ka saskaņā ar veikto aprēķinu, piena ražošanā uz vienu nodarbināto tiek radīta lielāka pievienotā vērtība nekā lauksaimniecībā vidēji (attiecīgi 5.4 un 4.0 tūkst. EUR 2006.gadā), bet savukārt – piena pārstrādē lielāka nekā vidēji apstrādes rūpniecībā. (Latvijas piensaimniecības ..., 2007; Ozoliņš, Vēveris, 2009). Līdz ar to nozarei Latvijā ir grūti pārvērtējama gan ekonomiskā, gan sociālā nozīme, turklāt arī stratēģiska nozīme kā vietējās pārtikas ražotājai nozarei, nozīmīga vieta lauku nodarbinātības, apdzīvotības veicināšanā un zemes uzturēšanā lauksaimniecībai derīgā stāvoklī.

Ņemot vērā piensaimniecības nozīmīgumu Latvijā, tās ekonomiskais stāvoklis un perspektīvas ir nozīmīgas visai Latvijas tautsaimniecībai. Jau pirms 2008.-2009.gadu ekonomiskās krīzes vairāki ekonomisti norādīja uz būtiskām problēmām piena nozarē, kas var ietekmēt tās perspektīvu. Piemēram, sadrumstalota piena ražošana un pārstrāde, salīdzinoši augsts starppatēriņa īpatsvars primārajā ražošanā, piena pārstrādē dominē masu produkti kā piens, skābpiena produkti, siers, sviests, kuriem uzņēmumi nav spējīgi ietekmēt cenu (Miglavs et al., 2007). Savukārt 2008. gadā galvenokārt ar pasaules ekonomikas izaugsmes tempa

1. tabula

Pienu ražojošo saimniecību raksturojošie rādītāji un specializācijas līmenis Latvijā 2003.-2008.g.

Rādītāji	2003.g.	2005.g.	2007.g.	2008.g.
Saimniecību skaits ar slaucamajām govīm	61108	59594	38825	35592
t. sk. specializētās piena saimniecības	5662	13145	22076	n.d.
Vidējais govju skaits vienā saimniecībā	3,0	3,1	4,6	4,8
t.sk.specializētajās SUDAT kopas saimniecībās	15,6	15,3	12,3	13,1
Vidējais izslaukums no govs, kg gadā	4261	4364	4636	4822
t.sk.specializētajās SUDAT kopas saimniecībās	4300	4624	5034	5294
Kopējais iegūtā piena daudzums (tūkst.tonnu)	783,1	806,8	838,4	832,1
Pārdotā piena daudzums (tūkst. tonnu)	435,6	501,7	630,7	633,8
Pārdotā piena daudzums % no iegūtā	56%	62%	75%	76%

Datu avoti: CSP, SUDAT

būtisko samazinājumu saistītie faktori, kuri vēl pastiprinājās 2009. gadā, radīja kritisku stāvokli Latvijas piena ražošanas nozarē. Tas vēl vairāk aktualizē esošās problēmas, kas saistītas ar piena nozares efektivitāti Latvijā,jo lai nozare izdzīvotu, tai jābūt vismaz tikpat efektīvai kā galvenajās ražotājvalstīs, ar kurām Latvijas piena ražotājiem nākas konkurēt iekšējā un ārējā tirgū.

Pētījumam izvirzītā **hipotēze** ir, ka veiktās investīcijas un citi atbalsta pasākumi piena nozarē tomēr nav pietiekami sekmējuši efektīvāku resursu izmantošanu pienu ražojošās saimniecībās Latvijā, un iespējams, Latvijas piena saimniecību pozīcijas ES tirgū ir apdraudētas.

Šīs publikācijas **mērķis** ir novērtēt pienu ražojošo saimniecību ekonomisko efektivitāti Latvijā un to ietekmējošos faktorus, izvērtēt efektivitātes izmaiņas laikā kopš Latvijas iestāšanās Eiropas Savienībā.

Mērķa sasniegšanai ir pakārtoti šādi **uzdevumi**:

1) analizēt piena sektorā notiekošās tendences kopš Latvijas iestāšanās ES, un to ietekmi uz ražošanas efektivitāti;
2) analizēt izmaksu struktūru Latvijas specializētajās piena saimniecībās un salīdzināt to ar vadošajām piena ražotājvalstīm ES, kā arī kaimiņvalstīm;
3) izmantojot analīzes rezultātus, novērtēt piena sektora perspektīvas Latvijā, iezīmējot „stiprās" un „vājās" vietas pienu ražojošo saimniecību ekonomikā un akcentējot virzienus piena sektora efektivitātes paaugstināšanai.

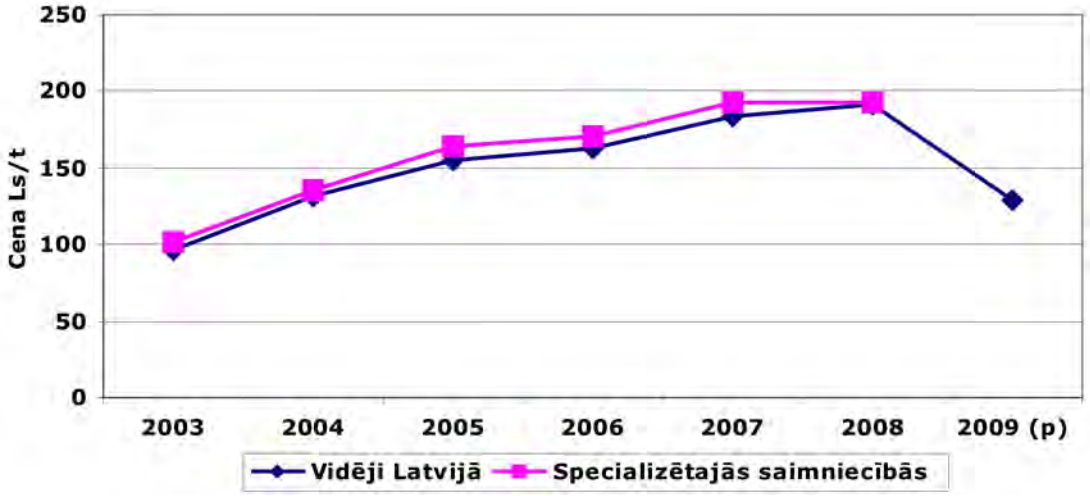
Pētījuma mērķa sasniegšanai izmantotas ekonomiski statistiskās analīzes **metodes** un paņēmieni – trendi, salīdzinošā analīze utt. Izmantota Centrālās statistikas pārvaldes (CSP) un Saimniecību uzskaites datu tīkla (SUDAT) informācija, līdzšinējie pētījumi un nozares dokumenti.

Šajā darbā izmaksas un ieņēmumi tiek analizēti ražotāju cenās – netiek ietvertas saņemtās valsts un ES subsīdijas. Šāda pieeja izvēlēta, lai varētu objektīvi salīdzināt tieši ražošanas efektivitāti un tās izmaiņas, izvairoties no atšķirīgu subsidēšanas līmeņu (gan pa gadiem, gan teritoriāli) izkropļojošās ietekmes.

Rezultāti un diskusija
Results and discussion

Pienu ražojošās saimniecības laikā kopš Latvijas iestāšanās ES ir skārušas nozīmīgas pārmaiņas. Turpinās samazināties saimniecību skaits, kuras nodarbojas ar piena lopkopību: ja 2000. gadā saskaņā ar Centrālās statistikas pārvaldes datiem tādu bija 81.8 tūkstoši (Lauku saimniecības ..., 2001), 2003. gada beigās vairs tikai 61 tūkst., bet 2008. gadā – 35.6 tūkst. (skat.1.tabulu). Slaucamo govju skaits pēc krituma 2000. gadu sākumā, kopš 2003. gada stabilizējās aptuveni 180-185 tūkst. līmenī, tomēr pēdējos gados turpinās neliels to skaita samazinājums, un 2009. gada beigās uzskaitīts 165 tūkst.govju (www.ldc.gov.lv). Savukārt govju produktivitātei ir tendence pieaugt caurmērā par 2-3% gadā, un 2008.gadā tā sasniegusi 4822 kg no govs gadā (par 13% vairāk nekā 2003. gadā), līdz ar to kopējais saražotā govs piena apjoms pēdējos gados Latvijā bijis stabils un 2008. gadā sasniedzis 833 tūkst.tonnu (par 6% vairāk kā 2003. gadā). 2009. gadā provizoriski tiek vērtēts neliels piena ieguves samazinājums - aptuveni 2% (LVAEI nepubl., 2009).

Vienlaikus ar kopējo piena lopkopībā iesaistīto saimniecību skaita samazinājumu laikā no 2003. līdz 2007. gadam strauji (3.9 reizes) audzis šajā nozarē specializēto saimniecību skaits – no 5.6 līdz 22 tūkstošiem (Lauku saimniecību struktūra ..., 2003-2007). Tas iezīmē tendenci, ka jau kopš 2007. gada šajā nozarē pārsvarā ir iesaistītas specializētās saimniecības. Kaut arī kopumā šāda tendence tiek uzskatīta par pozitīvu, tomēr, kā pierādīja krīze 2008.-2009. gados, specializācijai piemīt nozīmīgi trūkumi, jo piena cenas šajā laikā samazinājās ļoti strauji (laikā no 2008. g. 1. ceturkšņa līdz 2009. g. 2. ceturksnim – par 50%), taču vidēji lauksaimniecības produktiem cenu kritums šajā laikā bija ievērojami mazāks – par 23%. Līdz ar to ir pamats uzskatīt, ka tieši piena nozare visvairāk cieta no cenu krīzes, jo graudaugiem, kuriem arī strauji samazinājās cenas, tās tomēr nesamazinājās zem 2005. gada līmeņa, kā tas notika piensaimniecībā.



Avoti: CSP, SUDAT

1.attēls. **Piena pārdošanas cenas vidēji Latvijā un specializētajās SUDAT saimniecībās (LVL par tonnu)**

2.tabula

Izmaksu struktūra specializētajās piena saimniecībās (vidēji saimniecībā) Latvijā 2004.-2008.gados (ražotāju cenās)

Rādītāji	2004	2005	2006	2007	2008	2008./2004.
Produkcijas vērtība, Ls	**18994**	**22142**	**21971**	**20583**	**21053**	**111%**
t.sk. Piens	9524	11345	12579	11693	13054	137%
Izmaksas kopā, Ls	**15930**	**19895**	**21168**	**19771**	**22580**	**142%**
Izmaksu īpatsvars produkcijā %	**84%**	**90%**	**96%**	**96%**	**107%**	**1,28**
Tai skaitā: specifiskās izmaksas	46%	45%	50%	47%	50%	120%
lopbarība	35%	34%	36%	35%	37%	117%
augkopības izmaksas	6%	6%	8%	8%	8%	150%
pieskaitāmās izmaksas	23%	27%	25%	26%	29%	143%
degviela, smērvielas	9%	11%	10%	9%	12%	137%
ēku un tehnikas uzturēšana	6%	8%	7%	7%	7%	135%
Nolietojums	7%	10%	12%	14%	16%	241%
Algotais darbaspēks	6%	5%	7%	6%	8%	154%
Nomas maksa & procentu maksājumi	2%	3%	3%	3%	4%	267%
Bruto ieguldījumi	3279	8084	8036	6158	5610	171%

Dati: Autora aprēķini, izmantojot SUDAT datus

Tabulā salīdzinoši raksturotas visas pienu ražojošās saimniecības, kā arī specializētās. Jāatzīst, ka vidēji vienā saimniecībā esošais govju skaits joprojām ir ļoti niecīgs, tomēr to nosaka liels skaits pašpatēriņa saimniecību, kuras ražo galvenokārt savam patēriņam. Vēl 2008.gada beigās 25600 saimniecībās (72% no saimniecībām ar slaucamajām govīm) turēja tikai 1-2 govis. Lai arī liela daļa no mazajām saimniecībām pienu pārdotu un to ir darījušas, taču pēdējos gados to iespējas ir krietni samazinājušās. Taču arī specializētajās piena saimniecībās, kuras ietilpst SUDAT izlasē (ar ekonomisko lielumu virs 2 ELV[1]), vidējais govju skaits ir neliels – tikai 13 govis (2008.), turklāt salīdzinot ar 2003. gadu, tas ir pat samazinājies (būtiski pieaugot specializēto saimniecību skaitam).

Specializētajās piena saimniecībās izslaukuma līmenis ir par nepilniem 10% augstāks nekā vidēji, un jāatzīmē pozitīva tendence, ka šajās saimniecībās izslaukums kāpj straujāk. Pieaug arī kopējais pārdotā piena daudzums un it īpaši pārdotā piena īpatsvars – 2003. gadā, saskaņā ar CSP datiem, tikai 56% no saražotā piena tika pārdots, tad 2008. gadā – jau 76%.

Viens no galvenajiem nosacījumiem, kas ietekmē sekmīgu piena saimniecību darbību, ir atbilstoša piena pārdošanas cena. Piena vidējās pārdošanas cenas izmaiņas laikā no 2003. līdz 2009. gadam

[1] ELV – Eiropas lieluma vienība (ELV) – ekonomiskā lieluma mērvienība. 1 ELV atbilst 1200 eiro standarta bruto seguma (SBS). SBS ir produkcijas vērtība mīnus ražošanas tiešās izmaksas, novērtējot vietējās cenās.

apkopotas 1.attēlā. No tā redzams, ka laikā no 2003. līdz 2008.gadam piena cenai bija raksturīga pastāvīga pieauguma tendence, un šajā laikā tā pieauga 2 reizes – vidēji no 96 LVL par tonnu 2003. gadā līdz 192 LVL par tonnu 2008. gadā. Šim pieaugumam gan bija vairāki posmi: pirmais – līdz 2006. gadam – bija galvenokārt saistīts ar iekļaušanos vienotajā ES tirgū, ko papildus stimulēja sekmīga ārējo tirgu apguve. Savukārt otrs pieaugums bija lēcienveida – 2007. gada otrajā pusē, ko radīja straujš pieprasījuma un cenu kāpums pasaules tirgū. Visi šie apstākļi daļai piensaimnieku radīja ilūziju, ka cenas kāpums ir ilgtermiņa, un tika veikti plaši modernizācijas pasākumi, ieguldot lielas investīcijas, turklāt finanšu plānos dažkārt iekļaujot tirgus „lēciena" izraisītās cenas, neņemot vērā, ka ES politika ilgtermiņā, tieši pretēji, paredz piena cenas samazināšanos, tādēļ jau pirms vairākiem gadiem ekonomisti ieteica lauksaimniekiem rēķināties ar piena cenām, ne augstākām par 160 LVL par tonnu piena. (Latvijas piensaimniecības ..., 2007).

2009. gada vidū piena cenas gan nokritās vēl vairāk, un 2. un 3. ceturkšņos bija vairs vidēji tikai 113 LVL par tonnu. Tomēr arī tik zema cena visdrīzāk, nav gaidāma ilglaicīgi, ko rāda arī jau visai straujais cenas kāpums gada pēdējos mēnešos (2009.g.novembrī vidējā cena sasniegusi 155 LVL/t un turpina kāpt). Taču, kā redzams no 1. attēla datiem, 2009.gada vidējā piena cena (provizoriski 128 LVL/t) atrodas zem 2005. gada līmeņa (155 LVL/t) un pat nedaudz zemāka nekā 2004. gadā, kad bija 131 LVL/t. Daudziem citiem produktiem cenas kritums bija krietni mazāks (vidēji lauksaimniecībā 2009.gada provizoriskais cenu līmenis ir praktiski vienāds ar 2005. gada līmeni (LVAEI nepubl., 2009)), līdz ar to piena ražotājus šī krīze skāra īpaši smagi, salīdzinot ar citām lauksaimniecības apakšnozarēm.

1. attēlā salīdzināta arī cena visās saimniecībās un specializētajās piena saimniecībās ar ekonomisko lielumu virs 2 ELV (kuras apkopo SUDAT). Redzams, ka pēdējās cena gan ir bijusi nedaudz lielāka nekā vidēji, tomēr starpība sasniedz tikai 4%, turklāt 2008. gadā atšķirības vairs nebija. Tā kā cena ir atkarīga no produkta kvalitātes, apjoma u.c. nosacījumiem, tas liecina, ka nevaram runāt par būtiski augstākiem kvalitātes un ražošanas apjoma rādītājiem specializētajās saimniecībās. Tas ir skaidrojams arī ar to, ka lielākie lauksaimniecības uzņēmumi parasti ir specializējušies vairākās nozarēs, līdz ar to nav viennozīmīgas sakarības, ka specializētie uzņēmumi ir arī lielāki. Kā liecina iepriekšējie pētījumi, piena specializācijas saimniecību grupā ir vairāk vidēja lieluma saimniecību (16-40 ELV), bet mazāk lielo saimniecību (virs 40 ELV) nekā citās specializācijas grupās. (Veveris, 2009).

Analizējot specializēto piena saimniecību ieņēmumus un izmaksas (2.tabula), atklājas, ka neraugoties uz piena cenas kāpumu, laikā no 2004. līdz 2008.gadam vidējās specializētās saimniecības ieņēmumi palielinājušies maz – tikai par 11%. Ieņēmumi tieši no piena auguši vairāk – par 37%, tomēr izmaksu kāpums ir vēl nozīmīgāks par 42%. Šīs situācijas rezultāts ir straujš izmaksu īpatsvara pieaugums produkcijas vērtībā – no 84% 2004. gadā līdz pat 107% 2008. gadā.

Audzis ir visu galveno izmaksu posteņu īpatsvars, bet visvairāk tieši tās izmaksas, kuras līdz šim Latvijā bija salīdzinoši zemākas nekā lielākajā daļa ES valstu – pamatlīdzekļu nolietojums, procentu maksājumi Tā, nolietojuma vērtība vidēji vienā saimniecībā laikā no 2004. līdz 2008. gadam ir pieaugusi 2.4 reizes, bet nomas un procentu maksājumi – 2.7 reizes. Nozīmīgi palielinājušās arī pieskaitāmās izmaksas – par 43%. Specifisko izmaksu kāpums ir relatīvi mazāks, turklāt šo izmaksu līmenis Latvijā bija augstāks kā citās ES valstīs jau 2004.gadā (Veveris et al, 2007)., līdz ar to būtu sagaidāms, ka veiktās investīcijas būtu sekmējušas tiešo izmaksu līmeņa kritumu, tomēr līdzšinējie dati par to neliecina – tieši otrādi, arī to īpatsvars produkcijas vērtībā ir audzis.

Līdz ar to Latvijas piena saimniecību ekonomiskā efektivitāte ir mazinājusies – kā izriet no apkopotās informācijas, 2008. gadā pozitīvi ekonomiskie rezultāti piena saimniecībās kopumā varēja tikt sasniegti tikai ņemot vērā izmaksāto valsts un ES atbalstu, jo produkcijas vērtība nesasniedza izmaksu summu.

Šajā ziņā būtiski ir salīdzināt Latvijas piena saimniecību rādītājus ar citām Eiropas Savienības valstīm, jo atrodamies vienotā tirgū. Salīdzinājumam valstis tika izvēlētas, vadoties no diviem kritērijiem:

1) iekļaut galvenās ES piena ražotājas valstis (Vācija, Francija, Nīderlande, Dānija)
2) iekļaut Latvijas kaimiņvalstis, ar kurām Latvijai ir salīdzināmi apstākļi un svarīga loma tirdzniecībā (Lietuva, Polija, Igaunija), kā arī ziemeļvalstis salīdzinājumam (Zviedrija, Somija).

Līdz ar to izveidota 10 valstu grupa, kura (kopā ar ES vidējo rādītāju) saskaņā ar autora vērtējumu visai labi raksturo Latvijas piena saimniecību situāciju uz ES fona. Izmantoti 2007. gada dati, kas ir jaunākie ES datubāzē.

Datu analīze par galvenajiem izmaksu veidiem (3. un 4.tabulas) atklāj būtiskas problēmas Latvijas saimniecību efektivitātē. Latvijā saimniekošanas apjomi vienā saimniecībā (lopu skaits, izslaukums no govs, produkcijas vērtība) ir tuvi vienīgi ar Lietuvas un Polijas rādītājiem, taču izmaksu īpatsvars – daudz augstāks. Lietuvā un Polijā kopējo izmaksu īpatsvars produkcijā 2007. gadā nepārsniedza 70%, taču Latvijā tas sasniedza ap 100%. Izmaksu līmenis Latvijā ievērojami pārsniedz arī ES valstu vidējo rādītāju, kurš ir 83% no produkcijas vērtības (Latvijā 100%).

Analizējot atsevišķus būtiskākos izmaksu posteņus, atklājas, ka Latvijā galveno izmaksu īpatsvars produkcijas vērtībā ir augstāks nekā ES vidēji. Izņēmums ir procentu un nomas maksājumi (te piebilstams, ka Latvijā šie maksājumi joprojām palielinās un ir strauji kāpuši 2008. un 2009. gados – gan sakarā ar kredītsaistību apjoma pieaugumu, gan procentu likmju celšanos). Taču lopbarības izmaksas, kas ir lielākais izmaksu postenis lopkopībā, Latvijā ir visaugstākās – 37% no produkcijas vērtības. Tuvu šādam īpatsvaram no aplūkotajām valstīm ir arī Zviedrija, Igaunija un

3.tabula

Produkcijas vērtība un izmaksu īpatsvars piena specializācijas saimniecībās Latvijā un citās ES valstīs 2007.gadā

Valstis	Produkcijas vērtība, EUR	Izmaksu īpatsvars produkcijas vērtībā, %					
		Visas izmaksas	Lopbarība (ganāmiem mājlopiem)	Energo-resursi	Pamatlīdzekļu nolietojums	Algotā darbaspēka apmaksa	Procenti & rente
Dānija	526 173	101%	34%	3%	10%	7%	20%
Nīderlande	246 562	81%	16%	4%	12%	1%	16%
Zviedrija	216 931	106%	36%	7%	13%	7%	8%
Vācija	179 161	84%	19%	7%	13%	4%	8%
Igaunija	161 272	101%	35%	8%	11%	20%	4%
Francija	131 248	93%	17%	5%	20%	1%	9%
Somija	94 239	118%	24%	7%	29%	3%	7%
Polija	30 587	64%	19%	6%	13%	1%	2%
Latvija	**28 108**	**100%**	**37%**	**12%**	**15%**	**7%**	**3%**
Lietuva	27 024	70%	27%	7%	11%	3%	3%
Vidēji ES	***96 614***	***83%***	***24%***	***5%***	***13%***	***4%***	***8%***

Datu avots: SUDAT (FADN) publiskā datu bāze.

4.tabula

Dzīvnieku skaits, izslaukums un lopbarības izmaksu līmenis vidēji piena lopkopības saimniecībā 2007.gadā

Valstis	Liellopu vienību (LLV) skaits saimniecībā	Izslaukums gadā no govs, kg	Lopbarības izmaksas gadā, LVL	
			uz LLV	uz kg piena
Francija	85	6270	186	0,03
Polija	21	4981	200	0,04
Vācija	87	7028	283	0,04
Nīderlande	112	7770	253	0,05
Somija	39	8610	417	0,05
Lietuva	20	4990	256	0,05
Igaunija	93	6660	429	0,06
Zviedrija	97	8285	561	0,07
Latvija	**21**	**5080**	**344**	**0,07**
Dānija	194	8249	648	0,08
Vidēji ES	***52***	***6579***	***318***	***0,05***

Datu avots: FADN (SUDAT) publiskā datu bāze

Dānija, taču šajās valstīs ganāmpulki ir ievērojami lielāki, kas ļauj samazināt citas izmaksas. Tomēr kā redzams, minētajās valstīs arī kopējais izmaksu līmenis nav zemāks kā Latvijā. Taču īpaši augsts Latvijā ir energoresursu izmaksu līmenis. Kā zināms, Latvijā neizceļas ar augstām energoresursu cenām Eiropas līmenī, līdz ar to ir pamats runāt par nepietiekami racionālu energoresursu patēriņu. Arī pamatlīdzekļu nolietojums, kā jau dažus gadus iepriekš tika prognozēts (Veveris et al, 2007), Latvijā ir ievērojami pieaudzis un kļuvis par vienu no lielākajiem ES, Igauniju un Lietuvu apsteidzot par 4 procentpunktiem (nolietojuma īpatsvars Latvijā 15% no produkcijas vērtības, bet pārējās Baltijas valstīs – 11%).

Šāda situācija radusies sakarā ar strauju investīciju ieplūdumu Latvijas lauksaimniecībā, tajā skaitā piena nozarē. Kā rāda 2. tabulas dati, 5 gadu laikā (2004.-2008.) vidēji katrā Latvijas piena saimniecībā pamatlīdzekļos investēti vairāk nekā 30 tūkstoši latu. Šī summa pārsniedz vidējās saimniecības gada apgrozījumu, pie tam, kā iepriekš minēts, apgrozījums nav būtiski palielinājies. Līdz ar to ir apšaubāma ieguldīto investīciju ekonomiskā efektivitāte un saimniecību spēja tās atmaksāt.

Arī algotā darbaspēka apmaksas līmenis, kas vēl 2004. gadā bija viena no Latvijas saimniecību priekšrocībām, 2007.gadā jau gandrīz divkārt pārsniedz vidējo ES līmeni. To izraisīja algu celšanās, kas bija daudz straujāka nekā darba produktivitātes

kāpums. Visu šo faktoru kopums veido situāciju, ka aplūkojamā laikā periodā Latvijas piena saimniecībās veiktās investīcijas ir radījušas papildus izmaksas, taču vismaz līdz šim nav devušas būtisku ieguldījumu ražošanas efektivitātes veicināšanā. Tā rezultātā saimniecības izmaksu līmeņa ziņā kļuvušas daudz mazāk konkurētspējīgas ES tirgū, nekā tas bija vēl dažus gadus iepriekš.

Lopbarības izmaksas, kā lielākais izmaksu postenis, ir analizētas arī attiecinot tās uz liellopu vienību un izslauktā piena kilogramu (4.tabula). Šī analīze sniedz noderīgu papildu informāciju efektivitātes izvērtēšanā. No veiktās analīzes aplūkotajās valstīs izriet, ka ne vidējam lopu skaitam saimniecībā, ne vidējam izslaukumam nav tiešas saistības ar lopbarības izmaksu līmeni. Tā, piemēram, Polijā, kurā vidējais lopu skaits un izslaukums ir līdzīgi kā Latvijā, lopbarības izmaksas ir zemas, bet savukārt

Dānijā, kurā šie rādītāji ir vieni no augstākajiem – arī lopbarības izmaksas visaugstākās. Latvijā lopbarības izmaksas uz vienu liellopu vienību 2007. gadā bijušas 344 LVL, kas ir par 8% vairāk nekā ES vidēji, taču uz produkcijas vienību tās ir otrās lielākās aplūkoto valstu grupā aiz Dānijas, un veido 7 santīmus par kg piena. Savukārt 5 valstīs – Francijā, Polijā, Nīderlandē, Vācijā un Somijā – lopbarības izmaksas nepārsniedz 5 santīmus uz kg piena, Lietuvā ir tuvu tam, bet Igaunijā veido 6.4 sant./kg, kas ir nedaudz mazāk kā Latvijā. Par ļoti būtisku uzskatāms, ka Latvijā lopbarības izmaksas uz kg piena ir par 42% lielākas nekā ES vidēji, par 32% lielākas kā Lietuvā un par 70% lielākas kā Polijā. Līdz ar to Latvijas ražotājiem nākas samierināties ar zemākiem ienākumiem, bet krīžu gadījumos, kā tas bijis pēdējos 2 gados, šāds stāvoklis draud ar bankrotu, kas vispirms skar saimniecības ar augstākām izmaksām, īpaši ja tām ir daudz saistību.

Veiktais datu apkopojums un analīze rada pamatu, lai pārvērtētu Latvijas piena ražošanas sektoram izvirzītos mērķus un pašreizējā investīciju atbalsta kārtību, ņemot vērā to ietekmi uz piena saimniecību konkurētspēju. Vairākos pētījumos un arī valsts programmās (Jasjko et al, 2007; Latvijas piensaimniecības ..., 2007) likts uzsvars uz vajadzību kāpināt ražošanas apjomus un produktivitāti, atteikties no mazajām saimniecībām, ieguldīt lielus līdzekļus saimniecību modernizācijā, kā rezultātā tiktu izveidots neliels skaits modernu saimniecību, kas saražotu absolūti lielāko daļu no preču produkcijas. Tomēr pašreizējās tendences, kā arī citu valstu datu analīze rāda, ka ražošanas apjomi, lopu skaits un produktivitāte nav būtiskākie faktori, kas nosaka saimniekošanas efektivitāti. Veiktās analīzes ietvaros nav iespējams pilnībā atklāt un pierādīt minētos faktorus, taču pie tā darbu paredzēts turpināt. Tomēr var secināt, ka ļoti būtiska nozīme ir veikto investīciju atbilstībai reāli sasniedzamajiem saimniekošanas apjomiem, resursus taupošu, nedārgu tehnoloģiju izvēlei, kooperācijai gan resursu iegādē, gan produkcijas realizācijā.

Pētījuma rezultātu ticamības līmeni ietekmē izmantoto statistikas un SUDAT datu ticamības līmenis. Ņemot vērā, ka SUDAT metodika ir vienota visā Eiropas Savienībā, iegūtie rezultāti ir samērā labi salīdzināmi pa gadiem , kā arī apsekoto saimniecību kopa ir relatīvi liela (2007. gadā Latvijā dati apkopoti par 341 specializētu saimniecību), var vērtēt, ka ticamības līmenis ir pietiekams darba mērķa sasniegšanai.

Secinājumi un priekšlikumi
Conclusions and proposals

1. Pētījuma rezultāti apstiprina, ka kopš Latvijas iestāšanās ES pienu ražojošo saimniecību sektorā ir notikušas būtiskas strukturālas izmaiņas – strauji samazinājies saimniecību skaits (no vairāk kā 60 tūkst.2003. gadā līdz 35 tūkstošiem 2008. gadā), pieaudzis specializācijas līmenis (specializēto saimniecību īpatsvars no 9% pieaudzis līdz pat 57% (2007.g.), kāpusi govju produktivitāte (par 13%). Var uzskatīt, ka jau dažos gados pēc iestāšanās piena cena Latvijā praktiski sasniedza to līmeni, kāds tai var būt, atrodoties vienotā ES tirgū (ievērojot faktorus, kuri nosaka šīs cenas lielumu konkrēti Latvijā), un sākot ar 2006. gadu, piena cenas svārstības galvenokārt ir atkarīgas no situācijas piena un tā produktu tirgū ES un pasaulē.
2. Sakarā ar valsts un ES atbalstu investīcijām saimniecības ir investējušas lielus līdzekļus – vidēji katra specializētā saimniecība laikā no 2004. līdz 2008. gadam vairāk kā 30 000 Ls, kas aptuveni pusotras reizes pārsniedz vidējo gada apgrozījumu. Tomēr vienlaikus noticis straujš izmaksu kāpums, kad palielinājusies ne tikai visu galveno izmaksu posteņu absolūtā vērtība, bet arī to īpatsvars produkcijā (no 84% 2004. gadā līdz 107% 2008. gadā). Rezultātā saimniecību tirgus rentabilitāte no pozitīvas 2004.-2007. gados kļuvusi negatīva 2008. gadā.
3. Salīdzinājums ar citām ES dalībvalstīm rāda, ka Latvijai ir augstākais energoresursu un lopbarības patēriņš aplūkoto 10 valstu vidū, kā arī augstāks nekā vidēji ES pamatlīdzekļu nolietojuma un darbaspēka izmaksu īpatsvars. Iepriekšējo gadu pētījumi rāda, ka Latvijas saimniecību salīdzinošā efektivitāte pēdējo 5 gadu laikā ir samazinājusies. Tas liecina, ka veicot investīcijas, nav pievērsta pietiekama uzmanība resursu efektīvai izmantošanai, jo investīciju piesaiste ir radījusi papildus izmaksas, bet tiešo izmaksu līmenis nav samazinājies. Līdz ar to darbam izvirzītā hipotēze ir apstiprinājusies – veiktās investīcijas un citi atbalsta pasākumi piena nozarē nav pietiekami sekmējuši efektīvāku resursu izmantošanu, un Latvijas piena saimniecību pozīcijas ES tirgū ir apdraudētas.
4. Latvijā ir izveidotas daudz specializētas piena saimniecības (2007.gadā – 22 tūkstoši jeb 57% no visām saimniecībām ar slaucamajām govīm), tomēr analīze rāda, ka specializētām saimniecībām nav būtiski labāki rezultāti, turklāt pieaug to atkarība no viena produkta

tirgus. Krīzes ietekmē specializētās piena saimniecības cieta vairāk nekā daudznozaru saimniecības, jo piena cena kritās daudz lielākā mērā nekā lauksaimniecības produktiem vidēji (2009. gadā pret 2005.gadu vidējā piena cena samazinājusies par 17%, taču vidēji lauksaimniecības produktiem cenu līmenis ir aptuveni vienāds).

5. Citu ES valstu datu analīze rāda, ka nav nepieciešami milzīgi ražošanas apjomi un augsti izslaukumi, lai saražotu pienu ar zemām izmaksām, jo vienas no zemākajām izmaksām ir Polijā un Lietuvā, taču ganāmpulka lielums un izslaukumi specializētajās piena saimniecībās šajās valstīs ir līdzīgi kā Latvijā.
6. Situācijas analīze rāda, ka lai Latvijas piena saimniecības arī turpmāk spētu konkurēt ar citiem ES ražotājiem, tām ir jāspēj pazemināt izmaksas, vēlams līdz Polijas un Lietuvas līmenim. Vienīgā pieļaujamā starpība būtu uz augstākas kvalitātes rēķina. Līdz ar to, plānojot piena sektora attīstību, no kvantitatīviem mērķiem (kapitāla, ganāmpulku, izslaukumu palielināšana utt.) būtu jāpārorientējas uz resursus taupošiem, lai saražotu kvalitatīvu produktu ar iespējami zemākām izmaksām, savukārt tirgū spētu to realizēt par iespējami izdevīgāku cenu, kas būtu atbilstoša kvalitātei.
7. Veiktās iestrādes ļauj secināt, ka perspektīvie virzieni piena saimniecību konkurētspējas paaugstināšanai būtu:
   - ar valsts un ES līdzekļiem pirmām kārtām atbalstīt tādu tehnoloģiju iegādi, kas ļauj samazināt produkta vienības ražošanas izmaksas, atbalstot kooperāciju tehnikas u.c.pamatlīdzekļu iegādē un izmantošanā;
   - nepieciešama lauksaimnieku izglītošana ekonomiski efektīvas saimniekošanas organizācijā, kapitāla pārvaldīšanā, prasmē samazināt riskus, lai spētu pārvarēt arī krīzes apstākļus utt.;
   - saimniecību kooperācija un vertikālās integrācijas veidošana, lai piena ražotājiem būtu iespējas ietekmēt resursu un gatavās produkcijas cenas un līgumu nosacījumus.

Literatūras saraksts
Bibliography

1. 2005. gada lauku saimniecību struktūras apsekojums. LR Centrālā statistikas pārvalde, Rīga, 2006. 94 lpp.
2. Lauku saimniecības darba ekonomiskās analīzes rezultāti. Publikāciju sērija 2003.-2007. Rīga, LVAEI, 2004.-2008. 192-211 lpp.
3. Lauku saimniecības Latvijā. Publikāciju sērija 2000.-2008.g. LR Centrālā statistikas pārvalde. Rīga 2001.-2009. 36-80 lpp.
4. Lauku saimniecību struktūra Latvijā 2007.gada jūnijā. LR Centrālā statistikas pārvalde, Rīga, 2008. 76 lpp.
5. Lauku saimniecību struktūra Latvijā 2003.gada jūnijā. LR Centrālā statistikas pārvalde, Rīga, 2004. 86 lpp.
6. Miglavs A., Leimane I., Krieviņa A. Economic Analysis of the Value Adding Chain in Milk Sector. // Proceedings of the International Scientific Conference "Economic Science for Rural Development", No.13, 2007. Jelgava: Latvian Academy of Agriculture and Forestry Sciences, pp. 69-77
7. Veveris A. Analysis of the Cost Level and Production Efficiency in Agricultural Farms of Different Size. // "Economic Science for Rural Development". Proceedings of the International Scientific Conference. No.18, 2009, Latvian Academy of Agriculture and Forestry Sciences, Jelgava, pp.194-201.
8. Veveris A., Krievina A., Leimane I. "Efficiency Analysis of Agricultural Sector in Latvia Compared to Other EU Countries, Based on FADN Data" // Proceedings of the International Scientific Conference "Economic Science for Rural Development", No.13, 2007, Latvian Academy of Agriculture and Forestry Sciences, Jelgava, pp. 13-19.
9. Vēveris A., Krieviņa A. Latvijas lauksaimniecības ekonomiskais kopaprēķins 2007-2008. LVAEI, Rīga, 2008. 72 lpp
10. Ozolins J., Veveris A. Gross Economic Effect of Dairy Sector in Latvia and Other Baltic States. Proceedings of the International Scientific Conference. May 20-22, 2009, Latvian Academy of Agriculture and Forestry Sciences, Jelgava (iesniegts publicēšanai).
11. Centrālās statistikas pārvaldes nepublicēta informācija.
12. Latvijas Valsts Agrārās ekonomikas institūta nepublicēta informācija.
13. FADN public database. European Commission. // http://ec.europa.eu/agriculture/rica/dwh/index_en.cfm Skatīts 01.01.2010.
14. Jasjko D., Frolova L., Dobele A., Pančenko Ē., Ivanova T., Radionova A. (2007) Piensaimniecības nozares attīstības analīze un konkurētspējas novērtējums Latvijā un Eiropas Savienības tirgū. Pētījuma rezultāti. Pieejams: http://www.llu.lv/?mi=81&projekti_id=497,
15. Latvijas piensaimniecības nozares darbības uzlabošanas stratēģiskā programma. Rīga, Zemkopības ministrija, 2007. Pieejams: http://www.zm.gov.lv/index.php?id=4833&sadala=990 Skatīts 03.01.2010.
16. Lauksaimniecības datu centra informācija: www.ldc.gov.lv Skatīts 03.01.2010.

Latvijas kokrūpniecības nozares konkurētspējas izvērtējums
Competitiveness Analysis of Latvian Timber Industry

Raimonds Šulcs, MBA
vecākais loģistikas speciālists, AS „Latvijas Valsts meži"
Anita Auziņa, Dr.oec., asoc.prof., LLU
Aina Muška, Dr.oec., docente, LLU

Abstract. The research aim was to find out the development possibilities of Latvian timber industry and analyse its competitiveness. The analysis of Latvian timber industry showed that Latvia has a stable resource base and possibilities to ensure supply in time. Entrepreneurs think about a long-term development and conclude long-term business contacts with partners and employees. Most successful enterprises keep up with the European Union average indicators. The supply of good quality products is not the only essential factor to operate on the global scale market; it is also important to think about value added of goods following from good services, after-services and flexibility.
The authors have analysed the delaying problems of timber industry, development possibilities of timber industry and its competitiveness based on the following methods: resource-based view, SWOT, Porter 5 forces, expert interviews, and a questionnaire.
Key words: timber industry, competitiveness, market.
Atslēgas vārdi: kokrūpniecības nozare, konkurētspēja, tirgus

Ievads

Klimatisko un ģeogrāfisko apstākļu ietekmē Latvijā kokrūpniecības nozare vēsturiski ir izveidojusies kā viena no ekonomikas balsta nozarēm un tā ir sekmīgi attīstījusies tirgus ekonomikas apstākļos. Laika periodā no kokrūpniecības pirmsākumiem līdz pat mūsdienām, kokrūpniecības produkcijas apjomi ir pieauguši vairākas reizes, kur viens no galvenajiem veicinošajiem faktoriem ir izejvielu nodrošinājums. Kokrūpniecība samērā strauji pārorientējās uz Rietumu tirgu, izturot konkurenci ar brīvā tirgus apstākļos sen strādājošiem uzņēmumiem.

Darbojoties globālajā tirgū, konkurence starp precēm un pakalpojumiem, ko tajā piedāvā dažādu valstu nozaru uzņēmumi, kļūst arvien sīvāka un pieaugošāka. Tādējādi pašlaik ir izveidojusies situācija, kurā vairāk kā jebkad uzņēmumiem ir svarīgi izpētīt konkurenci, meklēt noieta tirgus un kāpināt ražošanas efektivitāti.

Līdz 2007.gadam nozarei ik gadu ir bijis pieaugums eksportētās produkcijas apjomā, kā arī eksportētā vērtība ik gadu ir augusi, kas liecina par aizvien augstāku apstrādes līmeni koksnei. Pēdējo 10 gadu laikā nozares kopējais apgrozījums ir audzis vidēji par 15% gadā, tomēr pēdējos 3 gados nozares izaugsme ir apstājusies.

2008. gads ir iezīmējis pārmaiņu laikus nozarē, ko izveidoja apjomu samazinājums galvenajās patērētājnozarēs – būvniecībā un transporta industrijā. Šis laiks Latvijas kokrūpniecībai ir vērtējams kā pārbaudījumu laiks, kad tiek izjusts agrāk veikto investīciju atbalsts, novērtētas stabilas ilgtermiņa attiecības ar biznesa partneriem un darbiniekiem, meklēti veidi produktivitātes kāpināšanai nozarē, meklēti risinājumi, kā radīt produktam papildus pievienoto vērtību, kā aizvien vairāk un racionālāk ražošanā izmantot vietējos resursus, tātad – meklētas konkurētspējas paaugstināšanas iespējas.

Veicot kokrūpniecības nozares nozīmes izvērtējumu Latvijas ekonomikā, autori uzskata, ka izvēlētā tēma ir aktuāla, turklāt šo aktualitāti pastiprina arī fakts, ka nozare ir iekļauta Ekonomikas Ministrijas izstrādātajā Latvijas prioritāro nozaru sarakstā.

Pētījuma laika periods ir no 2000. gada līdz 2008. gadam. Taču atsevišķi kokrūpniecības nozari raksturojošie 2008. gadā publicētie dati un aprēķini, kas tika iegūti no EUROSTAT, CEI-Bois (Eiropas Kokrūpniecības federācija) u.c., par būtiskākajiem kokrūpniecības nozares indikatoriem ir pieejami tikai par 2005. gadu.

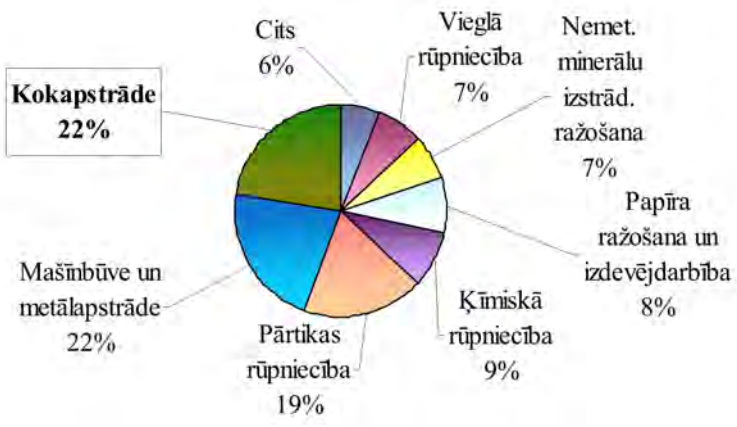
Pētījuma mērķis ir veikt Latvijas kokrūpniecības nozares konkurētspējas analīzi un noskaidrot nozares attīstības iespējas.

Mērķa sasniegšanai tika risināti sekojoši **uzdevumi**:

1. Raksturota un novērtēta kokrūpniecības nozare Latvijā, Eiropas Savienībā un citās valstīs.
2. Veikta kokrūpniecības nozares konkurētspējas analīze un noteiktas galvenās konkurētspējas priekšrocības.
3. Noteiktas kokrūpniecības nozares attīstības perspektīvas un sniegtas rekomendācijas tās konkurētspējas paaugstināšanai.

Pielietotās pētījuma metodes: vispārzinātnisko pētījumu metodes – monogrāfiskā, analīzes, sintēzes un loģiski konstruktīvā; datu ieguves un apstrādes metodes – statistiskās, grafiskās un matemātiskās; ekspertu aptaujas un intervijas; Resource-based view pieeja; SVID analīzes metode un M. Portera 5 spēku modelis.

Izmantotie materiāli: zinātniskās publikācijas, pētījumu rezultāti, lietišķās biznesa un kokrūpniecības nozares periodikas un interneta resursi, Latvijas Republikas par Meža nozari atbildīgo institūciju un valsts ekonomiskajiem rādītājiem publicētos datus



Avots: Meža nozare Latvijā …, 2009.

1. att. **Latvijas apstrādes rūpniecības struktūra pēc saražotā apjoma, 2007. g., %.**

un pārskatus, kā arī Latvijas un Eiropas Savienības statistikas datu bāzes – CSB un EUROSTAT, un kokrūpniecībā darbojošos asociāciju, federāciju un apvienību publicēto informāciju par kokrūpniecības nozari.

Rezultāti un diskusija

1. Kokrūpniecības nozares raksturojums Latvijā

Kokrūpniecība ar savām apakšnozarēm – zāģēšanu, plātņu materiālu ražošanu, taras ražošanu, mēbeļu rūpniecību un namdaru un galdniecības izstrādājumu ražošanu – ir kļuvusi par vienu no aktīvākajām Latvijas tautsaimniecības nozarēm un dod būtisku ieguldījumu ārējās tirdzniecības bilances stabilizēšanā. Tas panākts prasmīgi izmantojot pieejamos vietējos atjaunojamos meža resursus.

Pēc 1. attēla redzams, ka kokrūpniecība veido vairāk kā 1/5 no apstrādes rūpniecībā saražotā apjoma. Kokapstrāde ir arī viena no lielākām Latvijas rūpniecības nozarēm pēc apgrozījuma, kas 2007. gadā sastādīja 1.5 mljrd. Ls.

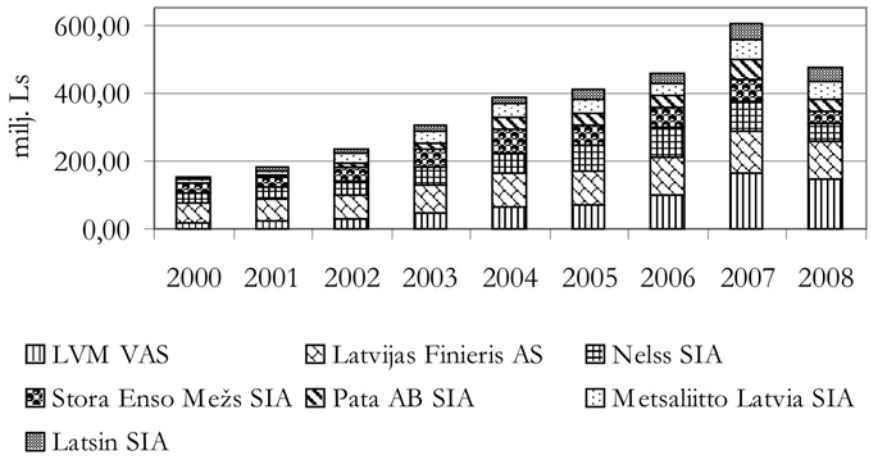
Nozares ieguldījums iekšzemes kopproduktā tiek vērtēts 5% apjomā. Savā pētījumā par eksporta attīstību no 2011.-2015. gadam D. Grūbe prognozē, ka no apstrādes rūpniecības apakšnozarēm vislielākais ieguldījums pievienotās vērtības pieaugumā būs kokrūpniecībai un pārtikas ražošanai, kas kopā veidos gandrīz 45% no visas apstrādes rūpniecības pievienotās vērtības pieauguma. Kā arī tiek izteikta prognoze, ka gandrīz 26% no eksporta pieauguma veidos tieši kokrūpniecība (Grūbe, 2009).

Kokrūpniecības nozīmi Latvijas ekonomikā apliecina eksporta – importa bilance, kur kokrūpniecība ir vienīgā pozīcija, kuras ārējās tirdzniecības saldo ir pozitīvs. No visa nozarē saražotā apjoma aptuveni 70% produkcijas tika eksportēti (Kokapstrāde, 2008), kas naudas izteiksmē pēdējos 9 gados sastādīja vidēji 31% gadā no visa valsts eksporta. Jāatzīmē, ka kopš 2005. gada nozares eksportētās produkcijas vērtības proporcija kļūst aizvien mazāka, 2007. gadā sastādot 24%, bet 2008. gadā tikai 18%, kas ļauj secināt, ka notiek citu Latvijas ražošanas nozaru ražoto produktu strauja eksporta attīstība. Nozares imports šajos 9 gados sastādījis vidēji 6% gadā. 2008. gada veiktā pētījumā par Latvijas eksporta nākotnes struktūru kokrūpniecība atzīta par konkurētspējīgāko no visām nozarēm 2005. gadā, taču atzīts, ka šāda eksporta struktūra, kāda tā ir šobrīd, nav labvēlīga ilgtspējīgai eksporta attīstībai. (Dāvidsons, Vītola, 2008).

Ražošanas sektoru analīzes norāda, ka 2008. gadā visos ražošanas sektoros, izņemot kokskaidu plātņu eksportā, salīdzinājumā ar 2007. gadu, ir vērojams produkcijas apjomu un vērtības samazinājums gan eksportā, gan importā, kas saistīts ar visā nozarē pašlaik notiekošajām straujajām izmaiņām globālā mērogā, ko izraisījis gan ar ekonomikas lejupslīdes ietekmētais pieprasījuma straujais samazinājums Latvijā un pasaulē, attīstības tempu sabremzēšanos galvenajās patērētājindustrijās – būvniecībā un transportā, elektroenerģijas un dabas gāzes resursu cenu kāpums, strauji pieaugošās darbaspēka izmaksas un zemais produktivitātes līmenis.

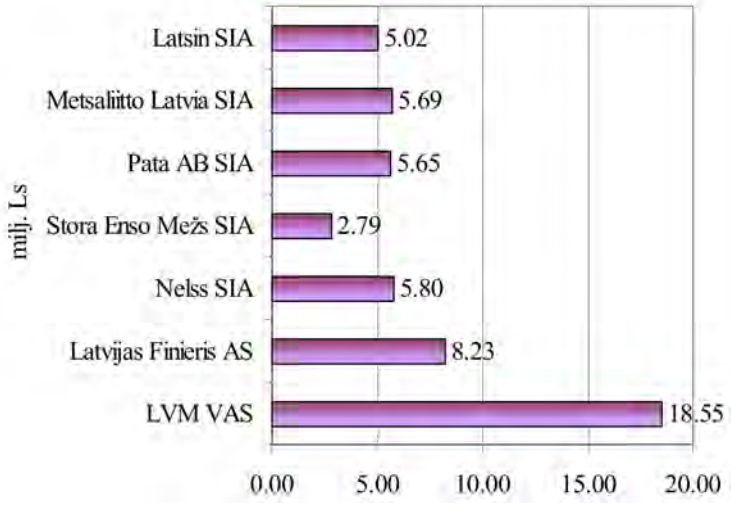
Analizējot Latvijas 7 lielāko kokrūpniecības uzņēmumu apgrozījumu (2.attēls), redzams, ka kopš 2004. gada 2 nozares lielākie uzņēmumi bijuši VAS Latvijas Valsts meži un AS Latvijas Finieris, kas 2007. gadā mainījušies vietām – līdz tam lielākais pēc apgrozījuma bija AS Latvijas Finieris, bet 2007. gadā par lielāko nozares spēlētāju kļuva VAS LVM, ko R. Strīpnieks un K. Klauss skaidro ar 2007. gada superaugstajām apaļkoksnes cenām, kas ievērojami palielināja galvenā nozares resursu turētāja – pārdevēja apgrozījumu un peļņu. (Ķirsons, 2008)

VAS Latvijas Valsts meži un AS Latvijas Finieris arī analizētajā laika periodā nodrošinājuši vidēji lielāko apgrozījuma pieaugumu gadā, attiecīgi 19 milj. un 8 milj. Ls/ gadā (3.attēls). Nelielu, bet stabilu ikgadējo apgrozījuma kāpumu nodrošinājis SIA Metsaliitto Latvia, 2008. gadā pārspējot SIA Nelss (2008. gadā pārtapis par AKZ Timber), kas līdz 2007. gadam ieņēma stabilu otro vietu pēc apgrozījuma. Saskaņā ar **uzņēmumu apgrozījuma iedalījumā pēc komersantu lieluma**, ***1106*** mikrouzņēmumi, kas nodarbina ***4515 iedzīvotājus, rada tikai*** 6 % no kopējā



* LVM VAS – Valsts akciju sabiedrība „Latvijas Valsts meži"
Avots: autoru veidots pēc Latvijas uzņēmumu Top 500, 2001.-2009.

2.att. **Latvijas 7 lielāko kokrūpniecības uzņēmumu apgrozījums 2000.-2008. g., milj. Ls.**



Avots: autoru aprēķini pēc Latvijas uzņēmumu Top 500, 2001.-2009.

3.att. **Latvijas 7 lielāko kokrūpniecības uzņēmumu vidējais apgrozījuma pieaugums gadā 2000. - 2008. g., milj. Ls.**

nozares uzņēmumu apgrozījuma. Savukārt lielie uzņēmumi (ar darbinieku skaitu 100 un vairāk) veido lielāko nozares apgrozījumu – 58 %.

Vērtējot uzņēmumu peļņas dinamiku redzams, ka būtisks palielinājums ir VAS LVM, kas 2007. gadā, kad citiem uzņēmumiem peļņa samazinājās, sasniedza straujāko peļņas pieaugumu – vairāk kā 2 reizes. AS Latvijas Finieris, ka ir otrs lielākais peļņas guvējs nozarē, straujāko peļņas pieaugumu – 824 reizes – piedzīvojusi 2004. gadā, ko var skaidrot ar jaunajām iespējām un tirgiem Latvijai iestājoties ES. Vislielākais – divpadsmitkārtīgs – peļņas samazinājums 2007. gadā bijis SIA Metsaliitto Latvia. Viszemākie peļņas rādītāji bijuši SIA Stora Enso Mežs, kas 2 gados pat strādājis ar zaudējumiem. Otri zemākie peļņas rādītāji bijuši SIA Latsin. Visiem šiem uzņēmumiem kopīgs ir tas, ka tie 100% nepieder Latvijas uzņēmējiem, ar ko iespējams izskaidrot šo uzņēmumu stratēģiju, ražot zemas pievienotās vērtības preces, strādājot ar zemu peļņu un rentabilitāti, lai eksportētu lētus izejmateriālus uz to īpašnieku valstīm un pievienoto vērtību radītu tur. Respektīvi, tas ir lielu koncernu iespēju meklēšana izvietot ražotnes tuvāk lētu izejmateriālu tirgum, tajā pašā laikā pievienoto vērtību radot savā valstī.

Kokrūpniecības nozare ir galvenā rūpniecības nozare lielākajā daļā industriālo valstu, turklāt, kā secina Eiropas Kokrūpniecības federācija, mežs ir ļoti nozīmīgs jauno dalībvalstu resurss. Kokrūpniecība kā nozare ir starp TOP 3 nozīmīgākajām nozarēm tādās valstīs kā Austrija, Somija un Portugāle. (The woodworking industry, 2007) Latvijā, Igaunijā, Ungārijā un Čehijā

šī nozare atzīta par ļoti svarīgu. (The Industry facts…, 2005)

Kā ES kokrūpniecības nozares, kurā iekļaujas arī Latvijas kokrūpniecības nozare, konkurētspējas galvenā priekšrocība ir definēta ķēde: produkts → darbs → bagātība → izaugsme. (Wall, 2008b.)

Ja analizē nozares nozīmi katrā valstī, tad to var izvērtēt vadoties no vēl kāda rādītāja – nozares nozīmīgums ražošanas sektorā (pievienotā vērtība un nodarbinātība). Kokrūpniecība ES rada aptuveni 8% pievienotās vērtības īpatsvaru no kopējās rūpniecības pievienotās vērtības. (Wall, 2008b.) Pēc šī rādītāja ES kontekstā līdere ir Latvija ar 26%, tai seko Igaunija ar 18% un Somija ar 17% kokrūpniecības pievienotās vērtības īpatsvaru kopējā ražošanas sektora radītajā pievienotajā vērtībā valstī. (Statistics in focus, 2008)

Pašreiz Eiropas kokrūpnieki saražo 6 milj. m^3 produkcijas, ~340 000 uzņēmumos, kas veido 2-4% no apstrādes nozaru produktu kopējas vērtības. (Introduction, 2005) Turklāt šī nozare ES ir tā, kurā tehnoloģiskā un inovatīvā attīstība noris visstraujāk, lai patērētājus nodrošinātu ar videi draudzīgiem un inovatīviem produktiem 21. gadsimtā.

Kopējais nozares apgrozījums 2007. gadā ES-27 sastādīja 340 mljrd. EUR.

Kopējā ES kontekstā kokrūpniecības būtiskākais ražošanas sektors ir mēbeļu ražošana un eksports – 49% no kopējā nozares apgrozījuma. Tas skaidrojams ar to, ka mēbeles ir produkts, kurš rada visaugstāko pievienoto vērtību, tam seko būvniecības elementu ražošanas sektors un zāģmateriāli. Ja vērtē šos sektorus pēc nodarbinātības, tad līderi ir mēbeļu ražošanas sektors, kam seko būvniecības elementi un zāģmateriāli, arī pēc uzņēmumu skaita sektorā līderis ir mēbeļu ražošana (43%), kam seko būvniecības elementu ražotāji ar 33% un zāģmateriālu ražotāji ar 10% no kopējā nozarē darbojošos uzņēmumu skaita.

Neskatoties uz spēcīgi attīstīto ražošanu nozarē, kā arī bagātīgo resursu bāzi, galvenie resursu un produkcijas piegādātāji ES ir Krievija, kura aizņem 19% no kopējā tirgus, Ķīna – 17% un Brazīlija – 8%. (Statistics in focus, 2008)

Piecas no ES-27 dalībvalstīm ir vadošās kokrūpniecībā. Šīs valstis ir – Vācija, Lielbritānija, Itālija, Francija un Spānija. To kopējais uzņēmumu skaits sastāda gandrīz pusi no ES-27 uzņēmumu kopskaita nozarē, arī nodarbināto skaits šajās 5 valstīs ir gandrīz puse no nozarē kopējā nodarbināto skata ES. Šīs valstis veidojušas aptuveni 2/3 no nozares kopējā apgrozījuma, kā arī 2/3 no kopējās pievienotās vērtības 2005. gadā kokrūpniecībā. Šie būtiskie rādītāji nenoliedzami apstiprina to, ka šīs valstis ir līdervalstis ES kokrūpniecībā. Jāsecina, ka Lielbritānija un Vācija ir arī lielākie eksporta un importa partneri Latvijai. Pēc prognozēm presē, šajās valstīs saražotās produkcijas eksports ir samazinājies un lielais saražotais daudzums tiek realizēts vietējā tirgū, kas vēl vairāk saasina konkurenci Latvijas kokrūpniecības nozarei tās galvenajos eksporta tirgos. (Kārkliņa, 2009)

2001.-2005. gados kokrūpniecības nozarei tika identificētas 4 barjeras, kas kavē kvalitatīvu resursu izmantošanu: tehnoloģijas; finanšu; normatīvā bāze; informācijas plūsma un izglītība.

Līdz ar to ES līmenī kokrūpniecībai definēti 5 būtiskākie izaicinājumi, kas ietekmēs visu ES nozari kopumā un katru valsti atsevišķi:

1. piekļuve resursiem,
2. klimata pārmaiņu politisko dokumentu ietekme,
3. inovācijas, zinātne un attīstība,
4. tirgus un sadarbība ar trešajām valstīm,
5. komunikācija nozarē un informācija.

Kopumā var secināt, ka meža nozare visā pasaulē šobrīd ir krustcelēs. Pieprasījums pēc koksnes produktiem pieaug, arvien vairāk tiek pārstrādātas koksnes daļas, kuras kādreiz tika uzskatītas par atliekām.

Tomēr, lai nodrošinātu efektīvu rentablu koksnes produktu ražošanu, ir nepieciešami būtiski ieguldījumi 2 galvenajos virzienos:

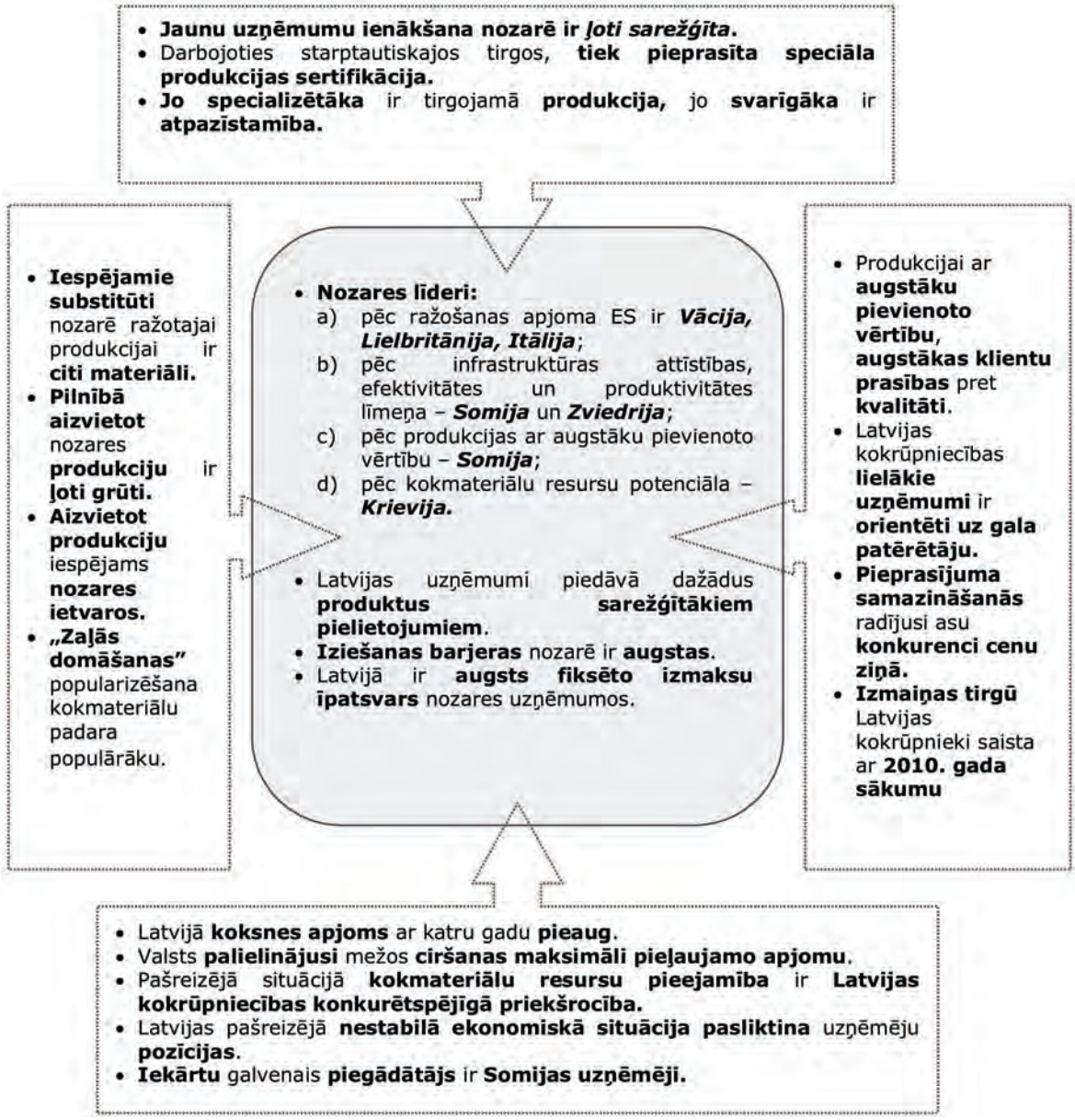
- meža infrastruktūras izveidošanā un uzturēšanā, kas nodrošina iespēju plānot koksnes produktu transportēšanas loģistiku ar vislielāko efektivitāti, ņemot vērā gan transportēšanas attāluma, gan kokvedēja pilnas masas optimizēšanu,
- darba ražīguma palielināšanā, iespējami samazinot degvielas patēriņu mežizstrādes laikā.

Tāpat baltoties uz iepriekš veikto analīzi var secināt, ka pozitīvi vērtējams ir tas, ka uzņēmēji domā par ilgtspējīgu attīstību, par ilgtermiņa attiecībām ar biznesa partneriem un darbiniekiem, par investīcijām, un veiksmīgākie uzņēmumi nebūt tik ļoti neatpaliek no ES vidējiem rādītājiem. Svarīgi saprast, ka šobrīd globālajā vidē vairāk ir jādomā ne tikai par „pliku" produktu, bet par to, kā šim produktam pievienot vērtību gan ražošanas procesā, gan arī tad, kad ražošanas process beidzies, respektīvi – serviss, apkalpošana, fleksibilitāte (elastība), piegādes, pēcapkalpošana – jo arī šie procesi rada produktam pievienoto vērtību un paaugstina tā konkurētspēju tirgū. Latvijā ir stabila resursu bāze un iespējas nodrošināt piegādes laikā, ko papildus apstiprina grozījumi MK rīkojumā par ciršanas apjoma palielināšanu – tas ir jāizmanto, šīs jomas ir jāpilnveido un jāattīsta.

Apvienojot visus iepriekš minētos faktorus un izdevīgo Latvijas ģeogrāfisko izvietojumu, kas ļauj nodrošināt piegādes nepieciešamajā vietā un laikā, tradīcijas un vēl daudzus citus nozīmīgus faktorus, Latvijas kokrūpniecība ir stabils sadarbības partneris ārvalstu tirgos.

2. Latvijas kokrūpniecības nozares konkurētspējas izvērtējums

Latvijas kokrūpniecības nozares konkurētspēju novērtēšanai tika veikta nozares ekspertu aptauja un intervijas, kas nodrošināja objektīvāku informāciju par faktoriem, kas ietekmēs kokrūpniecības nozares konkurētspēju. Aptaujā un intervijā piedalījās 13 eksperti, kas pārstāv Latvijas vadošos kokrūpniecības nozares uzņēmumus un ieņem vadošus amatus tajos, kas ļauj tiem sniegt vērtējumu par nozari kopumā. Lai noteiktu kokrūpniecības nozares attīstības perspektīvas,



Avots: autoru pētījums

4.att. **Latvijas kokrūpniecības nozares konkurētspēju ietekmējošie spēki pēc M.Portera 5 spēku modeļa**

aptaujā un intervijās iegūtā informācija tika izvērtēta un analizēta pēc trīs metodēm: Resource-based view (RBV) metodes, SVID metodes un M. Portera 5 spēku modeļa.

Veicot nozares analīzi pielietojot ***RBV metodi***, kā nozares konkurētspējīgā priekšrocība izvirzījās zemās resursu izmaksas, taču tas tiek vērtēts īstermiņā. Ilgtermiņā nozares konkurētspējīgā priekšrocība ir jābalsta uz augstākas pievienotās vērtības produkcijas ražošanu un nišas produktu ražošanu, cieši sadarbojoties ar klientu, un maksimālā apjomā utilizējot visus koksnes resursus, kas radušies mežistrādes un ražošanas procesos.

Latvijas kokrūpniecības nozares ***SVID analīze*** liecina, ka eksperti kā būtiskākās stirpās puses ir novērtējuši resursu pieejamību par salīdzinoši zemu cenu un nozares kompetento un zinošo vadošo personālu, kvalificētos speciālistus. Taču jāņem vērā, ka pašreizējā salīdzinoši zemā cena ir īslaicīga priekšrocība, uz kuras nevar modelēt nākotnes attīstību. Kā būtiskākā vājās puses ir novērtējuši zemo darba ražīgumu, efektivitāti un jaudu neizmantošanu, kā arī tehnoloģiju trūkums nekvalitatīvās koksnes un kokapstrādes atlieku pārstrādei. Savukārt pavisam nebūtisks ekspertu skatījumā ir fakts, ka Latvijā nav pieejami visu veidu resursi un patērētāju stereotips, ka kokmateriāli ir nepiemērots materiāls būvniecībai. Autori izprot un piekrīt šādam vērtējumam, jo pēdējās 2 vājās puses iespējams viegli mainīt, strādājot ar sabiedrību vai ievedot nepieciešamos materiālus, bet nozares

konkurētspēju kopumā šie faktori būtiski neietekmē. Pozitīvi vērtējam fakts, ka eksperti ir saskatījuši daudz iespējas, ko nozares uzņēmumi var izmantot, lai paaugstinātu nozares konkurētspēju. Iespējas, kas vispozitīvāk varētu ietekmēt nozares stiprās puses, ir:

- esošo sistēmu, procesu audits, loģistikas pilnveidošana,
- strādājošo kvalifikācijas celšana,
- jaunu tehnoloģiju ieviešana.

Savukārt iespējas, kas vispozitīvāk varētu samazināt nozares vājās puses, ir:

- jaunu tehnoloģiju ieviešana,
- strādājošo kvalifikācijas celšana
- tiekšanās uz resursu pilnīgu un racionālu izmantošanu produkcijas ražošanā.

Pēc ekspertu vērtējuma var secināt, ka draudi, kas visnegatīvāk varētu ietekmēt nozares stiprās puses, ir:

- neprognozējamā nodokļu politika,
- nespēja apgrozāmos līdzekļus saņemt bankās,
- kvalificētu speciālistu trūkums.

Draudi, kas visnegatīvāk varētu ietekmēt nozares vājās puses, ir:

- kvalificētu speciālistu trūkums,
- nespēja apgrozāmos līdzekļus saņemt bankās,
- sīva konkurence no apkārtējo valstu uzņēmējiem.

