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DEVELOPMENT AND ADMINISTRATION OF BORDER AREAS OF THE CZECH REPUBLIC AND POLAND

Conference Proceedings

Editor

Eva Ardielli

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Prologue

Dear readers,

this is the Proceedings of papers that were presented at the conference Development and Administration of Border Areas of the Czech Republic and Poland - Support for Sustainable Development organized by the Department of Public Economics, Faculty of Economics of the VŠB - Technical University of Ostrava.

The Czech Republic and the Poland are the nearby countries. Both countries are united not only by shared border but also by conjoint problems. To solve them especially in areas such as economic and social challenges of sustainable development, reducing air pollution, increasing energy efficiency, efficient waste management, minorities and migration and cross-border cooperation is focused the works of researchers and academics on both sides of the border.

Therefore the VŠB - Technical University of Ostrava, Department of Public Economics and ENET Centre in cooperation with the City of Ostrava prepared international scientific conference Development and Administration of Border Areas of the Czech Republic and Poland - Support for Sustainable Development. The patronage over the conference took Iveta Vozňáková, Deputy Mayor of Statutory City of Ostrava.

This proceedings of reviewed papers presents a summary of topics that has been prepared for the conference. The conference aimed to contribute to the exchange of scientific knowledge and also to growth of informal contacts of experts from both sides of the border. It served as the basis for the further cooperation of researchers between both countries and will continue in the next conference years.

I believe that included papers will be interesting to read and are going to be a quality reference for your research.

Ostrava, September 2016

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Content

eHealth in the Czech Republic and Poland

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Abstract
Electronization of healthcare (eHealth) is a global trend that solves most developed countries. eHealth is a health service supported by information and communication technology. It includes electronic health records, electronic drugs prescribing or health information systems. It brings clear benefits for patients, doctors and the entire health systems. eHealth is also very important issue in the European union (EU) policy. The EU aims to link individual national eHealth projects and to coordinate them. This effort is the part of the eEurope action plan approved in 2000. The coordination involves the rapid access to shared remote medical expert assessments through telecommunications and information technology, regardless of where the patient or relevant information is located. The article attempts to summarize the current activities in this field at already successful or less successful projects in the Czech Republic, and then follows to plan for the future like National Strategy for eHealth is and also tries to find parallels in Polish electronic health system.

Keywords: *eHealth, Poland, Czech Republic*

JEL Classification: *H83, H75, I13, I18*

eHealth in the Czech Republic and Poland

Eva Ardielli

1 Introduction

In recent decades are in the area of communication between citizens and government widely used electronic communication technologies. The computerization of government is called "eGovernment", which comes from English (eGovernment - electronic governance). Internet and the usage of communication technologies caused and enabled the development of many spheres of life as well as services; see Walczak and Pólkowski (2013). Also the field of medical services is no exception. So, currently eGovernment includes inter alia also the computerization of health care - eHealth. It is the use of modern information and communication technologies for diagnosis, therapy and prevention in health care. eHealth is also the question of lifestyle. It comprises the acquisition, management, storage and usage of health information in connected networks. eHealth is considered as potential tool to improve health care access, support information exchange, reduce costs, and improve the quality of patient care, see Bujnowska-Fedak (2015) or Jung and Loria (2010).

The aim of this paper is to evaluate the current state of eHealth in the Czech Republic and Poland by usage of the multi-criteria decision making methods. In practice the evaluation of the eHealth an important matter because it leads to selection of appropriate measures for further progress in this field and to propose recommendations for the development of eHealth in the country. In this research eHealth was evaluated based on the indicators of eHealth monitored by European Commission. The input data comprised the results "Benchmarking Deployment of eHealth among General Practitioners" study from 2013, see European Commission (2013) and "European Hospital Survey: Benchmarking Deployment of eHealth Services (2012-2013)" study from 2013; see European Commission (2014).

The results of the empirical research evaluate then the state of eGovernment in EU-28 countries by selected criteria and enable the comparison of the eHealth in the selected countries (Czech Republic and Poland) in international context. The analyse is performed by usage of TOPSIS and WSA method. These methods were used, because they represent a suitable tool for the selection and creation of the ranking of the larger number of alternatives. The empirical part of this paper was created using the software SANNA (System for Analysis of Alternatives), see more in Jablonský (2009).

2 eHealth in the Czech Republic and Poland

eHealth concept in the Czech Republic and Poland is mainly influenced by the concept of eHealth in the EU legislation and the recommendations of the World Health Organization (WHO).

Coordinator of eHealth in the Czech Republic is Ministry of Health. In 2007 was established the Interdepartmental Coordinating Committee for the introduction of electronic health. This committee developed main opinions in the area of implementation of eHealth in the Czech Republic (Kolín, 2015). There are 5 priorities in this area:

- Electronic health documentation;
- electronic prescribing;
- electronic identification of the insured and health service providers;
- registers and consolidation of departmental data;
- Portal, education and telemedicine, see Válek (2009).

Successful projects with a nationwide scope are for example the system of video medical documentation sharing ePACS or medical registries (e.g. transplantation or cancer). In addition to these systems, almost all health insurance companies offer the option to acquire and store own copy of medical records of clients into digital form.

However most of the projects aimed at computerization of health in the Czech Republic weren't properly finished like IZIP, eNeschopenka, ePrescription and health registers. For example costly project IZIP - Electronic medical books was not supported by doctors and patients and brought huge losses in billions crowns, see Janasová and Ardielli (2010).

In the Czech Republic is currently in progress computerization of healthcare rather at the local level. At the regional level can be as good example mentioned the project eMeDocS - Integrated Rescue System of Vysocina Region, where, among other things are shared emergent patient data.

In Poland stayed the responsibility of implementation of eHealth projects until 2000 the Ministry of Health. Since 2000 the Centre of Information Systems of Healthcare (CISH) has been responsible for development of eHealth. CISH had determined eHealth Initiatives in Poland for years 2007-2020. In frame of this initiatives there were defined 2 eHealth projects for years 2007-2012 (or 2014): Electronic Platform for Collection, Analysis and Sharing of Digital Medical Records (P1 project), Platform for sharing services and resources of digital medical records with on-line business (P2 project). The aim of P1 project was to build an electronic platform for public health care services, enabling public authorities, companies (including health care facilities, pharmacies, medical practices) and citizens to collect, analyse and share digital resources regarding medical events.

Key benefits of the Project:

- access to patient medical data regardless of time and place,
- faster access to case history,
- more effective treatment owing to updating data in the patient's medical documentation,
- better time management owing to on-line registration,
- easy access to medical information through online portals,
- secure storage of medical data,
- e-Prescription – convenient, safe and practical form of purchasing drugs,
- possibility of monitoring by a doctor if prescription was purchased,
- easier self-control of health owing to access to examination results.

Within the P2 project a platform for medical records was established and launched at the beginning of 2013. The Medical Records Platform is a universal IT tool used to keep registers and provide electronic services that ensure the optimal level of safety.

The CISH also holds the National Register of Blood Donors, the National Register of Cardiovascular Operations, the Central Register of Patients with Cerebral Palsy (CRCMPD), the Monitoring System of Consumer Accidents (SMWK) and the Healthcare Communication System (ZOZMAIL).

For the years 2014 - 2020 are defined 3 points of interest, see Ministry of Health of Poland (2016): Telemedicine, Electronic Medical Documentation and ICT skills.

3 Problem Description

In this paper all EU countries were analysed according to 25 eHealth indicators by using TOPSIS and WSA methods. Both TOPSIS and WSA method are operations research methods. TOPSIS method is based on the usage of the principle of minimizing the distance from the ideal option. It arranges the alternatives according to the indicator of relative distance from baseline (hypothetically worst) alternative (Chen and Hwang, 1992). This method determines in the result the overall order of alternatives. WSA method is based on the principle of utility maximization. It arranges the alternatives in the order according to the total utility, which is taking into account all represented criteria (Fiala 2008). The comparison of these two methods is presented on evaluation of eHealth in the European Union countries. The summarization of monitored eHealth indicators and their characteristics are shown in table 1 and table 2.

Table 1 - Indicators of eHealth use in acute hospitals and their characteristics

Indicator	Characteristic
Externally connected (i1)	Inter-connectivity between healthcare stakeholders. Access to the infrastructure outside the hospital - extranet systems, value-added networks and proprietary infrastructures.
Broadband > 50Mbps (i2)	High-speed broadband - enables the processing and transfer of an increasing amount of data, such as images, reports, telemonitoring services.
Single and unified wireless (i3)	Such infrastructure allows mobile access to different applications and services in every location of the hospital.
Single EPR shared by all departments (i4)	Unique file where patient clinical information is stored, managed, viewed, completed and shared everywhere in the hospital.
PACS usage (i5)	PACS facilitates quick access to images and reports, reduces the number of duplicate images and easy acquisition of a chronological view of the patient's radiology history.
ePrescribing (i6)	Crucial to avoid prescription duplicates and errors.
Integrated system for eReferral (i7)	Crucial to avoid faxes or letter losses in communications between two medical directors.
Tele-monitoring (i8)	Useful for patients living with chronic illnesses or elderly patients.
Exchange of clinical care information with external providers (i9)	Ability of the hospital to communicate with healthcare stakeholders those are outside the hospital in area of clinical care information.
Exchange of laboratory results with external providers (i10)	Ability of the hospital to communicate with healthcare stakeholders those are outside the hospital in area of laboratory results.
Exchange of radiology reports with external providers (i11)	Ability of the hospital to communicate with healthcare stakeholders those are outside the hospital in area of radiology reports.
Clear and structured rules on access to clinical data (i12)	To ensure privacy of data and access to certain types of data.
EAS for disaster recovery in less than 24 hours (i13)	EAS (Enterprise Archiving Strategy) enables users to restore clinical information facilities and information when necessary.

Source: European Commission (2014)

The research was based on data set across multiple data sources; see European Commission (2014) and European Commission (2013). Indicators i1 – i13 describe the level of eHealth use in acute hospitals in EU Member States. They cover the area of: Infrastructure, medical applications, integration and security.

Table 2 - Indicators of eHealth use among General Practitioners and their characteristics

Indicator	Characteristic
Health info & data (i14)	Core functionalities of HER.
Clinical Decision Support System' (Clinical DSS) (i15)	Contraindications, Drug-drug interactions, Drug-lab interactions, Drug-allergy alerts, Clinical guidelines, alerts to a critical laboratory value.
Order-Entry & Result Management' (OERM) (i16)	Medication list, Prescriptions / medications, Immunizations, Lab test results and Ordered tests.
Image (i17)	Radiology test images and Radiology test reports.

Administrative (i18)	Aspects of HER.
Clinical Data (i19)	Exchange of health related information.
Patient Administration (i20)	Certification and other administrative purposes.
Management (i21)	Exchange of data with payers (i.e. insurances) and other healthcare providers.
Professional to Patient (i22)	Consultations with patients and Remote monitoring of patients at home.
Professional to Professional (i23)	Use of telehealth for professional training purposes and consultation with other healthcare practitioners.
Clinical information (i24)	Include View medical records, Supplement medical records and View test results.
Requests (i25)	Include Request referrals, Request appointments and Request renewals or prescriptions.

Source: European Commission (2013)

Indicators i14 – i25 describe the level of eHealth use among General Practitioners in EU Member States. They cover the area of: Electronic Health Record, Health Information Exchange, Telehealth and Personal Health Record.

In the research, there was selected the final list of alternatives (EU-28 countries) and criteria (25 eHealth indicators). The state of eHealth in the EU countries and the comparison of the position of the Czech Republic and Poland were evaluated by usage of TOPSIS and WSA method.

4 Materials and Methods

The methods TOPSIS and WSA provide the complete ranking of the alternatives starting from the best towards the worst one. TOPSIS method is based on the selection of alternative that is closest to the ideal solution and furthest from baseline solution; see Shih, Shyur and Lee (2007). Application of TOPSIS method is as follows:

- Creation of normalized criterial matrix *R* according to following formula (1):

$$r_{ij} = \frac{y_{ij}}{\sqrt{\sum_{i=1}^{m} y_{ij}^2}} \tag{1}$$

where r_{ij} are elements of matrix *R*; $i = 1,2, \ldots m$; $j = 1,2, \ldots r$; y_{ij} are the original input data for alternative *i* and criterion *j*; *m* is the number of alternatives.

- Calculation of weighted criterion matrix *W* by following equation (2):

$$w_{ij} = v_i * r_{ij} \tag{2}$$

in such a manner that each column of the matrix *R* will be multiplied by the corresponding weight criterion v_i; w_{ij} is weight normalized value and v_{ij} is weight of criterion.

- Determination of the ideal and basal alternative relative to the matrix values *W*, see following formulas (3) and (4):

$$H_j = \max_i w_{ij} \tag{3}$$

$$D_j = \min_i w_{ij} \tag{4}$$

for $i = 1,2, \ldots m$ and $j = 1,2, \ldots r$.

- Distance calculation of alternatives from the ideal alternative, respectively basal alternative, see formula (5) and (6):

$$d_i^+ = \sqrt{\sum_{j=1}^{r} (w_{ij} - H_j)^2} \tag{5}$$

$$d_i^- = \sqrt{\sum_{j=1}^{r} (w_{ij} - D_j)^2} \tag{6}$$

for all $i = 1, 2, \ldots m$; and $j = 1,2, \ldots r$.

- Calculation of the relative distance indicator of variants from baseline variant by formula (7):

$$c_i = \frac{d_i^-}{d_i^+ + d_i^-} \tag{7}$$

where $i = 1,2, \ldots m$;

- Arrangement of variants by non-growing values of c_i.

  WSA method is based on linear utility function. The method provides complete ranking of alternatives according to their total utilities. Application of WSA consists of the following steps:

- Normalization of input data using following equation (8):

$$r_{ij} = \frac{y_{ij} - D_j}{H_j + D_j} \tag{8}$$

where r_{ij} are the normalized values for i alternative and j criterion, y_{ij} is original value of alternatives according to the criterion j, D_j are the values of the basal alternative and H_j are values of the ideal alternative.

- Calculation of the total utility according to the following formula (9):

$$u(a_i) = \sum_{j=1}^{k} v_j r_{ij} \tag{9}$$

where $u(a_i)$ is the total utility of the alternative a_i, r_{ij} are normalized values from the previous step, v_j is the weight of j-th criteria and k is the number of criteria.

- Order of alternatives according to the utilities.

5 Results

In this part of the paper there are presented the application results of TOPSIS and WSA methods. On the basis of the TOPSIS method there was performed distance calculation from ideal and basal alternative. The coefficient of total distance of alternative i from the ideal alternative d_i+ was calculated from formula (5). Coefficient of total distance of alternative i from basal alternative d_i- was calculated according to formula (6). Subsequently there was calculated the total relative indicator of distance from basal alternative c_i. The relative distance of alternative i from the basal alternative is given by formula (7). The values of the calculated index range between 1 and 0. Value 0 corresponds to the basal alternative; value 1 corresponds to the ideal alternative.

Based on the result, it is possible to determine the order of the EU countries in terms of the eHealth functioning, from the best to the worst, as shown in table 3. Assessment of the state of eHealth in the EU countries in 2013 according to TOPSIS method showed that on the best places are the Nordic countries – Denmark (1. position), Finland (2. position) and Sweden (4. position). On the 3. position is placed Estonia. The worst state of eHealth was found out in Slovenia, Poland and Lithuania.

Table 3 - Evaluation of eHealth in EU countries by TOPSIS method (2013)

Order	Variant	R.U.V
1	Denmark	0,75742
2	Finland	0,68290
3	Estonia	0,68030
4	Sweden	0,66793
5	Netherlands	0,64152
6	Spain	0,59475
7	United Kingdom	0,59046
8	Belgium	0,57384
9	Luxembourg	0,53958
10	Austria	0,53028
11	Croatia	0,52744
12	Italy	0,50331
13	Czech Republic	0,50311
14	Portugal	0,48717

Order	Variant	R.U.V
15	France	0,47469
16	Hungary	0,45119
17	Ireland	0,43080
18	Latvia	0,42331
19	Germany	0,40848
20	Slovakia	0,38664
21	Malta	0,35893
22	Cyprus	0,35182
23	Romania	0,34943
24	Greece	0,34117
25	Bulgaria	0,32799
26	Slovenia	0,32394
27	Poland	0,27647
28	Lithuania	0,24821

Source: Own research

WSA application was processed in three steps. The values of the criterion were normalized using formula (8) and it was calculated the total utility of each alternative using the equation (9). Then the total utility of alternatives was ordered from the highest to the lowest. The ranking of EU countries is represented in table 4.

Table 4 - Evaluation of eHealth in EU countries by WSA method (2013)

Order	Variant	Benefit
1	Denmark	0,83291
2	Estonia	0,75766
3	Finland	0,71356
4	Netherlands	0,67775
5	Sweden	0,66172
6	Spain	0,63717
7	United Kingdom	0,60703
8	Belgium	0,56887
9	Czech Republic	0,56251
10	Austria	0,55879
11	Italy	0,54762
12	Luxembourg	0,54370
13	Croatia	0,54069
14	France	0,52157

Order	Variant	Benefit
15	Hungary	0,50097
16	Portugal	0,50027
17	Ireland	0,48303
18	Germany	0,46938
19	Latvia	0,39022
20	Slovakia	0,38816
21	Romania	0,38126
22	Bulgaria	0,36523
23	Cyprus	0,35989
24	Slovenia	0,31519
25	Greece	0,31465
26	Malta	0,30645
27	Poland	0,30497
28	Lithuania	0,17827

Source: Own research

Evaluation of eHealth state according to WSA method in EU for 2013 presented that on the best place was also Denmark and then Estonia (2. position) and Finland (3. position). On the worst place ranked Lithuania. Other countries with the worst state of eHealth were Greece, Malta and Poland.

6 Conclusion

The results of the evaluation of EU countries in terms of the state of eHealth by TOPSIS and WSA method in the year 2013 acknowledged that the best ranking in this area obtained Denmark, Finland, Estonia and Sweden by usage of TOPSIS method and Netherlands by usage of WSA method as well. The worst state of eHealth was

reported in Slovenia, Poland and Lithuania (TOPSIS) and also Malta (WSA). Based on the evaluation of eHealth in the EU-28 countries in 2013 it was found highly unsatisfactory position of Poland in the field of eHealth. However there are implemented various interesting and innovative projects of computerizing of health system carried out by the Ministry of Health, there is lack of principal rules necessary in the field of computerizing and incomplete coordination of IT actions between the health care units and governmental ones. The on-line services lack the basic elements significant when it comes to the contact with the patients; see Walczak and Pólkowski (2013). The Czech Republic ranked slightly above average among EU-28 countries. However in the country there are serious shortcomings, particularly on the side of public digital services providers. Changing the attitude of government officials in area of eGovernment promotion is therefore required. eHealth is an useful tool for reducing the costs it is also the benefit for the residents in the form of time savings. Also in Poland remains this issue main challenge for the future.

When evaluating the applicability and relevance of used methods (TOPSIS and WSA), it is for the purpose of eHealth evaluation more objective and therefore more suitable TOPSIS method, which reflects the variability, for example the range of values among other countries. The WSA method then always exalts the extreme values before the average values, so through this procedure, get better evaluation those countries which have maximum values in some of the monitored criteria.

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Regional Education in the Czech Republic and Polish National Minority

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Abstract
The education in the territory of the Czech Republic has long-term tradition. The right to free education relates to duty of the state to ensure funding of compulsory education that is given by the law. The main aim of this contribution is the evaluation of number of individual schools according to their founder and the state of funding of regional education in the Czech Republic in 2010 - 2014. Population that is in the long term adhering to Polish nationality has on the part of Moravian-Silesian region, specifically only the district Frydek – Mistek and Karvina only little less tradition. The partial aim of this paper is to show the state and situation in area of education of Polish minority in the Czech Republic, which has the right to education in their native language. It has been found from the observed results, that the most common founders in the regional education are lower local governments. The funds provided to education are stabile in the term of financing, when there was a slight trend of growth in the proportion of founds spent in the early childhood and primary education in 2012 - 2014. It was found, to 30th of September 2015 from the perspective of Polish minority education, that there were, in above-mentioned districts, established 42 schools with education in Polish language specifically 20 nursery schools, 21 primary schools and 1 secondary school. Beyond this, there are other four nursery schools that teach both in Polish and in Czech language.

Keywords: *Funding, regional education, Polish national minority, founder*

JEL Classification: *H41, H52, I21, J15*

Regional Education in the Czech Republic and Polish National Minority

Jiří Bečica

1 Introduction

Education is one of the most significant and irreplaceable value a man can gain in his life. He is evaluated and compared not only as an individual but as a part of whole company as well according to his education. Education is human capital which can help us to reach our aims, satisfaction and employment in global labour market. All skills and knowledge were given from generation to generation in the past, thus people improved only in one branch and they missed general overview and education.

Compulsory school attendance, that gives general education to everyone without a distinction, was first introduced during the rule of Marry Terezie in the territory of today´s Czech Republic. She introduced compulsory school attendance for children aged 6 to 12 through so called, general school rules'' in 1774 by her decision. Currently, the right to free education is in accordance to Article 25 of Charter of Fundamental Rights and Freedoms that relates to obligation of the state to secure funding of compulsory education given by the law.

There is said in Charter of Fundamental Rights and Freedoms: „Everyone has the right to education. School attendance is compulsory for the age given by the law. Citizens have the right to free primary and secondary education according to their skills and to free education at the university according to the possibilities of society. It is possible to established school different to state school and teach there in the condition of the law. There can be education provided for bride. The law sets what condition have the citizens right to help of state in.''

The main aim of this paper is to evaluated a number of individual schools and the state of funding of regional education in the Czech Republic in 2010-2014

There is relatively large Polish national minority in the Czech Republic, which is concentrated in the municipalities of so called Tesin Silesia, i.e. in the territory of two districts of Moravian-Silesian region, Karvina and Frydek-Mistek. Thus the partial aim of this paper is to show a state and situation in education of Polish national minority across the Czech Republic.

The funding of school is ensured mainly by funds of state budget i.e. from the Ministry of Education Youth and Sports (hereinafter MEYS) and from the budgets of founder of school and school facilities in the Czech Republic. These are mainly regions, municipalities, municipal unions, registered churches, religious organizations, some other ministry and other legal entity too.

2 Material and Methods

Peková (2008) states education of people in every state influences economic development, easier flexibility in the labour market, coping of new technologies in national economy and ensuring of production of quality goods of all kinds. As the educational system in the Czech Republic is multistage, there was chosen for analysis of this paper only a part of educational system, specifically part of regional education which includes preschool education, primary education and secondary education. Compulsory school attendance is applied to primary education for pupils visiting primary school from first to ninth class in the Czech Republic.

The analysis of number of schools and evaluation of state of funding in regional education conducted below is based on data available from annual reports of Ministry of Education Youth and Sports in 2010 – 2014. Five years time series was deliberately chosen to show the latest available data in longer period and there were also evident changes in volume of funding in period when the Czech Republic continually got over recession period.

Information about Polish national minority used in this paper comes from available data of Czech statistical office, especially from people census in 2011. 39 096 people joined Polish nationality in the Czech Republic in census 2011. Most of them, about 80%, live in the territory of Tesin Silesia. Congress of Poles in the Czech Republic and Polish Cultural and Educational Union (PZKO), these are two civic association organizing activities of Polish minority in the Czech Republic, estimate there are in total 70 000 people of Polish nationality.

Data of financing of regional education comes from information available from Ministry of Education Youth and Sport of Czech Republic and Ministry of Finance of Czech Republic. Specifically the data were drawn from portal IISP – Monitor, there are shown budgets of individual municipalities and their funded institution. In the Czech Republic there are most schools established as allowance organization of state, region or municipality thus these institution are, in greater or lesser extent, connected to public budget. Schools that are

allowance organization are established to give public services (Mitwallyova, 2014) thus they are financing from funds of founder (state, region, municipality), that are public funds. The main character of public service is that this activity is non-profit and it must be subsidized by its founder (Ochrana, 2007, Rektořík, 2010). It is a fund of ounder´s budget in case of schools to secure routine expenses but there are not funds for labour costs of employees because they are paid by Ministry of Education Youth and Sport of Czech Republic in regional education. If it is necessary to invest in property managed by school management, the founder decides to provide specific grant to specific investment project.

In terms of current literature there are many authors who deals with issue of ensuring of public services, by the way the education part as well, for example Mockovčiakova, Prokupkova or Moravek (2015), who comprehensively describe working of allowance organization. Lovetinsky or Mylkova (2011) evaluate a position of allowance organizations in the Czech Republic and compare them to similary focused institutions in chosen countries of Europe. Ochrana (2007), Vaňková and Vrabkova (2014) or Bečica (2016) deal with efficiency of ensuring of public services in municipality level in the Czech Republic. It is possible to mention e.g. Jääskeläinen (2010) out of foreign authors, who tries to measure productivity of public sector institutions that gives public services in Finland.

3 Founders of schools and financing of regional education in the Czech Republic

Participants who influence financing of regional education are, except of government and Ministry of Education Youth and Sport, the founders of individual schools and school facilities in the territory such as municipalities, regions, registered churches, religious organizations. Those founders usually establish school in a legal form of allowance organization. Schools established in a legal form of educational legal entity are usually established by other legal entity.

A condition for establishment of activity of school and schools facilities is an entry in a register that is accessible to public. It contains a register of schools and school facilities and a register of educational legal entity. MEYS publishes an informative educational register in electronic form its website and information of this website are handled in a table no. 1, showing the total number of schools according to their founder and individual types of education dated to September 2015.

Table 1 - Comparison of schools in the Czech Republic according to their founder and type of education dated to 1st September, 2015.

Founder	Nursery school	Primary school	Conservatory	Secondary school	University	Total
State administration in education[1]	7	47	1	31	26	**112**
Municipality	4 714	3 629	0	27	0	**8 370**
Another central body of state administration[2]	0	0	0	5	2	**7**
Private entrepreneur	348	157	3	314	44	**866**
Church	49	43	2	40	0	**134**
region	133	288	12	893	0	**1 326**
TOTAL	**5 251**	**4 164**	**18**	**1 310**	**72**	**10 815**

Source: Own processing of data MEYS [online]. 2016 [cit. 2016-09-08]. Available from: http://www.msmt.cz

In terms of analyzed regional education in table no. 1 it is obvious most common founder of nursery schools and primary schools are municipalities, of secondary schools are regions followed by other legal entity. Specific feature is when MEYS of the Czech Republic can establish schools and schools facilities in a legal form of legal entity or stat allowance organization. Legislation of the Czech Republic allows to Ministry of the Interior, Ministry of Defence & Armed Force, Ministry of Justice and Ministry of Labour and Social Affairs

[1]Note: Ministry of the Czech Republic – Founded institution.
[2]Note: Ministry of Defence & Armed Force of the Czech Republic – State organization unit.

to established schools and school facilities as a state organization unit. Ministry of Foreign Affairs of the Czech Republic establishes schools at the diplomatic mission or consular offices of the Czech Republic as a part of these offices.

Act no. 561/2000 coll. educational act; act no. 128/2000 coll., about municipalities, act no. 250/2000 coll., budget rules of territorial budgets; Act no. 218/2000 coll., act about budget rules; act no. 400/2015 coll., about state budget of the Czech Republic 2016 and regulation no. 492/2005 coll., about regional norm amended are the basic legal norms, that govern regional education´s funding of the Czech Republic. Schools and school facilities in the territory of the Czech Republic manage the funds gained from the state budget, from their founder (MEYS, regions, municipalities, municipal unions, natural person), from their own activities, from institution´s fund and other resources (schools fees, presents, programs of EU, compensation of insurance, etc.), it is multi-source funding.

The following table no. 2 shows percentage distribution of funds taken from budget of MEYS of the Czech Republic in 2010 -2014 into individual parts of regional education, university education and others.

Table 2 - Percentage distribution of funds of MEYS in 2010 – 2014.