Kontekstā ar iespējām un draudiem, stiprās puses, kuras vispozitīvāk varētu ietekmēt noskaidrotās iespējas ir:

- preču ar augstu pievienoto vērtību, labu kvalitāti un specifisku produktu ražošana,
- modernās, jaunās tehnoloģijas ražotnēs, lielās iespējamās ražošanas jaudas.

Šos pašus faktorus visvairāk ietekmētu arī noskaidrotie draudi, no tā izriet, ka šie abi faktori ir ļoti jūtīgi uz ārējās vides ietekmi.

Būtiskākās vājās puses visvairāk varētu mazināt noskaidrotās iespējas. Savukārt draudu ietekmē pieaugtu sekojošu vājo pušu būtiskums:

- zemais darba ražīgums, efektivitāte, jaudu neizmantošana,
- visu veidu resursu nepietiekamība.

Kopumā izvērtējot iegūtos SVID analīzes rezultātus, ir iespējams modelēt, kā varētu neitralizēt kādu negatīvo faktoru, izmantojot vienu vai otru pozitīvo, kā padarītu par mazāk bīstamu kādu draudu faktoru. Jāizstrādā efektīvus modeļus, kā esošās iespējas izmantot un realizēt.

Taču jāuzsver, ka visus noskaidrotos faktorus nevar attiecināt viennozīmīgi uz visu nozari. Eksperti atzina, ka grūti ir novērtēt nozari kā vienu veselumu, jo katram ražošanas sektoram ir savas īpatnības un katram produktam ir atšķirīgs pielietojums, tirgus sektors, kura attīstība vai stagnācija ietekmē produkta attīstības iespējas vai kavē to, rada draudus. Piemēram, produktivitātes kāpuma nepieciešamību, saistībā ar tehnoloģiskajiem risinājumiem, nevar vērtēt viennozīmīgi, jo lielajiem uzņēmumiem šis nodrošinājums ir pietiekošs, savukārt kavējošs faktors nozares kopējo rādītāju uzlabošanai ir MVU (mikro, mazo un vidējo uzņēmumu) zemais tehnoloģiskais nodrošinājums.

Izmantojot ***M. Portera 5 spēku modeļa*** metodi kokrūpniecības konkurētspējas novērtēšanā, iegūtie rezultāti sakārtoti 4.attēlā.

Apkopojot visus iepriekš analizētos ekspertu viedokļus un sadalot tos pa pozīcijām – konkurence nozarē, pircēju un piegādātāju spēks, aizstājējpreču un jaunienācēju draudi, var secināt, ka pašreizējā situācija nozarē ir ļoti saspringta. Lielas aktivitātes un spiediens jūtams no pircējiem, piegādātājiem, un arī konkurenti ir ļoti aktīvi. Potenciālo konkurentu parādīšanās un aizstājējpreču radītie draudi Latvijas kokrūpniekiem pagaidām ir otrajā plānā.

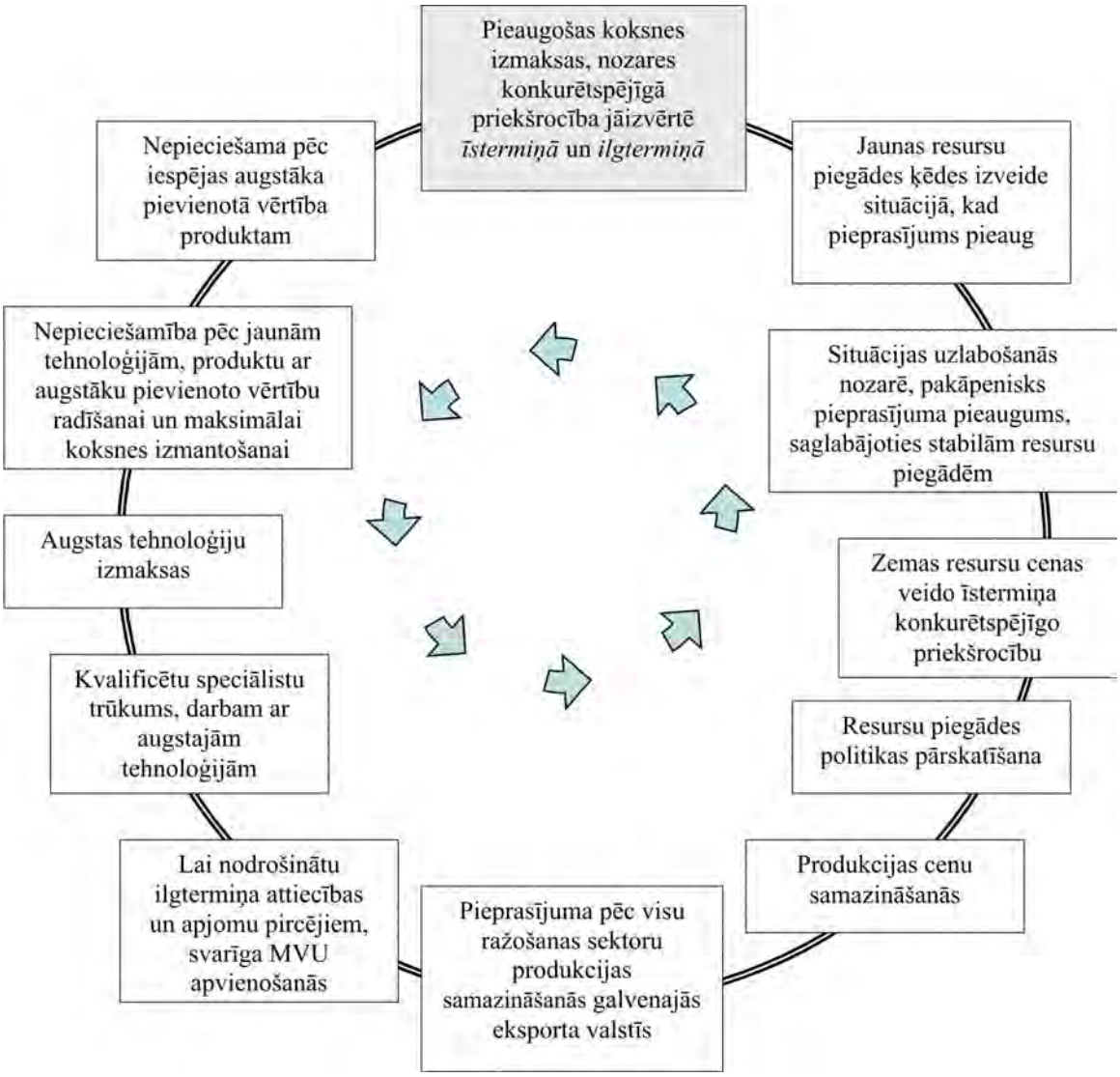
3. Latvijas kokrūpniecības nozares konkurētspējas paaugstināšanas iespējas

Apkopojot veiktā pētījuma rezultātus un esošās situācijas analīzi, tika izstrādāts nozares problēmaplis (5. attēls), kas aptver 2007.-2010. gadu laika posmu – no nozares izaugsmes maksimuma brīža, līdz ar nākotnes izteiktām prognozēm. Problēmaplī atspoguļota savstarpēji saistītu procesu ķēde, kurā katrs nākamais posms nav iespējams bez iepriekšējā. Kā centrālā problēma izvirzīta pieaugošās resursu (koksnes) izmaksas, kas, pēc ekspertu domām, iezīmēja Latvijas kokrūpniecības posma beigas, kurā konkurētspējīgā priekšrocība balstījās uz zemām izmaksām (galvenokārt koksnes un darbaspēka).

Aplī atspoguļota sekojoša notikumu savstarpējā kopsakarība: 2007. gadā, pieaugot pieprasījumam pēc kokrūpniecības produkcijas, kā arī Zviedrijas lielajam pieprasījumam pēc apaļkokiem papīrmalkas sektora vajadzībām, resursu izmaksas strauji pieauga, kā rezultātā pieauga gatavās produkcijas cenas visos kokrūpniecības sektoros, atsevišķos sektoros pat līdz 15%. Šajā periodā konkurētspējīgā Latvijas kokrūpniecības priekšrocība bija jāsāk balstīt uz citām vērtībām, ne vairs zemajām resursu izmaksām. Tātad produkcijai jābūt ar augstu pievienoto vērtību vai nišas produktam. Kas attiecas uz zāģmateriālu sektoru, 2007. gadā pieprasījums strauji auga un tie tika eksportēti, attīstoties būvniecībai. Lai produkts noturētos tirgū, ražotājam bija jāattīstās kopā ar patērētāju, bija nepieciešami jauni zinātniskie pētījumi par produkcijas pielietojumu, tās nozīmīgumu, kā arī jauni tehnoloģiskie risinājumi. Būtisks faktors šajā periodā bija un joprojām ir MVU uzņēmumu lielais īpatsvars nozarē, kuru apvienošanās būtu risinājums piegādes apjomu nodrošināšanai, kā arī veicinātu jaunu tehnoloģiju ieviešanu.

Sektoros, kuri orientējas uz ražošanas jaudu kāpināšanu un produkcijas ar augstāku apstrādi ražošanu, radās nepieciešamība pēc investīcijām jaunās tehnoloģijās, kas samazinātu darbaspēka izmaksas gala produkcijā, ļautu palielināt apjomus un kvalitāti, kas ir būtiski, ja orientējas uz ilgtermiņa sadarbību ar gala patērētājiem.

Būtiskas ir ne tikai ražošanā pielietotās tehnoloģijas, bet, kāpinot ražošanu, radās nepieciešamība pēc tehnoloģijām, kas atrisinātu atlikumu pārstrādi un nodrošinātu nozari ar bezatlikuma ražošanu. Diemžēl augstās tehnoloģiju izmaksas ir iemesls, kādēļ nozares produktivitāte joprojām ir salīdzinoši zema. Protams, tas



Avots: autoru pētījums

5.att. **Latvijas kokrūpniecības nozares problēmu aplis 2007.-2010.g.**

skaidrojams arī ar lielo MVU īpatsvaru nozarē. Lielie uzņēmumi investīcijas veic regulāri, orientējoties uz augstu produktivitāti un kvalitāti, kā arī darbu efektivitāti.

Attīstoties tehnoloģijām, būtiski, lai uzņēmumi būtu nodrošināti ar kvalificētu darbaspēku, kura trūkumu nozarē uzsver eksperti.

Sākot ar 2007. gada beigām un 2008. gada sākumā pieprasījums sāka samazināties. Rezultātā radās situācija, kad eksporta apjomi Latvijas kokrūpniecībai strauji samazinājās, bet konkurence galvenajos eksporttirgos saasinājās, jo Vācija un Lielbritānija savu saražoto produkciju sāka realizēt vietējā tirgū, nevis lielos apjomos eksportēt uz ASV un Kanādu, kur arī bija vērojams pieprasījuma samazinājums būvniecības sektorā. Saasinoties konkurencei, neizbēgami tirgū sāka kristies cenas. Latvijas kokrūpnieku uzdevums šajā posmā bija meklēt jaunus risinājumus, kā nezaudēt iekaroto tirgu un saglabāt konkurētspēju. Šo procesu rezultātā tika pieņemti grozījumi MK 2005. gada 5. oktobra rīkojumā Nr. 655 „Par koku ciršanas maksimāli pieļaujamo apjomu 2006.-2010. gadam". Rezultātā Latvijas kokrūpniecības nozarei ir nodrošināta stabila resursu piegāde situācijā, kad privātie meža īpašnieki neizcērt savus mežus.

Kā atzina vairāki eksperti, viens no iemesliem, kāpēc šobrīd sāk parādīties pozitīvas iezīmes kokrūpniecības eksportā, ir šis politiskais lēmums, kas saražoto produkciju padara konkurētspējīgu esošo cenu līmenī ES tirgū. *Tātad šobrīd Latvijas kokrūpniecības nozares konkurētspējīgā priekšrocība ir zemās resursu (galvenokārt koksnes un darbaspēka) izmaksas,* taču, šī priekšrocība ir tikai īstermiņa, jo, tiklīdz tirgus atdzīvosies, šiem resursiem cenas augs.

Sākot ar 2009. gada beigām un 2010. gada sākumā, eksperti prognozē, ka nozarē iespējamas pozitīvas tendences, eksportētā apjoma pieaugums, kā rezultātā prognozējas lēns vidējās cenas kāpums 2010. gada beigās.

Tā kā situācijai uzlabojoties prognozēts cenu kāpums resursiem, nozares problēmapli veidojošie faktori atgriežas sākumpunktā. Šāda situācija ir jānovērš, tāpēc, balstoties uz iepriekš veikto analīzi un ekspertu viedokļiem, definēti Latvijas kokrūpniecības nozares attīstības virzieni un veicamie uzdevumi mērķa sasniegšanā:

1. Ilgtspējīgas mežu apsaimniekošanas nodrošināšana nākotnē.
2. Produktu ar augstāku pievienoto vērtību ražošana, lielākos apjomos par zemākām izmaksām.
3. Resursu bezatlikumu izmantošanas nodrošināšana ražošanas procesā.
4. MVU uzņēmumu apvienošanās veicināšana.
5. Nozares nodrošināšana ar kvalificētu darbaspēku, tā piesaistīšana kokrūpniecības uzņēmumos.
6. Spēcīgas nozares zinātniskās un izglītības bāzes nodrošināšana, tās sadarbības veicināšana ar nozares uzņēmumiem.
7. Vienotas, kvalitatīvas, pieejamas un salīdzināmas kokrūpniecības nozares informācijas bāzes veidošana.

Kokrūpniecības nozare ir cieši saistīta ar meža nozari, jo tā nodrošina nozari ar resursiem, kuru esamība un pietiekamība ir viens no būtiskākajiem faktoriem konkurētspējīgas kokrūpniecības pastāvēšanai Latvijā. Tāpēc meža īpašniekiem jāievēro princips – daļu no līdzekļiem, kas saņemti par kokmateriāliem, ir jāiegulda atpakaļ mežā, lai tā vērtība nesamazinātos, savukārt ražotājiem, lai veicinātu nozares attīstību, ir jāiegādājas resursi no meža īpašniekiem par atbilstošu samaksu.

Lai ražotu produktus ar augstāku pievienoto vērtību, lielākos apjomos par konkurētspējīgu cenu, ražošanā arvien plašāk jāturpina ieviest modernas, augstražīgas, ekoloģiskām prasībām atbilstošas tehnoloģijas ne tikai lielajos uzņēmumos, bet arī MVU. Tas sekmēs roku darba izskaušanu un samazinās morāli novecojošo tehnoloģiju negatīvo ietekmi uz vidi, ļaus kāpināt ražošanas apjomu, samazināt darbaspēka izmaksu īpatsvaru uz 1 kokrūpniecībā saražoto vienību, palielināt darba efektivitāti, palielināt vidējo saražoto apjomu uz 1 darbinieku, tuvinās visas nozares produktivitāti ES vidējam līmenim, un palielinās pievienoto vērtību uz 1 m^3 koksnes produkcijas, kā rezultātā Latvijas kokrūpniecības nozare kļūs konkurētspējīgāka globālā tirgū.

Kokrūpniecības attīstība jābalsta uz pārstrādes pakāpes paaugstināšanu, ko var sasniegt nodrošinot resursu bezatlikumu izmantošanu ražošanas procesā. Tātad nepieciešams ieviest jaunas tehnoloģijas, kas radītu arī jaunus produktu veidus un to pielietošanu. Ārvalstu un Latvijas labāko uzņēmumu pieredze liecina, ka ražošanas rentabilitāti var ievērojami paaugstināt, ieviešot bezatlieku tehnoloģiju. Tā kā koksnes atliekas rodas ne tikai ražošanas procesā, bet arī mežizstrādes procesā, tad šajā posmā jāmeklē iespējas ieviest bezatlikumu resursu izmantošanu. Iespējamā atlieku izmantošana var būt enerģijas ieguvei, granulu vai brikešu ražošanai.

Tehnoloģiju modernizācijas procesā daļēji vai pilnībā mainās darbinieka pienākumi. Tāpēc mežizglītībā viens no svarīgākajiem uzdevumiem ir sagatavot apmācītus, kvalificētus speciālistus, kas labi pārzinātu un izprastu ražošanu, ražošanas tehnoloģijas, meža darba tehnoloģiju un tehniku, meža ekoloģijas pamatus. No tā ir atkarīga nozares nākotnes kvalitāte. Lai nodrošinātu kvalitatīvu un mūsdienu vajadzībām atbilstošu izglītību, jāveicina uzņēmēju ciešāka sadarbība ar izglītības iestādēm un valsti.

Lai celtu nozares prestižu, popularizētu nozari kā potenciālo darba vietu, popularizētu nozares produktus, uzsverot to pozitīvās īpašības, būtiski ir izglītot sabiedrību par kokrūpniecību un tās ražoto produkciju. Nepieciešams veidot gan esošo, gan potenciālo darbinieku un klientu lojalitāti pret visu nozari kopumā. To iespējams panākt, radot interesi jauniešos jau skolas laikā, lai vēlāk piesaistītu tos nozarei kā jaunus speciālistus.

Mežzinātnē ir svarīgi turpināt jau ilgstoši veiktos pētījumus resursu racionālā izmantošanā. Plašāk ir jāpievēršas praktiskiem jautājumiem, saistītiem ar esošo tehnoloģisko procesu analīzi, dažāda tipa tehnoloģiju izmantošanas efektivitātes izpēti u.c. ražotāju izvirzītiem jautājumiem.

Latvijas kokrūpniecībā darbojas daudz MVU, kas nespēj izpildīt lielus pasūtījumus un nodrošināt regulāras piegādes pircējiem, arī investīciju piesaiste šiem uzņēmumiem ir sarežģītāka nekā lielajiem. Kā iespējamais risinājums ir apvienošanās, kas nodrošinātu izmaksu samazinājumu veicot dažādus saimnieciskus pasākumus, ļautu attīstīt jaunus produktus, virzīt ražošanā inovatīvas idejas. Pasaulē, lai kāpinātu konkurētspēju, uzņēmumi veiksmīgi veido klāsterus, arī Somijas kokrūpniecības nozarē tie ir pierādījuši savu efektivitāti. Tomēr jāatzīmē arī fakts, ka Somijas kokrūpniecības nozares klāsteris ir veidojies vairākus desmitus gadu, kas nozīmē, ka tas ir ilgtermiņa risinājums, bet īstermiņa klāstera veidošana Latvijas kokrūpniecībai neko nedos.

Lai nozares konkurētspēja tiktu paaugstināta, būtiski ir pieņemt stratēģiskus lēmumus uz patiesas un visiem vienādas informācijas pamata. Tāpēc kā būtisku uzdevumu nozarei autori saskata informācijas un aktuālo datu aprites harmonizēšanu starp dažādām institūcijām un organizācijām, kā arī brīvas piekļuves nodrošināšanu operatīvajiem datiem.

Pieņemot stratēģiskus lēmumus un veicot nozares attīstības plānošanu – mērķu un uzdevumu definēšanu, jāņem vērā arī attīstības cikls, kurā kokrūpniecības nozare atrodas (veidošanās, augšanas, konkurences pastiprināšanās, brieduma, samazināšanās). Pēc ekspertu vērtējuma, nozare atrodas augšanas ciklā. Autori uzskata, ka cikls, no kura nozare patlaban cenšas iziet, ir „vienkāršie produkti" ar mazu apstrādes līmeni un šī produkcija atrodas samazināšanās ciklā. Savukārt nozare tiecas uz produkcijas ražošanu ar augstu pievienoto vērtību un šajā līmenī tā – atrodas augšanas ciklā, robežojoties ar konkurences pastiprināšanās stadiju.

Iespējamie finansēšanas avoti nozares konkurētspējas paaugstināšanai ir Valsts un ES finansējums, kā arī uzņēmumu līdzekļi.

Uzņēmumiem, izmantojot to rīcībā esošās finanses, jāveic uzņēmumos esošā darbaspēka

kvalifikācijas celšana. Piesaistot ES fondu līdzekļus tehnikas modernizēšanai, darba efektivitātes celšanai un tehnoloģiju ieviešanai ražošanā. ES 2007.-2013. gadu plānošanas periodā uzsvars tiks likts uz atjaunojamo energoresursu ražošanas ķēdes attīstību, līdz ar to uzņēmumiem ir iespēja piesaistīt līdzekļus bezatlikumu tehnoloģijas ieviešanai.

Secinājumi un priekšlikumi

1. Kokrūpniecības līdervalstis ES-27 ir Vācija, Lielbritānija, Itālija, Francija un Spānija. Kopējais uzņēmumu skaits tajās sastāda gandrīz pusi no uzņēmumu kopskaita nozarē, nodarbināto skaits ir gandrīz puse no nozarē kopējā nodarbināto skaita ES-27; 2005. gadā tās veidoja aptuveni 2/3 no nozares kopējā apgrozījuma, kā arī 2/3 no kopējās pievienotās vērtības kokrūpniecībā.
2. Veiksmīgi izmantojot vietējos atjaunojamos meža resursus, kokrūpniecības nozare kļuvusi par vienu no aktīvākajām Latvijas tautsaimniecības nozarēm, dodot ieguldījumu Latvijas ārējās tirdzniecības bilances stabilizēšanā.
3. Ar 2007. gada otro pusi ir vērojams kritums visos kokrūpniecības sektoros, jo krities ir pieprasījums galvenajās eksportvalstīs un patērētājnozarēs – būvniecībā un transporta industrijā.
4. Nozares konkurētspējīgā priekšrocība ilgtermiņā ir jābalsta uz augstākas pievienotās vērtības produktu un nišas produktu ražošanu, cieši sadarbojoties ar klientu, un maksimālā apjomā utilizējot vai izmantojot visus mežistrādes un ražošanas procesos radušos koksnes resursus.
5. Uzņēmumu vadītājiem ieteicams, izmantojot ES atbalsta noteiktās prioritātes plānošanas periodam no 2007.-2013. gadam, ieviest bezatlikumu tehnoloģijas uzņēmumos, tā kāpinot ražošanu un pilnībā izmantojot koksnes resursus.
6. Kokrūpniecības uzņēmumiem ieteicams veidot klāsteri, pārņemot labāko praksi no attīstīto valstu uzņēmumiem, kas nozarei kopumā nodrošinātu konkurētspējīgo priekšrocību attiecībā pret citu valsti, kāpinātu produktivitāti, paātrinātu informācijas apriti, kā arī veicinātu zinātnisko pētījumu veikšanu un inovatīvu tehnoloģiju ieviešanu.

Izmantoto informācijas un literatūras avotu saraksts

1. Dāvidsons G., Vītola K. Latvijas eksporta nākotnes struktūra. Averss un Reverss, 2008., Nr.2., 9.lpp.
2. Grūbe D. 2011. līdz 2015. gadā eksporta pieaugumu prognozē par 31.2%. [tiešsaiste] Agropols. [16.10.2009] [Skatīts: 17.10.09.] Pieejams: http://www.agropols.lv/?menu=53&newsid=91816
3. Introduction [on-line resource]. CEI-Bois, 2005. [viewed on 26.09.2009.]. Available at: http://www.cei-bois.eu/frameset.html
4. Kārkliņa G. Kokapstrāde ar būvniecību roku rokā. Multiprese, 2009., 21.apr.
5. Kokapstrāde [tiešsaiste]. LR Ekonomikas Ministrija, 2008. [skatīts 23.09.2009.]. Pieejams: http://www.em.gov.lv/em/2nd/?cat=81
6. Ķirsons M. Atpaliekam no konkurentiem [tiešsaiste]. Dienas Bizness, 2007. [skatīts 23.09.2009.]. : http://www.db.lv
7. Ķirsons M. Cenas ietekmē apgrozījumu. Uzņēmumu TOP 500 2007.gadā. Dienas Bizness, 2008.
8. Ķirsons M. Izšķirsies, kurš izdzīvos. Dienas Bizness. 2009.gada 21.oktobris. 9.lpp.
9. Latvijas lielākie uzņēmumi. TOP 500. Dienas Bizness pielikums. 2001.- 2008.
10. Meža nozare [tiešsaiste]. Latvijas Republikas Zemkopības ministrija, 2008. [skatīts 13.10.2009.]. Pieejams: http://www.zm.gov.lv/index.php?sadala=35
11. Meža nozare Latvijā [tiešsaiste]. Latvijas Republikas Zemkopības Ministrija, 2007. [skatīts 14.10.2009.]. Pieejams: http://www.zm.gov.lv/index.php?sadala=35
12. Meža nozare Latvijā 2008. Rīga: LR Kokrūpniecības federācija, 2009., 32 lpp.
13. Statistics in Focus. EUROSTAT, 2008., No.74
14. The Industry Facts and Figures [on-line resource]. CEI – Bois Roadmap 2010, 2005. [viewed on 10.10.2009.]. Available at: http://www.roadmap2010.eu/wisd/pdfs/68-81.pdf
15. The woodworking industry [on-line resource]. CEI- Bois, 2007. [viewed on 11.10.2009.]. Available at: http://www.cei-bois.eu/frameset.html
16. Wall J. (2008a) Impact of the EU Policies on the Competitiveness and Future Wood-based Panel Sector. 6th European Wood Based Panels Symposium Hanover, October 9, 2008.
17. Wall J. (2008b) The Roles of Wood in Green Building: Effects on the Forest Sector in the ECE Region. UNECE Team of Specialists on Forest Products Markets & Marketing. Workshop. Rome, October 20, 2008.
18. Zanders M. Mums ir jauni mazie un vidējie uzņēmēji. Kapitāls, 2009., Nr.1

Role of Agribusiness in Wealth Generation in Poland

Andrzej Jędruchniewicz
Department of Economics and Economic Policy
Warsaw University of Life Sciences-SGGW, Poland

Abstract. The main aim of the study is to present the role of food economy in generation of the Polish gross value added. It will be achieved through the analysis of value by branches of agribusiness. The research covers the period of 2001-2007.
Agribusiness is an important subsystem of economy in creation of the Polish wealth. The analysis based on the gross value added carried out in the study indicated that it had annual average share about 8.7% in domestic production. This value concerns food economy based on a classical structure. Agriculture had annual average share about 2.7% in GVA in the whole economy, industry of production means and services for agriculture also about 2.7%; whereas food and tobacco industry about 3.25%.
The analysis of income structure has proved that the gross operating surplus had the highest share in the gross value added of food industry in 2007 equalling to 55.64%. Costs connected with employment were also important, they represented 41.82%. The gross operating surplus had also the highest share in the gross value added contributed by agriculture, hunting and forestry in the same year. It includes nearly all the gross value added (94.89%), and it resulted from the employment structure and direct payments.
Key works: gross value added, agribusiness, agriculture, food and tobacco industry.

Introduction

From the economic point of view the main aim of human activities is to maximise needs' satisfying. The implementation of this aim forces people to produce and sell goods and services, so it leads to the increase in the wealth (Smith A., 1954). Agribusiness is one of the economy's subsystems.

The main aim of the study is to present the role of food economy in generation of the Polish gross value added. It will be performed through the analysis of this value dividing it into the branches of agribusiness.

The research covers the period of 2001-2007. The year 2000 is assumed as the base period for calculation of parameters in fixed prices. All values presented in the study are the data for the end of particular years.

Definition and methods of calculation of domestic product and generation of income account

Gross Domestic Product (GDP) is a value of production generated by means of production, which is located on an area of particular country regardless of the owner (Begg D., Fischer S., Dornbusch R., 2003). GDP is the main category in the system of national accounts and presents the final result of the activity of all entities of the national economy (Barro R. J., 1997).

Gross Domestic Product is contemporary calculated according to the system of national accounts (SNA). This system allows answering a question: who generates GDP and which goods (services) can be included into this calculation. According to the SNA's approach the product is generated by anyone whose work increases the product's value and contributes to the social wealth. This system takes into account both a material sphere of production as well as non-material services, for example science, culture, or sport. There is also a group of non-production persons in a society (children, pensioners). This group does not generate goods and services but participates in the division of GDP.

Gross Domestic Product is expressed in market prices in the system of SNA. It is measured according to three methods (Balicki W., 2001):

1) a sum of final values of goods and services;
2) a sum of gross added values + indirect taxes;
3) a sum of income of means of production + direct taxes – subsidies + amortisation.

The first method, called an expenditure approach, consists in summing of all expenditures on final goods and services purchased by a final user. They do not overcome further processing. Purchases of final goods are made by national entities (private and public) as well as foreign ones.

The second method is more "fair". Many branches in the economy are specialised in production of indirect goods, allotted to production of other goods so the gross value added (GVA) should be used in measuring of GDP in order to take into account all producers. Gross value added is a difference between the global production and the intermediate consumption (Rocznik… 2008). Apart from details it can be stated that GVA consists mainly of labour costs, amortisation, financial costs, charges and taxes (except indirect taxes) and gross financial result. It is the basic method used by the Central Statistical Office.

The third method of GDP calculation is summing of income of economic processes' participants due to the use of means of production and other parameters. There is an assumption that a value of a produced

good in the economy reflects remuneration of used means of production. Income of means of production equals to a sum of, inter alia, wages, rents, ground rents, interests, and profits.

Apart from GDP calculation, it is also essential to calculate national income and income of particular sectors. A theoretical formula for national income calculation is: Gross Domestic Product decreased by indirect taxes and amortisation; whereas increased by subsidies on products.

In Poland the account of income generation comprises (Rocznik… 2008):

1) employment costs, i.e. salaries, contributions to compulsory social security (paid by employers and employees) increased by contributions to the Labour Fund and other costs connected with employment;
2) taxes minus subsidies on production and import, which consist of taxes on products (mostly goods and services tax) and taxes from producers (for example on fixed property);
3) gross operational surplus, which is a position balancing in the account of income generation. This category reflects income from an economic activity.

Agribusiness structure

Agribusiness (food economy) is a branch of the economy, where entities are engaged directly or indirectly in activities connected with production of food and resources for its production.

A classical structure of agribusiness comprises three main branches:

- agriculture – a branch which is basics of the whole food economy. It consists mainly of plant material production of agricultural origin for the processing industry and the textile industry (fibres and leather);
- processing of resources of agricultural origin, i.e. the food industry including beverages, also alcohol as well as the tobacco industry;
- providing agriculture with means of production and services. This branch includes production of fixed assets: tractors, machines, etc.; current assets: means of protection, fertilisers, etc., and providing services, for example veterinary.

A wider approach to the agribusiness structure, apart from these three mentioned branches, comprises also (Winiarski B. (ed.), 1994, Woś A., 1996):

- industry production, which generates materials for the processing industry;
- contribution of trade to values of food commodities as well as value of materials providing for the agriculture and food industry;
- a part of production from other branches of the economy.

Level and structure of gross value added generation by agribusiness in Poland

Evaluation of the role of agribusiness in the structure of Poland's economy will be carried out on the base of the analysis of gross value added (GVA). As it was presented in the theoretical part of the

Table 1

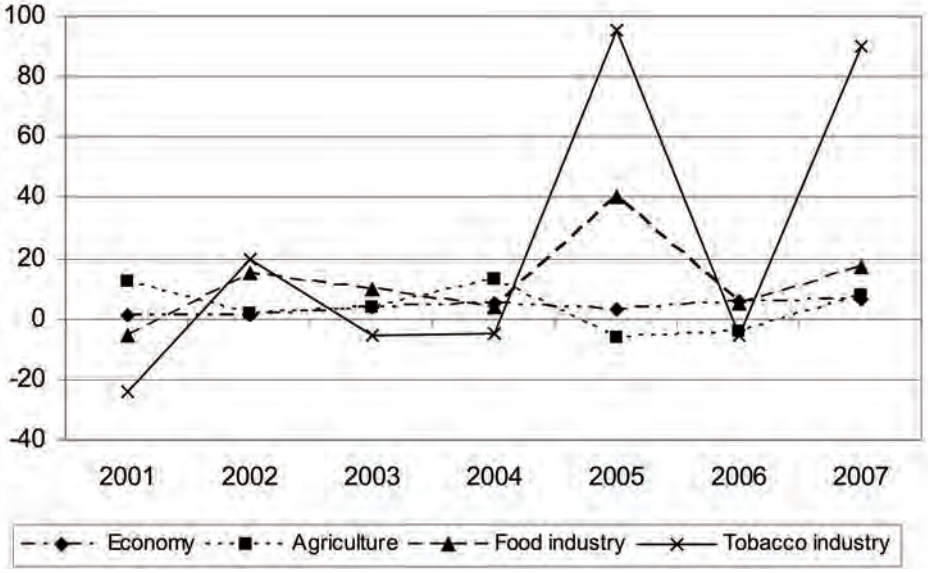
Global production (GP), intermediate consumption (IC) and gross value added (GVA) in Poland, in million PLN (current prices)

Year	National economy			Agriculture		
	GP	IC	GVA	GP	IC	GVA
2001	1499759	832564	667194	60320	40047	20273
2002	1535069	852208	682860	55706	38583	17123
2003	1610478	901872	708605	56263	39091	17172
2004	1853651	1033276	820375	69748	44200	25547
2005	1930488	1066804	863684	63329	41003	22326
2006	2156192	1225013	931179	65083	42757	22326
2007	2394995	1368502	1027631	81509	52277	29232
Year	**Food industry**			**Tobacco industry**		
	GP	IC	GVA	GP	IC	GVA
2001	101144	77911	23233	2891	2176	714
2002	98121	77928	20195	3245	2409	836
2003	105761	84474	21287	3466	2645	821
2004	119460	95558	23901	3370	2795	574
2005	126484	98551	27933	3905	2607	1298
2006	133184	104615	28570	4037	2869	1168
2007	155083	122383	32700	5596	3339	2257

Source: *Rocznik Statystyczny RP* (2002-2008), Warszawa: GUS, *Rocznik Statystyczny Przemysłu* (2002-2008), Warszawa: GUS, *Rocznik Statystyczny Rolnictwa i Obszarów Wiejskich* (2002-2008), Warszawa: GUS

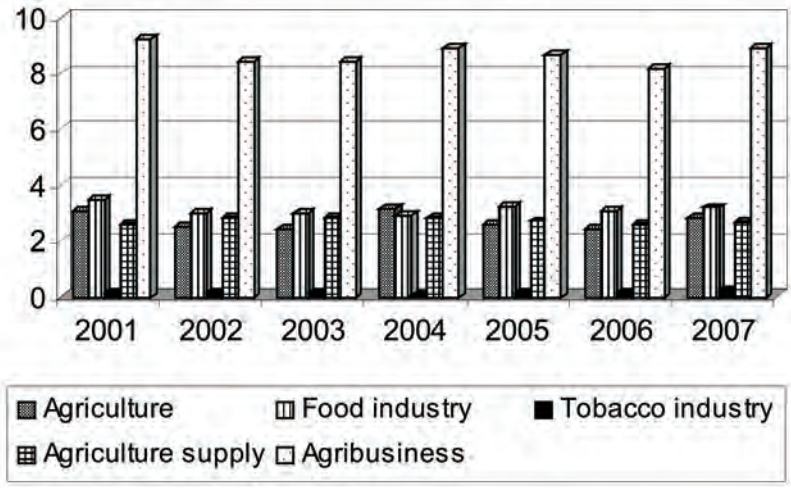
study, it is the basic element of the second method for gross domestic product calculation. The use of gross value added allows to precise evaluation of the level and change in the wealth generation in Poland by the food sector as well as from the technical point of view, it is the best for calculations and comparisons, since it occurs in statistics concerning nearly all branches of the economy.

Table 1 presents the basic categories concerning the whole economy as well as agribusiness, which allow evaluating the value of generated production and value added. The analysis of the global production, intermediate consumption and gross value added in current prices shows that they have had the highest values in 2007. It is not surprising taking into account the increase in process of generated and sold products. In 2007, GVA of the whole Polish economy firstly exceeded PLN one billion (PLN 1.02 billion). Data from Table 1 allows presenting the structure of the global production. The intermediate consumption in the whole economy, i.e. consumption of materials, resources, energy and other costs, was at the level of 55% of global production. In agriculture the figure was respectively about 68%, while in the food industry about 78%. The tobacco industry was characterised by the higher changeability: from 59% to 83%. These results prove that generation of the national wealth through producing goods is more expensive as using services for this aim.



Source: *Rocznik Statystyczny RP* (2002-2008), Warszawa: GUS, *Rocznik Statystyczny Przemysłu* (2002-2008), Warszawa: GUS and author's calculations

Figure 1. **Annual changes in gross value added, %**



Source: author's calculations, Table 1 and Urban R. (ed.), (2008), *Stan polskiej gospodarki żywnościowej po przystąpieniu do Unii Europejskiej.* Raport 5, nr 109, Warszawa: IERIGŻ-PIB

Figure 2. **Proportion of gross value added generation in the whole economy, %**

Apart from the data presenting the levels of GVA, their changes are also important. The analysis of changes in the researched category in current prices allow the statement that GVA in the whole economy has increased by 64.7% during these seven years, whereas in agriculture it has increased respectively by 63.5%, in the food industry by 40.7%; whereas in the tobacco industry by 66.9%. In the period of 2001-2007, changes in GVA in agriculture and tobacco industry were similar to the changes in the whole economy.

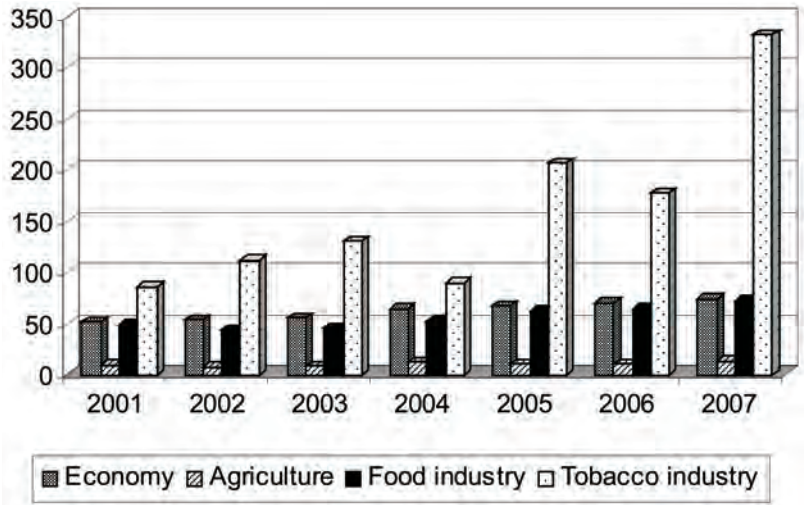
However, GVA in fixed prices in the analysed period has increased by 30.5% in the whole economy, in agriculture by 30.5%, in the food industry by 114.2%; whereas in the tobacco industry by 50.7%. This and above mentioned data prove that in a few years period, the change in the researched parameter was the same in agriculture as in the whole economy. A considerable increase in the rate of change can be also noticed in the food industry. Apart from changes in production generated by the agri-food sector calculated for the whole period it is also important to display annual changes. They are presented in Figure 1.

Precise estimation of the role of agribusiness in generation of the wealth in Poland using generally accessible public statistical data is very difficult. It is problematic to research the volume of gross value added generated in the industry by means of production and services for agriculture. Therefore the analysis concerning this industry will be based mainly on data calculated from values of means of production purchased by agriculture. These values will be decreased by indirect taxes. The method of the national production calculation based on the final goods and services will be used in the research.

The proportion of gross value added generated by agribusiness in the value of gross value added of the whole economy was quite stable in the researched period (Figure 2). The highest proportion of the national product was generated by the food sector in 2001 (9.22%); whereas the lowest one in 2006 (8.19%). An average annual proportion generated by the food sector was 8.7% of GVA. These data prove that agribusiness in the classical approach is an important element of the Polish wealth generation, so it plays a significant role in increasing of Poles' quality of life.

The analysis of the structure of production generation by agribusiness reflects that the food economy has the highest proportion in GVA in the economy. Its average annual contribution has been at the level of 3.12% of the Polish value added. On the contrary, the tobacco industry had the lowest level of contribution (the average annual proportion – 0.13%). The food industry is an important sector in the whole economy as well as in the industry generally (in 2007, only the section: electricity, gas, and water supply generated the highest value) but its percentage role in the economy is rather stable. It should be expected that it would decrease and move closer to an average level of the "old" European Union in the future (1.5%). Agriculture and the means of production industry have generated the average annual proportion of 2.7% of the national wealth.

Efficiency of sectors can be checked by the analysis of means of production use. The tobacco industry was in the best situation in agribusiness. Figure 3 presents that in 2007 GVA per one employee were at the level of PLN 332 thousand. The annual indicator in this industry was much diversified because of high annual changeability of GVA; nevertheless it has always been high. In the period of 2001-2007, GVA per one employee was systematically decreasing in the food industry. In 2007, this indicator was similar like in the whole economy. However, a dramatic situation took place in agriculture. This sector even wasted rare means of production. In this situation the



Source: *Rocznik Statystyczny RP* (2002-2008), Warszawa: GUS, *Rocznik Statystyczny Przemysłu* (2002-2008), Warszawa: GUS, *Rocznik Statystyczny Rolnictwa i Obszarów Wiejskich* (2002-2008), Warszawa: GUS and author's calculations

Figure 3. **Gross value added per one employee in the sector, thousand PLN**

Table 2

Elements of gross value added in million PLN (current prices)

Year	Food industry				
	GVA	Employment costs	Taxes from producers	Subsidies for producers	Gross operational surplus
2001	20427	13510	657	-96	6356
2002	19500	12203	644	-89	6742
2003	21287	12302	567	-136	8554
2004	23901	11748	578	-144	11721
2005	26414	11951	609	-244	14098
2006	28570	13293	1212	-274	14339
2007	32700	13674	1060	-227	18193
Year	Tobacco industry				
	GVA	Employment costs	Taxes from producers	Subsidies for producers	Gross operational surplus
2001	727	456	28	-15	258
2002	874	485	28	-10	370
2003	821	446	13	-3.6	365
2004	575	473	13	-1.1	91
2005	983	517	20	-1.9	448
2006	1168	541	28	-0.7	599
2007	2257	556	21	-1.9	1682

Source: *Rocznik Statystyczny RP* (2002-2008), Warszawa: GUS, *Rocznik Statystyczny Przemysłu* (2002-2008),Warszawa: GUS and author's calculations

basic question occurs: if the economic policy towards agriculture has brought positive effects?

Structure of income generated by agribusiness

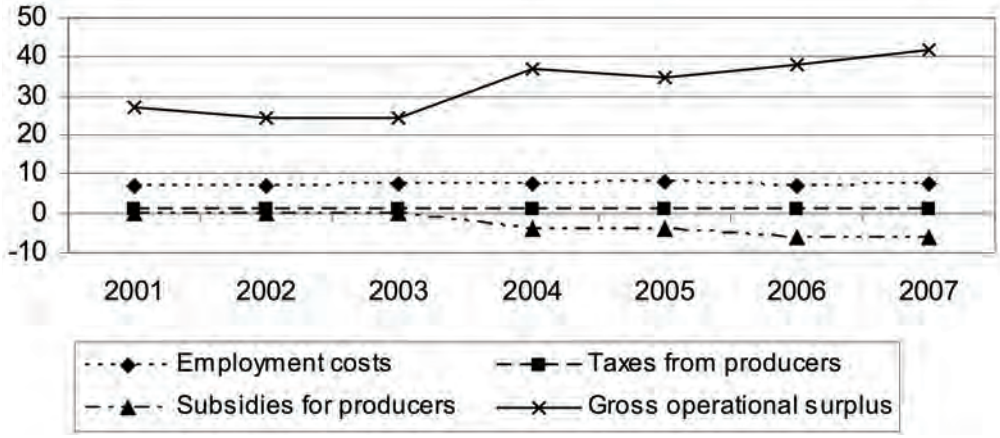
The level of generated gross value added plays a key role for the economy development. Elements of this category are also important because, apart from remuneration of means of production, also state subsidies are taken into account.

Table 2 presents categories, which generated gross income in the food and tobacco industry. In the period of 2001-2007, there were significant changes in the level of these categories and the structure of GVA in both industries. The analysis of the most important kinds of costs in the food economy, i.e. costs connected with employment of workers (total salaries, contributions to social security and other costs) it can be noticed that their level remained nearly the same despite the increase in salaries. It is connected with a reduction of employment in the analysed period. In 2007, there were 478 thousand of people employed in the food industry; whereas in 2007 only 453 thousand (Roczniki…2002, 2008). Despite the fact that employment costs remained similar in the period of 2001-2007, their proportion in GVA has decreased significantly. In 2001, it was on the level of 66.1%; whereas in 2007 – 41.8% (see: Urban R., 2002).

In the researched period there was a significant increase in the level and proportion of gross operational surplus (GOS) in value added. In 2001, it contributed to 31.1% of GVA; whereas in 2007 – 55.6%. GOS evidently differed from financial result achieved by food and tobacco companies. It results from the fact that GOS includes other income than work and means of production, for example capital.

Evaluation of the level and role of income generated and achieved by agriculture will be carried out on the base of the section: agriculture, hunting, and forestry. Technical issues resulting from the public statistic are the main reasons. However, it does not change the core of the issue.

In the period of 2001-2007, costs connected with employment in this sector of the economy calculated in current prices have increased (Figure 4). However, taking into account inflation, they have remained on a similar level. The analysis of the proportion of these costs in GVA generation leads to the conclusion that they did not change significantly. The average annual employment costs constituted 19.6% of GVA. However, there was increase in a systematic percentage role of gross operational surplus in GVA. In 2001, it was 77.6%; whereas in 2007 – 94.9%. It relates to two problems: 1) specific structure of employment in this sector; 2) receiving direct payments by farmers. Moreover, 90% of employed are persons running individual farms. It means that



Source: *Rocznik Statystyczny RP* (2002-2008), Warszawa: GUS and author's calculations

Figure 4. **Structure of gross income generated by agriculture, hunting and forestry, billion PLN (current prices)**

their salary is counted to GOS as income. Since 2004 direct payments are allotted, which also increase GOS. In 2007, their value was PLN 6.1 billion.

Conclusions

Agribusiness as the subsystem of the economy took a significant place in generation of the Polish wealth. The analysis carried out in the study, with the use of gross value added, proved that in the period of 2001-2007 it has annually generated 8.7% of the national production on average. This level concerns the food economy based on the classical structure. Agriculture has annually generated about 2.7% of GVA of the whole economy on average, the means of production and services for agriculture industry also about 2.7%; whereas the food and tobacco industry about 3.25%. The role of agribusiness in the Polish economy would be considerably more important with taking into account a wide understanding of its structure.

The analysis of income structure proved that the gross operating surplus had the highest share in the gross value added of food industry in 2007 equalling to 55.64%. Costs connected with employment were also important, as they represented 41.82%. The gross operating surplus had also the highest share in the gross value added contributed by agriculture, hunting, and forestry in the same year. It includes nearly all the gross value added (94.89%), and it has resulted from the employment structure and direct payments.

Bibliography

1. Balicki, W. (1996). *Makroekonomia*. Poznań: Wydawnictwo WSB w Poznaniu.
2. Barro, R. J. (1997). *Makroekonomia.* Warszawa: PWE.
3. Begg, D., Fischer, S., Dornbusch, R. (2003). *Makroekonomia.* Warszawa: PWE.
4. Grabowski, S. (1997). *Gospodarka żywnościowa w warunkach rynkowych*. Warszawa: Oficyna Wydawnicza SGH.
5. *Rocznik Statystyczny Przemysłu,* (2002-2008). Warszawa: GUS.
6. *Rocznik Statystyczny Rolnictwa i Obszarów Wiejskich*, (2002-2008). Warszawa: GUS.
7. *Rocznik Statystyczny RP*, (2002-2008). Warszawa: GUS.
8. Smith, A. (1954). *Badania nad naturą i przyczynami bogactwa narodów*, Warszawa: PWN.
9. Urban, R. (ed.), (2008). *Stan polskiej gospodarki żywnościowej po przystąpieniu do Unii Europejskiej.* Raport 5, nr 109. Warszawa: IERIGŻ-PIB.
10. Urban, R. (200). *Wartość dodana i marże w przetwórstwie głównych produktów rolnych*. Warszawa: IERIGŻ.
11. Winiarski, B. (ed.), (1994). *Polityka ekonomiczna*. Wrocław: Wydawnictwo AE im. O. Langego we Wrocławiu.
12. Woś, A. (1996). *Agrobiznes. Makroekonomia.* Warszawa: Wydawnictwo Key Text.
13. www.stat.gov.pl.

Uzņēmējdarbības intensifikācija un uzņēmējs Latvijas laukos
Intensification of Entrepreneurship and Entrepreneur in Rural Areas of Latvia

M.B.A **Rosita Zvirgzdiņa** lektore, doktorante
LLU Ekonomikas fakultāte, Ekonomikas katedra

Abstract. The paper analyses some problems related to intensification of entrepreneurship in rural areas of Latvia. The aim of the paper was to find out the most important factors influencing the facilitation of entrepreneurial activities in rural territories. The research encompasses the characteristics of the environment of entrepreneurial activities in rural areas of Latvia, the display of the most important factors to be taken into consideration in the development of entrepreneurship in rural areas and recommendations made on the basis of monographic, statistical, comparative analytical, expert, and SWOT methods. Some models suitable for organisation of production and processing process in agriculture in Latvia were also developed during the research.
Key words: entrepreneur, entrepreneurship, support measures, rural territories.

Ievads
Introduction

Viena no Latvijas galvenajām prioritātēm jau ilgu laiku ir un arī turpmāk būs iespējami ātra pietuvošanās ES vidējam sociāli ekonomiskajam līmenim. Lai to sasniegtu, ir jāpaveic daudz visā, kas saistās ar uzņēmējdarbības intensifikāciju. Tai jākalpo ražošanas krituma pārvarēšanai, kāds iestājās pēc 1990.gada, it īpaši tādā nozarē kā lauksaimniecība, kurā produkcijas ražošanas apjoms 2007.gadā bija 50,8% no 1990.gada līmeņa, tajā skaitā augkopībā 87,9%, bet lopkopībā – 34,5%. Šīs nozares devums Latvijas ekonomikā ir salīdzinoši zems: 2007.gadā šajā nozarē bija nodarbināti 9,6% darbaspējīgo, bet no pievienotās vērtības devuma tā nodrošināja tikai 3,1% (Latvijas Statistikas Gadagrāmata, 2008). Bet lauksaimniecības un ar to saistīto nozaru attīstībai ir izšķiroša nozīme lauku iedzīvotāju nodarbinātības un labklājības attīstībā.

Uzņēmējdarbības attīstība Latvijas lauku teritorijā ir kļuvusi par nopietnu aktualitāti. Par to liecina lielā diference, kāda pastāv produkcijas devumā un investīcijās starp galvaspilsētu Rīgu un no tās attālākajos novados. Izšķiroša nozīme uzņēmējdarbības intensifikācijā kā valstī kopumā, tā arī lauku areālos ir uzņēmējam kā centrālajai figūrai, kas kombinē ražošanas faktorus, veicot uzņēmējdarbību. Šajā procesā būtiska loma ir uzņēmēja iespējām gūt pareizu priekšstatu par nosacījumiem jeb faktoriem, kas var ietekmēt viņa aktivitātes, un izmantot priekšrocības, kādas var saistīties ar tiem.

Hipotēze: pareizs priekšstats par uzņēmēju aktivitāšu ietekmējošiem faktoriem var sekmēt uzņēmējdarbības attīstību Latvijas laukos.

Raksta **mērķis** ir noskaidrot, kādi faktori ir svarīgākie uzņēmēju aktivitātes veicināšanai Latvijas lauku teritorijā to intensīvas attīstības kontekstā.

Uzdevumi:
1) raksturot uzņēmēja aktivitāšu vidi lauku teritorijā;
2) noskaidrot uzņēmējdarbību ietekmējošos faktorus pēc to svarīguma;
3) novērtēt modeļa nepieciešamību priekšstata veidošanai par svarīgāko uzņēmējdarbības intensifikācijas faktoru izmantošanu lauku teritorijās.

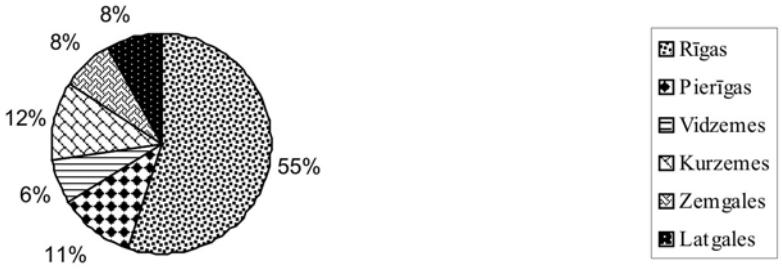
Izpētes gaitā pielietotas sekojošas **metodes**: monogrāfiskā, statistiskā, salīdzinoši analītiskā, ekspertu, SVID metodes

Diskusija un rezultāti
Discussion and Results

Uzņēmēja aktivitātes it visur, tajā skaitā arī lauku teritorijās, norit telpā, ko veido arējās un iekšējās vides faktoru nemitīga mijiedarbība.

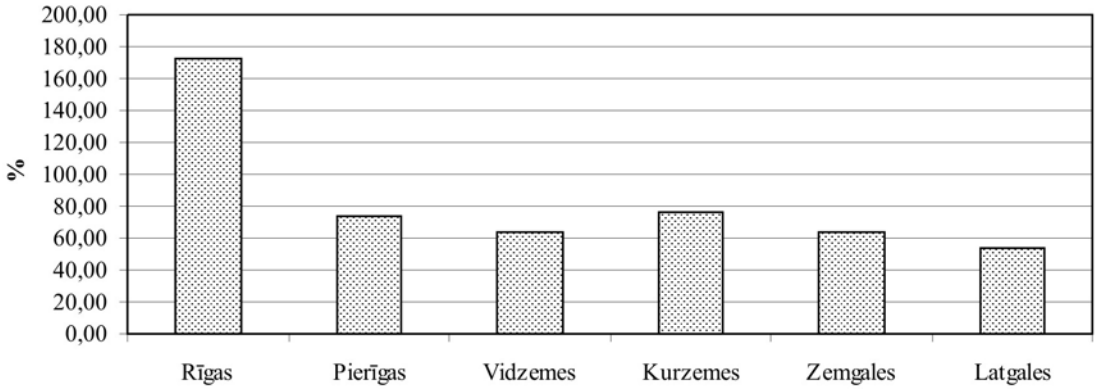
Pie ārējās vides faktoriem pieder politiskie, ekonomiskie, sociāli - kultūras, tehnoloģiskie, juridiskie un dabas vides faktori. Atkarībā no konkrētiem apstākļiem šiem faktoriem var būt vairāk vai mazāk nozīmīga ietekme.

Uzņēmēja aktivitāšu iekšējo vidi labi var raksturot ar D. Hāna (Хан Д., 1997) skaidrojumu, kādu viņš dod uzņēmumam: proti, tā ir uzņēmuma iekšiene, kur noris procesi, kas saistās ar materiālo un nemateriālo, reālo un nominālo jeb naudas labumu iegūšanu, pārstrādi, tālāk nodošanu un uzkrāšanu. Lai gūtu peļņu un sasniegtu citus mērķus, uzņēmumā ražo dažādus labumus - preces un pakalpojumus, lai apmierinātu pieprasījumu no ārpuses. Ar reālajiem labumiem saprot galvenokārt informāciju un materiālus labumus, par cik uzņēmumiem ir raksturīga vispirms materiālo labumu ražošana jeb izeja, kas ir cilvēku un/vai mašīnu darbības rezultāts, kuri tehnoloģiska procesa rezultātā pārstrādā vai apstrādā izejvielas, materiālus un pusfabrikātus, veidojot tā saukto ieeju. Informācija, materiālie un nominālie labumi – objekti, ar kuriem norit darbības, ir ieejas un izejas elementi. Ja viena elementa izeja ir otra elementa ieeja, tad starp tiem veidojas informatīvās, preču jeb materiālās, kā arī naudas plūsmas. Šīs naudas plūsmas norit caur uzņēmumu un saista to ar ārējo vidi. Informatīvās plūsmas daļēji notiek bez tās pavadošām preču un naudas



Avots: autores veidots pēc LR CSP datiem

1. att. **IKP vidējais īpatsvars Latvijas reģionos par laika periodu no 2000. līdz 2008. gadam**
Figure 1. **The average share of GDP in Latvia regions for the period of 2000-2008**



Avots: autores veidots pēc LR CSP datiem

2. att. **IKP uz vienu iedzīvotāju Latvijas reģionos salīdzinājumā ar vidējo rādītāju valstī (rādītāji aprēķināti vidēji par laika no 2000. līdz 2008. gadam)**
Figure 1. **GDP per capita in Latvia regions in comparison with the average indicator of the country (indicators are calculated as the average ones for the period of 2000-2008)**

plūsmām. Preču un citas reālas plūsmas var regulēt ar informatīvo plūsmu palīdzību. Līdz ar to D. Hans uzskata, ka uzņēmumu ar minētajām ieejošajām un izejošajām plūsmām var uzskatīt par sava veida „melno kasti".

Iekšējās un ārējās vides saistība ir cieša, ko uzņēmējam nevajadzētu aizmirst. Kaut gan daudzi uzskata, ka dabiskais sākuma punkts ražošanas faktoru izpētē veiksmīgākas kompānijas darbā ir meklējams uzņēmuma iekšienē, proti, cik efektīvi tā izmanto savas zināšanas, iemaņas un kapacitātes, taču uzņēmumi dažkārt gūst labumu no tā, kas notiek ārpusē, tas ir, no labākiem rezultātiem, ko sasnieguši to konkurenti (Productivity, innovation, and …, 2000). Līdz ar to, kombinējot ražošanas faktorus, meklējot iespējas, kā kāpināt produktivitāti, uzņēmējam būtībā ir jāfunkcionē sarežģītā atvērtā sociāli-tehniskā sistēmā, kas ir saistīta ar ārējo vidi ar specifiskām attiecībām.

Pieņemt saprātīgus un veiksmīgus lēmumus, kas saistās ar augstākminētās „melnās kastes" funkcionēšanu, uzņēmējam ir nepieciešamas attiecīgas aktivitātes un tām atbilstošas kvalitātes, kas saistās ar problēmas formulēšanu, lēmuma objekta specifikāciju, potenciālo stratēģiju specifikāciju, ierobežojumu specifikāciju un lēmuma iegūšanu un formulēšanu. Bet tas prasa izpratni un mērķu pārzināšanu, iztēli, praktiskās zināšanas, analītiskās spējas. It īpaši tas attiecas uz lauksaimniecību un ar to saistīto nozaru kopu, kurai piemīt noteiktas raksturīgas iezīmes:

- tajā ietilpst tehnoloģiski atšķirīgas uzņēmējdarbības jomas;
- nemitīgi pastiprinās lauksaimniecības un pārstrādes nozaru integrācija;
- lauksaimnieciskās izcelsmes preču ražošanā piedalās arī virkne citu nozaru;
- no nozares, kas ražo gala produktus, tā pakāpeniski kļūst par nozari, kas piegādā izejvielu pārstrādei.

Lauksaimniecība un ar to saistītā nozaru kopa ir svarīga, jo tā nodrošina daudzu iedzīvotāju ienākumu laukos, paplašinot pašmāju tirgu pārstrādes sektoram un mazinot iekšējās ekonomiskās atšķirības starp pilsētnieciskajiem centriem un lauku teritorijām. Šobrīd šīs atšķirības joprojām saglabājas visai būtiskas.

Rīgas reģionā saražo 55% no valstī saražotā IKP. Aktivizējies arī Pierīgas reģions, kurā saražots 11% IKP. Samazinājums vērojams Viszemākais IKP ražošanas apjoms ir Vidzemes reģionā, tikai 6 %.

Vērtējot saražoto IKP uz vienu iedzīvotāju dominējošais ir Rīgas reģions, kurā uz vienu

1.tabula
Table 1

Uzņēmējdarbības intensifikāciju ietekmējošo faktoru nozīmības vērtējums
Significance estimation of factors influencing the business intensification

Faktori	Vidējais ekspertu vērtējums
Ļoti nozīmīgi faktori (100 – 81)	
Finansējuma pieejamība	87
Zināšanas	82
Nozīmīgi faktori (80 – 61)	
Darbaspēks un tā pieejamība	78
Informācija jeb saziņas iespējas	75
Infrastruktūra	70
Konsultāciju pieejamība	68
Mazāk nozīmīgi faktori (60 – 41)	
Interneta pieejamība	59
Dibināšanas procedūra	58
Nodokļu politika	55
Atbalsts MVU	50
Tirgus pieejamība	47
Konkurence	45
Vismazāk nozīmīgi faktori (40 – 0)	
Izejvielu pieejamība	38
Ceļu tīkls	36
Valsts un pašvaldību atbalsts	35

Avots: autores pētījums un aprēķins

iedzīvotāju saražo 171.9% IKP salīdzinot ar vidējo līmeni Latvijā. Vissliktākais rādītājs saražotā IKP apjoma ziņā uz vienu iedzīvotāju ir Latgales reģionam – 53% no vidējā Latvijas līmeņa.

Lielās atšķirības IKP, rēķinot uz vienu iedzīvotāju, papildus labi raksturo šis rādītājs arī pa atsevišķām Latvijas pilsētām 2005. gadā. Tā, piemēram, Rīgā tas, ir 7114 Ls jeb 1.8 reizes vairāk nekā vidēji Latvijā un Ventspilī 6554 Ls jeb 1.7 reizes vairāk nekā vidēji Latvijā, tad Liepājā 3726 Ls jeb 94.6% no vidējā līmeņa Latvijā, Rēzeknē 2811 Ls jeb 71.4% no vidējā līmeņa Latvijā, Daugavpilī attiecīgi 2804 Ls un 71.2%, Jelgavā – 2759 Ls un 70.1%, bet Jūrmalā – 1519 Ls un 38.1% (Latvijas statistikas gadagrāmata, 2008).

Šo atšķirību mazināšanā nozīmīga loma var būt agrorūpnieciskā kompleksa sastāvdaļu harmoniskas mijiedarbības nodrošināšanai. Jāņem vērā, ka zems tehniskais līmenis vienā nozarē var radīt zaudējumus citā saistītā nozarē. Tā piemēram, lauksaimniecības produkcijas zema kvalitāte negatīvi ietekmē pārstrādes uzņēmuma darbības rezultātus. Ja piena kvalitāte būs zema, tad pārstrādes procesā no tā nebūs iespējams iegūt augstas kvalitātes izstrādājumus.

Tādējādi kļūst redzams, ka lēmumu pieņemšana attiecībā uz agrorūpniecisko kompleksu var saistīties ar ļoti daudziem faktoriem. Līdz ar to rodas jautājums par nozīmīgāko faktoru atlasi un to svarīguma novērtēšanu.

Lai noskaidrotu, kādi faktori ir svarīgākie lauku uzņēmējiem arējās un iekšējās vides mijiedarbības rezultātā Latvijas laukos, autore veica pētījumu ar ekspertu novērtējumu, kura rezultātā par nozīmīgākiem tika atzīti sekojoši faktori, kuri pēc to svarīguma pakāpes ierindojās šādā secībā (1.tabula).

Par ļoti nozīmīgiem tika atzīti sekojoši faktori: finansējuma pieejamība un zināšanas, par nozīmīgiem - darbaspēka pieejamība, informācija jeb saziņas iespējas, infrastruktūra, konsultāciju pieejamība. Finansējuma pieejamības nozīmību apliecina arī aptaujas un interviju rezultāti. Tā, autores 2008. gadā veiktajā aptaujā finansējuma pieejamību par ļoti svarīgu atzīmē 83.5% respondentu.

Tik liela uzmanība finanšu pieejamībai tiek veltīta vairāku apstākļu dēļ:

- lauku iedzīvotājiem nav starta kapitāls ar kuru varētu uzsākt uzņēmējdarbību;
- daudzos gadījumos nav hipotekārā nodrošinājuma, kas varētu apmierināt banku intereses;
- uzņēmējdarbības uzsākšana saistīta ar risku līdzekļus neatgūt;
- valstī nav riska kapitāla fonda, kas veiktu risku sadali starp valsti un topošo uzņēmēju.

Par svarīgākajiem faktoriem autore veica aptauju. Aptauja parādīja, ka pamatā apstiprinās ekspertu dotais sadalījums. Ekspertu vērtējumu un aptaujas rezultātu izmantošanas nolūkā autore veica virkni interviju ar uzņēmējiem, kā veidot pareizu sasaisti starp atsevišķu faktoru iedarbības novērtējumu dažādu nozaru uzņēmumos to funkcionēšanas procesā.

2.tabula
Table 2

Saimniecību vadītāju izglītības līmenis 2007. gadā
Farm managers level of education level in 2007

Izglītība	Kopā	Reģionos				
		Pierīga	Vidzeme	Kurzeme	Zemgale	Latgale
Augstākā	5430	992	1182	808	1272	1176
Profesionālā	21773	2606	5168	3436	3975	6588
Pamata	15639	2069	3221	2891	2503	4956
Praktiskā pieredze	70540	9367	11838	10031	12550	26771
Kopā	113382	15034	21409	17148	20300	39491
% pret kopskaitu						
Augstākā	4.8	6.6	5.5	4.7	6.3	3.0
Profesionālā	19.2	17.3	24.1	20.0	19.6	16.7
Pamata	13.8	13.8	15.1	16.9	12.,3	12.5
Praktiskā pieredze	62.2	62.3	55.3	58.4	61.8	67.8
Kopā	100.0	100.0	100.0	100.0	100.0	100.0

Avots: autores veidots pēc LR CSP datiem

Ievērību guva pareizas un efektīvas saiknes veidošanas nepieciešamība starp uzņēmēja uzņēmību un valsts atbalstu tādā izpratnē, ka tas ir vērsts uz svarīgāko ekspertu atzīto faktoru ievērošanu. Tas liek pievērsties tuvāk uzņēmējam šajā procesā. Taču vispirms jāatzīmē, ka šobrīd esošais valsts atbalsts dažādu atbalstu formu veidā (konsultācijas, biznesa centri u.c.) Latvijas teritorijā ir sadalītas ļoti nevienmērīgi, tā, piemēram, Rīgas un Pierīgas reģionos no visiem konsultāciju centriem ir izvietoti 87%, no 12 biznesa parkiem tajos atrodas 11, bet grāmatvedības un virtuālie biroji ir tikai šajos reģionos.

Tas tikai vēlreiz apliecina, ka, lai liktu lietā savu uzņēmību, īstenojot savas ieceres un iniciatīvas, uzņēmējam vajag daudz, un no viņa arī tiek prasīts daudz. Viņam būs jārēķinās ar to, ka konkurētspējīgas ekonomikas uzņēmējdarbības iezīme ir cilvēku spēja nepārtraukti meklēt un uztvert izdevības ienesīgām un jaunām aktivitātēm vietējos un pasaules tirgos (Harper, 2003). Viņam vajadzēs informāciju, bet tā par izdevībām gūt peļņu ir jāsintezē no dažādiem avotiem. Informācijas atgriezeniskai saitei ar iepriekšējām aktivitātēm ir kritiska loma uzņēmuma panākumiem ilgtermiņā (Casson, 2003). Viņam vajadzēs izvērtēt vilinošās uz „gaišām" idejām balstītas inovācijas, kas ir izplatītas visvairāk, bet ir visriskantākās (Drucker, 1985), kā arī ņemt vērā, ka jebkuras organizācijas dibināšanai ir sevišķa ietekme uz struktūru, procesiem un stratēģiju, kādu organizācija veidos un saglabās laika gaitā (Boecker, 1988). Un visbeidzot viņam jāsaprot, ka, kaut arī uzņēmējdarbība ir galvenais mehānisms, kas rada labklājību, ekonomiskās izaugsmes un attīstības skaidrojumi bieži ignorē uzņēmējdarbības spējas mainīties un pielāgoties iespējām, kādas slēpjas ekonomiskajā darbībā (Harper, 2003).

Uzņēmējs daudz iegūs, ja savlaicīgi izpratīs, ka ekonomiskā attīstība galu galā ir evolucionārs mācīšanās process, kas iesaista zināšanu augsmi un pārstrukturēšanu un atteikšanos no vecajām idejām un organizācijām (Harper, 2003). Līdz ar to aktualizējas izglītības jautājums: vai lēmuma pieņēmējam būs attiecīgas zināšanas. Lauku teritorijās tās ir īpaši svarīgas, jo lauksaimniecībai – šai svarīgākajai sastāvdaļai agrorūpnieciskajā kompleksā piemīt specifika, kas prasa īpašas zināšanas un izpratni. Latvijā tās varētu būt augstākas, par ko liecina saimniecību vadītāju izglītības līmenis.

Saimniecību vadītāju ar augstāko izglītību īpatsvars nevienā reģionā nepārsniedz 10%. Saimniecību vadītāju ar profesionālo izglītību īpatsvars svārstās no 24.1% Vidzemes reģionā līdz 16.7% Latgales reģionā. Saimniecību vadītāju ar praktisko pieredzi īpatsvars ir no 55.3% Vidzemes reģionā līdz 67.8% Latgales reģionā. Tāpēc var secināt, ka nav izpildīts viens no galvenajiem priekšnosacījumiem: izglītības līmeņa kāpināšanā, kam jānodrošina, lai saimniecības vadītāji pietiekami spētu novērtēt situāciju uzņēmējdarbībā un prastu izmantot tajā esošās priekšrocības.

Vērtējot valsts atbalsta lomu šā vārda plašākajā nozīmē, jārēķinās ar to, ka tas sasaucas ar nostādni, ka uzņēmējdarbības intensifikācijas turpmākā attīstība saistās ar ieceri par Latvijas kā ES dalībvalsts iespējami drīzu pietuvošanos ES vidējam sociāli ekonomiskajam līmenim, veicinot mūsu valstī izaugsmi, līdzsvarotu attīstību un izlīdzinātu dzīves standartu. Šādas ieceres īstenošana prasa saskaņotu un racionālu uzņēmējdarbības resursu izmantošanu. Tas nozīmē, ka jāveido tāda uzņēmējdarbības attīstības stratēģija, kas, rēķinoties ar globalizācijas ietekmi, paver iespēju nonākt pie modernas un konkurētspējīgas preču ražošanas. Šādas stratēģijas realizācija saistās ar plašu savstarpēji atkarīgu pasākumu kompleksu, proti:

- modernizēt ražošanu, investējot esošo uzņēmumu tehniskajos jauninājumos, radot jaunas konkurētspējīgas ražotnes, pilnveidojot pakalpojumu sfēras uzņēmumus, veicinot amatniecību;
- modernizēt infrastruktūru atbilstoši laikmeta prasībām, uzlabojot un izbūvējot ceļus un pilnveidojot sakarus;
- celt iedzīvotāju labklājības līmeni un uzlabot sociālo vidi;

- veikt pasākumus dabas aizsardzībai un ainavas izkopšanai;
- izveidot valsts pārvaldes struktūras, kuru funkcionēšana ir adekvāta sociāli ekonomiskās attīstības prasībām.

Valsts atbalsts var izpausties kā:

- valsts valdības atbalsts
- pašvaldības atbalsts;
- atbalsts mentoringa sadarbības formā;
- konsultāciju centru atbalsts;
- biznesa atbalsta centru atbalsts.

Svarīgs priekšnoteikums saskaņas veidošanā starp uzņēmēja iniciatīvām un valsts atbalstu ir tās atbilstībai lauku politikai un tās uzdevumiem. Šajā ziņā autore piekrīt viedoklim, kas uzskatāmi ir atspoguļoti A. Vēvera (2009) dotajos formulējumos, un pie tiem pieder:

- ražošanas apjoma un produktivitātes kāpināšana sektorā kopumā;
- mazo un vidējo saimniecību konkurētspējas paaugstināšana;
- resursu izmantošanas efektivitātes veicināšana;
- nodarbinātības nodrošināšana lauku apvidos;
- videi draudzīgu saimniekošanas tehnoloģiju attīstība.

No uzņēmējdarbības intensifikāciju iespēju izmantošanas viedokļa svarīga loma ir lēmuma pieņemšanai attiecībā uz atbalsta veidu un uzņēmumu sadarbības formas izvēli. Šajā kontekstā autore ir izvērtējusi franšīzes un mentoringa pamatdarbību ieviešanas efektivitāti Latvijas lauku teritorijās izmantojot SVID analīzi. Analīzes rezultātā tika noskaidrotas stiprās un vājas puses, iespējas un draudi.

Stiprās puses jeb ieguvumi:

- ražošanas paplašināšana pie mazākām investīcijām;
- ienākumu stabilizēšanās;
- paaugstināts motivētas vadības līmenis;
- palielināta preču zīmes sortimentu dažādība;
- samazināts risks pārbaudītā tirgū;
- preču pašizmaksas samazināšanās, pārceļot ražošanu ārpus pilsētas;
- atsevišķu pārstrādes punktu specializācijas padziļināšanās.

Vājās puses jeb zaudējumi:

- varētu nedaudz mazināties iekārtu izmantošanas ekonomiskā efektivitāti;
- rastos vajadzība pēc mazjaudīgākām, bet lielākā skaitā pārstrādes iekārtām;
- daļai uzņēmēju varētu būt problemātiska atteikšanās no pilnīgas neatkarības, jo franšīzes situācijā jāpakļaujas zināmiem vadošā uzņēmuma noteikumiem.

Iespējas:

- radīsies lielākas eksporta iespējas;
- tiktu veicināta uzņēmējdarbība lauku teritorijās;
- paplašinās vadošā pārstrādes uzņēmuma izaugsmes iespējas;
- rastos iespēja lielo uzņēmumu attīstībai, veidojot to filiāles lauku teritorijās;
- tiktu intensificēta izejvielu ražošana un mazo zemnieku saimniecību attīstība;
- veidotos ciešāka saikne un mērķu saskaņotība starp pārstrādes uzņēmumiem un izejvielu ražotājiem;
- tiktu intensificēta mērķtiecīgāka konsultatīvā palīdzība, saskaņota ar pārstrādes uzņēmumu vajadzībām;
- mazinātos nevajadzīga iekšējā konkurence, kopumā paaugstinot eksporta produkcijas konkurētspēju.

Draudi:

- attālināto ražošanas starpposmu izvietojuma dēļ varētu pazemināties produkcijas kvalitāte;
- lauku sociālās degradācijas rezultātā var rasties problēmas ar darbaspēku;
- rastos prasības pēc palielināta un mobila kvalitātes kontroles dienesta izveidošanas.

SVID analīzes faktori var krasi mainīties laika gaitā, lai ņemtu vērā šīs izmaiņas ir lietderīgi izmantot zināmus modeļus. Tas varbūt īpaši noderīgi organizatoriskās formas izveidē globalizācijas apstākļos, kad pastiprinās uzņēmumu struktūrvienību iekšējās saistības loma. Kā uzskatāms piemērs šajā ziņā var kalpot autores ieteiktais piena kooperatīva darbības paplašināšanas modelis, kas atspoguļo franšīzes attiecību veidošanu ar piena kombinātu.

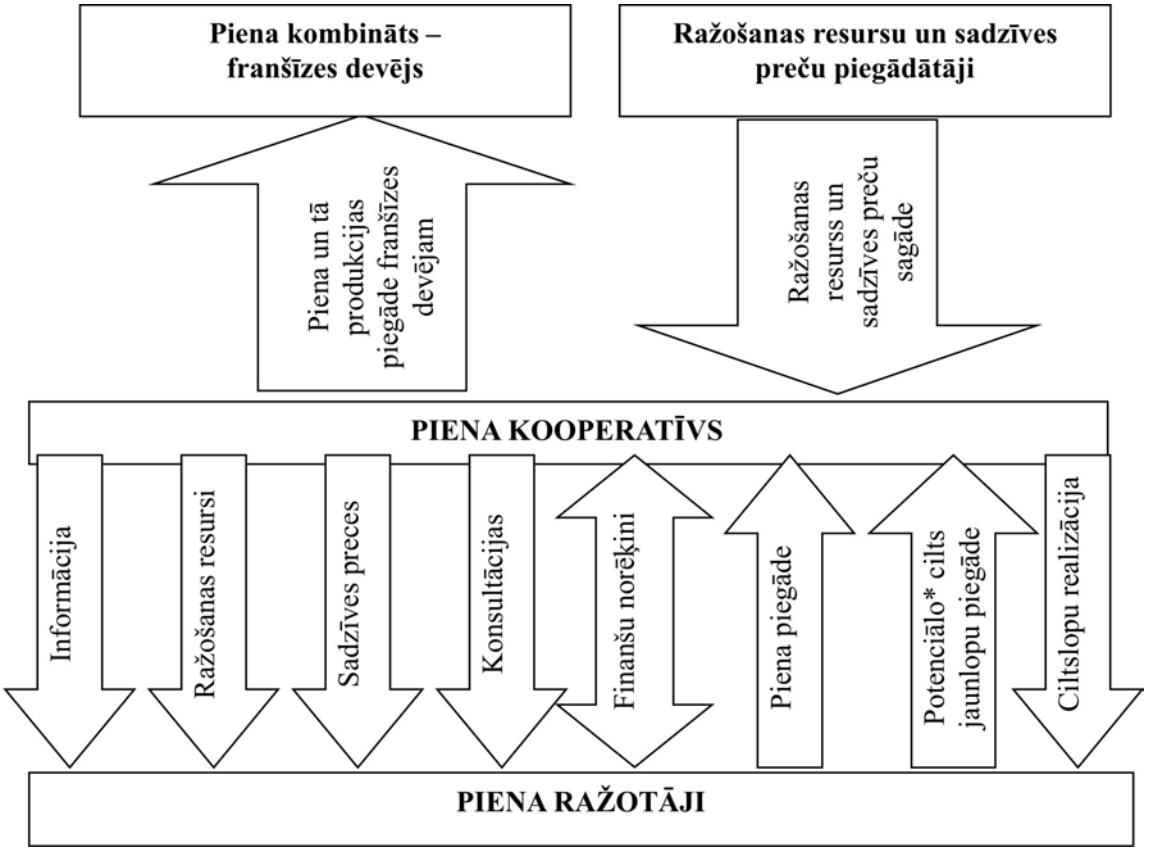
3. attēlā autore sniedz savu skatījumu iespējamai piena kooperatīvu darbības paplašināšanai Latvijā uz franšīzes attiecību veidošanas bāzes. Latvijas lielie piena kombināti uz franšīzes pamatiem varētu organizēt piena pirmapstrādi un tālāku pārstrādi piena kooperatīvos. Kombinātu centrālajiem uzņēmumiem varētu tikt piegādāts gan piens, gan jau pārstrādāta piena produkcija - krējums, biezpiens vai cita veida produkcija pēc savstarpējās vienošanās. Šāds modelis Latvijā bija izveidojies gan pirmā neatkarības periodā, gan padomju periodā, un tas vienmēr ir funkcionējis visai sekmīgi. Piedāvātais modelis varētu veicināt daļēju lauksaimniecības produkcijas pirmapstrādes vai pat pārstrādes atgriešanos lauku teritorijās. Šāds pirmapstrādes un pārstrādes struktūrvienību izvietojums lauku teritorijās būtu solis uz priekšu piena produktu ražošanas intensifikācijā.

Būtiskāks ieguvums būtu nodarbinātības līmeņa paaugstināšana lauku teritorijās un līdz ar to arī šo teritoriju labklājības pieaugums.

Piena kooperatīvi varētu veikt ne tikai ražošanas resursu, bet arī daudzu sadzīves preču piegādi savu kooperatīvu biedriem. Šāda darbība atrisinātu šobrīd sasāpējušos tirdzniecības jautājumus Latvijas lauku teritorijās. Ciešākas saites varētu veidoties arī starp kooperatīvu biedriem organizējot ciltsdarbu, kā tas tuvāk paskaidrots 4. attēlā.

Kooperatīvu ietvaros veidojot ciltsdarba uzraudzību un pārraugot teļu ieguvi un audzēšanu, no augstražīgām govīm iegūtos teļus kooperatīvu biedri varētu nodot kooperatīvu organizētai izsolei, tā dodot iespēju iegādāties šķirnei atbilstošu cilts materiālu lētāk, nekā iegādājoties to no ārvalstu piena ražošanas kooperatīviem.

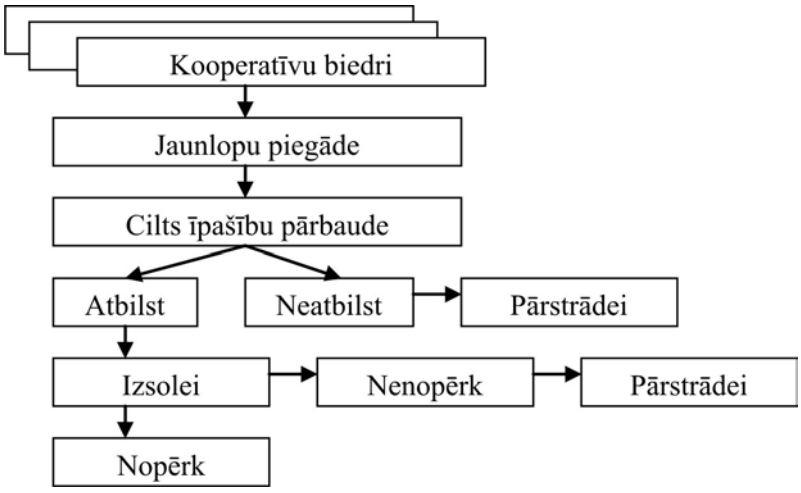
Ir pamats uzskatīt, ka veidojoties pareizam priekšstatam par uzņēmēja aktivitāšu ietekmējošiem faktoriem, arvien lielākai daļai lauku uzņēmēju var rasties vēlme iesaistīties uzņēmējdarbībā.



Avots: autores veidots modelis

3. attēls **Piena ražotāju sadarbības modelis ar franšīzes devēju kooperatīva ietvaros**
Figure 3. **Model of collaboration between milk producers and a franchiser in the framework of a cooperative**

* skaidrojums sniegts 4. attēlā



Avots: autores veidots modelis

4. attēls **Piena ražotāju sadarbības modelis ciltsdarba jautājumos kooperatīva ietvaros**
Figure 4. **Collaboration model between milk producers in pedigree cattle breeding sector in the framework of a cooperative**

Secinājumi un ieteikumi
Conclusions and proposals

1. Uzņēmējdarbības attīstība Latvijas lauku teritorijās joprojām ir nopietna aktualitāte, par ko liecina lielās sociālekonomiskās atšķirības starp galvaspilsētu Rīgu un no tās attālākajām teritorijām.
2. Izšķiroša nozīme lauku teritoriju sekmīgā attīstībā ir pastiprinātai uzņēmējdarbības intensifikācijai aktivizējot uzņēmēja lomu ražošanas faktoru kombinēšanā.
3. Lēmumu pieņemšanā uzņēmējam ir nepieciešams gūt reālu priekšstatu par iekšējās un ārējās vides mijiedarbības ietekmi uz viņa aktivitātēm.
4. Uzņēmējdarbības procesu veiksmīgā intensifikācijā svarīga nozīme ir dažādu faktoru ietekmes novērtējumam, par ko liecina lielās atšķirības ekspertu un aptauju novērtējumos.
5. Kā pēc ekspertu novērtējumiem, tā arī pēc aptauju rezultātiem par ļoti nozīmīgiem faktoriem Latvijā ir atzīti finansējums un zināšanas. Ļoti tuvu šim novērtējumam ir arī valsts atbalsta nozīmīgums.
6. Dažādu faktoru ietekmē svarīga nozīme ir pareizas sasaistes veidošanai starp valsts atbalsta formām un uzņēmēja iniciatīvām. Ir svarīgi, lai šī saskaņa atbilstu lauku politikai un tās uzdevumiem.
7. No uzņēmējdarbības intensifikāciju iespēju izmantošanas viedokļa svarīga loma ir lēmuma pieņemšanā veidot pareizu sasaisti starp atbalsta veidu un izvēlēto uzņēmumu sadarbības formu.
8. Sadarbības modeļi uz franšīzes tipa uzņēmumu bāzes, kas ir izrādījušies visai pieņemami un noderīgi dažādās nozarēs, var būt lietderīgi arī piensaimniecībā.
9. Veidojot Latvijas lauku teritorijās piena savākšanas, pirmapstrādes vai pārstrādes punktus uz piena kombināta piešķirtas franšīzes pamata, varētu veikt padziļinātāku specializāciju, tajā pat laikā paplašinot ražoto produkcijas sortimentu, aktivizēt uzņēmējdarbību lauku teritorijās un samazināt nepārstrādātu izejvielu pārvadāšanu.

Izmantoto informācijas un literatūras avotu saraksts
Bibliography

1. Boecker, W.P. (1988) *'Organisational Origins: Entrepreneurial and Environmental Imprinting at the Time of Founding'*, in Glenn R. Carroll (Ed), Ecological Models of Organisations, Chapter 3, Cambridge, MA: Ballinger, 33-51, in The Foundations of Entrepreneurship, Shane S. (Ed.), Volume 2, Cheltenham, UK. ISBN 1-84064-393-5.
2. Casson, M. *The Entrepreneur. An Economic Theory*. Second Edition. Cheltenham, UK. 2003, 271 p. ISBN 1-84542-193-0
3. Centrālās statistikas pārvaldes mājas lapa: http://www.csb.gov.lv
4. Drucker, P.F. (1985), The Bright Idea, in Innovation and Entrepreneurship: Practice and Principles, Chapter 10, New York: Harper and Row, 30-36, in The Foundations of Entrepreneurship, Shane S. (Ed.), Volume 1, Cheltenham, UK. ISBN 1-84064-393-5.
5. Harper, D. A. (2003). *Foundation of Entrepreneurship and Economic Development*. Routledge, London and New York. 276 p. ISBN 0-415-15342-3.
6. Latvijas Statistikas Gadagrāmata (2008). Rīga: Latvijas Republikas Centrālā statistikas pārvalde. 568 p. ISBN 978-9984-06-352-2, ISSN 1407-0626.
7. Productivity, Innovation and Economic Performance. Edited by Barrell R., Mason G., O'Mahony M. Cambridge University Press, 2000. 289 p. ISBN 0-521-78031-4.
8. Vēveris A. (2009) *Politikas loma lauksaimniecības sektora stabilizācijā un attīstībā.* LZA, Tautsaimniecības attīstības problēmas Latvijā #7. 175.-186. lpp.
9. Хан, Д. (1997). *Планирование и контроль: концепция контроллинга*. Под ред. Гурчака А. А., Головача Л. Г., Лукашевича М. Л., Москва, Финансы и Статистика, 799 стр. ISBN 5-279-01520-2.

Развитие сельскохозяйственных кооперативов в условиях глобализации
Development of Agricultural Cooperatives in the Context of Globalisation

Julius Ramanauskas, Dr. hab., professor, Klaipeda University
Audrius Gargasas, Dr., associate professor, Faculty of Economy and Management, Lithuanian University of Agriculture

Abstract. The main interference of competitive agricultural sector is not only small-scale farms, ageing farmers, or unreasonable land management structure, but also very weakly developed cooperatives. The article presents a new approach towards the operating principles of cooperatives in the context of globalisation.
Key words: cooperative, development, globalisation, profit.

Введение

В Стратегии развития сельского хозяйства и села Литвы отмечается, что основными факторами, препятствующими развитию конкурентоспособного сельскохозяйственного сектора, являются не только мелкие хозяйства, нерациональность структур землепользования и тенденция старения фермеров (Žemės..., 2008), но и недостаточно развита кооперация.

В Литве зарегистрировано около 400 кооперативов, однако реально функционирует только около 50 проц. из них. Основные типы кооперативов показаны на рис.

Кооперативы небольшие, хотя число их членов постепенно увеличивается. В 2007 г. кооперативы до 5 членов составляли 44 проц. от общего их числа, 65 кооперативов (от 6 до 20 членов) – 32,5 проц., 25 кооперативов (от 21 до 100 членов) – 12,5 проц. и только в 15 кооперативах (12,5 проц.) число членов было от 101 до 500 (Kuliešis, 2008).

Развие кооперативов является одной из основных проблем, решение которой способствует укреплению позиций мелких производителей сельскохозяйственной продукции.

Кооперативы создают условия фермерам выращивать больше продуктов, но если продуктов на рынке много, они становятся дешевле, а это выгодно потребителям. Именно поэтому государственная поддержка предоставляется не столько кооперативам и фермерам, сколько потребителям их продуктов.

Кроме классических кооперативов, земледельцы и жители села используют более простые формы кооперации, зачастую не создавая общих предприятий: объединения по использованию техники (ассоциации пользователей дренажных систем, помощь соседа соседу, машинные кружки и пр.), хозяйства, создаваемые при консолидации земельных участков, деревенские общины и др.

В условиях глобализации кооперативы должны быть конкурентоспособными, поэтому настало время пересмотреть и менять некоторые классические принципы кооперативов: принцип неприбыльности, принцип демократии управления, принцип открытого членства, т. к. применение этих принципов было вызвано потребностью достижения не экономических, а социальных (как было в прошлом веке) целей.

Занимающимся сельским хозяйством субъектам постоянно не хватает средств на создание кооперативов и развитие их деятельности, поэтому государство принимает конкретные меры поддержки: в последние годы выделяется немало средств, постоянно совершенствуются правовые акты, регламентирующие деятельность кооперативов.

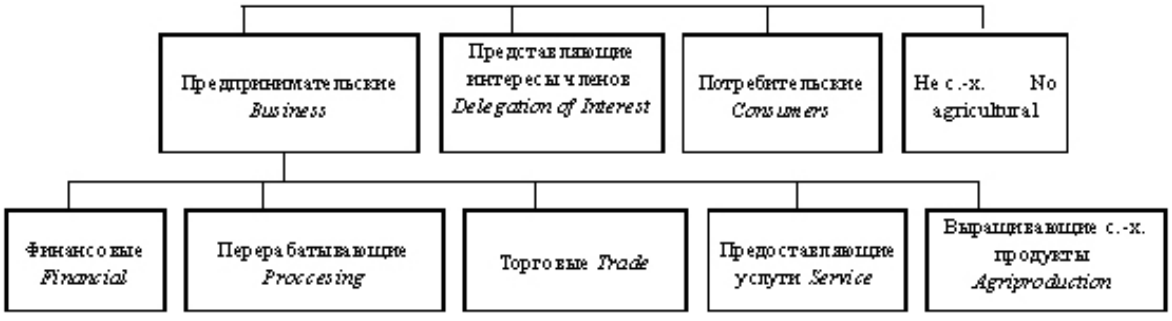


Рис. 1. **Типы кооперативов в Литве**

Цели данной работы – предложить модернизацию некоторых принципов вновь создаваемых и действующих сельскохозяйственных кооперативов в условиях глобализации.

Методика. В процессе долголетних (1991-2008 г.) исследований проводился опрос экспертов (фермеров и руководителей всех типов кооперативов) в Дании, Голландии, США, Литве, Польше, Украине, Швеции. В работе была использована научная литература, правовые акты, статистические данные. Применялись методы анализа, аналогии, логического сравнения.

Развитие кооперативов

Развитию сельскохозяйственных кооперативов уделяется довольно большое внимание во всем мире (Bublys, 1947, Cobia, 1989, Marvin, 1994, Šapiro, 1993, Горбонос, 2003, Зіновчук, 2001, Чаянов, 1919 ir kt.). В 2001 г. Генеральной Ассамблеей ООН была принята резолюция, в которой государства страны ЕС призываются создавать благоприятные условия для развития кооперативов, так как фермеры, сельскохозяйственные общества, принимая участие в деятельности кооперативов, могут расширить производство и, таким образом, на селе не только сохраняется существующие, но и создаются новые рабочие места.

Для выявления сути кооператива необходимо учитывать две стороны медали (Baltramijūnas, 1938; Fauquet, 1938; Ramanauskas, 2007; Туган-Барановский, 1989; Чаянов, 1919 и др.):

- фермерские кооперативы как социальное явление, которое стремится к снижению безработицы, повышению образования фермеров, навыков, повышения уровня жизни и так далее;
- кооперативы как организационно-правовая форма предприятия с экономическими целями и почти не решающий социальных проблем.

Развитие кооперативов в различных исторических этапах может быть проиллюстрирована в виде диаграммы (рис. 2).

Когда создавались первые кооперативы, их социальные и экономические цели почти совпадали. Зачастую доминировали социальные цели, а долгосрочные экономические цели были только средством решения социальных проблем, и лишь позднее в борьбе с капиталистическими предприятиям экономические цели начали приобретать все более важную роль. Кстати, и сейчас еще есть немало людей (и даже ученых), в чьем сознании укоренилось понятие о кооперативах, как маленьких, местных предприятиях, обьединяющих сельских фермеров для решения в основном социальных проблем.

Так В. Зіновчук (2009) считает, что уникальность кооператива состоит в том, что он ориентирован *не на получение прибыли*, а на как можно более полное удовлетворение потребностей своих членов, являющихся одновременно и клиентами и собственниками своего предприятия. По сути, кооперативы – это высокоорганизованная форма *взаимопомощи*. Их можно рассматривать в качестве вспомогательных или обслуживающих структур по отношению к тем экономическим целям, которые ставят перед собой члены кооператива. Следовательно, определение кооператива должно одновременно решить три основные задачи: подчеркнуть ассоциативно-корпоративный характер образования, выделить уникальные черты кооперативной организации, отличить кооперативы от других типов предприятий, что концептуально идентифицирует его как уникальную экономическую организацию. Это дает основание утверждать, что кооператив функционирует на неприбыльной основе, т. е. *не ради получения прибыли*, для обслуживания своих членов, распределяя экономию средств и другие доходы (которые в обычных предприятиях

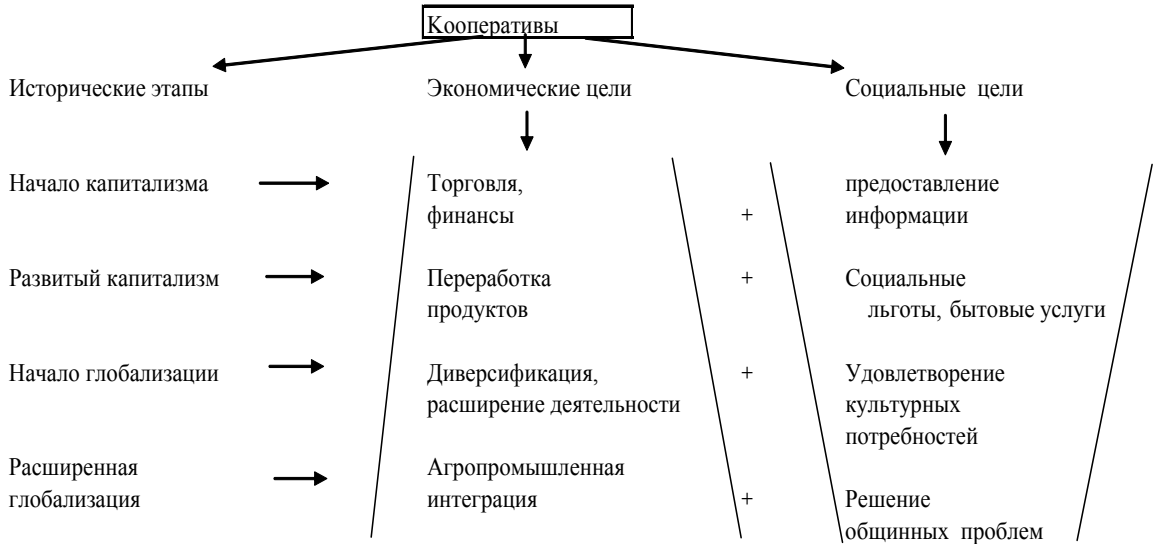


Рис. 2. **Изменение экономических и социальных целей кооперативов в различные исторические этапы**

принимают форму прибыли) пропорционально участию членов в хозяйственной деятельности предприятия. Требование пропорциональности распространяется и на обязательства членов кооператива относительно финансирования своей организации, компенсации убытков, распределения риска и т. д.

Однако в эпоху глобализации все более актуальной становится конкуренция предприятий. Бывший внутри страны рынок расширяется (продукты выходят за границы не только ЕС, но и других стран), действует рынок крупных перерабатывающих и торговых корпораций, особую опастность для предприятий представляет поступающая на рынок дешевая продукция из стран Восточной Европы...

Несомненно в таких условиях кооперативы должны быть очень сильными и экономически конкурентоспособными. Поэтому в деятельности кооперативов начали преобладать не социальные, а экономические соображения. Интересно, что назначение кооперативов по-разному оценивают молодые и старые фермеры. Шведские ученые (Hakelius, 1996) провели исследование и установили, что молодые фермеры кооперативы рассматривают как средство для совместного решения экономических проблем, а не как образ жизни. Для пожилых же фермеров кооперативы – способ солидарности с такими же фермерами для решения скорее социальных, а не экономических проблем.

В настоящее время создавая кооператив, фермеры по нашему мнению должны использовать один из важнейших принципов экономики – эффект крупномасштабного производства, т. к. объединившись, они смогут диспонировать большим количеством продукции и поэтому занять достойное место на рынке и стать конкурентоспособными (Gargasas, 2009).

Основные принципы кооперативов отличаются от других предприятий коллективной деятельности. Такие принципы, как обязательное участие членов в деятельности кооператива (иметь оборот), добровольность, выбор органов управления и их отзыв, демократия контроля (один член – один голос), нестремление получить прибыль, ограничение доходов от инвестиций, характерны только для кооперативов.

Однако далеко не все классические принципы целесообразно соблюдать в период глобализации, т. к. слепое применение их может препятствовать внедрению и развитию новых форм организаций предпринимательства. Думается, настало время модернизировать некоторые узаконенные принципы:

- *принцип неприбыльности* (некоммерческий принцип) в условиях рынка мешает кооперативам находить надежных партнеров, объединяться в ассоциации и т. д. Поэтому уже сейчас большинство кооперативов мира ориентируются на прибыль и создают различные фонды, отдельные члены кооперативов премируются, некоторым предоставляются социальные льготы, дифференцируется величина пая и т. д.;
- *принцип демократии управления*. Он был логичным в кооперативах, основной целью которых было решение социальных проблем его членов. Если целью кооператива является развитие хозяйственной деятельности своих членов, большее число голосов (как и большая часть доходов) должны иметь те, которые имеют больший товарооборот с кооперативом. Кроме того, соблюдение принципа демократии управления невозможно, если отдельные кооперативы хотят объединяться в более крупные организации, координировать свою деятельность с предприятиями другой юридической формы. При модернизации принципа управления в больших организациях основные проблемы решаются не всеми членами кооператива, а представителями, делегированными для участия на выборах, для контроля администрации и пр.;
- *принцип открытого членства*. В некоторых кооперативах вводится ограничение числа членов (Stefanson, 1995). В кооператив принимается столько членов, сколько требуется для обеспечения необходимого финансирования предприятия и какую часть рынка имеет кооператив. Такие кооперативы формируют капитал, предоставляя членам право приобрести акции. Стоимость акций пропорциональна объему сырья, доставляемого кооперативу его членом: одна акция дает право поставлять один продукт (единицу сырья). Таким образом, выкупивший акции, является более ответственным за деятельность кооператива и обеспечен рынком для реализации произведенного продукта.

В настоящее время кооперативы следует рассматривать как часть системы, в которую входят члены и работники кооператива, клиенты (закупщики, переработчики, торговцы), поставщики, община, регион и страна. Для того, чтобы оставаться полноценным участником системы, кооператив, действующий в окружении фирм другой юридической формы, обязан занять подобающее место на рынке. Только такой кооператив в условиях глобализации будет конкурентоспособным и сможет удовлетворять потребности своих членов. Однако сомнительным и дискуссионным (хотя и заманчивым) является желание создать крупные обособленные кооперативы, сфера деятельности которых требует больших инвестиций, высокого уровня технологий, развитой сети рыночных образований, множества специалистов высокой квалификации и т. д.

В последнее время жители литовских деревень и поселков активно создают сельские общины *(англ. rural community*), цель которых объединить живущих, работающих, выходцев из тех мест и просто имеющих какие-то интересы в данной местности лиц для решения различных проблем. Объединяя

социальную и экономическую политику, сельские общины содействуют развитию гражданской активности своих членов. Формы деятельности общин различны: организационные (гражданские группы, группы интересов), индивидуальные (участие в проектах и программах, голосование), поиски и распространение информации (работа с документами, их обзор, участие в митингах, конференциях, печати и др.).

Выводы

1. Процесс кооперации в Литве до сих пор протекает медленно. Зарегистрировано более 400 кооперативов, однако действует только около половины из них. Большинство кооперативов мелкие, хотя число их членов и товарооборот постепенно увеличиваются.
2. Кооперативы создают условия фермерам выращивать больше продуктов. Если продуктов на рынке будет много, они будут дешевле, а это выгодно в первую очередь потребителям. Именно поэтому по существу государственная поддержка предоставляется не столько кооперативам и фермерам, сколько потребителям сельскохозяйственных продуктов.
3. Кроме классических кооперативов, земледельцы и жители села используют более простые формы кооперации, зачастую не создавая общих предприятий: объединения по использованию техники (ассоциации пользователей дренажных систем, помощь соседа соседу, машинные кружки и пр.), хозяйства, создаваемые при консолидации земельных участков, деревенские общины и др. Эти формы кооперации очень перспективны, поэтому поддержка их особенно эффективна.
4. В настоящее время фермеры с помощью кооперативов стремятся к соблюдению одного из важнейших принципов экономики – принципа крупномасштабного производства. Поэтому главная мотивация создания кооперативов – достижение не социальных (как было в прошлом веке), а экономических целей.
5. В условиях глобализации кооперативы должны быть конкурентоспособными, поэтому необходимо менять некоторые классические принципы: принцип неприбыльности, принцип демократии управления, принцип открытого членства.
6. Наиболее эффективны и перспективны крупные конкурентоспособные предприятия, поэтому государственной стратегией развития кооперативов должна быть политика поддержки объединенным кооперативам и их ассоциациям, на осуществление больших проектов.

Литература

1. Baltramiejūnas, S. (1938). Kooperatinis auklėjimas, švietimas bei propaganda. – Kaunas.
2. Bublys, V. (1947). Die genossenschaftliche organizaton der Erzeugung und die Absatzes milchwirtschaftlicher Produkte in Litauen. Inaugural-Dissertation zur Erlagung der Wurde eines Doktors der Landwirtschaft. – Bona.
3. Cobia, D. (1989). Cooperatives in Agriculture. – New Jersey.
4. Fauquet, G. (1938). Kooperatinis ūkio sektorius. Lietuvos kooperatininkų sektorius. – Kaunas.
5. Gargasas, A., Ramanauskas, J. (2009). Kooperatyvų žaliavinio pieno tiekimo logistikos kūrimo aspektai // Vadybos mokslas ir studijos – kaimo verslų ir jų infrastruktūros plėtrai. Nr. 18 (3). – Kaunas: Spalvų kraitė.
6. Hakelius, K. (1996). Cooperative Values. Farmer Cooperatives in the Minds of the Farmers // Journal of Law, Economics, and OrganiSation. Swedish University of Agricultural Sciences – Uppsala.
7. Kuliešis, G., Pareigienė, L., Gedminaitė Ž. (2008). Kooperacijos plėtros stebėsena ir vertinimas. 2008 m. mokslinė ataskaita. – Vilnius: LAEI.
8. Marvin, A. Schaars. (1994). Kooperatyvai: principai ir praktika. – Vilnius: Viskonsino universiteto konsultacinė tarnyba.
9. Ramanauskas, J. (2007). Kooperacijos pagrindai. Mokomoji knyga. – Kaunas: VŠĮ Spalvų kraitė.
10. Šapiro, A. (1993). True Farmer Cooperation // American Cooperation: Journal Of Agricultural Cooperation. Vol. 8.
11. Stefanson, B., Fulton M., Harris A. (1995). New Generation Co-operatives Rebuilding Rural Economies // Centre for the Study of Co-operatives, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.
12. Žemės ūkio ir kaimo plėtros strategija. – http://www3.lrs.lt/pls/inter/w5_show?p_r=2710&p_d=18964&p_k=1 [2008].
13. Горбонос, Ф. (2003). Кооперация. – Львів.
14. Зіновчук, В. (2001). Організаційні основи сільскогосподарського кооперативу. – Київ: Логос.
15. Зіновчук, В. (2009). О проблеме псевдокооперативов в аграрном секторе Украины // Сельскохозяйственные кооперативы в рыночной экономической системе и демократическом обществе. Программа развития и интеграции Крыма ПРООН, Министерство аграрной политики Автономной Республики Крым. – Евпатория (Ukraina).
16. Туган-Барановский, М. (1989). Социальные основы кооперации. – Москва.
17. Чаянов, А. (1919). Основные идеи и формы крестьянской кооперации. – Москва.

“ECONOMIC SCIENCE FOR RURAL DEVELOPMENT”

Proceedings of the
International Scientific Conference

PRODUCTION AND TAXES

2. Finance and Taxes

Theoretical Aspects of Taxation Policy

Elmārs Zelgalvis, Dr.h.oec., professor
University of Latvia
Ilze Sproģe, Mg.oec., Mg.man., researcher, PhD student
Institute for National Economy Research
Aina Joppe, Dr.oec., assistant professor
University of Latvia

Abstract. The present research includes an analysis on the versions of definitions of the taxation policy, which can be found in the theory of economy; however the analysis is done with a critical approach. Theoretical study of the taxation policy permitted the authors to develop their own content of a taxation policy comprising strategic goals, tactical tasks, taxation system and tools.
The formation of a taxation policy is based on the understanding of the impact of taxes upon the processes of economy development on the macroeconomic level in compliance with the four functions of taxation: fiscal, stabilising, regulating, and integrating. The regulating function has received quite an attention by the state officials and economists-theory experts at the end of the 19th and at the beginning of the 21st century. The integrating function has actually appeared at the end of last century and it is not reflected in theoretical studies to a sufficiently wide extent. The research has focused a special attention on the regulating function of taxes and analysis of the utilisation results. The research carried out by the authors may serve as a theoretical basis for the development of Latvian taxation policy for the coming years.
The aim of the present article is to perform theoretical analysis of the taxation policy and to develop the system of elements forming this concept as well as to develop the theoretical justification for the development of a taxation policy in Latvia within the current phase of the economic development cycle.
Key words: tax, tax policy, tax system, budget.

Introduction

The topicality of the subject is determined by the following aspects:
- rapid decrease of the tax revenue as the economy enters the phase of recession;
- non-existence of the national taxation policy and the chaotic manipulations in the area of taxes which are not justified on scientific grounds by the government;
- insufficient theoretical research of the taxation policy leading to inadequate application of this concept in practice.

The aim of the article is to perform a theoretical analysis of the taxation policy and to develop the system of elements forming the content of this concept as well as to develop a theoretical basis for establishing a taxation policy in Latvia within the current phase of economic development.

For the purpose of achieving the set aim it is necessary to carry out the following **tasks**:
- to study the concept of a taxation policy in the theory of economy;
- to develop a set of elements of a taxation policy;
- to analyse the causes for changes in a taxation policy in the Western countries during the second half of the 20th century.

A taxation policy presents one of the most topical current economic problems. This problem is aggravated even more by the negative consequences of the cyclic development of the global economy. Integration of national economies and global competition for attraction of investments present another factor of equal importance affecting a taxation policy. Increase of tax burden causes "run-away" of investments, narrowing of the taxation base, and decrease of budget revenues. Thus, a scientifically justified national taxation policy presents one of the most important factors in the competition for attracting investments.

Tasks of a taxation policy may conditionally be split in three groups:
1) fiscal – mobilisation of financial resources within budgets of all levels for the purpose of providing the required resources for the fulfilment of the state functions;
2) economic or regulating – to promote the national economic development, to ensure even and stable development of economy along the whole economy cycle, to encourage development of international economic relations and solution of social problems;
3) controlling – to ensure control of business operations of economy subjects.

The monographic research **method** has been applied in the development of the present study.

The study **object**: taxation policy.

Results and discussion

Within the current phase of the economic development of Latvia creation of beneficial pre-conditions for promoting activity of business and financial operations of the economy subjects, encouragement of the economic growth by achieving the optimum balance between personal and public interests, i.e. achieving the optimum

balance between revenues kept by taxpayers and the amounts to be paid to the state as taxes present most important tasks of the national taxation policy.

The concept of taxation policy in the theory of economy

Quite a few economists, scientists and theoreticians starting from representatives of the classic political economy Adam Smith, David *Ricardo*, Jean-Baptiste Say, John Stuart Mill and up to the modern researchers of the field of finance and economy have dealt with the theoretical study of taxation policy. However, until now in the science of economy there is no uniform opinion on the treatment of the concept "taxation policy". Four conditional groups can be distinguished due to the comparison of opinions of several well-known economists on taxation policy.

1. Taxation policy is a set of measures implemented by the state in the area of taxes and taxation. Taxation policy presents a constituent of a national financial policy and a tool, by means of which the state regulates social economic processes within society. Or: taxation policy is a set of actions or a system of measures implemented by the state in the field of taxes. Some scientists consider that taxation policy is a system of targeted economic, legal, organisational and control measures implemented by the state in the field of taxation (Финансово-кредитный энциклопедический словарь, 2002; Пономарев, 2001; Сомоев, 2000).
2. Taxation policy is a set of administrative resolutions adopted by the national supreme level administration in the field of planning, regulation, and control of taxes. Or: taxation policy is a set of organisational legal methods, by means of which taxation is administered and which is implemented in practice with the help of a taxation mechanism (Юткина, 2002).
3. Several scientists analyse taxation policy as a set of measures in the field of taxation, by means of which revenues of the national budget are generated. Taxation policy presents a set of measures implemented by the state and directed at timely and complete collection of taxes and duties (Александров, 2003).
4. Taxation policy is viewed as a set of taxation measures supplementing the system of taxes. For example: Taxation policy is a set of economic, financial and legal measures implemented by the state and forming the system of taxes, providing for financial needs of the state and certain social groups as well as the national economic development based upon the re-distribution of financial resources. Or taxation policy forms a part of the economic policy and comprises a set of measures (first, regulatory and legal basis) ensuring improvement of the system of taxes based upon the strategic concept of development of taxes (Пансков , 2005).

The following conclusion can be drawn in the result of analysis of the above definitions:

1) all the definitions are very similar. The first part of the definition, which stipulates that a taxation policy is a set of measures, administrative resolutions or a set of activities implemented by the state, is practically the same;
2) authors have provided for more differences in the second part of the definition, which describes directions of implementing taxation policy. Some authors state that measures and resolutions are implemented exclusively in the field of taxation. Some authors mention that measures implemented by the state are related to timely and complete collection of taxes, provision for the national financial needs and certain public social needs as well as the development of economy.
3) taxation policy is defined as a constituent part of the economy policy or the national policy, as a tool for regulating social and economic processes.

The authors disagree in principle to the definitions of taxation policy provided by the above authors. This problem should be solved based upon a different methodological approach. The concept "policy" is explained in the Dictionary of Foreign Words as the most important attempts by the state, administration, goals, principles, the line of action, course, strategy, and tactics (Svešvārdu vārdnīca, 1999). The authors consider that taxation policy should be treated in compliance with the above explanation of policy. Taxation policy should not be defined as a set of measures or actions to be implemented by the state; it should be defined as the strategy of state in the field of taxes, instead. Strategy, in turn, comprises several elements.

First, strategic goals, which should be achieved within a set period of time. Taking into account trends of the cyclic development of economy, strategic goals of a taxation policy should not be set for a time period exceeding one phase of a cycle (5 – 10 years).

Second, strategy comprises also tactic tasks, which can be achieved by the implementation of the set goal. Tasks are particular measures, which shall be implemented by certain institutions within a certain time period. There can be several tactic tasks, and they can change depending on changes of various external and internal factors impacting the development of economy. Tactic tasks may change without any changes of strategic goals.

Third, a strategy comprises a set of tools, which can be used for solving the set tasks. The range of tools should be sufficiently broad and flexible because the changes of tasks set by the taxation policy may raise a necessity to change tools along with the changes of internal and external situation.

A similar methodological approach to the definition of taxation policy is supported also by other economists. For instance, A.Ponamarjov and T.Ignatova in their textbook "Administration of Taxes in the Russian Federation" write as follows: Taxation policy is a course of action, system of measures, which is carried out by the state in the field of

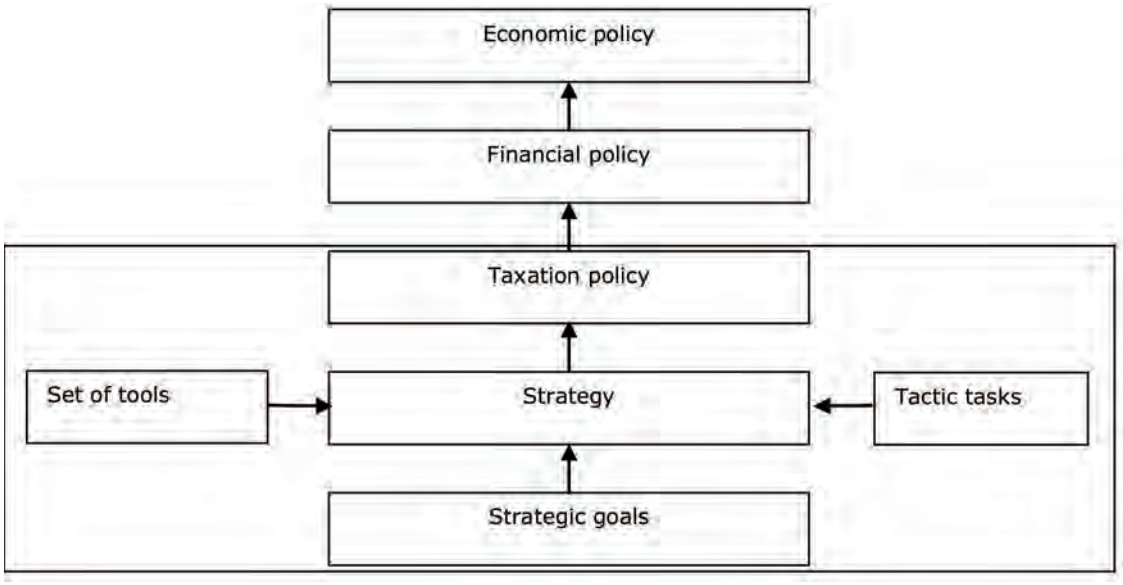


Figure 1. **Content of taxation policy**

taxes and tax administration (Пономарев , 2006). Thus, the above authors speak about a course, i.e. a direction, which the state should follow in carrying out a system of measures in the field of taxes.

In another edition dedicated to tax issues taxation policy is defined as a state goal, action, which is reflected in regulatory documents (Sally, 2007). This approach to the definition of taxation policy is closer to the treatment supported by the authors from the methodological point of view.

Also Latvian scientists have dealt with the analysis of taxation policy. Professor Lūcija Kavale in her report "Taxation policy" writes the following: "Taxation policy is a subjective activity performed by the state in the field of utilisation of taxes. Efficiency and authority of the government operations largely depends on the knowledge possessed by the government in the area of mechanism of operation of taxes and their skills for using it" (Kavale, 1998). As it can be seen from the above the Professor emphasises the state actions in the area of taxes, skilful utilisation of the taxation mechanism and does not speak about taxation policy as a national strategy, or goals, which have to be achieved.

The authors consider that strategic goals cannot be set voluntarily based upon the subjective viewpoint of political forces in the government of the state. Strategic goals of taxation policy should be set based upon the recognised basic principles of taxation policy, for instance, regularities of the global economic development and interests of the national economy.

The authors agree to the opinion expressed in literature and stating that taxation policy forms a constituent part of the national financial policy, which, in turn, is a constituent part of the economic policy. Therefore, strategic goals of taxation policy should comply with the basic approaches and goals of the national economy and financial policy.

In the course of studying the development of the theory on taxes the authors did not come across an exact definition of taxation policy. Individual researchers of taxes have pointed out particular taxation measures with methods of collection. Some time ago a theologian and philosopher *Aqvinas Thomas stated that from the point of view of the church payments by rich people is a more acceptable way of funding the state expenditure*. However, he does not exclude cases when all people participate in covering the expenditure. *Aqvinas Thomas referred to taxes as a permitted form of robbery. According to Aqvinas Thomas' opinion the criteria for setting taxes should be understanding and decency of the governor targeted at achieving the general wealth*.

Francis *Bacon, an* English philosopher *emphasised that taxes should be collected with the agreement of the population, since its virility is not weakened in such a way*. Collection of duties either with the agreement of population or without it is equal from the point of view of a taxpayer's purse; however, the impact on the spirit of the population differs (Бэкон, 1972; Bacon Francis, 2010). *Montesk'e Sharl' Lui*, a French philosopher stated that determination of the portions of income, which a citizen should be deprived of as taxes and which should be kept by a person requires more wisdom and intellect than anything else (Charles de Secondat , 2010).

An important contribution to the development of basic principles of taxation has been provided by representatives of the classic political economy. For example, William Petty, an English economist justified the advantages of indirect taxation, providing a positive assessment of taxation of consumption – excise tax, in his work "A Treatise of Taxes and Contributions" (Petty William, 2010). First, natural fairness requires that everybody should pay in compliance with his or her actual consumption. This type of tax (excise) it not

imposed upon anyone forcibly and it is easy to pay for persons, who consume naturally required items.

Second, if this tax is not transferred for redeem and is collected on regular basis, it encourages saving, which is the only means for population to become rich, as it can clearly be seen from the examples of Dutch, Jews and other nations, who have accumulated considerable wealth.

Third, nobody pays twice for the same item because nothing can be consumed more than once.

Fourth, in case of such taxation (excise tax) it is always possible to obtain perfect data on the wealth, development, production, and strength of a state. No separate agreements have to be concluded with families, no transfers for redeem have to be made; however, the tax has to be collected by special officials, who will not require even one fourth of the current expenditure related to collection of various and numerous taxes, when they are fully loaded (Petty William A Treatise, 2010; Петти, 1993).

Taxation developed in compliance with the theory. Thus, in 1776 the French Minister of Finance Joseph Marie Terray gave preference to indirect taxes because he considered that taxation of expenditures was less burdensome, such taxes were collected gradually and they were less noticeable. Terray commenced setting of indirect taxes depending on the character of an item: items of prime necessity (grains) should be released from taxation, a small tax should be imposed upon cattle, a slightly higher tax should be imposed upon wine, and a very high tax should be imposed upon luxury goods (Фор, 1979).

Researchers of taxes consider that the basic principles for imposing taxes were developed by Adam Smith in his work published in 1776 "A study of the Wealth of Nations" and they have not lost their importance even up to today. It should be noted that A. Smith in his above work does not provide a definition of taxation policy and does not list any particular principles of taxation. He just lists several preconditions, which should be taken into account when taxes are collected (The Wealth of Nations / Part II V.2.23, 2009). By summing A. Smith's indications economists have developed a few basic principles, which should be taken into consideration when the strategic goals of taxation policy are defined:

1) the principle of fairness (the principle of equability), which means generality of taxation, equal distribution of taxes among citizens in compliance with their income;
2) the principle of certainty, which requires that the amount of a payable tax, method of payment and term for its payment are known to a taxpayer well in advance;
3) the principle of convenience stipulates that a tax should be collected at a time and in a manner, which are most convenient for a taxpayer;
4) the principle of economy (the principle of low costs) provides for reduction of tax collection costs and improvement of the efficiency of the system of taxation.

The authors consider that the basic principles derived from A. Smith's work refer more to taxes in general, establishment of a taxation system, administration of taxes, and less to the selection of strategic goals of a taxation policy.

The understanding that a taxation policy may both encourage or restrict business in a certain field by creating circumstances allowing to reduce production costs or improving competitiveness of national goods on the global market reached the minds of politicians quite a long time ago. Already in the government lead by Colbert in the 17th century the Minister of Finance in France was practising imposing of taxes upon consumption, and creating tax privileges for industries, in the development of which the government was interested.

A.Smith and D. Riccardo as well as their followers in the theory of taxes restricted the role of taxes to their fiscal function. A.Smith based his theory on the idea about the state not interfering with the economy; he treated taxes first and foremost as a means for obtaining funds for the state treasury. He considered that only in exceptional cases taxes could be used for providing support for the national production, for example, by implementing the policy of trade protectionism. D.Riccardo's position in this respect was even stricter, since he considered that taxes perform only the fiscal function.

Later, in the 1990s Werner Sombart, a German economist in his research "Ideale der Sozialpolitik", 1897 put the development of production forces as a priority task and supported implementation of active national economy policy, which included also taxation policy (Koslowski, 2010).

A similar opinion is expressed also by the Russian academician J.Janžul (Иван Иванович Янжул). In the book "Basics of the science of finance" he is trying to justify the limits of a tax burden and has expressed a strict opinion that needs of the state should not contradict actual abilities of taxpayers not lowering the standard of living and not restricting possibilities for enlarging production.

Historical experience of implementation of taxation policy

The Great Depression of 1929-1933 forced to account for the state finance in another quality: as a tool for achieving macroeconomic stabilisation. Taxes were incorporated in the macroeconomic system of market regulators and were used for the purpose of regulating the economic condition. John Maynard Keynes's idea of "effective demand" permitted to link taxes to the trends of change of basic macroeconomic indices: national revenue, employment, inflation, etc. Aggregation of taxes meant a new quality of taxes and required that an optimum level of taxation should be established and impact of taxes upon the development of production, investments, and personal and corporate income should be identified. Taxes demonstrated themselves as an efficient tool for implementation of the national industrial, agricultural, social and external economic policy; following the Second World War developed countries utilised taxation policy as a comprehensive means for economy regulation. The above is clearly certified by the many measures of reorganisation

of taxation systems, which were implemented by the EU member states, USA, Canada, Japan, and other countries in the 1950s and the 1960s as well as the 1980s and the 1990s. Taxation systems were developed in compliance with the results of the research carried out by the leading economists of the 20th century Alfred Marshall, Paul Anthony *Samuelson*, John Maynard Keynes, Milton Friedman, Arthur Betz Laffer, and others.

No doubt that in the 20th century the regulating function of taxation was actively used in the national taxation policy along with the fiscal and stabilising functions. Besides, the role of the regulating function continues to grow in importance.

During the post-war period taxes were fulfilling mostly the role of stabilising the economic cycle. By means of periodic reduction of taxes countries were trying to encourage demand, to increase the speed of economic growth, and to encourage businesses to invest more. On the contrary, by increasing taxes the leading circles were trying to restrict inflation, and to stabilise the economic cycle. For the purpose of encouraging businesses to improve technologies, production management and organisation methods, the science of finance recommended state administrations to apply tax benefits. A diverse system of tax benefits was developed and applied extensively during the 1950s-1970s. Thus, almost all the liberalisation reforms of the taxation policy were carried out by the USA Federal Tax Service in the beginning of the current growth phase. Rates of income and indirect taxes were reduced before the growth of 1945-1947. Tax reliefs related to accelerated depreciation were broadened and tax reliefs in relation to taxation of dividends were introduced in the beginning of the growth of 1955-1956. During the growth of 1962-1966 reliefs related to depreciation were broadened, a 7% relief for the value of new investments was introduced, rates of income and indirect taxes were lowered. Practically all the tax legislation of the USA, which was adopted before an economic growth or during its beginning phase, provided for reduction of corporate profit tax and personal income tax as well as simultaneous reduction of indirect taxes. It meant the encouragement of both investment activity and demand on a consumption market. The policy of reduction of personal income tax of residents was implemented by the Federal government of the USA periodically before the four post-war crisis and during the post-crisis situation in 1967.

The analysis of the historical experience allows identifying the essential impact caused by taxation policy upon the character and speed of the economic cycle. Tax reforms became an important factor, which prolonged the growth phase of a cycle. The policy of introducing tax reliefs promoted renovation of assets. Strengthening of taxation of corporate and personal income allowed minimising the inflation trends in the economy.

During the 1980s tax reforms became one of the most important tools in implementation of the economic growth policy. On the conditions of growing inflation during the second half of the 1970s and in the beginning of the 1980s the financial science concluded that progressive taxation had a negative impact upon the development of efficient and modern production. The issue of increasing tax rates was solved by an American economist A. Laffer within the framework of the theory of supply economy. A.Laffer identified a mathematic relation between the budget revenue and tax rates. He proved that increase of taxes by means of raising tax rates does not increase the budget revenue, but on the opposite, decreases it at a certain point. According to A. Laffer's opinion high taxes exert negative impact upon the supply of labour and capital, and it was taken into account by the USA, Great Britain, Canada, and other countries in the course of implementing tax reforms in the 1980s.

The main direction of improving taxation of income was reduction of the portion of income of physical and legal entities, which was taken away by taxes, reduction of the progressive character of rates scale, and decrease of differentiation of rates. An important place in tax systems was taken by the new types of indirect taxation. Taxes were used as a powerful motivation for activation of investments, as a tool for implementing structural and regional policy, and also for solving ecological and social issues.

Main directions of development of a modern taxation policy

The basic principles of a modern taxation policy started to develop at the end of the 1970s and in the beginning of the 1980s. It was the time when the orientation regarding application of market economy regulation methods changed in the largest industrially developed countries. Borderlines were set for extensive increase of the state intervention and the material foundation of this process – state finance. A maximum priority was given to the application of market mechanisms for encouraging business operations and competitiveness.

In the works of Western economists analysing causes of global tax reforms of the 1980s and 1990s a certain stereotype can be identified. Scientists note that industrially developed countries refused the application of a taxation system for the purpose of redistribution of GDP and prioritised the principle of neutrality. The following are listed as causes of changes of tax policy: trends of increase of inflation processes, increase of the central budget deficit, and decrease of personal income at the second half of 1970s and in the beginning of the 1980s.

The authors of the present article think that the above explanation of causes of tax reforms is superficial and presents just an external, superficial reflection of deeper economic processes. Objective causes of crisis at the end of the 1970s were determined by a new and higher from quality point of view step ahead in technology development resulting in a change of production development goals and structural landmarks. Peculiarities of this process were based upon the global and universal character of technical

achievements and technological changes. This change affected all the elements of the cycle "science – production". The means of work and work items changed on quality level, untraditional energy resources, means of transportation and communications were developed, the rapid process of computerisation started. The role of science changed radically: it formed the basis of the production process.

The new stage of development of science and technologies in the beginning of the 1980s is characterised by several features.

1) research and production were combined to form a single basic unit;
2) the production, research and technology development obtained a universal character. Major scientific and technical developments usually were achieved at the points of intersection of different, previously autonomous directions of research, which permitted the application of the new achievements in several production areas. Production became interdisciplinary by character;
3) approximation of national economies, internationalisation of production intensified, in particular, within the framework of the EU;
4) the life-cycle of new technologies became shorter, technical re-equipping of the production process became the basis for ensuring functioning and profitability of production. It was necessary to search also for new forms of production organisation: thus promoting the development of small and medium companies, which were able to implement technical innovations at a faster speed;
5) it was necessary to improve knowledge of employees and their qualification, to master a second and third profession.

In the result, on the edge of the 1970s and 1980s a contradiction got formed between the directions of production, science and technical development on the one hand and the regulating methods applied within taxation policy on the other hand. The process of rapid development of the market economy experienced a radical change, however, methods forming the taxation policy remained traditional: they were targeted at encouragement of production development within narrow fields, separated stimulation of scientific and technological innovations and development of the existing production by means of taxation instruments.

In the course of tax reforms of the 1980s and 1990s a uniform conceptual approach to application of taxation policy for the purpose of macroeconomic regulation of modern economic systems got established.

Currently more attention is paid to the following directions of taxation theory and practice.

1. Improvement of the taxation system and set of tools for encouraging activities of businesses and people directed at promoting investments in the area of production and research.
2. Increase of taxation of consumption (VAT, first of all) as an efficient means for increasing the budget revenue.

In the taxation policy there is a certain interconnection: by promoting investments in production, research and technologies countries with the developed market economy consequently follow the policy, which provides for reduction of the share of corporate tax in the budget revenue. Caused losses are compensated by reforming the indirect taxation system, in particular, by applying VAT. It is a characteristic feature that a course towards liberalisation of economy, self-regulation of market and encouragement of private initiative is followed during the past 15-20 years. To a large extent it serves as the basis for the taxation policy implemented by various countries in the above referred two directions.

The idea on application of taxes for redistribution of personal income for the benefit of savings (investments) and less for consumption is gaining an increasing support. At present many governments consider simultaneous taxation of income and expenditure by balancing the income tax with a value added tax purposeful approach. Another direction: introduction of a direct expenditure tax is under serious consideration by the USA and Ireland governments planning to supplement or replace the personal income tax by it. The introduction of the direct expenditure tax, which would be supplemented by taxation of heritage and corporate financial expenditure, is intended as an incentive for creating savings and investments.

3. Another important line in the structure of taxes in the area of taxation of corporate and personal income is presented by broadening of the base for assessing the tax implemented by reducing tax reliefs and decreasing the tax rates at the same time. The increase of neutrality of taxation of income is based upon the universal and interdisciplinary character of the modern forms of technological development of production. In the 1950s and 1970s a strict orientation towards development of priority production branches and sub-branches ensured stable development of the national economy and gained leading positions in the international economic competition. On such conditions the application of tax reliefs was quite natural; it promoted development of certain production branches. Of course, the creation of greenhouse conditions as concerns taxation within one branch had to be balanced by high income tax rates for other taxpayers. Along with changes of the production technological priorities a necessity appeared to encourage technological renovation in all the business areas and a stable flow of investment financing. This problem was attempted to be solved by leaving taxpayers with a larger share of income and at the same time encouraging them to invest funds for further development.

If broadening of the taxation base for corporate income tax was consequent, then broadening of personal income taxation base by removing tax reliefs and uniforming rates was related

to a change of the method of assessment of income, which considerably weakened the neutrality of the tax. Practically all the countries maintained considerable tax reliefs for various categories of taxpayers. Therefore, it is very difficult to speak about the neutrality of personal income tax.

4. The production internationalisation process, capital migration and increase of the mutual dependence of national economies caused a necessity to develop uniform taxation systems.
5. Considerable tax reliefs are received by corporations, which continuously allocate resources for their personnel training and improvement of their qualifications. Tax reliefs are received also by small and medium companies.

Conclusions

The description of the economic situation, which should be taken into account in the course of development of the taxation policy:

- economy in the stagnation phase of the cycle;
- considerable decrease of GDP;
- high unemployment;
- decrease of consumption prices;
- decrease of the central budget revenue;
- low export;
- a low share of products with high value added;
- insufficient amount of investments.

From the above description of the economy it follows that the regulating function of taxation should be prioritised at the present moment in the course of development of the taxation policy. It should serve for achieving the increase of the economy development speed resulting in increase of budget revenue (also the fiscal function).

The development of production on all branches of the national economy should be defined as the strategic goal of the taxation policy for the coming 5-10 years. Along with the development of production also other transitional problems of economy will be solved: employment will increase, the internal consumption will grow, thus increasing tax payments to the budget and causing stabilisation of consumption prices, the economy will cross over from the stagnation phase to the growth phase.

For the purpose of achieving the above strategic goal a range of strategic tasks should be solved by means of application of the set of tools provided by taxes. Not simple production, but innovative production should be developed. It is the innovative production which provides high added value and, consequently, higher tax revenue to the budget and funds for further investments in Latvia.

Bibliography

1. Bacon Francis Available at: http://en.wikisource.org/wiki/1911_Encyclop%C3%A6dia_Britannica/Bacon,_Francis Access on January 5, 2010.
2. Charles de Secondat, baron de Montesquieu Available at: http://en.wikipedia.org/wiki/Charles_de_Secondat,_baron_de_Montesquieu Access on January 5, 2010.
3. Joseph Marie Terray Available at: http://en.wikipedia.org/wiki/Joseph_Marie_Terray Access on January 9, 2010.
4. Kavale L. Nodokļu politika / Rīga 1998, 28 lpp.
5. Koslowski Petet (editor) Methodology of the Social Science, Ethics, and Economics in the Newer Histroricla School from Max Weber and Rickert to Sombart and Rothacker / Springer 1997, p. 155, e-resource Available at: http://books.google.lv/books?id=f38GcLbskegC&pg=PA155&lpg=PA155&dq=Sombart+W.+Ideale+der+Sozialpolitik&source=bl&ots=mQwXVdL5wE&sig=GS2xTZNrdYTnm4pZUIS--V3u_ZE&hl=lv&ei=DgFbS63rBZeF_AbMxvyJBQ&sa=X&oi=book_result&ct=result&resnum=3&ved=0CBEQ6AEwAg#v=onepage&q=Sombart%20W.%20Ideale%20der%20Sozialpolitik&f=false Access on January 20, 2010.
6. Petty William Available at: http://en.wikipedia.org/wiki/William_Petty Access on January 9, 2010.
7. Petty William A Treatise of Taxes & Contributions Available at: http://socserv.mcmaster.ca/econ/ugcm/3ll3/petty/taxes.txt / Chapter 15 Of Excise Access on January 15, 2010.
8. Sally M. Jones Principles of Taxation for Business and Investment Planning / McGraw – Hill International edition, 2007, p.23 (543 p.)
9. Smith Adam The Wealth of Nations Available at: http://www.econlib.org/library/Smith/smWN.html Access on: December 28, 2009.
10. Svešvārdu vārdnīca / J.Baldunčika redakcijā / Rīga, Jumava, 1999 ISBN 9984-05-266-4 611. lpp (879 lpp)
11. Александров И.М. Налоги и налогообложение: учебник. — М: «Дашков и К», 2003. — с.288
12. Бэкон Ф. Сочинения / М., 1972, Т2 – с.416
13. Пансков В.Г. Нагоги и налогообложение в Российскои Федерации . Книги Издательского Дома «МЦФЭРЭ" М.: Финансы и статистика, 2005 – с. 50
14. Петти В. "Трактат о налогах и сборах" // Антология экономической классики В. Петти. А. Смит. Д. Рикардо. М.: Эконов, Ключ, 1993, ISBN 5-85978-008-7, 5-85239-003-8478 с. 77-78 (478 с.)
15. Пономарев А.И. Налоги и налогообложение в Российской Федерации. — Ростов н/Д: Феникс, 2001.- с.53
16. Пономарев А.И., Игнатова Т.В. Налоговое администрирование в Российской Федерации: учеб. пособие / М. : Финансы и статистика, 2006. – с.91.
17. Сомоев Р.Г. Общая теория налогов и налогообложения. — М.: Приор, 2000. — с. 51.
18. Финансово-кредитный энциклопедический словарь /Под ред. А.Г. Грязновой. — М: Финансы и статистика, 2002. — с.605

19. Фор Э. Опала Тюрго. М.: Прогресс. 1979 с.170
20. Черник Д.Г., Починок А.П., Морозов В.П. Основы налоговой системы: Учебник для вузов ISBN5-238-00144-4 Москва., Финансы, 1998 с,58-59
21. Юткина Т.Ф. Налоги и налогообложение: учебник.2-изд. — М.: Инфра-М, 2002. — с.211.

Kopsavilkums

Pētījumā kritiski analizēti ekonomikas teorijā sastopamie nodokļu politikas definīciju varianti. Nodokļu politikas teorētiskā izpēte ļāva autoriem izstrādāt savu nodokļu politikas saturu, kas ietver stratēģiskos mērķus, taktiskos uzdevumus, nodokļu sistēmu un instrumentāriju.
Nodokļu politikas veidošanas pamata ir atziņa par nodokļu ietekmi uz ekonomiskās attīstības procesiem makroekonomiskā līmenī atbilstoši četrām nodokļa funkcijām: fiskālai, stabilizācijas, regulēšanas un integrācijas. Regulēšanas funkcija ir guvusi visnotaļ lielu uzmanību valsts darbinieku un ekonomistu – teorētiķu vidū 19.gs beigās un 21.gs sākumā. Integrācijas funkcija reāli ir radusies pagājušā gadsimta beigās un tā nav pietiekoši plaši atspoguļota teorētiskajos pētījumos. Īpaša vērība veltīta nodokļu regulējošās funkcijas izpētei un izmantošanas rezultātu analīzei. Autoru veiktais pētījums var kalpot par teorētisku pamatu Latvijas nodokļu politikas izstrādāšanai turpmākiem gadiem.
Raksta mērķis ir veikt nodokļu politikas teorētisko analīzi un izstrādāt šī jēdziena saturu veidojošo elementu sistēmu, kā arī izstrādāt teorētisku pamatojumu nodokļu politikas izveidei Latvijā pašreizējā ekonomikas attīstības cikla fāzē.
Atslēgas vārdi: nodokļi, nodokļu politika, nodokļu sistēma, budžets

Tax System Impact on Regional Economic Activity
Nodokļu sistēmas ietekme uz reģionu ekonomisko aktivitāti

Biruta Pūle, assistant professor of Department of Finances, BA School of Business and Finance,
PhD student, Faculty of Economics, Latvia University of Agriculture,
e-mail: biruta.pule@ba.lv

Abstract. Historically Unitary tax system has been applied in Latvia. It means that all the fiscal powers have been delegated to the central government. The author has analysed the practice of other EU countries, which have implemented a multi-stage tax system. This kind of tax system has fiscal powers division between the federal level and the main regional levels. It is recognised that implementation of the multi – stage tax system has given positive impact on the region's economic stability. The research author analyses advantages of the multi-national taxation system in the context of regional economic development equalisation.
Key words: regions, economic development, tax system.

Introduction

Effective tax and duty system is able to provide full implementation of public functions and influence a region's economic development. However, the current tax system does not stimulate economic situation smoothing in the regions of Latvia; instead it is strengthening the formation of regional socio-economic differences and deepening of stratification related to various population groups. The country does not provide a sufficiently conducive environment for business and investment incentives. At the same time analysing the experience of the EU member states, which have implemented a multi-stage tax system where there is a fiscal realignment of powers between the federal level and the main regional levels, it is recognised that the tax system gives positive impact on the region's economic stability. Regional economic development can be stimulated by the production deployment in regions. Consequently new jobs and a stable social environment are created, thus allowing the regions to compete in perspective. It is necessary to establish that municipalities, regions and country individually have their own independent tax revenue base in order to stimulate effective regional development. The ratio between these levels should be determined according to the principle that taxpayers pay taxes for services at the levels they get in return from the village, region or country. The determination of tax types and rates should be based on the functions that are delegated to tax payers. This approach means that individuals and businesses pay a part of taxes directly to the municipalities, another part – to the regions, and the third – to the state. It means that authorised institutions would be entitled to determine the use of tax revenues in the situation when every tax goes directly either to the municipality, region or state budget.

In the context of this research the author has defined the **following hypothesis** – regional economic development incentives are achieved through the redistribution of fiscal powers between the national, regional and municipal levels.

The research aim is to study the tax policy as a regional development support tool.

The following tasks are advanced to achieve the set aim:

1) to identify economic support tools for the regional development;
2) to identify the regional development support tool – the tax system's role in promoting business in regions;
3) to set possible solutions for stimulation of the national economy.

The author has compiled information from the Internet resources, books, statistical publications, and other materials to reach the defined aim and tasks. The research is mainly based on the monographic descriptive method and abstractly logical method as well as the method of analysis and synthesis is used to study the tax system as a tool impacting the regional development.

Results and discussion

1. Economic support tools for regional development

Regional economic development is based on the implementation of a well-considered regional policy. The modern concept of regional policy was more broadly defined in the 1930s, when the British and the US governments undertook active measures to develop the problematic regions (Fatejevs V., 1994).

A modern regional development policy has several fundamental principles – democracy, openness, and decentralisation, when the local government and population interests and initiatives are set as primary. Regional policy concept is most precisely defined by A. Kuklinskis stating that regional policy is the art of government to use different approaches for different parts of the country. Regional policy is a previously considered

government action to reduce inequalities between regions, using specially designed instruments (Kuklinskis A., 1987).