		2010	2011	2012	2013	2014
Preschool education		**9,99%**	**9,37%**	**9,88%**	**10,33 %**	**10,81 %**
Nursery schools (NS)		9,76%	9,17%	9,67%	10,26%	10,61%
Primary education (PS)		**32,12 %**	**31,40 %**	**30,92 %**	**31,57 %**	**32,56 %**
Primary schools including schools club		29,33%	28,67%	28,29%	29,11%	30,20%
Primary art schools		2,37%	2,20%	2,31%	2,32%	2,31%
Secondary education (SS)		**21,16 %**	**19,55 %**	**19,45 %**	**18,59 %**	**18,22 %**
Of which	Grammar schools, including sport schools	4,61%	4,35%	4,40%	4,40%	4,32%
	Secondary vocational schools and conservatory, including higher professional education (HPE)	8,70%	8,08%	8,06%	7,83%	7,73%
	Secondary vocational school, vocational schools, SPV	7,14%	6,45%	6,30%	5,68%	5,50%
Eating of pupils of NS, PS, SS		2,27%	1,89%	1,80%	1,81%	1,80%
Accommodation facilities		2,65%	2,41%	1,83%	2,23%	2,10%
University		**19,83 %**	**19,70 %**	**19,99 %**	**19,81 %**	**18,33 %**
Government		0,47%	0,47%	0,46%	0,42%	0,42%
Other resources		9,15%	13,01%	13,36%	12,92%	13,45%
Total		**100,0 %**	**100,0 %**	**100,0 %**	**100,0 %**	**100,0 %**

Source: Own processing data of final chapters Account 333 MEYS [online]. 2016 [cit. 2016-09-08]. Available from: http://www.msmt.cz/vzdelavani/skolstvi-v-cr/statistika-skolstvi/statisticka-rocenka-skolstvi-soubor-ekonomickych-ukazatelu-6

It is evident from table no. 2, that financing of schools and schools facilities, belonging to regional education (preschool education, primary education and secondary education) take 66 -71 % of all funds in chapter of Ministry of education Youth and Sport of the Czech Republic in observed years.

The biggest sum of funds goes to direct costs of education to schools and school facilities established by regions, municipalities and municipal unions, based on republican normative[3] through Regional Office. MEYS also provides grants to universities for research and development of new technologies. The following table no. 3 shows part of public expenses in Education and learning in % of GDP.

Table 3 - Public expanses in education at current prices in 2010 – 2014 and their part of GDP in % (in million of CZK).

Year		**2010**	**2011**	**2012**	**2013**	**2014**
Ground Domestic Product at current prices		3 953 651,0	4 022 410,0	4 047 675,0	4 086 260,0	4 266 406,0
Consumer price index (2005=100)		114,9	117,1	121,0	122,7	123,2
Public expanses in education in total		162 965,1	173 722,0	171 369,9	172 805,2	174 477,3
Public expanses in learning		151 684,4	155 295,5	153 714,5	154 762,3	159 970,2
In it from budget	MEYS (333)	117 096,1	124 502,	124 197,6	124 411,5	125 097,6
	Transfers from MEYS to Regional offices and magistrate	-80 102	-84 824	-84756	-84 957	-86 503
	Municipalities and MU and Regional offices	113 600,2	114 663,9	113 277,3	114 227,5	120 253,3
	Ministry of Defence (307)	1 093,5	955,7	998,5	1082,6	1124,3
	Transfers from MD to Regional offi. and magistrate	-3,3	-2,5	-2,9	-2,4	-2,3
Public expenses to education in % GDP		4,1%	4,3%	4,2%	4,2%	4,1%
Public expanses to learning in % GDP		3,8%	3,9%	3,8%	3,8%	3,7%

Source: Own processing of data from annual report about state and development of education in the Czech Republic. Account 333 MEYS [online]. 2016 [cit. 2016-09-08]. Available from: http://www.msmt.cz/vzdelavani/skolstvi-v-cr/statistika-skolstvi/statisticka-rocenka-skolstvi-soubor-ekonomickych-ukazatelu-4

It is evident from the table no. 3, that expanses of state budget going to education has got decreasing tendency. The expanse decreased in years 2012 and 2013 in comparison with 2011 because of economical crisis and it was the same in year 2014 as in 2010.

4 Regional education and Polish national minority in the Czech Republic

Teaching language in school in the Czech Republic is Czech. If MEYS allows, there can be some exception of this rule. In accordance with article no. 25 of Charter of Fundamental Rights and Freedoms and in accordance with framework Convention for the Protection of National Minorities, it is ensured for the people of national minorities the right to learning in their native language, but it cannot be to the determinant of learning official language or teaching in this language. The conditions are set in §14 of Educational law. Minority education is guaranteed if the act conditions are hold, in the municipalities where are Committee for National Minorities established according to §117 paragraph 3, act

[3]**Financial normative** is sum given in CZK, that presents average fund of state (minimum grant) for covering of cost connected to activities (education, accommodation, eating etc.) to one pupil at certain type of school in one year. Financial normative are economical regulator of main activity in regional education.

no.128/2000Coll., about municipalities. Committee for National Minorities is established in municipalities, where there were registered at least 10% inhabitants of given minority in the last census.

According to the last census in 2011, the Committee for National Minorities should be established in 64 municipalities. In 2015, it was established in 48 municipalities, even though in 12 of them it was not necessary according to the law. There was established the Commission for National Minorities in three municipalities and district of Prague 8 has got it as well.

There are 28 municipalities, where there is not established the Committee for National Minorities even though it should be there according to the law. The reasons for this state are lack of interest and movement of these inhabitants motivated by short time job opportunities during consensus.

For teaching of member of national minorities are set certain conditions. There must be some number of children, pupils or students of given national minorities for opening a class:

- nursery school – at least 8 children in a class;
- primary school - 10 pupils and
- secondary school - 12 students.

For establishing primary school or nursery school with language of given national minorities all the classes of organization must have 12 children or pupils in average and for establishment of secondary school there must be at least 15 student in average for a class.

If it is not possible to fill the set number of children, pupils or students and there is interest in learning in minority language, a director of school may set, with agreement of founder of a school, some subjects of educational programme that can be taught bilingually. It follows the number of pupils is distinctly lower than an average set for other common schools.

There are given bilingual certificates, vocational certificates or diplomas in school where it is taught in language of national minority, in the Czech and in the language of national minority too. During leaving exams, it is taken into account some particularities. Education in language of national minority is allowed in cooperation of more founders too, including financing.

Polish national minority is the only minority in the Czech Republic at the moment that applies its claim to education in their own language. According to census 2011, 69 % inhabitants of Polish national minority are in the territory of two districts – Karvina and Frydek – Mistek. Institution taking care of needs of schools with Polish teaching language is educational centre for Polish national education with its seat in Cesky Tesin. This institution was established by MEYS and it was established on 1st January 1996.

According to data of MEYS dated to 30th September 2015 there are 42 schools in territory of above mentioned districts with Polish teaching language (20 nursery schools, 21 primary schools, 1 secondary school) and 4 nursery schools with Czech and Polish teaching language.

Table 4 - Development of number of pupils from primary schools with Polish teaching language in period of school year 2010/2011 and 2014/2015.

School year	Type of school	Number of		
		School	Classes	Students
2010/2011	Primary school	21	112	1161
2014/2015	Primary school	21	117	1758

Source: Polish national education in Moravian – Silesian region, own processing.

It is evident in table no. 4 that number of pupils of primary schools with Polish teaching language is increasing. 1758 pupils perform the Compulsory school attendance in school year 2014/2015. It is 597 more pupils than in 2010/2011, which is an increase of 51%.

5 Results and Discussion

In the Czech Republic, the most schools and school facilities are separate legal entity and manage as allowance organization or educational legal entity or as a state organization unit.

Upbringing and education have one of the decisive impact to community development. The education should be under constant supervision of state. Educational system of the Czech Republic is created by schools and school facilities according to types of founder and according to each level of educational system, as shown table number one.

In total, there is 10 815 different types of school in the territory of the Czech Republic. The biggest number is number of nursery schools (5 251) followed by primary schools (4 164) and secondary schools (1 310). These schools belong to regional education in the Czech Republic. The most often founder of schools are municipalities (found 8 370 schools) and regions (found 1326 schools). Other founders are private natural person and legal entity (866), church (134) and state (112).

Education can be understood as creation of accumulation and care of human capital. Education brings, not only to individuals but to whole society, many incontestable benefits and not just in material sense but in wide scale of other areas as well. Many social risk factors are, on the other side, connected to gaining of lower education. Not only knowledge, skills, abilities and attitude of graduates is gained with higher education but it distinctly increases satisfaction of a person too. It is related to both a better position in labour market and a number of non-economic benefits.

Funds that are necessary to secure function of regional education of the Czech Republic are mostly realized in caption of Ministry of Education Youth and Sports that secure, through transfers, about 70 % of expanses needed to function of institution of education, especially employees´ wages. The rest of missing funds, about 30 % of all expanses, are paid from the budgets of founders and these funds mostly covers current expenses for energy and other common operating of schools (travel expenses, repairs etc.). If it is necessary to invest or renovate buildings, it is paid by own budget of founder. There are possibilities of using different grants, both from the state (not only MEYS) and from European Union.

People who have higher education are applied better in current society, they have distinctly higher incomes, they are much less threat by long term unemployment and they show bigger economical merit to whole society too. Education has got many other positive effects: people with higher education live longer age, they are less prone to unhealthy habits, they are more socially engaged and they evaluate their lives as happier in whole.

Taking in account all positive facts we should conclude that expenses connected to securing of education should increase in proportion to GDP in individual years in the Czech Republic. Then we would be able to use all given positives for both individuals and in whole society. The opposite is true, conducted analyze of years 2010 – 2014 showed total expenses in education sphere stagnate, or even decrease and they got to value of 3,7 % GDP of the Czech Republic. Only slight increase of current expenses of regional education can be positively evaluated. And they are realized at the expense of expenditure given to higher education.

6 Conclusion

Regional education has multi-sources financing in the Czech Republic, but the largest part of funds to educational activities of schools is from state budget. It pays labour cost of the educational staff and necessary cost of ensuring of education. The funds are given to schools according to the number of pupils. This process cannot effectively evaluate the quality of education, thus the education is supplementary financed from funds of founder. Common expenses of schools and school facilities are paid from founder´s budget. The biggest sum of funds is transferred through appropriate Regional Offices to regional education, especially primary education. Primary education got in average 32,31 % from annual volume of total financial expanses of MEYS for ensuring education in the territory of the Czech Republic.

In terms of Polish minority education it was found out from comparison of number of pupils in 2014/2015 to 2010/2011 that the number of pupils increases in schools with Polish language teaching, although a total number of pupils in the Czech Republic decrease. A number of people claiming to Polish minority and a number of municipalities founding Committee for National Minorities have decreasing trend too. The number of schools with Polish language teaching is stabile in the long term, in total number of 42 subjects that are found solely in a legal form of allowance institution. Founders are municipalities in the districts Frydek – Mistek and Karvina and Moravian – Silesian region that establishes one grammar school in Cesky Tesin.

In conclusion, we can state that, by inhabitants but also by public founders of schools, great emphasis is placed on quality improvement (Vrabková, 2007) of provided education, introducing of modern teaching methods, development of information technologies and material aids given by the educational system to children, pupils and students who meet compulsory school attendance.

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Agri-food Clusters as an Opportunity for Development of Border Rural Areas

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Abstract
Cooperation within the framework of euroregions of the European Union is an answer to challenges posed by global economy and not merely an instrument to reduce negative external effects which exist in peripheral areas. In the long-term perspective, cooperation should serve to: ensure stability of natural capital, dissemination of knowledge and innovation as well as break the convention of simple industrialization thanks to the feedback of network economy. The sole meeting point of the three processes is a territory, the delineation of which should be executed by social actors capable of identifying resources that are available on it. The authors of the article present the justification of the thesis that in rural areas of Opole Province and the areas of the Czech Republic which are complementary to the former, there can be established a functional area generating intelligent specializations in agriculture. Identification of the conditions behind this process has been carried out on the basis of survey research conducted in commercial farms based in Opole Region. The presented data indicate that the agriculture of the Region generate potential of cooperation, which – owing to a variety of institutional solutions – is able to contribute to establishing a functional area with different ecosystems of business activity within the framework of bio-economy.

Keywords: *functional area, intelligent specializations, knowledge and innovation, regional development, sustainable intensification of agriculture*

JEL Classification: *R11, Q55, Q56, Q58*

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1 Introduction

Network economy and its mechanisms have contributed to the appearance of new poles of growth in the global and regional space. Consequently, network economies have been acknowledged to be a source of new transformation and restructuring of capitalism. These processes, however, run in opposition to negative external effects (mainly environmental ones) of simple industrialization and are regulated by the goals, principles and features of sustainable development, while institutional reflexivity, connected with defining them, influences selection of modernization-induced paths within different areas of economy on different territories. Thanks to the institutional reflexivity, awareness of the particular significance of identification of principles behind development as the main carrier of information about the accepted axiological system (system of values) is on the rise. So is that of integrated order as a target system of a new paradigm of development.

Sustainable and lasting development is a process of social integration. It possesses the following dimensions:

- purposeful – connected with horizontal social integration within the social, economic and natural capital,
- territorial – containing vertical social integration founded on the expression: "think globally – act locally",
- temporal – based on inter-generation social integration.

In each of the above dimensions, the network economy and information society which is being formed parallel to the former, offer a source of new social stratification and new forms of social exclusion. Accordingly, the new goals of sustainable development contained in the 2030 Agenda adopted by the UN and in the case of the EU – in the strategy Europe 2020 – are meant to serve to overcome the negative phenomena. The path of renewal presented in the strategy assumes intelligent, sustainable development which would favor social inclusion. All these features of development are complementary to each other; nevertheless, isolating them means also showing differences existing in integrated management of such a development [3]:

- in the case of sustainable development, its participants are not equivalent: the authorities, experts, local community, non-governmental and consumers' organizations hold different rights,
- intelligent development assumes a compromise (partnership) of all producers of space for which a plan of development is made,
- the term "inclusion", on the other hand, puts an emphasis on "user's democracy" in planning how to make use of specific resources of the space.

Integration of the dimensions of sustainable and lasting development occurs provided that the necessary and sufficient conditions are satisfied. The necessary condition consists in elimination of contradiction of goals which constitute a criterion of elements of the integrated order and hierarchy within orders and goals. On the other hand, the sufficient condition points to determination of the integrating goal which is meant to favor actions for maintaining individual orders [1]. The UN Agenda does not define the sufficient condition. Regarding the strategy Europe 2020, the condition is defined as a creation of intelligent specializations as a mechanism to delineate territorial socio-developmental partnerships. In the developmental perspective 2020, all the EU policies, including Common Agricultural Policy (CAP), contain mechanisms of an institutional change, which serve to establish intelligent spaces in areas of the united Europe. These instruments are not merely addressed to areas which have been delineated by way of administrative divisions – they allow free delimitation of developmental space within the framework of different forms of social self-organization, also in the area of trans-border cooperation.

2 Material and Methods

In the new paradigm of regional development, networking concerns chiefly urban centers. The Polish Conception of Spatial Management of the Country indicates possible network concentrations of Polish cities with European ones, among others, the trans-national area of intensive development of the European significance, whose vertices are Krakow, the Upper Silesian Agglomeration (in Poland) and Ostrava (in the Czech Republic). Opole Province makes a peripheral area of the network, similarly as the area of the whole Praded Euroregion. In the new strategy of development of this euroregion until 2020 [15], the postulate has been

accepted to delimit it as a functional area. Possible specializations within the territory have been proposed in the Regional Strategy of Innovation of Opole Province [13]. The following are listed among them: plant production and agri-food processing.

The aim of the present elaboration is to analyze the changes going on in commercial agricultural farms based in Opole Region, which follow in the process of the farms' adaptation to economy based on knowledge. The changes are identified on different planes: environmental, dissemination of knowledge and in the institutional environment. They are the planes of: transformation of the European model of agriculture and priority areas of cooperation within the framework of euroregions.

The empirical material comes from the research conducted in 2014, with the use of the questionnaire-based interview method. It was done in commercial holdings of the area exceeding 10 hectares of farmland, which were selected on purpose (nonprobability sampling). The farms, specializing in different types of agricultural production, are localized in sub-regions which are representative of Opole Province, that is in the following communes: *Głogówek*, *Kietrz*, *Lubrza*, *Biała*, *Skarbimierz* and *Olszanka*. The research sample included 100 agricultural farms.

The presented data allow answering the question: Does the agriculture of the region generate potential of cooperation which – owing to a variety of institutional solutions – is able to lead to creation of a functional area with different business ecosystems within bio-economy? A model for such networks can materialize in the form of clusters which function in *Wielkopolska* (Greater Poland) and Brandenburg, which specialize in production of functional food (e.g., the cluster "Food4Good") [16].

3 Results and Discussion

3.1 Role of environmental regulations in creating innovation in agriculture

Agricultural farms in the EU should target high effectivity and sustainability. The "ladder of sustainable development", which is constructed on the basis of the degree of restrictiveness of the principle of maintenance of natural capital, has been accepted to be the logical foundation and the model of such a transformation of them. Based on this, the following are distinguished [5]:

- the weak principle of durability, which assumes perfect substitution of different types of capitals: natural, anthropogenic (economic and cultural) as well as human,
- the sensitive principle of durability, which restricts the substitution of the above-mentioned capitals – assumes that the anthropogenic and natural capitals can be substitutes within tightly determined boundaries, which means a careful exploitation of resources of nature and avoidance of too rapid using them up,
- the strong principle of durability, which forces to preserve each capital on its own, since it assumes complementariness of capitals, but not their substitutability; a loss of an individual capital should be compensated by an accretion of the same capital, not an investment in another capital,
- the restrictive principle of durability, which means prohibition of depleting each of the capitals.

At present, the environmental regulations of the CAP result from the sensitive principle of durability; however, the long-term strategy relating to maintenance of bio-diversity on the European Continent till 2020 [9] will force agriculture to implement the strong principle of durability.

According to R. Perman et al. [10], the long-term impact of environmental regulations depends mainly on the effectiveness in the following spheres:

- shaping net incomes,
- implementation of technological innovations.

In the scope of the first factor, there are mainly subsidies that are used in the EU agriculture. According to some data, subsidies in agricultural farms in the EU make even 65% of their incomes. In the new member states their income-generating role is much more limited. Farmers from Opole Region do make a note of their influence on the economic condition of their farms, yet in the ranking list of the income-generating factors they take the fifth place. The farmers draw attention to the fact that maintaining the quality of the natural capital is not rewarded by the market (65% of the indications), or it is but indirectly through the quality of produce sold (19%). In these circumstances, as many as 73% of the respondents expect a bonus for their realizing the environmental functions. Other attitudes assumed by the farmers are also evident:

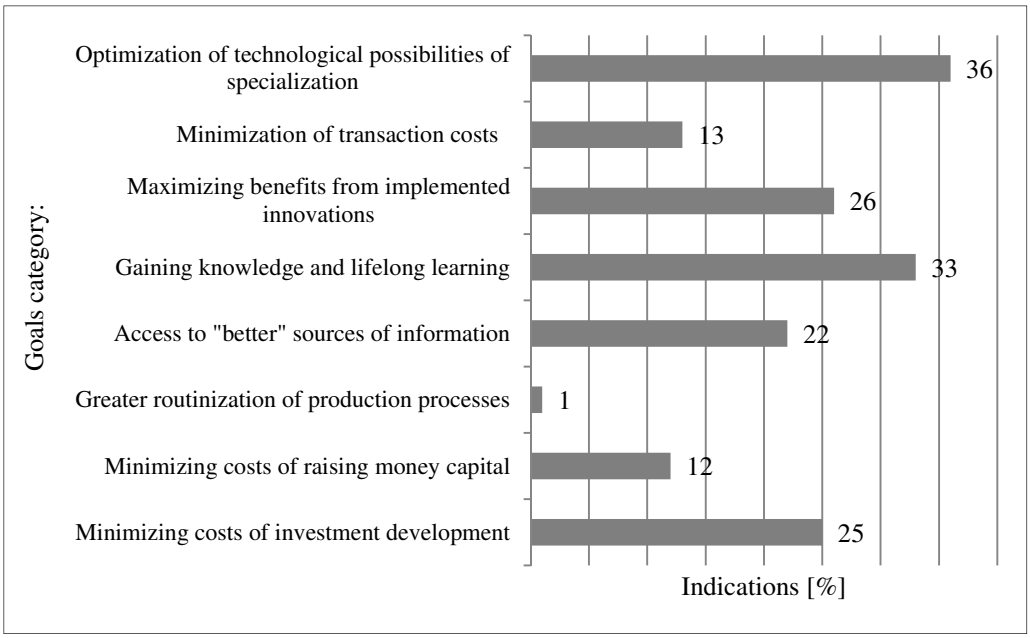
- 14% of the respondents consider that taking care of environment is written in the farmer's profession and should not be additionally rewarded,

- 12% of the examined acknowledge it to be justified to reward only individual commitments and actions which go beyond average norms.

The question of impact of the environmental regulations on implementation of technological and organizational innovations which compensate for the adjustment costs, is the subject of the so-called Porter's hypothesis [11]. In accordance with the hypothesis, the relation competitiveness-natural environment is wrongly classified, that is it is included in the statistical system of technologies, products, processes and customers of firms, which causes the ecological regulations to generate costs in them and to diminish their competitive advantage. The dynamic approach should make a proper perspective in examining this relation. If the answer of a firm/agricultural farm to rational designing and prudently implemented regulations is an initiation of processes introducing innovations, then they can more than compensate for the borne costs of adjustment to environmental requirements.

Implementation of innovations requires perfecting management and formulation of – beside common goals (profit, position in the market) – also autonomous targets which are decisive regarding the key competences of an organization [4]. Owing to them, the following are possible: mobilization, restructuring and diversification of the resources at the disposal. This is especially significant in the process of making farms multifunctional. Adaptation of agricultural holdings based in Opole Region to the European model of agriculture and environmental regulations has contributed to identification by the farms managers of management actions which made the source of the farms' development (see Figure 1).

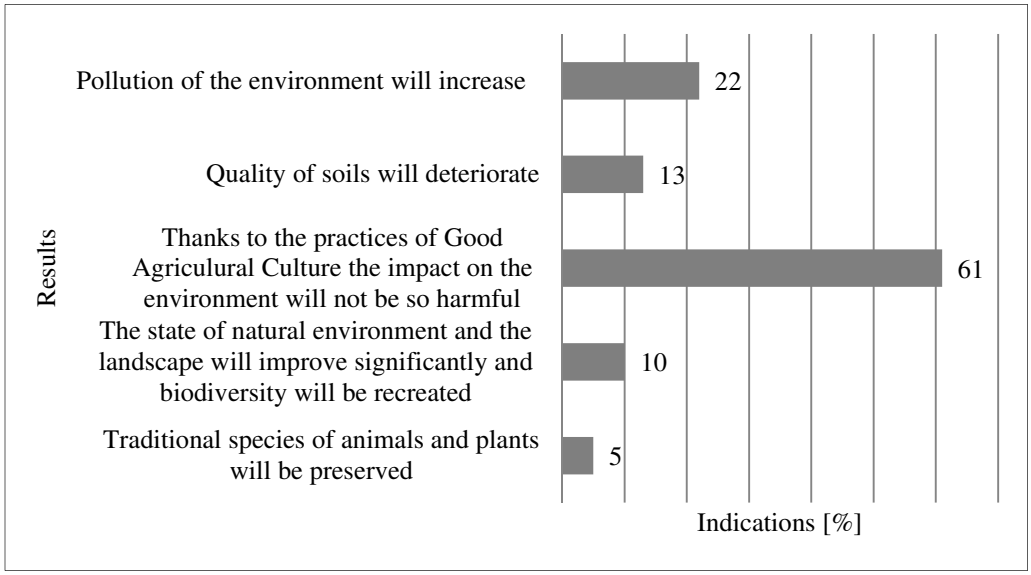
Figure 1 – The autonomous goals of farms, serving to improve their effectiveness. Source: Authors' own study based on the survey



The environmental regulations require new business models in agriculture. It follows from the data presented in Figure 1 that the biggest challenge to farmers in their implementation are: optimization of technological possibilities of specialization, acquisition of knowledge and lifelong education, as well as maximization of benefits resulting from the implemented innovations.

The effects of intensification of agricultural production, despite implementing the environmental regulations, are not assessed by the respondents in an explicit manner (see Figure 2).

Figure 2 – Environmental results of the current stage of modernization of agriculture in the respondents' opinions. Source: Authors' own study based on the survey

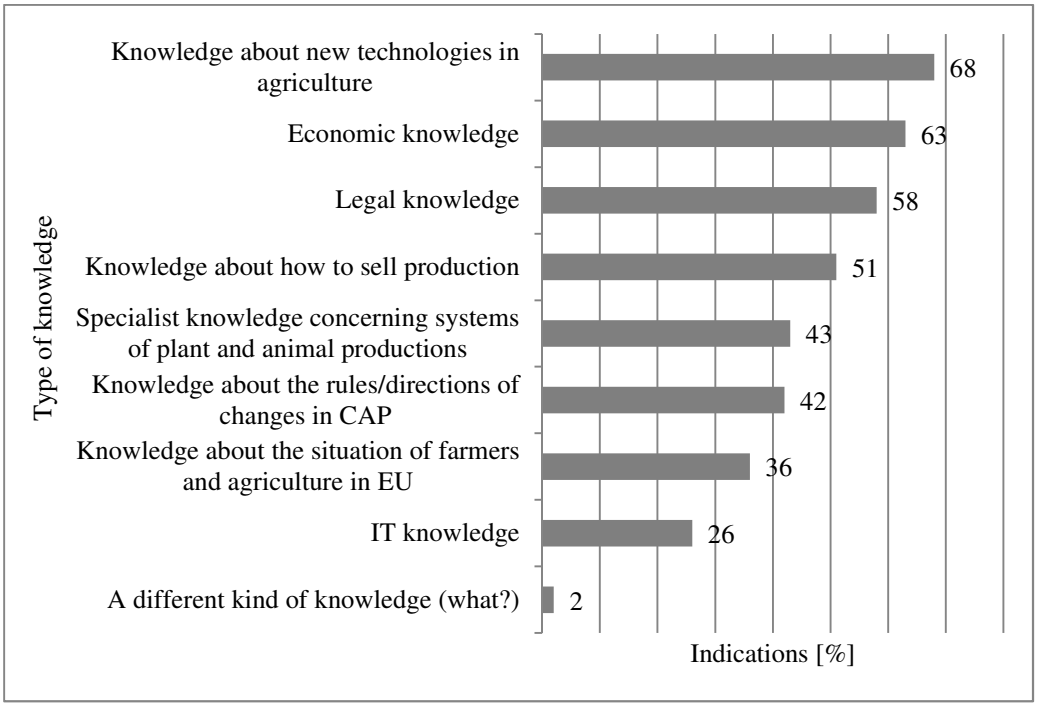


As the data presented in Figure 2 show, it is not only economists and ecologists, but also farmers who have doubts whether the present stage of modernization of agriculture will eliminate negative external effects connected with their business activity. Regarding the examined group, 22% of the respondents are of the opinion that contamination of environment will increase and the quality of soils will deteriorate (13%). Among the examined there is no shortage of optimists, though – 61% of the farmers confirm the influence of good practices on the quality of services of ecosystems, and 10% are convinced that considerable improvement in natural environment and recreation of biodiversity are possible.

3.2 "More knowledge per one hectare"

Sustainable intensification poses a serious challenge to most farmers. It is a knowledge-consuming system, in which farmers must choose between combinations of practices and adapt them creatively to local conditions. It is chiefly because of this that the sanctioning of the logic of the sustainable development ladder in the reforms of the CAP of 2003 and 2004 was accompanied by a reform of the system of agricultural counseling. In Opole Province, distinguishing the autonomous targets in management of agricultural holdings has become possible thanks to effective work of agricultural counsellors [14], the result of which is their high position in the process of taking production- and organization-related decisions: managers of farms consult them in the first place with their families and then with agricultural holdings (which is underlined mainly by young managers of agricultural farms). The analysis of the data presented in Figure 3 confirms the truth that managers of the farms pin effective management on different types of knowledge.

Figure 3 - Ranking of knowledge necessary to farmers. Source: Authors' own study based on the survey



Farmers, in particular, look for knowledge about new production technologies (68% of the indications), since with the stiff demand for land in Opole Region this type of knowledge can ensure improvement in effectiveness and productivity of agricultural farms. However, in the realization of this goal the respondents – to a greater and greater extent – also perceive the significance of other types of knowledge, such as: economic (63%), legal (58%), knowledge about directions of the change in the CAP (42%), about the situation of agriculture in the EU states (36%), knowledge which serves to improve management of transaction processes. Every fourth respondent is interested in knowledge of IT.

Like in other sectors of economy, knowledge of agriculture is of the dispersed character. It is thus necessary to identify the sources of different types of knowledge. Additionally, such a mapping of "knowledge islands" makes it possible to describe farmers' social networks which are formed around their different nodes. With the assumption that each of the nodes can be the source of different types of knowledge, their position was assessed in the farmers' social networks. Because of the above-mentioned criterion, the ranking list of sources of knowledge and information looks as follows: TV, the Internet, magazines, agricultural counsellors, trainings, radio, sales representatives, county branches of Agency for Restructuring and Modernization of Agriculture, information obtained from neighbors, county officials, county branches of Agricultural Market Agency, employees of cooperative banks. The most extensive social networks (measured by means of the number of relations) are formed on account of the following types of knowledge: market information, information on indispensable processes of adjustment to the EU requirements (standards), agricultural policy of the state and instruments of support for the CAP. The least extensive networks concern the knowledge about possibilities of drawing contracts. The density of the networks were assessed by means of concentrations forming around determined nodes due to the type of knowledge and information. For instance, strong relations with agricultural counsellors are established when it comes to the knowledge about the principles of good agricultural culture (GAEC) and requirements of managing SMR (Statutory Management Requirements), knowledge on instruments of support for the CAP as well as knowledge about the requirements for farms, which are contained in different EU directives.

The Internet offers an important source of knowledge to farmers. Farmers search branch www-sites and portals mainly for legal knowledge (the first place in the ranking list), information on the market and that on possibilities of renewable energy production (joint second place), information on drawing contracts and that on GAEC and SMR (joint third place). The growing role of the Internet in dissemination of knowledge and information and farmers' higher and higher competences of IT cause nearly half of the respondents (48%) to be interested in keeping records in the electronic form, transferring it to integrated systems of management and obtaining advice and suggestions from agricultural counsellors or other experts in the same way.

3.3 Network-based transformation of agro-business as a source of new economic rents

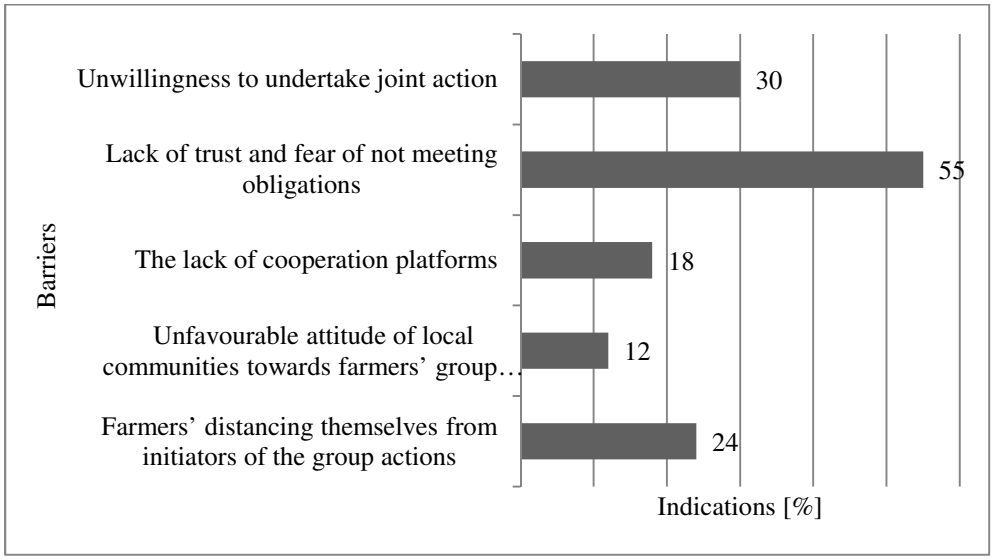
One of the conclusions which follows upon the analysis of the data presented in Figure 3 is the necessity of meeting the two types of knowledge: technological and managerial. Such meetings can – to some degree – be ensured by agricultural counsellors. This is, without a doubt, a necessary condition for ecological modernization of agricultural holdings. Nevertheless, this is not a sufficient condition in the process of creating intelligent territorial specializations which are an answer to challenges posed by globalization and which are meant to ensure participation of agriculture in the green increase.

The resources which exist in rural areas can be divided into common and specific. Using them can be of the standard or unique type. Depending on the manner of using them in rural areas, there appear different types of economy: dependent, enterprising and searching for rent [7]. The last two types need specific making use of the resources, both the common and endogenous ones. Each such making use can be the source of intelligent specializations in agriculture.

Creating new types of economy in rural areas requires taking a different look at the territory, which gives rise to both a new approach to organization of economic processes and the need for a new strategic thinking. In the period of simple industrialization, a territory was treated as a store of resources, which led to an internal colonization of development [6] through creating the relation of the center-peripheries. At that time the agro-business was organized in compliance with the schema of vertical integration, in the framework of which agriculture was expected to provide the largest possible amounts of standardized raw materials at the lowest possible prices. At present, a territory is perceived as a beam of social networks concentrated around specific regional resources. Thus, it is in contradiction with the branch-based approach and therefore requires adequate forms of organization, and consequently – completely different forms of inter-organizational connections. The essence of the branch-based approach is M.E. Porter's chain of values [12], organized by markets and hierarchies. Emancipation of the territory at the present stage of globalization (*glocalization*) is founded on network-based chains of values initiated by different business ecosystems [8], defined as a network of actors such as: clients, markets, products, processes, organizations, stakeholders, governmental communities and institutions, who treat the place of their rooting in a substantive manner [2]. Inter-organizational connections inside and outside business ecosystems are of both competitive and cooperative character – they are based on cooperation with a view to jointly take advantage of the possessed resources: knowledge, innovation, key competences. This type of connections, defined with the term "coopetition", gives rise to the possibility of creating rents of a new type: enterprising, innovative and network-based, which altogether form syncretic rents of business ecosystems. The types of economic rents delineate the frames of the contemporary approach to strategies of development, also within the local/regional framework. They ought to be oriented towards networks of intellectual values that are possible to create in a concrete space thanks to closeness and trust from different actors.

In the light of the possibilities of generating rents of the new type it is vital to ask the question of the potential of cooperation in rural areas of European regions. Answering it, it is important to both identify the barriers of cooperation and recognize the preferred forms of inter-organizational connections. Figure 4 presents the main barriers to cooperation as indicated by farmers from Opole Province.

Figure 4 – Barriers to farmers' participation in communication networks and cooperation. Source: Authors' own study based on the survey



The literature of the subject stresses that in society of risk, trust is a rare commodity and the shortage of it augments transaction costs and affects the effectiveness of production. The lack of trust and apprehension of not being able to meet obligations (55% of the indications) causes farms not to create their relational potential on the informal level. The unwillingness to take joint actions is also recorded (30% of the indications), which creates a distance towards their initiators. The lack of cooperation platforms and unfavorable attitudes on the part of local communities towards actions taken by clusters of farmers are of lesser importance.

Despite the visible distance which farmers keep in relation to different forms of cooperation, the respondents perceive their influence on the development of their holdings. This is cooperation with the following subjects:

- other farmers (36% indications),
- processing plants (47%),
- chain stores (20%),
- consumers (15%).

Cooperation with network enterprises is decisive in the development of a farm. Network connections with other farmers have only just started gaining in importance. In the farmers' opinions it is also necessary to introduce institutional solutions which would reward different forms of cooperation, mainly that with processing plants (47% of the indications) and other farmers (36%). Thus, it can be supposed that the new institutional forms of organization of agricultural markets proposed by the European Commission [COM (2013) 1308], designed to strengthen the organizational solidarity of agricultural producers, can easily take roots in farmers' social networks. The respondents, however, are not familiar with instruments connected with formation of operational groups in agricultural markets or taking advantage of relations within the branch in order to manage chains of supplies.

The main area in which it is possible to build cooperation around local/regional intelligent specializations are instruments of integrated management of regional development as well as instruments of cooperation offered by the European Agricultural Fund for Rural Development. Within the space of Opole Region, there have already been active institutions-organizations which can realize this type of management: producer groups, local activity groups, groups of renewal of the countryside. In the respondents' opinions, their role in the development of farms is lesser than that of governmental agencies and other established institutions. The dynamic development of producer groups in the Region (there are 88 such groups) and problems in agricultural markets have accelerated the establishment of cluster-oriented initiatives. On the other hand, local action groups have undertaken to create nested markets in the form of local clusters of good food.

It follows from the research conducted in Opole Province that farmers only to a small extent are interested in cooperating with this type of institutions-organizations. Merely 29% of the examined declare the will of such cooperation. The opinions on institutions which ought to be initiators of creating nested markets are varied, too. The following are listed, among others: local action groups (12% of the indications), producer groups (12%), local government (9%) and consumers' communities (8%).

Actions undertaken by the forming clusters and nested markets should be developed and directed in compliance with new goals of the regional innovativeness strategy. It would also be sensible to establish a trans-border operational group within the framework of the European Innovation Platform acting for the benefit of effective and sustainable agriculture. Only the establishment of it can ensure transformation of frontier territories into a functional area. Cooperation between academic centers and mapping of their competences occupy a particular place in this process. The task for today is then promotion and support of nested markets which offer regional produce. They can contribute to the development of culinary tourism which makes a special competence in the tourist branch in the Czech Republic. However, it is more important to create market niches for traditional products, e.g., shelves with traditional articles in selected chain stores acting on the territory of Opole Province and in the borderland of the Czech Republic. This can become a source of expansion of these markets within a broader social space.

4 Conclusion

Agrarian economy seeks for models of coping with possible global agri-food supply surplus in comparison with that of agricultural and food raw materials, without depleting renewable resources and restricted making use of non-renewable ones. Another challenge is restoration of the significance of agriculture in creating economic growth, which was negated in the industrialization process. A solution to these problems is to be deepened specialization within the framework of global and European space of rural areas. It is connected with sustainable intensification of agricultural production and intelligent territorial specializations. The analysis of this process through the prism of the new approach towards territory as a beam of social networks organized by endogenous resources leads to the following conclusions:

1. The process of sustainable intensification of agriculture was started thanks to implementing logic of the sustainable development ladder. Ecological modernization of farms has triggered processes of adaptation of agriculture to the knowledge-based economy.
2. Environmental regulations influence effectiveness of agricultural holdings, mainly due to subsidies of the Ist and the IInd pillars of the CAP. The examined farmers confirm the necessity of applying them since the market does not reward farms for realization of environmental functions.
3. In the long-term perspective, the environmental regulations can provide a source of innovations relating to technology, character of processes and products, organization and transactions, which are a compensation for the borne adaptation costs.
4. The mechanism of inducing the above-mentioned innovations are autonomous goals which are defined by managers of farms for the needs of effective management of production and transactional processes. As regards Opole Province, they are primarily as follows: optimization of technological possibilities of specializations, gaining knowledge and lifelong education as well as maximization of benefits from implemented innovations.
5. Building an enterprising economy, one inclined towards rents in rural areas, requires meeting two types of knowledge: technological and managerial. Their coming closer to each other is possible thanks to the reformed system of agricultural counselling.
6. Mapping sources of agricultural knowledge shows that it is of the diffused character, which – to a significant extent – can be overcome owing to institutional innovations which are connected with implementation of intelligent specializations.
7. Ecosystems of business in rural areas can raise territorial competitiveness of agriculture due to various forms of cooperation. Because of the existing barriers to cooperation, which are visible in building relational potential, instruments of integrated management of regional development should be used as well as already existing institutions-organizations: producer groups, local activity groups which take up cluster-related initiatives or ones aimed at creating nested markets.
8. Rural areas in Opole Province and in the borderland of the Czech Republic will have the peripheral character in relation to the networks of cities: Krakow, Katowice, Ostrava. Building intelligent specializations in agriculture on this territory requires cooperation within the frameworks of the existing euroregions.
9. Academic centers based within the trans-border area have a particular role to play in this process. In the first place, it is indispensable to map their competences in implementing intelligent specializations in rural areas, then to root them in the existing and newly-established clusters and nested markets.

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Changes in the Standard of Living in the EU Member States between 2005 and 2012, with Particular Emphasis on Poland and the Czech Republic

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Abstract
This chapter is dedicated to the issues relating to changes in the standard of living recorded in 25 EU countries, in particular in Poland and the Czech Republic. Given the availability of comparable and relevant statistical data, the standard of living was studied between 2005 and 2012. The study was conducted with the use of taxonomic method – Hellwig's synthetic measure. The results indicated that in 2012 Poland and the Czech Republic recorded a growth in the standard of living compared to 2005. Between 2005 and 2008, Poland was in the group of countries with a relatively low standard of living. It was not until the 2012, that it entered the group of countries with a moderate standard of living, and was placed on the 20th position in the ranking of 25 countries. Faster (compared to Poland) transition to a higher class caused that finally in 2012 the Czech Republic was placed on the 11th position in the ranking of 25 countries, and on the 2nd position in the group of countries with a moderate standard of living. Undoubtedly, the improvement of living standards in both countries was affected by measures taken under the EU cohesion policy. It was associated with a specified stream of funding flowing into the new EU members. Poland was the main beneficiary of these funds, although after translating the quotas into the amounts per capita it turned out that only in the first programming period (2004 - 2006) funds per capita were higher for Poland than for the Czech Republic.

Keywords: *taxonomic methods, cohesion policy, standard of living, the European Union*

JEL Classification: *C13, C40, E10*

Changes in the Standard of Living in the EU Member States between 2005 and 2012, with Particular Emphasis on Poland and the Czech Republic

Agnieszka Bobrowska, Mateusz Musiał

1 Introduction

The standard of living in different EU Member States has been and remains very diverse. The reason for this situation is the admission of the new EU members whose level of socio-economic development, due to the earlier belonging to the so-called communist bloc, differ significantly from the average level recorded for countries of the so-called old union. This also applies to Poland and the Czech Republic, which in May 2004 became members of the EU structures.

In this chapter, the authors have focused on changes in the standard of living, which took place in 25 EU countries, in particular in Poland and the Czech Republic. Among the many reasons in favour of the accession of the country to the EU, we can also distinguish the ones that are directly or indirectly relating to equalization of living standards. This problem is important for the functioning of the state (because it allows for a relatively uniform distribution of the positive effects of economic development and growth) and for the functioning of the EU itself (because without such a levelling, its development will be disturbed, and may prove to be impossible in the long-term). Therefore, issues of socio-economic inequalities occupy a key position in a wide EU policy, which through the use of financial resources available in the form of structural funds and diversified targeted programmes is focused on direct or indirect elimination of many of these inequalities. From this point of view, it appears necessary to assess the impact of the EU policy on changes in the standard of living, so that it was possible to determine its effectiveness in this area and, to some extent, to assess the merits of the decision on accession to the EU.

2 The standard of living - theoretical considerations

The standard of living, as a category of research, is not an unambiguous term, but rather a multidimensional (multi-element) category that is characterized by a relatively large capacity of meaning, which is generally reflected by identifying it with other related categories, which include: living conditions, standard of living or quality of life. For these reasons, it is necessary to make a distinction between the scopes of meaning of these terms. It is common in the research practice, that such a distinction is mainly used for two terms: the standard of living and the quality of life. The standard of living usually refers to satisfaction of material human needs, and the quality of life refers to satisfaction of needs that go beyond material needs [10].

Despite these methodological difficulties, rich literature of the subject contains many definitions of the standard of living, developed during research on this issue. One of the earliest yet basic definitions of the standard of living is the definition proposed in 1954 by one of the agencies of the United Nations. The definition states that "*the standard of living includes the entirety of actual conditions of living of people, as well as the extent of their material and cultural satisfaction of needs through a flow of goods and services, both payable and allocated from social funds*"[6].

One of the most important voices in the discussion about problems in defining the standard of living is the approach proposed by Allardt, who presents his considerations about the conditions of life on the basis of objective and subjective factors. He introduces four dimensions to the discussion about issues of the standard of living and quality of life: standard of living associated with satisfying material needs, quality of life associated with satisfying intangible needs, satisfaction constituting a subjective assessment of living conditions, and happiness which is a subjective measure of satisfaction with the quality of life [5].

The standard of living became also a point of interest for many Polish researchers, primarily including J. Drewnowski and A. Luszniewicz. Luszniewicz made some modifications to the definition proposed by the United Nations, so as to allow its use in the context of Polish conditions. This definition states that "the degree of meeting material and cultural needs of households executed (in the sense of its security) by flows of goods and services, both payable and allocated from funds of social consumption and natural use is understand as the standard of living of the population (Y) in a given unit of time (t) and a given unit of space ($d = 1, 2, 3, ...$)" [3]. In addition, the two researchers have proposed areas that describe the selected aspects of living standard (see Table 1).

Table 1 - Areas (fields) of life in relation to satisfaction of basic needs of the society according to the approach proposed by J. Drewnowski and A. Luszniewicz.

J. Drewnowski	A. Luszniewicz
1. Food 2. Clothes 3. Housing 4. Health 5. Education 6. Recreation 7. Safety 8. Social Environment 9. Physical Environment	1. Food 2. Shelter (housing, clothes, shoes) 3. Healthcare 4. Education 5. Recreation 6. Social Security 7. Material Security

Source: own work based on: [11], [9].

Another definition of the standard of living was presented by Cz. Bywalec, who defined the standard of living as "*the degree of satisfaction of population's needs resulting from the consumption of material goods and services and getting benefits from the natural and social environment.*" [1]. Presented approach focuses on the act of consumption that constitutes a fundamental opportunity to meet the needs of individual consumer units.

In fact, elaborations relating to studies on the living standard and its changes can be found in publications of scientific researchers from every Member State. For this reason, at the EU level there is no consensus on the proper scope of this term. In practice, it means that the experience of Member States is used in this regard. It is only possible to indicate that a common starting point for these considerations at the EU level constitutes definition of the United Nations [8].

The quoted definitions of the standard of living and a rich literature of the subject suggest that the standard of living became established in research practice as one of the most important categories that reflects the efficiency of the economy of a given country and a justice of the existing political system. However, changes in standards of living allow evaluation of the effects of political, economic, social and cultural transformation in a given region, country or group of countries forming a larger international structure. This category unquestionably can be used to evaluate the effectiveness of the socio-economic policy at the country level, and at the EU level in the field of activities relating directly or indirectly to levelling and improving the standard of living of societies.

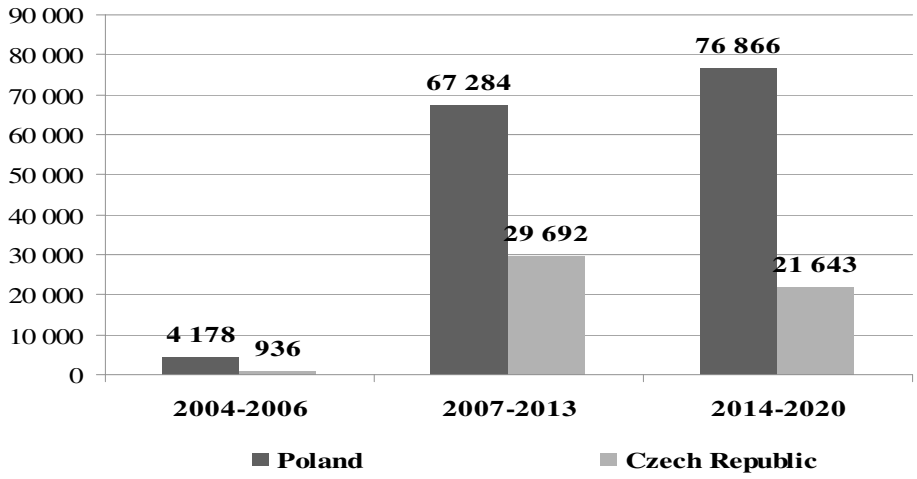
3 The cohesion policy as an element of EU policy aimed at balancing socio-economic inequalities

Evolution of the EU regional policy aimed at eliminating disparities in the development of individual regions shows the EU efforts to optimize solutions in this area. Funds, initially acquired as a result of the implementation of regional policy, were treated by the Member States as an equivalent of funds paid to the common EU budget. Large automatism and lack of visible effects, expressed in improvement of socio-economic situation of less developed regions, forced a change in the approach to eliminating disparities in the development. The funds available under the regional policy were linked with specific actions set out in the framework of policy priorities (objectives), adopted during the programming period. The key moment in the evolution of the EU policy was the biggest expansion of the EU, which took place in 2004 - as much as 10 new countries were admitted to the EU. Large diversity of new members and the prospect of taking over a significant part of the funds by these countries, again forced a change in the approach to regional policy. To this end, cohesion policy has been separated from regional policy and has become the main instrument for balancing socio-economic inequalities of the Member States [4].

Measures funded under the cohesion policy primarily relate to the newly admitted countries, because their case has reported significant disparities in relation to the so called 'Old EU' countries. Therefore, the newly admitted countries participate in the structure of expenditures on the polity implementation to the greatest extent. Figure 1 presents data on funds obtained under cohesion policy by Poland and the Czech Republic in three successive programming periods, starting from the moment of accession to the EU.
Data presented in Figure 1 reflect a substantial disparity in the amount of funds available to Poland and the Czech Republic, with a considerable surplus of funds allocated to Poland. That disparity also applies to other Member States, as in the three programming periods Poland was and still remains the biggest beneficiary of these funds. Of course, it should be emphasized that Poland and the Czech Republic have different population potential. Translating the amount obtained under the cohesion policy into the amount per capita, it turns out that

in the programming period 2004-2006 the amount accounted for EUR 109.5 per citizen of Poland, and EUR 91.5 one citizen of the Czech Republic. In the next programming period (2007-2013) the situation was quite different, because the Czechs received funds amounting to EUR 2,550.7 per capita, and the Poles only EUR 1767.4 per capita. In the years 2014 -2020, these quotas will be at similar levels to each other - 2,052.2 euro for the Czech Republic and 2,023.5 euro for Poland.
Striving to eliminate disparities in the development under the cohesion policy is based on the implementation of three specific objectives: convergence, improvement of regional competitiveness and employment and European territorial cooperation. The biggest share of funds under the cohesion policy is allocated for convergence. It covers measures that encourage cohesion in enhancing economic and human potential in the most remote regions. The second objective has been pursued by a number of projects aimed at improving professional skills, increasing innovation and supporting the idea of sustainable development. The third objective concerns international cooperation, whose main objective is the exchange of experience between the Member States [2].

Figure 1. Funding obtained by Poland and the Czech Republic under the cohesion policy in three successive programming periods. Source: own work based on [7].



4 Changes in the standard of living in Poland and the Czech Republic between 2005 and 2012

The use of funds allocated for implementation of the EU cohesion policy should lead to a reduction of disparities in standards of living. Based on this assumption, an analysis was conducted relating to differentiation of living standards in the EU, with special emphasis on Poland and the Czech Republic in the years 2005-2012. Since, as already mentioned, the standard of living is a multidimensional category, one of the taxonomic methods was used - the Hellwig's synthetic measure of development. This method allows the linear arrangement of objects (e.g. countries or regions) characterized by many features. Measure indicated in this method provides a synthetic variable describing a given phenomenon - in this case it was the standard of living.

The Hellwig's synthetic measure of development is an example of taxonomic methods based on determining a pattern. From the substantive point of view, the most important element in taxonomic methods is the selection of features for the purpose of a specific study. The selection procedure is to eliminate the correlated and quasi-constant features. Then it is necessary to carry out standardization of variables, aimed at eliminating the units of measurement and the effect of randomness on a given phenomenon. Variables used for analysis can have character of destimulants, stimulants and nominants. Stimulant shows a positive relationship with the examined phenomenon, while destimulant is negatively correlated with it. Up to a certain point a nominant acts as a stimulant, and as of a certain moment as a destimulant. The limit value for a nominant is called a nominal value, which is also the most favourable value.

The study was conducted in the following four phases:
1) selection of a set of quantitative variables representing some aspects of living standards using data available in the Eurostat database;
2) proper choice of variables based on their variability (coefficient of variation was used) and the absence of the phenomenon of autocorrelation between variables (autocorrelation coefficient was used);
3) determination of the effect of selected variables on the standard of living, in the case of a positive impact the variable was identified as a stimulant, and in the case of a negative impact as destimulant;

4) study on variation in standards of living conducted with the use of Hellwig's synthetic measure of development.

The study used (due to the availability and comparability) data from the years 2005-2012 from 25 countries that have been members of the EU at least since 2004. Therefore the study does not include Bulgaria, Romania (EU members since 2007) and Croatia (EU member since 2013).

14 quantitative variables correlated with the standard of living were selected from the data available in Eurostat. As a result of verification of the level of variability (assuming the critical value for the coefficient of variation - 10%) and the strength of correlation of the variables, five variables have been eliminated: people living in households with very low work intensity (percentage of total population aged less than 60) people at risk of poverty or social exclusion (Percentage of total population), total unemployment rate (percentage of active population) share of total population having neither a bath, nor a shower, nor indoor flushing toilet in Their household), fertility rate. Eventually, 9 diagnostic variables of 14 selected ones were chosen and at the same time their impact on the standard of living was determined (see Table 2).

Table 2 -Diagnostic variables adopted for the construction of the Hellwig's synthetic measure of development.

Symbol	Variable	Type of variable
x_1	Expenditure on social protection (% GDP)	Stimulant
x_2	Curative care beds in hospitals per 100 000 inhabitants	Stimulant
x_3	Long-term unemployment rate, % of active population aged 15-74 (percentage of active population)	Destimulant
x_4	Overcrowding rate (%)	Destimulant
x_5	CO2 emissions per inhabitant in the EU and in developing countries	Destimulant
x_6	Young people neither in employment nor in education and training (15-24 years) – % of the total population in the same age group	Destimulant
x_7	Real GDP per capita	Stimulant
x_8	Share of total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames of floor	Destimulant
x_9	Level of internet access (percentage of households who have internet access at home)	Stimulant

Source: own work.

Determination of the Hellwig's measure required standardization of variables (1), determination of the pattern (2), determination of the development measure (3) with the use of the Euclidean metric (4) as a measure of distance from a fixed pattern.

Formula adopted for standardization:

$$z_{ij} = \frac{x_{ij} - \bar{x}_j}{S(\bar{x}_j)} \qquad i = 1,2,\dots,n \quad j = 1,2,\dots,m \qquad (1)$$

Formula adopted for determining coordinates of the pattern:

$$z_{0j} = \begin{cases} \min\limits_i \{z_{ij}\} \ dla\ D \\ \max\limits_i \{z_{ij}\} \ dla\ S \end{cases} \qquad i = 1,2,\dots,n \quad j = 1,2,\dots,m \qquad (2)$$

Formula adopted for indicating the development measure (m_i):

$$m_i = 1 - \frac{d_{i0}}{d_0} \qquad i = 1,2,\dots,n \qquad (3)$$

Where: d_{i0} – square of the Euclidean distance of the variable from the pattern; d_0 - critical value.
Variables used in the formula were indicated based on the following formula:

$$d_{i0} = \sqrt{\sum_{j=1}^{m} (z_{ij} - z_{0j})^2} \qquad d_0 = \bar{d}_{i0} + 2S(d_{i0}) \qquad (4)$$

Where: $\bar{d}_{10}$ – the arithmetic average of the calculated Euclidean distances; $S(d_{10})$ – standard deviation of the calculated Euclidean distances

$$\bar{d}_{10} = \frac{1}{n}\sum_{j=1}^{n} d_{10} \qquad S(d_{10}) = \sqrt{\frac{1}{n}\sum_{j=1}^{n}(d_{10} - \bar{d}_{10})^2} \qquad \textbf{(5)}$$

The last phase included classification (grouping) of objects according to the value of development measure. The classification can use ranges generated based on arithmetic average and standard deviation (6). Then a set of analysed objects will be divided into four groups (classes) [11]. The survey highlights the following classes of objects: I - high standard of living, II - average standard of living, III - moderate standard of living, IV - low standard of living.