Regional policy objects depend on each country's administrative division and institutions - parish, city, county, state, district, municipalities, federal lands, state, territorial and government agencies, private, non-governmental organisations, individuals, and families. The state and government institutions as well as international organisations, in particular the European Commission and other EU institutions are the main objects of regional policy implementation. However, the decentralisation of power and governance process, which occurs in many, both developed and less developed countries, according to the subsidiarity principle increase the role of regional policy-implementation in municipalities (local and regional). Therefore, it is considered that the government is simultaneously both the object and entity of regional policy. The more powerful are municipalities, the greater are the opportunities for regional development (Vaidere I., 2006). Regional development policy includes certain operating principles, methods, tools and a set of measures, which are known as regional development tools. Like the entire administration in general, the regional development may be divided into three main groups of management methods:

- administrative methods;
- economic methods;
- socio-psychological methods.

Such a classification of management methods is rather conditional, since in practice all the methods are closely related. Management methods, including regional management, may also be classified as direct and indirect, active and passive, or incentive and restrictive. The indirect methods are directed to the problem of adjustment, while the direct methods are limited to the adjustment of symptoms.

The experience of different countries has shown that there are numerous regional development support tools. The following support tools may be named as the most important:

- grants and loans of national and international organisations to local and regional municipalities for production, establishment and development of social and environmental infrastructure;
- placement of new and existing national (or state-controlled) companies and government agencies in the problematic regions ;
- provision of regional grants and loans to private companies in order to stimulate generation of new production units;
- regional targeted government subsidies and loans for the development of small and medium-sized enterprises;
- provision of public orders to private companies operating in depressed areas;
- appropriate fiscal (tax) policies for individual areas;
- provision of regionally differenced basic funds less developed areas;
- development of industrial or other special purpose areas;
- activities stimulating the production and population movement to problematic regions;
- assistance to the development of innovation in less developed areas;
- the government forced Contract for supply to less developed regions;
- enabling the creation of business counselling centres, innovation centres, technology parks and other business organisational structures (Fatejevs V., 2004).

Many of these regional development funds can be used as complex. In addition, the same resources may be either stimulating or restrictive in different regions. It is exactly the environment that forms an investor's opinion either to invest or not the funds in the business environment of the particular region. Consequently, not all economic potential of the country is used, thus leading to an uneven regional economic development. The socio-economic difference of Latvia's regions is characterised by different volume of GDP per capita (Table 1). The situation when the share of GDP for one region (Riga) ranges from 54% to 57%, while the respective

Table 1

GDP by regions of Latvia for the period of 2004-2007, thou. LVL

Regions	2004		2005		2006		2007	
	GDP total	GDP per capita	GDP total	GDP per capita	GDP total	GDP per capita	GDP total	GDP per capita
Riga	4 321466	5 892	5 190886	7 114	6 174398	8 516	8 036228	11 163
Pieriga	723 849	1 985	1 008529	2 743	1 467991	3 954	1 818255	4 826
Vidzeme	472 774	1 916	563 908	2 309	733 130	3 033	990 399	4 143
Kurzeme	886 411	2 841	965 196	3 118	1 149313	3 741	1 517697	4 979
Zemgale	480 386	1 662	629 684	2 192	805 037	2 819	1 180164	4 154
Latgale	547 508	1 493	691 460	1 910	831 952	2 329	1 219612	3 471

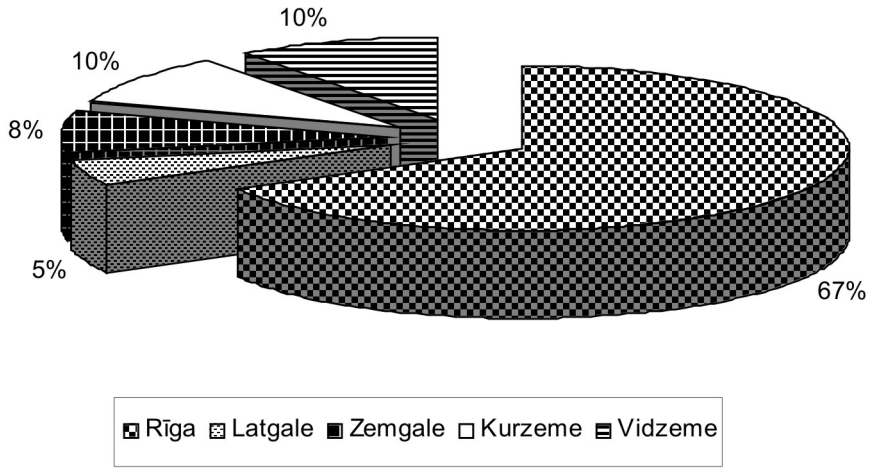
Source: Central Statistical Bureau of Latvia

Table 2

The dynamics of economically active enterprises in the regions of Latvia, registered in the Commercial and Enterprise Registers

Regions	2004	2005	2006	2007	2008	2009
Riga	26892	31074	39018	39865	44117	46472
Latgale	2811	1920	2325	2675	3180	3411
Zemgale	3778	3230	3751	4384	5114	5498
Kurzeme	5339	5061	5624	6178	6586	6778
Vidzeme	4584	4472	5138	5738	6405	6714

Source: made by the author according to the Lursoft data



Source: made by the author according to the Lursoft data

Figure 1. **The share of economically active enterprises in the regions of Latvia in 2009**

share in other regions of Latvia ranges only from 6% to 12% indicates on the segregation of different population groups and shows that the country lacks a uniformly positive environment for business and investment incentives.

If more than half of the economic potential and more than a third of the population is concentrated in the country's capital (Latvian example), then the rest of the economic indicators and the population density is quite low. Encouraging the economic potential of disadvantaged regions in the identification and application of the unused production factors could make a significant contribution to the country's economic growth (Vaidere I., 2006). Therefore, the primary condition shall be the provision of regional economic stability implemented through the regional policy instruments. The appropriate fiscal policy to each area is one of the most common regional development support tools (Fatejevs V., 2004).

2. Role of tax system in promoting regional business activities

Creation of new jobs in Latvia is a measure of the economic policy and the government's priority. The implementation of regional economic policy provides the increase of business activities, creation of additional jobs and livelihoods for those who live in regions with the highest unemployment and lowest income levels, thereby levelling the disparities in living standards. The support of business throughout the country requires not only state investment in infrastructure development, but also the fiscal policy promoting regional development.

Concerning that the tax payments in the national budget are the main source of income, and they primarily perform the revenue-raising (fiscal) function, it is in the interests of any country to create an efficient tax system. Namely, a system that is flexible, fair, simple, easy to administer as well as regional economic development incentive.

Tax systems in various studies are systematised according to different criteria. From taxation point of view, the administrative territorial division is the first classification criterion. The type and organisation of the state systems determine the fiscal instruments of national, regional and local authorities, and budget formation aspects on the national government level. There are three systems distributed by the administrative territorial principle: federal, confederative, and unitary tax system. Federal tax system is characteristic to the federal states (Austria, Germany, Spain, etc.) Confederative tax system is an example of Switzerland where the cantons delegate part of fiscal powers to the Confederation government. Countries with the unitary state system have a unitary tax system (Italy, Latvia,

Lithuania, Estonia, Poland, Sweden, France, and other countries).

In federative and confederative states national tax system architecture is provided by the state system, in the sense of relatively independent components (regions, countries, state government, land, republics, cantons, etc.), forming the state's "second" regional level. Organisation of this level is linked with the national powers and the division of powers, which significantly affects the distribution of fiscal powers. Federal tax system is based on the so-called fiscal federalism, which is a division of powers between the federal and regional level federations. The regional powers limitation is one of the approaches to fiscal federalism. Regions can set tax rates and tax incentives, but the tax base and the object of calculation methodology are analogous to federal taxes. By contrast, fiscal equalisation mechanism is used to ensure an even regional development. One of the best practise examples for this approach is German Federal Republic tax administration model. Its land tax calculation conforms to the federal tax system calculation mechanism. State Federal financial institutions provide state federal and regional land tax collection. Moreover, a smoothing mechanism has been developed between the federal state and regional land budgets.

There is another approach to federalism in the USA, where the national (state) legislators have the right to form their own tax systems, not excluding the possibility that income tax system operates on the federal and state levels at the same time. In confederation case – Switzerland, the cantons, which are sovereign territories, determine the central (Confederation) government power, thus delegating the determination of the powers to the Confederation.

In unitary states covering the majority of the world countries, administrative territorial units, have no sovereign rights of taxation, and thus the local government tax collection is entirely subordinate to the central authorities (government) decisions (Ketners K., 2000). The analysis on the trends of states having unitary tax systems shows that business development concentrations are observed around the major cities, while the business in regions is dying, as the total number of companies is declining in regions (Table 2).

The analysis on the records of liquidated and re-established companies shows that the number of liquidated companies in 29 municipalities (out of 118 municipalities) of Latvia exceeds the number of newly established companies.

In Latvia, 67% of economically active enterprises are concentrated in Riga region, while in other regions of Latvia active business handling tax payers constitute from 5% in Latgale region to 10% in Kurzeme and Vidzeme regions (Figure 1). It means both a reduction of tax payments, and rising unemployment in less developed regions. In Latvia the following regions are considered as problematic - Latgale and Zemgale, Kurzeme and Vidzeme regions.

3. Possibilities for promotion economic activity in regions

In regional policy, taxes are used to support any of the sectors or regions. It is often tried to achieve tax advantages coming in the form of subsidies to affect the structure of the holding, in order to direct resources in certain directions. In fact, tax policy, just as a regional policy should promote national, social and economic development as well as increase the population employment. K. Ketners indicates that it can be achieved by reducing and differentiating tax rates and allocating tax relief.

Every government, forming its tax system, has to clearly state the government policy objectives and the ways to achieve them. In essence it is a question of the role of national economy and the government intention to use taxes.

Usually the tax burden serves as the main fiscal policy indicator, defined as a percentage of Gross Domestic Product (GDP), which respectively shows the proportion of GDP re-allocated to the national tax policy. The tax burden in the EU countries has slightly declined over the past ten years, concerning the joining of new member states.

Compared with other EU member states, Latvia has one of the lowest tax burden rates – 30.5%, which is the fourth lowest rate in the EU and by 9.3 percentage points lower than the average for the EU (Taxation Trends in the European Union, 2009). Of the EU-27 countries, only four countries: Austria, Belgium, Germany, and Spain, have a multi-tiered tax system. The analysis of tax burdens in these four countries and comparison of tax burdens with other countries (Table 3) show that the tax system structure (single-level, multi-level) does not affect these parameters, since there are high tax burdens in both, single-level and multi-tiered taxation systems.

Currently Latvia suffers from an imbalanced tax structure, caused both by the global economic impact on local markets as well as the current domestic fiscal policy, which is not sufficiently coordinated due to the lack of savings. Therefore major reforms in the tax system are required aimed at strengthening the competitiveness of Latvia, promoting balanced economic development as well as ensuring the sustainability of public finances (Ministry of Economics, Informative Report on the Review of Tax Policy to Stimulate the Economy, 2009).

The above-mentioned report of the Ministry of Economics emphasises that several principles have to be respected for successful implementation of tax reforms. Firstly, a long-term view is needed, which means stability and predictability. Secondly, there is need for a clear communication between objectives and action. Thirdly, tax policy changes shall be supporting or at least not hindering the development of export industry, not reducing the competitiveness of local businesses on the local markets.

Fiscal policy stability, predictability, and arrangement of any country is one of the factors of economic subjects rational behaviour directly

Table 3

Tax burden in the EU member states (tax revenues as a percentage of GDP)

Data	Government									
	Central			State / regional			Local / municipal			Total
Country	2005	2006	2007	2005	2006	2007	2005	2006	2007	2007
Austria	22.5	22.1	22.3	3.0	3.0	3.1	4.6	4.6	4.7	42.1
Belgium	14.3	14.0	13.3	10.8	10.7	10.7	2.2	2.2	2.3	44.0
Bulgaria	23.8	24.6	24.7	n.a.	n.a.	n.a.	0.6	0.8	0.9	34.3
Cyprus	26.6	27.9	33.2	n.a.	n.a.	n.a.	0.4	0.5	0.5	41.6
Czech Republic	25.9	25.5	25.7	n.a.	n.a.	n.a.	5.4	5.2	5.2	36.9
Denmark	32.8	31.8	35.8	n.a.	n.a.	n.a.	16.9	16.7	11.8	48.8
Estonia	21.9	22.3	23.4	n.a.	n.a.	n.a.	4.0	4.1	4.4	33.1
Finland	23.6	22.8	22.5	n.a.	n.a.	n.a.	9.1	9.2	9.2	43.0
France	17.6	16.8	16.2	n.a.	n.a.	n.a.	4.8	4.8	4.9	43.6
Germany	11.1	11.3	11.8	8.2	8.6	8.9	2.9	3.1	3.2	39.4
Greece	20.1	19.9	20.1	n.a.	n.a.	n.a.	0.2	0.2	0.2	32.1
Hungary	21.4	21.2	22.6	n.a.	n.a.	n.a.	4.3	4.3	4.4	39.8
Ireland	25.9	27.2	26.2	n.a.	n.a.	n.a.	0.7	0.7	0.7	31.3
Italy	21.2	22.8	23.3	n.a.	n.a.	n.a.	6.4	6.5	6.7	43.3
Latvia	15.4	16.1	16.0	n.a.	n.a.	n.a.	4.9	5.2	5.4	30.5
Lithuania	15.3	16.0	15.9	n.a.	n.a.	n.a.	2.8	2.9	3.0	29.9
Luxemburg	25.5	24.3	24.9	n.a.	n.a.	n.a.	1.7	1.6	1.6	36.7
Malta	33.3	33.3	34.2	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	34.7
Netherlands	22.6	23.2	23.6	n.a.	n.a.	n.a.	1.5	1.3	1.3	38.9
Poland	16.4	17.4	18.2	n.a.	n.a.	n.a.	4.1	4.3	4.7	35.2
Portugal	20.8	21.6	22.2	n.a.	n.a.	n.a.	2.2	2.2	2.2	36.8
Romania	12.3	11.5	11.7	n.a.	n.a.	n.a.	6.0	7.5	7.6	29.4
Slovakia	15.4	14.2	14.4	n.a.	n.a.	n.a.	3.5	3.3	3.2	29.5
Slovenia	21.5	21.3	20.8	n.a.	n.a.	n.a.	2.8	2.9	3.4	38.2
Spain	12.9	13.5	14.2	7.9	8.1	8.9	3.1	3.2	3.1	38.4
Sweden	27.9	27.5	26.8	n.a.	n.a.	n.a.	15.9	15.7	15.7	48.2
United Kingdom	34.0	34.9	34.3	n.a.	n.a.	n.a.	1.7	1.7	1.7	36.3
EU - 27										37.5

Source: made by the author according to the data from Taxation Trends in the European Union (2009)
n.a.- not available

or indirectly aimed at raising the Gross Domestic Product and sustained economic development. Therefore medium-term fiscal targets and principles have to be defined, which are implemented simultaneously. It would promote the inflow of foreign and domestic investments as well as facilitate understanding on future development perspectives of economic activities.

In unitary taxation systems, half of the municipal budget revenues consist of tax revenues. Municipal revenues from taxes and duties characterise their financial capacity. The greater is the amount of taxes; the financially stronger is the municipality. The tax system in which no business-related tax is directly related to the municipal budget, create conditions that do not stimulate local economic development. By contrast, multi-tiered tax system is a sound basis for steady economic development in the region, as it provides the flexibility to respond to the business environment through fiscal policy instruments – the tax object, entity, and tax rate.

Stimulation of the regional economic development by the production placement in the regions, creation of new jobs and a stable social environment, has to be promoted by the business attractive tax policy, allowing regions of the country set different items, tax payer groups and rates. In the interests of regional and territorial

development, it is necessary that municipalities, regions and countries have their own independent tax revenue base. The ratio between these levels should be determined according to the principle that taxpayers pay taxes for services at the levels they get in return from the village, region or country. The determination of tax types and rates should be based on the functions that are delegated to tax payers. This approach means that individuals and businesses pay a part of taxes directly to the municipalities, another part – to the regions, and the third – to the state. It means that authorised institutions would be entitled to determine the use of tax revenues in the situation when every tax goes directly either to the municipality, region or state budget.

Conclusions and recommendations

1. Effective tax and duty system is capable to ensure full implementation of state functions. The current tax system does not stimulate the economic growth in the territory of Latvia, consequently smoothing socio-economic differences and strengthening the regions.
2. The economic development incentives in regions are achieved reached through redistribution of fiscal powers between the national, regional and municipal levels.
3. The experience of different countries has shown that fiscal policy is one of the most influential regional development support tools (instruments).
4. The support of the business throughout the country requires not only public investment in infrastructure development, but also the regional development motivating incentive-based fiscal policy.
5. In regional policy, taxes are used to support some of the sectors or regions. In fact, tax policy, just as a regional policy should promote national social and economic development as well as increase the employment.
6. In the interests of regional and territorial development, it is necessary that municipalities, regions and countries have their own independent tax revenue base. Thus the residents and businesses will pay a part of taxes directly to the municipalities, another part – to the regions, and the third – to the state.

Bibliography

1. Bache, J. (2004.) *Multi-level Governance and European Union Regional Policy*. Oxford University Press, Oxford, pp. 165-178.
2. *European Tax Handbook 2008*. (2008.) ed. Kesti, J., 19th ed., IBFD, Amsterdam, pp. 60-98.
3. Fatejevs, V. (2004.) *Reģionālā politika: teorija un prakse*. EGU, Rīga, 480 lpp.
4. Ketners, K. Lukašina, O. (2008.) *Nodokļi Eiropas Savienībā un Latvijā: salīdzinoša analīze un praktiski ieteikumi.* Rīga: Merkūrijs LAT, 237 lpp.
5. Kuklinski, A. (1987.) Regional Policies: Experiences and Prospects. *International Social Science Journal*. Oxford: Basil Blackwell. No. 2(112).
6. Par Latvijas Republikas statistiskajiem reģioniem un tajos ietilpstošajām administratīvajām vienībām. Ministru kabineta 2004.g. 28.apr. rīkojums Nr.271., "Latvijas Vēstnesis" 69 (3017), 01.05.2004.
7. Vaidere, I. Vanags, E. Vanags, I. Vilka, I. (2006.) *Reģionālā politika un pašvaldību attīstība Eiropas Savienībā un Latvijā*. Rīga LU Akadēmiskais apgāds Latvijas Statistikas institūts 285lpp.
8. Informatīvais ziņojums par nodokļu politikas pārskatīšanu ekonomikas stimulēšanai. Pieejams: www.mk.gov.lv/doc/2005/EMZino_080909_nodokli.3236.doc. Skatīts: 2009. gada 14. decembrī.
9. Taxation Trends in the European Union 2009. Available at: http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_structures/2009/2009_full_text_en.pdf. Viewed on December 12, 2009.
10. Centrālā statistikas pārvaldes datu bāzes. Pieejams: http://data.csb.gov.lv/Dialog/varval.asp?ma=IK0020&ti=IK02%2E+IEK%D0ZEMES+KOPPRODUKTS+STATISTISKAJOS+RE%CCIONOS&path=../DATABASE/ekfin/Ikgad%E7jie%20statistikas%20dati/Iek%F0zemes%20kopprodukts/&lang=16. Skatīts: 2009. gada 29. decembrī.
11. Latvijas rajoni un novadi. Pieejams: http://www.lursoft.lv/lursoft-statistika/Latvijas-rajoni-un-novadi. Skatīts: 2009. gada 29. decembrī.

Improvement of Government Competitiveness by Means of Taxes

Aleksejs Nipers, M.oec, RICEBA Institute of Economics and Business
Vulfs Kozlinskis, Dr.habil.oec., Latvia University of Agriculture

Abstract. Taxes are commonly regarded as a factor decreasing competitiveness of enterprises in a country, since they influence producer prices. However, the core question refers to the purpose of the use of government revenues. In case the government revenues are purposefully used to support entrepreneurship (exporting industries), the overall effect from tax increase may be positive.
Key words: international competitiveness, tax burden, government support.

Introduction

Discussions about taxes in the economic theory are essentially based on assumption that taxes are used for provision of public services and reallocation of funds among different social groups (2, 287).

Influence of taxes on entrepreneurship and international competitiveness of active enterprises in a country is quite often considered as negative. Taxes influence costs of production and prices, thus decreasing competitiveness of goods produced in a country.

Such a conclusion is logical, assuming that entrepreneurs in different countries operate on the conditions of fair competition and the government performs only two functions mentioned above. However, these assumptions have to be complemented to match the real-life processes. More or less governments in many countries support entrepreneurship, directly and indirectly – with subsidies, allowances, infrastructure investments, promotion of innovation, risk pooling, provision of guarantees, etc.

The paper compares competitiveness of countries with higher tax burden and countries with lower tax burden, taking into account the government support for entrepreneurship.

The paper explores theoretical insights into the issue in order to demonstrate tax influence on the national economies.

Core assumptions

The analysis starts with modelling an economy with private and government sectors. Labour is the only factor of production in this economy, while budget revenues derive from taxing the labour.

Household income X is made up of wages w and social transfers G^S. Labour tax is t^d.

$$X = w \cdot \left(1 - t^d\right) + G^S \quad (1)$$

Whereas budget revenues G are:

$$G = w \cdot t^d \quad (2)$$

All budget expenditures are divided into two groups:

$$G = G^S + G^P \quad (3)$$

Where: G^S stands for social transfers, as mentioned above, and G^P stands for expenditures for the provision of public services.

All citizens are divided into two groups: employed and unemployed, or living on the dole. Those, who are employed, do not get the dole.

$$X^* = w \cdot \left(1 - t^d\right) \quad (4)$$

$$X^{**} = G^S \quad (5)$$

where X^* – income of the first group, X^{**} – income of the second group (the dole-based).

All goods are divided into two groups – internationally traded (T) and non-traded (NT).

Public services are free of charge, while the price of goods in a private sector is a function of labour costs.

$$P = f\left(w\right) \quad (6)$$

where

$$\frac{\partial P}{\partial w} > 0 \quad (7)$$

which means that the price of goods increases with the increase of labour costs.

Closed and open economies

Assume that there are two identical closed economies (let's mark them 1 and 2, accordingly). If labour tax in one of these countries is higher than in the other ($t_2^d > t_1^d$), income of employed citizens in the country, where the tax is higher, will be lower ($X_2^* < X_1^*$). Therefore, the difference between labour costs (w) and income of employed households used for state functions will also increase $\left(w_2 - X_2^*\right) > \left(w_1 - X_1^*\right)$.

If funds are not channelled to disadvantaged society groups as social transfers in these countries

($G^S = 0$), demand in the private sector will decrease, since the household income X will decrease along with the market (assuming the government does not purchase in the market for goods and services). If the government channelled all funds into social transfers ($G = G^S$), the market would not generally decrease, however, the employed households would get less income.

Since the prices of goods are the function of costs, the overall tax burden in the second country is higher than in the first one ($G_2 > G_1$) given that $G = G^P$

$$\frac{X_1}{P_1} > \frac{X_2}{P_2}; \quad (8)$$

because labour costs w are equal in both countries (thus, prices also remain equal), the household income X in the second country will be lower due to the higher tax burden.

In case of the same conditions ($G_2 > G_1$), but $G = G^S$:

$$\frac{X_1}{P_1} = \frac{X_2}{P_2} \quad (9)$$

because the funds are actually divided among the households. At the same time, the purchasing power of the employed households would decrease.

$$\frac{X_1^*}{P_1} > \frac{X_2^*}{P_2} \quad (10)$$

The case with an open economy will be similar – when the goods are perfectly mobile, but the factor of production (labour – in our case) is perfectly immobile, since the prices of goods have to be equal in both countries to ensure the equilibrium; the labour costs have to be equal too ($w_1 = w_2$).

In a country, where the labour tax is higher, depending on purposes, which the government funds are used for (provision of public services or social transfers), either the purchasing power of all households, or the purchasing power of employed households will decrease (but the range of public services will be larger).

Purchasing power of households is lower in a country, where the labour tax is higher, as compared with a country, where the tax is lower. Since private demand in a country is narrower, given that other conditions are constant, supply has to be narrower too, including a number of entrepreneurs and employees in the private sector. At the same time, in case of a country, where taxes are higher and the public sector is larger, this could imply a larger number of employees in the public sector (to ensure provision of public services). When the government provides services, which the market can provide more effectively, it can impede effective use of resources and, thus, the economy.

Government support in a closed economy

In the previous cases, we assumed that the government has two functions: provision of services and social transfers to redistribute funds among households. In real life, the government also supports the private sector:

$$G = G^S + G^P + G^I \quad (11)$$

where G^I is government support for the private sector (investments).

Therefore, the function of price changes – an enterprise can reduce costs and price of goods owing to the government support.

$$P = f\left(w; G^I\right) \quad (12)$$

where

$$\frac{\partial P}{\partial w} > 0 \quad \text{and} \quad \frac{\partial P}{\partial G^I} < 0 \quad (13)$$

Due to this component (even if labour tax is high), it does not mean that the household income will be lower or the price of goods will be higher in comparison with the country having lower taxes.

There are generally such support (investment) positions in economies, which are more rational to delegate directly to the government, because of market failure or scale effect. Since in our case the only factor of production is labour, without going into details, let us agree that support of the government reduces the price of goods – whether directly, by subsidising production, or indirectly, e.g. by increasing productivity.

Getting back to the example, even in case one country carries lower tax burden, it does not guarantee that the goods produced are competitive enough.

Assume that overall tax burden is lower in the first country:

$$G_1 < G_2 \quad (14)$$

However, in case

$$G_1 - G_1^I > G_2 - G_2^I, \quad (15)$$

then – vice versa – in the second country (where the overall tax burden is higher), competitiveness of goods could be higher, because the price of production decreases as a result of a more substantial support from the government.

Theoretically, from the government's perspective, it is rational to invest into sectors, which generate positive effects (scale effect) – the private sector is not able to manage this process with a similar outcome due to various reasons. However, let us assume that in our example there is no positive effect from the government investments and entrepreneurs can produce the same outcome. Thus, in case $G_1 < G_2$ and $G_1 - G_1^I = G_2 - G_2^I$, the price of goods has to be lower in the second country, because

$$w_1 = w_2, \quad \text{but} \quad G_1^I < G_2^I \tag{16}$$

Since

$$P = f\left(w; G^I\right), \quad \text{where} \quad \frac{\partial P}{\partial G^I} < 0 \tag{17}$$

then

$$P_1 > P_2 \tag{18}$$

Due to higher tax, household income in the second country will be lower, however –

$$\frac{X_1}{P_1} = \frac{X_2}{P_2} \tag{19}$$

Given the above-mentioned conditions (case of a closed economy) and the assumption that there is no positive scale effect from the government investments and the investments can be equated to the government subsidies:

$$P_1 = \frac{\left(w_1 - G_1^I\right)}{\left(w_2 - G_2^I\right)} \cdot P_2 \tag{20}$$

where

$$w_1 = w_2 \tag{21}$$

However, if the government undertakes to invest into sectors, where it has scale advantages and, therefore, can manage processes more effectively and efficiently, then

$$P_1 > \frac{\left(w_1 - G_1^I\right)}{\left(w_2 - G_2^I\right)} \cdot P_2 \tag{22}$$

Irrespective of the higher tax burden, the purchasing power of households in the second country does not necessarily have to be lower. Given certain conditions, it can be even higher.

At the same time, the inequation (22) can give a reverse result – in case the government intrudes into processes, where the market and competitiveness work perfectly.

Government support in an open economy

The afore-mentioned conclusions are based on the example of a closed economy. For that reason, the government support influenced the prices of goods. In case of an open economy (with mobile goods and non-mobile labour), prices in both counties have to become equal in a state of equilibrium – according to the law of one price.

$$P_1 = P_2 \tag{23}$$

Therefore, in the equation

$$P_1 = \frac{\left(w_1 - G_1^I\right)}{\left(w_2 - G_2^I\right)} \cdot P_2 \tag{24}$$

labour costs have to be different. Since $G_2^I > G_1^I$, then $w_2 > w_1$.

However, considering that the tax burden is higher in the second country ($t_2^d > t_1^d$), household income will be equal in both countries (taking into account that price levels and purchasing power are also equal).

$$X_2 = X_1 \tag{25}$$

Depending on the economic effectiveness of the government support, X_2 could be higher than X_1. Similarly, the household purchasing power in the second country has to be higher or at least equal to the purchasing power in the first country:

$$\frac{X_2}{P_2} \geq \frac{X_1}{P_1} \tag{26}$$

where $P_1 = P_2$, since it is the case of an open economy and prices of goods have to be equal at the point of equilibrium.

At the same time, in case the government tends to participate in projects, where the private sector could operate more rationally (from the economic viewpoint); the purchasing power has to lower in that country.

Economies with sectors of tradable and non-tradable goods

Economists classify goods into two groups: internationally tradable (that can be exported and imported) and non-tradable (that cannot be exported and imported due to some reasons). In fact, the economic case for the sector of non-tradable goods has already been analysed, when exploring the government support in the closed economy, whereas the economic case for the sector of tradable goods – when exploring the government support in the open economy. Let us bring both cases together into one economy.

This approach allows concluding that even if the overall tax burden and the government support are equal in both countries

$$G_1 = G_2 \quad \text{and} \quad G_1^I = G_2^I, \tag{27}$$

competitiveness of one of these countries can be higher.

Let us assume that in the first country the entire government support is proportionally divided among all sectors (tradable and non-tradable goods in our case), but in the second country the government support is exclusively channelled towards the sector of tradable goods.

Thus, the price level in the first country will be:

$$P_1^T = f\left(w_1; (G_1^I)^T\right) \tag{28}$$

$$P_1^{NT} = f\left(w_1; (G_1^I)^{NT}\right) \tag{29}$$

where T – the sector of tradable goods, but NT – the sector of non-tradable goods.

Whereas in the second country:

$$P_2^T = f\left(w_2; G_2^I\right) \quad (30)$$

$$P_2^{NT} = f\left(w_2\right) \quad (31)$$

Since $\frac{\partial P}{\partial w} > 0$, $\frac{\partial P}{\partial G^I} < 0$ and $G_2^I > (G_1^I)^T$ (provided $G_1^I = G_2^I$, $(G_1^I)^T > 0$ and $(G_1^I)^{NT} > 0$), we conclude that

$$P_1^T > P_2^T \quad (32)$$

$$P_1^{NT} < P_2^{NT} \quad (33)$$

Therefore, the prices of non-tradable goods in the second country are higher than the prices of non-tradable goods in the first country, while the internationally tradable goods in the second country are more competitive.

Now let us assume that each country has its own currency and the currency exchange rate is floating. It means that the rate will change, supporting the equilibrium, in order to equate the prices of tradable goods in both countries.

$$E = \frac{P_1^T}{P_2^T} \quad (34)$$

where $E > 1$.

After that, if we compare both countries, household income in the second country will be *E*-times higher in absolute figures:

$$X_2 = E \cdot X_1 \quad (35)$$

While the prices of tradable goods will be equal,

$$P_1^T = P_2^T \quad (36)$$

the prices of non-tradable goods in the second country will be clearly higher than the prices of non-tradable goods in the first country:

$$P_2^{NT} > E \cdot P_1^{NT} \quad (37)$$

It means that the second country will become more expensive for the citizens from the first country. At the same time, if we look at the household income, income of the citizens in the second country will be higher than in the first country.

If there is one currency in both countries (or the exchange rate is fixed), the second country will start to squeeze out the first country – due to the government support, they produce tradable goods cheaper. Production of the internationally tradable goods will relocate from the first to the second country, providing new jobs and increasing taxable base in the second country, as a result.

Having raised taxes, the second country promoted own economic development and increased the international competitiveness of the goods produced using taxes.

Conclusions

The analysis shows that in terms of national or regional competitiveness, higher tax burden cannot be exclusively regarded as negative. Tax effect can be very different depending on purposes government funds are used for. However, a positive effect from increasing taxes is theoretically possible, but with a number of conditions, such as: stability of an economy, professionalism of the government management system – to meet various international obligations regulating business support and to effectively channel support funds to reach the aims.

Bibliography

1. Aghion, P. and Howitt, P. (1998) Endogenous Growth Theory, MIT Press, Cambridge.
2. Balassa, B (1964) The Purchasing Power Parity Doctrine: a Reappraisal, Journal of Political Economy, Vol. 72, pp. 584-596.
3. Cambridge Econometrics (2004) A Study on the Factors of Regional Competitiveness, European Commision, http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/3cr/competitiveness.pdf
4. Begg, D., Fisher, S., Dornbusch, P. (1991) Economics, Third edition, McGraw-Hill, ISBN 0077072456, pp. 287-292.
5. Dixit, A., Skeath, S (2004) Games of Strategy, Second edition, W.W. Norton & Company, ISBN 0393924998.
6. Hamalainen (2003) National Competitiveness and Economic Growth, Edward Elgar Publishing Limited, ISBN: 1840644540, pp. 161-174.
7. Krugman, P., (1994) Competitiveness: A Dangerous Obsession, Foreign Affairs, Vol. 73(2), pp. 28-44.
8. Mankiw, G. (2006) Principles of Economics, 4th Edition, South-Western College, ISBN: 0324224729.
9. Samuelson, P (1964) Theoretical Problems on Trade Problems, Review of Economics and Statistics, 46, pp. 145-154.
10. Samuelson P., Nordhaus W. (1989) Economics, Thirteenth edition, ISBN: 0070547866, pp. 434-435.
11. Sinn, H. W. (2002) The new system competition, NBER Working Paper No. 8747.
12. Tyson, L. (1987) Creating Advantage: Strategic Policy for National Competitiveness, UC Berkeley: Berkeley Roundtable on the International Economy.

Administrative Burden and its Evaluation in the Sphere of Food Safety

Dr.oec. **Ligita Melece**
Head of Department,
Latvian State Institute of Agrarian Economics, ligita@lvaei.lv
Dr.oec. **Irina Pilvere**
Dean of Faculty of Economics,
Latvia University of Agriculture, Irina.Pilvere@llu.lv

Abstract. The paper presents results of studies, which aimed at establishing the research outline or theoretical framework for the evaluation and assessment of administrative burdens, particularly in the agri-food sector, caused by food safety legislation. Mainly qualitative methods are used for the studies. The results are presented in the following sections: 1) administrative burdens and their influence both on the state economy and small and medium enterprises, including enterprises of the agri-food sector; 2) assessment methods for the evaluation of administrative burdens; 3) prior legislation in the sphere of food safety from the European Union (hereinafter - the EU) point of view. The role of administrative burden is stressed and some principles of its evaluation are indicated in the research, thereto, noting the main aspects of food safety legislation under the analysis. Some proposals are set for further estimation of impact of administrative burdens caused by the food safety normative acts in Latvia.
Key words*:* administrative burdens, enterprises, food safety.

Introduction

Many countries have already taken important steps towards improving the administrative conditions for businesses. Some results have been achieved, but the administrative burdens are still a huge obstacle to a progressive and dynamic business environment. In recent years the issue of better regulation and in particular, the issue of administrative costs on enterprises has gained increasing attention internationally, on the EU level and in the EU member states (hereinafter – the MS). In January 2007, the European Commission (hereinafter – the EC) proposed the launch of an ambitious Action Programme (Commission of the European Communities, 2007) to eliminate unnecessary administrative burdens on businesses in the EU. Later the European Council agreed that burdens arising from the EU legislation, including national rules implementing or transposing this legislation, should be reduced by 25% before 2012. The effect that is expected from a reduction on the EU as well as national levels is an increase of the GDP by 1.4% (EUR 150 billion) (Bremmer H.J. et al., 2008). The EU Better Regulation Programme consists of an Action Programme to decrease administrative burden, a simplification programme (broader than administrative burden) and impact assessments for proposed legislation. The necessity to review administrative costs caused by the legal regulations and to reduce red tape[1] and administrative burdens is directly related to the objective for development. In order to attain the above objective, in 2007 the EC, in cooperation with the MS, identified 13 areas in which the reduction of administrative burdens would be a priority, including along other the regulations affected agri-food sector: agriculture, fisheries, and food safety. The measurement focuses on the most burdensome information obligations in the selected priority areas (European Commission&Enterprise and Industry, 2008).

Red tape is costly, not just in time and money spent filling out forms but also in the terms of reduced productivity and innovation in business (OECD, 2003; Hampton, P., 2005). It is particularly burdensome to smaller businesses and may even discourage people from starting up a new business. These effects are more costly on global markets, where the efficiency of the domestic regulatory and administrative environment can affect business competitiveness (OECD, 2007).

In the context of the renewed Lisbon Strategy, refocused on growth and jobs, the EC announced its intention to launch a comprehensive initiative to ensure that the regulatory framework in the EU meets the requirements of the 21st century. This initiative builds on the Commission's 2002 initiative for better regulation and reinforces the way in which better regulation contributes to achieving growth and jobs (Commission of the European Communities, 2005a). As mentioned above, in January 2007, the EC presented a programme for measuring the administrative costs arising from the EU legislation and reducing administrative burdens by 25%. In March 2007, the European Council endorsed this Action Programme for Reducing Administrative Burdens and invited the EC to launch it with the assistance of the MS.

[1] "Red tape" is a term for excessive regulation or rigid conformity to formal rules that is considered redundant or bureaucratic and hinders or prevents action or decision-making.

In this line on 19 May, 2008 the Cabinet of the Republic of Latvia (LR Ministru kabinets, 2008) adopted the national target - 25% for reduction of administrative burdens in Latvia until 2013.

The importance of burdensome procedures is indicated by the regulatory environment for businesses, which can influence how well companies cope with the crisis and are able to seize opportunities when recovery begins. The World Bank (2009) argues that where business regulation is transparent and efficient, it is easier for business to reorient them and for new companies to start up. Recognising the importance of companies – especially small and medium size enterprises – for creating jobs and revenue, some governments have included reforms of business regulation in their economic recovery plans.

The paper presents results of a project studies outline or theoretical framework to identify the administrative burdens caused by food safety legislation, and it assesses the impact of administrative burdens on Latvian agri-food sector. The whole project of evaluation of administrative burden's evaluation is carried out for the Ministry of Agriculture of the Republic of Latvia.

The research **aim** is to estimate the research outline or theoretical framework for the evaluation of administrative burdens, particularly in the agri-food sector, caused by food safety legislation.

The research **object** is administrative burdens, their importance and estimation methods.

The study includes the following **tasks**: 1) to estimate administrative burdens and their influence both on the state economy and small and medium enterprises, including enterprises of the agri-food sector; 2) to estimate aspects of evaluation and assessment methods; 3) prior legislation in the sphere of food safety from the EU point.

The principal **materials** used for the studies are as follows: different sources of literature, research papers, reports and information of the EU and Latvian institutions.

Both qualitative and quantitative research **methods** were used in this research: monographic analysis, reference, data grouping, logical and abstract constructive methods.

Only the most important research results are set out in the paper due to the limited space.

Results and discussion

1. Administrative burdens and its impact

Small and medium-sized enterprises[2] (hereinafter SMEs) are often referred to as the backbone of the European economy, providing a significant source of jobs and economic growth (Avermaete, T. et al., 2003; Edwards, T., et al., 2005; Schmiemann, M., 2009). Thereto, small businesses are well recognised and acknowledged worldwide as vital and significant contributors to the economic development, job creation, and the general health and welfare of economies, both nationally and internationally (Morrison, A. et al., 2003; Vickers, I. et al., 2005). SMEs grew in number and in the number of persons employed by them almost twice as fast as large enterprises in the EU. M. Schmiemann (2009) comparing data of the EU-27 argues that the value added at factor cost showed the fastest growth, being in double figures for SMEs and the faster growth of value added, compared with the growth in employment, is reflected in the growth of apparent labour productivity, by 8.1% for SMEs and 6.2% for large enterprises. Comparing the changes of the labour productivity between SMEs and large enterprises in the EU-27, the largest growth by 61.7% and 61.4% is observed in Romania and Latvia respectively (Schmiemann, 2009). SMEs contributed two thirds of the increase in value added of the non-financial business economy of the EU between 2004 and 2006. The micro-businesses are the real giants of the European economy, because the number of micro-enterprise was 91.5%; small – 7.3%; medium-sized – 1.1%; large – 0.2% in 2006 (European Commission, 2008). Moreover, SMEs account for 99.8% of all food businesses within the catering, hotel and retail sectors (Fairman, R., Yapp, Ch., 2004).

The data of OECD (2001) show how SMEs perceive national administrative and regulatory costs and accords with broadly accepted view that SMEs suffer by administrative costs more than larger enterprises (Crain, W.M., Hopkins, T.D., 2001).

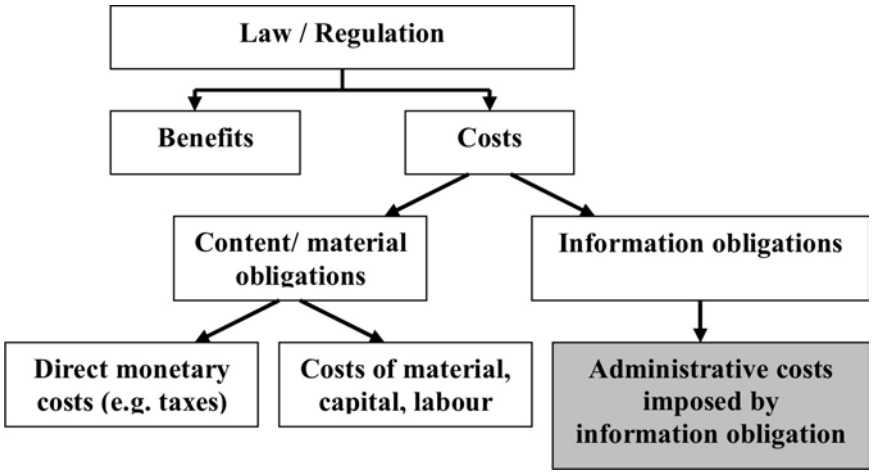
Regulations and government formalities, the so-called 'red tape', are important tools used by governments to carry out public policies in many policy areas, including safety, health, and environmental protection. However, if they are poorly designed or applied, inefficient, or outdated, they can impede innovation, entry of investment, and create unnecessary barriers to trade, investment, and economic efficiency. The result of poor regulation and formalities is that national economies become less able to grow, compete, adjust, and create jobs. Based on a survey of almost 8 000 businesses, this report assesses the quality, application and burdens of employment, environment and tax regulations and formalities. The results of OECD research are dramatic, for instance, the red tape accounts for 4% of the annual turnover of companies, while the hardest hit are the smallest companies, and these costs are growing in most countries.

Figure 1 explains the origin of administrative costs, which are caused by implementation or enforcement of the legislation.

Figure 2 illustrates different types of costs that legislation and regulations can impose on businesses. Complying with regulations usually involves costs for businesses, which can be divided into different categories.

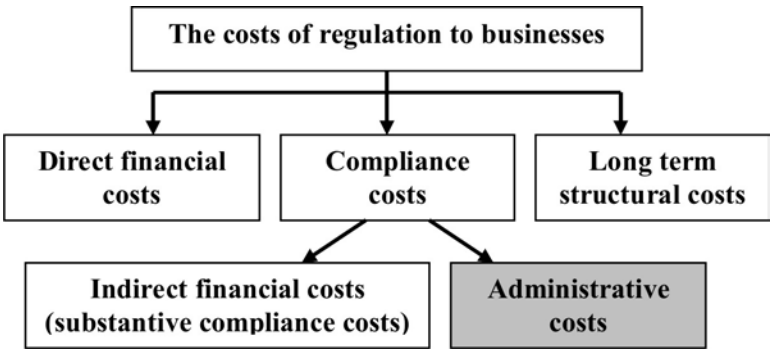
Direct financial costs are the result of a concrete and direct obligation to transfer a sum of money to the government or the competent authority. The compliance costs are all costs to businesses

[2] Micro sized enterprise: < 10 employees, maximum EUR 2 million annual turnover; Small sized enterprise: < 50 employees, maximum EUR 10 million annual turnover; Medium sized enterprise: < 250 employees, maximum EUR 50 million annual turnover (European Commission, 2003)



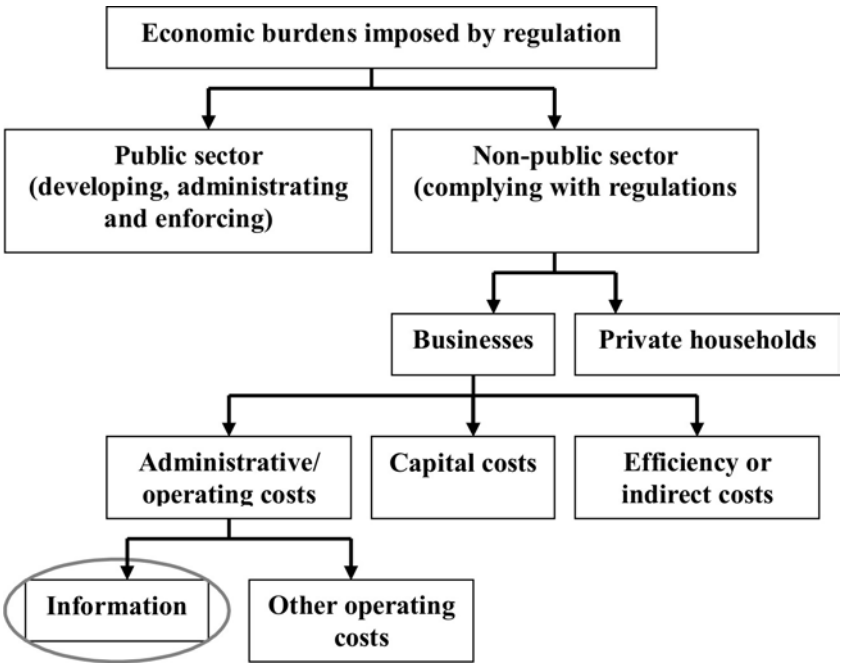
Source: adapted from Böllhoff, 2007

Figure 1. **Origin of administrative costs**



Source: SCM Network, 2005

Figure 2. **Different costs of regulation to businesses**



Source: adapted from Jacobs, 2008

Figure 3. **Impact of administrative burdens on the state economy**

of complying with regulation, with the exception of financial costs. These costs can be divided into 'substantive compliance costs' and 'administrative costs'. Substantive compliance costs are the costs that enterprises make in order to comply with the content obligation that legislation and regulations require of a production process or a product. Compliance costs are the costs businesses make to comply with substantive obligations due to the government legislation and regulations (Colophon Regulatory Reform Group, 2009). Administrative costs are not so visible, for instance, it is impossible to find the costs for the time used on filling in forms to get a license in a company's bookkeeping system, although, such activity has been quite costly for businesses.

While, administrative costs are defined by the EC (Commission of the European Communities, 2005a) as the costs incurred by enterprises, the voluntary sector, public authorities and citizens in meeting legal obligations to provide information on their action or production, either to public authorities or to private parties. However, P. Hampton (2005) considers that the administrative burdens are the costs that come from enforcement activities.

The economic impact of administrative burdens and their costs more affect business environment, yet they also negatively influence all sectors of broad society as shown in Figure 3, since enterprises include part of administrative burden caused costs in the price of a product or service.

In the Netherlands alone all the paperwork companies suffer from the government costs EUR 16.4 billion a year. It corresponds to 3.6% of the Gross Domestic Product (GDP), while in Denmark the total amount of administrative burdens equals to 2.4% of GDP. Therefore it is important that the governments focus on reducing administrative costs for businesses. A number of studies have documented the success of change in the regulatory environment in Europe. B.Hagerup (2005) calculated that in Denmark recent successes have reduced the administrative costs of regulatory compliance by EUR 11 million increasing the GDP by EUR 25 million and productivity by 0.1%. In the Netherlands the results have been even more dramatic, with a 25% reduction in the red tape leading to a 1.5% increase in the GDP and a 1.7% increase in productivity.

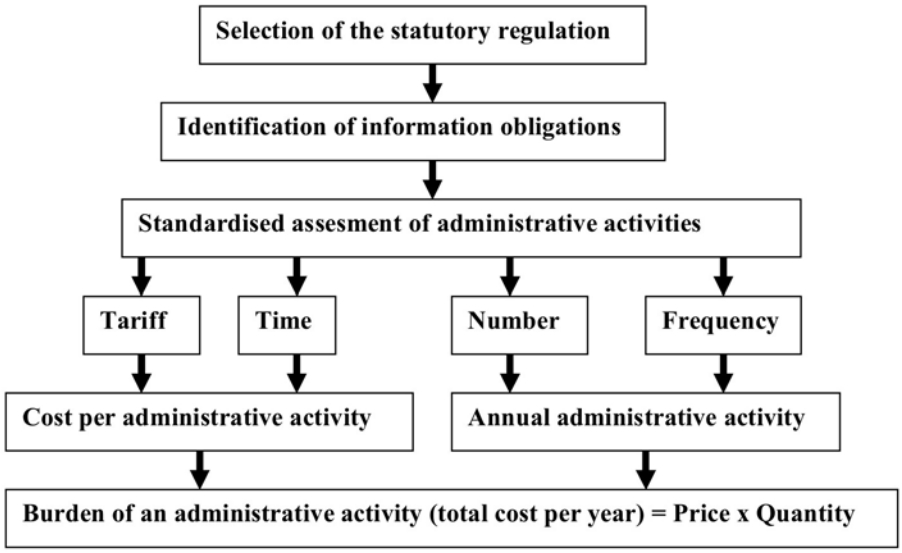
S. Djankov et al. (2003) stressed that entry regulation is extremely heavy in most countries in terms of both the time and the number of procedures that an entrepreneur must complete. Moreover, a heavier entry regulation is not associated with a superior quality of products, but rather with greater corruption and larger shadow economies. The authors argue that last but not least, heavier regulation of entry is pursued by the less democratic and less limited governments. All of these results support the public choice view that regulation of entry contributes to bureaucrats and politicians rather than consumers. Thereto, more regulation is associated with a larger shadow economy. Competition in countries with more regulation is perceived to be less intense, although this result is only statistically significant without the income control.

2. Aspects for evaluation methods of administrative burdens

Setting administrative objectives for the reduction of administrative burdens is directly linked with assessment of the current situation. At present, it is considered that the most complete way for "measuring" administrative burdens is the so-called Standard Cost Model (SCM), which was developed by specialists in the Netherlands, who envisaged to "measure" the costs of every information activity performed pursuant to some legal regulation (SCM Network, 2005). The EC uses the so-called EU Net Administrative Cost Model for these measurements and this model is based on the SCM (Commission of the European Communities, 2005b). The methodology of the SCM focuses on the systematic identification and measurement of levels of the red tape that relate to one particular source, which are the regulatory obligations to provide information to some part of the government and or third parties (Weijnen, T., 2007). In 2003, some European countries formed an informal network – the SCM Network – committed to using the same methodological approach when measuring administrative burdens (OECD, 2006; European Commission, 2005b). The strength of the model is not only its high level of detail in the measurement of administrative costs, but also the fact that the numbers obtained are consistent across policy areas. Moreover, the model allows governments to set numerical targets for burden reduction and to measure progress towards these targets over time (OECD, 2007).

In order to keep the EU common methodology as simple as possible and to minimise subjective judgment in the assessment, no distinction should be made between 'pure obligation' and obligation corresponding to what an entity would normally do in the absence of any legal obligation. Similarly, optional participation which could be considered as *de facto* obligatory should not be assimilated to administrative burden. The benefits of the EU SCM include: bringing clarity about possible differences in procedures followed by the EU institutions and different MS; facilitating cross-country or cross-policy area comparisons, benchmarking, and the development of best practices; offering economies of scale in terms of data collection and validation. The administrative costs are measured on the basis of the average cost of required action (Price) multiplied by the total number of actions performed per year (Quantity), where the price per activity will be generally estimated by multiplying a tariff (based on the average labour cost per hour including prorated overheads) and the time required per action, but the quantity will be calculated as the frequency of required actions multiplied by the number of entities concerned (Commission of the European Communities, 2005b).

Administrative burdens are measured through in-depth interviews with a small number of businesses within the target group of the law. They are asked to specify how much time and money they spend, performing each administrative activity that is required when fulfilling a given information obligation. In order to take into account, the



Source: adapted from Federal Statistical Office, 2006

Figure 4. **Application of the cost calculation model**

different impact a law may have on various types of businesses, a relevant segmentation of businesses is carried out. It may for example be relevant to distinguish between smaller and larger businesses. The overall administrative burden resulting from the existing information obligations is the sum total of the administrative costs of the individual information obligations. As a first step, regulatory acts must be classified by legislative level of origin in one of the categories that can be the subject of the SCM measurement (Figure 4).

A greater part of the burden identified was due to the complex language used in the regulation and the need for adoption. The high number of businesses affected and the need for more senior staff to spend a significant amount of time on understanding and becoming familiar with the rules meant that administrative costs were significant for businesses (Food Standards Agency, 2009).

3. Prior legislation in the food safety sphere

The priority 'Food Safety' is one of 13 areas of the EU legislation investigated in the framework of the Action Programme for reducing administrative burdens (High Level Group, 2009). The priority areas were selected on the basis of a 2006 pilot study and are estimated to account for a large part of administrative burdens of the EU origin. The seven legal acts chosen for the Food Safety priority area are expected to cover a big proportion of burdens imposed on businesses operating in the agri-food sector. The scope of measurement covers the following main topics: 1) Traceability of live animals and meat products[3]; 2) Animal welfare[4] ; 3) Product labelling (including price) and packaging[5] and Plant health; Veterinary medicine etc.

In these areas of legislation the studies of burdensome evaluation had been performed by several researchers (Kimura, A. et al.; Golan, L. et al., 2000), for instance, L. Golan et al. (2000) conclude that the costs of origin labelling exceed the benefits and the mandatory labelling would not be effective if it is not accompanied by consistent, achievable standards, testing services (or IP), certification services, and enforcement. Hampton's (2005) key recommendations on the food safety sphere are as follows: reducing inspections where risks are low, but increasing them where necessary; making much more use of advice, applying the principle of risk assessment; substantially reducing the need for form-filling and other regulatory information requirements; and applying tougher and more consistent penalties where necessary.

The IO in the North Ireland (Dowling, M. et al., 2009) relating to 'record keeping' is accounted for 83% of total administrative burden (Table 1). These are records kept by different kinds of agri-food enterprises: farms, slaughterhouses, milk processing premises, fish farms etc.

Animal welfare regulations are the least burdensome, as identified by the respondents, where 82% of them reported that keeping records, inspections, and notification of activities as being the

[3] Regulation (EC) No 1760/2000 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products; Regulation (EC) No 21/2004 establishing a system for the identification and registration of ovine and caprine animals.

[4] Regulation (EC) 1/2005 Protection of animals during transport and related operations.

[5] Directive 2000/13/EC of the European Parliament and of the Council on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs; Directive 98/6/EEC on consumer protection in the indication of the prices of products offered to consumers.

Table 1

Administrative burden by Information Obligation (IO) type

IO type	% of administrative burdens
Keeping records	83
Application for authorisation	12
Statutory labelling for third parties	5

Source: from Dowling et al., 2009

most burdensome activities overall (DEFRA, 2007). Besides it is stressed that the difference in responses between the EU-15 and the new MS is interesting: overall, responses from the old member states indicate higher levels of administrative burden than responses from the new MS, especially with respect to inspections and reading guidance. The examples of measures for reducing administrative burden proposed by the EC (Court of Justice, 2009) in the sphere of food safety are: abolishing authorisation procedures and simplifying labelling requirements for feed materials; simplifying ovine identification procedure; streamlining legislation on the production, marketing and use of animal by-products; simplifying general food labelling and nutritional labelling; lowering the number and length of inspections of animal transport etc.

Conclusions

The results of study attest the role and importance of administrative burdens and their reduction in the whole state development and business environment, where Latvia and its entrepreneurs are not exemption. The costs of administrative burden significantly influence the business environment, especially for small and medium enterprises and particularly in the agri-food sector.

Providing the theoretical framework for the further research – evaluation and assessment - of administrative burdens in the field of food safety, the measurement methodology of the SCM, which is accepted on the EU and MS level, is conceived to make assessment of administrative burdens cased by food safety legislation in enterprises of the agri-food sector.

The prior legislation of food safety for assessment in Latvia is the following: Traceability of live animals and meat products; Animal welfare; Product labelling (including price) and packaging; Plant health; Veterinary medicine and similar EU origin normative acts.

Bibliography

1. Avermaete, T. et al. (2003) Determinants of Innovation in Small Food Firms. *European Journal of Innovation Management*, 6(1), pp. 8-17.
2. Böllhoff, D. (2007). *Better Regulation through Systematic and Standardised Measurement of Administrative Costs in Germany*. Available at: http://ec.europa.eu/dgs/legal_service/seminars/de_bollhoff.pdf. Access: 14 April, 2009.
3. Bremmers H.J. et al. (2008) Administrative Burdens and Dairy Industry Available at: http://ageconsearch.umn.edu/bitstream/44275/2/574.pdf. Access: 17 August, 2009.
4. Colophon Regulatory Reform Group (2009). *Regulatory Burdens on Businesses: the Netherlands.* Hague: Rijksoverheid, pp. 18.
5. Commission of the European Communities (2005a). *Better Regulation for Growth and Jobs in the European Union*. Communication from the Commission to the Council and the European Parliament, COM(2005) 97 final.
6. Commission of the European Communities (2005b). *EU Common Methodology for Assessing Administrative Costs Imposed by Legislation: Operational Manual.* Annex 10 to "Impact Assessment Guidelines" of the European Commission SEC(2005)791.
7. Commission of the European Communities (2007). *Action Programme for Reducing Administrative Burdens in the European Union*, Brussels, COM 23, p 21.
8. Court of Justice (2009). *Cutting Red Tape – Overview of Reduction Measures and Illustrative Examples.* Available at: http://www.eumonitor.net/modules. Access: 7 December, 2009.
9. Crain, W.M., Hopkins, T.D. (2001) *The Impact of Regulatory Costs for Small Firms*. Washington DC: US Office of Advocacy.
10. DEFRA (2007). *Administrative Burdens in European Agriculture: an Evidence Base*. Norwich: Crown copyright, pp. 41.
11. Djankov, S. et al. (2003) The New Comparative Economics. *Journal of Comparative Economics*, 31, pp. 595–619.
12. Dowling M. et al. (2009). *Northern Ireland Agri-Food Better Regulation and Simplification Review*. Belfast: Department of Agriculture and Rural Development, p. 314.
13. Edwards, T. et al. (2005) Understanding Innovation in Small and Medium-sized Enterprises: a Process Manifest. *Technovation*, 25, pp. 1119-1127.
14. European Commission (2003). Commission Recommendation (EC) No 361/2003 of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. Brussels.
15. European Commission (2007). http://ec.europa.eu/enterprise/regulation/better_regulation/index_en.htm

16. European Commission (2008). *Putting Small Businesses First: Europe is Good for SMEs: SMEs are Good for Europe*. Brussels: European Communities, p. 28.
17. European Commission & Enterprise and Industry (2008). Reduction of Administrative Burdens Programme: Achieving Results. *The magazine of Enterprise policy*, pp. 1-6.
18. Fairman, R., Yapp, Ch. (2004). Compliance with Food Safety Legislation in Small and Micro-businesses: Enforcement as an External Motivator. *Journal of Environmental Health Research*, 3 (2), pp. 40-48.
19. Federal Statistical Office (2006). *Programme for Bureaucracy Reduction and Better Legislation: Introduction of the Standard Cost Model Methodology Manual of the Federal Government*. Wiesbaden: Federal Statistical Office, p. 74.
20. Food Standards Agency (2009). *Proposals for Reducing the Administrative Burden*. Available at: http://www.food.gov.uk/consultations/consulteng/2009. Access: 17 September, 2009.
21. Golan, E. et al. (2000) *Economics of Food Labelling*. USDA Research Service, Agricultural Economic Report, No. 793, p. 41.
22. Hagerup, B. (2005) Global Efforts to Reduce Regulatory Burdens. Global Perspectives on Entrepreneurship Policy. *Proceedings of a Pre-Conference Session of the International Council for Small Business Annual Meeting*, pp. 17-20.
23. Hampton, P. (2005). *Reducing Administrative Burdens: Effective Inspection and Enforcement*. Norwich: HM Treasury, p. 140.
24. High Level Group[6] (2009) Food Safety, Opinion of the High Level Group. European Commission.
25. Jacobs, S. (2008) Cutting Red Tape: How to Make it Work? Available at: http://www.cuttingredtape.eu. Access: 21 July, 2009.
26. LR Ministru kabinets (2008). Uzņēmējdarbības vides uzlabošanas pasākumu plāna 2008.gadam, (2008.gada 19.maija MK rīkojums Nr.263).
27. Kimura, A. et al. (2008) Consumer Valuation of Packaged Foods. Interactive Effects of Amount and Accessibility of Information. *Appetite*, 51, pp. 628–634.
28. Morrison A. et al. (2003) Small Business Growth: Intention, Ability, and Opportunity. *Journal of Small Business Management*, 41 (4), pp. 417-425.
29. OECD (2001) *Businesses' Views on Red Tape: Administrative and Regulatory Burdens on Small and Medium-sized Enterprises*. Paris: OECD Publishing, p. 128.
30. OECD (2007). Cutting Red Tape: National Strategies. Paris: OECD publishing, p. 8.
31. OECD (2006) Cutting Red Tape: National Strategies for Administrative Simplification. Paris: OECD publishing, p. 108.
32. OECD (2003). *From Red Tape to Smart Tape.* Policy Brief. Paris: OECD publishing, p. 7.
33. Schmiemann, M. (2009). *SMEs were the Main Drivers of Economic Growth between 2004 and 2006.* Luxemburg: Office for Official Publications of the European Communities, p. 8.
34. SCM Network (2005) International Standard Cost Model Manual – Available at: http://www.oecd.org/dataoecd/32/54/34227698.pdf. Access: 21 November, 2009.
35. Vickers, I. et al. (2005) Understanding Small Firm Responses to Regulation. *Policy Studies*, 26(2), pp. 149-169.
36. Weijnen, T. (2007) *Methods to Measure Administrative Burdens*. Rotterdam: Erasmus University Rotterdam, p. 18.
37. World Bank (2009). *Doing Business 2010: Reforming through Difficult Times.* Washington: World Bank Publications, p. 228.

[6] High Level Group of Independent Stakeholders on Administrative Burdens Priority area

Pievienotās vērtības nodokļa problemātiskie aspekti un tā pilnveidošanas iespējas Latvijā
Problematic Aspects of Value Added Tax and Improvement Possibilities in Latvia

Īrija Vītola, Dr.oec., LLU profesore
Irēna Baraškina, Mg.oec., doktorante

Abstract. The research has resulted in the conclusion that an increase in tax revenues promoting economic development may be reached by extending the tax base as well as by applying a selective scientific approach to solving tax problems, especially in agriculture. The hypothesis – *improvement of the tax system in Latvia is necessary to ensure economic development and social justice* – emphasises the need for making taxes simple, just, comprehensible, and neutral. The research findings are applicable for improving the regulatory mechanisms to develop individual economic sectors by means of taxes in order to promote sustainability of the national economy in the common EU market. The tax burden has to be differentiated according to income, thus reducing social tension in the country. An improved tax system has to promote the nation's well-being and culture, and emergence of a strong middle class by reducing the proportion of the needy in the society. It shall also prove its great economic and social role in the national economy. The Latvian tax system has to be reformed and improved according to the principle of paying capacity, at the same time national interests have to be taken into account. The amendments to the tax laws include various possibilities for increasing tax revenues, which have to ensure extra tax revenues, i.e. in 2009 the core VAT rate was increased from 18% to 21% and the reduced VAT rate was increased from 5% to 10%. The studies showed that between January and March 2009, the VAT revenues in Latvia have decreased by 30% on average compared with the respective period of the previous year; it means that the VAT rate increase to 21% has not produced extra tax revenues in the government budget. The research methods: comparative examination and monographic methods as well as induction and deduction methods. The research methodology includes the study and analysis of the tax system operation, including the value added tax, in Latvia.
Key words: tax system, value added tax, world practices.

Ievads
Introduction

Kopš XX gs. deviņdesmito gadu sākuma lielākajā daļā ES valstu nodokļu sistēmās notikušas būtiskas pārmaiņas. Nodokļu sistēma tikusi reformēta vairakkārt, dažkārt ņemot vērā pretrunīgas intereses. No fiskālām sistēmām tiek prasīta un gaidīta ieņēmumu palielināšana, lai tiktu ievērotas Māstrihtas prasības un to stabilitāte (noturīgums). No otras puses, tiek prasīta fiskālā spiediena samazināšana ar iespēju kāpināt IKP un to ietekmējošo rādītāju pieaugumu, kā arī nodarbinātības palielināšanos. Pie nodokļu sistēmas pilnveidošanās parādās jauni problēmu risinājumi, tādi kā nodokļu bāzes paplašināšanās u.c. Ir notikusi pārorientēšanās no nodokļu stimulēšanas uz selektīvi stimulētu nodokļu problēmu risinājumu, galvenokārt šādās jomās – mazie uzņēmumi, investīciju izpēte un attīstība, riska kapitāls u.c. Zinātniskās izpētes hipotēze – Latvijas nodokļu sistēmas pilnveidošana ir nepieciešama tautsaimniecības attīstības un sociālā taisnīguma nodrošināšanai.

Nodokļu politikas mērķi ir daudzi un dažādi. Tie ietver visu iedzīvotāju ienākuma pārdali, nodrošinot sfēras, kas saistītas ar iedzīvotāju izglītību un kvalifikācijas celšanu, indivīda darbspējas celšanu ar veselības aizsardzību un sociālo aprūpi, iekšējās kārtības un drošības nodrošināšanu, valsts ārējās aizsardzības nodrošināšana, tautas kultūras, sporta veicināšana un citi uzdevumi. Visu šo daudzo mērķu veikšanai valdība var izstrādāt nodokļu sistēmu, kas orientēta uz turīgo slāņu interesēm, kā arī tādu, kas ievēro taisnīguma principus.

Kopējais viedoklis un nostādne ir palielināt tautsaimniecības efektivitāti, tādā veidā akcentējot nepieciešamību nodokļus padarīt vienkāršākus, saprotamus un neitrālus.

Katras valsts nodokļu politika tiek veidota ņemot vērā tās nacionālās intereses. Latvijas nodokļu sistēma ir jāsakārto atbilstoši maksātspējas principam. Nodokļi jāmaksā tiem, kas to spēj un var, tādējādi mazinot sociālo spriedzi valstī. Nodokļu sistēmai ir jāveicina tautas labklājība un kultūra, jāveicina spēcīgas vidussķiras veidošanās pēc iespējas samazinot maznodrošināto īpatsvaru sabiedrībā. Nodokļu sistēmai ir jāveicina arī demogrāfiskās problēmas risināšana, izdalot nepieciešamās valsts atbalsta summas, kas stimulētu visus iedzīvotājus nākošās paaudzes radīšanai, bērnu izglītošanai valsts nākotnei. Tas arī parāda nodokļu sistēmas lielo ekonomisko un sociālo nozīmi tautsaimniecībā. Pētījuma objekts ir Latvijas nodokļu sistēma, pētījuma priekšmets – pievienotās vērtības nodokļa darbība.

Pārskata gadā par 2009. gadu analizēts pievienotās vērtības nodoklis Latvijā. Darba **mērķis** ir izpētīt un atsegt pievienotās vērtības nodokļa darbību, tā vietu nodokļu sistēmā, it sevišķi tā sakārtošanu atbilstoši fiskālās politikas principiem.

Izvirzītie **uzdevumi** mērķa sasniegšanai:
- Pievienotās vērtības nodokļa lomas un būtības izpēte;
- Pievienotās vērtības nodokļa problēmas risinājums Latvijā;
- Priekšlikumi pievienotās vērtības nodokļa pilnveidošanai Latvijā.

Darbs pamatojas uz pētījumiem, kas veikti pēdējos gados par nodokļu sistēmas pilnveidošanu Latvijā. Pētījuma mērķa sasniegšanai izmantotas ekonomiski statistiskās analīzes metodes un paņēmieni – salīdzinošās apsekošanas, indukcijas un dedukcijas un loģiski konstruktīvās metodes. Izmantoti Valsts Centrālās statistikas pārvaldes (VCSP), Valsts ieņēmumu dienesta (VID) un EUROSTAT dati.

Rezultāti un diskusija
Results and discussion

Nodokļi 2008. gadā deva 4918.8 milj. LVL jeb 85.3% no visiem valsts budžeta ieņēmumiem, bet nenodokļu ieņēmumi 845.6 milj. LVL jeb 14.7%. Tātad nodokļu nozīme ir ļoti liela, kaut arī pēdējos gados atsevišķiem nodokļiem ir tendence samazināties. Pēc Centrālās Statistikas pārvaldes datiem redzams, ka 2008.gadā nodokļu ieņēmumi bijuši 4918.8 milj. LVL, no kuriem tiešie nodokļi sastādīja 52.7%, t.sk., valsts obligātās sociālās iemaksas 24.1%, kas sastādīja 1389.3 milj. LVL un kas ir paredzēti izmantot speciāliem mērķiem. Netiešie nodokļi 2008.gadā iekasēti 1619.5 milj. LVL apjomā, kas sastāda 28.1%, bet no tiem būtisku lomu ieņem pievienotās vērtības nodoklis (PVN) ar 1064.1 milj. LVL jeb 18.5% [Latvija 2009].

Analizējot valsts konsolidēto kopbudžetu secinām, ka 2008.gadā līdz ar ekonomikas lejupslīdi nodokļu ieņēmumi mainās, no kopējiem ieņēmumiem tiešie nodokļi sastāda 81.6%, kas, salīdzinot ar 2006.gadu, bija 82.2%, kā arī īpatsvarā sarukuši arī netiešie nodokļi, kuri 2008.gadā deva 28.1%. No netiešo nodokļu ieņēmumiem būtisku lomu ieņem PVN. Kopējos kopbudžeta ieņēmumos analizējamā periodā pietiekami augstu īpatsvaru devuši nenodokļu un pārējie ieņēmumi – 1062.1 milj. LVL jeb 18.4%. Šī darba būtiskais nolūks ir analizēt pievienotās vērtības nodokli, kuru maksā patērētājs (pircējs), izdodot savus naudas ienākumus, pērkot preces un pakalpojumus. Latvijā 2008.gada nogalē tika pielietotas nodokļu samazināšanas un arī palielināšanas paņēmieni. Tika samazināta iedzīvotāju ienākuma nodokļa likme no 25% uz 23% ar domu, ka iedzīvotāji saņems lielākas algas, taču tai pat laikā patēriņa nodokļa PVN likme no 18% tika palielināta līdz 21%, bet samazinātā PVN likme no 5% tika pacelta līdz 10%, līdz ar to veidojas situācija, ka, saņemot nosacīti lielāku algu, iedzīvotāji ne vienmēr to patērē patēriņa preču iegādei, bet liela daļa valsts iedzīvotāju, kam ir kredītsaistības, tās atmaksā un pat pa daļām, jo šīs naudas nepietiek un gaidītie nodokļi neienāk valsts kasē. Izteikto apgalvojumu pierāda 19 OECD valstīs veiktais pētījums laika periodā no 1970.-2002. gadam par fiskālās politikas ietekmi uz privāto patēriņu ekonomiskās recesijas un attīstības periodos [Tagkalakis A., 2008].

Nodokļu ieņēmumu efekts izteiktāki novērojams valstīs, kur ir zemāka iedzīvotāju kreditēšanas tirgus attīstība. Tā kā Latvijā ir samērā augsts iedzīvotāju īpatsvars ar kredītsaistībām un valstī ir ekonomiskā lejupslīde, tad varam secināt, ka gaidāmie nodokļu ieņēmumi neienāks valsts budžetā. Tātad iedzīvotāju lielās kredītsaistības (hipotekārie un patēriņa kredīti) ir bremzējošs nodokļu politikas īstenošanas un tautsaimniecības attīstības faktors.

Pēc 2008.gada ieņēmumu plāna pārdales VID iestādes nebija spējīgas iekasēt no saviem nodokļu maksātajiem nepieciešamo ieņēmumu summu, jo, pasliktinoties ekonomikas situācijai valstī, daudziem uzņēmumiem samazinājās apgrozījums, kas noveda pie PVN nodokļa iemaksu samazinājuma, gan arī darbinieku atlaišanas, kas vienlaicīgi samazināja valsts budžetā iemaksājamo sociālās apdrošināšanas iemaksu un iedzīvotāju ienākuma nodokļu summas. Līdzīgi arī ar aktivitātes samazināšanos nekustamā īpašuma tirgū par vairāk nekā ceturto daļu samazinājušies nodevu ieņēmumi par īpašuma tiesību nostiprināšanu Zemesgrāmatā.

Kā nodokļu sloga rādītāju parasti izmanto nodokļu kopējo daudzumu valstī, salīdzinot ar iekšzemes kopproduktu (IKP). Latvijā nodokļu īpatsvars no IKP periodā no 2004. līdz 2008. gadam nepārtraukti aug no 27.2% 2004. gadā līdz 30.3% 2008. gadā (skat.2. tabulu). Neskatoties uz atsevišķu nodokļu likmju samazināšanu kā IIN un UIN, kopējais nodokļu slogs valstī aug. Šī nodokļa īpatsvara attiecība no iekšzemes kopprodukta (IKP) pasaules valstīs svārstās ap 35% robežās; no 10% līdz 50% atsevišķos gadījumos pārsniedzot minētās amplitūdas, bet ES- 27 valstīs vidēji pārsniedz 39% (skat. 1. tabulu).

1. tabula

Nodokļu īpatsvars iekšzemes kopproduktā (IKP) periodā no 2004.-2008. gadam, %

Gads	Latvijā, %	ES-27 valstīs, svērtais vidējais %
2004.	27.2	38.9
2005.	28.1	39.2
2006.	29.5	39.7
2007.	29.7	39.8
2008.	30.3	...

Avots: autoru aprēķini un EUROSTAT dati, 2009

2. tabula

Kopējais nodokļu slogs ES-27 valstīs un Norvēģijā attiecībā pret IKP 2007.gadā, %

Nodokļu īpatsvars	Valstis
< 30	Lietuva, Slovākija, Rumānija
30 - < 35	Latvija, Īrija, Polija, Igaunija, Bulgārija, Grieķija, Malta
35 - < 40	Apvienotā Karaliste, Portugāle, Spānija, Nīderlande, Luksemburga, Vācija, Čehija, Ungārija, Slovēnija
40 - < 45	Norvēģija, Somija, Francija, Austrija, Itālija, Beļģija, Kipra
45 - <50	Zviedrija, Dānija

Avots: autoru veidots pēc EUROSTAT datiem, 2009

3. tabula

PVN likmes ES-27 valstīs 2009, %

Valsts	Nodokļa pamatlikme	Samazinātā nodokļa likme	Īpaši samazinātā nodokļa likme
Beļģija	21	6/12	-
Bulgārija	20	7	-
Čehija	19	9	-
Dānija	25	-	-
Vācija	19	7	-
Igaunija	18	5	-
Īrija	21.5	13.5	4.8
Grieķija	19	9	4.5
Spānija	16	7	4
Francija	19.6	5.5	2.1
Itālija	20	10	4
Kipra	15	5/8	-
Latvija	21	10	-
Lietuva	19	5/9	-
Luksemburga	15	6/12	3
Ungārija	20	5	-
Malta	18	5	-
Nīderlande	19	6	-
Austrija	20	10	-
Polija	22	7	3
Portugāle	20	5/12	-
Rumānija	19	9	-
Slovēnija	20	8.5	-
Slovākija	19	10	-
Somija	22	8/17	-
Zviedrija	25	6/12	-
Apvienotā Karaliste	15	5	-

Avots: EUROSTAT, 2009

Kā augstākās nodokļu slodzes valstis var minēt Zviedriju un Dāniju (skat. 2. tabulu). Kopumā starp augsto nodokļu valstīm izdalās divas grupas: Ziemeļvalstu klasteris, kurā ietilpst Dānija, Zviedrija, Somija un arī Norvēģija; ES centrālās daļas klasteris, kurā ietilpst Beļģija, Francija, Itālija un Austrija. Šajās valstīs nodokļu slogs pārsniedz 40% no IKP. Izņemot Kipru, kurā vēl pirms pāris gadiem nodokļu slogs bija zem vidējā ES līmeņa, kopumā ES-27 valstīs novērojama tendence, ka no ES centrālās daļas attālākās valstīs, it īpaši Austrumeiropā ir zemāks nodokļu slogs [Taxation Trends..., 2009].

Lai atvieglotu nodokļu slogu uz ekonomiku, tiek veidotas arī tā saucamās beznodokļu zonas (jeb ofšori), kurās ietilpst vairāk kā 50 dažādas pasaules valstis un to atsevišķi reģioni, arī atsevišķas brīvās ekonomiskās zonas Latvijā: Liepājā, Ventspilī, Rīgā un Rēzeknē. Caur šīm Latvijas nodokļu atvieglojumu brīvajām zonām nodokļu sloga samazinājums 2008. gadā sasniedza vairāk kā 120 milj. LVL, tas sastādīja vairāk kā 6% no kopējā nodokļu sloga valstī. Iepriekšminēto zonu atbrīvotos nodokļus maksā pārējie nodokļu maksātāji, un šeit jābūt atkārtotiem pētījumiem. Jāatzīmē, ka viennozīmīgs nav arī IKP rādītājs, jo nedaudz atšķirīga pa valstīm ir tā aprēķināšanas kārtība un metodika.

Likums „Par pievienotās vērtības nodokli" Latvijā ir spēka ar 1995. gada 1. maiju, kurā līdz 2009. gadam bija noteikta PVN pamatlikme 18%. Ikviens iedzīvotājs neatkarīgi no viņa ienākumiem, pērkot preces vai pakalpojumus, un kuri nav atbrīvoti no PVN, maksā šos procentus. Samazināta PVN likme bija 5%, bet kopš 2009. gada 1. janvāra PVN likmes ir paaugstinātas un noteiktas attiecīgi 21% un 10% apmērā.

PVN likmei pēc likuma grozījumu stāšanās spēkā 2009. gada 1. janvārī ir šāds dalījums:

- Nodokļa pamatlikme 21% apmērā tiek piemērota arī 13 darījumu veidiem, kuriem iepriekš bija piemērota 5% likme;
- Likumā minētie grozījumi nav ietekmējuši 0% likmes piemērošanu, kā arī atbrīvojumu no PVN maksāšanas.

Būtiski tika samazināts arī ar 10% apliekamo darījumu skaits, proti, tika izslēgti 13 darījumi, kuriem iepriekš tika piemērota pazeminātā 5% likme. Pazeminātā likme, kura ir dubultojusies ir saglabājusies vairs tikai 8 darījumiem, kas pieskaitāmi pie pirmās nepieciešamības precēm un darījumiem (medikamenti, medicīnisko ierīču un medicīnisko preču piegāde, zīdaiņu produkcijas piegāde, siltumenerģijas, dabasgāzes un elektroenerģijas piegāde iedzīvotājiem, transporta pakalpojumi un prese). Likuma 6. pantā ir atrunāti arī 0% piemērošana starptautiskajā tirdzniecībā, transportā, par preču piegādēm un pakalpojumiem, tūrismu, beznodokļu tirdzniecības veikalos veiktajām preču un pakalpojumu iegādēm fiziskajām personām, kas izbrauc no iekšzemes uz trešajām valstīm vai teritorijām un citas sfēras.

Gandrīz visās pasaules valstīs, kurās iekasē pievienotās vērtības nodokli, uz atsevišķām precēm un pakalpojumiem PVN likmes ir diferencētas pēc principa: zemākas likmes par standartlikmi ir pirmās nepieciešamības precēm un pakalpojumiem, augstākas par standartlikmi ir luksusa precēm un pakalpojumiem. Savukārt, īpaši svarīgas preces un darījumi, pakalpojumi vispār ir atbrīvoti no PVN maksājumiem – ieturējumiem.

Savukārt cīņai ar ekonomisko krīzi tādās valstīs kā Apvienotā Karaliste, Portugāle, Rumānija PVN likmes tika samazinātas. Apvienotajā Karalistē tieši uz ekonomiskās krīzes laiku no 2008. gada 1.decembra līdz 2009. gada beigām pievienotās vērtības nodokļa likme ir samazināta par 2.5%, attiecīgi no 17.5% līdz 15% (skat. 3.tabulu). Portugālē samazināta par 1% gan pamatlikme, gan samazinātā PVN likme. Arī Francija ir paziņojusi par PVN pamatlikmes samazināšanu viesnīcu un restorānu pakalpojumiem attiecīgi no 19.6% līdz 14%. Katrā ziņā šāda PVN likmes samazināšana veicinās attiecīgajās valstīs uzņēmējdarbības attīstību. Šajās valstīs tiek veicināta attiecīgo nozaru attīstība un reizē arī nodokļu kopējie ieņēmumi.

Vairums jaunpienācēju valstīm Eiropas Savienībai, tai skaitā Latvijai nodokļu politikas īstenošanas situācija ir atšķirīga. Lai pārdzīvotu tik dziļu ekonomisko krīzi pašreizējos apstākļos un nodrošinātu Eiropas valstu finansiālo ilgtspēju un uzlabotu kontinenta konkurētspēju, valstīm būs jāsadarbojas ciešāk nekā jebkad un tas liek ES pārvērtēt ekonomiskās, tai skaitā fiskālās politikas koordināciju.

Finansiālās noturības problēmas risinājumu Somijas premjerministrs Matti Vanhanens saredz nodokļu palielināšanā ilgtermiņā. Piemēram, īpašuma nodokļa un mantojuma nodokļa likmes var tikt noteiktas nacionālajā līmenī. Taču šie minētie nodokļi būtiski nepalielinās nodokļu ieņēmumu apjomus. Tikai izmaiņas pievienotās vērtības nodoklī, dažādos akcīzes nodokļos vai ienākuma nodoklī nesīs reālas izmaiņas tautsaimniecībā [Bīdens R., 2009.]. Autori piekrīt Matti Vanhanenam, jo PVN ir patēriņa nodoklis, kas tūlītēji ienes nodokļu ieņēmumus budžetā ar piebildi, ka augstāk minēto nodokļu paaugstināšana var izraisīt un izraisa migrāciju, uzņēmējdarbības reģistrāciju un / vai pakalpojumu ņemšanu reģionos ar zemākām PVN likmēm. Kā piemērs minams tas, ka Latvijas iedzīvotāji Igaunijas pierobežā pārtikas preces iegādājas Valgā, kur PVN likme ir 18%. Lūk, tādēļ ir nepieciešama ES starpvalstu sadarbība, neskatoties uz to, ka taksācija pēc likuma ir nacionāla līmeņa kompetence. Process būs grūts, bet iespējams.

Autoru uzskats, kas balstīts uz ilglaicīgu visu tautas saimniecību nozaru analīzi norāda, ka patiesībā katrai nozarei pasaulē ir raksturīgs savs, atšķirīgs ienesīgums – parasti pēc vispārējās shēmas, zemākais tas ir mežsaimniecībai, tad seko lauksaimniecība, iegūstošā rūpniecība un apstrādājošā rūpniecība, bet augstāks tas ir tirdzniecībai, bankām un apdrošināšanai, pakalpojumiem, izpriecu un azarta spēlēm. [Vītola Ī, Boruks A.....] Protams katrai valstij var būt savi izņēmumi.

Pieredze rāda, ka valsts uzdevums ir veicināt visu reģionu attīstību, lai radītu iedzīvotājiem samērīgas darba un konkurences spējas, mazinot to negatīvo ietekmi, ko veido nelabvēlīgie dabas apstākļi. Līdz ar to ir ļoti svarīgi valstī izdalīt reģionus pēc to noderīguma lauksaimniecībai, un šie reģioni nosaka lauksaimniecības atbalsta veidus, kā subsīdiju tā arī ar nodokļu palīdzību. Šajā sakarā autori uzskata, ka sociāli taisnīgāk patreizējos apstākļos būtu variants, ka nepārstrādātajai vietējai lauksaimniecības produkcijai – olas, piens, gaļa, kartupeļi, dārzeņi, augļi u.c.. PVN likme būtu īpaši samazināma kā tas ir Polijā, kur samazinātā PVN likme tiek piemērota lauksaimniecības produkcijas tiešajām piegādēm patērētājiem. Turpretim vides aizsardzības regulēšanas nolūkos ar fiskālo politiku kā negatīvs piemērs ES valstu vidū jāmin Slovēnija, kurā augsnes

4. tabula

PVN ieņēmumi Latvijā un VID ZRI 2007.-2009. gada janvārī - martā
VAT revenues in Latvia and Zemgale Regional Institutions of the State Revenue Service (ZRD of SRS) between January and March 2007-2009

Gads Year	Mēnesis Month	Faktiski iekasēts, milj. LVL Revenues collected, mln. LVL	Pieaugums/ samazinājums attiecībā pret iepriekšējo gadu Increase/ decrease against the previous year		Faktiski iekasēts, tūkst. LVL Revenues collected, thou. LVL	Pieaugums/ samazinājums attiecībā pret iepriekšējo gadu Increase/ decrease against the previous year	
			+/-	%		+/-	%
Latvijā / Latvia					VID ZRI / ZRD of SRS		
2009	Janvāris January	92008.40	-31523.20	**-25.5**	1251.40	-602.47	**-32.5**
2008		123531.60	12137.90	10.9	1853.87	-871.22	-31.9
2007		111393.60	29355.80	35.8	2725.09	935.53	52.3
2009	Februāris February	60214.50	-33124.80	**-35.5**	-1089.57	-758.99	**-229.6**
2008		93339.30	7415.90	8.6	-330.58	-509.39	-284.8
2007		85923.40	24105.60	39.0	178.81	-202.99	-53.2
2009	Marts March	64408.80	-21980.60	**-25.4**	448.77	-100.67	**-18.32**
2008		86389.40	6750.10	8.5	549.44	400.82	42.18
2007		79639.30	18049.10	29.3	950.26	822.02	641.00

Avots: Dudareva, 2009

mēslošanas līdzekļiem un pesticīdiem tiek piemērota samazināta PVN likme – pamatlikmes 20% vietā samazinātā likme veido tikai 8.5%. (Taxation trends in the European Union, 2009) Šī īpaši pazemināta PVN likme dotu iespēju maznodrošinātajiem iedzīvotājiem ietaupīt (pērkot vietējo produkciju) savus ienākumus un vienlaicīgi tā tiktu vērsta uz lauksaimniecības attīstību valstī.

Tā kā PVN ir netiešais nodoklis, tad šis nodoklis nepastarpināti (tieši) iedarbojas uz mazturīgo iedzīvotāju ienākumiem. Šis nodoklis ir instruments nabadzīgo (mazturīgo) iedzīvotāju dzīves līmeņa paaugstināšanai.

Par PVN nodokļa paaugstinājuma devumu vai nodokļu ieņēmumu efektivitāti tika veikta PVN ieņēmumu analīze kopumā valstī un Valsts ieņēmumu dienesta Zemgales reģionālajās iestādēs (VID ZRI) laika periodā no 2007.-2009. gada janvāra – martam (skat.4. tabulu).

VID ZRI ir VID pakļauta iestāde, kas sastāv no sešām VID nodaļām: Aizkraukles, Bauskas, Dobeles, Jelgavas, Jēkabpils un Tukuma nodaļām. Nodokļu ieņēmumus VID ZRI veido tieši nosauktajās VID nodaļās. Pētījums veikts ar ģenerālo kopu, kas 2007. gadā sastādīja 6116 PVN maksātāju, 2008. gadā 6993, bet 2009.gadā 7652, tātad PVN maksātāju skaits palielinās, bet, salīdzinot ar PVN ieņēmumiem, pierādās, ka kopumā saimnieciskajā darbībā nav izaugsmes.

Analizējot Latvijā PVN ieņēmumus 2009. gada pirmajos trīs mēnešos (janvāris, februāris, marts) pārliecināmies, ka tie ir būtiski samazinājušies visos trīs mēnešos, attiecībā pret iepriekšējo gadu vidēji par 30%. Šo pašu PVN samazinājuma tendenci pierāda sniegtie dati par atbilstošo periodu kā valstī, tā arī VID ZRI. Tātad secinām, ka PVN pamatlikmes paaugstināšana līdz 21% robežai nav sevi attaisnojusi. Pievienotās vērtības nodoklis pārsvarā ir Eiropas attīstītās valstīs, bet tā nav ASV, Honkongā u.c. Pievienotās vērtības nodoklis ES valstīs pārsvarā ir no 0-25%, bet no šī nodokļa pārsvarā ir atbrīvoti nepārstrādāti lauksaimniecības produkti, medikamenti, izglītības izdevumi, nekustamais īpašums u.c., līdz ar to rēķinot uz visu realizēto produkciju PVN ir daudz zemāks. Šai sakarībā nav pamata apgalvot, ka ES ir augsts PVN – tas ir augsts atsevišķām preču grupām – pārsvarā tām, kuras iegādājas iedzīvotāji ar lielākiem ienākumiem. [Sproģis A., Vītola Ī. u.c...., 2000].

Nodokļu politikas vienam no galvenajiem mērķiem ir jābūt valsts iedzīvotāju labklājības paaugstināšanās, galvenokārt maznodrošinātajiem un zemu nodrošinātajiem iedzīvotājiem, likvidējot nosacījumus nepamatotu ienākumu gūšanai. Nodokļu politikai ir jāietekmē sabiedrības labklājībai nevēlama patēriņa samazināšanās (alkohols, cigaretes u.c.). Kas attiecas uz pievienotās vērtības nodokli, tad to jāmaksā visiem, kas veic darījumus uzņēmējdarbībā un jāveicina spekulatīvas pārpirkšanas samazināšanās. Tas jāmaksā jebkurā pārpirkšanas gadījumā (procesā). [Sproģis A., Vītola Ī. u.c.... 2000]. Šim nodoklim jāveido efektīva saite ražotājs – patērētājs, bez liekām struktūrām (vairumtirgotājs, pircējs, mazumtirgotājs). Šis akcents liekams jau šobrīd krīzes pārvarēšanai valstī, kā arī moderno informācijas komunikācijas tehnoloģiju jomā (piemēram, tiešā pārdošana internetā), tā veicinot produkcijas noietu bez starpniekiem un vienlaicīgi mazinot preces sadārdzinājumu no starpniecības operācijām.

Pēc vairāku autoru pētījumiem konstatēts, ka pastāv cieša sakarība starp personas iegādāto produktu apjomu internetā un PVN likmēm. Valstīs, kur ir augstas PVN likmes, cilvēki ir vairāk ieinteresēti preces iegādāties internetā, tā samazinot preces sadārdzinājumu uz starpniecības operācijām, bet jāpiebilst, ka šeit var būt arī liela ēnu ekonomikas iespēja PVN nodokļa neiekasēšanai pilnā apjomā, tajā pat laikā pastāvēs pozitīva saikne ražotājs-patērētājs, kas attiecas arī uz PVN nodokļa nomaksu.

Secinājumi un priekšlikumi
Conclusions and proposals

1. Valstī veiktie grozījumi nodokļu likumos ir orientēti galvenokārt uz budžeta ieņēmumu palielināšanu, taču vēra netiek ņemta šo izmaiņu iespējamā ietekme uz ekonomisko situāciju, tautsaimniecības turpmāko attīstību un iedzīvotāju maksātspēju.
2. Nodokļu likumdošanas grozījumos tiek ienestas nodokļu ieņēmumu palielināšanas paņēmieni kurām jāsekmē papildus nodokļu ieņēmumi valsts budžetā, t.i., palielināta PVN pamatlikme no 18% uz 21% un pazemināta likme mainīta no 5% uz 10%. Ar PVN nodokļa palielināšanu tiek izslēgti 13 darījumu veidi, kuriem iepriekš tika piemērota pazemināta PVN likme 5% apmērā.
3. 2009. gada janvārī-martā PVN ieņēmumi Latvijā attiecībā pret iepriekšējā gada attiecīgo periodu samazinājās vidēji par 30%, kas nozīmē to, ka PVN likmes palielināšana līdz 21% nav sekmējusi papildus nodokļu ieņēmumu ieplūdi valsts budžetā, kā arī nav notikusi saimnieciskās darbības attīstība.
4. Pievienotās vērtības nodoklis jāmaksā visiem, kas veic darījumus uzņēmējdarbībā un jāveicina spekulatīvās pārpirkšanas samazināšanās. Tas jāmaksā jebkuras pārpirkšanas gadījumā (procesā). Šim nodoklim jāveido efektīvāka saite ražotājs-patērētājs, bez liekām starpniecības struktūrām, liekot akcentu jau šobrīd krīzes pārvarēšanai valstī.
5. Lai veicinātu tautsaimniecības attīstību, nodokļu sistēmai ir jābūt atkarīgai no atbilstošā reģiona, nozares un produkcijas veida.
6. Veicinot iedzīvotāju ienākumu palielinājumu ar nodokļu politikas palīdzību, valstī netiek sasniegti vēlamie rezultāti, jo valsts iedzīvotājiem ir lielas kredītsaistības, kuras iedzīvotāji cenšas vispirms atmaksāt nevis palielināt privāto patēriņu.
7. Ekonomikas recesijas periodā iedzīvotāju lielais kredītsaistību īpatsvars ir bremzējošs nodokļu politikas īstenošanas un tautsaimniecības attīstības faktors.
8. Ar pilnveidotu nodokļu politiku sekmēt godīgu un labprātīgu nodokļu nomaksu, kā arī attīstīt starpvalstu sadarbību finansiālās noturības problēmu risināšanai.
9. VID lielāka uzmanība jāvelta nodokļu maksātāju informētībai par gaidāmajām izmaiņām likumdošanā, kā arī jāsniedz kvalitatīvas un izsmeļošas konsultācijas nodokļu jautājumos, veicinot racionālu sadarbību nodokļu maksātājiem ar VID.
10. Krīzes laika valdībai jāapsver iespēja nevis tikai stimulēt nodokļu palielināšanu, bet rast iespēju veicināt ražošanas un uzņēmējdarbības attīstību, kas bremzētu ēnu ekonomiku un veicinātu sabiedrības konsolidēšanos, kas ir attīstības spēks.
11. Īpaša pieprasījuma precēm un pakalpojumiem (luksusa un prestiža, cilvēka veselībai kaitīgām u.tml.) būtu nepieciešams noteikt paaugstinātas PVN likmes.
12. Latvijas Republikas nodokļu sistēmai, tai skaitā PVN (iedzīvotāju ienākuma un nekustamā īpašuma nodokļiem) ir jāpievērš īpaša uzmanība, jo tā nosaka ceļu, pa kādu virzīties sabiedrībai: vai nu par destruktīvu un masveida nabadzības ceļu vai visas sabiedrības uzplaukuma un labklājības ceļu.
13. Jūtamu kopbudžeta un tautsaimniecības pieaugumu varēs panākt ar izmaiņām pievienotās vērtības nodoklī, dažādos akcīzes nodokļos, arī ienākuma nodoklī, šo nodokļu celšana ir jāparedz ilgtermiņā, diferencējot pievienotās vērtības nodokli pa dažādām nozarēm un preču grupām.

Izmantotā literatūra
Bibliography

1. Belan P., Gauthier S., Laroque G. (2008). Optimal Grouping of Commodities for Indirect Taxation. *Journal of Public Economics*, 92, pp. 1738-1750
2. Bīders R. Ja palielināsim nodokļus ES, tad visi reizē. *Dienas Bizness.* [tiešsaite] [skatīts 2009-06-17]. Pieejams: http://www.db.lv/
3. Dudareva S. (2009). Nodokļu ieņēmumus ietekmējošo faktoru analīze VID Zemgales reģionālajā iestādē. Attīstība daudzveidībā. *Referātu tēzes V*, Jelgava: LLU, 6. lpp..
4. Latvijas statistikas gadagrāmata 2008. Rīga: 2008, 47.-106.lpp. ISSN 1407-0626; ISBN 978-9984-06-354-2
5. Latvija 2009. Galvenie statistikas rādītāji, 7.lpp. ISSN 1691-5437; ISBN 978-9984-06-358-4
6. Likumprojekts *Par valsts budžetu 2009. gadam* paskaidrojumi. LR Ministry of Finance [tiešsaite] [skatīts 2009-02-22]. Pieejams: http://www.fm.gov.lv/?let/ valsts_budzets/ paskaidrojumi/ 2009.gada_projekts
7. Likums par valsts budžetu 2008.gadam: LR likums. (2007) [online] [retrieved 2009-02-22]. Available from: http://www.likumi.lv/doc./php?id=167035&from=off
8. Par pievienotās vērtības nodokli: LR likums. (1995) [online] [retrieved 2009-03-11]. Pieejams: http://www.likumi.lv/doc.php?id=34443
9. Sproģis A., Jaunzeme M., Vītola Ī. u.c. (2000). Nodokļu un subsīdiju politikas problēmas un pilnveidošanas virzieni. *The Main Directions*

of Research in Economics, Law and Historical Sciences by the Latvian Council of Science in 1999, Rīga: The Humanities and Social Science Experts' Commision of the Latvian Council of Science, 5, 61-77 p., ISBN 13: 978-9984-19-923-9
10. Tagkalakis A. (2008). The Effects of Fiscal Policy on Consumption in Recessions and Expansions. *Journal of Public Economics*, 92, pp. 1486-1508
11. Taxation Trends in the European Union (2009). *European Communities*, Bruxells: EUROSTAT, p. 391
12. Ī.Vītola, A.Boruks, I.Jakušonoka, I.Leibus, Dz.Bergmane (2009). Latvijas nodokļu sistēmas pilnveidošana tautsaimniecības attīstības un sociālā taisnīguma nodrošināšanai. LZP Ekonomikas un juridiskās zinātnes galvenie pētījumu virzieni 2008.gadā. Nr.14. Rīga, 154.–156.lpp. ISSN 1691-290X, ISBN 13:978-9984-19-923-9

Kopsavilkums

Zinātniskās izstrādes rezultātā nonākts pie slēdziena, ka nodokļu ienākumu efektivitātes kāpums tautsaimniecības attīstībai tiks panākts paplašinot nodokļu bāzi, kā arī veicot selektīvi zinātnisku pieeju nodokļu politikas risinājumam, īpaši lauksaimniecībā. Ar zinātniskās izpētes hipotēzi – *Latvijas nodokļu sistēmas pilnveidošana ir nepieciešama tautsaimniecības attīstības un sociālā taisnīguma nodrošināšanai,* akcentējot nepieciešamību nodokļus padarīt vienkāršus taisnīgus, saprotamus un neitrālus. Zinātniskās izstrādes varēs izmantot atsevišķu nozaru attīstības regulēšanas mehānismu pilnveidošanai ar nodokļu palīdzību, lai veicinātu tautsaimniecības ilgtspēju ES kopējā tirgū. Nodokļu slogs ir jādiferencē atbilstoši ienākumiem, tādējādi mazinot sociālo spriedzi valstī. Pilnveidotai nodokļu sistēmai ir jāveicina tautas labklājība un kultūra, spēcīgas vidusšķiras veidošanās pēc iespējas samazinot maznodrošināto īpatsvaru sabiedrībā. Tas arī pierāda nodokļu sistēmas lielo ekonomisko un sociālo nozīmi tautsaimniecībā.
2009. gada nodokļu likumdošanas grozījumos ir ienestas nodokļu ieņēmumu palielināšanas paņēmieni kurām jāsekmē papildus nodokļu ieņēmumi valsts budžetā, t.i., palielināta PVN pamatlikme no 18% uz 21% un pazemināta likme mainīta no 5% uz 10%. Veiktie pētījumi VID ZRI laika periodā no 2007.-2009. gadam, katrā gadā atbilstoši no janvāra līdz marta mēnesim parāda, ka PVN ieņēmumi 2009. gada minētajos trīs mēnešos ir būtiski samazinājušies. Šo pašu PVN samazinājuma tendenci pierāda sniegtie dati (par atbilstošo periodu) kā valstī, tā arī VID ZRI, kas nozīmē to, ka PVN likmes palielināšana līdz 21% nav sekmējusi papildus nodokļu ieņēmumu ieplūdi valsts budžetā, kā arī nav notikusi saimnieciskās darbības attīstība. Latvijas nodokļu sistēma ir jāsakārto un jāpilnveido atbilstoši maksātspējas principam, ar nepieciešamību saglabāt valsts nacionālās intereses.
Pētījuma mērķa sasniegšanai izmantotas ekonomiski statistiskās analīzes metodes un paņēmieni-salīdzinošās apsekošanas, indukcijas un dedukcijas un loģiski konstruktīvās metodes. Izmantoti Valsts Centrālās statistikas pārvaldes (VCSP), Valsts ieņēmumu dienesta (VID) un EUROSTAT dati.
Atslēgas vārdi: nodokļu sistēma, pievienotās vērtības nodoklis, pasaules prakse

Accounting of Biological Assets in Latvia

Jeļena Jesemčika, graduated economist
Department of Accounting and Audit
Faculty of Economics and Management
University of Latvia
Aspazijas b. 5, Riga, LV-1050
E-mail: lu4ikk@inbox.lv

Anna Jesemčika, Mg. oec., associate professor
Faculty of Economics
Latvia University of Agriculture
Svētes iela 18, Jelgava, LV-3001
Email: anna.jesemcika@llu.lv

Abstract. Biological assets – animals and plants which are able to produce agricultural production are the main productive elements of agricultural enterprise. The profit of enterprise depends exactly on the management efficiency of these assets. Properly organised accounting ensures the control of biological assets ownership and shows favourable prerequisites for enterprise development, which affects both the management and the welfare of state in general. In Latvia very little attention is paid to the questions of accounting for biological assets. There are no regulations developed which would determine processes of accounting for biological assets as well as no researches done which would be related to the problematic of accounting for biological assets.

The research objects: agricultural enterprises in Latvia, foreign and Latvian researches and publications, and theoretical conclusions on biological assets. The research is done in accordance with the previous researches and experience in accounting in agricultural enterprises.

Key words: biological assets, IAS 41, evaluation of the fair value, evaluation of the production expenses, animal accounting.

Introduction

In 2008 agricultural sector accounted for only 4.3% of GDP, thus indicating that agriculture is one of the smallest sectors in Latvia. However, it is ranked first by importance. Agriculture is one of the most important sectors of the national economy, which provides the necessary products to population. Thus, maintenance and development of agricultural enterprises is one of the most important questions in the government policy. On conditions of market relations, comprehensive, objective and due information is necessary for successful economic development. The data of accounting report of enterprises served as the main source of information.

The aim of the article: to study and analyse biological assets accounting guidelines from the view of legislation of the Republic of Latvia and ISA as well as to disclose solutions for typical problems and corrections of identified deficiencies in accounting for biological assets.

The following **tasks** are set to achieve the aim of the article:

1) to explain the definition of biological assets and its classification attributes;
2) to study theoretical aspects of biological assets admission and evaluation methods;
3) to explain the applied methods of biological assets evaluation in agricultural enterprises of Latvia;
4) to valuate reflection of biological assets in agricultural enterprises' financial reports according to the regulatory enactments of Latvia and ISA;
5) to develop proposals for solution of typical problems solve and correction of identified deficiencies in accounting for biological assets.

The research methods. The method of logical analysis and methods of comparison and generalisation are used in the article. The research is done on legislative and regulatory enactments. The research authors have used studies of foreign researchers, providing their own estimations on knowledge of biological assets. The research analyses the history of accounting methodology for biological assets as well as concept of problem understanding.

Biological reformation control which results in quantitative and qualitative changes of biological assets as well as enabling of favourable conditions (tillage, sufficient nutrients, lighting, temperatures (for example, in greenhouses or poultry farms) and ensuring of humidity level – are the characteristics of agriculture. If an enterprise gets agricultural production from uncontrolled biological sources (hooking fish in rivers, sea or shooting animals in wild forest), such activities cannot be called agriculture.

According to IAS 41, agricultural production is the production obtained from enterprise's biological assets. The definition itself indicates that enterprises shall manage this asset. Biological assets comprise

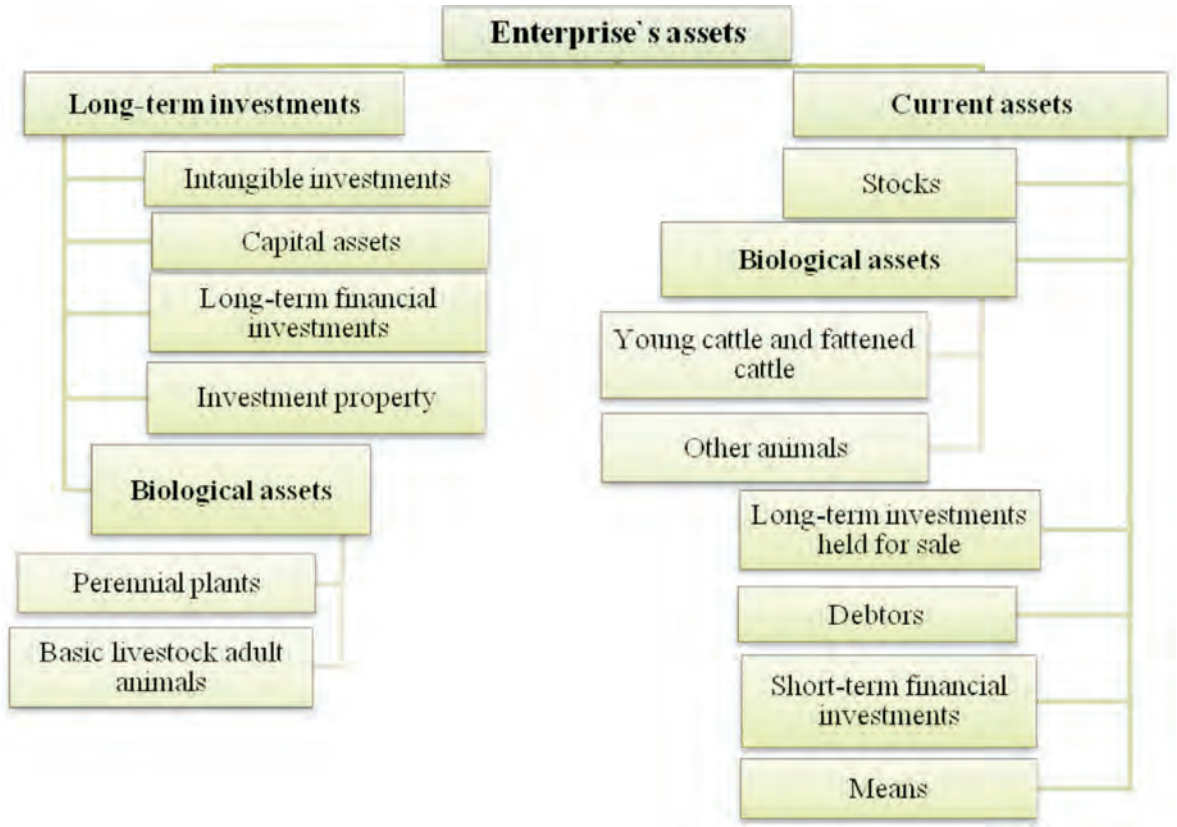


Figure 1. **Assets qualification and the place of biological assets in its content**

alive animals and plants, which through biological conversion are able to provide additional biological assets or agricultural production as well as are able to give economic improvements in another way.

According to Annual Accounts Law of the Republic of Latvia, biological assets which are able to provide agricultural production or/and additional biological assets as well as in another way to ensure economic improvements in the enterprise in time period exceeding 12 months, are included in the Item "Biological assets" of the long-term **assets** list.

In any case, plant as a part of biological assets, is related to the land. There can be perennial plants which are able during many years to produce agricultural production or/and additional biological assets or, as already mentioned to ensure economic improvement for enterprise in some other way (village protective forest zone) and are considered as long-term investments [4,13]. According to Annual Accounts Law of the Republic of Latvia, these assets are included into the long-term investment list, in account item "Biological assets", in account "Perennial plants".

Unlike perennial plants, there are another plants, which are able to give agricultural production or/and additional biological assets in a time period, which does not exceed 12 months (sugar beets, sunflowers, corn etc.). These plants according to the legislation of Latvia are not included into a separate analytical account; here the analytical accounts includes only expenses which are related to seeding or harvesting of plants as well as income from sales of agricultural production. However, if the enterprise itself starts to grow a biological asset or buys a plant, and it shall grow till it is be able to give products or other goods, these assets are included in the reserve list as goods in process.

Plant characteristics are associated with long-term period of productive age. In this period an enterprise is investing a lot of resources to maintain plant development periods. According to the authors, it is necessary to include a new item "Development costs of biological assets" in the content of long-term investments which reflects plants under growing process. Firstly, it allows the users of a financial report to understand the enterprise's development perspectives and the fair financial position of the specific data. Secondly, this technique is economically based on accounting guidelines.

Unlike plants, animals are not related to the land. Parts of those animals which are called productive animals are able to provide agricultural production. This animal group is included into long-term investment account "Basic stocking adult animals".

Special current assets group contains animals for growing and fattening. These are included into the account group "Productive and working animals". It is necessary to open a separate account for accounting of these animals, for example ac account "Animals for growing and fattening" which includes animals born on a farm and bought as young cattle.

Schematically the place of biological assets in the assets of Latvia's enterprises is shown in Figure 1. Presently biological assets encompassed

by the current assets are not reflected as a separate balance item. "Productive and working animals" are included in the reserves. According to the authors, it is necessary to provide a separate item as it is shown in Figure 1. The reserves comprise materials, raw materials, goods as well as goods in process. Unless two features are characteristic to these subjects:

— they are not alive objects;
— they are materials in different phases of readiness.

Animals or plants are living beings which are based on the laws of nature. Thus, according to the authors, it is not possible to classify raw materials and living beings as equivalent accounting objects. Therefore also biological assets in long-term investments are presented separately, and they are included into capital assets.

Results and discussion

Several authors as L. Todorova (Moldova), J. Gazjanova, S. Bichkova, S. Stefanova, G. Lisovichs, V. Palijs, J. Fastova, J. Zaharova, R. Alborovs, S. Konceva, J. Sheluxina, J. Stepanenko (Russia), J. Kliperts, A. Chechetkins, A. Federovicha (Belorussia), V. Gavriluks, O. Birjukova, M. Ogijchuk, T. Shevjakova, L. Panchenko, L. Skolotij, M. Belenkova (Ukraine), G. Kalniņa, A. Jesemčika (Latvia) and others have studied issues related to biological assets recognition and evaluation problems. Despite these authors' contribution to this problem research, it is necessary to add that they view individual aspects of accounting for biological assets. Many of them suggest using general assets valuation principles in the development of a specific item as biological assets. Researchers pay larger attention to biological assets of livestock than on crop production. As a result the theory lacks unified approach towards a single concept on biological assets valuation which would meet the national standards and legislation as well as the IAS.

In Latvia biological assets in agricultural enterprises are recognised and valued based on the IAS, since currently there are no national accounting standards which would regulate accounting for biological assets.

Recognition of biological assets is determined based on the IAS, and they are not differentiated from the rest of the material assets in terms of recognition. Biological assets shall be recognised in public accounting only in cases when:

— the enterprise controls the assets of past events;
— the enterprise cash flow is associated with the assets future economic benefits;
— the fair value or the expenses can be reliably measured [7, 485].

The enterprise may buy an asset, rent it, obtain free of charge, create it itself (young cattle increase), or obtain it as an investment in fixed assets. At the same time these operations reflect the past events, which define the order of recognition and valuation of the object.

Obtaining of the future economic benefits is possible only in cases if the income from the use of assets exceeds the expenses, like income from pedigree livestock sales, meat sales, or first processing products etc. [5, 32]. If an agricultural enterprise is growing grapes for sales which also bring a profit for the enterprise, it is undoubtedly an economic benefit. The enterprise's forest zone brings fetus. However, if it was grown to protect the crop from negative natural impact, it may be recognised as biological asset.

International Accounting Standards pay a special attention to the questions of valuation. Hence it is necessary to choose a particular method [5,36]. Valuation – monetary unit determination process, which recognises and valuates elements of financial report in the enterprise's balance sheet and income statement. The problem appears if there is no single valuation system, which, for example, defines national standards, as it is in the case of Latvia. In this situation the reports of enterprises representing one business sector are not comparable, since each of them uses different methods. It creates problems both to external users and internal users of financial reports. For example, an investor wants to invest capital in an apple growing enterprise. Enterprises are using different methods for valuation of orchard value, which relates also to the prime cost of agricultural production (apples). Economic indicators will be different, and investors will reach the dead end without understanding in which enterprise there is sense to invest financial resources.

According to J. Gazjanova, problematic of valuation of biological asset is related to the fact that agriculture highly depends on agro climatic conditions and distance of an enterprise from sales markets. Especially strongly this problem is felt in the process of long-term biological assets valuation, as fair value is formed for a long period of time on constantly changing market conditions. Besides perennial plants and productive animals' valuation significantly changes depending on location. It is related to changes in the degree of risk and the cost of production. It is necessary to add that over time the original plant and animal values differ from similar physical and most productive new biological asset values [5,37].

International Accounting Standard 41 defines that biological assets shall be valuated based on fair value at the moment of recognition. Though according to Annual Accounts Law of the Republic of Latvia, biological assets in the initial accounting and subsequently are allowed to be valuated in fair value, from which sales costs are deducted, if one of the following conditions is observed:

— biological asset object has an active market and constantly available market prices;
— It is possible for the biological asset objects with other recognised methods to specify a reliable fair value at the current location and condition.

It is necessary to understand the definition of "fair value" to comprehend the application of this norm for a specific animal or plant. According to Annual Accounts Law of the Republic of Latvia, fair value

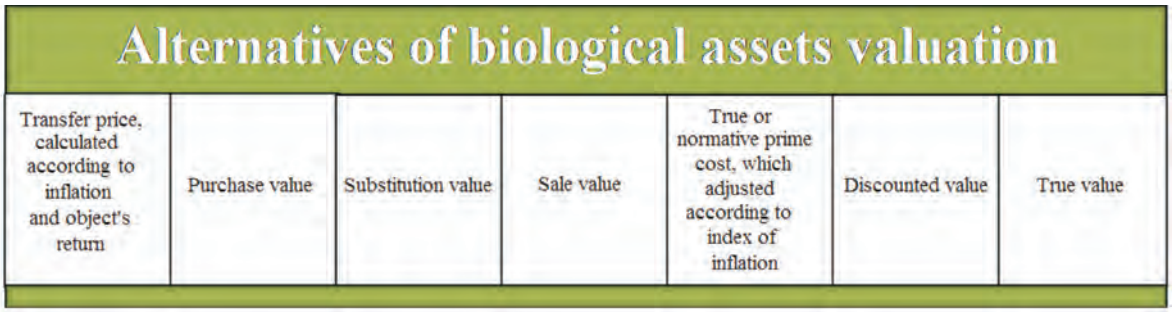


Figure 2. **Alternatives for valuation of biological assets in financial accounting** [6,13]

is the amount in respect of which it is possible to exchange assets or fulfil obligations in a transaction between well-informed, interested and financially independent persons. Fair value is based on its present location and condition, as result fair value has to be understood as market price, from which sales costs are deducted [5,13].

The fair value of biological assets is defined on each balance date, having regard of the active market price at the moment. The value of biological asset changes the entire reporting period due to its physical characteristics and market price changes. Fair value of biological asset is obtained deducting the estimated sales costs at the end of period + written-off (sold, slaughtered, fallen) asset value, thus obtaining (bought or obtained by enterprise) asset value – fair value deducting the estimated sales costs at the beginning of period [4,13].

As it was already mentioned, an active market existence is one of the conditions, when it is possible to use valuation of fair value. Active market means the market where homogeneous objects and services are sold and where it is not difficult to find buyer or seller, or where the participants of market are able to get information on prices. If further accounting for biological assets is not possible in active market, then based on IAS 41, an enterprise has the rights to choose one or more indicators for fair value, if such are available:

- the latest market transaction price on the condition that business circumstances in the time period between transaction date and balance date are not significantly changed;
- market prices of similar assets with correction, to reflect the differences;
- industry benchmarks such as the value of cattle, expressed per kilogram of meat.

These indicators are used in internationally recognised methods of valuation. Many of them are widely used in Latvia, while some of them are known only in certain sectors. Moreover, as it was just mentioned, Annual Accounts Law allows applying general accepted methods in the process of fair value valuation.

L. Todorova in her PhD thesis defines the methods for assets valuation, which are possible to use for valuation of biological assets. This method is presented in Figure 2.

In Latvia, it is not possible to valuate reliable fair value of biological asset (there is no active market, there is no information on recent sales, etc.), this asset is valuated by the production prime cost, which contains direct and indirect production costs. This selection occurs, because Latvia is one of former USSR republics. In the Soviet times animals and plants were included only in the production prime cost. Thus, accountants, who were making biological assets accounting in the Soviet times, are directly familiar with this method in practice. However, it is possible to use this method only if no significant biological changes have occurred in the time period between expenses incurred and biological asset fair value valuation process, or biological change influence on the price is considered as not significant [3,13].

Annual Accounts Law of the Republic of Latvia does not prescribe the use of fair value in biological assets valuation, but as it was just mentioned, it allows applying these methods on certain conditions. Thus, there is an option to choose which method to use for valuation of biological assets.

Documentation and registers of biological assets accounting are one of the most problematic questions. It is associated, firstly, with the lack of regulatory enactments in Latvia which would define the necessary volume of documentation and their content; secondly, there are no professional articles published which could provide any proposals. The research shows that established legislation acts which define the necessary documentation content and examples of documents exist in such states as Russia, Ukraine, Byelorussia, and Moldova. According to the authors, Latvia has to act the same. Firstly, it will improve the quality of biological assets accounting, since all necessary data are summarised in due time and are reflected in the accounting data. Secondly, it will make business financial data comparable due to unified accounting methods. Thirdly, it will considerably facilitate the work of auditors who provide audit for agricultural enterprises, because on the one hand it will make accounting data transparent and on the other hand it will allow valuation according to the legislation.

Correctly presented financial information is good advertisement of an enterprise. The information included in the report shows external users that the enterprise has nothing to hide. It shows its weaknesses and strengths. For many investors it is a signal that there is a sense to cooperate with this enterprise. Preparing explanations, the enterprise

arranges all the available information in a specific sequence which also affects decision-making on the enterprise.

The content of information on biological assets in enterprise's financial report is defined in Annual Accounts Law of the Republic of Latvia and IAS 41. It is important not only to reflect animals and plants fair value in the annual report, but to provide also additional information in the report's appendix. The appendix of an enterprise's annual report shall provide information on biological assets value for the previous accounting period, its enlargement, including improvements in the reporting year, the initial value in the liquidation report year, any movement from item in the accounting period, revaluation in the accounting period as well as information on depreciation as biological asset value becomes a subject for amortisation.

J. Gazjanova thinks that the appendix of the financial report shall provide information on biological assets physical characteristics changes that allow valuating agricultural activities effectiveness and its development perspectives in the future. This information is especially important if the production cycle lasts for several years. As a result of biotransformation there are changes in physical characteristics of animals.

According to the authors, the question of biological assets accounting in Latvia at the moment has a lot of un-researched and unsolved problems, which hinder the work of practicing accountants and negatively affect on the development of agricultural sector.

Conclusions, proposals and recommendations

The theoretical research covers the period of 2006-2009. In 2005 IAS 41 came into effect, which prescribes the guidance for accounting of biological assets. For one year this standard was analysed from the practical side and starting from 2006 foreign and Latvian scientists publications started to appear containing studies and information on animals and plants reflection in an enterprise accounting. Up to now accounting for biological assets was based on the Soviet time books. Accounting of biological assets is reviewed from a new aspect with taking effect of the standards. The goal of new accounting policy is to improve accounting so it meets the international and national accounting standards.

In general the authors conclude that the quality of biological assets accounting in Latvia is not sufficient. The main necessary improvements are as follows:

1. As animals and plants are reflected in the content of biological assets, it is necessary to substitute item of balance sheet stated in Annual Accounts Law "Productive and working animals" with the item "Biological assets" as well as it shall be shown separately in the content of current assets.
2. The balance scheme of Annual Accounts Law offers to create a new balance item "Development expenses of biological assets" in the content of long-term investments which contains animals and plants with the growth period to maturity exceeding one year.
3. Each agricultural enterprise management shall establish the asset accounting regulation of organisation to arrange accounting for biological assets.
4. Animal zoo-technical and financial accounting shall be unified; hence animal movement documentation examples shall be created to meet the mentioned needs of the accounting system.
5. Agricultural enterprises shall change the existing methods of valuation and choose one of generally accepted methods, and to transform the system of biological assets accounting accordingly.
6. The enterprises which choose valuation of biological assets based on the production prime cost shall establish and unify calculation of prime costs based on the unified methodology.
7. The management of enterprise shall improve internal control measures to perfect the efficiency of biological assets accounting and to ensure the control of enterprise's owned assets.

Bibliography

1. LR Likums *Gada pārskatu likums.* Available: http://www.likumi.lv/doc.php?id=66461 Viewed: December, 2009.
2. *Starptautiskais grāmatvedības standarts Nr.41* Available at: www.fm.gov.lv/gramatvediba/sgs/41.doc Viewed: December, 2009.
3. Kalniņa G. *Alternatīva bioloģisko aktīvu uzskaitē* Bilance Nr. 3 (135), 2006, 10.-15.lpp.
4. Гаврелюк В., Бирюкова О., Огийчук М., Шевьякова Т., Панченко Л., Сколотый Л., Беленкова М. *Бухгалтерский учет в сельском хозяйстве в первичных документах и проводках*. Харьков, Фактор, 2008. 479 с.
5. Тодорова Л. *Учет биологических активов.* Автореферат, Кишинёв, 2007. Available at: http://www.cnaa.md/files/theses/2007/7234/ludmila_todorov_abstract_ru.pdf Viewed: December, 2009.
6. Захарова Е. *Управление биологическими активами*. Автореферат, Ижевск, 2009. Available at: http://v4.udsu.ru/files/1236032454.pdf Viewed: December, 2009.
7. Палий Ф. *Международные стандарты учета и финансовой отчетности.* Москва, Инфра-М, 2007. 512 с.
8. Фастова Е. *Реформирование бухгалтерского учета в сельском хозяйстве*. Автореферат, Москва, 2007. Available at: http://www.timacad.ru/catalog/disser/referat/fastova.pdf Viewed: December, 2009.
9. *МСФО (IAS) 41: Сельское хозяйство-новое пособие* Available at: http://www.accountingreform.ru/ru/materials/accounting/workbooks/ Viewed: December, 2009.

Kopsavilkums

Teorētiskā pētījuma periods ir laika posms no 2006.-2009. gadam. 2005. gadā stājās spēkā 41.SGS, kurš satur norādījumus par *bioloģisko aktīvu uzskaiti*. Gada laikā šis standarts tika analizēts no praktiskā viedokļa un sākot ar 2006. gadu parādījās ārzemju un Latvijas zinātnieku publikācijas, kas sevī ietvēra informāciju par dzīvnieku un augu atspoguļojumu uzņēmumu grāmatvedībā. Līdz šim momentam bioloģisko aktīvu uzskaite balstījās uz padomju laika grāmatvedības nostādnēm. Stājoties spēkā standartam, bioloģisko aktīvu uzskaite tika aplūkota no jauna skatu punkta. Tiek veidotas jaunas sistēmas, kas raksturīgas mūsdienīgai grāmatvedības praksei. Jaunās grāmatvedības politikas mērķis ir pilnveidot grāmatvedības uzskaiti, lai tā atbilstu starptautiskiem un Latvijas grāmatvedības standartiem.

Kopumā var secināt, ka Latvijas bioloģisko aktīvu uzskaites kvalitāte nav pietiekama. Galvenie nepieciešamās uzlabošanas virzieni ir šādi:

1. Tā kā īstermiņa bioloģisko aktīvu sastāvā tiek atspoguļoti gan dzīvnieki, gan augi, Gada pārskatu likumā minētā bilances shēmā posteni „*Produktīvie un darba dzīvnieki*" ir jāaizstāj ar posteni „*Bioloģiskie aktīvi*", kā arī to jāuzrāda atsevišķi apgrozāmo līdzekļu sastāvā.
2. Gada pārskatu likumā minētajā bilances shēmā tiek piedāvāts ilgtermiņa ieguldījumu sastāvā izveidot jaunu bilances posteni „*Bioloģisko aktīvu izveides izmaksas*", kurā tiks uzskaitīti dzīvnieki un augi, kuru augšanas periods līdz brieduma vecumam pārsniedz vienu gadu.
3. Lai sakārtotu bioloģisko aktīvu uzskaiti katrai lauksaimniecības uzņēmumu vadībai ir jāizstrādā šo aktīvu uzskaites organizācijas nolikums.
4. Dzīvnieku zootehniskai un grāmatvedības uzskaitei ir jābūt vienotai, līdz ar to ir jāveido dzīvnieku kustības dokumentācijas paraugus, kas atbilstu minēto uzskaites sistēmu vajadzībām.
5. Lauksaimniecības uzņēmumiem ir jāmaina esošās novērtēšanas metodes, izvēloties vienu no vispāratzītām, un atbilstoši tai jāpārveido bioloģisko aktīvu uzskaites sistēmu.
6. Lauksaimniecības uzņēmumiem izvēloties bioloģisko aktīvu novērtēšanu pēc ražošanas pašizmaksas, ir jāveido uz vienoto pašizmaksas aprēķina pamatotu un vienoto metodoloģiju.
7. Lai pilnveidotu bioloģisko aktīvu uzskaites darbu un nodrošināt uzņēmumam piederošo aktīvu kontroli, lauksaimniecības uzņēmumu vadībai ir jāpilnveido iekšējās kontroles pasākumi.

Cooperative Banks in Poland on Financial and Economic Crisis Conditions

Alina Danilowska, Dr. hab.
Department of Economics and Economic Policy, Adjunct,
Warsaw University of Life Sciences –SGGW, Poland

Abstract. The aim of the paper is to examine the conduct and performances of the cooperative banks on the financial and economic crisis conditions. The analyses show that the cooperative banks meet successfully the challenges they have faced due to the crisis. Despite the crisis, cooperative banks have increased their lending and deposits activity; however growth rate of these activities shows a falling tendency. It is worth noting that the indicators of different aspects of banking activity in the case of cooperative banks were better than in commercial banks in the period of July 2008-September 2009. In the first period of crisis, cooperative banks strengthened their position in banking sector; however, in 2009 their position weakened as estimated by the share in loans market and deposit market.
Key words: cooperative banks, credit, debt.

Introduction

The economic crisis which is strongly tied with financial crisis from the second half year of 2008 is the most serious crisis after the Second World War regarding the size and scope. The GDP of many European countries decreased noticeably. According to the forecast for 2009 the average GDP for the EU member states (27) would decrease to – 4.1%. The Baltic States, like Latvia, Lithuania and Estonia are especially severe affected by the crisis: - 18%, -18.1%, -13.7% respectively. In some EU member states the scale of crisis is much lower, though in 26 countries from 27 members of the European Union the GDP is expected to decrease. The fall in GDP is observed in other European countries, like Switzerland (-2.4%) or Norway (-2.2%) and in countries which are the world economic leaders like the United States (-2.5%) and Japan (-5.9%). Poland is the only country from the EU member states, which GDP is expected to increase by 1.5% (Eurostat, 2009). This relatively better situation does not mean that the Polish economy has no trouble. The decrease in the rate of GDP growth from 6.8% in 2007 to 4.9% in 2008 and 1.5% in 2009 indicates that the Polish economy has slacked. The effects of this process for employment, investment, foreign trade, and other aspects of economy may be estimated fully in some months or even years if the crisis continues. What we can do now is the current observation of economic phenomena with endeavours to interpret and make forecasts on the ground of economic theory and a very short-term data.

The research aim is to examine the conduct and performance of cooperative banks on the financial and economic crisis conditions. The analysis should answer some questions: 1) how strong the economic crisis affected cooperative banks in Poland, 2) have the cooperative banks changed their behaviour and in what way, and 3) how the crisis influenced the position of cooperative banks in the banking sector.

Methodology and sources of information

The following sources of data are used for the research: Eurostat, the Polish Financial Supervision Authority (PFSA) (the main source), the National Bank of Poland, and the Central Statistical Office. Moreover, the author has used the results of personal studies on the determinants of granting agricultural credits by cooperative banks. The study encompassed all cooperative banks in Poland[1]. The review was carried in two steps - in 2008 and 2009. Nearly 28% of all cooperative banks in Poland filled in questionnaires.

Several methods were used to achieve the set aim: descriptive method, statistical and comparative methods.

The paper is structured as follows. It starts with the theory of financial crisis in modern economy. Next, the short characteristics of Polish banking system is given, followed by the evaluation of the crisis influence on conduct and performance of cooperative banks and their position in the banking system. The conclusions from analysis are drawn out at the end of the paper.

Financial crises in theory and practice

Financial crisis can be defined as a phenomenon of rapid changes in the financial market, which is connected with insufficient liquidity and/or insolvency

[1] except one bank that fulfills the requirement on the capital funds the same as in the case of commercial banks

of financial market participants and intervention of governments again them (Miklaszewski S., 2006).

Radelet and Sachs (2000) point out that not all financial crisis are alike, even though superficial appearances may deceive. Only a close historical analysis, guided by the theory, may disentangle the key features of any particular financial crisis. The authors identify five main types of financial crises, which may in fact be intertwined in any particular historical episode. They are as follows: 1) *Macroeconomic Policy-Induced Crisis* – arises when domestic credit expansion by the central bank is inconsistent with the pegged exchange rate; 2) *Financial Panic* – it is a case of multiple equilibria in the financial markets. A panic is an adverse equilibrium outcome in which short-term creditors suddenly withdraw their loans from a solvent borrower. The panic may result in large economic losses; 3) *Bubble Collapse* – occurs when speculators purchase a financial asset at a price above its fundamental value in the expectation of a subsequent capital gain; 4) *Moral Hazard Crisis* – arises because banks are able to borrow funds on the basis of implicit or explicit public guarantees of bank liabilities. If banks are undercapitalised or under-regulated, they may use these funds in overly risky or even criminal ventures; 5) *Disorderly Workout* – occurs when an illiquid or insolvent borrower provokes a creditor grab race and a forced liquidation even though the borrower is worth more as an ongoing enterprise.

The theoretical differences among these five types of crises are significant on several levels: diagnosis, underlying mechanisms, prediction, prevention, and remediation.

According to Miklaszewski (2006) the financial crisis can be classified into currency crisis, foreign insolvency crisis, bank crisis, and financial system crisis. Kenen (2000) underlines that while financial and currency crises go together frequently, it is still useful to distinguish between them. The European Monetary System crisis of 1992-1993 was a currency crisis. The savings and loan crisis in the United States was a financial crisis, although limited to a sub-sector of the financial system. In the East Asia in 1997-1998 both banking crisis and currency crisis occurred at same point (Knoop T.A., 2008).

The results of crises differ noticeably regarding the scope and term. Often they affect not only economy but the political and social life as well. The crisis in Indonesia (1997-1998) is the example of a very vast spectrum of consequences (Kupiecka E., 2003).

It is useful to distinguish between crises due to weak fundamentals, including microeconomic fundamentals, and self-fulfilling crises that would not occur if market participants did not expect them (Kenen P.B., 2000).

The global character is the characteristic feature of the current financial crisis and economic crisis that followed it. The financial crisis started in the USA and involved European countries as well as developing countries. Stiglitz (2009) mentions it because of globalisation there cannot be a major downturn in the world's richest country without implications for every other country. The United States caused the global financial crisis by bad regulation and bad financial practices. Financial markets are the most direct channel through which this crisis affected all the countries of the world.

It can be said that a reason of the current financial was moral hazard of bank managers encouraged by national and international bailouts. The bailouts were used during the Great Depression of 1929-1933 (Bordo M.D., James H., 2009) and are used now at huge scope by the governments and the International Monetary Fund.

Characteristics of the Polish banking system

Polish banking system has undergone great changes during 20 years of the market economy in every aspect of activity. Besides the adjustments to requirements of market economy being a great challenge, it had to operate on the conditions of globalisation, integration with the European Union, and technological revolution. Polish banking system includes the central bank on the first level and commercial banks, cooperative banks and branches of credit institutions[2] on the second level. The number of banks which was very high at the beginning of market economy was falling gradually. This process was observed in commercial banking and in cooperative banking sector as well. At the end of September, 2009, the number of commercial banks has decreased by 40%, while the number of cooperative banks – by nearly 65%. Accession to the European Union has enabled branches of banks from the EU member states operate directly in Poland. Consequently the number of branches of credit institutions has been rising since 2004. The banking sector in Poland had a strong development potential. Poland is relatively underbanked. In 2003, just before accession to the EU, Poland took the last but one place among the EU member states taking into consideration the ratio bank assets to GDP at 60.9%. This ratio was rising during the 5 years of the EU membership, though the ratio is still under 100% (Table 1) and the place of Poland in ranking of the EU member states has not changed[3].

The characteristic feature of Polish banking sector is polarisation. One polar encompasses some big banks which conduct operations on the whole market, while the other polar comprises some hundreds of small local banks. The concentration level of this banking sector is rather low. Data indicate that the level of concentration has slowly decreased during the second half of the previous decade. In case of assets, the ratio has decreased by 5 percentage

[2] The term "credit institution" is used to refer to bank undertakings with registered offices outside Poland, in another country of the European Union

[3] The noticeable increase in 2008 was an effect of decrease of the exchange rate of the Polish currency and very high activity of brunch of Greek Eurobank

Table 1

The structure and performance of Polish banking sector

Specification	1993	1995[1]	2000	2005	2006	2007	VI 2008	XII 2008	VI 2009	IX 2009
Number of banks	1740	1591	754	649	647	645	644	649	650	647
of which										
- commercial banks	87	81	74	54	51	50	50	52	52	51
- branches of credit institutions	0	0	0	7	12	14	15	18	19	18
- cooperative banks	1653	1510	680	588	584	581	579	579	579	578
Assets/GDP	-	48.8,	59.2	59.7	64.4	67,5	-	82.2	-	-
Employment (thousand)	x	x	171.2	153,0	157.9	167.1	173.6	181,3	178.3	176.6
Share of 5 largest banks in (%):										
- total assets	x	48.8	46.5	48.6	46.5	46.6	45.5	44.6	43.6	43.5
- deposits	x	52.3	54.7	55.8	54.7	56.9	56.2	55.3	53.5	53.2
- loans	x	43.8	46.1	45.0	44.0	44.6	43.9	43.1	42.8	42.8
Share of foreign investors in the equity (%)	x	18.1	53.8	73.1	72.9	70.1	68.6	69.2	69.7	68.4
Average weighted interest rate on loans (%)										
- all loans	x	x	x	7.64	7.17	8.25	9.05	9.59	8.45	8.39
- new granted loans	x	x	x	8.5	7.37	9.52	11.15	11.41	10.69	10.6
Average weighted interest rate on deposits (%)										
- all deposits	x	x	x	3.42	3.05	3.78	4.35	6.02	5.00	4.76
- new granted deposits	x	x	x	3.73	3.45	4.22	5.45	3.85	3.54	3.3
Share of non-performing loans in total loans (%)	30,1	20.4	15.0	7.7	5.6	4.1	3.8	3.5	4.2	4.9
banks by capital adequacy ratio <8	371	379	35	1	1	1	2	2	6	3
ROA (%)	x	1.9	1.05	1.6	1.7	1.7	2.1	1.6	0.8	1.2
ROE (%)	-2,9	22.7	14.5	20.6	22.5	22.5	27.4	21.2	11.3	11.8

x – data not available

[1] in the case of concentration the data on 1996

Source: Summary Evaluation of the Financial Situation of Polish Banks 1999, 2006, the National Bank of Poland, Information about situation of banks in 2007, 2008, January-September 2009 Polish Financial Supervision Authority, www.knf.gov.pl

points at the end of September of 2009 comparing with 2005. The rate of concentration in Poland is relatively low among the other EU member states. It was the lowest among countries that joined the EU together with Poland in 2003. In 2006 Poland took the 17th place in the ranking of concentration of banking sectors among the EU members (Summary, 2007).

The banking sector in Poland was an area of special activity for foreign investors. Their share in equity was rising very quickly till 2005 when it reached 73%, though in the following years it decreased by some percentage points (Table 1).

The employment fluctuations can also be observed in the banking sector. After the distinct decrease in employment in 2005-2006, the employment has increased up to 2008, and in 2009 it fell by some thousand workers. It is an effect of the reduction of cost of activity and can indicate on the pessimistic prognosis made by managers on the future and nature of the crisis conditions, and propensity to cost reduction. On the contrary, the recession is a very good occasion to give leave of inefficient workers.

The levels of interest rates show that after the first crisis shock when banks tightened the lending policy and tried to increase quickly the level of deposits, the situation was stabilised and banks decreased interest rate on loans as well as on deposits. It indicates that the deposit war has come to the end. The fall of net interest rates was a negative phenomenon for banks.

The share of non-performing loans in total loans and the number of banks by capital adequacy ratio less than 8 show the negative phenomena in the banking system in Poland and thus reflect an effect of worse situation in the economy. It is confirmed by the decrease of financial results and worsening of the level indicators as ROA and ROE.

Table 2

The performances of cooperative banks between 2005 and September, 2009

Specification	2005	2006	2007	VI 2008	XII 2008	VI 2009	IX 2009
Employment	28265	28904	30103	30808	31265	31439	31489
Dynamic (previous period =100)	102.5	102.3	104.1	102.3	101.5	100.6	100.16
Branch and other Office	3598	3799	4014	4097	4199	4372	4381
Dynamic (previous period =100)	106.2	105.6	105.7	102.1	102.5	104.1	100.2
Loans to non-financial customers (PLN million)	18567	226991	27851	30908	32064	34406	35792
Dynamic (previous period =100)	114.4	122.3	122.7	111.0	103.7	107.3	104.0
of which to							
- corporates	3557.5	4391.8	5528	6434	6791	7520	79188
- households	14948	18216	22158	24293	25061	26672	27629
Deposits taken from non-financial customers (PLN million)	25290	32170	36718	37737	41529	41 033	41482
Dynamic (previous period =100)	119.0	127.2	114.13	102.8	110.0	98.8	101.1
of which from							
- corporates	3455	2851	455	3070	3712	3 412	3692
- households	32122	28374	32122	33368	36513	36 131	36201
Net profit (PLN million)	512	503	686	487,7	913.9	360,0	558.6
Dynamic (previous year =100)	106.5	98.2	136.4	-	133.2	-	61.12
C/I - Cost Income Ratio %	72.2	72.9	69.2	63.5	65.7	70.8	69.7
Breakdown of banks by capital adequacy ratio <8	1	1	1	1	1	3	2
Share of non-performing loans in total loans (%)	4.2	3.2	2.4	2.1	2.1	2.1	2.2
ROE - Net earnings to average core capital %	17.6	14.5	17.2	21.8	19.6	13.7	13.3
ROA (%)	1.6	1.3	1.5	1.9	1.7	1.3	1.6

Source: Summary Evaluation of the Financial Situation of Polish Banks 2006, the National Bank of Poland, Information on the situation of banks in 2007, 2008, after the first half of 2009, January-September 2009 Polish Financial Supervision Authority, www.knf.gov.pl

Conduct and performance of cooperative banks on the financial and economic crisis conditions

The cooperative banks differ from commercial banks noticeably in respect to the size, scope and area of activity, structure of capital, technical equipments, access to capital, and others. The financial and economic crisis is the test they face and the future will show the potential of banks.