High standard of living	$m_1 \geq \bar{m}_1 + S(m_1)$
Average standard of living	$\bar{m}_1 + S(m_1) > m_1 \geq \bar{m}_1$
Moderate standard of living	$\bar{m}_1 > m_1 \geq \bar{m}_1 - S(m_1)$
Low standard of living	$\bar{m}_1 - S(m_1) > m_1$

(6)

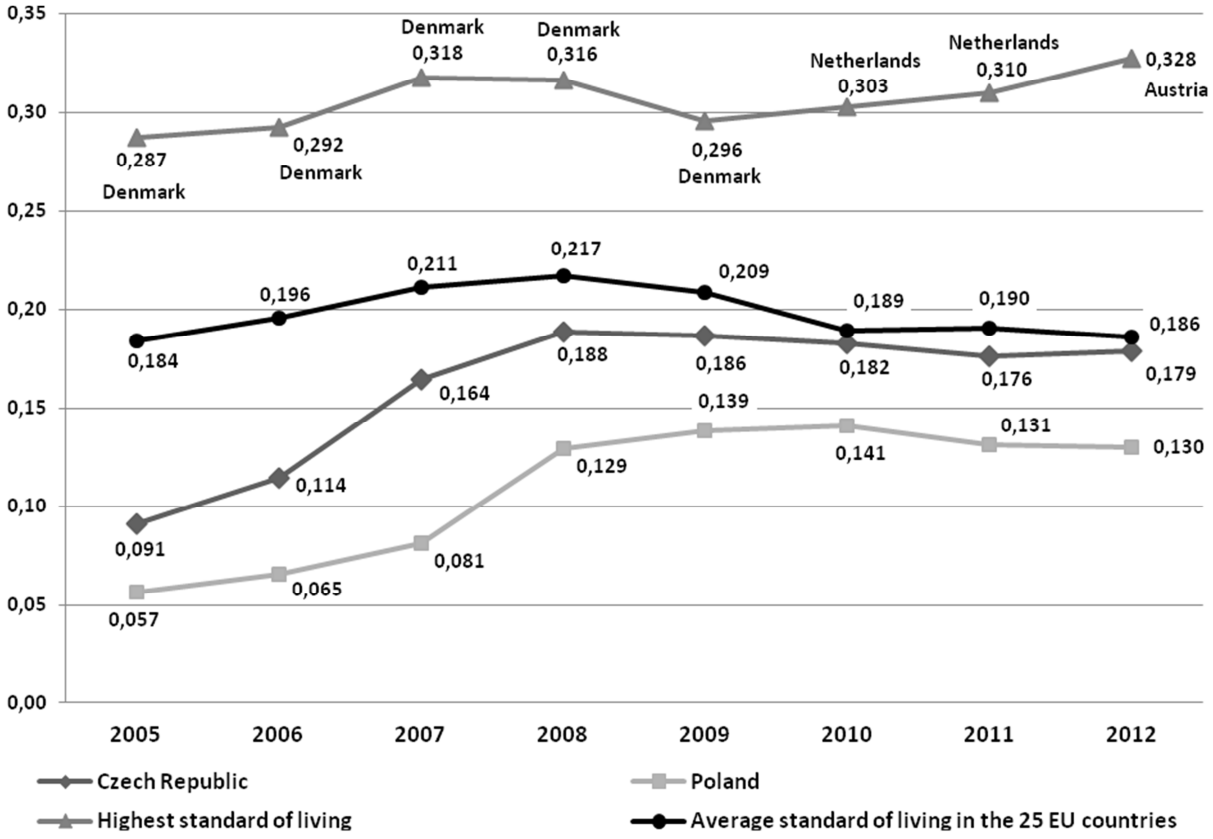
The survey determined pattern for the development measure on the basis of observations from all years of the study period. Adoption of such a pattern meant that it was possible to capture changes in the standard of living in all analysed years, while maintaining the comparability of results. The determined values of the Hellwig's development measure, describing variation of the living standard in 25 EU Member States are presented in Appendix. Bold horizontal lines separate individual classes from I to IV. The top of the table includes countries with a high standard of living, and the bottom part presents countries with a low standard of living.

The studies, performed on the basis of indicated Hellwig's development measure, show that both in the case of Poland and the Czech Republic the standard of living recorded growth in 2012 compared to 2005. A systematic increase in the living standard measure was observed in both countries throughout the whole study period. At the same time there were discrepancies in the level of measure recorded in Poland and the Czech Republic, with a predominance of the Czech Republic. Between 2005 and 2008, Poland was in the group of countries with a relatively low standard of living, so with the largest distance from the determined pattern. It was not until the 2012, that it entered the group of countries with a moderate standard of living and eventually was placed on the 20th position in the ranking of all analysed countries. The Czech Republic was in the group of countries with a low standard of living in the years 2005-2006, so the country was in this group two years shorter than Poland. Faster (compared to Poland) transition to a higher class caused, that finally in 2012 the Czech Republic was placed on the 11th position in the ranking of all 25 countries and on the 2nd position in the group of countries with a moderate standard of living. It can be assumed that if the rate of growth of changes in the standard of living in the Czech Republic will remain at a similar level, promotion to a group of countries with an average standard of living will be possible. Undoubtedly, the improvement of living standards in both countries was affected by measures taken under the EU cohesion policy. It can be presumed that the slower pace of improvement of the standard of living in Poland could also result from the fact that in the programming period 2007-2013 the funds received by Poland under the cohesion policy (per capita) represented only 69.3% of the corresponding funds allocated for the Czech Republic.

The determined development measure also showed an overall decrease in the average standard of living in 2009 in the case of all 25 analysed countries. It was probably caused by crisis that occurred in 2008, and that caused a decline in GDP growth in most European countries. This concerned in particular countries with the highest standard of living. However, values of the development measure observed in Poland and the Czech Republic in 2009 indicate a slight decline in living standards in the Czech Republic, and growth in Poland (this is confirmed by data on the development of the Polish economy, which recorded a positive GDP growth rate). the exact course of changes in the standard of living in Poland and the Czech Republic is illustrated in Figure 2. Additionally, the graph presents data on the average value of the development measure for the EU countries and the value of a measure for a leader of the ranking of countries.

Graphical presentation of the indicated Hellwig's measure of development values confirms similar course of changes in the standard of living in Poland and the Czech Republic. At the same time showing differences (distances) between the values obtained in these countries. Both Poland and the Czech Republic are still below the average values recorded in the EU. Nevertheless, since 2009 the Czech Republic has began to quickly approach the EU average. It is therefore possible that a decrease in the average standard of living recorded in 2009 for the EU has accelerated the process of levelling differences in standards of living.

Figure 2. Hellwig's development measure values for Poland and the Czech Republic between 2005 and 2012. Source: own calculations based on [7].



5 Conclusion

The European Union at an early stage of its operation was to serve as an additional accelerator of economic development of Member States that entered on the path of rapid economic growth at that time. Successive expansion of the EU caused that countries with a much lower level of development joined the group of countries with a rather equal level of development. Thus, it became necessary to create mechanisms of levelling broadly-understood disparities in order to ensure the synchronization of EU actions. Evolution of the EU policy and separation of cohesion policy was supposed to cause, that positive economic effects will translate i.a. into an increase in the standard of living of citizens of the Member States. The studies show that the diversity in standards of living gradually decreases in the EU. At the same time it should be noted that there are still visible differences between countries of the so called 'Old EU' and countries admitted to the EU in 2004. In the years 2005-2012, most of the new member states reduced the distance from the average standard of living observed for EU-25.

Hellwig's development measures indicated for Poland and the Czech Republic show a steady rise in standards of living. This indicates, among others, on the positive effects of the use of EU funds for cohesion policy. In 2005 the distance of Poland and the Czech Republic to a leader of the ranking amounted to: 0.337 and 0.340 respectively. However, in 2012 these distances decreased significantly and amounted to: 0.202 and 0.165. Analysis of the distance of these countries from the EU average also indicated improvement of the analysed relationship. In the case of 2005 the distance of Poland and the Czech Republic from the EU average amounted to: 0.132 and 0.102, and in 2012 only: 0.021 and 0.058 respectively. Similar observations can be made also for the majority of countries admitted to the EU in 2004.

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Appendix– Hellwig's development measure values for 25 EU Member States between 2005 and 2012

Country	2005	Country	2006	Country	2007	Country	2008	Country	2009	Country	2010	Country	2011	Country	2012
DK	0.395	DK	0.411	DK	0.413	DK	0.437	DK	0.420	NL	0.368	NL	0.362	AT	0.328
SE	0.324	NL	0.337	SE	0.379	NL	0.397	NL	0.411	DK	0.342	SE	0.313	NL	0.323
NL	0.293	SE	0.326	NL	0.363	SE	0.361	SE	0.333	SE	0.306	AT	0.310	SE	0.320
FI	0.291	AT	0.292	AT	0.318	FI	0.335	FI	0.304	AT	0.303	LU	0.296	FI	0.304
AT	0.287	FI	0.292	FI	0.315	AT	0.316	AT	0.296	LU	0.287	FI	0.296	DE	0.272
LU	0.285	LU	0.260	LU	0.284	LU	0.256	LU	0.292	FI	0.281	DK	0.280	DK	0.271
UK	0.264	UK	0.247	CY	0.256	CY	0.249	CY	0.258	DE	0.243	DE	0.260	LU	0.265
FR	0.227	FR	0.233	FR	0.231	FR	0.243	BE	0.236	FR	0.223	BE	0.244	BE	0.256
BE	0.205	CY	0.223	BE	0.228	MT	0.230	DE	0.236	BE	0.216	FR	0.242	FR	0.230
IE	0.201	BE	0.222	DE	0.224	DE	0.230	FR	0.229	CY	0.190	MT	0.180	MT	0.177
DE	0.201	MT	0.211	UK	0.215	BE	0.226	MT	0.199	MT	0.185	CY	0.178	CZ	0.162
MT	0.184	DE	0.200	MT	0.209	UK	0.209	UK	0.193	UK	0.170	IE	0.175	UK	0.162
CY	0.159	IE	0.193	IE	0.200	LT	0.190	SI	0.176	IE	0.160	UK	0.167	IE	0.155
SI	0.151	ES	0.161	LT	0.192	IE	0.190	IE	0.170	SI	0.157	CZ	0.163	CY	0.145
PT	0.141	SI	0.152	SI	0.186	SI	0.174	SK	0.163	SK	0.156	SI	0.159	ES	0.141
ES	0.139	PT	0.147	ES	0.167	CZ	0.169	CZ	0.163	CZ	0.155	PT	0.144	LT	0.140
HU	0.122	LT	0.144	CZ	0.148	ES	0.165	LT	0.155	PT	0.145	SK	0.140	SI	0.140
LT	0.121	HU	0.131	SK	0.147	PT	0.156	PT	0.152	ES	0.127	LT	0.133	SK	0.138
IT	0.118	SK	0.128	PT	0.144	SK	0.137	HU	0.142	LT	0.127	ES	0.127	PT	0.137
SK	0.117	IT	0.123	HU	0.136	GR	0.134	ES	0.139	PL	0.124	PL	0.127	PL	0.126
LV	0.096	LV	0.115	LV	0.130	LV	0.132	GR	0.137	IT	0.119	HU	0.120	HU	0.112
GR	0.094	GR	0.114	IT	0.130	IT	0.130	IT	0.128	HU	0.118	IT	0.110	IT	0.108
CZ	0.081	CZ	0.104	GR	0.124	HU	0.123	PL	0.128	GR	0.116	GR	0.106	GR	0.097
PL	0.051	EE	0.073	EE	0.076	PL	0.120	LV	0.094	LV	0.074	LV	0.072	LV	0.073
EE	0.046	PL	0.058	PL	0.073	EE	0.114	EE	0.069	EE	0.043	EE	0.056	EE	0.060

Source: own calculations based on [7].

The Opportunities of Cluster Development in Borderland of Poland and the Czech Republic

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Abstract
The cluster was defined according to the definition proposed by M.E. Porter as a specialized concentration of mutually competing and cooperating enterprises which gives them the ability to generate and maintain a competitive advantage. The most important element of the cluster are geographically concentrated companies from a single industry. A concentration of enterprises aggravates their mutual competition in the markets and factors of production and simultaneously produces external effects which are beneficial for them - for example, a greater influx of innovative resources and staff necessary for the smooth running of the production process or provision of services in their industry. Polish and Czech entrepreneurs operating in the border area are more and more interested in such a form of running business. To achieve the objective, the available source materials and study and secondary source documents and statistics, domestic and foreign. The research allowed to interpret it by the method of analysis, comparison and deduction.

Keywords: *borderland, economic cooperation, cluster development, competition.*

JEL Classification: *A11, A19, B12*

The Opportunities of Cluster Development in Borderland of Poland and the Czech Republic

Maria Bucka

1 Introduction

The article attempts to identify the conditions for the development of clusters on the Czech-Polish border. Polish - Czech borderland is an area of active socio-economic development, which creates great opportunities to create cluster structures. Entrepreneurs, especially small and medium leading economic activity in the cross-border area, look for cooperation partner on the other side of the border. This cooperation is possible within the cluster. The cooperation in such a form may generate for businesses many benefits. The most important of them is the increase in profit, build competitive advantage, acquiring new experiences and easier access to markets. In the article, the borderland is regarded as an area located on both sides of the border and cooperation as a cross-border or borderless cooperation. While the cluster was defined according to the definition proposed by M.E. Porter, as a specialized concentration of mutually competing and cooperating enterprises, giving them the ability to generate and maintain a competitive advantage. The most important element of the cluster are geographically concentrated companies from a single industry. A concentration of enterprises aggravates their mutual competition in the markets and factors of production and simultaneously produces external effects which are beneficial for them - for example, a greater influx of innovative resources and staff necessary for the smooth running of the production process or provision of services in their industry. Therefore, more and more Polish and Czech entrepreneurs operating in the cross-border area are interested in this form of business.

Because of the opportunities offered by clusters - even those associated with access to a large group of companies from the neighboring countries, the institutional environment involved in the cluster and legal and language assistance - it seems that they may constitute an important element in the development of cooperation on the border between Poland and Czech Republic.

The aim of the article is to present the specifics of the borderland and to identify opportunities pf building sustainable economic relations between businesses within the cluster structures. To achieve the objective, the available source materials and secondary research of source documents and statistics, domestic and foreign were used. The research allows the interpretation done by the method of analysis, comparison and deduction.

2 The essence of clusters

In the European Union and OECD countries great interest in the problems of groupings of economic operators of specific sectors at regional level is observed. These groupings in the literature are called clusters of companies, districts, learning regions or intelligent regions [8]. The literature emphasizes that clusters can be very important in the process of growth and increasing competitiveness not only of small and medium-sized enterprises, but also the regions and thus the entire economy. The concept of the cluster has not been existing in the literature for long.

It is universally accepted that the economic meaning of this term first appeared in the works of Michael E. Porter and from there it was translated as 'klaster' or 'grono' and incorporated in the Polish business administration terminology [5].

Clusters do not have data on its members, coordinators do not collect data on a regular and structured, making it difficult to formulate proposals on further cooperation opportunities in their business structures. An economic cluster is nothing else but a network of strongly interdependent companies (including specialised suppliers) that are linked to one another in the chain of creating the added value. In selected cases, clusters form strategic alliances with universities, research institutes, highly specialised service providers, consultants and customers. It is commonly believed that the cluster development is an indispensable condition for enterprise innovation quality and thus for enhancing the economy's competitiveness [10]. No matter what terminology is used, it is possible to point to several common features of clusters: geographical (spatial) concentration; cooperation and

competition between cluster members; specialisation; interdependence of cluster members; exploitation of identical markets and technologies and of the common knowledge base. Because of the structure of participating enterprises, the links among them and the type of their internal cooperation, clusters may be assigned to the following groups:

• Cluster as an industrial (network) district. It is comprised of a network of small companies sharing the identical or similar production profile. They are characterised by the ability to quickly adapt to the changing market and varied requirements through cooperation and the use of new technologies. An important feature of the network cluster is the lack of a centre around which the companies group themselves - we witness more like a varied base of firms forming a cluster.

• Hub-and-Spoke Cluster. It is characterised by the existence of large firms each of which has its own network of suppliers (commodities and services). Small firms are often tied to the dominating company through the delivery chain. The neighbourhood of large firms helps attract smaller companies. As opposed to network clusters, large companies dominate the system of companies' interrelationships.

• Satellite Cluster. In this group, clusters that operate as spokes for the hub may be called satellite clusters. A satellite cluster differs from the hub-and-spoke cluster in such a way that firms (satellites) found around a large enterprise may begin to cooperate with one another independently of the said large enterprise.

It can be concluded that regardless of the form and type, clusters are a set of (a collection of) autonomous organizations with direct or indirect relationships resulting from agreements (alliances) between the participants of the group. It is characteristic that clusters are a structure in which individuals and groups, acting independently, cooperate to achieve a common goal [9]. Joint activities of cluster participants include various areas such as for example: joint innovative projects, knowledge transfer, design of development strategies, gaining of new experiences and skills and the development of positive relationships with the environment. Due to its characteristics, clusters may provide a platform for the development of economic potential, including the border regions by strengthening existing structures, increasing the competitiveness of business entities and mobilization of the whole economy on both sides of the border.

3 Clusters on the Polish – Czech Borderline

Czech - Polish border has a length of 796 km, being by approx. 22.7 % of the total length of the Polish borders. On the Polish border with the Czech Republic runs through the three provinces (regions): Lower Silesia, Opole and Silesia. On the Czech side it runs through the country: Liberec, Kralovehradec, Moravian - Silesian, Olomouc and Pardubice. Polish part of the border region covers 15 districts and 2 cities with the rights of districts of the provinces of Lower Silesia, Opole and Silesia. Their total area is 10.2 thousand km2 (3.3 % of Poland). In the Czech part, the borderland region includes 13 counties lying in the five regions (countries). The total area of the Czech part of the border is 12.6 thousand km (16.0 % of the country). In many scientific studies and analyzes it is indicated that the Polish - Czech border region has became a model example of the most innovative cross-border cooperation. Polish -Czech cooperation has gained a new dimension in 2004, after the accession of both countries to the European Union. This cooperation is manifested among other things in the increasing economic exchange, the joint acquisition of EU funds, a growing number of contracts concluded partnership and cooperation of the local governments. The partnership within the territorial framework is being developed which together realizes long-time measures for a specific region while maintaining the principle of equal distribution of resources, responsibilities, risks and benefits. The partnership concerns the territorial entities and activities designated on contiguous geographical area [4]. In this case, this geographical area is the Polish- Czech borderline. An example of territorial partnership for the Czech-Polish border is the creation of the next European Grouping of Territorial Cooperation "NOVUM" [3]. It must be mentioned, that the first structure of this type of Polish participation is the European Grouping of Territorial Cooperation „TRITIA" [2], working for several years on the Polish -Czech – Slovak borderline. These initiatives conducive to increasing the economic attractiveness of the border region and the integration of adjacent communities of Poland and Czech Republic.

A number of actions leading to common goals such as the promotion of the region or even attracting investors, favors the extension of contacts between local communities on the borderline. They also favor the appointment

of cluster initiatives that can contribute to a better use of the diverse potential of the whole Czech-Polish border. The research concerning the Polish – Czech borderline, it is indicated that the clusters enliven the peripheral location of border areas, contribute to the use of the development opportunities arising from the proximity of the neighboring country, international cooperation, the spread of innovation and socio – cultural penetration [1;14]. The use of new forms of cooperation, which are clusters can effectively overcome the difficulties in interpersonal relations and increase the chances of development of the region. Clusters are important for the region, but above all are important to the participants. On the Czech-Polish border, such factors as:

- common territorial area,
- the need for economic development and implementation of innovations,
- rich, diverse tourist attractions,
- territorial proximity to a neighbour, a potential business partner,
- contacts between Euro-regions, local government and business institutions

give the option to create clusters, as a tool to promote the competitiveness of both sides of the border.

Specific opportunities concern the tourism industry. As a result of the project „Cross-border tourism clusters „in 2016, a cluster VisitOpolskie was formed. The main objective of the project was the development of cooperation between tourism industries on the Czech-Polish border. The cluster was joined by 28 entities. These are companies that offer accommodation and catering, as well as local governments, universities, local action groups, transport companies and travel agents. The primary objective of the cluster is to strengthen the tourist attractiveness of the borderline and Opole region. The project partner was a Czech tourist cluster of the Moravian - Silesian Klacr o.s, which brings together 36 members [15]. A joint project is a good example of cooperation between clusters, the two neighboring countries. In the Opole province in the tourist industry are already two such initiatives: the cluster of Opava Mountains and the cluster Land of Milk and Honey. On the Czech-Polish border, there are possibilities of formation and development of clusters in other than touristic branches. Cluster initiatives can be directed to the Polish and Czech businesses, especially small and medium-sized, regardless of the type of business. Contrary to popular belief (also presented in scientific studies), that history and stereotypes hinder entrepreneurs on both sides of the border cooperation, the situation in this area is slowly significantly changing. More and more the facts are shown which may bring closer cooperation between entrepreneurs. Among the factors facilitating cooperation on the Czech-Polish border are mentioned [11]:

- similarity of languages, which allows relatively easy contact,
- both countries applicated parallel to the European Union,
- both countries during the Cold War were vitiated by the same restrictions,
- on either side of the border a similar level of economic development is noted,
- historical problems certainly exist, but currently are not particularly exposed,
- natural tendency to integration and cross-border cooperation,
- similarity in terms of the economic base.

Moreover, on the Czech-Polish borderline there are industrial centers, rural areas, service centers and units with mixed economic structure which can intensify the cooperation between enterprises. Enterprises there include, among others, heavy industry, energy industry, as well as other branches: manufacturing textiles, clothing, machinery, glass, ceramic, production of beverages and foodstuffs. Mostly these are small and medium-sized. The economic structure formed on the Czech-Polish border is conducive to the formation of many cluster initiatives both on the Polish and Czech side of the border. An example could be the cluster initiative Poland 3.0. It is the rankandfile initiative where local authorities, county, provincial, local companies and research institutions have the opportunity to influence the development and deployment of the river Oder. Generated by the cooperation program supports many communities that perceive themselves to many benefits in its implementation. It is a program of integrated activities aimed at the linking of Polish rivers, highways and railways in one area of multimodal transport and the construction of Europe's largest Transnational Logistics

Centre in Gorzyczki. The program involves the construction of development areas in Gorzyczki and Lower Lutynia - Wierzniowice . The area lies on the Czech-Polish borderline. The potential of transit of tourism and the proximity of densely populated regions make favorable conditions for the location of the commercial center for trade, services and leisure activities. In the part of the area there will be the production zone and the associated land for the location of services, production and storage for smaller, particularly domestic Polish and Czech companies [18]. The result of the discussed initiative could be a cooperation between Polish and Czech businesses within the cluster.

An example of cooperation between entrepreneurs which is already functioning in the form of clusters may be signed in 2016 in Olomouc cooperation agreement between Stone Clusters from Poland and the Czech Republic. Czech Stone Cluster was founded in March 2007 with headquarters in Spa Belohrad. Participants in the cluster combine elements of science, education and practice in order to improve competitiveness and increase innovation in the field of rational use of mineral resources of the earth. Individual members can achieve increased revenues while reducing costs, creating products from unique material, which does not occur in other parts of Europe [17]. The entrepreneurs from Portugal and Hungary also joined the agreement. Participants declare cooperation on joint research, development and innovation activities between economic operators and research institutions. They want to deepen the internationalization activities and the development of cooperation cluster [16]. Cluster Sudecka Sieć Innowacji (Sudecka Innovation Network), is another example of cooperation. The creators of the cluster basically decided to initiate and support the construction of networks of entrepreneurs, governments and the scientific sphere. Partners from Germany and the Czech Republic set up a cooperation and exchanging of the experiences. Another example is the Design Silesian Cluster which brings together companies from the creative industry. The concept of creative industries includes a sector of the economy which basing on the creativity and skills generate new ideas circulated and supplied to the market in the form of goods (e.g. movies, music) and services (e.g. the design, scriptwriting). Entities operating in the creative sectors show a strong tendency to focus on areas with favorable conditions, thus creating clusters [13]. The purpose of the Design Silesian Cluster is to increase the competitiveness of the region's economy by exploiting the potential of knowledge and innovation, which is characterized by current design. Silesian Cluster of the Design supports the creation of new innovative products and companies and the development of partnerships for innovation, not only with the domestic partners, but also from abroad. On both sides of the border there is a large number of different types of entities: public, commercial, non-governmental, working on the field of culture. Therefore, on the Polish – Czech borderland more and more cluster initiatives in the sphere of culture and education appear. Making contacts between Polish and Czech companies and clusters, numerous seminars, workshops and conferences with the participation of local authorities in both countries, as well as trade fairs and exhibitions are helpful. It is widely recognized that clusters can be beneficial for both entities creating them, as well as the region where the cluster exists. The impact of clusters on the development of the Czech-Polish border stems from the face of the modern economy. The current times imply the fact that the prospects and competitive development of enterprises depends not only on themselves, but mainly is determined by the environmental conditions in which they operate.

4 Conclusion

On the Czech-Polish borderline there are significant social and economic changes. A major role in the changes taking place play not only Euro-regions, bilateral agreements between municipalities, cities, districts and provinces, but also new institutions which are clusters. Clusters increase the economic attractiveness of the Czech-Polish border and deepen cooperation between the two countries. The rich cultural heritage of the Polish – Czech borderline, natural tendencies to integration and cross-border cooperation, the functioning of Euro regions and institutional environment, which has experience of cross-border cooperation, high activity of many institutions and above all easy to overcome language barriers create opportunities for development of clusters, not only in tourism, but also in other businesses operating in the borderline area. The benefits of clusters for entrepreneurs coming from neighboring countries

indicate the legitimacy of supporting such forms of cross-border economic cooperation. Due to the variety of legal forms, in which the clusters are:

contracts, agreements, associations, limited liability partnerships, foundations, chambers of commerce and informal groups, it is necessary to conduct an inventory of cluster initiatives and clusters on both sides of the border.

Undoubtedly, this will facilitate cooperation between the Polish and Czech clusters and joint socio – economic initiatives. What is more, the analysis of the materials shows that clusters do not have data on its members, coordinators do not collect data in a regular and structured way, making it difficult to formulate proposals on further cooperation opportunities in their business structures.

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Energy Utilization of Alternative Fuels and Waste

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Abstract
Possibilities of modern waste treatment and its utilization is one of many priorities of the 21st century. This article presents the experiences and insights of the Centre ENET - VP01 with the thermal decomposition of organic material without the access of oxidants. Basic considerations Centre ENET lie in the utilization of waste, which cannot be processed through waste recycling and make the product for another use. In the case of the thermochemical decomposition the influence of temperature causes degradation of material properties, changing its structure and physical state. Resulting gas products (their energy value) are subsequently used for cogeneration of electricity and thermal energy. The liquid phase of pyrolysis can be further used as a suitable source of liquid hydrocarbon compounds for further processing in the petrochemical industry. Solid residue of pyrolysis in the form of carbon black is a source of carbon and can be used as fuel in furnaces and equipment intended for burning solid fuel. The solid residue of pyrolysis can be used as a raw material in the chemical industry, similarly as its liquid phase.

Keywords: *energy, pyrolysis, waste*

JEL Classification: *Q420, O330, Q550*

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1 Introduction

Today's Man and the overall modern human population produces a fairly significant amount of unused waste. This vegetable and animal waste and ultimately organic is quite largely landfilled without the possible use of its potential energy. In recent years the great emphasis on minimizing the generation of this waste is placed in the form of a recycling plan or complete elimination of their occurrence. But what we will do in the situation when the waste can not be longer recycled or its quantity cannot be minimazed? And what if this situation has already appeared? What is the right way of using of this potentially valuable material? There are several answers for these questions. Nowadays is quite a complex issue to find an optimal way of effective utilization of waste, both in terms of economic, ecological and energetic.

Probably the best way to minimize the waste appear to be thermal processes in the form of combustion. In this processing method (use) of the material there is a radical volume reduction of the material up to 90%. Afterwards the potential energy is used in the secondary facilities. Compared to the above advantages, this way of using waste has opponents. Opponents point to the formation of harmful emissions with the necessity of subsequent cleaning.

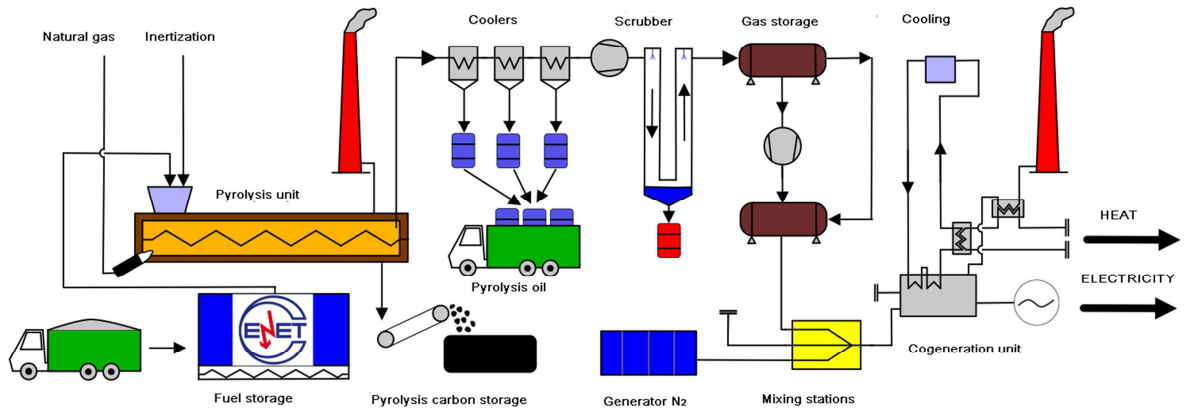
Czech Republic's entry into the European Union and especially before in the preparatory period they have been implemented EU standards on environment and waste management. In connection with the introduction of new legislation into practice, there are positive changes in the area in environmental protection. On the other hand it brings increasing the cost of processing the waste and considerable interest in the development or improvement of modern technologies.

This method was extensively used in the past and its essence is the synthesis liquid and gaseous hydrocarbons from organic materials by the pyrolysis process. [1, 2]

2 Technologies pyrolysis processing of organic waste

The Technology Centre of Ostrava (figure 1) is engaged in research in the field of thermal processing of waste materials and alternative fuels. The intention is maximization the efficiency of the process. The aim of the research of thermal processing of waste materials using pyrolysis technology is the development of new units for the energy and material use of a wide range of waste. [3, 4] Equipment for the utilization of organic material consists of several separate the sub-assemblies. The device is capable of accommodating up to 250 $kg.h^{-1}$ of the input material. This value is dependent on its bulk weight and bulkiness.

Figure 1 – Scheme pyrolysis technology with energetic output.



2.1 Transport of material

The input and transport of the material is realized with the aid of technological line. The underground storage is located in an adjacent part of the hall TCO and it is neccesary for ensuring the fuel to the start of teh technological line. Then material is transported through a system of conveyors and shovels in the weighted trays in the hall. From these containers material or a desired mixture is supplied to the inlet poppet conveyor hopper above the pyrolysis furnace. From these containers, the material, or a desired mixture is supplied to the inlet poppet conveyor hopper above the pyrolysis furnace. Material that is not possible for any reason utilized in pyrolysis unit can be moved into a waiting wheelchair.

2.2 Pyrolysis technology

The equipment for the pyrolysis process is located in the hall of TCO (figure 2). Its basic technical parameters are shown in table 1. The main part of the pyrolysis unit is the retort in which the screw is mounted for moving of the material. The flow of material in the furnace leads to a degassing and reducing the weight of the charge. The solid pyrolysis product (pyrolysis coke) is discharged by means of screw conveyors into the repository for solid rest of pyrolysis. Input and output of material is separated by a system of pneumatic slide valves. Conscription of the gas is realized gas pipeline. The diesel generator is installed and connected to the device in the case of electric power failure. This generator is used for power selected circuits pyrolysis unit and for the safe completion of the process and the plant shutdown. In the case of system failure the pyrolysis gas is liquidated in emergency torch.

Table 1 - Technical parameters of the pyrolysis unit

Title	Value
Proportions	4400 - 14800 - 4950 mm
Weight	5800 kg
Input material	250 $kg \cdot h^{-1}$
Max. operating temperature reactor	750 °C
Max. working pressure reactor	2 kPa (overpressure)
Medium for heating	Natural gas
Power of the primary on the burner min.	15 kW
Power of the primary on the burner max.	600 kW
The minimum gas pressure at the inlet- primary burner	5 kPa
Power of the secondary on the burner min.	2 kW
Power of the secondary on the burner max.	20 kW
The minimum gas pressure at the inlet- secondary burner	2 kPa

Figure 2 – Pyrolysis unit - Pyromatic

2.3 Cleaning of the pyrolysis gas

The produced pyrolysis gas is conducted from retort via the cooling system into the cleaning process. The system of cleaning the pyrolysis gas ensures adequate gas quality in terms of PM, organosilicon substances, aerosols, tars and other additives (HCl, HF, H_2S, NH_3). These substances harm of the internal combustion of engine resulting in a reduction of its lifetime. The required values for purity gas as fuel are shown in table 2.

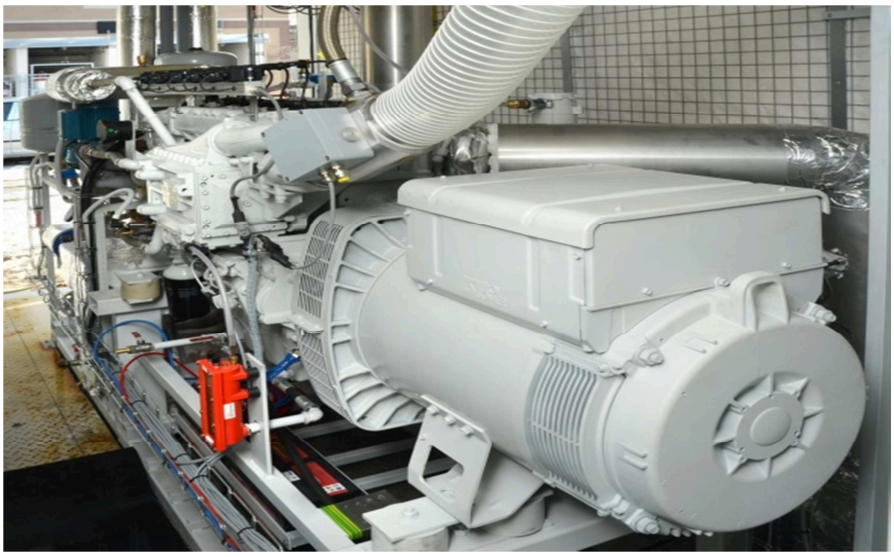
Table 2 - Purity requirements pyrolysis gas.

Pollutants	**Maximum allowable concentration ($mg.m^{-3}$)**
Solid pollutants 3-10µm	<10
Si	<10
Cl	<100
F	<50
Cl+F	<100
H2S	<2300
S	<2200
NH3	<30
>C5<C10	<3000
Tar I	<250
Tar II	<50
	% rel.
H2O	<80

2.4 Stabilization and combined production of electricity and thermal energy

When fluctuations in the calorific value of the pyrolysis gas this value can be adjusted on mixing station. The main causes of variation are diversity composition of the input material of the pyrolysis, temperature of the pyrolysis process and the residence time of material in the pyrolysis process. [5] For the transformation of the pyrolysis gas into electrical energy engine is used. The device is placed in the outside of the soundproofed container. Maximum electric performance 100kW is provided by a 6-cylinder engine MAN with the posibility of setting from 50% to 100% power. Inlet pressure pyrolysis gas (fuel) must vary in the range 3-5kPa. [6]

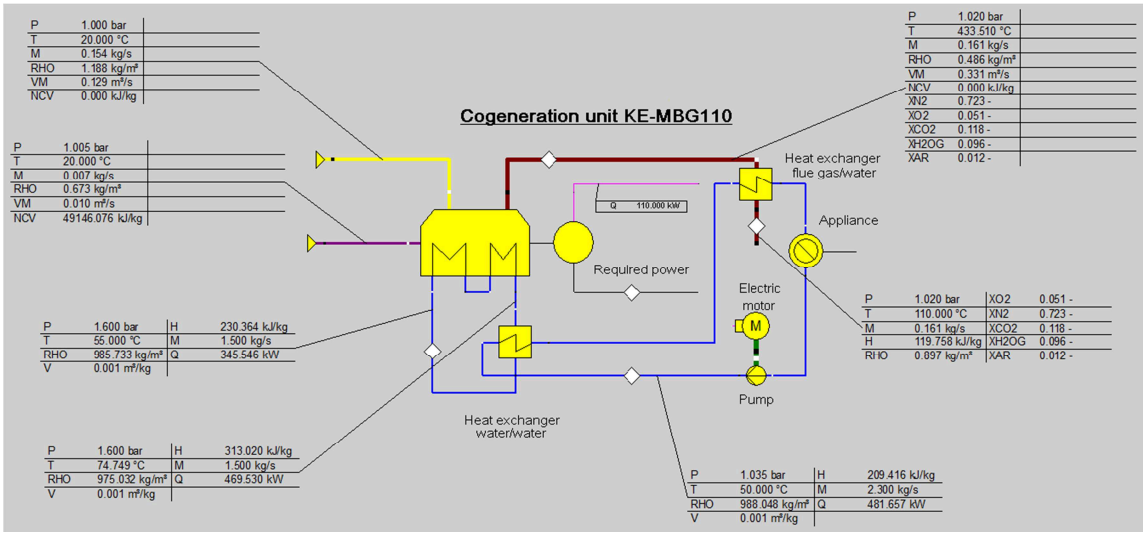
Figure 3 – Cogeneration unit KE-MBG110



3 Results and Discusion

For the calculation and prediction model situations was selected model program Ebsilon. It deals with the prediction model situations and solve the issue of converting chemical energy of pyrolysis gas to electricity and heat in cogeneration system Ebsilon program is suitable for the simulation of thermodynamic changes used in energy equipments. Ebsilon is able to model various energy components or assemblies interlinks. Linking the individual components is realized using lines with predefined characteristic of data flow. For new or existing specification of individual components or pipes, we are able to use definable polynomials. The advantage of the numerical model is predictions of operation of power equipment in terms of performance or possible optimization. Calculation in program Ebsilon should be performed prior to the construction. The result is cost saving and error analysis in the system being modeled. The data obtained are important for the production of pyrolysis gas with respect to the input material, processing temperature, residence time or at a desired stabilization of the pyrolysis gas in the mixing station. [7, 8, 9]

Figure 4 – Model cogeneration units



Model cogeneration units see on the figure 4 was equipped with an internal combustion engine with the elements from the Ebsilon program library. The parameters of engine KE - MBG110 have been previously defined. Heat exchangers with the required performance for the taking heat from cooling water were incorporated in to the model. Pump with attached electric engine simulates movement of the cooling medium in the pipe system. According to a predefined algorithm fuel and air are converted into electrical and thermal energy.

For initial simulation and also as a reference standard for the further procedure, mixture of propane-butane (also known under the tradename LPG) and nitrogen, was chosen. The proportional percentage of calorific value of the mixture was from 10 to 50 $MJ.kg^{-1}$. Excess of air required for burning the mixture of LPG-N_2 was chosen φ =1,3. Calculated values of cogeneration unit KE - MBG110 with increasing calorific value of fuel are shown ascending in table 3.

Table 3 - Calculated values of aggregate KE - MBG110, according to the calorific value of the gas mixture etalon LPG - N_2

Etalon mix LPG and N_2									
KE – MBG110, surplus air φ = 1,3									
Sample	**Amounts of ingested fuel cycle [m^3_N·cyklus^{-1}]**	**Amount of flue gas [m^3_N·cyklus^{-1}]**	**Indicated work [J·cyklus^{-1}]**	**Indicated power [kW]**	**Amout of fuel [m^3_N·s^{-1}]**	**Heat input in fuel [kW]**	**Effective power [kW]**	**The total effective efficiency [%]**	**Heating value [MJ·m^{-3}]**
1	0,000354	0,001484	1721,250	129,094	0,02656	265,59	105,857	39,857	10,00
2	0,000199	0,001469	1972,845	147,963	0,01493	298,51	121,330	40,645	20,00
3	0,000138	0,001464	2068,863	155,165	0,01038	311,37	127,235	40,863	30,00
4	0,000106	0,001460	2119,542	158,966	0,00796	318,23	130,352	40,962	40,00
5	0,000086	0,001458	2150,862	161,315	0,00645	322,49	132,278	41,018	50,00

In the table 4 selected values of pyrolysis gas from tests performed on the pyrolysis unit Pyromatic are listed. During measurements on the pyrolysis unit the main interest was directed to gas-productive and commercially available input material.

Table 4 - Selected values from measurements of the pyrolysis process

Sample	**Temperature proces**	**H_2**	**CO**	**CO_2**	**CH_4**	**C_2H_4**	**C_2H_6**	**C_3H_8**	**C_4H_{10}**	**C_5H_{12}**	**C_6H_{14}**	**N_2**	**Heating value**
	[°C]	**[%]**											**[MJ·m^{-3}]**
Wood pellets	500	6,40	18,70	20,30	12,40	3,70	1,30	1,00	0,10	0	0	0	11,54
	550	13,20	8,00	19,90	14,90	4,90	1,70	1,20	0,20	0	0	0	13,09
	600	18,70	12,00	18,30	15,40	4,70	1,70	1,20	0,20	0	0	0	14,24
	650	19,90	30,50	16,20	15,10	3,90	1,40	1,00	0,10	0	0	0	15,64
Brown coal	500	15,10	10,90	19,20	21,30	1,10	2,90	2,00	0,60	0,50	0,30	0	17,02
	550	19,50	10,30	18,30	20,70	2,50	2,50	2,20	0,60	0,10	0,10	0	16,94
	600	27,00	10,90	18,10	24,40	3,10	3,10	2,80	0,80	0,10	0,10	0	20,67
	650	33,90	11,90	16,10	24,80	2,50	2,20	2,00	0,60	0,20	0,10	0	19,96
Tire crumb	500	12,40	2,80	2,40	17,90	3,00	4,40	5,60	4,20	4,50	0,80	0	31,41
	550	13,30	3,70	2,30	19,80	3,90	4,70	5,20	3,60	2,40	1,00	0	29,03
	600	22,20	3,10	1,90	29,20	4,00	4,90	5,40	3,70	2,50	1,10	0	34,12
	650	28,30	2,90	1,40	4,60	5,20	6,30	7,00	4,80	3,20	1,40	0	31,98
PE Lentil	500	10,00	0,50	2,10	15,30	36,00	0	0	0	0	0	0	28,04
	650	14,20	0,80	1,10	24,10	58,80	0	0	0	0	0	0	45,24
Natural gas	-	0	0	0,07	98,39	0	0,44	0,16	0,07	0,03	0	0,84	35,86

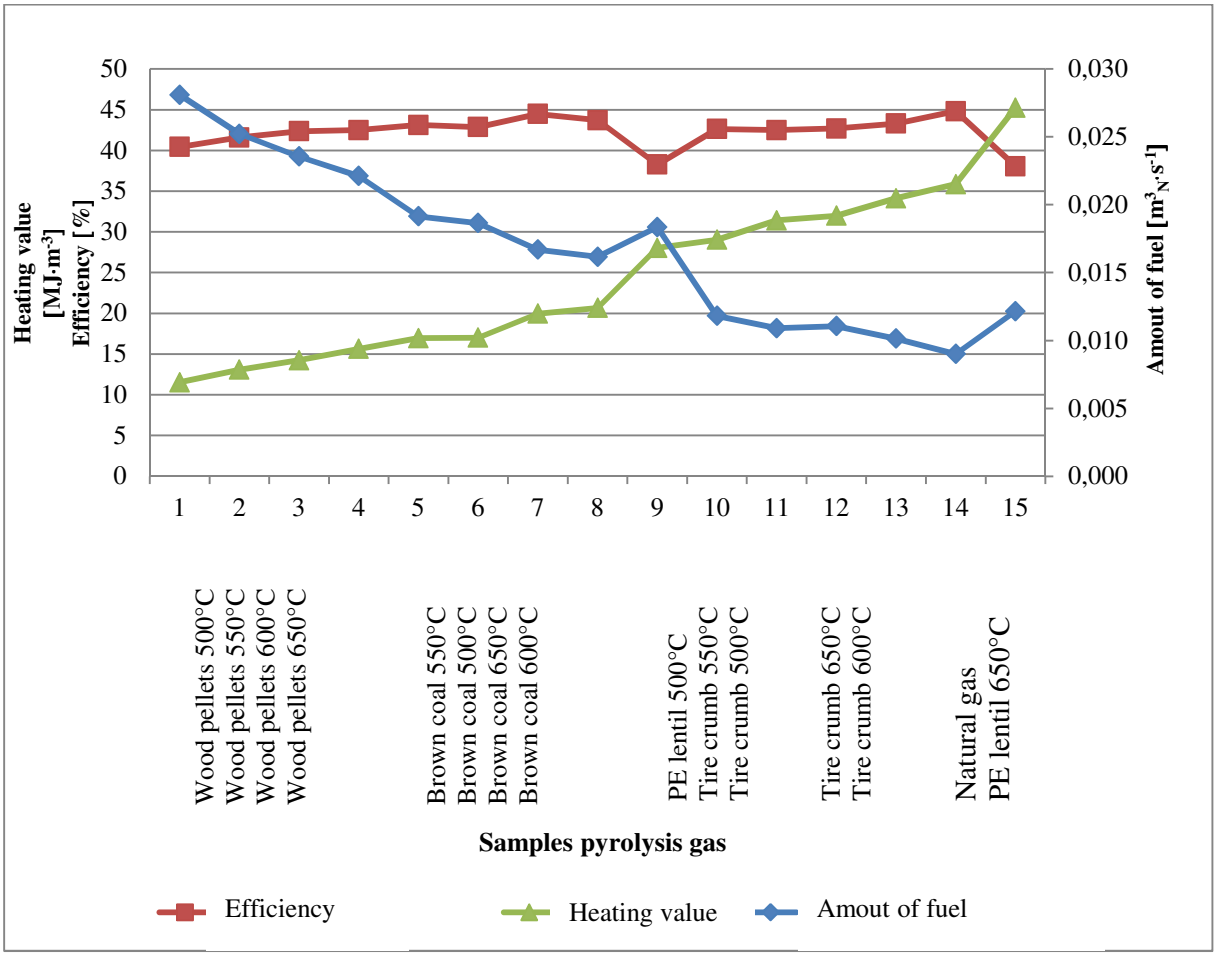
The results of modeling of a sample of pyrolysis gas on the cogeneration unit are available in table 5. Pyrolysis gas samples were sorted according to the calorific value from lowest to highest. Then you can better compare the samples with standard gas.

Table 5 - Calculated values of the program Epsilon on unit KE - MBG110

Cooled pyrolysis gas										
KE – MBG110, surplus air 1,3										
Sample	**Temperature [°C]**	**Amounts of ingested fuel cycle [m^3_N·cyklus^{-1}]**	**Amount of flue gas [m^3_N·cyklus^{-1}]**	**Indicated work [J·cyklus^{-1}]**	**Indicated power [kW]**	**Amout of fuel [m^3_N·s^{-1}]**	**Heat input in fuel [kW]**	**Effective power [kW]**	**The total effective efficiency [%]**	**Heating value [MJ·m^{-3}]**
Wood pellets	500	0,000375	0,001406	2131,00	159,825	0,0281	324,10	131,06	40,4	11,5
	550	0,000336	0,001385	2231,46	167,359	0,0252	329,96	137,23	41,6	13,1
	600	0,000314	0,001365	2311,11	173,333	0,0236	335,48	142,13	42,4	14,2
	650	0,000295	0,001355	2389,34	179,200	0,0221	345,83	146,94	42,5	15,6
Brown coal	550	0,000255	0,001366	2274,72	170,604	0,0191	324,43	139,90	43,1	16,9
	500	0,000249	0,001380	2212,50	165,938	0,0187	317,44	136,07	42,9	17,0
	650	0,000223	0,001331	2409,32	180,699	0,0167	333,13	148,17	44,5	20,0
	600	0,000216	0,001353	2375,12	178,134	0,0162	334,14	146,07	43,7	20,7
PE lentil	500	0,000245	0,001447	3202,72	240,204	0,0184	514,52	196,97	38,3	28,0
Tire crumb	550	0,000158	0,001419	2378,57	178,392	0,0118	343,03	146,28	42,6	29,0
	500	0,000145	0,001428	2367,78	177,583	0,0109	342,61	145,62	42,5	31,4
	650	0,000147	0,001415	2455,09	184,131	0,0111	353,66	150,99	42,7	32,0
	600	0,000135	0,001399	2436,58	182,744	0,0101	346,03	149,85	43,3	34,1
Natural gas	-	0,000120	0,001367	2354,19	176,564	0,0090	323,04	144,78	44,8	35,9
PE lentil	650	0,000162	0,001443	3403,52	255,264	0,0122	549,89	209,32	38,1	45,2

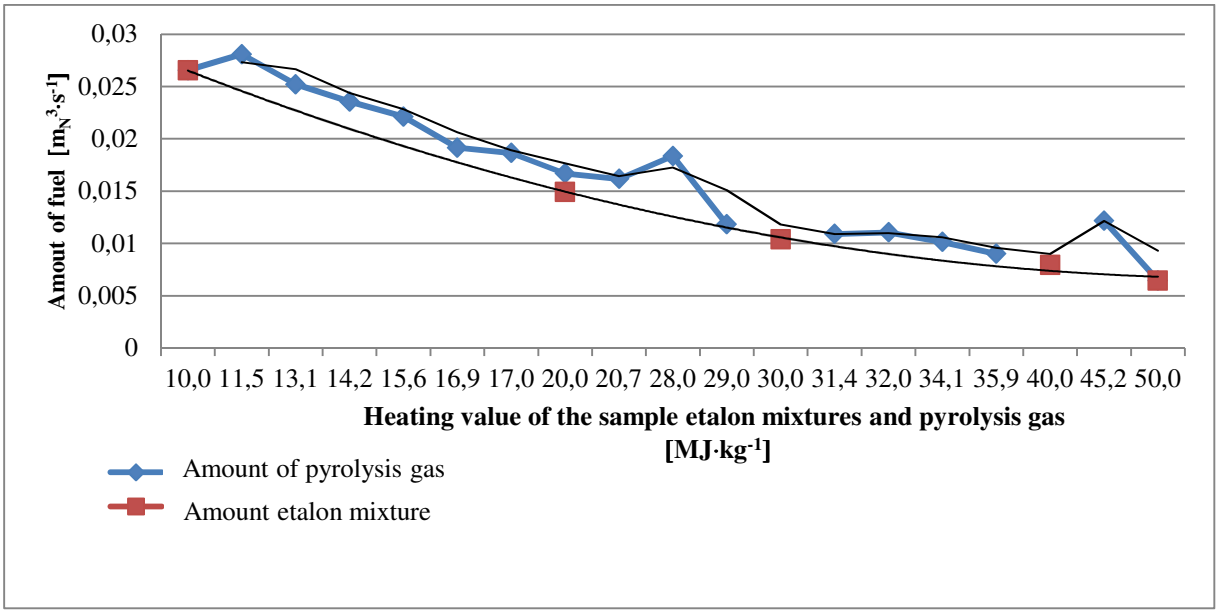
The dependence of consumption of fuel in the engine is shown in figure 5. The chart shows that with increasing calorific value decreases the amount of fuel supplied to the engine of the cogeneration unit. Deviation was recorded only on the samples of polyethylene. This deviation is probably caused by substantial representation of C_2H_4 hydrocarbon groups in the sample. Total effectiveness grows slowly and in percentage units with increasing calorific value. Maximum overall efficiency is 44.5% and the cogeneration unit reaches it by the combustion of the pyrolysis gas from lignite. This pyrolysis gas was generated at the process temperature of 650 °C. Process efficiency is 0.3% less than for the operation of cogeneration units to natural gas. It is here to be noted that the consumption amount of fuel in the pyrolysis gas at a given efficiency doubled.

Figure 5 – The dependence of the amount of fuel and the overall efficiency on the heating value of the sample, φ = 1,3



When comparing the amount of fuel (pyrolysis gas vs. etalon mixture) supplied to the engine it can be argued that the amount of fuel consumption increases with the calorific value of both fuels. The amount of fuel delivered to the engine is higher for the pyrolysis gas than that of a standard gas mixture. Quite significant increase in the amount of fuel consumption is recorded in the pyrolysis gas from the polyethylene lens 500 °C and 650 °C. This deviation is probably caused C_2H_4 and its substantial presence in the sample analysis of the pyrolysis gas. For comparing the amount of fuel samples pyrolysis gas figure 6 was supplemented with trend line moving average. This connector approximates the characteristics of the connection between points. Individual points of etalon fuel mixture (LPG-N_2) were interspersed by curve of polynomial regression trend. This curvature seems best to interleave points entered by the standard mixture see figure 6. A sample of the pyrolysis gas from the crushed tyre (process temperature 550 °C) lies on the curve of etalon fuel mixture. It can be assumed that with the same calorific value of a standard gas consumption will be the same for the standard mixtures and pyrolysis gas. Final and initial connection of the two curves is necessary to disregarded.

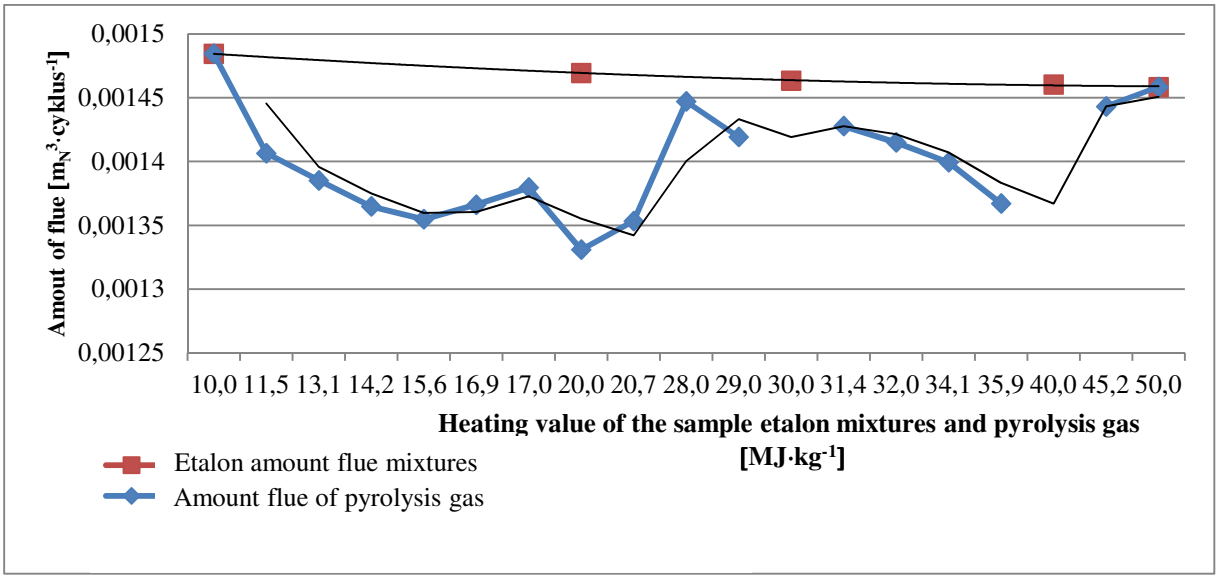
Figure 6 – Amount of pyrolysis gas and etalon mixtures depending on the heating value



From the figure 7 is evident that the amount of combustion products from the pyrolysis gas is lower than the amount of combustion products of etalon mixture. Excess of air is j =1,3. The curve of amount of pyrolysis gas at two points approximates with the curve of amount of flue gas from the etalon mixture. These points are samples of gas PE lens 500 °C and 650 °C.

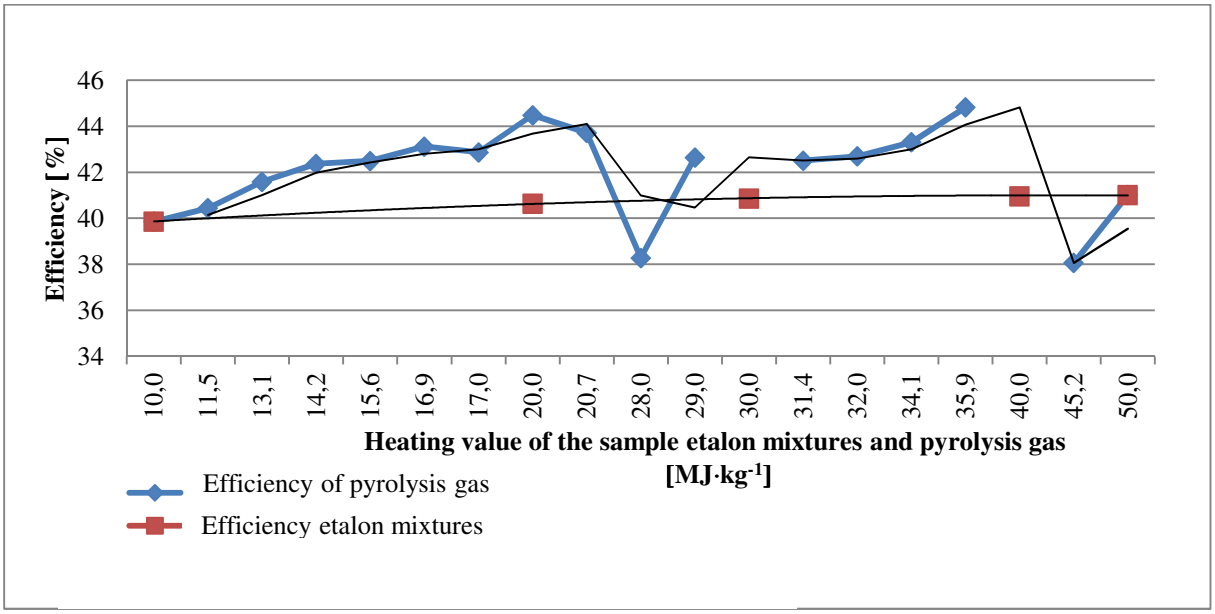
For a sample of wood pellets (500-650 °C) occurs with increasing of calorific value to decreasing the amount of flue gas. With further development of the curves amount of flue gas from the pyrolysis gas can not clearly confirm that with increasing calorific value occurs within combustion of the pyrolysis gas to reduce the amount of flue gas.