After the serious difficulties in adjustment to the requirements of market economy, at the beginning of the 1990s, the cooperative banks found their place on the market of banking services and even were able to improve their position in the banking sector despite the very strong competition. They gradually developed their activity and contrary to the commercial banks have been opening new and new offices, and raising the employment since 1996. The growth rates of employment and network of offices got their pick in 2007 when the rate of economic growth was the highest during 1998-2007. In first half of 2008, the distinct growth lasted due to the optimistic economic prognosis (prospects) and it continued after the burst of crisis and in the case of offices was especially high in the first half of 2009. During the first year of crisis, September 2008-September 2009, the commercial banks reduced the employment by 1.6%; although they increased the number of offices by 3.6% (the Evaluation 2009).

In spite of very pessimistic prognosis about the future economy condition at the beginning of crisis and not very optimistic and clear prospects in 2009, cooperative banks have developed lending activity. The dynamics of credits in 2008 and 2009 was not as good as in 2007 but was still two-digit and in Quarter 3, 2009 it even raised[4] (Table 2). Of course, it was possible due to the propensity of banks to disburse credits in a slumping economy and also due to the increase in credit demand of households and enterprises. It is remarkably that in 2009, one third of commercial banks decreased their level of lending, while only 7% of cooperatives banks behaved in this way. The remaining 93% of cooperative banks increased lending, and 56% of cooperative banks

[4] Assuming that the tendency will last in the next quarter

Table 3

The position of cooperative banks in the banking sector (%)

Specification	1993	1995	2000	2005	2006	XII 2007	VI 2008	XII 2008	VI 2009	IX 2009
Share of cooperative banks in:										
- total assets	6.6	4.8	4.2	5.8	6.2	6.2	6.0	5,4	5.5	5.6
- loans to non-financial customers	7.1	5.5	5.4	7.2	7.0	6.5	6.3	6.5	5.5	5.7
- deposits taken from non financial customers	7.6	5.5	5.2	7.7	8.6	8.8	8.5	8.8	7.8	7.9
- net profit	-	-	7,5	5.6	4.7	5.0	5.7	5.0	8.3	8.0
- equity	8.0	5.4	5.4	7.0	7.3	7.2	7.6	7.2	6.9	6.8

Source: Information on the situation of banks in 2007, 2008, after the first half of 2009, January – September 2009 Polish Financial Supervision Authority, www.knf.gov.pl

increased it more than 10% (Information, 2009). It is important regarding the risk of this activity that the cooperative banks disbursed credits mainly in the national currency – PLN. The characteristic feature of lending activity of cooperative banks even on the economic crisis conditions is that the share of non-performing loans in total loans did not get worse; whereas in commercial banks it increased nearly two times. It shows that besides other factors, cooperative banks although, they use simpler techniques for estimating creditworthiness of clients than commercial banks, are more successful in this area partly because of their local character.

The level of deposits in cooperative banks has increased very noticeably at the beginning of crisis mainly because of fears of depositors to deposit their financial means in commercial banks strictly linked with foreign capital groups. In the first half of 2009 "the deposit war" took place and the level of deposits even decreased by 1.2% (Table 2) but it did not limited lending activity of cooperative banks.

Although the increase in lending activity took place in cooperatives banks, their profits decreased deeply in 2009, and as a result the ROA and ROE indicators worsened; however, not so much as in the case of commercial banks. It should be pointed out that only 2 cooperative banks reported net losses (Information, 2009). Some reasons for falling of net profit in cooperative banks were different from those in commercial banks. The cooperative banks as aforementioned were very careful in granting credits and allowed credits mainly in PLN, they did not have to increase provisions/revaluation write offs as commercial banks had to do. However, they were affected by "deposit war", which made them to increase the deposit rates to limit the outflow of deposits to commercial banks. The next important reason was the decline of central bank interest rates (from 5.25 in 2007 to 3.75 in 2009). It influenced very negatively the interest income on preferential loans granted to agriculture, which is the most important sector for cooperative banks. The interest rates on preferential credits are strictly related to the central bank rediscount credit rate and the preferential credits for farmers constitute almost 36% of loans to non-financial sector portfolio of cooperative banks (Bilansowe, 2009).

Position of cooperative banks in the banking sector

The cooperative banks have competed successfully with the commercial banks since the beginning of the new century. It stems from deep restructuring, which this sector undergone during the 1990s, operating in rural areas, where commercial banks are not interested in, specialisation in traditional area of theiractivity like agri-food sector, and involvement in the preferential system of agricultural credits. The author's personal investigation on the opinion of cooperatives banks (chairmen of the cooperative banks) about the advantages of cooperative banks over commercial banks in granting loans to farmers shows that 90% of respondents see the advantage of cooperative banks. According to the respondents, this advantage results from long term experiences and skills in financing agriculture and good knowledge of clients connected with the local character of cooperative banks. The especially high increase in the share of cooperative banks in the banking sector took place in the middle of decade 2000-2009, when the shares in assets, loans, deposits, and equity rose by one percentage point each. The highest improvement was observed regard deposits. The position of cooperative banks weakened only in the case of profits. In 2007, the position of cooperative banks got worse slightly in the case of assets and loans due to the boom on the real estate credit market in which mainly commercial banks were involved.

The differences in conduct and performance between cooperative banks and commercial banks on the crisis condition allow expecting that the position of cooperative banks in the banking sector would change during the crisis.

The data for the crisis period show that the position of cooperative banks has worsened regarding assets, loans, deposits, and equity and at the end of September, 2009 it was similar to the position of the cooperative banks in 2005 except for loans. The sharp increase is observed only in the case of profits. However, it can be expected that the increase is not long term in the context of worsening position regarding other aspects of activity.

Conclusions

1. The cooperative banks were affected by the crisis; though generally the decrease was observed in the form of profits. It can be expected that the dynamics of employment and development of office network will also decrease in the future.
2. The cooperative banks were less affected by the crisis compared with commercial banks as far as now. The local character of these banks and different kinds of clients (kinds of credits) seems to be the most important reason here.
3. The reasons caused worsening of cooperative banks differed from commercial banks.
4. The position of cooperative banks in the banking sector has worsened during the crisis.
5. It is very difficult to forecast further changes in the situation of cooperative banks as well as whole banking sector, since the situation is determined by the macroeconomic conditions like growing unemployment or rapid increase in the budget deficit. Moreover, the tendencies of external financial and economic crises are very important.

Bibliography

1. Bilansowe wyniki banków w 2008. The Central Statistical Office, Warsaw 2009, www.stat.gov.pl. Access: 5. January, 2010.
2. Bordo M.D., James H. (2009). The Great Depression Analogy. *Working Paper 15584.* NBER Working Paper Series http://www.nber.org/papers/w15584.
3. Eurostat.Real GDP growth. http://epp.eurostat.ec.europa.eu. Access: 20 December, 2009.
4. Information on the Condition of Polish Banks in the Period: in 2007, 2008, after the First Half of 2009, January-September 2009, Polish Financial Supervision Authority, Warsaw 2009.
5. Kenen P.B. (2000). Involving the Private Sector in Crisis Resolution In: *Currency Crises.* Krugman P., (ed.) University of Chicago Press Volume ISBN: 0-226-45462-2 pp. 339-344.
6. Knop T.A. (2008). *Modern Financial Macroeconomics*. Blackwell Publishing, Malden USA, Oxford UK Carlton Australia.
7. Kupiecka E. (2003). *Kryzys finansowy w Indonezji w latach 1997-1998*, National Bank of Poland.
8. Miklaszewski S., (2006). *Międzynarodowe Stosunki Gospodarcze u progu XXI wieku*, Difin, Warszawa.
9. Report on the Condition of Polish Banks in 2007, Polish Financial Supervision Authority. Warsaw 2008.
10. Radelet S., Sachs J. D. (2000). The Onset of the East Asian Financial Crisis In: *Currency Crises*, Krugman P., (ed.) University of Chicago Press Volume pp. 105-162. http://www.nber.org.
11. Stiglitz J. (2009). The Global Crisis, Social Protection and Jobs. *International Labour Review.* Vol. 148 (2009). No. 1–2.
12. Summary Evaluation of the Financial Situation of Polish Banks, 2006. National Bank of Poland. Warsaw 2007.

EU Structural and Cohesion Funds in the Economy of Latvia

Vineta Tetere, PhD, lecturer
Latvia University of Agriculture

Abstract. According to the aim of Latvia's government to join the European Union, there was a possibility to obtain financial instruments provided by the European Union starting from 2000. It is a great opportunity for the country economy to develop open market and entrepreneurship in Latvia in different sectors.
In compliance with a possibility of regional development to diminish regional disparities these instruments provide the regional policy of the European Union. Three periods may be displayed for Latvia's economy: the first period – 2000-2006, the second period – 2004-2006 (2008), and the third period – 2007-2013. It has to be mentioned that Latvia's government has to co-finance all European Union financial instruments as a part of this support.
Recently a lot of macroeconomic indicators have rapidly changed, like the employment rate, the GDP growth and amount per capita as well as the increase of average salaries in the country. These changes have a strong impact on population's welfare that should be the aim of every government.
Theoretical information on the three EU planning periods in Latvia is compared in the article.
Key words: Structural Funds, GDP, regional development.

Introduction

The enlargement of the European Union to include the countries of the Central and Eastern Europe is an historic milestone. The Community, including both its institutions and policies, faces what is probably its greatest challenge ever, given the large number of applicant countries and the economic and social disparities involved.

Despite the major efforts being made by the applicant countries, their integration into the existing Community structures and policy programmes is a complex task. The enlargement process requires the Union to conduct its relations with its other partners in Europe and beyond with great care so that the enlargement contributes to the general goals of enhanced security and international cooperation.

The Commission presented to the Council a series of global proposals for strengthening the pre-accession strategy for the entire applicant Central and Eastern European countries in its communication entitled 'Agenda 2000'. The aims of this strategy were:

- to provide a consistent and coherent programme to prepare these countries for joining the Union;
- to provide with the Accession Partnerships a single framework for the various forms of the EU assistance;
- to make the applicants familiar with the procedures and policies of the Union so that they can take part in Community programmes, and to provide assistance in compliance with the Community acquis.

Since the middle of the previous century the aim of the European Community was to reduce regional differences in the European Union. Structural Funds, which serve to strengthen economic and social alignment in the EU member states is a financial tool in order to reach the goal. It has a significant impact on the competitiveness of the regions and on the living conditions of their inhabitants, mainly by co-financing multi-annual development programmes (The European Structural Funds, A solidarity policy).

The regional policy support had 3 main objectives between 2000 and 2006:

1) development of the least favoured regions;
2) conversion of regions facing difficulties;
3) improved training and job opportunities (The European Regional Development Fund).

Objective 1 of the Structural Funds is the main priority of the European Union's cohesion policy. In accordance with the Treaty, the Union works to promote harmonious development and aims particularly to narrow the gap between the development levels of the various regions. Therefore more than 2/3 of the appropriations of the Structural Funds were allocated to helping areas lagging behind in their development where the Gross Domestic Product (GDP) is below 75% of the Community average.

All these regions have a number of economic signals/indicators 'in the red':

- low level of investment;
- higher than the average unemployment rate;
- lack of services for businesses and individuals;
- poor basic infrastructure.

Some fifty regions (including Latvia as one) were covered in the period of 2000-2006. The Structural Funds support the takeoff of economic activities in these regions by providing them with the basic infrastructure they lack, whilst adapting and raising the level of trained human resources and encouraging investments in businesses (Objective 1: Supporting development in the less prosperous regions).

The research of EU financial instruments has been done by some scientists as well PhD students

are interested to observe this topic for past years, but the research has been done for separate funds. For example, L.Jankova (2009), V.Tetere (2009), S.Blumberga (2009), I.Upīte (2009), and I.Pilvere (2007) are sure that availability of the Structural Funds financing in Latvia after accession to the EU is a significant opportunity to develop economy and to solve social problems. For example, G.Mazūre (2007) has analysed the uptaking of SAPARD and European Agricultural Guidance and Guarantee Fund in Latvia compared with the situation in Lithuania and Estonia. She concludes that several factors, like state macroeconomic stability, level of produced assets, load of the present capacities and compliance with modern technologies and other factors, explain the recently increasing amount of financial resources and consequently investments into agricultural and rural sectors. It has to be understood that financial investment will always bring new opportunities and development. E.Jermolajeva (2007) concludes that the appropriate and effective usage of the EU co-funding, regular analysis and adjustments of the plans according to the situation should become one of the public administration priorities in order to accomplish the main task to uptake the funds – to ensure balanced and sustainable development of all the regions. Funds do increase the development, though they are not evenly spread out in the country due to administrative disagreements.

Therefore ***the aim*** of the research is to compare the three EU planning periods and Structural Funds available for Latvia. The EU regional policy documents, information on available funds, institutional framework, and the development of the country during the period from 2000 to 2008 will be used for the purpose of comparison. The following tasks shall be completed to reach the set aim:

- to analyse the EU pre-accession period;
- to analyse the period from 2004 to 2006;
- to analyse the period from 2007 to 2013, and to draw conclusions and proposals.

Information sources from the European data bases: regulations and publications as well data from different EU and local reports on the allocation and implementation of Structural Funds are used for the research of financial instruments.

The research object is the EU Structural Funds in Latvia.

The main methods used in the article include statistical data analyses, monographic and abstract – logical method.

Results and discussion

1. The EU pre-accession period

The European Council made a clear distinction between pre-accession expenditure and enlargement. Expenditure reserved for pre-accession could only be used during the pre-accession period. Once a country joins the European Union, it benefits from special enlargement assistance.

There were three instruments assisting the applicant countries until they joined the EU.

1) PHARE: consolidation of institutions, participation in the Community programmes, regional and social development, industrial restructuring and development of the small-business sector;
2) ISPA (Instrument for Structural Policies for Pre-Accession): development of transport and environmental infrastructure;
3) SAPARD (Special Accession Programme for Agriculture and Rural Development): modernisation of agriculture and rural development.

Eligible countries were Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Czech Republic, Romania, Slovenia and Slovakia, and Croatia since January 2005 (Introduction to the pre-accession strategy).

During this period Latvia has received EUR 0.65 billion from the pre-accession structural funds to prepare for joining the EU. The biggest contribution was received from ISPA.

Launched in 2000, ISPA is one of the three financial instruments to assist the candidate countries in the preparation for accession. Based on the principles that govern the Cohesion Fund, it provides assistance for infrastructure projects in the EU priority fields of environment and transport. It has the following objectives:

- familiarising the candidate countries with the policies, procedures, and funding principles of the EU;
- helping them catch up with the EU environmental standards;
- upgrading and expanding links with the trans-European transport networks.

For the period of 2000-2006, annually EUR 1 040 million have been made available from this instrument. After the EU enlargement in 2004, the remaining ISPA beneficiary countries were Bulgaria and Romania, the other beneficiary countries having become eligible to the Cohesion Fund (Introduction to the pre-accession strategy).

Table 1

The EU pre-accession financial instruments for Latvia from 2000 to 2004 (EUR)

Fund	EU contribution	%
ISPA	310 241 258	47.8
PHARE	186 300 000	28.7
SAPARD	152 499 876	23.5
Total:	649 041 134	100

Source: made by the author according to www.esfondi.lv

Total ISPA contribution amounted to EUR 7.0 billion available for 10 pre-accession countries during the period from 2000 to 2004, of which EUR 4.3 billion or 61.7% have been committed. Almost 57% were available for Poland and Hungary as prioritised countries, the available amount for Latvia was 4.49% (EUR 310 241 258) out of total.

SAPARD was established in June 1999 by the Council of the European Union to help countries of the Central and Eastern Europe deal with the problems of the structural adjustment in their agricultural sectors and rural areas as well as in the implementation of the *acquis communautaire* concerning the Common Agricultural Policy (CAP) and related legislation. SAPARD was the first instrument with decentralised administration.

The Phare programme as well was one of the three pre-accession instruments financed by the European Union to assist the applicant countries of the Central and Eastern Europe in their preparations for joining the European Union.

Originally created in 1989 as Poland and Hungary Assistance for Restructuring their Economies (PHARE) programme, it assisted eight of the ten 2004 accession Member States: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia as well as those countries that acceded in 2007 (Bulgaria and Romania), in a period of massive economic restructuring and political change.

The Phare funds focused entirely on the pre-accession priorities. The country should address to prepare for accession and the resources available to help them do so. The objectives of Phare were:

1) to strengthen public administrations and institutions to function effectively inside the European Union;
2) to promote convergence with the European Union's extensive legislation and reduce the need for transition periods;
3) to promote Economic and Social Cohesion.

These orientations were further refined in 1999 with the creation of SAPARD and ISPA, which took over rural and agricultural development (SAPARD) and infrastructural projects in the environmental and transport fields (ISPA) allowing Phare to focus on its key priorities that were not covered by these fields (Phare).

2. The EU Planning Period of 2004-2006

The Single Programming Document (SPD) Priorities were set by the government of Latvia for the period of 2004-2006 to promote economic and social cohesion, using the EU Structural Funds financing.

In total Latvia received EUR 0.63 billion for this period of which the biggest share came from the ERDF.

European Regional Development Fund (ERDF) – its principal objective is to promote economic and social cohesion within the European Union through the reduction of imbalances between regions or social groups.

ERDF resources are mainly used to co-finance:

- productive investment leading to the creation or maintenance of jobs;
- infrastructure;
- local development initiatives and the business activities of small and medium-sized enterprises.

In practice, all development areas are covered: transport, communication technologies, energy, environment, research and innovation, social infrastructure, training, urban redevelopment and the conversion of industrial sites, rural development, fishing industry, and tourism and culture (The European Regional Development Fund).

European Social Fund (ESF) is the main financial instrument allowing the Union to implement the strategic objectives of its employment policy.

The ESF fields of application are as follows:

- occupational integration of the long-term unemployed;
- occupational integration of young unemployed persons;
- occupational integration of persons excluded from the labour market;
- promoting equal opportunities for all in accessing the labour market;
- specific actions to improve women's access to the labour market;
- improving education and training systems;
- promoting a skilled workforce;
- boosting human potential in the field of research and development (2000-2006: The European Social Fund (ESF)).

European Agricultural Guidance and Guarantee Fund (EAGGF) contributes to the structural reform of the agriculture sector and to the development of rural areas. The EAGGF was composed of two sections, the Guidance section and the Guarantee section. Within the framework of European economic and social cohesion policy, the EAGGF supported rural development and the improvement of agricultural structures.

The EAGGF fields of application:

- investment in agricultural holdings;
- aid for the setting up of young farmers and vocational training;
- aid for early retirement;
- compensation for less-favoured areas;
- agri-environmental measures;
- processing and marketing of agricultural products;
- development and optimal utilisation of forests;
- development of rural areas through the provision of services, support for the local economy, encouragement for tourism and craft activities, etc.

In Objective 1 regions, these measures were financed by the EAGGF-Guidance section, with the exception of compensatory allowances, aid for early retirement, agri-environmental measures, and measures for the development of forests, which were financed by the EAGGF-Guarantee section. Outside of Objective 1 areas, all measures were financed by the EAGGF-Guarantee section.

Table 2

The implementation progress of the Structural Funds (as to January 31, 2009)

#	Fund	SF allocation (2004-2006)		Commitments	
		EUR	%	EUR	%
1.	**ERDF**	382 045 851	61.0	388 892 576	101.79
2.	**ESF**	127 342 685	20.3	127 439 105	100.08
3.	**EAGGF**	91 848 712	14.7	100 516 767	109.50
4.	**FIFG**	24 335 138	4.0	26 966 875	110.81
	Total:	*625 572 386*	*100*	*643 815 323*	*102.92*

Source: made by the author according to www.esfondi.lv

Table 3

The Cohesion Fund allocation by financing sectors, 2004-2006

Sector	Contribution, EUR	%
Environment	257 933 331	50
Transport	257 933 331	50
Total:	*515 866 662*	*100.00*

Source: made by the author according to www.esfondi.lv

Financial Instrument for Fisheries Guidance (FIFG) is a specific Fund for the structural reform of the fisheries sector. The FIFG aimed to contribute to achieving a sustainable balance between fishery resources and their exploitation. It also strengthened the competitiveness of the sector and the development of areas dependent upon it. FIFG fields of application:

- adjustment of the fishing effort;
- fleet modernisation;
- aquaculture development;
- protection of marine areas;
- fishing port facilities;
- processing and marketing of fishery products;
- product promotion.

The implementation of SF for the period of 2004-2006 was not as effective as it was planned, so the implementation was prolonged up to the end of 2008.

The data show that the level of commitments is higher than the allocated funds for Latvia. It means not all committed projects would receive full EU support from funds. However, an agreement prescribes that the missing part is covered from the government budget.

Cohesion Fund is one of the financial instruments of the EU regional policy and aims at reducing economic and social disparities between the Member States and between regions.

Initially, the Cohesion Fund has been set up as the compensation mechanism for the EU member states with comparatively low income in connection with the establishment of European Monetary Union that was envisaged in the Maastricht Treaty (1992).

The Cohesion Fund was set up with the aim to finance large infrastructure projects in the fields of environmental protection and transport. It provides the financial contribution to projects, which complement achieving the objectives laid down in the Treaty on European Union, in the fields of environment and transport. The Member States whose GNP is less than 90% of the Community average are entitled to assistance from the Cohesion Fund.

3. The EU Planning Period of 2007-2013

The National Strategic Reference Framework (NSRF) for Latvia is a policy programming document which lays down a common strategy for the obtaining of the EU Structural Funds (SF) and Cohesion Fund (CF) resources, and provides coordination between the funds and the operational programmes (OP). The NSRF concerns funding from the Structural Funds and the Cohesion Fund which is accessible to Latvia as a Convergence objective territory for the period of 2007-2013. Pursuant to the decision by the Cabinet of Ministers of October 18, 2005 concerning the concept for a model for the implementation of the SF and CF for the period of 2007-2013 in Latvia, it has been decided to draft three operational programmes: the first is the ESF OP, which is directed towards support for employment and investment in human resources, the second is the ERDF OP, which is directed towards support for entrepreneurship, innovation and science, and research, and the third is the joint ERDF and CF OP, which is directed towards the improvement of infrastructure and public services (NRSF, 2007)

The biggest share of finances out of EUR 4.53 billion amounts to ERDF of 53.86% out of total amount available for Latvia in this period.

There have been some changes done for each planning period. Therefore these three periods

Table 4

EU financial instruments for Latvia from 2007 to 2013 (EUR)

Fund	EU contribution	%
ESF	550 653 717	53.86
ERDF	2 440 017 364	12.15
CF	1 539 776 553	33.99
Total:	4 530 447 634	100

Source: made by the author according to www.esfondi.lv

Table 5

Comparison of the EU Financial Instruments for three planning periods

Indicators	2000- 2004	2004-2006	2007-2013
Amount of the EU contribution (EUR, average per year)	162 260 283.50	380 479 682.66	647 206 804.86
Chain increase, %	x	135	70
Base increase, %	100	135	299
EU contribution per EUR 1 of GDP, EUR	0.21	0.38	0.54
Chain increase, %	x	81	42
Base increase, %	100	81	157
EU contribution per 1 inhabitant, EUR	69	165	284
Chain increase, %	x	139	72
Base increase, %	100	139	311
Available Structural funds	ISPA Phare SAPARD -	Cohesion Fund - EAGGF, FIFG ESF, ERDF	Cohesion fund - - ESF, ERDF
Institutional Framework	Ministry of Finance Ministry of Agriculture	Managing authority Paying authority First level intermediate bodies Second level intermediate bodies Four steering committees	Managing authority Responsible authorities Paying authority Cooperation authorities Intermediate bodies Certifying authorities
Documents	Agenda 2000	SPD	NSRF

Source: made by the author

should be compared to see the development of EU contribution to Latvia's economy.

The data of Table 5 show that the amount of the EU funds increases with each following planning period. But the length of each period differs according to the time available for Latvia to allocate these funds.

According to the types of funds, it may be concluded that from the pre-accession period ISPA was transferred into the Cohesion Fund for the next periods; Phare stopped the existence; SAPARD was transferred into EAGGF and FIFG; and there are two funds (ESF, ERDF) set anew from 2004 for Latvia available. For the last period there are just two structural funds and Cohesion Fund left in centralised administration. The part for agriculture and rural development is decentralised, so it is not analysed in this article.

Exploring the increase rates, it may be concluded that the second period had the highest chain increase related to the contribution per EUR 1 of GDP and 1 inhabitant in the country; thus showing a good income for economy with every next period. Even the number of population decreases; the base increase rate has been very high for the last period.

The institutional framework seems to be very complicated and bureaucratic, even so many changes and improvements have been done during different planning periods.

Conclusions and recommendations

Latvia has received a significant financial support from the European Union amounting to about EUR 6 billion to promote regional development and cohesion. There were 3 funds - Phare, ISPA, and SAPARD - available for the first planning period, 5 funds for the second period – ESF, ERDF, EAGGF, FIFG, and CF, and 3 funds for the current period – ESF, ERDF, and CF.

The biggest investments are set for the last planning period to align Latvia's development to the EU average.

Each planning period had different length for Latvia's economy, thus creating a burden for the governance and appliance of funds. The policy makers have to follow the rule that each period has to be successive, so the beneficiaries easily may follow all the regulations and understand the forms.

Latvia's government is responsible for institutional framework to administrate and implement all these instruments, which is a quite sophisticated and time consuming procedure.

Most of the financial support instruments are invested in the economy, and still the last year's economic development shows an insignificant outcome.

Institutional framework procedure should not be changed for each planning period.

Institutions should do the survey among potential beneficiaries to ease the implementation of funds. The regulations should be more flexible and simple to apply.

Bibliography

1. Blumberga S.(2009), European Union Funds and their Influence on the Regional Development in Latvia, Proceedings of International Scientific conference Research for Rural Development 2009, Jelgava, pp. 196-202, ISSN 1691-4031
2. Draft National Strategic Reference Framework 2007-2013, Ministry of Finance, Riga, May 2007, 116 pp. Available at: http://www.esfondi.lv/upload/NSRF_2007-07-10_draft.pdf Access: 9 November, 2009.
3. European Regional Development Fund. Available at: http://ec.europa.eu/regional_policy/funds/prord/prord_en.htm Access: 15 May, 2009.
4. European Social Fund 2000-2006 (ESF): Available at: http://ec.europa.eu/regional_policy/funds/prord/prords/prdsb_en.htm, Access: 15 May, 2009.
5. European Structural Funds, A solidarity policy. Available at: http://ec.europa.eu/regional_policy/atlas/factsheets/pdf/fact_eu25_en.pdf Access: 15 May, 2009.
6. Institutional Framework. Available at: http://www.esfondi.lv/page.php?id=512 Access: 25 May, 2009.
7. Introduction to the Pre-accession Strategy. Available at: http://ec.europa.eu/regional_policy/funds/ispa/intro_en.htm Access: 15 May, 2009.
8. Jankova L. (2009) European Union Funds and Programmes in Latvia In: Ekonomika ir vadyba: Aktualijos ir perspektyvos, Mokslo darbai, No 3 (16), iauliu Universitetas Socialiniu mokslu fakultetas, pp. 267-275. ISSN 1648-9098.
9. Jermolajeva E. (2007). Co-financing of European Union Funds, Economics Science for Rural Development, Proceedings of the International Scientific Conference, No. 14, ISSN 1691-3078, p. 176.
10. Mazūre G. (2007). Effective Use of Financial Resources for Rural Development Economics and Rural Development, Research papers, Vol. 3, No. 2, p.44.
11. Objective 1: Supporting Development in the Less Prosperous Regions. Available at: http://ec.europa.eu/regional_policy/objective1/index_en.htm Access: 15 May, 2009.
12. Overview of ISPA projects decided between 2000 and 2003, The mini ISPA report, European Committee, 2007.
13. Phare. Available at: http://ec.europa.eu/enlargement/how-does-it-work/financial-assistance/phare/index_en.htm Access: 15 May, 2009.
14. Pilvere I. (2007). EU Agriculture Structural Fund Support Results in Latvia // Žemes ūkio mokslai, Lietuvos mokslu akademijos Leidykla, T.14, Vilnius, pp. 145-150.
15. Pilvere I., Bulderberga Z. (2009) Results of Rural Development Programme 2007-2013 Implementation in Latvia. In: *Rural Development 2009:* The fourth international scientific conference proceedings, Volume 4, Book 1, 15-17 October, Akademija, Kaunas region, Lithuania, pp.252-257.ISSN 1822-3230.
16. Pilvere I., Packeviča R. (2009) The European Union Funds for Agriculture and Rural Development in Zemgale Region (Latvia) In: *Ekonomika ir vadyba: Aktualijos ir perspektyvos*, *Mokslo darbai*, 2009 3 (16), iauliu Universitetas Socialiniu mokslu fakultetas, pp. 292-300. ISSN 1648-9098.
17. Status of Structural Funds. Available at: http://www.esfondi.lv/page.php?id=495 Access: 25 May, 2009.
18. Supporting Enlargement – What Does Evaluation Show?, Ex-post Evaluation of Phare Support Allocated between 1999-2001, with a Bbrief Review of post-2001 Allocations, Consolidated Summary Report, July, 2007, p. 36.
19. Tetere V. (2009) EU Structural Funds – Part of Investment in Latvia's Development, Proceedings of the International Scientific Conference "Economic Science for Rural Development 2009", No 18, Jelgava, pp. 240-245. ISSN 1691-3078.

Analyses of Rural Development Plan Measure „Meeting of Standards" Implementation in Latvia

Zane Bulderberga
Mg.oec., lecturer, Faculty of Economics, Latvia University of Agriculture
Irina Pilvere
Dr.oec. professor, Faculty of Economics, Latvia University of Agriculture

Abstract. Since accession to the European Union (EU) Latvia has received the EU financial support to reach several goals in agriculture. Rural Development Plan (RDP) measure "Meeting of Standards" received a large attention and popularity between agriculturists. Totally 8278 projects have been submitted and 7800 were approved and accomplished. The funding allocated for this measure is EUR 66 million constituting a significant part (16%) of total financing under the RDP for the period of 2004-2006.
The research aim is to evaluate the impact of RDP measure *Meeting of standards* on the development of agricultural holdings in Latvia over the period of 2004-2008. The achieved implementation result of the measure is conformity of agricultural holdings to the EU standards. It will serve as promotion of achieving the required qualification to uptake the funding under the Rural Development Programme for 2007-2013 for further modernisation of agricultural holdings. The study provides analysis and assessment on the main results of project amount and financial indicators of the measure *Meeting of standards*. Data are reviewed in the trans-section of regions, time, and specialisation of agricultural holdings. The study reflects accomplishment of the holdings achieving the EU standards: it provides the analysis of 462 projects of the RDP measure *Meeting of standards* in Dienvidlatgale (Eastern part) and Dienvidkurzeme (Western part) regions of Latvia.
Key words*:* agriculture, agricultural holdings, EU standards, development.

Introduction

After the Republic of Latvia joined the EU in May 2004, the local agriculturists had to conform to the EU requirements of ensuring the environment, plant health, animal health and welfare, and consumer protection standards in the process of agricultural production. These standards are mandatory to all EU member states. The EU requirements in respect of meeting standards were considerably more rigorous than those in place before. R. Zapereckis (2004) emphasises that a new development stage has set in – Latvia is an EU member state of and all the CAP measures would start working. At this moment, the main problems are associated with stringent requirements of food safety. Our enterprises continue their upgrading very seriously to benefit from operation on the EU market.

Thus agriculturalists intending to produce for the market were in need of money resources for upgrading their operations in conformity with the requirements. The European Commission took due account of the fact that spare resources were not readily available to farmers setting up the support measure *Meeting of Standards* targeted at achieving the compliance with the EU standards in the fields of human and environment protection, plant and animal health, and animal welfare. This Measure was implemented as part of Latvian Rural Development Plan for 2004-2006 (Procedure for Implementation of the Programming Document..., 2004).

The support-related issues have been extensively analysed in the studies by different authors in Latvia: D. Jasjko, A.Miglavs and D.Feldmans (2004), I.Pilvere and A.Rukmanis (Pilvere, 2007, Rukmanis, Pilvere, 2006), V. Buģina and Ģ. Krūmiņš (2005), D. Saktiņa and W.H. Meyers (2005) etc. Despite that, the Measure *Meeting of Standards* has not been so far analysed neither in Latvia nor in any other EU member state, since it was introduced to facilitate the candidate countries acceding to the EU in 2004. Furthermore, not all of the new member states chose to introduce this Measure.

The research **aim**: to evaluate the results of the RDP Measure *Meeting of Standards* implemented in Latvia over the period of 2004-2008. The research **hypothesis**: the investments provided under the Measure *Meeting of Standards* have improved the conformity of agricultural holdings to the EU standards, especially in the field of animal production.

The following **tasks** were formulated to validate the hypothesis and achieve the research aim:

1) to analyse the nature and main results of the RDP Measure *Meeting of Standards* in Latvia;
2) to profile and evaluate the agricultural holdings involved in the Measure;
3) to analyse the implementation indicators for different activities under the Measure.

Methods applied in the study: monograph, graphic, constructive logic, analysis and synthesis, deduction and induction, analysis of documents and mathematically statistic methods.

In the course of study, 462 projects were analysed of the Measure *Meeting of Standards* administrated by Dienvidlatgale and Dienvidkurzeme Regional Agricultural Departments of Rural Support Service (RSS). The former comprises the territories of Preiļi, Daugavpils, and Krāslava districts, the latter – Liepāja, Saldus, and Kuldīga districts. These departments were selected as they had received the highest numbers of project applications consequently they took up the largest portion of funding. The sample size in the above departments constitutes

6% of the approved projects in each department. On the whole, the study samples represent 6% of all approved project applications in Latvia (7 800).

Results and Discussion

1. Measure *Meeting of Standards* as a type of the EU support

The EU financial aid for development of different sectors in Latvia includes several financial instruments: Structural Funds, Cohesion Fund, community incentives, direct payments and rural development measures each tailored for the achievement of distinctive goals. The EU support for Rural Development of Latvia over the period of 2004-2006 was funded from the European Agricultural Guidance and Guarantee Fund, Guarantee Section, pursuant to the RDP and its appropriations had to be fully up-taken by the end of 2008. The total funding available for measures of RDP constituted EUR 410 million, including EUR 328 million of the EU co-financing which makes up 56% of total EU support for agricultural and rural development in Latvia over the period of 2004-2006. The importance of the RDP measure *Meeting of Standards* is emphasised by its **ultimate goal:** ensuring of conformity of agricultural holdings to definite EU standards in the fields of consumer and environment protection, plant and animal health, and animal welfare. The RDP of Latvia for 2004-2006 is the main regulatory enactment governing conditions of introduction and implementation of this Measure. The funding provision of the Measure is EUR 66 million: an important share (16%) of RDP financial provision. This is the sole measure providing support to agriculturists for improvement of the conformity to the standards. Consequently, holdings having achieved conformity to the standards in the period of 2007-2013 can qualify for projects under the Measure *Modernisation of Agricultural Holdings* of the Rural Development Programme because the underlying condition – the conformity of investments to the Community standards applied to them – has been fulfilled (Latvian Rural Development Programme....., 2008).

Over the whole application period for the Measure *Meeting of Standards* 8278 project applications were received out of which 94% or 7800 were approved. The project approval level for this Measure was high as the package of documents to be prepared for submission was comparatively smaller and the procedure less complicated. The highest number of the submitted and approved projects (57%) related to the Activity *Milk hygiene* foreseeing compensation for acquisition of milking and chilling equipment, reconstruction, renovation or construction of milk storage premises as well as for movement of pigs to a separate holding. Under the Activity *Welfare of agricultural animals* 2106 projects or 27% of total number of projects were submitted. This activity concentrated on offsetting costs for installation of water supply and air ventilation systems. The highest number of approved projects was registered in RSS departments of Dienvidlatgale RAD (22%), Dienvidkurzeme RAD (16%), and Ziemeļvidzeme (15%) RADs, the latter comprising Cēsis, Valmiera, Limbaži, and Valka districts. The least number of applications was submitted to Zemgale (Dobele, Bauska and Jelgava districts) and Ziemeļaustrumu RAD (Gulbene, Alūksne and Balvu districts): 479 and 516 applications respectively.

The total amount of concluded contracts under the Measure *Meeting Standards* amounted to EUR 71 149 064, by 7% exceeding the financing provision under the RDP (EUR 66 139 078), for, paying due respect to high interest and activity on the part of agriculturists, the RSS has undertaken over-commitments giving opportunity to implement every relevant project submitted, thus ensuring meeting of the EU standards.

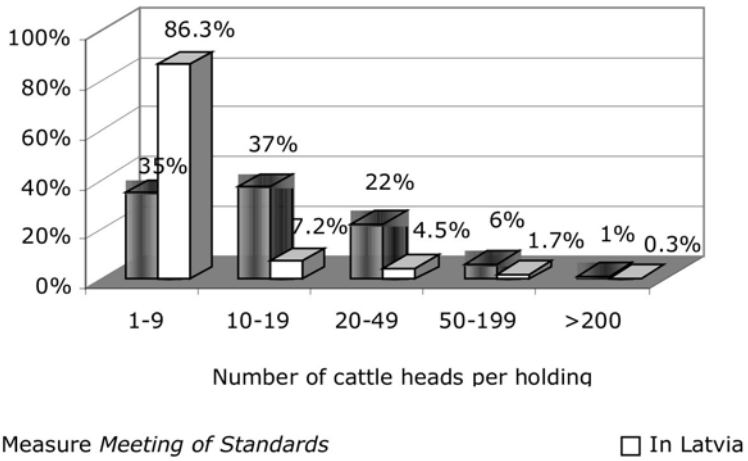
In Latvia, under the Measure *Meeting of Standards* support was granted to 4 713 agricultural holdings. In 2007, there were 113 382 agricultural holdings in Latvia, 55.2% of which were not market-oriented but producing only for the own consumption, therefore the EU standards were not applicable to these holdings. Thus 44.8% or 50795 of agricultural holdings producing for the market have to observe the EU standards (Structure of Agricultural Holdings ..., 2008). The holdings having received support under this measure represent 9.3% of all commercial agricultural holdings.

2. Profile of the holdings involved in the Measure

The research comprises the analysis of 462 projects implemented by 282 holdings distributed in 6 districts: Krāslava, Daugavpils and Preiļi districts – situated in the Eastern part; and Saldus, Liepāja and Kuldīga districts – situated in the Western part of Latvia. The holdings in the territories of Dienvidlatgale RAD and Dienvidkurzeme RAD were evaluated in three areas: land area farmed, number of agricultural animals and financial indicators.

2.1. Land area farmed

The total land area for holdings involved in this Measure widely varies: from 2.5 ha to 641 ha. The holdings in question possess 49 ha on the average. Although the average land area size for these farms is larger than the average for Latvia (25.6 ha) (Structure of Agricultural Holdings ...., 2008), it should be noted that in 75% of the analysed holdings, the land area does not exceed 19.5 ha. The calculations show that the relatively high average indicator has been obtained on the account of the few large holdings with vast land areas. Therefore it can be concluded that mainly small and medium-to-small holdings have benefited from the Measure. Analysing the agricultural land area (AL) it is evident that the agricultural land constitutes on the average 77.5% of total land area belonging to holdings and 39 ha per holding on the average. Also this average indicator is high due to areas of agricultural land farmed by the large agricultural holdings. For about half of holdings, the AL area is smaller than 23.5 ha, but in three quarters of all holdings the AL area does not exceed 40.3 ha.



Source: authors' calculations according to the data of the projects and Agricultural Holdings in Latvia..., 2007.

Figure 1. **Distribution of holdings by the average number of bovine animals per holding, %**

2.2. Agricultural animals

Analysing the structure of holdings by animal numbers, the conclusion is that 99% or 279 holdings keep agricultural animals. Such indicator had to be expected for the Measure *Meeting of Standards* was oriented towards achieving compliance with certain standards largely in animal production, and specifically dairying. Apart from bovine animals, 43% or 121 holdings analysed keep pigs, 29% of holdings – poultry, mostly hens. Other animals are met less often: horses are kept in 11% of holdings, sheep – in 9% but goats – only in 2% of holdings.

Mainly the number of animals in the analysed holdings is small. Figure 1 shows that in 72% or 203 sampled farms the number of cattle heads per herd is from 1 to 19, namely 90 holdings keep up to 9 heads of cattle and 104 holdings – from 10 to 19 heads of cattle. This trend contradicts with the common situation in the country, for there are 86.3% of holdings keeping less than 9 heads of cattle, while farms keeping from 10 to 19 heads of cattle constitute 7.2% of the number of total holdings. The total number of holdings in Latvia keeping cattle equals to 42 575 holdings (Visu veidu saimniecību… 2009). The proportion of farms however, keeping more than 20 heads of cattle is small in the overall number, i.e. 29% of the sampled holdings and 6.54% of total holdings in Latvia. Holdings keeping more than 19 heads of cattle, keep 68% of total number of cattle in Latvia which in 2008 constituted 380 232 heads (Visu veidu saimniecību grupējums pēc liellopu skaita… 2009).

Analysing the number of pigs, it is evident that in a similar way as with cattle, for the majority of holdings (82%) the number of pigs does not exceed 20 heads. Totally per country, there are 91.8% of farms with the pig number not exceeding 10 heads. There are just 8.2% of holdings with a large number of pigs. These commercial pig production holdings are the keepers of 82.4% of total number of pigs in Latvia, namely, 339 968 pigs. In 2008, totally 383 724 pigs were kept in 17 582 holdings of Latvia (Visu veidu saimniecību grupējums pēc cūku skaita…, 2009).

2.3. Financial indicators of agricultural holdings

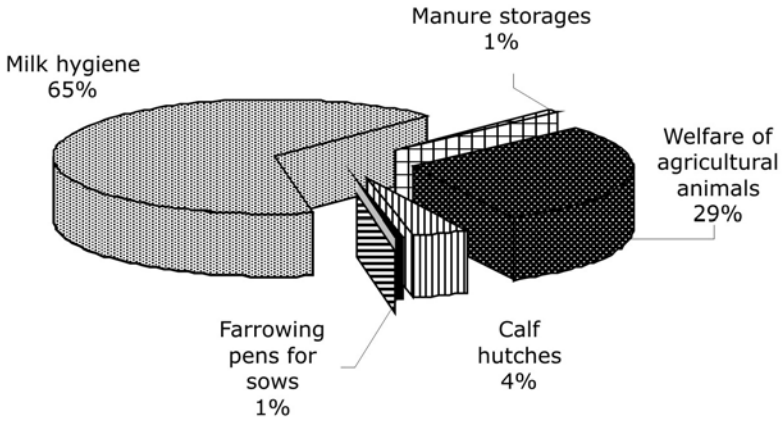
Revenues from animal production constitute about 39% of farm income on the average which conforms to the overall indicators per country: the average value of animal production in Latvia makes up 32% of the farm income, and plant production - 36% (Lauku saimniecības darba..., 2009).

The farm cash flow was also analysed, because a positive cash flow as an economic viability indicator was one of the main conditions for receiving support. Analysing the obtained data, one can conclude that over the coming years the cash flow (agriculturists had to reflect the cash flow for the whole term of the project implementation, even for over three years) will increase in 55% of farms. It is a favourable indicator showing that the farm income will grow as a result of meeting the standards. Although agriculturists project the increase of costs due to the inflation in 63% of farms, despite the available cash or surplus in 59% of holdings.

The support amount received implementing projects varies from EUR 370 to EUR 43 870. The average scope of projects in the analysed holdings is EUR 7615. Totally, for 462 projects the agriculturists will receive EUR 3 881 798, adding up to 5% of the total financing provision under this Measure. Consequently, the projects in both RADs analysed, are of smaller scope than on the average, for 6% of total number of applications were sampled for the study.

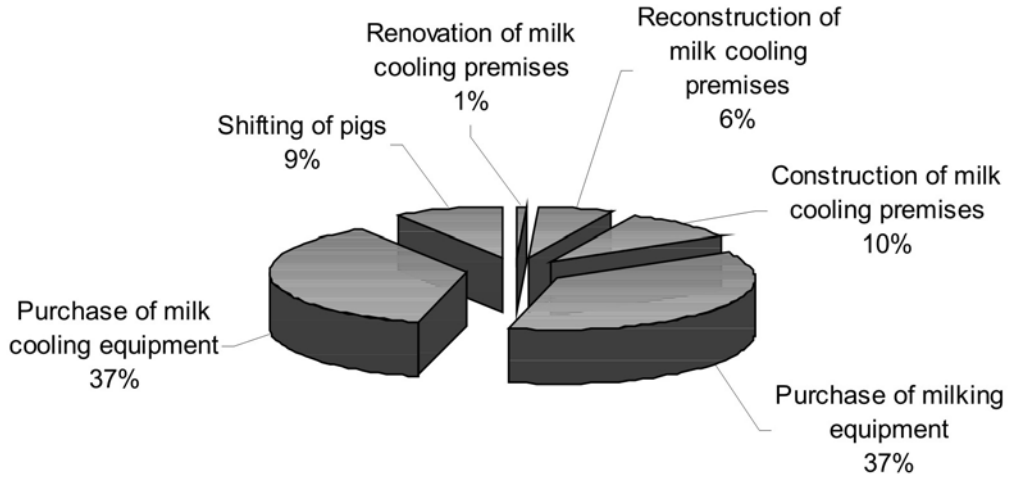
The financial support provided by the Measure makes up 44% of the farm income. The calculations show that the compensation disbursed for the implemented projects lays a statistically favourable impact both, on the farm income and the cash flow surplus or the cash savings in holdings.

The amount of financing received by the holdings under the Measure is EUR 147 or LVL 103 per 1 ha. The total amount of the EU and state support in Latvia is LVL 146 per 1 ha (Pilvere I., 2007), thus it is evident that the amount of financing acquired through this Measure is 1.4 times lower that on the average in Latvia; however constituting a



Sources: authors' calculations according to the data from the projects

Figure 2. **Distribution of activities in the holdings analysed, %**



Source: study according to the data of projects

Figure 3. **Distribution of projects within the Activity *Milk Hygiene*, %**

substantial part (71%) of the average support amount in the holdings analysed.

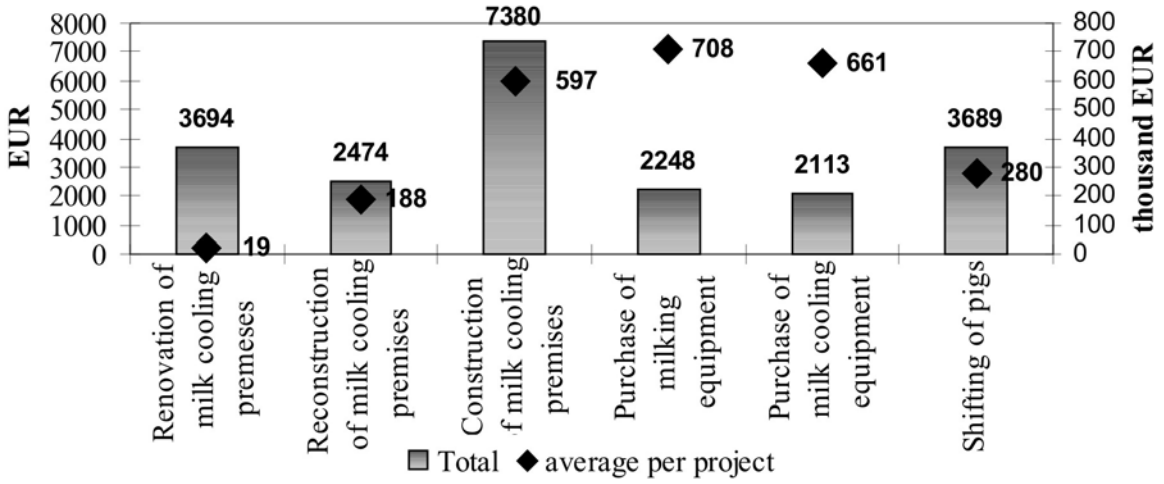
3. Meeting of the EU standards in the holdings

The representative indicator for evaluation of the impact of the Measure *Meeting of Standards* is the projects accomplished by holdings: the type and number of the acquired equipment, the buildings constructed, reconstructed or renovated, and the total area of these structures or their volumes in case of manure storages.

Sixty-five per cent of activities in the analysed projects were carried out for meeting standards in the field of milk hygiene (Figure 2). Twenty-nine per cent of activities were targeted at general welfare upgrading of agricultural animals.

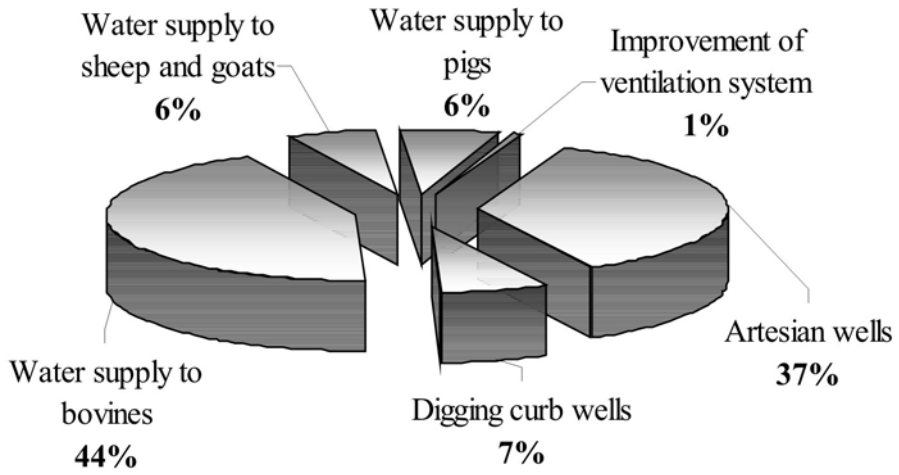
Within the Activity **Milk Hygiene** the most applications were received for the purchase of milk cooling and milking equipment for the milking cows – 37% of total number of projects in each sub-activity (Figure 3). The results of the study indicate that within this Activity there are 313 units of chilling equipment and 315 units of milking equipment acquired or 1.1 units of equipment per holding. The total amount of funding for these projects amounts to EUR 1369 million. The average offset received by agriculturists having purchased milking equipment is EUR 2247 per holding, while the funding amount for the cooling equipment is slightly lower: EUR 2113.

The reconstruction, renovation or construction of milk cooling premises also enjoyed a considerable popularity among agriculturists: 17% of the holdings have taken part in the sub-measure of the **Milk Hygiene**. The construction opportunity of milk cooling premises compliant with the EU standards has aroused the highest interest: 10% of all the approved projects. Eight milk cooling premises with the total area of 125 square metres have been renovated (Figure 4) costing EUR 20 thousand. There is a higher number of reconstructed milk cooling premises: totally 51 with the area of 836 square metres and the total funding of the projects amounting to



Source: authors' calculations according to the data of projects

Figure 4. **Total and average funding of projects under the Activity *Milk Hygiene*, thousand EUR /EUR**



Source: authors' calculations according to the data of the projects

Figure 5. **Distribution of projects under the Activity *Welfare of Agricultural Animals***

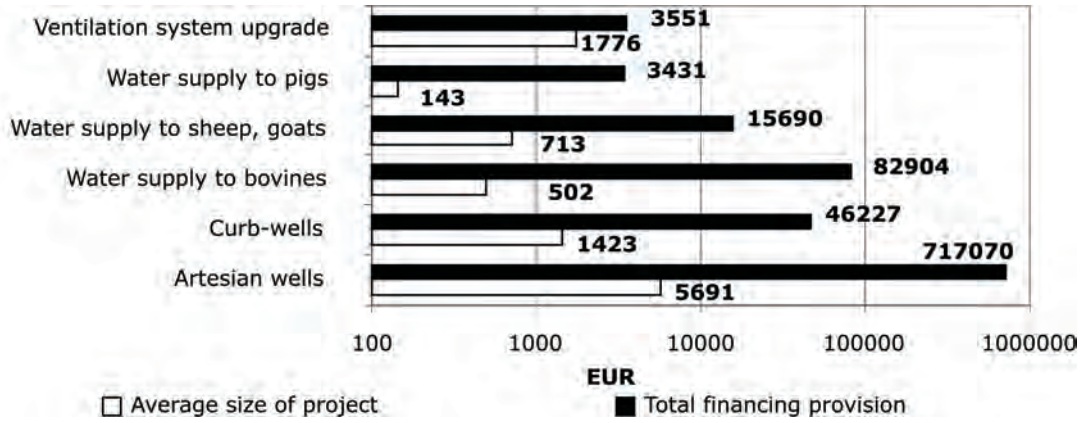
EUR 188 thousand. However, the interest in building new milk cooling premises has been the highest: 81 milk cooling premises have been constructed with the total area of 1677 square metres. The total funding of the projects has been the largest here: EUR 597 thousand, also the average level of funding for these projects is larger than that for the renovation or reconstruction of milk cooling premises: EUR 7380.

Altogether under this Activity the conditions have been improved in 140 milk cooling premises with the total area of 2638 square metres receiving compensation in the amount of EUR 805 thousand. On the average, each of the premises has cost EUR 5 750 or EUR 305 per square metre.

Nine per cent of projects within this Activity were targeted to shifting of pigs to different premises if pigs have been kept together with cows, thus providing for the improvement of animal welfare standards in cattle care and keeping areas. Altogether, EUR 280 358 have been spent within this sub-activity comprising 11% of total funding under this Activity. The average funding per project is EUR 3689.

The total funding disbursed in offsetting costs in the analysed holdings under Activity **Milk Hygiene** is EUR 2 455 710, constituting 63% of total funding under this Measure in the holdings analysed. Comparing all the sub-activities of **Milk Hygiene** among themselves, the largest total funding has been disbursed for the purchasing of milking equipment (EUR 708 thousand or 29% of total funding), the smallest: for the renovation of milk cooling premises (EUR 19 thousand).

Comparing funding among different projects, it is evident that the highest offset has been paid for projects envisaging construction of buildings but the lowest one for projects focussed on the purchase of cooling equipment. The difference between both average indicators in these sub-activities is EUR 5 267 (3.54 times). The results demonstrate that



Source: authors' calculations according to the data of the projects

Figure 6. **Total and average financing of projects under the Activity *Welfare of Agricultural Animals*, EUR**

the average funding per project in the sub-activity for the purchase of milking and cooling equipment is rather small but it has attracted many beneficiaries.

Projects under the Activity **Welfare of Agricultural Animals** comprise 29% of the analysed projects (Figure 5). The total financing provision for this Activity is almost EUR 900 thousand.

Regarding the Activity **Welfare of Agricultural Animals** the most popular sub-activity in the area of improving the water supply systems was setting-up of water supply systems for bovine animals: 44% of total number of projects. The amount of funding earmarked for this sub-activity is EUR 82 thousand.

Many agriculturists have opted for an Artesian well: 37% projects, curb-wells on their turn are to be set up in 7% of holdings. These sub-activities utilise the largest part of funding under the Activity **Welfare of Agricultural Animals** – EUR 717 thousand or 82%. An equal number of agriculturalists have set up the water supply systems for sheep and goats as well as pigs: 6% of total number of approved projects under this Activity. The opportunity to set up an artificial ventilation system, an alarm system and back-up ventilation has generated little interest though: just 1% of the projects with the total financing of EUR 3552.

Analysing the average amount of funding across a number of projects under this sub-activity, it should be noted that the highest average funding has been spent for drilling of Artesian wells: EUR 5691 have been paid out to offset expenditure in this field. For drilling of Artesian wells or digging of curb-wells a fixed sum is paid out: it does not change depending on the number of animals or other circumstances.

The total financing provision for this Activity is EUR 868 874 or 22% of total funding under this Measure in the holdings analysed. The largest share is filled by projects for drilling of Artesian wells: 82%. The lowest proportion financed under this Activity is represented by projects supplying water to pigs: 0.003% as well as projects for upgrading of the ventilation system: 0.004%.

Within the Measure *Meeting Standards* agriculturists were offered an opportunity to set up **calf hutches compliant with the EU standards:** 53 projects were included this activity. On the whole, the financing provision for this Activity was EUR 63 481 or EUR 1197 per project on the average. The total funding under this Activity amounted to 1.6% of financing for the whole Measure.

Activities like **Manure Storages** and **Farrowing Pens for Sows** have produced a small number of projects: 1% of total number of activities. The sub-activity **Manure Storages** has been carried out by 12 holdings for the total amount of EUR 485 273 or EUR 40439 per project on the average. The total funding of this Activity is 13% of total financing for the whole Measure. The sub-activity **Farrowing Pens for Sows** was implemented by 8 holdings for the total amount of EUR 8460 or 0.2% of total financing for this Measure in the holdings analysed. The average offset amount for one project: EUR 1057.

Conclusions

1. The Measure *Meeting of Standards* has improved the conformity of holdings to the EU standards thus providing for continuation of production and operation on the market of these holdings. Having met the above standards, the holdings are given the opportunity to modernise the production within the Measure *Upgrading of Agricultural Holdings* of the Rural Development Programme for the period of 2007-2013.
2. Over the project implementation period the income has increased for half of the participating holdings, while the cash surplus has increased for almost two thirds of the holdings. The financial support provided by the Measure makes up 44% of the farm income.
3. The study included the analysis of 462 holdings have been involved in different Activities to achieve the compliance with the relevant EU standards:
   - milk cooling premises: 8 renovated, 51 reconstructed and 81 constructed anew. The total area for milk cooling premises compliant with the

EU standards: 2638 m^2, investment EUR 805 thousand. For upgrading milk cooling premises in one holding EUR 5 750 have been spent or – EUR 305 per square metre;

- for adherence to milk hygiene standards, the holdings have purchased and installed milking and cooling equipment: 315 and 313 respectively or 1.1 units of equipment per holding. The support for these sub-activities amounted to EUR 1.37 million or EUR 2 181 per holding on the average;
- for adjustment of the water supply system to the EU standards, 26 curb-wells and 140 Artesian wells have been set up in the holdings for the total amount of EUR 763 thousand, the offset amount for setting up one location of the water source has been EUR 1423 and EUR 5691 respectively;
- the adjustment of the water supply system for agricultural animals has taken place in 211 holdings catering for bovine animals, goats, sheep, and pigs. The installation of a pressure pump, trunk water main, secondary water main, and drinkers have cost EUR 102 thousand or EUR 483 per farm on the average.
- Fifty-three of the analysed holdings have set up adequate calf hutches for the total amount of EUR 63 thousand or EUR 1188 per holding on the average.

Bibliography

1. Buģina V.,Krūmiņš Ģ. Eiropas Savienības tiešie maksājumi Latvijas lauksaimniekiem // Proceedings of the International Scientific Conference "Economic Science for Rural Development' 2005". Rural Development in the Expanded Europe at the Beginning of the 21st Century", No. 8, Jelgava, 2005, pp. 72-84.
2. Būmane I. Trim gotiņām atskrēja dvīņi//Agrotops, Rīga, 01.11.2008., Internet resource. Available at: http://www2.la.lv/lat/agrotops/jaunakaja_numura/lopkopiba/?doc=42584&date=2008-10-01, viewed on 06.12.2008.
3. Jasjko D., Miglavs A., Feldmans D. The Structural Changes in Latvian Agricultural Sector after Application of CAP reform // Economic Science for Rural Development – Proceedings of the International Scientific Conference "Possibilities for Rural Development in the Enlarged Europe", No 5, Jelgava, 2004, pp. 25-34.
4. The Procedure for Implementation of the Programming Document *Rural Development Plan of Latvia for Implementation of the Rural Development Programme of 2004–2006* [on-line]: Cabinet Regulations No. 1002 (2004). [viewed on 11.11.2008]. Available at: http://www.zm.gov.lv/index.php?sadala=496&id=831
5. Lauku saimniecības darba ekonomiskās analīzes rezultāti 2008. [tiešsaiste]. sast. Dambiņa L., Filmanoviča R., Muceniece I., Lazdiņa V., Inkina I. Latvijas Valsts agrārās ekonomikas institūts (2009). [skatīts 15.01.2010]. Pieejams: https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx
6. Lauku saimniecības Latvijā 2007. gadā. Statistisko datu krājums. Rīga: Latvijas Republikas Centrālā statistikas pārvalde, 2007., 43 lpp
7. Lauku saimniecību struktūra Latvijā 2007. gada jūnijā. Latvijas Republikas Centrālā statistikas pārvalde, Rīga, 2008, 76 lpp.
8. Latvijas lauku attīstības programma 2007.-2013. gads [tiešsaiste]. [skatīts 29.12.2008.] Pieejams http://www.lad.gov.lv/images/data/latvijas_lauku_attistibas_programma.pdf,, Rīga, 2008., 471 lpp.
9. Pilvere I. EU Agriculture Structural Fund Support Results in Latvia // Žemes ūkio mokslai, Lietuvos mokslu akademijos Leidykla, T.14, Vilnius, 2007, pp. 145-150.
10. Pilvere I. Atbalsta maksājumi Latvijā Kopējās lauksaimniecības politikas reformas nosacījumos//LLU raksti Nr.19 (314), 2007., 3.-15. lpp.
11. Pilvere I., Rukmanis A. Experience and Provisional Impact of Direct Support Payments in Latvia// Proceedings of the International Scientific Conference "Economic Science for Rural Development" Finance and Credit Diversification", No 11, Jelgava, 2006, pp. 12.-19.
12. Rukmanis A., Pilvere I. Reformētās Kopējās lauksaimniecības politikas finansiālā atbalsta stratēģiskās problēmas nākošajam plānošanas periodam // Proceedings of the International Scientific Conference "Economic Science for Rural Development" Finance and Credit Diversification", No 11, Jelgava, 2006, pp. 86.-93.
13. Saktiņa D., Meyers W.H. Eiropas Savienības līdzfinansētās un nacionālās lauku atbalsta programmas Latvijā: gatavojoties jaunajam programmēšanas periodam, Rīga, 2005, 242 lpp.
14. Visu veidu saimniecību grupējums pēc lielopu skaita gada beigās, [tiešsaiste], Centrālās statistikas pārvaldes datu bāze, [skatīts 15.01.2010]. Pieejams: http://www.csb.gov.lv/csp/content/?cat=355
15. Visu veidu saimniecību grupējums pēc cūku skaita gada beigās, [tiešsaiste], Centrālās statistikas pārvaldes datu bāze, [skatīts 15.01.2010]. Pieejams: http://www.csb.gov.lv/csp/content/?cat=355
16. Zapereckis R. Role of Government Policy in Agriculture. Workshop on Enhancing Competitiveness in the Agro-food Sector: Making Policies Work 16-17 June 2004, Vilnius, Lithuania, [on-line]. [viewed on 29.12.2008.] Available at: http://www.oecd.org/dataoecd/30/36/32607677.pdf, 9 pp.

Eiropas Savienības sniegtās iespējas - struktūrfondi Latvijā un Īrijā
Opportunities Offered by the EU Structural Funds in Latvia and Ireland

Ilze Latviete Mg.oec.
Sanda Čingule Mg.oec.
LLU Ekonomikas fakultātes doktorantes
Doctoral students of Faculty of Economics, Latvia University of Agriculture

Abstract. During the past five years Latvia as an EU member state has received remarkable financial resources through the European Union financial instruments, which still in the hard economic times keep stimulating the growth and development of the state. A substantial support from the European Union budget for Latvia is also planned in the period from 2009 to 2015. The ability of Latvia to acquire and forward these finances for the development of the most important sectors in the regions is a milestone of a successful development of the state.

Ireland is one of economically most developed, industrial, and trade – oriented states, which until now has managed to use the means of the EU Structural Funds most successfully. The received finances from the EU support funds have considerably favoured to the state's economic growth. Considering the experience of the EU peripheral state – Ireland, Latvia has the opportunity to compare its situation and governmental decisions in the national development area with Ireland; hence evaluating the core reasons of development and analysing mistakes of a similar country. The development model of Ireland provides Latvia with an opportunity to create to the utmost effective directions, core statements and plans for further economic development facilitating sustainable increase of the state welfare. The analysis of Latvia's experience in the field of economic growth shows that Latvia has mainly performed in an experimental way without regard of other countries experiences in similar situations. At the same time Latvia has disregarded political, social, economic and regional targets, thus relying only on the ability of new political forces to change the leading political environment.

Many documents related to the Structural Funds highlight the aim of the EU Structural Funds to eliminate regional and social inequalities among the EU member states and to improve economic and social cohesion throughout all Europe. Certainly, these financial means are a great benefit for Latvia and they can essentially favour development of the state. The real current situation of Latvia shows the necessity to pay special attention to the fact that large funds also create venture, and inappropriate use of the financial means may promote regional inequalities, social off-casting, degradation of the environment, and corruption.

Key words: Structural Funds, financing, activity, development of theories, regional equality.

Ievads
Introduction

Kopš ES izveidošanās, tā ir piedzīvojusi lielas pārmaiņas un attīstījusies, gan vēršoties plašumā, gan veidojoties arvien ciešākai valstu savstarpējai sadarbībai. Pirmajām sešām dibinātājvalstīm ir piepulcējušās citas, un tagad ES apvieno jau 27 valstis. Vēl lielākas pārmaiņas ir skārušas izvirzītos mērķus un darbības jomas: no kara rūpniecības – ogļu un tērauda nozares – pārnacionālas kontroles institūcijas, kuras mērķis ir nodrošināt stabilu mieru Eiropā, mūsdienu ES ir kļuvusi par savienību, kas aptver vairāk nekā divdesmit kopējas politikas un darbības jomas. Eiropas integrācijas process tiek turpināts, izvirzot jaunus mērķus, sastopoties ar citiem izaicinājumiem un meklējot labākos risinājumus.

Katrai jaunai dalībvalstij, piepulcējoties ES dalībvalstu pulciņam, jāievēro, acquis conimunautaire[1] – princips, kas paredz, ka „kandidātvalstīm laikus jāsagatavojas palīdzības saņemšanai no ES struktūrfondiem. Tas nav viegls uzdevums; vispirms katrai nākamajai dalībvalstij ir jāiepazīstas ar ES reģionālās politikas noteikumiem, bet pēc tam jāpielāgo sava likumdošana, administratīvie un finansu instrumenti finansējuma piesaistīšanai no struktūrfondiem. Jo sekmīgāk valsts pratīs izpildīt šos uzdevumus, jo efektīvāk tā varēs izmantot struktūrfondu palīdzību. Kā rāda Īrijas piemērs, fondu palīdzība var dot ļoti nozīmīgu un pozitīvu atbalstu nacionālās ekonomikas attīstībai" (Kalniņa I., Sebre A., Grūberte D., 2001).

Līdz ar iestāšanos ES 2004. gada 1. maijā, arī Latvijai kā vienai no jaunajām dalībvalstīm pavērsās iespējas līdzdarboties ES reģionālās un strukturālās politikas procesos, ar mērķi nodrošināt Latvijas ekonomisko un sociālo rādītāju ātrāku tuvināšanos vidējam ES dalībvalstu līmenim. Šo piecu gadu laikā valsts budžetā ieplūdis finansējums pozitīvā bilancē vairāk nekā 1 miljarda LVL apmērā jeb vidēji 2%

[1] ES pamatlikuma kopums, kuru pamatā veido dibināšanas līgumi un tiem pakārtotie normatīvie akti un kurš ir saistošs visām ES dalībvalstīm.

no attiecīgā perioda valsts iekšzemes kopprodukta (Finanšu ministrija, 2009).

Ar ES budžeta līdzekļiem tiek sniegts atbalsts plašam pasākumu kopumam. Šis atbalsts apjomu ziņā var būt mainīgs – sākot ar pilnu izdevumu segšanu un beidzot ar dažu procentu finansiālu līdzdalību. Arī finansiālās palīdzības potenciālo saņēmēju loks ir ļoti plašs. To vidū var būt ne tikai dalībvalstis, bet arī kandidātvalstis, atsevišķas pašvaldības, sabiedriskas organizācijas, privātie uzņēmumi, universitātes un pat atsevišķi indivīdi.

Kā teikts daudzajos ar struktūrfondiem saistītajos dokumentos, ES struktūrfondu mērķis ir novērst reģionālās un sociālās nevienlīdzības starp ES dalībvalstīm un to reģioniem un uzlabot ekonomisko un sociālo kohēziju visā Eiropā. Neapšaubāmi, šie līdzekļi ir liels ieguvums Latvijai un tie var būtiski veicināt mūsu valsts attīstību. Taču jāatceras, ka liels finansējums arī rada risku un ka šo līdzekļu neadekvāta izmantošana var tikai veicināt reģionālo nevienlīdzību, sociālo izstumtību, vides degradāciju un korupciju (Brizga J., 2007).

Vēl tikai uzsākot Latvijas ceļu uz ES, tika izvirzīts mērķis - "Latvija pievienojas tāpēc, ka mēs gribam redzēt Eiropu kā efektīvu un konkurētspējīgu aktieri, kurš spēlē globālā mērogā un Latvijai būtu dziļi jāintegrējas un jākļūst par tās daļu. Latvijas cenšanās kļūt par ES dalībvalsti izceļas no mūsu sabiedrības pamatinteresēm. Latvija integrējas ES lai realizētu sabiedrības intereses. ES ir kaut kas vairāk nekā tikai un vienīgi ekonomikas koncepcija. Kopējās vērtības un ideāli ir stabils pamats lai izveidotu ģimeni ar stabilām, drošām un laimīgām nācijām. Integrācijas ideja ir dzīva, kamēr to atbalsta sabiedrība." (Hajoš B., Kissiov V., Martikonis R., Marton I. and Šulca I., 2002). Tātad Latvijas mērķis ES ir veicināt Latvijas iedzīvotāju labklājību un paaugstināt dzīves kvalitāti.