Figure 7 – Amount of flue gas samples and etalon mixtures depending on the heating value



On the curve - the total effective efficiency of the etalon mix (figure 8) is seeing its slow growth till the calorific value of 40 MJ.m^{-3}. The maximum value of achieved effective efficiency is at calorific value 41%. When comparing the total effective efficiency of pyrolysis gas with the etalon fuel mixture, we can state its upward trend. Samples PE lenses (500 and 650 °C) as what as in the previous comparison outside the course of emerging trend.

Figure 8 – The total effective efficiency of individual samples and etalon mixtures depending on the heating value



4 Conclusion

During simulation program EBSILON was confirmed several important connections. The prediction of the results before the initialization of technology is more than suitable. The reason is the required setting of process conditions technology, with the required output values of the model. Afterwards possibility of confusion of the fuel with the change of inlet boundary conditions of pyrolysis gas was dealt and the effect to change of the performance in the case of different composition. Pyrolysis gas was compared with standard (etalon) gas. Calorific value of the mixture was intentionally reduced with help of N_2 for subsequent comparison with the pyrolysis gas. Attention was mainly focused on the effect of fuel on engine performance and the real amount of obtained electric energy. From the model cannot unequivocally confirm effect of increasing the of calorific value of the pyrolysis gas at increasing engine power. The reason for this is assumption of the presence of higher hydrocarbon compounds in the pyrolysis gases and the associated problems with the perfect burn-mixture in the engine cylinder. The solved issue will continue to be examined in terms of burning speed and the quality of burning of mixture in the engine cylinder.

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Effectiveness and Efficiency of Social Economy Organizations

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Abstract
The social economy is a sector that contributes significantly to job creation, sustainable development and income generation as well as equitable distribution of wealth. It is a sector capable of combining profitability with social inclusion within the system of democratic governance, work in the public and private sectors as adjustment of service provision to social needs. Within the social economy there are many different organizations that are usually referred to as social enterprises. SE as a specific mechanism for delivery of goods and services within the existing socio-economic system may not disregard the effectiveness and efficiency.
The relationships between effectiveness and efficiency are very complex but, nevertheless, are one of the main issues dealt with by economic sciences. Currently, we can observe equating of the two terms, or rather treating them as complementary dimensions of the assessment of an organization activity. Combining both components we can talk about organizational effectiveness, i.e. the ability of a company to current and strategic adaptation to changes in the environment, as well as to productive use of resources in order to implement the adopted structure of objectives [38].
Activities of social economy organizations (social enterprises) should take into account appropriate relationships between the purpose, effect and effort. Therefore, the issues of efficiency and effectiveness should be treated as foreground elements in the process of implementing their social mission.

Key words: *social economy, social enterprises, effectiveness, efficiency*

JEL Classification: *A11, A19, J10, J11*

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1 Introduction

The social economy (social economy - SE) as a phenomenon implementing important social tasks through economic activities is known to the world since the dawn of humanity. Social goals of economic processes, in relation to the dynamics of the capitalist economy, do not seem to be a truism[9]. In the process of management one cannot separate strictly economic benefits from social benefits. The market economy actually applies to only a certain segment of society, limited and isolated from a wider area[37].SE is a sector that contributes significantly to creation of jobs, sustainable development as well as income generation and equitable distribution of wealth. It is a sector capable of combining profitability with social inclusion within the system of democratic governance, work in the public and private sectors as adapting the provision of services to social needs. Most importantly, it is a sector that has survived the economic crisis much better than the others and is gaining more and more recognition at the European level [21].

The growing importance of this sector makes the social economy organizations (SEO) seen both as a sphere of praxis and as an object of interest for researchers. However, it is Borzaga C. and E. Torti who are right claiming that the current economic theory is paying little attention to companies with social focus,somehow outreaching beyond the individual interest[7]. However, it needs to be emphasized that the attention is focused from a variety of positions. B. Rogowska claims that the social economy, in the context of contemporary heterodoxy, takes place in the area of traditional research programs [32].

Treating the SE as a specific mechanism for delivery of goods and services within the existing socio-economic system, it is impossible to disregard efficiency and effectiveness of organizations included in this sector. This article focuses on these issues. Regarding the substance, they are one of the most important problems in the field of economic sciences [35]. Understanding the increasing role of SEO in today's economy, therefore, requires indication of the basic (and selected, due to the necessity) aspects of their effectiveness and efficiency. The analysis will be based on the realm of theory; this could provide a useful starting point for future empirical research.

2 Social Economy Organisations

Our understanding of the essence of social economy is not facilitated by the abundance of terminology and confusion that, consequently, create basic conceptual ambiguity; this can be considered, within the field in question, as a serious issue. Different groups of researchers use, depending on their preferences, such terms as "social enterprise," "non-governmental organizations," "non-profit," "charity" and "third sector," "civil society,"frequently applying them interchangeably or exposing only small differences between them [18]. Almost intuitively we can sense the relationship of these terms as belonging to the same field[8]. This terminological "blurring" makes it difficult to understand the essence of the SE as an immanent sphere of economic activities with a social orientation and to indicate organizations included in this set. J. Defourny, P. Develtere believe that as part of the social economy can be considered any economic phenomenon, which has a social dimension and every social phenomenonthat has an economic dimension [11]; this is, however, a significant simplification. There is no doubt that the social economy is equated with the third sector or is understood as its important part [11]. Organizations other than public and market units constitute entities belonging to it. They combine economic and social objectives. However, there is no complete agreement among researchers concerning the fact whether SEO constitute a part of the third sector, or an independent sector - separate from the market, public and civil [33]. Different positions on this matter are due to the fact that the social economy and its development are seen in relation to the area of operations of the public sector, non-profit organizations and voluntarism, philanthropy and charity, but also as a sign of business activities or across them[40]. Social economy organizations usually include: cooperatives, mutual societies, associations and foundations [15]. This is not, however, a closed catalogue. In fact, social economy organizations have different organizational forms. The way of including particular units within this set may comprise normative or legal-organizational criteria[11] that, in case of different countries, stem from their tradition and legal and political circumstances [41].The term "social enterprise" that was coined by the end of the 20th century has brought about certain confusion to the discourse on the social economy organizations. It does not include all of the SEO, but it is rather used to expose its new types [36]. In this sense, social entrepreneurship is synonymous with

contemporary social economy. In the long-term evolution of SE, social enterprises can be perceived as the latest phenomenon [26].

Talking about the definition of social economy organizations, is worth noting that the commonly accepted way for defining them is an indication of criteria related to the economic and social activities of such companies. According to the criteria of the EMES European Research Network , a social enterprise can be considered an entity that meets specific conditions. Borzaga C. and J. Defourny were the first to present these criteria of definition in the now classic position on social entrepreneurship[6]. EMES has singled out economic and social criteria. The first group contains the following differentiators:

1. Contrasting traditional non-profit organisations, social enterprises are directly involved in the production and/or sale of services and goods(rather than in mainly advisory or grant-giving activities);
2. Social enterprises are created voluntarilyand their management is carried out by groups of citizens. As a result, social enterprises are entitled to receive donations or grants from public sector or private companies, they canbenefit from a high degree of autonomy with their shareholders having the right to participate ('voice') and to leave the organisation ('exit');
3. Unlike in case of most public institutions,the social enterprises financial viability depends on the efforts of their members, who are responsible for ensuring adequate financial resources. Social enterprises therefore involve a significant level of economic risk;
4. Activities carried out by social enterprises require a minimum number of paid workers; however, they may combine voluntary and paid workers.

In case of the social criteria the following can be distinguished:

1. Social enterprises are initiated by citizens, involve people belonging to a community or to a group that shares a certain need or goal. They must maintain this dimension in one form or another;
2. Shareholders share the rights of decision-making, generally, through the principle of 'one member, one vote'. Despite the fact that capital owners in social enterprises play an important role, decision-making powers are not based on capital ownership;
3. Social enterprises are participatory in their nature, insofar as those affected by the activities (the users of social enterprises' services) are represented and participate in the management of activities. In many cases one of the goals is to strengthen democracy at local level through economic activity;
4. Social enterprises incorporate organisations that prohibitcompletely the distribution of profits as well as organisations such as co-operatives, which may distribute their profits only to a limited degree. Social enterprises therefore avoid profit maximising behaviours, as they involve a limited distribution of profit.
5. Social enterprises pursue an explicit goal to bring about benefits to the community or a specific group of people. By doing so, they directly and indirectly promote a sense of social responsibility at local level [39].

On the other hand, according to the classic definition by J. G Dees, social entrepreneurs act as agents of change in the social sector through:

- Taking up a mission in order to create and sustain social value (the value not only of personal / private character),
- Identifying and continuous search for opportunities to accomplish this mission,
- Involvement in the process of continuous innovation, adaptation and learning,
- Taking up actions regardless of the limitations caused by a lack of resources and capabilities,
- Identifying the meaning and purpose of the attitude of responsibility towards society [12].

Concluding, we can agree with the claim that SEOs constitute a hybrid unit [1]. They belong to four sub economics: of the market, the state, the third sector and the household [29]. Through transformation, they contribute to social changes aiming at inclusion and multiplication of wealth in society. Combining social goals and economic methods in order to provide public goods, they must focus on effective and efficient action.

3 Efficiency and effectiveness–mutual dependencies

The relationship between the concepts of efficiency and effectiveness is very complex [4]. They are often intuitively grouped together. In economics, however, the two terms are described from different perspectives. This is, undoubtedly, a problem of the consistency of their interpretation. The concept of efficiency is a subject to interpretation in microeconomics and management sciences. The term efficiency is, in turn, considered mainly on the basis of management sciences. Theoretically, the two concepts are mutually complementing categories, constituting alternative criteria for economic organizations evaluations [24]. In a general sense, the concept of efficiency is relatively broad, reflecting appropriate relationships between the effects, objectives, effort and costs from the perspective of structure and dynamics [25]. It refers to the principle of rational management, as formulated in two variants: productivity (maximization effect) and savings (minimization of effort) [27]. Effectiveness is, in turn, the comparison of the real effects of the undertaking project to its supposed objectives, describes the degree of implementation of the goals assumed. Is a concept restricted for characterization of a project or undertaking that is to provide an assumed effect [43]. It allows as sessing to what extent the objectives defined at the programming stage have been reached [30]. Following this reasoning of P. Blaik, it needs to be noted that the term effectiveness indicates a relation of the expected effects to the results achieved and, thus, the effectiveness of the performance in relation to the previously set objectives (target-effect relationship) [5]. Hence, the efficiency, as contrasted with the effectiveness is seen primarily as a situation in which the obtained effects of a given action outweigh the costs incurred in its implementation. But whatever is efficient, it must refer to some assumed goals of an organization's activities, i.e. its effectiveness [10]. P. Drucker defined a clear difference between efficiency and effectiveness as "doing the right things" - the effectiveness; and "doing the things right" - efficiency [14].

Today those two terms are considered identical, or treated as complementary measures for an assessment of the organization activities. According to M. Kulikowska-Pawlak, it is due to the fact that both concepts are etymologically and linguistically of the same root. Both refer to the action, but recognize its result from two different perspectives: achieving of an objective and the expenditures related to it [25]. Trying to organize this kind of terminological confusion, G. Kozuń-Cieslak states that the effectiveness is sometimes referred to as a condition for achieving efficiency. This is a necessary condition, but it is not sufficient. Not every effective actionis reflected in the efficient activity [3]. According to the author, other researchers see this problem in the opposite way– efficiency is treated as a criterion for evaluation of effectiveness. Still,some others consider both categories as independent. You can also find examples of identifying the efficiency with productivity without referring to the operation effectiveness or focusing the efficiency on resource allocation in the sense of V. Pareto's optimum. In general, there are two approaches to interpretation of the analysed concepts:the first case, the concepts of efficiency and effectiveness are interpreted as parallel, in order to present the complementarity of ratings based on these criteria; here both dimensions are treated as organizations performance or activities evaluation. In the second case, they are interpreted individually by reference to individual aspects of economic assessments [24]. Basically, the first approach seems to be more relevant in the analysis of social organizations, including SEO.

Currently, by combining those two components in relation to public, social and market actors, we more frequently talk about organizational efficiency. It is the company's abilityto adjust instantly or strategically to environmental changes as well as to use productively of resources ownedin order to implementthe adopted structure of objectives [38]. Productive application of resources constitutes, de facto, an efficiency componentand the structure adopted of the objectives is an illustration of concentration on the organisation's activities effectiveness.

4 Efficiency and effectiveness of social economy entities

In the context of efficiency and effectiveness of the SE, it seems to be crucial to conduct, through its social mission organizations which, despite the fact that may relate to a variety of issues (social, ecology, sustainable development, fair trade), is the primary goal of every social enterprise. The social mission of the SOE may be perceived in terms of the social impact (influence). It is, of course, a very broad and difficult to define conceptual category. Sometimes, however, it operationalized. The European Commission indicates that it can be defined as a reflection of societal outcomes in a form of long and short-term measurements, adjusted with the effects achieved by other entities, with the effects that would have occurred regardless of the actions, with the negative consequences and with the fading of the effects in time [23]. While making a distinction in relation to the social result which, de facto, is related in its sense to the concept of social impact. Thus, the social effect is both long and short-term change, achieved by consumers as a result of action taken in order to make a social change, taking into consideration both positive and negative changes [23]. In light of this nomenclature, it can be assumed that social impact is measurable (quantitatively and qualitatively) reflection of social impact. Repeating the considerations mentioned here already, it is worth pointing out that, according to B. Juraszek-Kopacz and J.

Tyrowicz the measurement of social impact allows evaluating both the efficiency and effectiveness of SEO and their projects [22]. Commercial organizations can also generate positively perceived social impact, both as external effects (externalities), as well as a part of their strategy(as it is the case of companies implementing the principles of corporate social responsibility). Sometimes it is difficult to identify where the social entrepreneurship ends and where the CSR begins, or vice versa. It seems that the core difference lies in the sphere of values [17].

Therefore, the SE as a term is used to describe the effects of the organization activities not necessarily in the category of making profits (income) but, to a greater extent, to describe innovations in the implementation of social changes (outcomes) [13]. Such results of the changes (outcomes) also differ from the yield (output) - the effect of a given investment (given action)that is made of the products and services provided [20]. Impact Analysis is based on something more complex than mere analysis of yield (output). The output is made of the activity units that a given entity (organization) produces. The fact whether they generate the desired social impact is, however, a completely different and much more complex issue[34]. The expected social change falls into the category of effectiveness. Whereas an action is efficient when the relationship between the required use of resources (input) and yield/effect (output) reaches the optimum value[5]. Therefore, the social economy organization activities should take into accountappropriate relationships between the purpose, effect and effort.

With regard to the effectiveness of SEO activities, one should try to answer the question of how can we estimate the economic value ofsocial undertakings? Carrying out environmental, cultural, integration or social activities usually aims not only on improving the current situation, but also on motivatingfuturedevelopment possibilities. For instance, reinstatement of an excluded person into the labour market can lead directly not only to lowering of the burden put on working people (the cost of social benefits), but also to creating an opportunity to increase the value of social services for all citizens (by taxing another employee), or to decreasing in the average tax burden[22].

From a purely economic point of view, efficiency should be easily measurable, but objectified measures of efficiency in the form of financial measures (economic efficiency) can be used in SEO only to a limited extent. This applies to purely market component of their business. Whereas, the non-market part of the organizations analysed that is related to their social mission requires application of non-financial indicators, characterized by considerable subjectivity. Goods-social values are not traded on the markets, thus, they have no prices that could accurately measure their usefulness for the consumer/purchaser and reflect their costs of production. All activities of social economy entities require, instead, an application of efficiency measurements that combine these two components [28]. This is supported by A. Frączkiewicz-Wronka who indicates that the social organizations efficiency measurement should take into account the reasons for examining it in at least two areas: economic and social. In both cases the essence lies in getting greater effects in relation to the investments. However, it can be noted that in case of searching for efficiency in the economic context, both effects and expenditures are more readily measured than in case of efficiency in the social context [16]. In order to analyse both dimensions, one can follow K.S. Alter, who refers to the concept of a mixed (blended value). Traditionally, it was thought that third sector organisations are responsible for social and environmental activities, whereas entities focused on generating profitsare responsible for economic value. In fact, both types of organizationsgenerate all three types of values [2]. In a similar way M. Porter and M. Kramer refer to a related concept of shared value. It focuses on the connections between social and economic progress. It can be defined as apolicy of practices that increase the company's competitiveness and, at the same time, a development of favourable economic and social conditions within collectives that carry out operational activities. Creation of a common value focuses on identification and development of connections between the social objectives and economic progress. This concept is based on the assumption that both economic and social progresses must be carried out with a base value concept. Values are defined as benefits gained in relation to the costs, and not simply as the benefits only [31]. This is an efficiency-based perception of the realm of benefits that refer, of course, to the material and immaterial sphere.

5 Conclusion

Understanding and measuring of the effectiveness and efficiency of social economy organizations constitute issues that are both crucial and difficult to implement.It seems that these two dimensions for assessment of social enterprises activities should be regarded jointly as mutual dependent elements. The problems with measure of bothresults from the fact that the effectiveness assessment of SEO must usually cover a wide time scope, whereas assessing the efficiency cannot be limited to only a narrow scope of economic efficiency. Social entrepreneurship means that the action taken is of entrepreneurial character, but not based on the market-price mechanism. Such an understanding of entrepreneurship includes a combination of public services provided in the quasi-market circumstances (resulting from the effectiveness and efficiency in the production realisation) [42]. It means that the importance of efficiency and effectiveness in the activities of SEO is equally high as in case of

market actors and public sector organizations, especially, when SEO's, as subjects of social policy, are treated as a remedy for market and government failures [19].

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Demographic and Economics Determinants of Differentiation of Consumption Model in Silesia in Poland in the Years 1994-2013

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Abstract
The research presented in this article focuses on long-term changes in consumption patterns in Silesia, which covers three border provinces of Poland - Silesia, Opole Voivodship and Lower Silesia. The investigation concerns also identification of the most important factors determining differentiation of consumption patterns implemented by households in that region. Based on data of the Central Statistical Office in Warsaw coming from the panel research on households' budgets in 2004-2013 there was conducted an econometric analysis of few characteristics of households (such as: the level and the main source of income, place of residence, age or educational level of reference person (leader of a household) and their impact on the level and structure of household spending. There was assumed that the model of consumption can be inferred on the basis of consumer spending of a household.

Keywords: *consumption, Engel curves, household, income, spending*

JEL Classification: *C13, D12, E21*

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1 Introduction

The chapter presents the results of research concerns the differentiation of consumption patterns of households in Silesia. It is a continuation of the study of consumption in Poland, conducted by the authors since the early nineties.

Needs, their hierarchy and accepted ways of their meeting create certain patterns, or different models of consumer behavior that are realized in specific market conditions and the specific constraints of income met by consumers Consumption model is the result of the needs of the consumer and his knowledge of the possible and acceptable ways to satisfy them [1].

There were studied empirical consumption models of household in Silesia in the years 2004-2013 and their most important demographic and economic determinants. At the same time it was assumed that a consumer unit is the household, whose consumption model can be inferred from the structure of consumer spending. Additionally, it was assumed that the level and structure of consumer spending is also strongly determined by family income, the market situation, as well as factors such as age and educational level of a head of the household, household size, place of residence, or socio-economic type of the household. In this connection, there were analyzed:

- relationship between household spending and its income,
- changes in the level and structure of expenditure in the distinguished types of households,
- hierarchy of meeting needs depending on household income.

In the study there were used data on income and expenditure of households in Poland coming from the Central Statistical Office in Warsaw. A detailed comparative analysis of the spending carried out for the years 2004 and 2013. It should be noted that at the time of preparing the article the latest available data on household were from 2013.

2 Income and the propensity to consume of the Silesian households in the years 2004 and 2013

In conditions of the development market economy, when most household needs are satisfied by goods purchased on the market, a major limitation for consumption is an income. The relationship between income and consumer spending can be measured by many indicators such as the average propensity to consume, the marginal propensity to consume, the income elasticity of consumer spending, which can be considered in terms of microeconomic or macroeconomic level.

The relationship between income and spending of households in Silesia in the years 2004 and 2013 are presented in Table 1. At the same time, the classification of households by the criterion of the main source of income, education level of the household's head and the place of residence of households were taken into account. In addition, in the table are presented selected demographic characteristics of households.

In Silesia, like in the whole country, the economic changes (began after 1989) were accompanied by demographic and social changes. They were continued in the analyzed decade and reflected by a decrease in fertility, increase the length of life of the people, and improve the educational level. The effect of these processes was a significant decrease in the average household size, increase in the average age and increase the educational level of the household's head. As a result of the economic transformation in Poland, especially in the countryside (rural areas), the share of households working in agriculture decreased significantly.

Analyzing the changes of real household income and real consumer spending it can be noted that in Silesia, as in Poland, in the analyzed decade their absolute level increased. However, while in Silesia incomes increased by 25% and consumer spending by 15%, the national average income also increased by 25% but spending only about 9%.

The share of consumer spending in households' income in Silesia and in Poland was at a relatively high level in 2004 and amounted respectively 92.7% and 93.9%. In ten years, this share has decreased and reached the level of 85.1% for households in Silesia and 81.9% for households in Poland. The studies confirm classical relationship between consumer spending and income (the share of consumer spending decline along with

increase of households income).

Household may be in a situation in which its income is not sufficient for necessary consumer spending, the income may be equal to expenditures or it may exceed the level of expenditures. That dependences on the level of household income and the realized consumption pattern.

Therefore, the differentiation of relationship of consumer spending and income was examined, that is, the average propensity to consume of households living in Silesia grouped by three basic classification criteria, namely: the main source of income, educational level of a household leader, and place of residence.

In the analyzed period, spending on consumer goods were lower than households' income, moreover, in Silesia as well as in Poland, the average size ratio declined significantly. In households of persons with non-earnings sources of income, that is, households with the lowest income expenditures exceeded an income. In the case of households of employees, self-employed and pensioners there was a significant decrease in the level of average propensity to consume. However, in households of farmers the level of the index in 2013 raised up to 121%. That was primarily the result of growth of a seasonal variation of the monthly income of this group of households compared to 2004.

Due to the place of residence the propensity to consume of Silesian households differed less than in the case of criterion of the main source of income, both in 2004 and 2013.

However, it should be noted changes that have occurred in this period in the case of households resident different types of urban and rural areas. In 2004 the highest level of income average achieved households living in large agglomerations. The same households demonstrated the biggest spending on consumption. At the same time the lowest income and the lowest expenses were characteristic for households from small towns in Silesia. In 2013 the highest income reached already households from agglomeration and large cities and the highest level of consumer spending was demonstrated by households in large cities and rural areas. In contrast the highest decrease in value of index of the average propensity to consume was recorded in the case of households living in urban areas over 500 thousand. citizens and in small towns.

Another criterion for grouping the households in Silesia was an educational level of household's leader, according to which there were distinguished six households types. In this case, it may be noticed that the income of households in both analyzed years were positively correlated with the education level of households leaders. Taking into account all deliberated criteria, income of households differed the most due to educational level, whereas in 2013 differentiation of income between households with different levels of education slightly decreased. In 2004 the average household's income of people with higher education were 1.54 times higher than the average income of households in the region, and in 2013, this ratio fell to 1.39.

Average income and spending of most groups of households in Silesia increased in the ten years. Only income and expenditure of households of people with secondary education remained almost unchanged. For all types of households, excluding households of farmers, the rate of marginal propensity to consume has decreased.

The foregoing analysis leads to the conclusion that in the analyzed period, households consumption expenditures in Silesia, as in Poland were very strongly influenced by current income and along with the increase in real income there has been a noticeable decrease in the average propensity to spend the part of income for consumption.

Table 1 – Demographic and economic determinants and symptoms of differentiation of households' consumption patterns in Silesia on the background of Poland in the years 2004 and 2013

Types of households	**Structure of the sample in %**		**Average number of persons in a household**		**Age of a household leader in years**		**Average monthly income in PLN (constant prices from 2013)**		**Average monthly expenditures in PLN (constant prices from 2013)**		**Average propensity to consumption in %**	
	Years											
	2004	**2013**	**2004**	**2013**	**2004**	**2013**	**2004**	**2013**	**2004**	**2013**	**2004**	**2013**
By income sources												
Employees	41,80	49,01	3,37	3,05	40,0	42,8	3178,54	4057,94	2877,34	3360,36	90,52	82,81

Farmers	4,51	1,55	4,07	3,91	41,1	49,1	3325,92	3086,41	2959,58	3763,26	88,99	121,93
Self-employed	5,85	6,35	3,48	3,04	42,9	43,7	3881,12	4569,15	3574,76	4006,77	92,11	87,69
Retirees and pensioners	39,92	38,50	2,21	1,94	63,5	67,0	2349,50	2778,07	2233,69	2378,18	95,07	85,61
Maintained from non-earned sources	7,92	4,59	2,73	2,34	43,0	42,7	1645,22	1731,16	1698,31	1796,43	103,23	103,77
By educational level of a household's leader												
Unlettered	0,92	0,25	2,13	1,86	75,7	75,2	1590,41	2229,09	1544,15	1821,19	97,09	81,70
Primary	18,08	12,81	2,48	2,17	60,4	65,2	1943,03	2315,26	1798,90	1986,96	92,58	85,82
Lower secondary	0,12	0,38	2,78	3,16	40,4	33,7	2217,13	2271,38	2111,79	2106,63	95,25	92,75
Basic vocational	36,72	34,30	3,27	2,85	46,7	52,2	2543,09	3128,18	2385,95	2686,04	93,82	85,87
Secondary	31,98	32,43	2,82	2,56	48,1	50,7	2975,76	3510,54	2762,00	3058,93	92,82	87,14
Tertiary	12,18	19,83	2,66	2,52	46,1	46,6	4268,07	4809,01	3860,07	3919,99	90,44	81,51
By place of a residence												
Urban area over 500 thous.	8,32	4,02	2,51	2,19	48,5	51,2	3172,09	3731,02	2956,39	2972,32	93,20	79,67
Urban area 200-500 thous.	12,14	8,83	2,66	2,30	49,8	51,2	2729,07	3734,69	2545,95	3172,58	93,29	84,95
Urban area100-200 thous.	21,66	24,13	2,84	2,45	48,9	51,5	2725,63	3474,62	2481,42	2895,54	91,04	83,33
Urban area 20-100 thous.	23,81	19,83	2,83	2,52	50,8	52,4	2868,20	3484,77	2630,51	2946,39	91,71	84,55
Urban area under 20 thous.	10,70	12,22	2,84	2,56	50,6	53,1	2515,25	3200,31	2441,10	2726,82	97,05	85,20
Rural area	23,38	30,98	3,30	2,94	49,9	52,9	2722,51	3472,86	2530,96	3041,41	92,96	87,58
Silesia - total	100,00	100,00	2,90	2,60	49,8	52,3	2773,90	3475,84	2571,53	2957,74	92,70	85,09
Poland - total	x	x	3,07	2,76	49,6	52,1	2909,07	3625,50	2730,88	2967,69	93,87	81,86

Source: own calculations on the basis of data the Central Statistical Office in Warsaw coming from researches on households' budgets in Poland in the years 2004 and 2013

3 Changes in a structure of the households' consumption in Silesia in the period 2004-2013

In the next stage of the study we analyzed the problem of the impact of income growth on changes in a structure of households' consumption, which is the model of consumption. In the research was used classification of consumer spending set by the Central Statistical Office, namely spending on: food and non-alcoholic beverages, alcohol, clothing and footwear, housing, health care, transport, communication and connectivity, culture and recreation, education and hygiene.

Directions of changes in consumption patterns and their differentiation in all types of households are presented in Table 2.

As it can be seen expenditures on food and housing have the largest share in households' consumption expenditures in Silesia in 2004 respectively 28.34% and 21.28%, so it can be concluded that food and housing needs were the most important for households. Next were spending on transport (8.48%) and expenditures on culture and recreation (6.68%). Shares of spending on meeting the other needs were relatively lower (less than 5%). In the case of expenditures on clothing and footwear their share was 4.6%, health care less than 4.9 %, furnishings 4.85% and communication 4.76%. Spending on education, health, alcohol and other drugs had very low shares – less than 3%.

After ten years of Polish membership in the European Union, the structure of consumer spending of households in Silesia has changed very slightly. First of all, the share of spending on food fell in the studied region about almost 4 percentage points averagely, however this group of spending still has the highest share. In addition, the shares of spending on alcohol, culture and recreation, and education also decreased, in which the declines were not more than 1 percentage point. For other types of households' consumer expenditures we observed slight increase in their shares - the largest increase refers to spending on transport, relatively the littlest increase has the share of expenditure on housing.

In the consumption model of all households in Silesia, as in Poland, the most important, as already it has been noted, were spending on food. The share of these type of expenditures was and remained within the analyzed decades very diverse within separate groups of households. Households income remained the major determinant of food expenditures. The largest share of expenditures on food were in the least affluent groups of households, namely households of persons with non-earned sources of income, households of pensioners and retirees, households of persons with a very low level of education or households from rural areas and the smallest towns. In the case of households of farmers a relatively large share of spending on food could also be the result of self-supply of food and the most traditional way of life.

Considering the differences in the share of expenditures on food due to the place of households residence it must be emphasized that in the analyzed period this share was the lowest in large agglomerations. One can assume that it was caused by the highest level of income and changes in consumer preferences.

The second group of spending in terms of their importance were households' expenditures on housing. In the period 2004-2013 there was a slight increase in the share of these expenditures, particularly noticeable in groups of households of relatively poor people (maintained from non-earned sources) and the richest households of self-employed persons. The highest share of expenditures on housing occurred in households of retirees and pensioners and households with non-earned sources of income. In turn the smallest part of consumer spending enmarked for housing occurred in households of farmers, self-employed persons and persons with higher education.

The type of residence place has not in the period significant impact on the differentiation of shares of household expenditures on housing and their changes in Silesia. In the ten years shares of these kind of expenditures have changed slightly (increased in the smallest urban and rural areas and declined in large and medium-sized cities). It can be assumed that the most significant impact on these changes had the rise in prices of energy and municipal services.

In the years 2004-2013, the third group of consumer spending, in terms of relevance, were spending on transport. The level and the share of these expenditures in consumer spending are conditioned besides income by the activity of members of household and the place of residence. That is why, the smallest share of expenditures on transport occurred during the analyzed period in households of retirees and pensioners and households with non-earned sources of income, in turn the largest share occurred in households of persons with higher education or self-employed persons. According to the place of residence the levels and changes of share of expenditures on transport were very similar.

Table 2 – Changes of a structure of households' consumption expenditures in Silesia on the background of Poland in the years 2004 and 2013

Types of households	Sharesof groups of expenditures in total expenditures on consumer goods and services (in %)																							
	Food and non-alcoholic beverages		Alcoholic beverages		Clothing and footwear		Housing		Furnishings		Health		Transport		Communication		Culture and recreation		Education		Higiene		Other expenditures	
	Years																							
	2004	2013	2004	2013	2004	2013	2004	2013	2004	2013	2004	2013	2004	2013	2004	2013	2004	2013	2004	2013	2004	2013	2104	2013
By income sources																								
Employees	27,00	23,43	3,04	2,89	5,49	5,19	20,06	20,35	5,22	4,99	3,50	3,78	9,73	10,83	4,96	5,51	7,40	7,05	1,90	1,24	2,91	2,90	8,78	11,84
Farmers	33,98	28,56	3,01	2,36	5,20	5,40	14,44	16,57	3,55	8,68	3,86	4,09	12,87	9,10	4,49	4,96	5,95	6,21	1,23	0,93	2,27	2,19	9,14	10,96
Self-employed	24,86	21,25	2,83	2,51	5,14	6,64	18,00	19,36	4,92	5,61	3,36	3,98	12,79	10,67	5,54	5,31	8,91	8,36	1,88	1,48	3,32	3,16	8,45	11,67
Retirees and pensioners	29,45	26,41	2,64	2,84	3,20	3,06	24,06	24,34	4,67	4,29	7,59	7,79	5,63	6,90	4,44	4,65	5,48	5,12	0,57	0,22	2,02	2,13	10,24	12,25
Maintained from non-earned sources	32,68	27,34	3,65	3,00	4,52	3,86	25,62	28,69	3,86	3,41	3,29	3,28	5,21	5,38	4,15	5,36	5,39	5,28	1,28	0,97	2,60	2,49	7,73	10,93
By educational level of a household's leader																								
Unlettered	37,40	30,08	2,08	3,48	2,90	2,88	26,81	24,35	3,67	3,62	9,72	7,75	2,41	2,39	2,13	4,47	2,24	4,99	0,68	0,00	1,75	2,69	8,20	13,31
Primary	34,61	28,99	3,33	3,31	3,35	2,76	23,84	25,08	4,56	3,61	6,97	7,00	4,41	6,31	3,97	4,70	4,54	4,33	0,63	0,32	1,87	1,95	7,93	11,64
Lower secondary	22,32	28,58	1,29	3,15	2,82	2,94	35,93	24,38	1,72	3,27	3,29	5,56	4,47	6,28	5,50	4,18	5,56	7,24	2,12	1,38	1,74	3,18	13,25	9,85
Basic vocational	31,54	27,34	3,46	3,34	4,22	4,15	21,65	23,08	4,58	4,64	4,15	4,52	8,39	7,93	4,43	5,61	5,77	5,53	1,04	0,62	2,34	2,30	8,43	10,95
Secondary	26,75	23,99	2,68	2,78	4,89	4,78	21,84	21,80	5,07	5,12	4,83	4,98	8,66	9,66	5,15	5,32	6,78	6,25	1,57	0,92	2,77	2,68	9,01	11,73
Tertiary	20,76	19,77	2,09	2,16	5,71	5,61	17,52	18,63	5,16	5,22	4,93	5,04	11,36	11,95	5,28	4,79	9,79	8,69	2,15	1,49	3,23	3,28	12,01	13,38
By place of a residence																								
Urban area with number of population																								
more than 500 thous.	24,01	22,23	2,67	2,73	5,26	4,05	20,46	20,92	4,56	3,31	5,68	5,61	8,68	8,99	5,22	5,95	8,82	6,96	1,92	1,62	3,29	2,97	9,41	14,66
200-500 thous.	26,84	22,63	2,87	3,02	4,03	4,44	24,40	21,13	5,59	5,32	4,87	5,19	7,19	10,72	4,72	5,26	6,63	5,93	1,05	1,17	2,60	2,92	9,21	12,27
100-200 thous.	27,60	23,48	3,22	2,93	4,52	4,49	23,14	22,68	4,66	4,70	4,79	5,05	7,88	8,03	4,87	5,42	6,70	7,25	1,54	1,02	2,66	2,77	8,42	12,18
20-100 thous.	27,16	23,84	2,75	3,11	4,77	4,82	22,55	21,45	4,44	4,74	4,73	5,24	8,53	9,65	4,78	5,47	6,63	6,14	1,46	0,84	2,60	2,86	9,59	11,85
less than 20 thous.	29,19	25,14	3,11	2,84	4,96	4,97	19,97	21,66	4,81	5,20	4,59	5,11	8,06	8,32	4,67	5,14	6,45	6,37	1,31	0,84	2,52	2,59	10,36	11,82
Rural area	32,46	25,89	2,85	2,56	4,37	4,60	17,52	21,27	5,19	4,99	5,06	4,74	9,77	10,35	4,52	4,82	5,94	6,33	1,08	0,79	2,23	2,35	9,00	11,32
Silesia - total	28,34	24,37	2,92	2,84	4,60	4,62	21,28	21,66	4,85	4,86	4,91	5,03	8,48	9,41	4,76	5,21	6,68	6,50	1,37	0,93	2,59	2,66	9,22	11,91
Poland - total	28,30	25,14	2,75	2,58	5,01	4,99	19,89	20,69	4,94	4,74	4,88	5,11	9,33	9,88	4,66	5,07	6,82	6,39	1,58	1,10	2,58	2,76	9,26	11,53

Source: own calculations on the basis of data the Central Statistical Office in Warsaw coming from researches on households' budgets in Poland in the years 2004 and 2013

Before 2004 in Poland and in Silesia there was a strong differentiation and a large increase in the share of household expenditures on communication especially in rural areas. In the years 2004-2013 we are already observed the alignment of the share of household spending on communication and their relatively small increase almost in all groups of households. These changes were caused in both improving the availability of telecommunications services, as well as from a decrease in their prices.

Little differentiation characterized shares of the health spending. Throughout the period 2004-2013, they increased on a similar scale in different types of households. Only in households of retirees and pensioners they were and remained significantly higher, that is connected with age and health status of members of these households.

The strong growth in level and share of household expenditures on culture and recreation confirmed the significant change in wealth and lifestyle of households. In the analyzed decade shares of this group of households' expenditures were different, while the differentiation was much higher in the case of households classified according to the main source of income or education level of household's leader, than in the case of households classified according to the place of residence. Therefore, differences in the shares of expenditures on culture and recreation were induced by differences in households' income.

Other groups of consumer spending, because of their small share in the structure of expenditure, can be seen as expenditures with a small influence for the differentiation of consumption patterns.

4 Empirical exemplification of a transformation of needs' hierarchy of households in Silesia in 2004 and 2013

The hierarchy of needs is one of factors that determine consumption model. The order of meeting the needs also depends on a consumer's income. This relationship is known in economics as the law of Engel [2].

Therefore, There were estimated models describing the dependence of consumer spending on household income in Silesia. Results of the estimation are presented in Table 3. Figure 1 and 2 are their graphical presentation. Structural parameters of the models are significant and their match to empirical data is good enough.

Table 3 – Models of consumption expenditures (y) depending on income (x) of households in Silesia in the years 2004-2013

Specification	Years	Function	Parameters		
			a	b	R^2
Expenditures – total	2004	$y = ax^b$	16,31	0,64	0,34
	2013	$y = ax^b$	5,16	0,78	0,45
Food and non-alcoholic beverages	2004	$y = \frac{ax}{(x+b)}$	1595,13	2859,64	0,34
	2013	$y = \frac{ax}{(x+b)}$	1565,10	3570,70	0,32
Alcoholic beverages	2004	$y = \frac{ax}{(x+b)}$	248,63	5863,61	0,07
	2013	$y = \frac{ax}{(x+b)}$	277,18	7340,34	0,05
Clothing and footwear	2004	$y = \frac{ax}{(x+b)}$	1731,08	34135,47	0,16
	2013	$y = ax + b$	0,05	-29,18	0,18
Housing	2004	$y = \frac{ax}{(x+b)}$	1133,33	2547,49	0,07
	2013	$y = \frac{ax}{(x+b)}$	1296,89	3099,87	0,08

Furnishings	2004	$y = \frac{ax}{(x+b)}$	1340,13	25307,22	0,06
	2013	$y = ax + b$	0,06	-60,49	0,10
Health	2004	$y = \frac{ax}{(x+b)}$	466,39	6898,91	0,06
	2013	$y = \frac{ax}{(x+b)}$	485,30	7297,07	0,05
Transport	2004	$y = \frac{ax}{(x+b)}$	7761,92	85331,42	0,06
	2013	$y = ax + b$	0,11	-97,19	0,05
Communication	2004	$y = \frac{ax}{(x+b)}$	894,64	16705,96	0,22
	2013	$y = \frac{ax}{(x+b)}$	463,53	6293,79	0,25
Culture and recreation	2004	$y = ax + b$	0,05	45,09	0,11
	2013	$y = ax + b$	0,06	-24,40	0,14
Education	2004	$y = \frac{ax}{(x+b)}$	747,24	45285,15	0,03
	2013	$y = ax + b$	0,01	-18,07	0,04
Higiene	2004	$y = \frac{ax}{(x+b)}$	1025,18	37997,04	0,22
	2013	$y = \frac{ax}{(x+b)}$	1442,28	59286,07	0,20

Source: the same as Table 1.

Power functions' models for total household spending helped to identify the elasticity of consumer spending according to income. In the studied years, indicators of income elasticity of total consumer spending were at the level of 0,64-0,78. This means that the relative increase in income caused lower growth in consumer spending in the year 2004 than in 2013 [3].

Most consumer spending, both in 2004 and 2013, were changing according to the function of Törnquist the 1st type describing the relationship between expenditures on primary goods and income. After ten years, upper asymptotes of spending functions gone up or the relationships have become linear, which may mean that the rising income has an impact on increase in a level of lack feeling by consumers. Only in the case of expenditures on food and non-alcoholic beverages an upper asymptote of the function decreased slightly. This in an effect of decreasing share of these kind of expenditures in total households' expenditures and achieving the saturation point by consumers with relatively lower income levels.

In addition, the Törnquist's function could be used in some types of spending, for example: the maintenance of housing, health, hygiene, and communications. This proves the existence of such a level of income that allows you to meet the specific groups of needs.

The linear character of relationship between expenditure and income indicates a situation of deficiency even at relatively high level of households' income. This type of dependence has occurred in the case of expenditures on culture and recreation, and in 2013 also in the case of expenditures on clothing and footwear, furnishings, transport and education. The rise of household income caused a significant shift of the level of these types of expenditures accepted by households.

Figure 1 – Models of expenditures of households in Silesia according to income in the year 2004. Source: the same as Table 1.

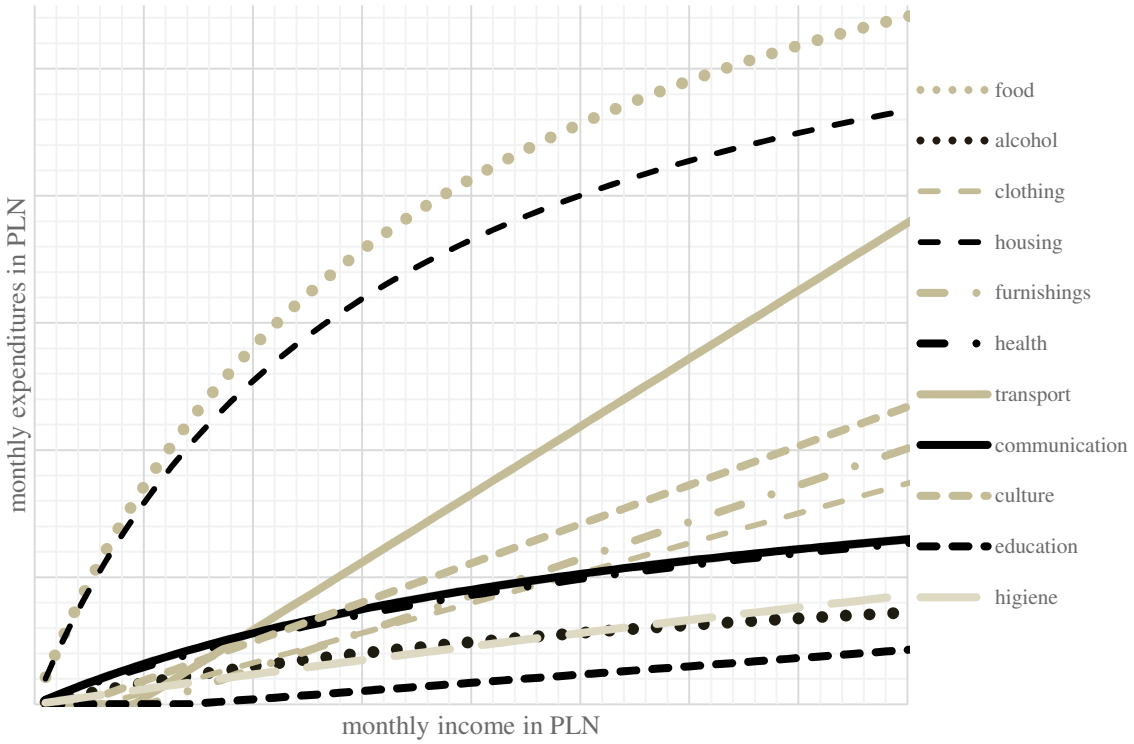
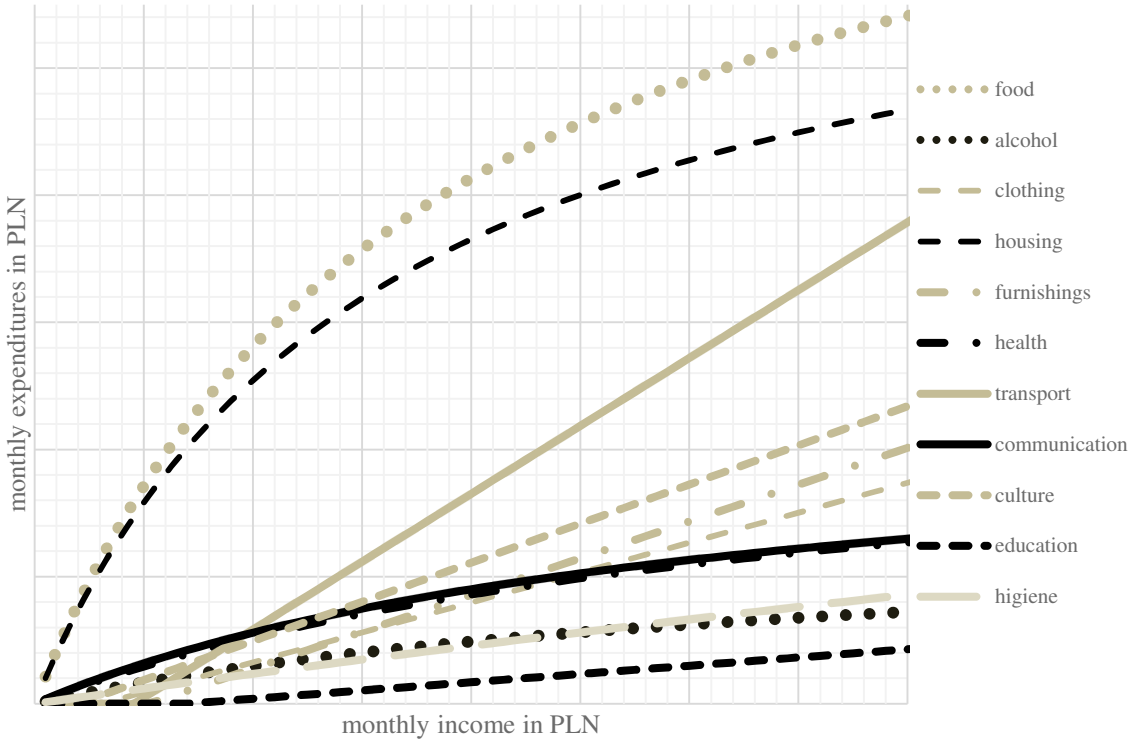


Figure 2 – Models of expenditures of households in Silesia according to income in the year 2013. Source: the same as Table 1.



5 Conclusion

In the period 2004-2013 real consumption expenditures of households increased but significantly slower than their income. Changes in the absolute value of consumer spending, however, did not result in significant changes of consumer spending structure, both in Poland and in Silesia.

In the period 2004-2013 in Silesia could be observed primarily the declining share of household expenditure on food and at the same time there have been grow shares of other expenditures which include spending on luxury goods and financial services.

More important for the consumption model were: educational level of household's leader, main source of income and place of a household's residence. This proves that income determinants have a greater importance for differentiation of the structure of expenditures in the distinguished groups of households.

In the analyzed period, consumption of households in Poland was strongly dependent on current income. Along with the increase in real income, however, there has been a noticeable decrease in the average propensity to spend a part of income for consumption.

In the period, the most important signs of changes in consumption patterns of households in Silesia are changes of expenditures' structure. Significantly decreased the share of expenditure on food and this applies to all groups of households. Such a trend could be considered as positive, especially in the case of increase in real households income.

Increase in a level and shares of households' expenditures on transport, communication, culture and recreation proves the civilization development of our society. What is worth noting, the largest increase related to spending on connectivity and communication. In all types of households in Poland there has been an alignment of a share of these expenditures.

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Geriatric Care Resources in Poland and the Czech Republic - Comparative Analysis

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Abstract
The demographic forecasts show that by 2035. subpopulation of people aged 65+ in Poland and in Czech Republic will grow rapidly. The increase in the number of the oldest has in turn a significant impact on even faster growth of demand for the provision of care and grooming, and hence - for the resources of geriatric care.
Demographic aging of the population is one of the social processes focused the attention of researchers from many disciplines: economists, specialists in medicine and public health, social politicians and sociologists. Demographic aging of the population is not unexpected process; it is determined by several factors, especially the increasing of life expectancy. High impact on this occurrence has also entering into the age of 65+ generation born during the post-war baby boomers. However the disparity in the rate of increase the percentage of old people in different regions in Poland and Czech Republic should be pointed. Special importance has the problem of scarcity of geriatric care resources; also diversify access to them by people living in different regions.
The aim of this article is diagnosis the geriatric care resources in a situation of an aging population in Poland and Czech Republic. To achieve the aim the demographic forecasts for Poland and Czech Republic until 2035 divided by regions were presented and the analysis of selected geriatric care resources - material and human – were done.

Key words: *aging population, geriatric care, resources*

JEL Classification: *D83, M12, D78, I19*

Geriatric Care Resources in Poland and Czech Republic - Comparative Analysis

Agnieszka Krawczyk-Sołtys

1 Introduction

The demographic forecasts show that by 2035. subpopulation of people aged 65+ in Poland and in Czech Republic will grow rapidly. The increase in the number of the oldest has in turn a significant impact on even faster growth of demand for the provision of care and grooming, and hence - for geriatric care resources.

The changes in the demographic structure of the Polish and Czech Republic society, which are increasingly the subject of public discussion, still require in-depth reflection on the trend of demographic processes in the future. Special importance has the problem of scarcity of geriatric care resources; also diversify access to them by people living in different regions.

Demographic aging of the population is one of the social processes focused the attention of researchers from many disciplines: economists, specialists in medicine and public health, social politicians and sociologists. Demographic aging of the population is not unexpected process; it is determined by several factors, especially the increasing of life expectancy. High impact on this occurrence has also entering into the age of 65+ generation born during the post-war baby boom. However the disparity in the rate of increase the percentage of old people in different regions in Poland and Czech Republic (among other things due to the migration of young people) should be pointed.

The aim of this article is diagnosis the geriatric care resources in a situation of an aging population in Poland and Czech Republic. To achieve the aim the demographic forecasts for Poland and Czech Republic until 2035 divided by regions were presented and the analysis of selected geriatric care resources - material and human – were done.

2 The aging population in Poland and Czech Republic

The demand for health care services for the elderly can be estimated on the basis of demographic parameters. Poland and Czech Republic are countries demographically old since the sixties of the last century. Currently, they should be classified as countries with advanced age. Because of entering into old age post-war baby boomers further increasing the pace of aging is projected. Forecasts aging boomers are quite dramatic, especially in the context of the tasks facing the organizers of the health care services provided for the elderly, which can eventually break down already not too efficient health care systems [9].

Changes in the percentage of people aged over 65 in the last 10 years, and forecast these changes until 2035 in Poland are presented in Table 1, in Czech Republic – in Table 2. In Poland, in 2013 this percentage was 14.7%, in Czech Republic – 17.4%.

Table 1 - Share of persons aged +65 in the total population in particular voivodeships in Poland in 2005-2035 (in %)

Voivideship	2005	2010	2013	2020	2035
Dolnośląskie	13,5	13,4	14,8	19,5	23,8
Kujawsko-pomorskie	12,3	12,6	14,1	18,0	23,0
Lubelskie	14,3	14,5	15,4	18,9	24,4
Lubuskie	11,7	11,8	13,4	17,9	23,1
Łódzkie	14,9	15,0	16,6	20,4	25,0
Małopolskie	13,4	13,7	14,5	17,2	22,1
Mazowieckie	14,5	14,5	15,4	18,5	22,1
Opolskie	13,7	14,3	15,3	19,0	25,2
Podkarpackie	12,9	13,2	14,0	17,1	23,0
Podlaskie	14,5	14,8	15,3	18,2	24,9
Pomorskie	11,9	12,2	13,5	17,3	21,6
Śląskie	13,2	14,3	15,5	19,5	24,7
Świętokrzyskie	14,9	15,0	16,1	20,2	26,2
Warmińsko-mazurskie	11,6	11,8	12,8	16,9	22,9
Wielkopolskie	11,9	11,9	13,5	17,0	21,6
Zachodniopomorskie	12,1	12,4	13,9	18,5	23,2

Source: Own study based on data: [10], [11].

The largest percentage of people aged +65 in Poland in 2013. characterized voivodships: łódzkie and świętokrzyskie (over 16%), and the lowest – voivodships: warmińsko-mazurskie, lubuskie, pomorskie, wielkopolskie and zachodniopomorskie, where it didn't exceed 14%. In Czech Republic in 2013. this ratio exceeded 18% in Praha and region Královéhradecký, while was lower than 17% in regions: Středočeský, Ústecký and Karlovarský. Forecasts indicate that in 2035. the largest percentage of people aged 65+ will characterize voivodships: świętokrzyskie, opolskie, podlaskie and regions: Zlínský, Vysočina, Karlovarský, Královéhradecký, Moravskoslezský, and this percentage double both in Poland and Czech Republic during 20 years.

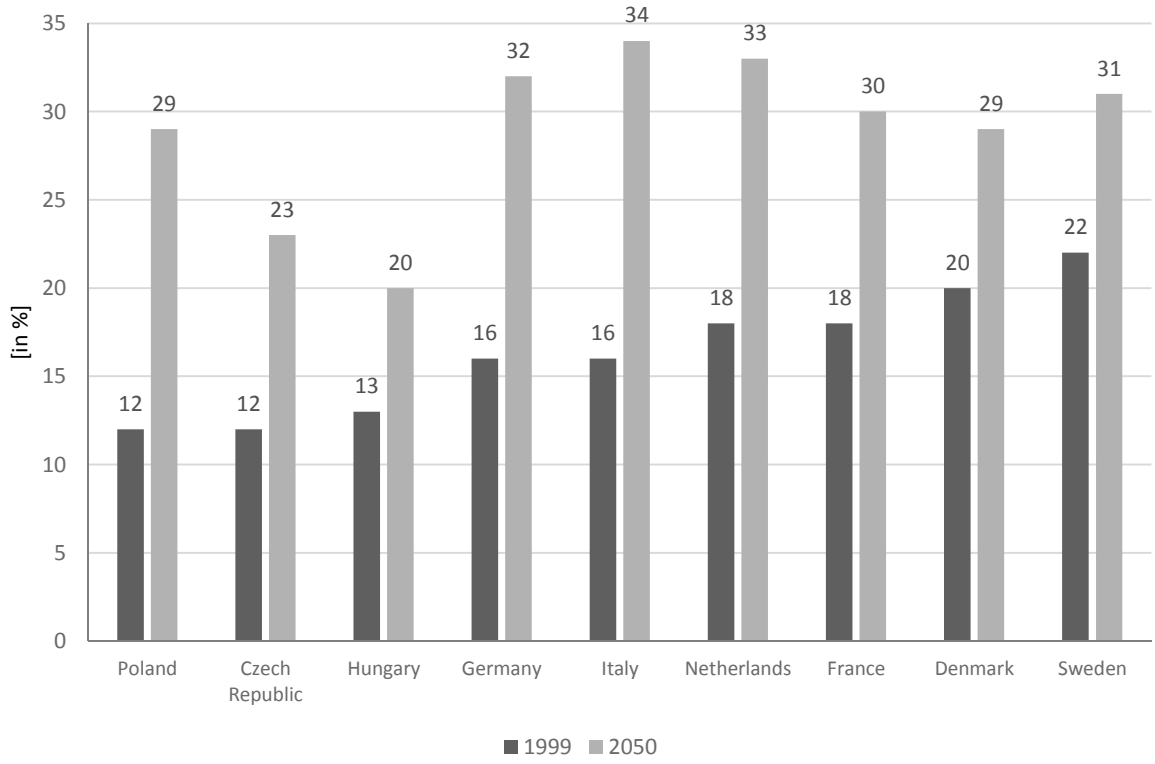
Table 2 - Share of persons aged +65 in the total population in particular voivodeships in Czech Republic in 2005-2035 (in %)

Region	2007	2010	2013	2020	2035
Praha	15,6	16,4	18,1	19,8	20,7
Středočeský	14,1	14,7	16,3	18,9	22,8
Jihočeský	14,5	15,5	17,5	20,8	26,3
Plzeňský	15,0	16,0	17,9	21,0	25,5
Karlovarský	13,4	14,4	16,8	20,8	26,8
Ústecký	13,0	14,0	16,4	20,1	25,0
Liberecký	13,6	14,6	17,0	20,7	25,0
Královéhradecký	15,3	16,5	18,4	22,0	26,7
Pardubický	14,8	15,7	17,5	20,7	25,3
Vysočina	14,9	15,9	17,7	20,8	27,2
Jihomoravský	15,2	16,2	17,8	20,5	25,1
Olomoucký	14,7	15,8	17,7	21,0	26,3
Zlínský	15,1	16,2	17,8	21,1	27,4
Moravskoslezský	14,1	15,2	17,0	20,3	26,6

Source: Own study based on data: [6], [7].