Laika periodā no 2004. līdz 2008. gadam Latvijā kā finansiāls stimuls ekonomikas attīstībai ieplūdusi ES un cita ārvalstu finanšu palīdzība 1,55 miljardu latu apmērā, kas ir gandrīz trīs reizes vairāk nekā 0,54 miljardi LVL, ko Latvija šajā periodā iemaksājusi ES budžetā. Šis finansējums nonācis valsts un pašvaldību infrastruktūras attīstībā, izsniegts kā atbalsts uzņēmumiem, ticis izmantots iedzīvotāju kvalifikācijas celšanai un citām jomām. No 2004. līdz 2007. gadam papildu finansējumu 0,09 miljardu LVL apmērā ārpus valsts budžeta pa tiešo no ES saņēmis privātais sektors, pašvaldības un nevalstiskās organizācijas (Finanšu ministrija, 2009).

Arī laika periodā no 2009. līdz 2015. gadam Latvijai ir ieplānots nozīmīgs ES budžeta atbalsts, kurš nākamajos gados turpinās nonākt valsts ekonomikā. Latvijas spēja apgūt šo finansējumu un novirzīt to attīstībai nozīmīgākajām nozarēm reģionos ir kā stūrakmens sekmīgai reģionālajai attīstībai.

Īrija ir viena no ekonomiski attīstītākajām, industriālajām, uz tirdzniecību orientētajām valstīm, kura līdz šim ir visveiksmīgāk spējusi izmantot ES struktūrfondu līdzekļus. Saņemtie līdzekļi no ES fondiem ir ievērojami veicinājuši valsts ekonomisko izaugsmi. Pēdējo gadu laikā Īrijā ir piedzīvota strauja augšupeja ar iespaidīgiem izaugsmes un nodarbinātības rādītājiem. Paralēli tam, Īrijas valsts intensīvi strādā pie kvalitātes un efektivitātes, darba tirgū esošo pieprasījumu nodrošinājuma jautājumiem. Lielākoties jautājumu risināšanas un realizēšanas efektivitāte tiek panākta ar ES struktūrfondu finansējuma palīdzību.

Ņemot vērā ES perifērās valsts Īrijas pieredzi, Latvijai ir iespēja salīdzināt savu situāciju un valdības lēmumus valsts attīstības jomā, tādējādi izvērtējot līdzīgas valsts galvenos attīstības pamatiemeslus un analizējot pieļautās kļūdas. Īrijas valsts attīstības paraugs dod iespēju Latvijas valstij izveidot maksimāli efektīvus valsts ekonomikas tālākattīstības darbības virzienus, pamatnostādnes un plānus, kas sekmētu pastāvīgu valsts attīstības augšupeju. Salīdzinot Latvijas pieredzi ekonomiskās izaugsmes attīstības jomā, ir redzams, ka Latvija ir darbojusies vairāk vienkārši eksperimentējot, nevis ieskatoties citu, līdzīgas situācijas, valstu pieredzē, nesaistot kopā politiskos, sociālos, ekonomiskos un reģionālos mērķus, ņemot vērā arī to, ka tie vienmēr krasi mainījās ieejot politiskās vides vadībā jaunam politiskajam spēkam.

Tāpēc ir definēts **pētījuma mērķis** - izvērtēt Latvijas un Īrijas panākumus struktūrfondu apguvē.

Mērķa izpildei risināmie **uzdevumi**:

1. Analizēt Latvijas pieredzi un rezultātus ES struktūrfondu apguvē.
2. Izvērtēt Īrijas valsts labās prakses pieredzi ES struktūrfondu apguvē.

Materiāli un metodes
Materials and Methods

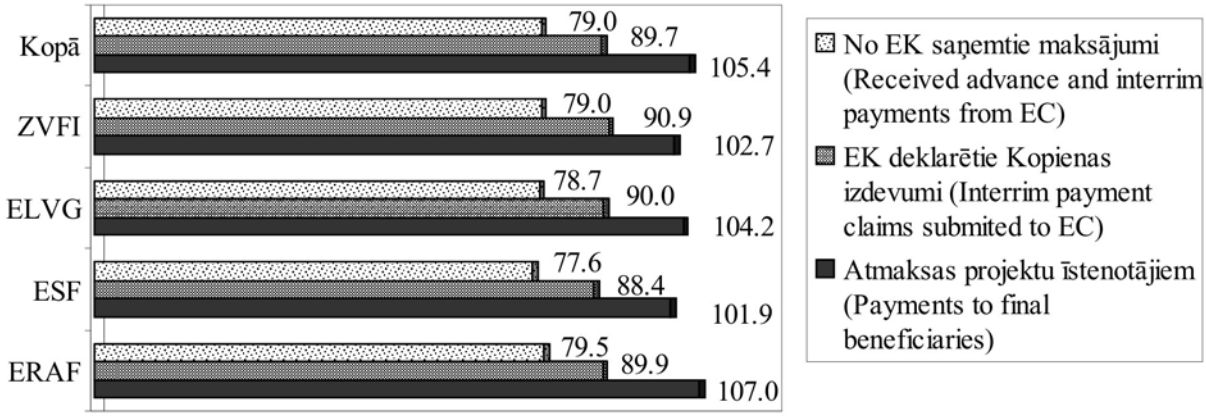
Tēmas izpētē izmantoti LR normatīvie dokumenti - zinātnieku pētījumi ES struktūrfondu jomā, Finanšu ministrijas mājas lapā apkopotie dati, EUROSTAT dati un IR normatīvie dokumenti – Īrijas zinātnieku pētījumi valsts pārmaiņās kopš iestāšanās ES, Īrijas republikas Zemkopības ministrijas interneta mājas lapā apkopotie dati un Īrijas Centrālās Statistikas pārvaldes publiski pieejamie dati.

Galvenās izmantotās metodes – monogrāfiski aprakstošā metode, saturiskās atbilstības pārbaudes starp dažāda līmeņa dokumentiem, analīzes un sintēzes metodes, lai izpētītu problēmu elementus un sintezētu kopsakarības vai formulētu likumsakarības, faktu, statistikas u.c. datu, specifiskās informācijas iegūšana un uzkrāšana par ES struktūrfondu īstenotajiem pasākumiem.

Rezultāti un diskusija
Results and discussion

Eiropas Savienības struktūrfondu apguve Latvijā
Acquisition of the EU Structural Funds in Latvia

ES struktūrfondu atbalsts tiek sniegts, lai izlīdzinātu reģionālās atšķirības reģionu līmenī. Līdz ar to Latvija saņem finansējumu kā valsts, nevis tās atsevišķi reģioni, kā tas tiek praktizēts lielākajā daļā ES dalībvalstu. Latvijā jau 2004.-2006. gada plānošanas perioda sākumā tika izvirzīti atšķirīgi viedokļi par ES finansējuma efektīvu izlietojumu. Kā atzīmē J.Brizga, šie līdzekļi ir neapšaubāmi liels



Avots: Finanšu ministrija, 2009 un autoru aprēķini

1.attēls. **2004.-2006.gada plānošanas perioda Struktūrfondu apguve (līdz 31.03.2009.) Latvijā, %**

Figure 1. **Acquisition of the EU Structural Funds in the planning period of 2004-2006 (until March 31, 2009) in Latvia, %**

ieguvums un var būtiski veicināt mūsu valsts attīstību. Tie vairo cerības, ka Latvija straujāk nekā līdz šim tuvināsies Rietumeiropas valstu labklājības līmenim. Vienīgās bažas, kas saistās ar struktūrfondiem, izsakāmas divos jautājumos: pirmkārt, vai Latvija spēs un paspēs apgūt tai pienākošos finansiālo palīdzību? Jeb – tiek apšaubīta atbildīgo institūciju un projektu pieteicēju prasme un rīcībspēja, lai nodrošinātu fondu līdzekļu savlaicīgu nonākšanu projektu īstenotāju rīcībā. Otrkārt, vai struktūrfondu finansējuma sadale būs atklāta un taisnīga? Citiem vārdiem – pastāv aizdomas par korupcijas un nepārskatāmas līdzekļu pārdales iespējamību, un to stiprina arī Latvijas nesenās vēstures pieredze ar ārvalstu līdzekļu izsaimniekošanu. Šie ir ļoti būtiski jautājumi. Tomēr tie paliek vienas paradigmas ietvaros – ar atziņu, ka struktūrfondu līdzekļi ir pozitīvs ieguvums Latvijai. Vai struktūrfondu apguves vadmotīvam vajadzētu būt „ātrāk un vairāk"? Vai lielu līdzekļu ieplūšana valstī automātiski nozīmē labvēlīgus uzlabojumus? (Brizga J., 2005).

Latvijā 2009.gada 30.jūnijā ir noslēdzies ES struktūrfondu 2004.-2006. gada plānošanas periods. Šobrīd jau var izvērtēt iepriekšējos četros gados paveikto un izvērtēt cik lielā mērā struktūrfondu līdzekļi sasnieguši izvirzīto pamatmērķi – samazināt sociālās un ekonomiskās atšķirības starp ES reģioniem, proti, pietuvināt Latvijas sociālekonomiskos rādītājus vidējam ES līmenim.

Kā redzams 1.attēlā par ES stuktūrfondu apguvi 2004.-2006.gada plānošanas periodā, jāsecina, ka Latvija ir viena no valstīm, kas ir pat pārsniegusi 100% struktūrfondu finansējuma atmaksas finansējuma saņēmējiem, jo Latvija ir uzņēmusies virssaistības un ir iespēja deklarēt attiecināmos izdevumus virs 100%, tādējādi iespējamas EK finanšu korekcijas gadījumā, ir zināma elastība aizstāt neattiecināmos izdevumus ar attiecināmiem, joprojām saglabājot iespēju saņemt maksimāli iespējamo noslēguma maksājumu. Vislielākais atmaksu procents no ES piešķīruma ir ERAF, kam seko ELVG un ZVFI un kā noslēdzošais ir ESF. Arī deklarētā ES finansējuma un no EK saņemto maksājumu salīdzinājumā starp fondiem ir redzams, ka labākie rādītāji ir ERAF, kam seko ELVG un ZVFI un kā noslēdzošais, bet kopumā ar labiem rezultātiem ir ESF. Jāpiemin, ka Latvija ir arī viena no ES fondu jaunajām dalībvalstīm, kuras sasniegušas maksimāli iespējamo avansu un starpposma maksājumu līmeni 95% apmērā no struktūrfondu piešķīruma.

Jāpiekrīt E. Jermolajevas un autoru grupas teiktajam, ka ES finansējuma ietekmi uz reģionu attīstību var novērtēt ne ātrāk kā 2-3 gadus pēc tā ieguldījuma un 2008. gadā jau varēja analizēt 2004.-2006. gadā veikto ieguldījumu ietekmi (Jermolejeva E., Zelča S., Baltere.R., 2008). Līdzšinējie pētījumi liecina, ka reģionu iespējas un intereses apgūt finansējuma nav vienādas. Arī reģiona ekonomikas „reakcija" uz investēto līdzekļu efektivitāti nav identisks, jo starp reģioniem pastāv atšķirīgas ekonomiskās priekšrocības un ekonomiskās attīstības intereses (Saktiņa D., 2008).

Pētot ES fondu ieguldījumu Latvijā, autores 1.tabulā ir izanalizējušas ES fondu finansējumu Latvijā 2004.-2008.gadā no attiecīgā perioda valsts iekšzemes kopprodukta, procentos. Visaugstākais procentuālais ieguldījums ir bijis 2007.gadā, kas arī ir pamatoti, jo tika uzsāktas īstenot pirmās 2007.-2013.gada plānošanas perioda aktivitātes, kā arī redzams, ka 2007.gadā 2004.-2006. gada plānošanas perioda finansējums fondu ietvaros ir bijis lielākais. Salīdzinot ES fondu ieguldījumu 2004.-2006. gada periodā, jāsecina, ka procentuāli lielākais finansējuma apjoms bija 2005.gadā 2.11% no 2005.gada IKP. IKP laika periodā no 2003. līdz 2008.gadam ir pieaudzis par 8 840 042 tūkstošiem latu, jeb 54%. Saskaņā ar EUROSTAT datiem sešu gadu laikā – no 2003. līdz 2008. gadam ieskaitot – pēc IKP uz 1 iedzīvotāju Latvija pietuvinājās ES-27 līmenim par 12.3 procentpunktiem - no 43.3% līdz 55.6% pret vidējo ES-27, kam kā autores uzskata ir noteikta daļēja ES fondu ietekme.

1.tabula
Table 1

ES fondu finansējums Latvijā 2004.-2008.gadā no attiecīgā perioda valsts iekšzemes kopprodukta, % (tūkst.LVL)
Financing of the EU Structural Funds in Latvia between 2004 and 2008, of the respective period GDP in % (thou. LVL)

Fonds (Fund) \ Gads (Year)	2004	2005	2006	2007	2008
Kohēzijas fonds (KF) (Cohesion Fund (CF))	16 708.2	56 429.2	73 410.7	96 063.3	70 326.7
Eiropas Sociālais fonds 2004-2006 (ESF) (European Social Fund 2004-2006 (ESF))	9 265.0	8 016.4	2 719.8	45 876.8	4 070.9
Eiropas Reģionālās attīstības fonds 2004-2006 (ERAF) (European Regional Development Fund 2004-2006 (ERDF))	24 404.3	24 296.1	22 286.2	107 254.0	75 292.7
Zivsaimniecības vadības finansēšanas līdzeklis 2004-2006 (ZVFI) Financial Instrument for Fisheries Guidance 2004-2006 (FIFG)	1 773.7	5 556.1	2 430.4	5 687.3	696.1
Eiropas Lauksaimniecības Vadības un Garantiju fonds Virzības daļa 2004-2006 (ELVGF) (European Agricultural Guidance and Guarantee Fund 2004-2006 (EAGGF))	29 564.1	96 645.2	113 264.4	13 682.0	-
KF (CF) 2007-2013				27 054.0	43 286.1
ESF (ESF) 2007-2013				7 740.0	11 610.1
ERAF (ERDF) 2007-2013				34 297.1	51 445.6
Kopā (Total)	81 715.3	190 943.0	214 111.5	337 654.5	256 728.2
IKP (GDP)	7 434 454	9 059 087	11 171 693	14 779 810	16 274 496
% no IKP (% of GDP)	1.10	2.11	1.92	2.28	1.58

Avots: Finanšu ministrija, 2009 un autoru aprēķini

Autores piekrīt Biedrības "Baltijas starptautiskais ekonomikas politikas studiju centrs", SIA "Baltijas Konsultācijas" pētnieku grupai, kura savā pētījumā secina – „…, ka ES fondiem ir bijusi pozitīva ietekme uz galvenajiem rādītājiem, piemēram, ražīgumu un IKP 2004.-2006. gada programmēšanas periodā, kā arī, ka ir paredzama pozitīva ietekme arī 2007.-2013. gada programmēšanas periodā. Tai pat laikā uzskats, ka fondi varētu būt atbildīgi par līdzsvara trūkumu, kas Latvijā ir novērojams pēdējos gados, vai arī tam, ka šie fondi varētu būt nestabilitātes avots nākotnē, tiek visai atturīgi atbalstīts. Īstenībā ir gluži pretēji – fondi visticamāk kompensēs saimnieciskās darbības lejupslīdi, kas ir nesen sākusies Latvijā un mūsu Baltijas kaimiņvalstīs." Pētnieku grupa arī atzīmē "…, ka Latvijā fondu ietekme uz galvenajiem ekonomiskajiem rādītājiem, piemēram, ražošanas apjomu (IKP), inflāciju un ārējo bilanci, ir atkarīga no līdzsvara starp pieprasījuma ietekmi un piedāvājuma ietekmi. (Biedrība "Baltijas starptautiskais ekonomikas politikas studiju centrs", SIA "Baltijas Konsultācijas", 2008).

Līdz šim ES strukturālo fondu nauda, kā rāda dažādu institūciju publicētie statistiskie dati, ir nonākusi galvaspilsētas Rīgas un tās areālā ietilpstošo teritoriju vajadzību apmierināšanai. Tas vēl vairāk padziļina plaisu starp lielajiem attīstības centriem un pārējo Latvijas teritoriju. Sakarā ar finanšu trūkumu nīkuļo kā lielākā daļa Latvijas pašvaldību, tā arī mazpilsētas. Arī politiskais uzsvars, kurš tiek likts uz to, ka Rīga, tās areāls un lielie attīstības centri arī perspektīvā nodrošinās augstus IKP pieauguma tempus, kas vairos visas Latvijas teritorijā iedzīvotāju labklājības līmeņa nemitīgu pieaugumu līdz vidēji pārtikušu ES dalībvalstu iedzīvotāju līmenim, ir apšaubāms. Šo hipotēzi pētnieku grupa turpināja pārbaudīt arī 2008. gadā, veicot monitoringa novērojumus un veicot pētījumus par neizmantotajām iespējām valsts reģionālajā attīstībā (Keišs S., Tilta E., Zariņa V., Jesemčika A., Medne A., Kazinovskis A., Balode G. 2008).

Analizējot sniegtos vērtējumus par ES fondu līdzekļu ietekmi uz Latvijas tautsaimniecības un sabiedrības attīstību, SKDS dati liecina, ka 2008.gada decembrī kopumā nedaudz mazāk kā 2/3 (63%) aptaujāto iedzīvotāju šo ietekmi vērtē pozitīvi (summētas atbildes ļoti pozitīvi un drīzāk pozitīvi), savukārt, tikai 5% aptaujas dalībnieku kopumā pauduši pretēju nostāju (ļoti negatīvi un drīzāk negatīvi). To, ka Eiropas Savienības fondi nav ietekmējuši Latvijas tautsaimniecības un sabiedrības attīstību, 2008. gada decembrī norādījuši 14% aptaujas dalībnieku (SKDS, 2008).

2.tabula
Table 2

ES fondu līdzekļu sadalījums pa ieguldījumu kategorijām 2004.-2008.gadā Latvijas reģionos (milj.LVL)
Allocation of the EU funds by investment categories between 2004 and 2008 in the regions of Latvia (milj.LVL)

	Rīgas reģions	%	Latgales reģions	%	Zemgales reģions	%	Vidzemes reģions	%	Kurzemes reģions	%	Kopā (Total)	%
Ieguldījumi kopējā faktoru ražīgumā (Investment in total factor productivity)	148.9	54	18.9	39	12.4	18	19.6	28	27.2	33	226.9	41
Ieguldījumi tehnoloģijās (Investing in technology)	14.8	5	0.2	0	0.8	1	0	0	0.7	1	16.6	3
Ieguldījumi iekārtās, ēkās un citā kapitālā (Investment in equipment, buildings and other capital)	63.3	23	18.3	38	36.0	52	33.4	48	38.7	46	189.7	35
Ieguldījumi cilvēkkapitālā (Investment in human capital)	49.3	18	11.2	23	19.8	29	16.9	24	16.9	20	114.3	21
Kopā (Total):	276.3	100	48.6	100	69.0	100	69.9	100	83.5	100	547.5	100

Avots: Finanšu ministrija, 2009 un autoru aprēķini

Kā pierāda autoru ES fondu līdzekļu statistisko datu analīze pēc līdzekļu piesaistes vietas, laika periodā no 2004. līdz 2008.gadam Rīgas reģions (Rīgas pilsēta un Pierīga) saņēma 55% no visiem ES līdzekļiem (summēti gan projekti, kas realizēti Rīgas reģionā, gan nacionālā mēroga projekti). Latgale saņēma mazāko finansējuma daļu 9%, bet pārējie līdzekļi tika sadalīti vairāk vai mazāk līdzīgi starp Zemgali (12%), Vidzemi (11%) un Kurzemi (14%). Lai izvērtētu šo līdzekļu piesaisti, autores 2. tabulā tos aplūkot sadalījumā pa izdevumu kategorijām.

Aplūkojot 2.tabulas datus - rezultāts liecina, ka sadalījums pa izdevumu kategorijām ir atšķirīgs dažādos reģionos, proti, – 35% no kopējiem ES fondu līdzekļiem tika izmantoti fiziskā kapitāla veidošanai (kategorija – ieguldījumi iekārtās, ēkās, citā kapitālā). Vislielākie ieguldījumi kapitālā bija veikti Zemgales reģionā (52%), kam tuvu sekoja Vidzemes reģions (48%) un Kurzemes reģions (46%). Rīgas reģionā kapitālieguldījumi bija proporcionāli viszemākie un bija zem Latvijas vidējā rādītāja (23%), bet Latgales reģionā 38% fondu investēti kapitālā. Lielākā ieguldījumu kategorija – ieguldījumi kopējā faktoru ražīgumā Latvijā kopumā bija 41%, un šie ieguldījumi stipri atšķīrās starp reģioniem. Lielākie ieguldījumi kopējā faktoru ražīgumā veikti Rīgas reģionā – 54% no visiem reģiona ieguldījumiem. Vismazāk šajā izdevumu kategorijā iztērēts Zemgales reģionā (18% no visiem reģiona izdevumiem), izdevumi Latgales reģionā bija tuvu Latvijas vidējam rādītājam (39%), bet zemāki Vidzemes reģionā un Kurzemes reģionā (attiecīgi 28% un 33%). Visvairāk proporcionāli cilvēkresursos ieguldīts Zemgales reģionā (29% no visiem reģiona izdevumiem), bet pārējos reģions proporcijas bija līdzīgas. Tehnoloģiju izmaiņas visumā bija vismazākā izdevumu kategorija (tikai 5% no visiem izdevumiem), un lielākā izdevumu daļa tika koncentrēta Rīgas reģionā. Rīgas reģionā lielākā fondu proporcija bija izdevumi, kas veicina kopējo faktoru ražīgumu. Vidzemes reģionā, Zemgales reģionā un Kurzemes reģionā ieguldījumi tika veikti galvenokārt fiziskajā kapitālā.

Profesore V.Bikse savā darbā atzīmē, ka ES struktūrfondu līdzekļi Latvijā tiek izlietoti neefektīvi. Ir trīs ES struktūrfondu projektu īstenošanas veidi: nacionālie, atklāta konkursa un grantu shēma. Īstenoto projektu analīze, kā arī piedalīšanās projektu konkursā liecina, ka:

— ES struktūrfondu līdzekļu izlietošanā nav skaidra redzējuma, kādas ir būtiskākās nacionālās

problēmas, kuru risināšanai ir jānovirza ES struktūrfondu līdzekļi. Bieži vien līdzekļi netiek novirzīti Latvijas attīstībai būtisku jautājumu risināšanai, bet gan tiek sadrumstaloti pa dažādām ministrijām līdzīgu vai ļoti tuvu pasākumu īstenošanas finansēšanai.

— Nav lietišķas sadarbības starp ministrijām, lai kopīgi līdzekļus novirzītu Latvijai svarīgu problēmu risināšanai. Nauda tiek sadalīta starp dažādām valsts institūcijām līdzīgu pasākumu īstenošanai, izpaliekot problēmu risināšanai starp ministriju līmenī.

— Turklāt mūsu novērojumi liecina, ka patlaban Latvijā valdības līmeņa institūcijas nav ieinteresētas sadarboties ar Eiropas Komisijas projektu ekspertiem, iedziļināties projektu būtībā, mēģināt izprast to svarīgumu, gādāt par to īstenošanu, jo, viņuprāt, tas ir darbietilpīgs process.

Raksta autori piekrīt Ekonomikas zinātņu profesores teiktajam, ka iespējamais iepriekšminēto problēmu risinājums Latvijai kā zemāka attīstības līmeņa ES dalībvalstij „vajadzētu vairāk ES struktūrfondu līdzekļus novirzīt nacionālo projektu izstrādei, piesaistot augsti kvalificētus speciālistus" (Bikse V., 2009). Tas tiek darīts arī patlaban. Taču, lai noteiktu jau izstrādāto nacionālo projektu efektivitāti, vajadzētu veikt papildu pētījumus.

Lai maksimāli veicinātu visu struktūrfondu izmantošanu, 2006. gadā tika rasti risinājumi vairākiem struktūrfondu apguvi kavējošiem faktoriem, kurus varēja piemērot vēl 2004.-2006. gada struktūrfondu projektos. Taču šis darbs ir jāturpina, lai novērstu pamanītās nepilnības un neizveidotu jaunas barjeras projektu izvērtēšanai ES fondu plānošanas periodā 2007.-2013. gadā.

2005. gada decembrī ES dalībvalstu valdību vadītāji Eiropadomē vienojās par finanšu perspektīvu 2007.-2013. gadiem. Latvijai šajā budžeta periodā izdevās panākt ievērojamu finansējuma palielinājumu, kā rezultātā Latvija nākamajos septiņos gados saņems 4,53 miljardus eiro (aptuveni 3,18 miljardu latu). Papildus tam 2007.-2013. gadā Latvijā būs pieejami ES fondi – Eiropas lauksaimniecības fonds lauku attīstībai – kopējais finansējuma apjoms ir 1363 miljoni eiro, Eiropas zivsaimniecības fonds, kura kopējais finansējuma apjoms ir 164 miljoni eiro, un Eiropas lauksaimniecības garantiju fonds tiešajiem maksājumiem, kam paredzēti 1012 miljoni eiro (Eiropas Savienības informācijas aģentūra, 2007).

Kā svarīgākie mērķi šī finansējuma izlietojumam tiek paredzēts Latvijas ekonomikas un sabiedrības konkurētspējas veicināšana, darba vietu radīšana un produktivitātes palielināšana. Valsts galvenā stratēģija paredz kvalitatīvas izglītības iespējas visiem, mudināt vairāk jauniešus iegūt augstāko izglītību dabas zinātnēs un tehniskajās specialitātēs un veicināt valsts pētniecības, attīstības un inovāciju sistēmu, lai pārkārtotu ekonomiku uz rūpniecības nozarēm ar augstāk attīstītām tehnoloģijām. Īpaša uzmanība tiek veltīta tādām horizontālajām prioritārajām jomām kā līdzsvarota teritoriālā attīstība, Rīgas konkurētspēja starptautiskajā arēnā, vienlīdzīgas iespējas, ilgtspējīgums, makroekonomiskā stabilitāte un informācijas sabiedrība. Lielāku uzmanību veltīs arī pilsētu attīstībai un aktivizēšanas pasākumiem nelabvēlīgā sociālā vidē esošo grupu atbalstam.

Īrijas valsts labās prakses pieredzes piemērs ES fondu apguvē

Ireland's best practice example for the acquisition of the EU funds

Īrija ir viena no centralizētākajām valstīm Eiropā, suverēna, neatkarīga valsts. Republikā pastāv liberālā demokrātija ar parlamentāro pārvaldes sistēmu. Tajā ietilpst apmēram 80% no Īrijas salas un kopš 1973. gada ir ES dalībvalsts. Īrijas galvaspilsēta ir Dublina, teritorija aizņem 70 300 kvadrātkilometrus ar 3,6 miljoniem iedzīvotāju (Agriculture in Ireland).

Īri savu vietējo varu īpaši nostiprinājuši labākai ES palīdzības izmantošanai. Tieši šim nolūkam veikta reforma un visas pašvaldības apvienotas astoņos reģionos. (Platības un iedzīvotāju skaita ziņā ļoti līdzīgi Latvijā iecerētajiem pieciem novadiem). Reģionu pārvaldes vienīgais uzdevums ir vērienīgu attīstības projektu saskaņošana starp grāfistēm un Briseli — ar šiem darbiem tiek galā tikai trīs ierēdņi un katra reģiona jaunās pārvaldes uzturēšanai valsts gadā tērē no 70 līdz 140 tūkstošiem latu (I. Andiņš, 2002).

Uz doto brīdi tikai nedaudz vairāk kā 20 gados Īrijas valsts ir sasniegusi savu ekonomisko izaugsmi un tās rezultāti pēdējos gados rāda, ka tā ir ES valsts ar vislielāko iekšzemes kopprodukta (IKP) pieaugumu gadā. Tāpat kā Latvija, arī Īrija atrodas Eiropas malā, tā ir maza, perifēra valsts, kura pirms 25 gadiem bija atpalikusi Rietumeiropas nomale un tās vienīgais ekonomikas dzinējs bija lauksaimniecība (Par Īrijas veiksmēm, Latvijas izredzēm).

Īrijas valsts ekonomikas jomā vislielākā ietekme bija ES, kur tās ietekmē nostiprinājās valsts lauksaimniecība un rūpniecība (Vaidere I., Vanags E., Vanags I., Vilka I., 2008).

Analizējot Īriju salīdzinājumā ar Latviju lauksaimniecības ekonomikas jomā, ir redzams, ka uz doto brīdi lauksaimniecības attīstība un politika Īrijā ir daudz progresīvāka, atvērtāka un attīstītāka nekā Latvijā, tā ir viena no valsts pamatnozarēm, kamēr Latvijā tikai tagad par to sāk spriest un plāno virzīt kā vienu no valsts attīstības pamatnoteikumu prioritātēm. Tāpat arī jāņem vērā, ka lauksaimniecības zeme Latvijā, salīdzinot ar Īriju, ir daudz kvalitatīvāka un augstvērtīgāka, kas nozīmē, ka minētais dabas resurss Latvijā ir pieejamāks nekā Īrijā – nav jāizmanto tik daudz papildus ķimikāliju. Latvijā ir iespēja daudz dabiskāk un bioloģiskāk ražot pārtiku. Rūpniecības jomā Īrijā īpaši attīstījās augstās tehnoloģijas, plaši tika piesaistīts ārvalstu kapitāls, kompānijām bija pieeja lielajam Eiropas tirgum. Lai arī Īrija pēc iestāšanās ES daļēji zaudēja autonomiju ekonomiskās politikas jomā, ieguvumi bija daudz lielāki. Tirdzniecība kļuva daudz sabalansētāka. Ja 1960. gadā 75% no Īrijas preču eksporta bija uz Apvienoto Karalisti, tad 1980. gadā – 43% un 1995. gadā – vairs tikai 35%. Preču importa īpatsvars no Apvienotās Karalistes samazinājās no 50%

1960. gadā līdz 35% 1995. gadā (Vaidere I., Vanags E., Vanags I., Vilka I., 2006).

Stājoties ES, Īrija uz to lika lielas cerības. Tas bija saistīts ar ES kopējām politikām dažādās dzīves sfērās, kā arī ar Strukturālajiem fondiem, kas naudas līdzekļus piešķīra dažādām valsts dzīves sfērām. Pēc savienības līguma noslēgšanas 1992. gadā par prioritātēm tika atzītas izglītība, ideju apmaiņa, apmācība, jaunatnes problēmas, veselības aizsardzība, kultūra un cilvēktiesības. Tomēr jāatzīst, ka salīdzinoši ar Latvijas politiķiem, īru politiķi un speciālisti māk daudz labāk no Strukturālajiem fondiem iegūt ievērojami lielus līdzekļus, kas viņiem ļaus uzlabot tās valsts sfēras, kas kopskatā izkrīt no ES. Galvenokārt finansējums tika novirzīts šādiem mērķiem:

1. lauksaimniecība, zvejniecība, mežu industrija, tūrisms un lauku attīstībai;
2. rūpniecības un pakalpojumu nozarēm;
3. perifērijas efekta novēršanai;
4. darba resursu vajadzībām.

Pati Īrijas valsts saprot, ka bez iestāšanās ES tās attīstība nebūtu tik veiksmīga, bet te ir jāmin lieliskā valdības spēja tādai perifērai valstij spēt apgūt un piesaistīt ES fondu līdzekļus un tos veiksmīgi arī ieguldīt valsts kopējā attīstībā. Lielākā daļa no tiem bija paredzēti ES kopīgās lauksaimniecības politikas realizēšanai, kas valsts attīstībai nāca par labu (Ireland Agriculture, Ireland Republic Department of Agriculture oficiālā interneta mājas lapa). Kopumā dalība ES Īrijai ir devusi investīciju un kapitāla plūsmu pieaugumu, jaunas darba vietas, lielāku stabilitāti un līdz ar to augstāku labklājību.

Analizējot Īrijas valsts veiksmīgās ekonomikas augšupeju jau vairāk kā 20 gadu laikā, var izšķirt vairākus ārējos un iekšējos pamatiemeslus valsts attīstībai. Starp tiem ir minama arī dalība ES un tās sniegto fondu finansējuma iespēju apguve. Valsts veiksmīgi izmantotās attīstības iespējas un valdības rīcība ES fondu apguvē pierāda, ka tālākminētie iemesli ir bijuši kā pamats valsts augšupejai un savas pozīcijas nostiprināšanai, kā arī nodrošināšanai mūsdienās. Īru politiķis, ekonomists, Eiropas Komisijas loceklis un internacionālas bankas vadītājs Peter Sutherland ne vienu vien reizi publiski ir izteicis viedokli, ka: „Īrijas dalība ES bez šaubām ir vissvarīgākais būtiskākais iemesls Īru ekonomikas panākumiem nesenajā pagātnē. Tā ir robežu noņemšana un atkarības no Apvienotās Karalistes noņemšana, kas ir saistīta ar lielisku piekļuvi tirgiem" Sweeney P., 2008).

Valdības un aģentūru intensīvā darbība, viedokļu pamatojums un spēja piesaistīt papildus līdzekļus no ES fondiem, sniedza valstij ievērojamu attīstības lēcienu, it īpaši infrastruktūras un apmācību jomās (Clinch P., Convery F., Walsh B., 2002). Īrijas valsts īsteno un saprot arī to, ka izolēta struktūrfondu izmantošana un finansu apguve nenodrošina izaugsmi ekonomikā. Tam visam paralēli ir jāīsteno atbilstoša valsts ekonomiskā un sektorālā politika, jāveido efektīvas institucionālās un administratīvās struktūras, kas arī sekmē fondu piešķirto finanšu līdzekļu racionālu izmantošanu.

ES fondu finansējuma apguvē Īrijas ekonomikas jomas speciālistu viedokļi dalās – daļa analītiķu uzskata, ka ES finansējums daļēji tika izniekots ieguldot to sociālajā sfērā, tai vietā, lai līdzekļus ieguldītu infrastruktūras attīstībā, kas mūsdienās joprojām vēl nav pilnīga (Sweeney P., 2008). Jāpiebilst, ka salīdzinājumā ar Latvijas esošo infrastruktūru, Īrijas valsts paveiktais ir krietni augstāk, nekā Latvijā.

Nodarbinātības pieaugums un zemais bezdarba līmenis radīja situāciju, kad Īrijas iedzīvotāju populācijas piramīda vairs nebija normāla – vidū tā bija ļoti šaura, kas nozīmēja, ka valstī trūka darbaspējīgā vecuma iedzīvotāju (Sweeney P., 2008). Esošā reālā situācija bija kā sekas Īrijas valsts laika posmam, kad tā piedzīvoja strauju un graujošu migrācijas vilni deviņpadsmitā gadsimta septiņdesmitajos gados. Vairumā emigrēja talantīgie, darbspējīgie un strādāt gribošie iedzīvotāji, bet palikušie pārsvarā bija zemas kvalifikācijas iedzīvotāji. Pēc 1980. gada situācija strauji mainījās – jauniešiem tika sniegta labāka izglītība, valsts pievērsa uzmanību izglītības jomas finansēm, tās palielinot un nostiprinot izglītības kvalitāti, piedāvājot labākas iespējas (materiālā bāze, pedagogu atalgojums utt.) tās iegūšanai (Sweeney P., 2008). Šo jautājumu risināšanā veiksmīgi tika izmantots ES fondu finansējums iedzīvotāju pārkvalifikācijai un/vai kvalifikācijas celšanai. Līdz ar to tika panākta iespēja iedzīvotājiem paaugstināt zināšanu un prasmju līmeni, kā arī sniegt daudz kvalitatīvāku pamatizglītību jauniešiem. Mērķtiecīgas politikas rezultātā Īrijā 2004. gadā izglītības līmenis bija augstāks nekā vidēji ES.

Valsts attīstība, sociālās garantijas, iespējas un stabilitāte deva iespēju un interesi atgriezties daudziem iedzīvotājiem, kas bija emigrējuši uz citām valstīm. Tāpat arī atvērtais valsts darba tirgus palīdzēja izlīdzināt populācijas piramīdas negatīvās novirzes. Elastīgais darba tirgus, labas kvalitātes nodrošinājums un relatīvi lētais darbaspēks piesaistīja daudzus pašmāju un ārvalstu investorus (Clinch P., Convery F., Walsh B., 2002). Izglītības sistēmas reformas Īrijas valstij ir devušas iespēju arī nākotnē saglabāt savas attīstības līmeni un celt kopējo dzīves kvalitāti. Īrijā atzīts un respektējamais ekonomikas zinātņu pārstāvis, analītiķis, vairāku ekonomikas un sociālās jomas zinātniski analītisko grāmatu autors Paul Sweeney uzskata, ka viens no svarīgākajiem valsts attīstības veicinātājiem ir visu izglītības līmeņu (pamata, vidējās, augstākās, aroda utt.) kvalitāte un izglītībai kā tādai ir jābūt vienai no valsts svarīgākajām prioritātēm – „Izglītībā jāinvestē pēc iespējas lielāki resursi – gan finansiālie, gan cilvēciskie – tikai tad Īrija spēs saglabāt savu ekonomisko, sociālo un kultūras veiksmi un to pilnībā nodrošināt saviem cilvēkiem arī nākotnē" (Sweeney P., 2008).

Īrijas attīstība ir visveiksmīgākais piemērs starp ES dalībvalstīm: pievienošanās brīdī 1973. gadā tās iekšzemes kopprodukta līmenis uz vienu iedzīvotāju bija tikai aptuveni 60% no ES vidējā līmeņa, 1990. gadā šis rādītājs pieauga līdz 75% un vēl pēc desmit gadiem jau pārsniedza ES vidējo līmeni par 20%. Jāņem vērā, ka Īrijas ekonomika ir būtiski atkarīga no pasaules tirgus svārstībām, un vairāk kā citas Eiropas valstis to ietekmē arī situācija ASV tirgos. Tādējādi Īrijai nav izdevies izvairīties no

3.tabula
Table 3

Financing of the EU Structural Funds, including per capita, in Latvia and Ireland, EUR
ES struktūrfondu finansējums, tai skaitā uz vienu iedzīvotāju, Latvijā un Īrijā, EUR

	Latvija (Latvia)	Īrija (Ireland)
ES struktūrfondu finansējuma piešķīruma periods (gados) (EU Structural Funds grant period (years))	3	7
Platība km^2 (Area km^2)	64 589	70 300
Iedzīvotāju skaits (2007.gads) (Population (in 2007))	2 275 500	4 339 000
ES struktūrfondu finansējums plānošanas periodā (EUR) (EU Structural Funds programming period (EUR))	625 568 826	901 000 000
ES struktūrfondu finansējums vidēji vienā gadā (EUR) (EU Structural Funds on average per year (EUR))	208 522 942	128 714 286
ES struktūrfondu finansējums vidēji uz vienu iedzīvotāju (EUR) (EU Structural Funds on average per capita (EUR))	274.91	207.65

Avots: EUROSTAT dati un autoru aprēķins

ekonomikas attīstības tempu krituma. Piemēram, laika periodā no 2000. gada līdz 2005. gadam un 2008. gadā ir vērojams Īrijas IKP pieauguma tempu samazinājums (Central Statistic Office, 2009).

IKP pieauguma nodrošināšanā nozīmīgākas nozares ir rūpniecība, komercpakalpojumi un finanses, tirdzniecība, transporta un sakaru pakalpojumi. Īrijas panākumu svarīgais ārējais elements ir līdzdalība ES, kas labi pastiprināja konkurenci, paplašināja tirgus jomas un sekmēja efektivitātes pieaugumu. Pie tam Īrijai jau kādu laiku ir priviliģētais statuss ES. Pēdējās programmu ietvaros Īrija pēc 1989. gada saņēma ievērojamus līdzekļus, kuri pieturēja pieprasījumu un atviegloja adaptācijas procesu pie atvērtas konkurences. Šie papildus līdzekļi sekmēja valsts infrastruktūras attīstību un palielināja pievilcīgumu ārvalstu investoriem.

Dalība ES un ES struktūrfondu un Kohēzijas fonda līdzekļi, Vienotais tirgus un Vienlīdzīgas konkurences likums ir vislielākais finansiālais ieguvums Īrijai. Īrijas valsts piemērs parāda, ka jebkurai valstij, vai tā atrodas perifēri no Eiropas, pasaules centra vai pašā centrā, ir jābūt aktīvai darbībai, vēlmei attīstīt valsti ilgtspējīgā laika posmā, izmantojot jebkuru sniegto iespēju – valsts ārēju vai iekšēju. Svarīgi ir uzsvērt, ka Īrijas valdības, aģentūru un reģionu aktīvā darbība ir iemesls tam, ka valsts ir izmantojusi tai sniegtās iespējas un veiksmīgi tās realizē dzīvē. Dzīves kvalitātes uzlabošana ir atkarīga no produktivitātes pieauguma, t.i. – viena nodarbināta cilvēka ieguldījums vai arī rezultāts, kas tiek sasniegts vienas nostrādātas stundas laikā (Clinch P., Convery F., Walsh B., 2002). Jebkuram darbam un aktivitātei kā galvenā nozīme ir produktivitāte – svarīga ir produktivitātes pieauguma kā dzīves standarta determinanta nozīme, kas arī rada dzīves kvalitāti. Ir liela atšķirība vai produktivitāte pieaug par 1,5% vai 3% gadā. Pie zemākā pieauguma paies 46 gadi, lai dzīves kvalitātes standarti dubultotos, bet pie augstākā – 23 gadi (kā to pierāda Īrijas valsts piemērs). Valsts, kurā ir zems produktivitātes līmenis, piedzīvos arī zemu dzīves kvalitātes standartu. Kā galvenie mūsdienu produktivitātes faktori minami – labi izglītots un adaptēties spējīgs darbaspēks, kas strādā ar jaunajām tehnoloģijām, modernu fizisko infrastruktūru (iekārtas, ēkas) un inovācijas, zinātniskie, tehnoloģiskie pētījumi, ražošanas izpēte un attīstība. Īrijas piemērs uzskatāmi pierāda, ka emigrācija arī nav vienmēr slikts faktors. Aizbraukušie iedzīvotāji ārzemēs izglītojas, gūst labu pieredzi un atgriežas ar daudz lielāku kapacitāti. Latvijas valstij būtu vairāk jāvelta uzmanība emigrējošo iedzīvotāju atgriešanai uz dzimteni, jo to īpatsvars un 2009. gada straujas emigrācijas vilnis pierāda, ka tas ir nozīmīgi liels emigrējošo iedzīvotāju skaits valsts attīstībai un izaugsmes iespējām nākotnē. Produktivitāte saistās arī ar atvērtību jaunām idejām, jaunām pieejām darbībā, tas ir būtiski, it īpaši, ja jāsaglabā produktivitātes un pieauguma līmenis.

Vairums Īrijas republikas politiķu un valsts attīstības jomas pētnieku, zinātnieku un akadēmiķu atzīst, ka viens no noteicošajiem Īrijas attīstības aspektiem ir bijusi mērķtiecīga ES fondu finansējuma ieguldīšana cilvēkresursos. Salīdzinot ar citām struktūrfondu saņēmējvalstīm, kas cilvēkresursos ieguldījušas vidēji 20% no kopējā finansējuma, Īrija ieguldījusi vidēji 35%. Īrijā īstenotā izglītības attīstības un nodarbinātības veicināšanas programma ir bijusi balstīta uz diviem pamatprincipiem:

- izglītībai ir jāatbilst tautsaimniecības prasībām, un tai jāsagatavo kvalificēti cilvēkresursi aktuālajām tirgus nepieciešamībām;
- finansējumam ir jābūt pieejamam pēc iespējas vienkāršāk (Janova K., 2003)

Autores ir apskatījušas arī abu valstu ES struktūrfondu ieguldījumu vienā gadā un uz vienu

iedzīvotāju 2000.-2006. gada plānošanas periodā, kurš Īrijai bija 7 gadi, bet Latvijas gadījumā tie bija 3 gadi.

Analizējot 3.tabulu redzams, ka gan platības, gan iedzīvotāju skaita, gan arī ES struktūrfondu finansējuma ziņā Latvijai ir mazāki rādītāji, taču aprēķinot ES struktūrfondu finansējums vidēji uz vienu iedzīvotāju redzam, ka Latvijas gadījumā finansējums ir par 67.26 EUR lielāks nekā Īrijas gadījumā.

Kopvērtējumā secināms, ka viens no veiksmīgākajiem piemēriem, kas ilustrē ES fondu darbības principu, ir Īrija. Tā ir viena no lielākajām ES fondu finansējuma saņēmējām. Jāatzīmē, ka savulaik tā bija nabadzīga ES valsts, bet šobrīd tās attīstības līmenis pārsniedz ES vidējo. ES fondi noteikti ir nospēlējuši savu lomu šajā procesā. Tomēr ir skaidri redzama liela starpība vislielāko fondu saņēmējvalstu ekonomiskajā izaugsmē - piemēram, Grieķijas attīstības līmenis neapstiprina cerības, kas tika liktas uz ES fondu pozitīvo lomu. Tas liek secināt, ka šķietami par brīvu ienākošā nauda automātiski nenodrošina ātrāku ekonomisko izaugsmi. Turklāt izturēšanās pret šiem fondiem, kā pret finansu dāvinājumu, brīvas, vieglas naudas saņemšanas iespēju, ir vislielākā iespējamā kļūda. Svarīgs faktors ir katras valsts finansējuma novirzīšanas jomas un pasākumu izvēlē. Piemēram, Īrija izteikti atšķīrās no Grieķijas, Spānijas un Portugāles savā prioritāšu noteikšanā, izmantojot ES fondu pieejamo finansējumu. Ievērojama ES naudas daļa – aptuveni trešā daļa – Īrijā tika virzīta cilvēkresursu attīstīšanas projektiem. Citās valstīs šai prioritātei tika izdalīts mazāk par ceturtdaļu no ES fondiem, tā vietā izceļot investīcijas fiziskajā infrastruktūrā.

Salīdzinot Latvijas un Īrijas pieredzi ekonomiskās izaugsmes attīstības jomā, ir redzams, ka Latvija ir darbojusies vairāk vienkārši eksperimentējot, nevis ieskatoties citu, līdzīgas situācijas, valstu pieredzē, nesaistot kopā politiskos, sociālos, ekonomiskos un reģionālos mērķus, ņemot vērā arī to, ka tie vienmēr krasi mainījās ieejot politiskās vides vadībā jaunam politiskajam spēkam. Līdz ar to uz doto brīdi Latviju var salīdzināt ar Īriju, kad tā bija līdzīgā situācijā vairāk kā pirms 25 gadiem. Latvijas valsti no neatkarības atgūšanas līdz šim brīdim var izšķirt kā vienu attīstības posmu, kas diemžēl nevis rada valsts augšupeju, bet tieši otrādi – daudzu bijušo valdību pieņemtie lēmumi, kuri valsts ekonomiskas attīstībai nav bijuši ilgtermiņā labvēlīgi, rada reālus draudus valsts ekonomiskajai sistēmai, kas var novest līdz pilnīgam valsts sabrukumam. Lai izveidotu labu politisko, ekonomikas un reģionālo attīstības sistēmu, tā nav obligāti jāpārmanto – Latvijai bija pietiekami daudz laika, iespēju un piemēru, lai attīstītu valsti un radītu labvēlīgus apstākļus tās ilglaicīgai augšupejai. Ņemot vērā ES perifērās valsts Īrijas pieredzi, Latvijai ir iespēja salīdzināt savu situāciju un valdības lēmumus valsts attīstības jomā, tādējādi izvērtējot līdzīgas valsts galvenos attīstības pamatiemeslus un analizējot pieļautās kļūdas. Īrijas valsts attīstības paraugs dod iespēju Latvijas valstij izveidot maksimāli efektīvus valsts ekonomikas tālākattīstības darbības virzienus, pamatnostādnes un plānus, kas sekmētu pastāvīgu valsts attīstības augšupeju.

Secinājumi
Conclusions

1. ES fondu līdzekļi ir pozitīvs ieguvums Latvijai. Tomēr struktūrfondu apguves kvalitāte Latvijā ir vērtējama kā zema un mazefektīva – ir novērojama būtiska finansējuma daļas bezmērķīga un bezrezultatīva aizplūšana. Līdz šim Latvijā ES strukturālo fondu līdzekļi nav sasnieguši savu mērķi. Tie nav mazinājuši atšķirību starp reģioniem un Rīgu. Tieši pretēji: ļoti strauja attīstība notiek Rīgā, bet Latvijas reģionu iedzīvotāju cerības uz dzīves līmeņa pieaugumu nav attaisnojušās.
2. ES fondiem Latvijā ir bijusi pozitīva ietekme uz galvenajiem rādītājiem, piemēram, ražīgumu un IKP 2004.-2006. gada programmēšanas periodā, kā arī, ka ir paredzama pozitīva ietekme arī 2007.-2013. gada programmēšanas periodā.
3. ES struktūrfondu palīdzība Latvijā būtu jāpiešķir, pamatojoties uz reģionālo dalījumu. Finansējums būtu jāparedz procentuāli atsevišķiem reģioniem pa gadiem, pamatojoties uz tādiem rādītajiem kā IKP uz vienu iedzīvotāju, iedzīvotāju skaits reģionā, nodarbinātības un bezdarba līmenis, teritoriju attīstības indekss u.c. Savukārt, ja, kāds reģions attiecīgā gada beigās nav spējis pilnā apmērā apgūt tam paredzētos struktūrfondu līdzekļus, pārpalikums varētu tikt attiecīgi sadalīts nacionālās valsts pārējiem reģioniem, kuri aktīvāk izmantojuši līdzekļus.
4. Īrija ir viena no ekonomiski attīstītākajām, industriālajām, uz tirdzniecību orientētajām valstīm, kura līdz šim ir visveiksmīgāk spējusi izmantot ES strukturālo fondu līdzekļus.
5. Latvija no Īrijas valsts darbības un attīstības pieredzes varētu mācīties kā atgūties no ekonomiskās krīzes un gūt labumu no ES, kā produktīvāk un lietderīgāk izmantot esošos resursus un pieejamo ekonomisko potenciālu, to pēc iespējas vairāk attīstot un pielietojot ar tālejošām attīstības sekām nākotnē un veidot ciešāku sadarbību starp valsts iestādēm – darba devējiem un darba ņēmējiem.
6. Īrijas valsts piemērs pierāda, ka jebkurai valstij, vai tā atrodas perifēri no Eiropas, pasaules centra vai pašā centrā, ir jābūt aktīvai darbībai, vēlmei attīstīt valsti ilgtspējīgā laika posmā, izmantojot jebkuru sniegto iespēju – valsts ārēju vai iekšēju.

Priekšlikums
Proposals

Šķietami par brīvu ienākošā nauda no ES fondiem automātiski nenodrošina ātrāku ekonomisko izaugsmi. Turklāt izturēšanās pret šiem fondiem, kā pret finansu dāvinājumu, brīvas, vieglas naudas saņemšanas iespēju, ir vislielākā iespējamā kļūda. Svarīgs faktors ir katras valsts

finansējuma novirzīšanas jomas un pasākumu izvēlē. Piemēram, Īrija izteikti atšķīrās no citām lielvalstīm savā prioritāšu noteikšanā, izmantojot ES fondu pieejamo finansējumu – novirzot finansējumu cilvēkresursu attīstīšanas projektiem. Tajā pat laikā lielākā daļa pārējo ES dalībvalstu kā prioritāti bija noteikušas fizisko infrastruktūru attīstību. Rezultāti liecina, ka Īrijas valsts lēmums ir nesis daudz vairāk veiksmīgu un tālejošu seku. Latvijai, ieguldot cilvēkresursos, ir iespēja mazināt iedzīvotāju emigrāciju no valsts. Ieguldījums cilvēkresursos sniedz arī lielākas, kvalitatīvākas zināšanas un iespējas iedzīvotājiem iegūt darbu, uzsākt uzņēmējdarbību, kļūt sociāli aktīviem, kas pakāpeniski mazinātu valstī esošās sociālekonomiskās problēmas.

Ņemot vērā ES perifērās valsts Īrijas pieredzi, Latvijai ir iespēja salīdzināt savu situāciju un valdības lēmumus valsts attīstības jomā, tādējādi izvērtējot līdzīgas valsts galvenos attīstības pamatiemeslus un analizējot pieļautās kļūdas. Īrijas valsts attīstības paraugs dod iespēju Latvijas valstij izveidot maksimāli efektīvus valsts ekonomikas tālākattīstības darbības virzienus, pamatnostādnes un plānus, kas sekmētu pastāvīgu valsts attīstības augšupeju.

Lai maksimāli veicinātu visu struktūrfondu izmantošanu, 2006. gadā tika rasti risinājumi vairākiem struktūrfondu apguvi kavējošiem faktoriem, kurus varēja piemērot vēl 2004.-2006. gada struktūrfondu projektos. Taču šis darbs ir jāturpina, lai novērstu pamanītās nepilnības un neizveidotu jaunas barjeras projektu izvērtēšanai ES fondu plānošanas periodā 2007.-2013. gadā.

Izmantotā literatūra
Bibliography

1. Agriculture in Ireland, Īrijas republikas lauksaimniecības jomas vispārējas apraksts. Available at: www.library.lousville.edu/government/subjects/agriculture.html. Viewed on Decembe 13, 2008.
2. Alašejeva J. (2003), Īrijas skola – kā vislabāk izmantot Es naudu?, Pieejams: http://www.politika.lv/temas/7197/. Skatīts 2009. gada 17. septembrī.
3. Andiņš I. (2002), Zaļās salas zilzaļie brīnumi IV, Pieejams: http://www.impro.lv/?selected=articles&artId=ZALJASALA3&referer=CPIRIJA. Skatīts 2008. gada 18. oktobrī.
4. Kalniņa, I., Sebre, A., Grūberte, D. (2001) *ES reģionālā politika un strukturālie instrumenti*. (2001) Rīga, A/S „McĀbols", 5.lpp.
5. Hajoš, B., Kissiov, V., Martikonis, R., Marton, I. and Šulca, I. (2002) "The Future of the European Integration Process: Ideas and Concepts of Candidate Countries", Centre for European Integration Studies, Rheinische Friedrich Wilhelms – Universität Bonn, Discussion Paper C 107, 2002, 43-44; P.46.
6. Brizga, J. (2007) ES struktūrfondi – palīgs vai drauds Latvijas ilgtspējīgai attīstībai? Rīga, 2 lpp., Pieejams: http://www.politika.lv/index.php?id=2996. Skatīts 2008. gada 4. oktobrī.
7. Bikse V. (2009) Latvijas progress uzņēmējdarbības izglītības attīstībā pēc iestājas Eiropas Savienībā, Eiropas Komisijas pārstāvniecība Latvijā, 2009, 47 lpp., Pieejams: http://www.politika.lv/temas/fwd_eiropa/17406/. Skatīts: 2009. gada 26. jūlijā.
8. Brizga J. (2005) Latvijas Attīstības plāna ilgtspējīgas attīstības novērtējums. Sabiedriskās politikas centrs PROVIDUS. Pasaules dabas fonds. – Rīga, 2005 - 95.lpp
9. Biedrība "Baltijas starptautiskais ekonomikas politikas studiju centrs", SIA "Baltijas Konsultācijas" (2008) ES fondu makroekonomiskās ietekmes izvērtējums. Otrā posma ziņojums, 2008., Rīga, 20 lpp, 16.-17.lpp. Pieejams: http://www.esfondi.lv/upload/01-strukturfondi/petijumi/27072007-30062008_2_Makroek.iet.izv..pdf. Skatīts: 2009. gada 27. oktobrī
10. Clinch P., Convery F., Walsh B. (2002) After the Celtic Tiger. Challenges Ahead. Dublin: The O'Brien press, 2002. – 29., 30., 43.pp., 207.p.
11. Sweeney P. (2008) Irelands Economic Success, Reasons and Lessons. Dublin: New Island, 2008. – pp. 108., 115., 134., 140.
12. Ireland Agriculture, Ireland Republic Department of Agriculture, Available at: www.agriculture.gov.ie. Viewed on December 13, 2008.
13. Janova K. (2003) Kā ieguldīsim ES fondu 4 miljardus? Pieejams: http://www.politika.lv/temas/fwd_eiropa/9082/. Skatīts: 2009. gada 17. septembrī.
14. Jermolejeva E., Zelča S., Baltere.R. (2008) Eiropas Savienības ietekme uz reģionu ilgtspējīgu attīstību. LZP Ekonomikas, juridiskās un vēstures galvenie pētījumu virzieni 2008.gadā, Nr.14 - Rīga, 2008. 67-72 pp., 233.p.
15. Keišs S., Tilta E., Kazinovskis A., Zariņa V., Medne A., Reģionalizācija un tās loma līdzsvarotā administratīvi teritoriālā attīstībā Latvijā. LZP Ekonomikas un juridiskās zinātnes galvenie pētījumu virzieni 2006.gadā: Nr.12. – Rīga: LZP Ekonomikas un juridiskās zinātnes ekspertu komisija, 2007. – 68.-75.lpp. ISSN 1691-290X.
16. Keišs S., Tilta E., Zariņa V., Jesemčika A., Medne A., Kazinovskis A., Balode G. (2008) Reģionalizācija un tās loma līdzsvarotā administratīvi teritoriālā attīstībā Latvijā. LZP Ekonomikas, juridiskās un vēstures zinātnes galvenie pētījumu virzieni 2008 gadā Nr. 14 – Rīga, Tautsaimniecības attīstības institūts, Tipogrāfija P&Ko, 2008 – 85-92 lpp., 232.lpp
17. Eiropas Savienības informācijas aģentūra (2007) Mēs Eiropā!, Rīga. 2007. ISBN 978-9984-39-262-2, 55.lpp.
18. Par Īrijas veiksmēm, Latvijas izredzēm. Latvijas Vēstnesis, 18.02.2003. B6.lpp
19. Tirgus un sabiedriskās domas pētījumu centrs SKDS (2008) Sabiedrības informētība par Eiropas Savienības fondu līdzekļu apguvi Latvijā. Latvijas iedzīvotāju aptauju datu analīze 2008.gada decembris, Rīga. 64 lpp.

Pieejams: http://esfondi.lv/upload/01-strukturfondi/petijumi/SKDS_rezultati_12-2008.pdf. Skatīts: 2009. gada 10. oktobrī
20. Saktiņa D. (2008) Sociāli ekonomiskās attīstības izvērtējums klasifikācijā noteiktajos atšķirīgo lauku tipu reģionos, ES atbalsta pasākumu ietekmes izvērtējums, klasifikācijas pilnveidošana lauku politikas īstenošanas vajadzībām. LZP Ekonomikas, juridiskās un vēstures zinātnes galvenie pētījumu virzieni 2008.gadā Nr. 14 – Rīga: Tautsaimniecības attīstības institūts, Tipogrāfija P&Ko, 2008 - 125-126.lpp, 232.lpp.
21. Sweeney P. (2008) Irelands Economic Success, Reasons and Lessons. Dublin: New Island, 2008. – 13.lpp., .p 233.
22. Vaidere I., Vanags E., Vanags I., Vilka I. (2008) Regional Policy and Develpoment of Local Government in Latvia and the European Union. – Rīga, 2008 – 61.lpp, 326.p.
23. Vaidere I., Vanags E., Vanags I., Vilka I. (2006) Reģionālā politika un pašvaldību attīstība Eiropas Savienība un Latvijā. – Rīga: Latvijas Universitātes Akadēmiskais apgāds, Latvijas Statistikas Institūts, 2006 – 56.lpp, 295.lpp
24. Central Statistic Office (2009) National Income – Gross Product, Available at: www.cso.ie/statistics/nationalingp.htm. Viewed on October 18, 2008.
25. Finanšu ministrija (2009). Saskaņā ar Finanšu ministrijas sniegtajiem datiem par Eiropas Savienības budžetā iemaksāto un no Eiropas Savienības budžeta saņemto līdzekļu apjomu – Pieejams: http://www.fm.gov.lv/?lat/eiropas_savieniba/es_budzets/. Skatīts: 2009. gada 8. septembrī.
26. http://www.eubusiness.com/Social/scroller_newstic.html, skatīts 15.06.09.

Kopsavilkums

Latvijai kā Eiropas Savienības (ES) dalībvalstij piecu gadu laikā ir bijuši pieejami ievērojami ES politiku finanšu instrumentu līdzekļi, kas šī brīža sarežģītajos tautsaimniecības apstākļos turpina veicināt valsts attīstību un izaugsmi. Arī laika periodā no 2009. līdz 2015. gadam Latvijai ir ieplānots nozīmīgs ES budžeta atbalsts, kurš nākamajos gados turpinās nonākt valsts ekonomikā. Latvijas spēja apgūt šo finansējumu un novirzīt to attīstībai nozīmīgākajām nozarēm reģionos ir kā stūrakmens sekmīgai valsts attīstībai.

Īrija ir viena no ekonomiski attīstītākajām, industriālajām, uz tirdzniecību orientētajām valstīm, kura līdz šim ir visveiksmīgāk spējusi izmantot ES struktūrfondu līdzekļus. Saņemtie līdzekļi no ES palīdzības fondiem ir ievērojami veicinājuši valsts ekonomisko izaugsmi. Ņemot vērā ES perifērās valsts Īrijas pieredzi, Latvijai ir iespēja salīdzināt savu situāciju un valdības lēmumus valsts attīstības jomā, tādējādi izvērtējot līdzīgas valsts galvenos attīstības pamatiemeslus un analizējot pieļautās kļūdas. Īrijas valsts attīstības paraugs dod iespēju Latvijas valstij izveidot maksimāli efektīvus valsts ekonomikas tālākattīstības darbības virzienus, pamatnostādnes un plānus, kas sekmētu pastāvīgu valsts attīstības augšupeju. Salīdzinot Latvijas pieredzi ekonomiskās izaugsmes attīstības jomā, ir redzams, ka Latvija ir darbojusies vairāk vienkārši eksperimentējot, nevis ieskatoties citu, līdzīgas situācijas, valstu pieredzē, nesaistot kopā politiskos, sociālos, ekonomiskos un reģionālos mērķus, ņemot vērā arī to, ka tie vienmēr krasi mainījās ieejot politiskās vides vadībā jaunam politiskajam spēkam.

Daudzos, ar struktūrfondiem saistītajos dokumentos, ir uzsvērts, ka ES struktūrfondu mērķis ir novērst reģionālās un sociālās nevienlīdzības starp ES dalībvalstīm un to reģioniem un uzlabot ekonomisko un sociālo kohēziju visā Eiropā. Neapšaubāmi, šie līdzekļi ir liels ieguvums Latvijai un tie var būtiski veicināt valsts attīstību. Reālā Latvijas šī brīža situācija uzrāda, ka būtiski jāpievērš īpaša uzmanība faktam, ka liels finansējums arī rada risku un ka šo līdzekļu neadekvāta izmantošana var tikai veicināt reģionālo nevienlīdzību, sociālo izstumtību, vides degradāciju un korupciju.

Atslēgas vārdi: Struktūrfondi, finansējums, aktivitāte, teritoriju attīstība, reģionālā vienlīdzība.

Priorities of the European Union Structural Funds in Zemgale Region (Latvia)

Līga Jankova, Ms.paed., PhD student, Latvia University of Agriculture
Irina Pilvere, Dr.oec., professor, Latvia University of Agriculture

Abstract. Starting from May 1, 2004 Latvia as one of the EU member states has received the possibility to use the European Union (EU) Structural Funds (SF) for equalisation of regional disparities. The research focuses on the analysis of Structural Funds uptaking in Latvia for the period of 2004-2006, when Latvia received public financing from the Structural Funds amounting to LVL 462 million, of which Zemgale region received 11%. The research provides the assessment of the main regulatory enactments and characteristics of the five strategic priorities prescribed by the SF. The research dwells upon the evaluation of financing attracted through the SF priorities, number of implemented projects, and operating efficiency in Latvia and Zemgale as one of the central regions of Latvia. Totally 7571 projects have been implemented in Latvia, of which 13% in Zemgale. The largest number of projects has been implemented in Priority 4 (Promotion of Development of Rural Areas and Fisheries) – 50% in Latvia, while 75% of total number of projects have been implemented in Zemgale. The authors have chosen 3 main indicators to determine the operating efficiency of Structural Funds. The authors have calculated the actual use of the SF public financing per 1000 inhabitants, 1000 economically active enterprises and LVL 1000 of Gross Domestic Product (GDP) for the period of 2004-2006.
Key words: EU Structural Funds, priorities, financing, projects.

Introduction

Since regaining the second independence in 1991, the key strategic goal for Latvia has been to join the European Union. The goal was achieved in 2004; hence it has also been a time of challenges for Latvia. The EU Structural Funds have promoted a rapid economic growth in Latvia, yet at the same they have revealed low efficiency of individual economic sectors. Presently the first programming period (2004-2006) for uptaking financing from the EU Structural Funds has been completed; the experience in attraction and uptaking of the SF financing has been mastered through investments. The final evaluation on the use of funding requires studies for the assessment of the SF financing operating efficiency for the planning period of 2004-2006 and in individual regions. Such an assessment is essential for improvement of the use of Structural Funds in the period of 2007-2013 and in future.

Several authors have studied the significance of the SF uptaking in Latvia as means for the economic growth: in 2003 E. Dubra and other authors concluded that the main goal of structural policy was the reduction of economic dissimilarities between different countries and regions. In 2009 evaluating the dynamics of non-financial investments in Latvia between 1997 and 2006, she specified that the accession of Latvia to the EU in 2004 had become one of the most fundamental incentives for Latvian enterprises to attract investments. Recently the amount invested in the national economy of Latvia has been by 26.4% larger compared with 2003. Also in 2005 and 2006 the increase of the amount of non-financial investments has been quite fast. Since the accession of Latvia to the EU, the average annual real growth rate of non-financial investments has equalled to 18.1%, thus indicating on high entrepreneurial activity in investment attraction, which still remains against the background of a recent fast economic growth (Dubra, 2009). I. Slavinska (2005) emphasises that when attracting the EU investments and credits it is necessary to create an attractive space of living, thus arousing wish to live in the countryside not only for the present rural population, but also arousing interest of urban population to move to rural areas. R. Zvirgzdiņa (2007) underlines that the EU support facilitates structural changes in the national economy and helps reduce social and economic disproportions. I. Pilvere (2007) indicates that during the period of 2003-2005, positive changes were observed in the agricultural efficiency and development describing indicators. Some indicators, for instance, value added in agriculture and the average monthly wage for the employed in agriculture has increased more rapid compared with the average respective indicators of the national economy in Latvia.

V. Tetere and I. Pilvere (2007) point out that the uptaking of SF financing is quite successful; although the activity of beneficiaries differs by regions. V. Tetere (2009) concludes that since Latvia is an EU member state the amount of investments has been one of the largest in the EU; although the amount of investments per capita is one of the lowest indicators with an increasing tendency. Investments constitute approximately 35% of Latvia's GDP, which is a high indicator. With the attraction of SF financing, entrepreneurs took the possibility to use the financing for company development: introduction of new technologies, creation of new jobs, and training of employees. On a state scale the SF financing helped develop infrastructure.

The use of the EU Structural Funds has been studied also in other new EU member states, for instance, Poland – P. Mickievicz (2007), J.J. Sienkiewicz (2009), A. Zawojska (2009), M.Marciniak (2009) etc., Lithuania – W.H. Meyers, N. Kazlauskiene, R. Naujokiene, I. Kriščiukaitiene (2006), E.Ribašauskiene, E.Kairyte, W.H.Meyers (2007), and Hungary – T.Mizik (2007).

Consequently the following research **aim** was set: to analyse the uptaking of the EU Structural Funds in Zemgale region by priorities in comparison with aggregate indicators of Latvia for the period of 2004-2006.

The research **hypothesis:** the uptaking of the EU Structural Funds financing in Zemgale region differs by target priorities.

The following **tasks** are advanced to achieve the set aim:

1) to summarise the information on regulatory enactments prescribing the introduction of the EU Structural Funds in Latvia;
2) to analyse the key priorities of the Structural Funds in Latvia for the period of 2004-2006;
3) to study indicators characterising the introduction of the SF in Zemgale region and compare these indicators with the aggregate indicators for Latvia;
4) to assess the operating efficiency of the EU Structural Funds.

The following methods were used for the purpose of the research: monographic, graphic, logically constructive, method of analysis and synthesis, method of deduction and induction, document analysis method, and methods of information grouping and structuring.

The information was analysed in compliance with NUTS III classification applied by the Central Statistical Bureau (CSB) of the Republic of Latvia thus dividing Latvia into 6 statistical regions – **Riga** region (covering the city of Riga), **Pierīga region** (Jūrmala, districts of Limbaži, Ogre, Riga, and Tukums), **Vidzeme region** (districts of Alūksne, Cēsis, Gulbene, Madona, Valka, and Valmiera), **Kurzeme region** (Liepāja, Ventspils and districts of Liepāja, Kuldīga, Saldus, Talsi, and Ventspils), **Zemgale region** (Jelgava, districts of Aizkraukle, Bauska, Dobele, Jelgava, and Jēkabpils), and **Latgale region** (Daugavpils, Rēzekne and districts of Balvi, Daugavpils, Krāslava, Ludza, Preiļi, and Rēzekne) (LR CSP -b, 2008).

The authors have also analysed studies of other researchers as well as regulatory enactments, planning documents concerning the introduction of the Structural Funds and institutional reports on the implementation of the SF projects in Latvia for the period of 2004-2006.

Results and discussion

1. Regulatory enactments for the implementation of the EU Structural Funds in Latvia

The Single Programming Document (SPD), which was designed as a programming document for the European Union Structural Funds Objective 1 intervention in Latvia for programming period of 2004-2006 is the key document. Latvia is regarded as a single NUTS II region for this programming period. It means that the whole territory of Latvia was eligible for the Structural Funds support. The SPD envisaged four priorities of the EU Structural Funds, which were financed through four funds – European Regional Development Fund (ERDF), European Social Fund (ESF), European Agriculture Guaranty and Guidance Fund (EAGGF) – Guidance Part, and Financial Instrument for Fisheries Guidance (FIFG). In preparing the Single Programming Document Latvia has used the European Commission (EC) guidelines "The EU Structural Funds and their Coordination with the Cohesion Fund, Guidelines for Programmes in the Period 2000- 2006" as well as further indicative guidelines for the candidate countries. The SPD preparation process was marked by the principles of partnership, transparency, coherence, qualification, and additionality (VPD, 2003).

The analysis of Latvia's economic performance had identified the key challenges for enhancement of the economic growth through the Structural Funds financing. The following mid-term objectives were devised:

- promotion of Competitiveness and Employment;
- development of Human Resources;
- development of Infrastructure (VPD, 2003).

The Programme Complement (PC) defined provisions for the implementation of the Structural Funds programme in Latvia for the period of 2004-2006. The document determined five main strategic priorities. Each priority outlined dedicated areas of investment or measures to facilitate the implementation of the SPD objectives. In addition there were horizontal themes concerned with the information society, sustainable and regional development, and equality. These themes were ensured through the project selection criteria to enhance the harmonisation of the PC with the overall EU development objectives (PP, 2004).

Several national regulatory enactments were passed to ensure the legal framework for the introduction of European Union Structural Funds and to provide the management of European Union Structural Funds in compliance with the Council Regulation (EC) No. 1260/1999 of June 21, 1999. The primary enactments were as follows:

- the Cabinet Regulations No. 500 adopted on September 2, 2003 "On the Institutional System of European Union Structural Funds Management, Monitoring, Control and Evaluation". The regulations prescribe the following authorities for the management of Structural Funds: managing authority, paying authority, intermediary institutions, monitoring committee, and management committee as well as the regulations define the role of a beneficiary in the management of Structural Funds. The regulations determine three types for the introduction of Structural Funds – national programmes, aid schemes and open call projects;

- the Cabinet Order No. 573 adopted on September 10, 2003 "On Tasks for the Implementation of a System for the Management, Monitoring, Control and Evaluation of the European Union Structural Funds". The order determines the main tasks for the institutions and beneficiaries to ensure the implementation of a system for the management of the Structural Funds;
- the Cabinet Regulations No. 727 adopted on December 16, 2003 "Procedures by which Funds in the State Budget for the Implementation of Projects Financed by Structural Funds of the European Union shall be Planned and by which Payments shall be Transferred" prescribe the procedures for planning of the EU co-financing in the state budget, planning of the state budget financing and advance financing for the use of the state budget resources;
- the Cabinet Regulations No. 200 adopted on March 30, 2004 "Regulations Regarding Management of the European Union Structural Funds" prescribe the procedures for the EU Structural Funds management process, managing authority, paying authority, first level intermediary institutions, second level intermediary institutions, beneficiaries of the Structural Fund financing, monitoring and management committees as well as the rights and responsibilities of these persons and institutions. These regulations were in force up to July 1, 2006, when the law "Management of the European Union Structural Funds" became effective on January 1, 2006;
- on December 8, 2005 the law "Management of the European Union Structural Funds" (effective from January 1, 2006) was passed to specify the management of the Structural Funds in order to promote the efficient and transparent introduction of the European Union funds in Latvia, which complies with the principles of financial management.

2. Priorities of the Structural Funds in Latvia for 2004-2006

The SPD Programme Complement defines 5 priorities, which display the main courses for the Structural Funds financing.

Priority 1 "Promotion of Territorial Cohesion" was implemented with the ERDF support.

This priority related primarily to the promotion of regional development. Its measures were aimed to raise the quality of life, improving the attractiveness of Latvia's regions, thus promoting balanced development of the whole territory of Latvia. The priority included four support measures with the respective structure of financing:

- Improvement of Environmental Infrastructure and Promotion of Tourism (29% of total financing under this priority);
- Development of Accessibility and Transport System (46% of financing);
- Development of Information and Communication Technologies (10% of financing);
- Development of Healthcare, Education and Social Infrastructure (15% of financing) (PP, 2004).

Priority 2 "Promotion of Enterprise and Innovation" (financed from the ERDF).

In order to raise competitiveness of the national economy, it was decided to implement a targeted innovation policy; it meant the development of knowledge intensive sectors of economy and production of high value added goods and services in traditional sectors. Innovations are vitally important in all sectors of economy (agriculture, industry, transport, tourism and others) as well as for all types of commercial companies (microenterprises, small and medium commercial companies, large and trans-national commercial companies). In the case of Latvia, where the sector of high technologies is only on the development stage, technological growth in the traditional sectors of economy becomes especially important for the development and use of innovations on a large-scale thus resulting in increase of competitiveness and growth of value added. The Priority measures and structure of financing was as follows:

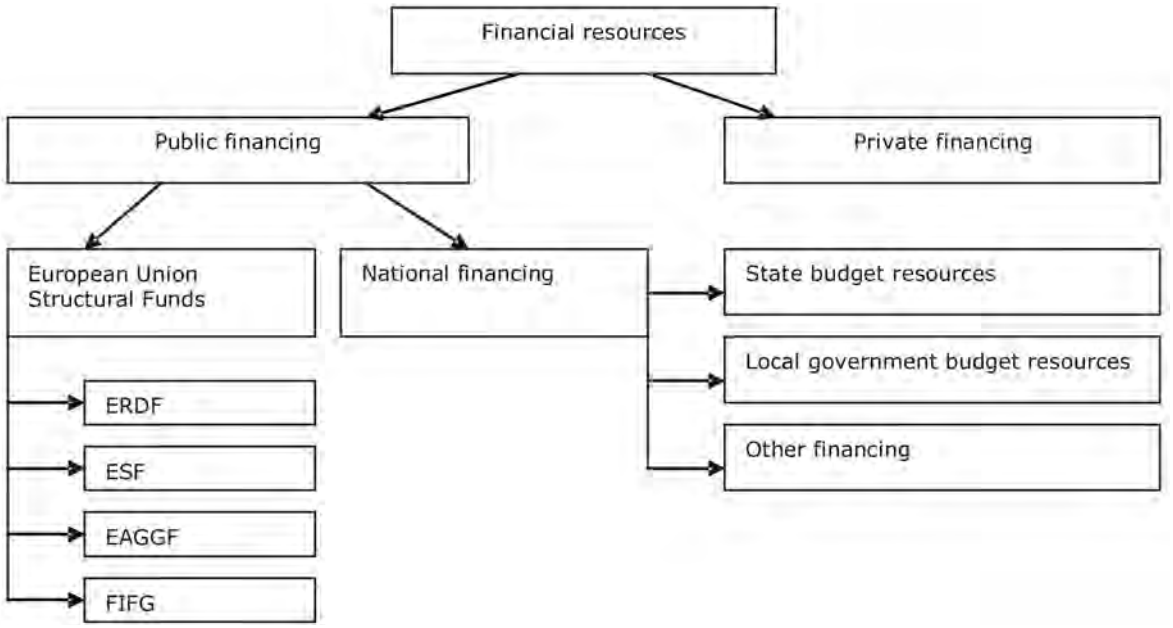
- Support to Public Research and Promotion of Transition towards Use of Innovation and Technologies in Enterprises (15% of total financing under this priority);
- Business Infrastructure Development (45% of total financing);
- Enhancing Support Measures for Increase of Business Competitiveness (15% of total financing);
- Accessibility of Business Financing (25% of total financing).

To maximise crossover opportunities these measures were closely coordinated with the ESF support measures (training, education) and with the EAGGF support measures (rural development, diversification of agriculture) (PP, 2004).

Priority 3 "Development of Human Resources and Promotion of Employment", which was implemented though the ESF support measures.

In order to ensure relevance of the qualification of the labour force with the development tendencies of the labour market and development of the national economy, Latvia had prioritised human resource development and employment as key factors enhancing economic growth and labour market competitiveness. Employment and education policy as an integral part of human resource development has to contribute to increase in productivity, entrepreneurial activity and enhance competitiveness and employability. The Priority measures and structure of financing was as follows:

- Promotion of Employment (43% of total financing under this priority);
- Development of Education and Continuing Training (38% of total financing);
- Combating Social Exclusion (19% of total financing) (PP, 2004).



Source: made by the authors according to the Cabinet Regulations of the Republic of Latvia No. 200, 2004

Figure 1. **Financial resources used in Latvia for the implementation of priorities, measures and activities included in the Programming Document for the period of 2004-2006**

Priority 4 "Promotion of Development of Rural Areas and Fisheries" using the financing from the EAGGF and the FIFG.

Rural and agricultural development problems were solved through modernisation of agricultural production, improvement of soil, increase of competitive processing of agricultural products, establishment of new jobs, effective use of natural resources, activation of rural inhabitants, and inclusion of young persons in agricultural production. Another part of priority was focused on sustainable utilisation of fish resources available to Latvia allowing the catch of sea and inland fish resources to produce high value added fish products which would be competitive on the local and international market as well as create opportunities for the acquisition of new market outlets.

In respect to the Common Agricultural Policy and the EU Forestry Policy the priority envisaged the following support measures and structure of financing:

- Investments in Agricultural Holdings (19% of total financing under this priority);
- Support to Setting Up of New Farmers (4% of total financing);
- Improvement of Processing and Marketing of Agricultural Products (17% of total financing);
- Promotion of Adaptation and Development of Rural Areas (29% of total financing);
- Forestry Development (6% of total financing);
- Development of Local Action (LEADER+ Type Measure) (2% of total financing);
- Training (2% of total financing).

In respect to the Common Fisheries Policy the priority envisaged the following support measures:

- Adjustment of Fishing Effort (6% of total financing);
- Fleet Renewal and Modernisation of Fishing Vessels (3% of total financing);
- Development of Processing and Marketing of Fishery and Aquaculture Products, Fishing Port Facilities Aquaculture (8% of total financing);
- Development of Coastal Fisheries, Socio-economic Measures, Promotion of New Market Outlets and Temporary Fishing Support (4% of total financing) (PP, 2004).

Priority 5 "Technical Assistance"

For successful implementation of the assistance provided by the EU Structural Funds to Latvia, it is vitally important to strengthen the administrative capacity of Latvian institutions involved in the EU Structural Funds process management. Hence the following priority measures were defined:

- Support for Programme Management (ERDF), (60% of total financing under this priority);
- Other Technical Assistance Costs (ERDF), (27% of total financing);
- Support for Programme Management (ESF), (7% of total financing);
- Other Technical Assistance Costs of ESF (ESF), (3% of total financing);
- Support for Programme Management of EAGGF (EAGGF), (2% of total financing);
- Other Technical Assistance Costs of EAGGF (EAGGF), (1% of total financing) (PP, 2004).

3. Main results of the Structural Funds implementation in Latvia and Zemgale region

The authors have analysed the financing attracted through the EU Structural Funds in Latvia and Zemgale region; however the analysis covers only the part of public financing (Figure 1).

Table 1

Analysis of the EU Structural Funds public financing and projects in Zemgale region and Latvia as of the beginning of 2009

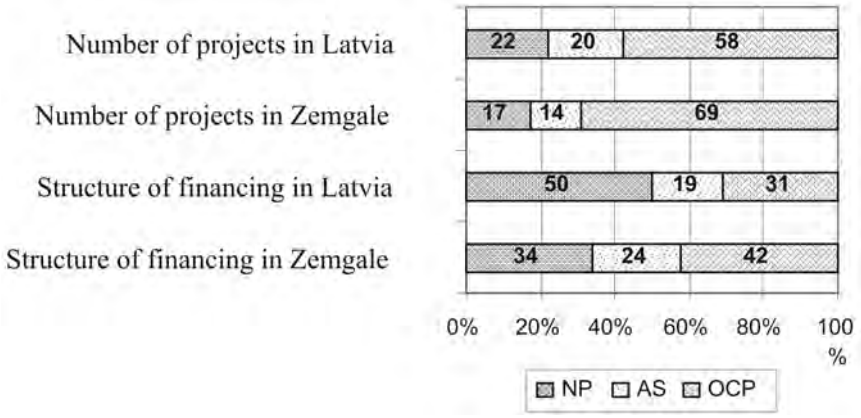
Indicators	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5	Total by all priorities
Total SF financing:						
Latvia (thou. LVL)	157 354	119 359	90 038	83 864	11 971	462 587
Structure of financing in Latvia (%)	34	26	19	18	3	100
Zemgale (thou. LVL)	11 184	17 792	9 779	10 547	181 385	49 484
Zemgale vs. Latvia (%)	7	15	11	13	2	11
Structure of financing in Zemgale (%)	23	36	20	21	0.4	100
Number of projects:						
Latvia	421	1 901	1362	3 765	122	7 571
Structure of the number of projects in Latvia (%)	6	25	18	50	2	100
Zemgale	56	170	167	542	12	947
Zemgale vs. Latvia (%)	13	9	12	14	10	13
Structure of the number of projects in Zemgale (%)	6	18	18	57	1	100
Average scale of projects:						
Latvia (LVL)	373 763	62 787	66 107	22 275	98 128	61 100
Zemgale (LVL)	199 721	104 661	58 560	19 459	15 115	52 254
Average scale of projects in Zemgale vs. Latvia (%)	53	167	89	87	15	86

Source: authors' calculations according to the data of LAD, LGA, CFLA, SPP, LHZB, LIAA, SIF, IZM, VRAA, VIAA, ZPR, 2009

The summary and analysis of data on the results of the SF implementation by different priorities for the period of 2004-2006 available from different governmental institutions engaged in the introduction of Structural Funds, namely, Central Finance and Contracting Agency (CFLA), State Education Development Agency (VIAA), Zemgale Planning Region (ZPR), Society Integration Foundation (SIF), Rural Support Service (LAD), Latvia Mortgage and Land Bank (LHZB), Latvia Guarantee Agency (LGA), Investment and Development Agency of Latvia (LIAA), State Regional Development Agency (VRAA), Ministry of Education and Science (IZM), Social Services Administration (SPP), and State Employment Agency (NVA) lead to the conclusion that Latvia at the beginning of 2009 has uptaken LVL 462 million of the SF public financing (Table 1).

The analysis of information included into Table 1 on the implementation results of the EU Structural Funds in Latvia and Zemgale region allows drawing several conclusions:

- the largest share of public financing in Latvia has been attracted through Priority 1-34%, followed by Priority 2-26%. The amount of financing attracted through Priority 3 equals to 19% of total financing for Latvia, while the smallest share of public financing has been attracted through Priority 4 covering two large sectors: agriculture and fishery – 18%, excluding technical assistance (Priority 5);
- the structure of the EU SF public financing in Zemgale region differs from general indicators of Latvia. In Zemgale the largest share of financing has been attracted through Priority 2-10% more compared with Latvia, while the financing through Priority 4 accounts for 21% of total SF financing, thus being by 3% more than in Latvia on average;
- in general only 11% of total SF public financing available to Latvia have been uptaken in Zemgale region. The largest uptaking of public financing has been observed through Priority 2-15%, followed by Priority 4-13%, while the smallest financing has been uptaken through Priority 1-7% of total SF public financing uptaken in Latvia;
- totally 7571 projects have been implemented in Latvia through the Structural Funds financing for the period of 2004-2006, of which 947 projects or 13% have been implemented in Zemgale region;
- the largest number of projects in Latvia has been implemented in Priority 4-50% of total number of projects. The number of projects implemented in Priority 4 exceeds the number



Source: authors' calculations according to the data of LAD, LGA, CFLA, SPP, LHZB, LIAA, SIF, IZM, VRAA, VIAA, ZPR, 2009

Figure 2. **Structure of number by project types and financing implemented under the Structural Funds in Zemgale region and Latvia as of the beginning of 2009**

of projects implemented in Priority 2 and Priority 1 two and nine times respectively;

- the structure of number of projects by priorities in Zemgale region is similar to the general structure in Latvia; where projects implemented in Priority 4 govern, thus equalling to 57% of total number, yet smaller share of implemented projects is observed in Priority 1, only 6% compared with the average figures of Latvia;
- in Latvia the largest by scale projects are implemented in Priority 1, while the smallest by scale projects are implemented in Priority 4. In Zemgale region the situation complies with the average figures of Latvia. The largest differences in the scale of projects between Zemgale and Latvia are observed in Priority 2. In Zemgale region the scale of implemented projects almost 1.6 times exceeds the scale of projects implemented in Latvia in the same priority. Total scale of projects implemented in all priorities is by 14% smaller than in Latvia on average.

The SPD Complement prescribes different types of projects for the achievement of set priority targets:

- national programmes (NP) – programmes developed by a respective ministry, which include already established projects. State and municipal institutions are beneficiaries of the SF financing under the National programmes;
- aid schemes (AS) – final beneficiary is a certain institution, for example, Investment and Development Agency of Latvia, which allocates financing to implementers of aid schemes, for example, an entrepreneur;
- open call projects (OCP) – are implemented so that calls for applications are announced and all the possible applicants whose projects are eligible for support may submit their applications.

The structure of number by project types and financing implemented under the Structural Funds in Latvia for the period of 2004-2006 is shown in Figure 2.

According to the data of Figure 2, the authors have concluded that:

- in Latvia 58% of all projects are implemented as open call projects with 31% of public financing. Twenty-two per cent of total number of projects is implemented through the national programmes and here the largest amount of public financing equalling to 50% has been attracted. Aid schemes account for 20% of implemented projects which corresponds to only 19% of public financing;
- the structure of number of projects implemented in Zemgale region differs from the respective structure of Latvia, since the share of national projects and aid schemes is smaller in the total structure of projects; however here the share of projects implemented as open call projects is larger compared with the average indicators of Latvia. Also the structure of financing differs in Zemgale region – 42% of total public financing from the EU Structural Funds have been attracted in open call for projects, which by 11% exceeds the total indicator of Latvia in the mentioned group of project types, public financing attracted through national programmes and aid schemes accounts for 34% and 24% respectively.

4. Operating efficiency of the EU Structural Funds by priorities

Three main indicators are used for the assessment of the operating efficiency of the EU Structural Funds financing by priorities for the period of 2004-2006, i.e. financing attracted by a respective priority and total public financing attracted in Latvia and Zemgale:

1) per 1000 inhabitants;
2) per 1000 economically active enterprises;
3) per 1000 LVL of GDP.

The calculations are included into Table 2.

In 2008 total population of Zemgale region equalled to 283 480 inhabitants or 12.5% of total Latvia population. In 2007 the number of registered enterprises in Zemgale region totalled to 14 224 enterprises or 11% of total number of enterprises in Latvia. In 2006 Zemgale region generated LVL 805 037 thousand of GDP or 7.2% of total GDP generated in Latvia (authors' calculation

Table 2

Assessment of the EU SF public financing by priorities in Latvia and Zemgale for the period of 2004-2006 as of the beginning of 2009

Position/ Indicators	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5	Total by all priorities
Per 1000 inhabitants (LVL) *:						
Latvia	69 292	52 560	39 649	36 930	5 272	203 703
Zemgale	39 454	62 764	34 498	37 206	640	174 562
Zemgale vs. Latvia (%)	57	119	87	101	12	86
Per 1000 enterprises (thou. LVL) **:						
Latvia	1 219	925	698	650	92	3 586
Zemgale	786	1 250	687	741	12	3 478
Zemgale vs. Latvia (%)	64	135	98	114	14	97
Per 1000 LVL of GDP (LVL)***:						
Latvia	14 085	10 684	8 060	7 507	1 072	41 407
Zemgale	13 893	22 101	12 148	13 101	225	61 469
Zemgale vs. Latvia (%)	99	207	151	175	21	148

* in 2008,** in 2007, ***in 2006

Source: authors' calculations according to the data of LAD, LGA, CFLA, SPP, LHZB, LIAA, SIF, IZM, VRAA, VIAA, ZPR, 2009 and CSP-a, 2009

according to CSP-b, 2009). The comparison of the share of main indicators in Zemgale region with the structure and number of projects under the SF public financing (Section 3) shows that:

- the share of SF public financing (11%) in Zemgale complies with the share of number of enterprises in total structure of Latvia; however in Zemgale this indicator exceeds the share of GDP in a region by 3.8%;
- the comparison of SF public financing efficiency indicators leads to the conclusion that in Zemgale region it exceeds the aggregate indicator of Latvia by 48% calculating per LVL 1000 of GDP. The figure on 1000 enterprises is by 3% smaller than the aggregate indicator of Latvia, and it is by 14% smaller than the aggregate indicator of Latvia if calculated per 1000 inhabitants;
- the efficiency indicators for attracting the SF public financing in Zemgale region are the highest ones for Priority 2, Priority 3, and Priority 4, since efficiency indicators in these priorities exceed the average Latvia indicators in respective priorities by 25-100%.

Conclusions

1. Regulatory enactments of several levels were adopted for the introduction of the EU Structural Funds. The main planning documents were as follows: Latvia Development Plan for 2004-2006 or the Single Programming Document and the Programme Complement. Besides several Cabinet Regulations and the law "Management of the European Union Structural Funds" was adopted on December 8, 2005, i.e. in the middle of the planning period.
2. The Programme Complement of Latvia Development Plan set forward 5 priorities through which the envisaged targets were achieved in the planning period of 2004-2006. Four EU Structural Funds were used for implementation of the priorities.
3. Public financing is a significant indicator in uptaking the EU SF financing and characterising the attraction of the EU and national financing for project implementation.
4. The EU SF financing was uptaken through the implementation of 3 different project types. In Latvia 58% of implemented projects were introduced as a result of open call for projects, 22% – as aid schemes projects, and 20% – as national programmes.
5. At the beginning of 2009 total public financing uptaken in Latvia equalled to LVL 462 million, while in Zemgale region the respective figure was LVL 49.4 million or 11% of total financing. In Latvia the largest share of financing has been channelled for the achievement of Priority 1 targets, in Zemgale – for the achievement of Priority 2 targets.
6. In Latvia 7571 projects financed from the Structural Funds have been implemented between 2004 and 2006, of which 947 projects or 13% have been implemented in Zemgale region. The largest number of projects has been implemented in Priority 4-50% of projects were

implemented in Latvia and 57% – in Zemgale of total number of projects.

7. The authors have assessed the SF public financing per 1000 inhabitants, 1000 economically active enterprises, and LVL of GDP both in Latvia and Zemgale region. The indicators of Zemgale region lag behind the total indicators of Latvia in the first two positions, though it exceeds total indicators of Latvia in the third position.

Proposals

To equalise regional disparities, state institutions of Latvia shall envisage an even allocation of resources by regions, including Zemgale region for the planning period of 2007-2013, in compliance with the subsidiarity principles, especial attention drawing to:

- promotion of sustainable development, so in Zemgale region the amount of available financing per 1000 inhabitants and enterprises increases and reaches the average indicators of Latvia in a respective priority, thus creating qualitative and attractive space of living for population and business entities;
- promotion of human resource development and employment, so the amount of financing per 1000 inhabitants and enterprises increases up to the average level of Latvia, thus enhancing a long-term GDP growth in a region.

Bibliography

1. Centrālā finanšu un līguma aģentūra (CFLA). *Centrālās finanšu un līguma aģentūras ziņojums par Eiropas Savienības struktūrfondu līdzfinansēto pasākumu aktivitāšu ieviešanu par pārskata periodu no 01.01.2009.-31.03.2009 (Report of Central Finance and Contracting Agency on Introduction of Activities of Measures Co-financed by the European Union Structural Funds for Report Period January 1-March 31, 2009).* Available at: http://www.cfla.gov.lv/?object_id=984. Viewed on: October 20, 2009.
2. Dubra, E. (2009) *Latvijas ekonomikas konkurētspēja un investīciju nozīme tās veicināšanā (Competitiveness of Latvian Economy and Importance of Investment for Promotion of Competitiveness).* Rīga: LU Akadēmiskais apgāds, 2009, 168 lpp.
3. Dubra, E., Kassalis, E., Skribāne, I., Eglīte, S., Ozola, A.(2003) *Strukturālās politikas metodoloģiskais pamatojums integrācijas kontekstā Eiropas Savienībā (Methodological Substantiation of Structural Policy in the EU Integration Context).* Latvijas integrācija Eiropas Savienībā- jaunās Eiropas aprises, tautsaimniecības pielāgošana. Rīga: LZA EI, 2003, 47-76.lpp.
4. Eiropas Savienības struktūrfondu vadības likums (2005) (law "Management of the European Union Structural Funds"). Available at: http://www.likumi.lv/doc.php?id=124260&from=off. Viewed on: October 20, 2009.
5. Izglītības un zinātnes ministrija (IZM). *Izglītības un zinātnes ministrijas ziņojums par Eiropas Savienības struktūrfondu līdzfinansēto pasākumu un aktivitāšu ieviešanu pārskata periodā no 01.01.2009.-30.06. 2009 (Report of Ministry of Education and Science on Introduction of Activities of Measures Co-financed by the European Union Structural Funds for Report Period January 1-June 30, 2009).* Available at: http://esfondi.izm.gov.lv/1195.html. Viewed on: October 20, 2009.
6. Latvijas Hipotēku un zemes banka (LHZB). *ALTUM atbalsta programmas pārvalde. Realizējamās atbalsta programmas (ALTUM Programme Management. Support Programmes to be Implemented.).* Available at: http://www.altum.lv/public/29674.html. Viewed on: October 20, 2009.
7. Latvijas Attīstības plāns (Vienotais programmdokuments) (VPD) 1. mērķa programma 2004.-2004. gadam (2003) (Latvia Development Plan (Single Programming Document) for Target 1 Programme for 2003-2004). *Finan u ministrija.* Available at: www.esfondi.lv/upload/05-saistosie_dokumenti/spd_lv_04122003.pdf. Viewed on: October 20, 2009.
8. Latvijas garantiju aģentūra (LGA). *Arhīvs/ Garantiju saņēmēji/Investīciju saņēmēji (Archive. Beneficiaries of Guarantees/Beneficiaries of Investment).* Available at: http://www.lga.lv/index.php?id=49 Viewed on: October 20, 2009.
9. Latvijas investīciju un attīstības aģentūra (LIAA). *SF (2004.-2006.) Informācija par LIAA izmaksātajām summām ES struktūrfondu finansējuma atbalsta saņēmējiem uz 2008. gada 1. septembri (Information on Disbursed Amounts from Investment and Development Agency of Latvia for Beneficiaries of the EU Structural Funds on September 1, 2008).* Available at: http://www.liaa.gov.lv/lv/es_strukturfondi/cita_informacija/sf_arhivs_(2004_2006)/izmaksatas_summa. Viewed on: October 20, 2009.
10. Latvijas mērķa 1 programmas Vienotā programmdokumenta programmas papildinājums (VP PP) 2004-2006 (2004) (Single Programming Document Programme Complement of Target 1 Programme for Latvia). Available at: http://www.esfondi.lv/upload/05-saistosie_dokumenti/pc_lv_23022004.pdf . Viewed on: October 20, 2009.
11. Lauku atbalsta dienests (LAD). *Lauku atbalsta ziņojums par Eiropas Savienības struktūrfondu līdzfinansēto pasākumu un aktivitāšu ieviešanu par pārskata periodu 01.10.2008.-31.12.2008 (Report of Rural Support Service on Introduction of Activities of Measures Co-financed by the European Union Structural Funds for Report Period October 1, 2008 – December 12, 2008).* Available at: http://www.lad.gov.lv/index.php?d=1037 . Viewed on: October 20, 2009.

12. Lauku atbalsta dienesta (LAD) sniegtā informācijā pēc pieprasījuma. *Informācija par veiktajiem atbalsta maksājumiem par periodu no 01.01.2004.-31.12.2008. ELVGF izmaksātās summas 2004.-2006 (Information on Support Payments for the Period of January 1, 2004- December 12, 2008. Disbursed Amounts through the ERAGGF for 2004-2006).*
13. LR Centrālā statistikas pārvalde (CSP-a). *IKP rajonos un reģionos (GDP by Districts and Regions).* Available at: www.data.csb.gov.lv/Dialog/varval.asp?ma=02-. Viewed on: October 20, 2009.
14. LR Centrālā statistikas pārvalde (CSP-b). *Statistisko reģionu kodi saskaņā ar NUTS klasifikāciju (Codes of Statistical Regions According to NUTS Classification).* Available at: http://www.csb.gov.lv/csp/content/?cat=2024. Viewed on: October 20, 2009.
15. Marciniak, M (2009) *Absorption of Structural Funds in Poland in the Context of Information Society Development on Rural Areas.* Proceedings of the International Scientific Conference "Economic Science for Rural Development' 2009", No. 18. Jelgava, pp. 210-216.
16. Meyers, W.H., Kazlauskiene, N., Naujokiene, R., Kriščiukaitiene I. (2006) *Lessons Learned and Challenges in Rural Development Programmes of Lithuania.* Žemes ūkio mokslai. Lietuvos mokslu akademijos Leidykla, 2006 Nr.1(priedas), Vilnius, pp.1-8.
17. Mickievicz, P. (2007) *Investment by Agricultural Holdings under Programmes Co-funded by the EU.* Proceedings of the International Scientific Conference "Economic Science for Rural Development", No. 14. Jelgava, pp. 122-129.
18. Mizik, T. (2007) *Rural Development in Hungary after the Accession - the Role of EU Co-financed Programmes. P*roceedings of the First Green Week Scientific Conference "Managing Economic, Social and Biological Transformations", Germany: Margraf Publishers GmbH, pp. 108-115.
19. MK 02.09.2003. noteikumi nr.500 „ Noteikumi par Eiropas Savienības struktūrfondu vadības, uzraudzības, kontroles un novērtēšanas institucionālo sistēmu" (Cabinet Regulations No. 500 "On the Institutional System of European Union Structural Funds Management, Monitoring, Control and Evaluation"). Available at: www.likumi.lv/doc.php?id=79175&from=off. Viewed on: October 20, 2009.
20. MK 16.12.2003. noteikumi Nr.727 "Kārtība, kādā valsts budžetā plāno līdzekļus Eiropas Savienības struktūrfondu līdzfinansēto projektu īstenošanai un veic maksājumus" (Cabinet Regulations No. 727 "Procedures by which Funds in the State Budget for the Implementation of Projects Financed by Structural Funds of the European Union shall be Planned and by which Payments shall be Transferred"). Available at: http://www.likumi.lv/doc.php?id=82578&from=off . Viewed on: October 22, 2009.
21. MK 10.09.2003. rīkojums nr. 573 „Par uzdevumiem Eiropas Savienības struktūrfondu vadības, uzraudzības, kontroles un novērtēšanas sistēmas ieviešanai" (Cabinet Order No. 573 "On Tasks for the Implementation of a System for the Management, Monitoring, Control and Evaluation of the European Union Structural Funds"). Available at: www.likumi.lv/doc.php?id=78957&from=off. Viewed on: October 20, 2009.
22. MK 30.03.2004. noteikumi Nr.200 "Noteikumi par Eiropas Savienības struktūrfondu vadību" (Cabinet Regulations No. 200 "Regulations Regarding Management of the European Union Structural Funds"). Available at: http://www.likumi.lv/doc.php?id=87575&from=off. Viewed on: October 24, 2009.
23. Padomes Regula (EK) Nr. 1260/1999 (1999. gada 21. jūnijs), ar ko paredz vispārīgus noteikumus par struktūrfondiem (EC Regulation No. 1260/19999 of June 21, 1999 Envisaging General Provisions on EU Structural Funds). Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31999R1260:LV:HTML, Viewed on: October 6, 2009.
24. Pilvere, I. (2007) *EU Agriculture Structural Fund Support Results in Latvia*. Žemes ūkio mokslai. Lietuvos mokslu akademijos Leidykla, T. 14, Vilnius, pp. 145.-150.
25. Ribašauskiene, E., Kairyte, E., Meyers, W.H. (2007) T*erritorial Dimensions of Lithuanian Rural Development Plan 2004-2006: Lessons for 2007-2013.* Žemes ūkio mokslai. Lietuvos mokslu akademijos Leidykla, T. 14, Vilnius, pp. 11-18.
26. Sabiedrības integrācijas fonds (SIF). *ESF atbalstītie projekti par laika periodiem 2005.-2007 (Projects Supported from the ESF for the Period of 2005-2007).* Available at: http://www.lsif.lv/atbalstitie-projekti/eiropas-socialais-fonds. Viewed on: October 20, 2009.
27. Sienkiewicz, J.J.(2009) *Use of the EU Public Funds in Agriculture on the Example of the Western Pomeranian Regions.* Proceedings of the International Scientific Conference "Economic Science for Rural Development' 2009", No. 18. Jelgava, pp. 99-104.
28. Slavinska, I. (2005) *Kvalitatīvas dzīves vides izveide- viens no Latvijas lauku attīstības virzieniem (Establishment of Qualitative Space of Living – One of Directions for Rural Development of Latvia).* Rural Development in the Europe at the beginning of the 21st Century No. 8, 2005, pp. 124-130.
29. Sociālo pakalpojumu pārvalde (SPP). *ESF un ERAF projekti. ESF projektu saraksti; ERAF projektu saraksti (ESF and ERDF Projects; Lists of ERDF Projects).* Available at: http://www.spf.lv/?object_id=711; http://www.spf.lv/?object_id=256. Viewed on: October 20, 2009.
30. Tetere, V.(2009) *European Structural Funds – Part of Investment in Latvia's Development*. Proceedings of the International Scientific Conference "Economic Science for Rural Development", Jelgava, 23-24 April, 2009/Latvia University of Agriculture. No. 18 pp. 240-245.

31. Tetere, V., Pilvere, I. (2007) *EU Structural Funds for Rural Development of Latvia's Economy*. Proceedings of the International Scientific Conference. The Economics and Social Issues of Sustainable Development. Agricultural University in Szczecin, Volume III. Szczenin, pp. 109-117.
32. Valsts izglītības attīstības aģentūra (VIAA). *Noslēgtie līgumi 2004.-2006. gadā (Concluded Agreements between 2004 and 2006).* Available at: *http://www.viaa.gov.lv/lat/strukturfondi/noslegtie_ligumi_2004_2006/*. Viewed on: October 20, 2009.
33. Valsts Reģionālās attīstības aģentūra (VRAA). *Pārskats „Reģionu attīstība Latvijā 2008" (Report "Regional Development in Latvia, 2008).* Available at: http://www.vraa.gov.lv/uploads/petnieciba/petijumi/Regionu%20attistiba%20Latvija%202008%20LV%20WEB.pdf. Viewed on: October 20, 2009.
34. Zawojska, A. (2009) *Impact Assessment of the European Union Funds to Support Rural Population and Economy in Poland*. Proceedings of the International Scientific Conference "Economic Science for Rural Development' 2009", No. 18. Jelgava, pp. 150-156.
35. Zemgales plānošanas reģions (ZPR) ES *struktūrfondu informācijas centra mājas lapa. Projektu karte (Web site of the EU Structural Funds Information Centre. Projects).* Available at: http://www.esfondi.zemgale.lv/modules/pagewrap. Viewed on: October 20, 2009.
36. Zvirgzdiņa, R. (2007) *Uzņēmējdarbības attīstības tendences Latvijas reģionos (Business Development Tendencies in the Regions of Latvia).* LLU Raksti 19 (314), 2007; 54-61. lpp.

Forfaiting and Factoring as the Means for Handling Transactions

Gunita Mazūre, Dr.oec., associate professor
Department of Accounting and Finances, Faculty of Economics, Latvia University of Agriculture

Abstract. Forfaiting is a commercial finance technique that has attracted growing interest in both the banking and diversified financial sectors and the financial press of export oriented countries over the past years. It is certainly due to the fact that in many cases it has proven to be the most efficient and profitable instrument when it comes to export finance. The nominal value of forfaiting instruments issued each year is now estimated to be around USD 9-11 billion. However, very little official statistical data have been published. Factoring in turn is one of the oldest methods of business financing in existence. The history of factoring dates back to the days of moneylenders in the middle ages. It has taken on a new life in recent years as a financing method for many businesses in the world. The paper explores historical and theoretical aspects of forfaiting and factoring as means for handling transactions with a particular emphasis laid on the dynamics of factoring. The research shows that the world factoring volume has grown at a rate of 82.98% over the period of previous 7 years. The largest increase is shown by Australia and Asia; however their share in the world factoring market equals only to 2.6% and 17.8% respectively. The study concludes that enormous volume differences exist between the member states, with, for example, the UK market being around 313 times bigger than Luxembourg market, and considerably larger than the markets in Cyprus, Switzerland, Hungary, Poland, and Denmark. The research is mainly based on the monographic descriptive method as well as the methods of analysis and synthesis.
Key words: forfaiting, promissory notes, factoring, exporter, importer, forfaiter, factor, volume.

Introduction

The origins of the forfaiting market lie in changes in the economic structure during the early 1960s, when trade between Western and Eastern Europe was re-established, though the importance of forfaiting and factoring varies considerably around the world, it occurs in most countries and is growing especially quickly in many developing countries. There are several scientific studies done on factoring (Bakker, Udell et al, 2006; Klapper, 2006; Soufani, 2002; Cox and Mackenzie, 1986; Rutberg, 1994; Papadimitriou, Phillips and Wray, 1994, etc.) in the world; however there are quite few studies on factoring in Latvia (Leja, 2002), the majority of publications fall under the category of newspaper and magazine articles (Hartmanis, 2004, Kronberga, 2006; Apsīte, 2006; Kļavis, 2006; Rebits, 2001; Līcītis, 1999, etc.), besides they have looked upon the problem from different aspect, mainly theoretical, legal and accounting. Unfortunately there are very fewresearches on forfaiting (Singer J.F., 1985), some theoretical materials might be found in study-books (Maurice D.Levie, 2005 etc.). The present study focuses on historical and theoretical development of forfaiting and factoring with a particular emphasis laid on the dynamics of factoring. The research **hypothesis**: factoring as means of export crediting is more popular due to its origins and well developed network of factoring companies. The **aim** of the research is to study forfaiting and factoring as the basic means for handling transactions. The following **tasks** are advanced to achieve the set aim:

1) to give a survey on historical development of forfaiting and factoring;
2) to study comparatively the process of forfaiting and factoring transactions;
3) to analyse the volume of factoring market in the world.

The analysis of forfaiting market is impossible due to the lack of statistical data. The information compiled by the International Forfaiting Association, the Factoring Chain International, internet resources, different working papers, scientific publications, and other materials have been used for the purpose of the study. The research is mainly based on the monographic descriptive method as well as the methods of analysis and synthesis are used to study the problem elements and synthesise coherencies or formulate regularities.

Results and discussion

1. Survey on historical development of forfaiting and factoring

The development of forfaiting probably owes its origin with the introduction of Eurodollars, though not its subsequent popularity to the difficulties faced in the West-east trade. The practice of forfaiting dates back to the 1960s with the placing of orders by the Eastern bloc Comecom countries for capital equipment and grain. Many of these orders were placed with German companies, which were not in a position to supply trade credit themselves, or to arrange financing with banks or official lending agencies. Thus the exporters were unable to offer supply credits, and they were unable to arrange

buyer credits through lending institutions. Instead, they found banks which were willing to purchase the importers' promissory notes at a discount. One of the first banks to recognise the opportunity was Credit Suisse through its subsidiary finance A.G. Zurich. The original deals involved the US grain to Germany which resold the grain to the Eastern European countries. Forfaiting allowed the US exporters to be paid immediately and the Eastern European buyers to receive medium-term trade credit. While originally viewed as "lending of last resort", forfaiting grew in popularity, spreading from Switzerland and Germany, where it began, to London, later to Scandinavia and the rest of Europe, and eventually to the United States (Maurice D. Levie, 2005). Forfaiting is still not as important as payment by traditional time or use bills of exchange or credit from official export financing agencies, but it has nevertheless become a potential source of financing, especially for medium-term maturities.

Forfaiting in its most elementary form has developed during the years following the World War II as the reconstruction sellers' market for capital goods gradually dwindled and the immediate post-war period methods of trade finance, such as barter and trade switching, declined in importance due partly to their increasing complexity. Many suppliers did not have adequate capital to provide their own supplier credit and, in view of the large amounts involved, could not hold their buyers' promissory notes or Bills of exchange to their maturity. Forfaiting, therefore, developed as a means of providing terms beyond the traditional 90 or 180 days, such terms being less suitable for the small and medium sized firm. Initially, forfaiting was used by the Eastern European purchasers of Western capital goods and the forfaiting market was controlled by a small group of specialist banks and finance houses based in Switzerland. As international trade expanded in the 1960s and 1970s, other countries began to avail themselves of forfaiting assisted by growing numbers of banks and financial institutions based in all of the international financial centres. Today, the international forfaiting market trades the financial obligations of approximately 80 to 90 countries. The nominal value of forfaiting instruments issued each year is now estimated to be around USD 9 to USD 11 billion with about USD 14 to USD 16 billion currently outstanding (International Forfaiting Association, 2010). However, very little official statistical data have been published.

Factoring is one of the oldest forms of commercial finance. Some scholars (Rutberg, 1994) trace its origins to the Roman Empire, while some scientists (Papadimitriou, Phillips, and Wray, 1994) date it back 4000 years to the days of Hammurabi. The first widespread, documented use of factoring occurred in the American colonies before the revolution. With the advent of the Industrial Revolution, factoring became more focused on the issue of credit, although the basic premise remained the same. By assisting clients in determining the creditworthiness of their customers and setting credit limits, factors could actually guarantee payment for approved customers. It is known as factoring without resource and is quite common in business today (NYC Factoring Cash Flow Company, 2008).

Factoring was also a well-developed activity in England in the 14th century, where it evolved with the growth of the wool industry. The job of factors focused on their functions as sales agents or commission merchants for textile mills. The distances between customers and manufacturers made commerce problematic due to the quite primitive forms of transportation and communication, therefore factors assumed complementary functions to address the business challenges that arose because of these issues. At the centre of these functions was the factors' role as the sales force for the textile mills. Factors also assumed some critical financial functions on behalf of the mills. They offered credit advice on how much to sell on account to potential customers. They also guaranteed payments to the mills, assuming full responsibility for the creditworthiness of the mills' customers. To protect themselves, factors established reserves to cover claims for defective merchandise and any disputes that arose out of those claims. Finally, and equally important from an historical perspective, factors advanced funding to the mills based on the value of the merchandise sold (Bakker et al, 2006).

Prior to the 1930s, factoring in this country occurred primarily in the textile and garment industries, as the industries were direct descendants of the colonial economy that used factoring so specifically. After the war years, factors saw the potential to bring factoring to other forms of invoice-based business and the expansion began. Many of these private factors sprung up in record numbers as interest rates rose to new heights in the 1960s and 1970s. This trend intensified in the 1980s, primarily due to the increasing impact of interest rates and changes in the banking industry. With banks becoming too expensive and too inflexible due to heavy regulation, the small businessperson was forced to find other sources of financing for expansion and growth. As more and more banks stop befriending the small business person, factoring is becoming an increasingly popular option (NYC Factoring Cash Flow Company, 2008).

Thus, in essence, factoring was fully reflected economically in the financial component of the factoring business as it existed 600 years ago. The difference between today and 600 years ago is that the sales, or "agenting," component has been purged from the factoring relationship. Today, factors exist in all shapes and sizes: as divisions of large financial institutions or, in larger numbers, as individually owned and operated entrepreneurial endeavours.

2. Essential requisites of forfaiting and factoring transactions

Forfaiting is the purchase of a series of credit instruments such as drafts drawn under time letters

of credit, bills of exchange, promissory notes, or other freely negotiable instruments on a "non-recourse" basis (non-recourse means that there is no comeback on the exporter if the importer does not pay). The forfaiter deducts interest (in the form of a discount), at an agreed rate for the full credit period covered by the notes. The debt instruments are drawn by the exporter (seller), accepted by the importer (buyer), and will bear an aval, or unconditional guarantee. The guarantee will normally be issued by the importer's bank, but some strong corporates can be accepted without a bank guarantee. In exchange for the payment, the forfaiter then takes over responsibility for claiming the debt from the importer. The forfaiter either holds the notes until full maturity (as an investment), or sells them to another investor on a non-recourse basis. The holder of the notes then presents each receivable to the bank at which they are payable, as they fall due (Maurice D. Levie, 2005).

Hence, forfaiting is a mechanism by which the right for export receivables of an exporter (client) is purchased by a financial intermediary (forfaiter) without recourse to him. It is different from International Factoring in as much as it deals with receivables relating to deferred payment exports, while Factoring deals with short term receivables.

The International Forfaiting Association, IFA, is the worldwide trade association for commercial companies, financial institutions, and intermediaries engaged in forfaiting. Founded in August 1999 and with more than 140 members the IFA aims to foster business relationships and enable best practice among those engaged in the ever-expanding, global forfaiting community. The primary goal of the IFA's members is to transact forfaiting business profitably and safely (the International Forfaiting Association, 2010).

The following figure (Figure 1) reflects a typical forfaiting transaction where the buyer and the seller of goods are located in different countries.

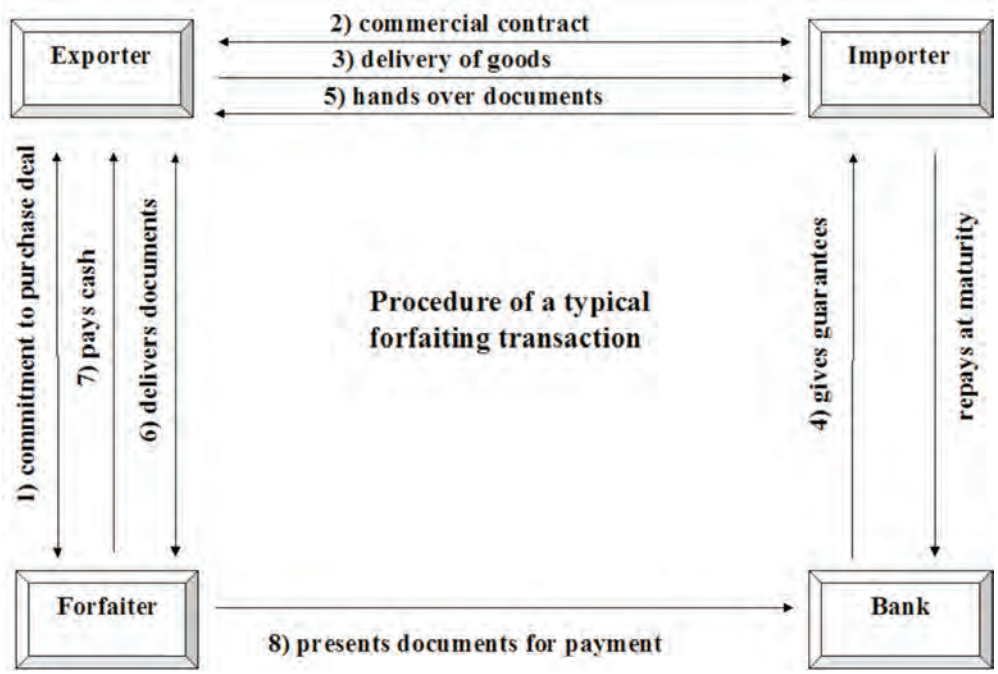
Steps undertaken at the process of forfaiting are as follows:

1. During the course of negotiations between an exporter and an importer for the supply of goods, the importer asks for credit terms.
2. The exporter approaches a forfaiter and asks for an indication of whether the forfaiter is willing to provide this credit and how much it is likely to cost. At this stage the forfaiter will need to know: the country of the importer, the importer's name, the type of goods, the value of the goods, the expected shipment date, the repayment terms sought by the importer, and whether the importer's obligations will be guaranteed by a bank, and if so, who.
3. The forfaiter provides the exporter with an indication of the costs involved. At this stage neither party is committed in any way.
4. When the details of the commercial contract have been agreed, but usually before it has been signed, the exporter asks the forfaiter for a commitment to purchase the debt obligations (bills of exchange, promissory notes etc.) created under the export transaction.
5. The information required for this is the same as for an indication.
6. The forfaiter issues a commitment which is accepted by the exporter and which is binding on both parties (1). This commitment will contain the following points: details of the underlying commercial transaction; nature of the debt instruments to be purchased by the forfaiter, the discount (interest) rate to be applied, together with any other charges; the documents that the forfaiter will require in order to be satisfied that the debt being purchased is valid and enforceable; the latest date that the exporter can deliver these documents to the forfaiter.
7. The exporter signs the commercial contract with the importer and delivers the goods (2+3).
8. In return, if required, the importer obtains a guarantee from his bank (4) provides the documents that the exporter requires in order to complete the forfaiting (5). This exchange of documents is usually handled by a bank, often using a Letter of Credit, in order to minimise the risk to the exporter.
9. The exporter delivers the documents to the forfaiter who checks them and pays for them as agreed in the commitment (6+7).
10. Since this payment is without recourse, the exporter has no further interest in the transaction. It is the forfaiter who collects the future payments due from the importer (8) and it is the forfaiter who runs all the risks of non-payment.

Forfaiting can be applied to a wide range of trade related and purely financial receivables. Although discounted receivables typically have maturities over medium terms of 3 to 5 years they can be as short as 6 months or as long as 10 years. Forfaiting is a flexible discounting technique that can be tailored to the needs of a wide range of counterparties and domestic and international transactions.

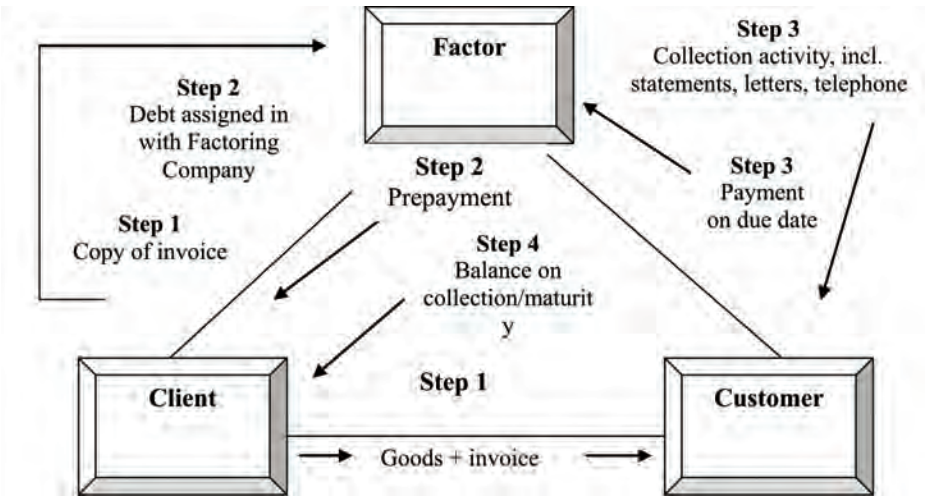
Factoring is risky, but highly profitable kind of crediting, effective instrument of financial marketing, one of the forms of integration of bank operations, which are most adapted to modern processes of development of world economy. **Factoring** is a loan for financing the working capital of an enterprise or a financial institution, whereby the factoring company acquires accounts receivable (claims) of such enterprise or financial institution by taking over the enterprise's or financial institution's right of claim on receivers of goods or services and assuming credit risk. Factoring as the service is most effective for the small and medium size enterprises, which traditionally experience financial difficulties because of delayed repayment of duties and limitation of sources, accessible to them, of crediting. Financial institutions, which give factoring of service, refer to as the factor of firms. They are created by the largest banks (or banks carry out functions the factor of firms), that provides high reliability factoring of the bargains and minimal costs for the clients.

Usually three persons participate in operation factoring: the factor - buyer of the requirement, initial creditor, and debtor who has received from the client



Source: the International Forfaiting Association, 2010

Figure 1. **The process of forfaiting**



Source: Analysis of Use of Factoring, 2002

Figure 2. **The process of recourse and non-recourse factoring**

the goods with a delay of payment. The operation factoring consists that factoring the department of bank buys the debt requirements (account of the invoice) client on conditions of an immediate reimbursement up to 80% of costs of deliveries and payment of other part, minus percent for the credit and commission payments. If the debtor does not pay in time account factoring, the factoring department carries out payments instead of it.

Figure 2 highlights the process of a recourse and non-recourse factoring.

Steps undertaken at the process of factoring are as follows:

1. The client ships goods with original invoice to the customer. This invoice would normally instruct the customer to pay the factor (giving full payment details). At the same time, the client sends a copy of the original invoice to the factor.
2. On receipt of the copy invoice by the factor the associated debt is assigned to the factor in accordance with the factoring agreement. Simultaneously, the factor makes available a credit line (normally of up to 80% of the invoice value) against which the client can choose to immediately draw down a pre-payment (factors

usually provide finance within one day of receiving the client invoice).

3. The customer pays the full invoice balance directly to the factor on the due date. In case of overdue payment against an "unchallenged" invoice, the factor initiates the process of credit collection from the customer. In the case of continued non-payment, it is normally the factor who proceeds with legal action and foreclosure against the customer. In case of recourse factoring, the factor has recourse to the client for any outstanding uncollected debt. Conversely, under non-recourse factoring the factor assumes any loss (in some cases such loss may be protected through credit insurance held by the factor).
4. On payment by the customer (or in case of late payment on an agreed date) of the full invoice amount, the factor credits the balance (less the prepayment and fees) to the client account. The factoring agreement with the client is, in almost all cases, on a whole turnover basis (rather than individual invoices), and as such, the factoring process is perpetual. This is an important point and means that factoring involves the client selling its entire "sales ledger" to the factor (Analysis of Use of Factoring, 2002).

Both forfaiting and factoring have advantages and disadvantages, which either promote or hinder the process of handling transactions (Table 1).

Apart from advantages and disadvantages, it is possible to make comparative analysis for the two

Table 1

Advantages and disadvantages of forfaiting and factoring

	Forfaiting	Factoring
Advantages	*speed and simplicity of transactions* – fast, tailor-made financing solutions, financing commitments can be issued quickly, documentation is typically concise and straightforward, no restrictions on origin of export, relieves seller of administration and collection burden; *eliminates risk* – removes political, transfer and commercial risk, provides financing for 100% of contract value, protects against risks of interest rate increase and exchange rate fluctuation; *enhances competitive advantage* – enables sellers of goods to offer credit to their customers, making their products more attractive, helps sellers do business in countries where the risk of non-payment would otherwise be too high; *improves cash flow* – enables sellers to receive cash payment while offering credit terms to their customers, removes accounts receivable, bank loans or contingent liabilities from the balance sheet.	*speed* – factoring and invoice discounting allow to capitalise on the company's invoices with a minimum of delay; *cost* – factoring the company's invoices is cheaper than using credit cards, overdrafts and many other forms of finance; *time saving* – rather than having to chase debts, factoring usually means the invoice finance company will collect the money themselves; *security* – factoring does not require the company to risk its home or business assets as security on the finance, as the money is secured on the sales already made; *suitable for businesses of all sizes*.
Disadvantages	it does not cover pre-delivery risks; an export shipment is effectively open account until a commitment is obtained from the forfaiter and exporter fulfils its obligations; exporter has the responsibility to ensure that the debt is legal and enforceable; exporter must insure that the debt instrument is properly guaranteed; cost of forfait financing can be higher than commercial bank financing; importer must pay for both forfait financing and the fee for bank's guarantee; cost for financing and bank guarantee can be more than direct credit loan; the bank aval or guarantee may be counted against and reduce availability of importers bank credit lines; importer may need to cover foreign exchange risk over repayment period.	relatively *expensive* method of financing; comparatively *bureaucratic* process; *reputation* – some less reputable invoice finance companies can damage customer relations by being too aggressive in collecting factored invoices; *control* – factoring reduces the control the company has on its debts, as the invoice finance company collects them for the company.

Source: made by the author according to International Forfaiting Association and Factors Chain International (2010)

Table 2

Comparative analysis of forfaiting and factoring

Points of difference	Factoring	Forfaiting
Scrutiny	Service of sale transaction	Individual sale transaction
Extent of finance	Usually 75 – 80% of the value of the invoice	100% of invoice value
Credit worthiness	Factor does the credit rating in case of non-recourse factoring transaction	Forfaiting Bank relies on the creditability of the Avalling Bank.
Services provided	Day-to-day administration of sales and other allied services	No services are provided
Recourse	With or without recourse	Always without recourse
Sales	By turnover	By bills
Sales administration	Done	Not done
Term	Short term	Medium term
Charge creation	Assignment	Assignment

Source: made by the author according to International Forfaiting Association and Factors Chain International (2010)

Table 3

Total world factoring volume by continents in the last 7 years (in millions of EUR)

Continents	2002	2003	2004	2005	2006	2007	2008	Percent change 2002 - 2008
Europe	522.85	546.94	612.50	715.48	806.98	932.27	888.53	**69.94**
America	115.30	104.54	110.09	135.63	140.94	150.22	154.45	**33.95**
Africa	6.20	5.84	7.59	6.24	8.51	10.71	13.26	**113.87**
Asia	69.85	89.10	111.61	135.81	149.99	174.62	235.62	**237.32**
Australia	9.53	13.72	18.18	23.13	27.57	33.08	32.55	**241.55**
New Zealand	465	263	236	250	280	700	700	**50.54**
Total world	724.20	760.39	860.22	1.016.55	1.134.29	1.301.51	1.325.11	**82.98**

Source: Factors Chain International (2002-2008) and author's calculations

types of export financing based on the most common features or points of difference (Table 2).

The most significant aspects of difference relate to the extent of finance, term, and services provided. Forfaiting covers 100% of invoice, while factoring only 75-80%, and the rest 20-25% are received after a factoring company has collected accounts receivable. Factoring is a short-term, but forfaiting is a medium-term financing; besides day-to-day administration of sales is provided in case of factoring.

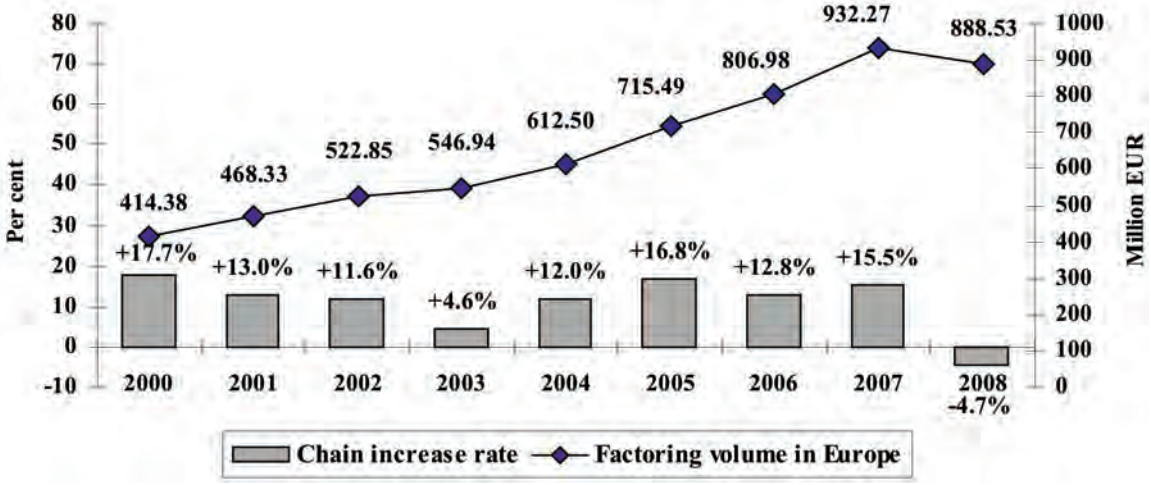
Analysis of factoring market dynamics

On a worldwide scale, almost a thousand companies currently offer factoring services, of which 435 are in Europe. The factors, namely the companies operating in this market, are usually subsidiaries of banking groups, financial institutions, insurance companies or manufacturing firms, and rarely independent companies (Factors Chain International, 2010).

The current internationalisation of the market is reflected in a growing trend towards buyouts and mergers in a sector still dominated by essentially national agents. The diverse nature and current demands of businesses that use factoring are currently contributing to the emergence of new services and ever-increasing incorporation of new technologies.

Factors Chain International is a global network of leading factoring companies, whose common aim is to facilitate international trade through factoring and related financial services. It was established in 1968 as the umbrella organisation for independent factoring companies around the world, and currently the **Factors Chain International** network counts 247 factors in 66 countries, actively engaged in more than 80% of the world's cross-border factoring volume.

The world factoring volume has grown at a rate of 82.98% over the period. The largest increase is shown by Australia (241%) and Asia (237%);



Source: made by the author according to the data of Factors Chain International (2000-2008)

Figure 3. **Factoring volume in the European market for the period 2000-2008, millions of EUR**

Table 4

Aggregate Factoring Volumes in Europe 2002-2008 (in millions of EUR)

Country	2002	2003	2004	2005	2006	2007	2008	Percent change 2002-2008
Austria	2.275	2.932	3.692	4.273	4.733	5.219	6.350	**179.12**
Belgium	9.391	11.500	13.500	14.000	16.700	19.200	22.500	**139.59**
Bulgaria	0	0	0	0	35	300	450	**1185.71***
Croatia	0	0	28	175	340	1.100	2.100	**7400***
Cyprus	1.997	2.035	2.140	2.425	2.546	2.985	3.255	**62.99**
Czech Republic	1.681	1.880	2.620	2.885	4.025	4.780	5.000	**197.44**
Denmark	5.200	5.570	6.780	7.775	7.685	8.474	5.500	**5.77**
Estonia	2.143	2.262	3.920	2.400	2.900	1.300	1.427	**-33.41**
Finland	9.067	8.810	9.167	10.470	11.100	12.650	12.650	**39.52**
France	67.398	73.200	81.600	89.020	100.009	121.660	135.000	**100.30**
Germany	30.156	35.082	45.000	55.110	72.000	89.000	106.000	**251.51**
Greece	2.694	3.680	4.430	4.510	5.230	7.420	10.200	**278.62**
Hungary	580	1.142	1.375	1.820	2.880	3.100	3.200	**451.72**
Iceland	16	25	16	15	25	5	5	**-68.75**
Ireland	8.620	8.850	13.150	23.180	29.693	22.919	24.000	**178.42**
Italy	134.804	132.510	121.000	111.175	120.435	122.800	128.200	**-4.90**
Latvia	Shown with Estonia until 2003		155	20	276	1.160	1.520	**880.65***
Lithuania	Shown with Estonia until 2003		1.040	1.640	1.896	2.690	3.350	**222.12***
Luxembourg	197	257	285	280	306	490	600	**204.57**
Malta	0	0	0	0	1	25	52	**5100***
Netherlands	20.120	17.500	19.600	23.300	25.500	31.820	30.000	**49.11**
Norway	7.030	7.625	8.620	9.615	11.465	17.000	15.000	**113.37**
Poland	2.500	2.580	3.540	3.700	4.425	7.900	7.800	**212.00**
Portugal	11.343	12.181	14.700	16.965	16.886	16.888	18.000	**58.69**
Romania	141	225	420	550	750	1.3000	1.650	**1070.21**
Russia	168	485	1.130	2.540	8.555	13.100	16.150	**9513.10**
Serbia	0	0	0	0	150	226	370	**146.67**
Slovakia	240	384	665	830	1.311	1.380	1.600	**566.67**

Continue of Table 4

Country	2002	2003	2004	2005	2006	2007	2008	Percent change 2002-2008
Slovenia	75	170	185	230	340	455	650	**766.67**
Spain	31.567	37.486	45.376	55.515	66.772	83.699	100.000	**216.79**
Sweden	10.229	10.950	14.500	19.800	21.700	21.700	16.000	**56.42**
Switzerland	2.250	1.514	1.400	1.900	2.000	2.513	2.590	**15.11**
Turkey	4.263	5.330	7.950	11.830	14.925	19.625	18.050	**323.41**
Ukraine	0	0	0	333	620	890	1.314	**294.59**
United Kingdom	156.706	160.770	184.520	237.205	248.769	286.496	188.000	**19.97**
Total Europe	**522.851**	**546.935**	**612.504**	**715.486**	**806.983**	**932.269**	**888.533**	**69.94**

* calculated to the 1st year having the figure above the zero
Source: Factors Chain International (2002-2008)

however their share in the world factoring market equals only to 2.6% and 17.78 % respectively. Africa is the second smallest world factoring market covering 1.0% of the world factoring volume.

Overall the performance of the global factoring market increased up to 2007, with a growth rate of +15.5% in 2007 (Figure 3).

In 2008 the European market has shown a decline for 4.7% and now represents 67.05% of global volume.

Table 4 presents data on aggregated factoring volumes for each European country over a seven years period, and considers the respective rates of growth in factoring volume over the period.

There are clearly enormous volume differences between member states, with, for example, the UK market being around 313 times bigger than Luxembourg market, and considerably larger than the markets in Cyprus, Switzerland, Hungary, Poland, and Denmark. Italy as the third largest market is still only around 32% of market size in the UK.

The following conclusions may be drawn based on the figures of Table 4:

- **the UK** (EUR 188 billion) is still the largest market;
- after three years of recession, **Italy** (EUR 128 billion) has returned to growth;
- **France** (EUR 135 billion) has moved to the second position, with respectable growth of 10.96%;
- **Germany** (EUR 106 billion) is continuing its strong growth (+47.22% or 1.5 times in three years);
- Latvia (EUR 1.5 billion) has grown enormously – 9.8 times.

Importantly, almost all countries demonstrate positive, and in many cases highly positive, rates of growth in total factoring volumes over the period 2002-2008; however some countries, like Estonia, Iceland, and Italy have experienced a decline by 33.41%, 68.75%, and 4.90% respectively, in 2008 compared with 2002.

Conclusions

1. The international forfaiting market trades the financial obligations of approximately 80 to 90 countries. The nominal value of forfaiting instruments issued each year is now estimated to be around USD 9 to USD 11 billion with about USD 14 to USD 16 billion currently outstanding.
2. Around the world factoring is a growing source of external financing both for large corporations and small and medium size companies. Factoring is risky, but highly profitable kind of crediting, effective instrument of financial marketing, one of the forms of integration of bank operations, which are most adapted to modern processes of development of the world economy.
3. Factoring as the service is most effective for the small and medium size enterprises, which traditionally experience financial difficulties, because of delayed repayment of duties and limitation of sources, accessible to them, of crediting.
4. The world factoring volume has grown at a rate of 82.98% over the period. The largest increase is shown by Australia (241%) and Asia (237%); however their share in the world factoring market equals only to 2.6% and 17.8% respectively. Africa is the second smallest world factoring market covering 1.0% of the world factoring volume.
5. There are clearly enormous volume differences between member states, with, for example, the UK market being around 313 times bigger than Luxembourg market, and considerably larger than the markets in Cyprus, Switzerland, Hungary, Poland, and Denmark. Italy as the third largest market is still only around 32% of market size in the UK.

Bibliography

1. Analysis of Use of Factoring – Final report. DG Enterprise – Access to Finance Unit ETD/00/503408. Available at: http://ec.europa.eu/enterprise/entrepreneurship/financing/

docs/factoring_en.pdf. – London, 2002, p. 102. Access: December 15, 2009.
2. Apsīte I. Faktorings – darījuma būtība un uzskaite faktoringa ņēmēja grāmatvedībā (Factoring – Essence of Transactions and Accounting) // Bilance, Nr. 21, 2006.
3. Bakker M., Klapper L., Udell G.F. Financing Small and Medium-size Enterprises with Factoring: global growth and its potential in eastern Europe, World Bank Working paper, June, 2006, Report No. 3342, p. 50.
4. Cox A., Mackenzie J., International Factoring // Journal of Banking & Finance, Volume 11, Issue 4, December 1987, pp. 605-606.
5. Factoring Essentials. Available at: http://www.allfactoringweb.com/essentials. Access: December 15, 2009.
6. Factors Chain International. Available at: http://www.factors-chain.com/?p=ich&uli=AMGATE_7101-2_1_TICH_L773120274. Access: December 20, 2009.
7. International Forfaiting Association. Available at: http://www.forfaiters.org/about/. Access: December 15, 2009.
8. Hartmanis M. Faktoring lieto aizvien aktīvāk (Factoring is Used More Constantly) // Diena, 2004. gada 21. jūnijs.
9. Klapper L. The Role of Factoring for Financing Small and Medium Enterprises // Journal of Banking & Finance, Volume 30, Issue 11, November 2006, pp. 3111-3130.
10. Kļavis A. Faktorings – viens risinājums vairākām problēmām (Factoring – One Solution for Several Problems) // Bilance, Nr. 18, 2006
11. Kronberga G. Faktorings kā biznesa veicinātājs (Factoring as Business Promoter) // Latvijas Vēstnesis Plus, Nr. 191 (219), 2006. gada 12. decembris.
12. Leja L. Comprehension and Application of Factoring in Latvia and Europe // Law and Justice 2002. gada jūlijs Nr. 35. Available at: http://www.ius.lv/law_and_justice_2002.html. Access: December 5, 2009.
13. Līcītis K. Pieaug faktoringa pakalpojumu izmantošana (Use of Factoring Services Increases) // Diena, 1999. gada 20. septembris.
14. Līcītis K. Pieaug faktoringa pakalpojumu izmantošana (Use of Factoring Services Increases) // *Diena*, 1999. gada 20. septembris.
15. Maurice D. Levie. International Finance, 2005, New York. p.648.
16. NYC Factoring Cash Flow company. Available at: http://www.nycfactoring.com/factoring_history.html. Access: December 5, 2009.
17. Papadimitriou D., Phillips J. and Wray L.R. Community-Based Factoring Companies and Small Business Lending // Working Paper 108. Jerome Levy Economics Institute, Annandale-on-Hudson, NY., 1994.
18. Rebits Dž. Faktorings – terminoloģija un pieejas (Factoring – Terminology and Approaches) // Latvijas Ekonomists, Nr. 6-12, 2001.
19. Rutberg S. The History of Asset-Based Lending // New York: Commercial Finance Association, 1994.
20. Singer J.F. A Small Business Exporter's Guide to Forfaiting Practices in International Finance. Available at: http://www.sbaer.uca.edu/research/sbida/1985/PDF/18.pdf. Access: February 23, 2010.
21. Soufani K. On the Determinants of Factoring as a Financing Choice: Evidence from the UK // Journal of Economics and Business, Volume 54, Issue 2, March-April 2002, pp. 239-252.

ECONOMIC SCIENCE FOR RURAL DEVELOPMENT Nr. 21
Atbildīgais redaktors Aija Eglīte
Iespiests www.grafika.lv