On the Figure 1 are presented changes in the percentage of people in the so-called "old age" in the elderly in EU countries in 1999. and 2050. Among the countries shown [14], the largest percentage of elderly in 2050. will characterize Italy, Netherlands and Germany. The process of aging the population, according to the presented forecasts, will be the fastest in Italy and Germany (percentage in 2050. will be about twice high as in 1999.) and the slowest in Denmark and Sweden (percentage in 2050. will be less than 50% higher than 1999.).

Figure 1 - The percentage of people in the so-called "old age" in the elderly in selected EU countries in 1999 and 2050. Source: Own study based on: [14].



3 Geriatric care resources in Poland and Czech Republic

The health care systems for the elderly in Poland and in Czech Republic are unsuited to the needs of this population – have disintegrated, fragmented and inconsistent medical services. The systems do not meet the standards of geriatric approach – universality, quality, availability and comprehensiveness of satisfying complex needs. Long-term care for the elderly, both in Poland and in Czech Republic, rests mainly on the families – insufficient supported by medical and non-medical services of the welfare state system.

According to the previously analyzed data, the shortage of geriatric beds should be emphasized – this specialty beds in Poland in 2013. accounted for only 0.3% of all hospital beds [23]. Their placement in voivodeships was also diversified. In Silesia in 2013. there were more than 39% of all geriatric beds, in lubelskie voivodeship was over 14%, while in opolskie and małopolskie – after nearly 10%. In the four voivodeships there are no geriatric beds in general [12]: mazowieckie, podlaskie, pomorskie and warmińsko-mazurskie. Changes in the number of geriatric beds in each voivodeship in the years 2005-2013 are presented in Table 3.

Table 3 - The number of geriatric beds in particular voivodeships in Poland in the years 2005-2013

Voivodeship	2005	2010	2013
Dolnośląskie	0	40	27
Kujawsko-pomorskie	51	21	21
Lubelskie	33	88	100
Lubuskie	0	0	25
Łódzkie	0	10	21
Małopolskie	48	48	70
Mazowieckie	0	0	0
Opolskie	0	50	66
Podkarpackie	15	30	42
Podlaskie	0	0	0
Pomorskie	0	0	0
Śląskie	171	191	273
Świętokrzyskie	0	0	25
Warmińsko-mazurskie	0	0	0
Wielkopolskie	0	20	20
Zachodniopomorskie	6	6	6

Source: Own study based on: [1].

Similarly, unsatisfactory is the number of geriatric beds in Czech Republic. The decrease in the number of beds of this medical specialty, despite the growing number of elderly people, should also be pointed. In five regions there are no geriatric beds in general: Jihočeský, Karlovarský, Ústecký, Liberecký and Vysočina.

Only in the Plzeňský region there is one geriatric bed at 10 thousand. residents, and in Praha and the following regions: Olomoucký, Královéhradecký and Jihomoravský this ratio is 0.5 (in other regions is even lower) – table 4.

Table 4 - The number of geriatric beds in particular regions in Czech Republic in the years 2005-2013

Region	2005	2010	2013
Praha	54	62	62
Středočeský	34	22	22
Jihočeský	0	0	0
Plzeňský	54	54	54
Karlovarský	0	0	0
Ústecký	0	0	0
Liberecký	0	0	0
Královéhradecký	46	30	27
Pardubický	4	4	4
Vysočina	0	0	0
Jihomoravský	174	59	59
Olomoucký	90	90	40
Zlínský	41	30	30
Moravskoslezský	0	0	0

Source: Own study based on data: [8].

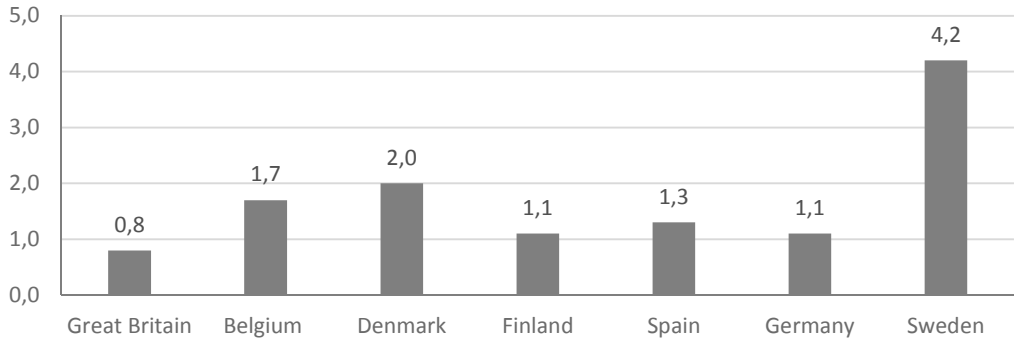
In Germany, Austria and Belgium this ratio is recommended by state institutions from 5 to 10 thousand beds at 10 thousand. residents [9]. This could be a value recommended also for Poland and Czech Republic, but then the number of geriatric beds should be increased to 19,000 in Poland and 5,000 in Czech Republic, which now seems to be impossible. It would be good enough if Poland and Czech Republic reach the European average value of this ratio, ie. 2 beds per 10 thousand. residents. Then it should be created 7,600 geriatric beds in Poland and 2,100 in Czech Republic as part of restructuring beds: internal medicine, rheumatological or neurological.

Extremely low number of geriatric advices in Poland and Czech Republic confirms that majority of seniors in Poland and Czech Republic are treated, often in parallel, with many professionals, which generates unnecessary costs, increases the risk of polypragmasy, reduces the availability of specialists, etc. Considering complexity, time-consuming and laborious of these advices, even the highest rates do not cover the real value of this type of service and are discouraging for potential providers.

Another critical problem in many European countries is the lack of specialists in geriatrics. Between disincentives of taking this specialization should pointed: low salaries, shortage of research facilities and academic base, shortage of staff mentors and geriatric centers. To remedy this, reforms in the sponsorship system of this specialization and guarantees higher salaries for doctors taking up work in this specialization are recommended.

Assuming that, following the example of Great Britain, at approximately 4,000 people 75+ and 8,000 aged 65-74 years should be one specialist in geriatrics, the needs for geriatricians should be estimated at least 800 specialists in Poland and 300 in Czech Republic. The number of specialists in geriatrics at 10 thousand. residents aged 65+ in selected European countries is shown in Figure 2.

Figure 2 - The number of specialists in geriatrics at 10 thousand. residents aged 65+ in selected European countries. Source: Own study based on: [14].



In order to meet this challenge in a relatively short period, taking into account the learning opportunities, a system of so-called "a short path of specialization" in geriatrics should be introduced. It would be addressed to specialists in internal medicine, who have had work experience in internal medicine wards. The number of specialists in geriatrics at 10 thousand. residents in Poland is presented in Table 5 and in Czech Republic in Table 6. Most geriatricians at 10 thousand. residents are in the voivodships: śląskie, małopolskie and lubelskie, and the least in the voivodships: świętokrzyskie, zachodniopomorskie, podkarpackie and warmińsko-mazurskie.

Table 5 - The number of specialists in geriatrics at 10 thousand. residents in Poland in 2014

Voivodship	Ratio
Dolnośląskie	0,05
Kujawsko-pomorskie	0,05
Lubelskie	0,12
Lubuskie	0,05
Łódzkie	0,08
Małopolskie	0,15
Mazowieckie	0,06
Opolskie	0,03
Podkarpackie	0,05
Podlaskie	0,11
Pomorskie	0,09
Śląskie	0,13
Świętokrzyskie	0,03
Warmińsko-mazurskie	0,05
Wielkopolskie	0,06
Zachodniopomorskie	0,04

Source: Own study based on: [14].

Also in Czech Republic can be observed deficit of geriatricians – in 2013. in three regions: Jihočeský, Karlovarský and Liberecký there were no doctors of this specialty. The highest percentage of geriatricians at 10 thousand. residents were in the following regions: Královéhradecký, Olomoucký and Jihomoravský. It should be pointed that these doctors provide geriatric services not only in hospitals but also in ambulatory care.

Table 6 - The number of specialists in geriatrics at 10 thousand. residents in Czech Republic in 2013

Region	Ratio
Středočeský	0,02
Jihočeský	0
Plzeňský	0,07
Karlovarský	0
Ústecký	0,01
Liberecký	0
Královéhradecký	0,13
Pardubický	0,07
Olomoucký	0,12
Moravskoslezský	0,10
Jihomoravský	0,12
Zlínský	0,08
Vysočina	0,01
Praha	0,08

Source: Own study based on: [20].

Due to the lack of specialists in the field of geriatrics and concentration of geriatric care in major centers, the urgent training of primary care physicians with the basics of geriatrics is advisable. For the purposes of geriatric ambulatory treatment the possibility of specialization in geriatrics for family medicine doctors should be

maintained. Apart from this, there is an urgent need to introduce the issue of geriatrics programs for specialization in family medicine.

As it was repeatedly emphasizes in the article, the shortage of specialists in the field of geriatrics and other professionals caring for people in old age is a big problem. Due to the significant lack of specialists in geriatrics and geriatric beds it is necessary to increase the competence of doctors in other specialties, and above all, specialists in internal medicine and family medicine. As planned reconstruction of specialist supervision will be conducive to reduce costs of care for the elderly, while improving their health and quality of life [22].

Old age is one of the most important factors determining the scale of the health needs of society in many dimensions. The growing demand for geriatric care determines also changes in other medical specialties. As an example, the creation of a new field of medicine - geriatrics oncology as a specialty of clinical oncology [17] – should be specified.

4 Conclusion

Demographics is the area, which is rather well understood and allows to build reliable judgments about the future - longer life expectancy, lower birth rates, changing family model – all these factors are the reasons of increasing the role of formal long-term care [2]. Also the great importance has increasing demand for geriatric services, and hence – for the geriatric care resources.

Therefore it is particularly important to rational plan the medical staff, which main objective is to ensure in the future the necessary number of employees of a certain competence profile, as well as the best use of their professional potential, according to the needs of the system [21]. The structure of hospital beds should be adjusted to the needs of an aging population. That especially concern geriatric beds – appropriate number not only protect the health needs of the elderly, but also improve the efficient use of hospital beds in other medical specialties. In addition, the disparities in access to geriatric care resources should be overcome.

Changes in the care sector taking place in accordance with the traditions of caring in particular countries [13]. An effective geriatric care model should meet the criteria: continuity, comprehensiveness and accessibility. Such model, because of early diseases detection, would allow for the efficient prevention of hospitalization and institutionalization of care for the elderly, and thus - enable significant savings.

There are many different geriatric care models [16] which can be adopted, at least partially. Daily geriatric hospital (e.g. Great Britain) provides mainly medical care in the forms: medical consultations, treatments, rehabilitation, occupational therapy, speech therapy, etc. Besides, ensures transportation and meals to patients. Usually it operates on the basis of a general hospital. Next model – home hospitalization (e.g. Sweden) – is defined as the services including the active treatment, performed by clinicians at the patient's home, in case of diseases that typically require treatment in a hospital ward. Home hospitalization is limited only to the period when the patient requires hospital treatment.

Among the US geriatric care models can be distinguished:

- Long Term Care. It focuses on the treatment, care, rehabilitation and care activities in the patient's home. This kind of care is directed to persons eligible for admission to the extended care facility.
- Comprehensive Care for Elderly offers not only chronic care but also intensive medical care in case of rapid illness, which can be performed in the clinic or hospital.
- PACE (The All-Inclusive Care for Elderly) enables old people qualified for admission to the extended care facility being and functioning in their home environment. They have provided the needs of health, social and rehabilitation. The basic purpose of The All-Inclusive Care for Elderly is to prevent hospitalizations or placement in the extended care facility which are not absolutely necessary.
- Transitional Care Centres – their task is to take over the geriatric patients from the hospital to rehabilitate them and prepare to return home.

Beside of the adopted model, preventive actions should be intensified – replacing repair medicine in preventative medicine. The growing number of elderly people imply the escalation of the independent existence problems of this subpopulation – mainly among people who require help (care, treatment and rehabilitation). These problems are discussed not only in Poland and Czech Republic, but also in other European Union countries [15].

As it is shown in the article, Polish and Czech society is aging unevenly. So rapid creation of a comprehensive system of medical, nursing and care services [3], using the geriatric care resources should be strived. This will, at least partially, overcome future shortages of medical personnel and destabilization influence on health and

benefit systems [18]. Moreover, as research shows, it will reduce costs of medical services provided for the elderly people [4], [5].

To sum up – the aging of the population puts new tasks for the health care system. Due to the double aging of the population, the demand for procedures connected with the specific needs of the oldest patients will particularly increase. Besides demographic factor, demand for medical care for the elderly will be the result of mental transformation – more and more frequent the perception of senility not as an inevitable period of disability and chronic diseases but as the phase of life free from these ailments [19]. Such changes will result in the necessity of further reformulation of economic and social policy (including health care system and care services).

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Conditions for Development of Co-operation between Educational Institutions – a Case Study of the INTERREG V-A Czech Republic - Poland (2014-2020)

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Abstract
Poland's accession to the European Union has offered a plane for building a variety of forms of territorial cooperation as elements of the cohesion policy and the European neighborhood policy. They serve to realize of the strategy "Europe 2020" and are accompanied by the possibility of making use of appropriate sources of financing or co-financing programs and enterprises from European funds. Territorial cooperation covers projects of trans-national, trans-European and cross-border ranges, the INTERREG V-A between the Czech Republic and the Republic of Poland being one of them in the financial perspective 2014-2020.
The aim of the paper is to present the principles behind the participation in the projects within the INTERREG V-A Czech Republic-Poland, and also those accepted for cross-border cooperation within the frameworks of the priority axis Education and qualifications in the context of EUROBAROMETER research results. They include two projects accepted for financing, which are based on cooperation between colleges of higher education, that is Cross-border education of students of medical majors and A practical program of educating personnel to develop low-emission economy in the borderland.
The conclusions from the conducted analysis should make the basis for creating new joint programs and individual projects having a cross-border influence.

Keywords: *barriers, cross-border cooperation, education*

JEL Classification: *R580, H830, I250, O220*

Conditions for Development of Co-operation between Educational Institutions – a Case Study of the INTERREG V-A Czech Republic - Poland (2014-2020)

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1 Introduction

Poland's accessing the European Union has offered a plane for launching various forms of cooperation both between states and their individual regions. They make elements of the policy of cohesion and the European policy of neighborly relations and serve to realize the targets of the strategy "Europe 2020", taking into account three priorities which complement one another, that is: intelligent development, sustainable development and development favoring social inclusion[4]. They are accompanied by the possibility of taking advantage of appropriate sources of financing or co-financing them, including means assigned by the European Regional Development Fund (ERDF).

Programs put forward within European Territorial Cooperation (ETC) include projects of transnational, trans-European and cross-border ranges, being a form of realization of Objective 3 (2007-2013) and Objective 2 (2014-2020) of the EU cohesion policy[5]. The projects are realized within the frameworks of the inner and outer borders of the EU, as well as with reference to the states-candidates for future enlargement of the EU, with the aim to jointly meet challenges, make use of potential of partners' growth and strengthen the process of cooperation for ensuring a harmonious development also of the whole of the EU[6]. Cross-border relations, however, are invested with a particular role to perform, since borderlands are inhabited by 37.5% of the EU citizens and the existence of about 38 inner "borders" results from not only geographical, but also economic, language or cultural barriers.

2 Evolution of the INTERREG cooperation programs

The INTERREG program was the first initiative within the Commonwealth, which was elaborated in 1990 and reorganized within the frameworks of the EU cohesion policy in 2000[7]. It makes a form of undertaking and implementing joint enterprises between national, regional and local entities from different EU member-states (or candidates), which are financed with the ERDF means and their own sources. It includes both elements of building "neighbor's" trust (in the conditions of deficit) and more mature forms of solving common problems, managing unused potential to stimulate economic development in regions. The INTERREG covers three planes (components): cross-border – INTERREG A (the broadest range, the largest budget), transnational – INTERREG B and international – INTERREG C. The background and evolution of the 5 INTERREG programs launched so far date back to the beginning of the 1990s and is connected with periods in which perspectives for financing within the EU opened. The periods of programming covered the following time, respectively: INTERREG II (1994-1999), INTERREG III (2000-2006), INTERREG IV (2007-2013) and INTERREG V (2014-2020). Figure 1 presents the stages of the INTERREG (1990-2020) programs evolving.

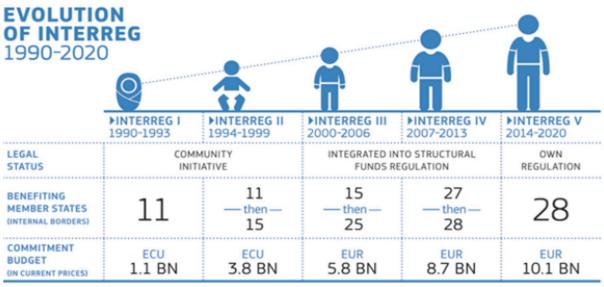
[4] INTERREG Europa 2014-2020. CCI 2014 TC 16 RFIR 001. Document of the cooperation program, final version (2014), [online]. [cit. 2016-07-20]. Available: http://www.strukturalni-fondy.cz/getmedia/ff0aa8 c2-85d1-47e8-9018-4ba58c1b9157/Final-CP-INTERREG-EUROPE_June-2014-EN_1.pdf?ext=.pdf, p. 5.

[5] http://www.euroregions.org/pl/index/o-programie-powt-cz-pl/10.html; http://www.euroregion-silesia.pl/index, ewt-2014-2020,99.html [online]. [cit. 2016-08-17].

[6] Rozporządzenie Parlamentu Europejskiego i Rady (UE) NR 1299/2013 z dnia 17 grudnia 2013 (Dz.U. L 347/259).

[7] http://ec.europa.eu/regional_policy/en/policy/cooperation/european-territorial/cross-border/#1[online]. [cit. 2016 03-14].

Figure 1- Stages of the evolution of INTERREG (1990-2020). Source: http://ec.europa.eu/regional_policy/pl/policy /cooperation/european-territorial/



INTERREG I made the Commonwealth's initiative for borderland regions of 11 member-states within the inner borders of the EU. It was designed for regions displaying relatively unfavorable economic and social situation. Next, INTERREG II took into account not only cross-border cooperation (INTERREG I), but also supranational one. Regarding its content, the objectives of this Program were divided into three components: INTERREG II-A – the Union's initiatives for promoting cross-border cooperation (CBC)[8], INTERREG II-B – cooperation in the scope of creating trans-European networks and INTERREG II-C – transnational cooperation.

The range of INTERREG III (extended in comparison with the previous programs) covered mainly cooperation with borderland regions of candidate-states aspiring to access the EU, which benefitted from PHARE Program (Central Europe), TACIS (countries of the former USSR) and MEDA (Mediterranean countries and the Near East)[9]. In total, the budget within INTERREG III assigned for Poland amounted to over EUR 221 million, allocated as follows: Component A - 80%, B - 14%, C - 6%. In the case of Poland, INTERREG III-A included, among others, cross-border programs with the Czech Republic, Germany, Slovakia, Lithuania and Ukraine.

The total budget of INTERREG IV was distributed to financially support 77 projects of cooperation of member-states on the outer EU borders (including the Instrument of Pre-accession Assistance /IPA/[10] and the European Neighborhood Policy /ENI/. The expenses borne on projects realized as part of ETC, co-financed with means of the ERDF, were refunded to beneficiaries[11]. The most important condition to be satisfied as a member of IV-A was cooperation of partners on both sides of the border, where one of them was the so-called leading partner bearing full responsibility for the implementation of the given project. Obtaining financial support was also conditioned by satisfying at least three of the four cooperation criteria[12]: joint preparation of the project, joint realization of it, joint personnel and joint financing.

3 Program assumptions, goals and sources of financing INTERREG V (2014-2020)

The future of the ETC in the financial perspective 2014-2020 is planned on the basis of directives of the European Parliament and the European Council[13]. Accordingly, INTERREG V is founded on 11 EU investment priorities (Fig. 2) and four priority axes (PA), each of which possesses a particular objective connected with an investment priority, the realization of which it contributes to, including as follows:

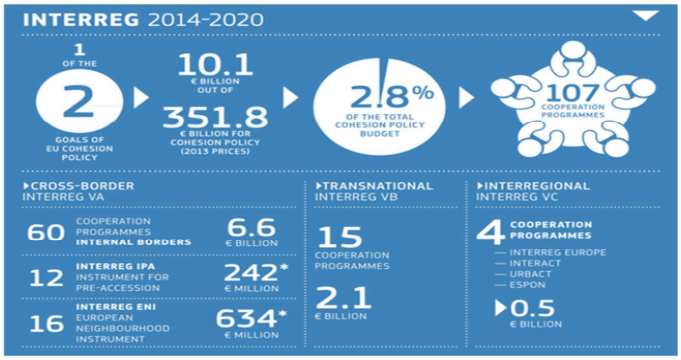
- PA1 "Joint risk management";
- PA2 "Development of natural and cultural potential for support of employment";
- PA3 "Education and qualifications";
- PA4 "Cooperation of institutions and communities";
- PA5 "Technical aid".

[8] http://enpi.interact-eu.net/interreg_ii/interreg_ii/347/5752 [online]. [cit. 2016-05-11].
[9] http://europa.edu.pl/portal/index/articles/europa?methid=971282770&page=article&artid=1175 [online]. [cit. 2016-05-11].
[10] Rozporządzenie Rady (WE) nr 1085/2006 z dnia 17 lipca 2006 r. (Dz.U. L 210 z 31.7.2006); Rozporządzenie Komisji (WE) nr 718/2007 z dnia 12 czerwca 2007 r. (Dziennik Urzędowy L 170 z 29.6.2007); Decyzja Komisji 2007/766/WE z dnia 14 listopada 2007 r. (Dz.U. L 310 z 28.11.2007).
[11] http://ewt.slaskie.pl/article/1279787593[online]. [cit. 2016-03-14].
[12] http://www.cz-pl.eu/program-pl.html [online]. [cit. 2016-09-01].
[13] Rozporządzenie Parlamentu Europejskiego i Rady (UE) nr 1303/2013, nr 1301/2013, nr 1299/2013 z dnia 17 grudnia 2013 r. (Dz.U. L 347 z 20.12.2013).

Figure 2- Priorities of the UE program INTERREG 2014-2020. Source: http://ec.europa.eu/regional_policy/pl/policy/ cooperation/european-territorial/

INTERREG V has at its disposal a budget amounting to EUR 10 billion to invest within the scope of 107 programs of territorial cooperation between regions and partners. It covers also allocation of means of the ERDF for member-states to participate in cooperation programs on the outer EU borders. The main element of INTERREG V are 60 projects of INTERREG VA (CBC), including 38 ones within the inner EU borders (contribution from the ERDF – EUR 6.6 billion). Figure 3 presents budget in over 100 cooperation programmes between regions and territorial, social and economic partners INTERREG 2014-2020.

Figure 3 - Budget Programme INTERREG V (2014-2020). Source: http://ec.europa.eu/regional_policy/pl/policy/ cooperation /european-territorial/



INTERREG V-A includes various categories of projects: standard (classical), flagship (strategic), projects of road infrastructure, micro-projects (of the local character), including the so-called umbrella projects and also specific enterprises realized within PA5. The standard projects are typical joint ones (at least one partner from each side of the border, including the Leading Partner), submitted during the call-for-projects periods within the given priority axis which reflects the character of the project. The flagship projects are of the strategic and priority character to the program. They can be realized within each priority axis (apart from PA5) during call for projects in this category. Flagship projects must take account of 8 specific dedicated criteria connected with, among others, identification of actions that are of key importance to obtaining the specific result of a given PA, impact exerted on the whole area covered by the Program or its substantial part, strategic significance for cross-border cooperation, long-term influence on the area of support, etc. The key condition behind evaluation of flagship projects is meeting all the four criteria of cross-border cooperation (joint preparation, realization, staff, financing).

Projects of road infrastructure do not have the character of standard solutions. They are a form of improvement of cross-border availability of cultural and natural heritage thanks to making use of the strategic approach14. Micro-projects Fund (MF) offers a specific instrument designed to support enterprises of the local character between communities on both sides of the border, which exert an influence across the border. The MF, like in the previous programming periods, is managed by euro-regions (Nisa-Nysa, Glacensis-Glacensis, Praded-Pradziad, Silesia-Silesia, Těšínské Slezsko-Śląsk Cieszyński, Beskydy-Beskidy). The projects of this type do not entail submitting a project proposal15. The projects of the Technical Aid axis serve to secure effective

[14] Podręcznik Wnioskodawcy. Program Interreg V-A Republika Czeska–Polska, Wersja 1, 09.09.2015, p. 17.
[15] Ibidem, p. 18.

management and implementation of the Program, to ensure effectiveness of using its means as well as to support promotion and information actions. It is exclusively entities which are included in the process of management and implementation of the Program that can become partners of PA5 and applications to have means assigned are submitted following a simplified mode, on the continuous call for applications basis. These projects are exclusively subject to control of eligibility, without evaluation of the quality, cooperation and cross-border influence.

4 Assessment of the cross-border relations between the Czech Republic (CR) and the Republic of Poland (RP)

The diagnosis executed for the support area and the SWOT analysis of the ETC Program CR-RP 2014-2020 allowed formulating a list of strong and weak sides as well as chances and threats. An advantage of weak sides and threats over strong ones and chances of development of a cross-border region confirms the need for realization of programs and projects directed at strengthening this functional area[16]. Selected elements of the SWOT analysis of the cross-border area of Poland and the Czech Republic are presented in Table 1.

Table 1- SWOT analysis of the Poland-Czech Republic cross-border area

Chances	**Threats**
Possibility of attracting know-how and transfer of experience from functional urban areas, including making use of the potential of academic centers from outside the area	Competition of strong centers of growth, which can cause attractiveness of the borderland area to inhabitants and entrepreneurs to decrease
Possibility of connecting the area with the system of dual carriageways in Poland, the Czech Republic and the FRG	Incoherent strategic documents on the national and regional levels of PL-CZ
Active local communities and large potential to develop cross-border cooperation – the existing networks of cooperation JST – cooperation within PL-CZ 2004-2006, 2007-2013	Different structure of administration and system of competences of the administration on both sides of the border
Engagement in cross-border cooperation of subjects lying in direct vicinity of the border, but not taking part in the program as yet.	Constant outflow of young and educated inhabitants from borderland areas
Strong sides	**Weak sides**
Area of intensive functional integration	Shortage of cross-border cities – except Cieszyn
Relatively even distribution of services of higher rank in relations to the border	Big inner differentiation in the state of preservation of natural landscape
Relatively well developed communication system (III Paneuropean communication corridor)	Lack of similarities between trends of transforming economy
Tourist attractiveness of the borderland area – potential for development of all-year-round active and spa tourism	Share of services in the structure of the economy on both sides of the border lower than national average

[16] Kozak M., Olejniczak K., Płoszaj A., Kościelecki P., Wolański M.,, Borowczak A., Kozicki B., Ledzion B., Weremiuk A., Pander W., Czerniejewski B., *Wyzwania i cele dla programów współpracy transgranicznej z udziałem Polski po 2013 roku*. Ekspertyza, EGO - Evaluation for Government Organizations/ European Policies Research Centre – University of Strathclyde, Ministerstwo Rozwoju Regionalnego, Warszawa 2012, p. 136.

Similar structure of economy on both sides of the border	Substantial disproportion in the level of innovativeness (PL- very low, CZ-the majority of countries have a higher index than the national average) – large inner disproportion on the level of the country
Large share of society available for work in the employment structure – the structures similar on either side of the border	Birth rate being on a lower level than the national average, with a big inner differentiation (CZ, PL – considerable population potential in Silesia)

Source: *more detail in:* Kozak M., Olejniczak K., Płoszaj A., Kościelecki P., Wolański M.,, Borowczak A., Kozicki B., Ledzion B., Weremiuk A., Pander W., Czerniejewski B., *Wyzwania i cele dla programów współpracy transgranicznej z udziałem Polski po 2013 roku*. Expert opinion, EGO - Evaluation for Government Organizations/ European Policies Research Centre – University of Strathclyde Glasgow, Ministerstwo Rozwoju Regionalnego, Warszawa 2012, p. 146.

Results of the studies conducted by the European Commission since 1973, called BAROMETER, serve to monitor changes in the public opinions held by citizens of the EU member-states. They are meant to be the basis of taking decisions and their implementation, and also to provide an assessment of the European Commission's activity in Parliament[17]. In 2005, for the first time the studies had dealt with relations of the cross-border character, including those between the Czech Republic and Poland. The goal of the studies was to collect opinions and determine attitudes and moods of the population inhabiting the borderland regions of the EU as regards, among others, Union's funds, trust, reasons for visiting the given country and other information which is useful to design development programs of the EU states in the future. It was acknowledged, at the same time, that negative relations (lack of trust, unwillingness) towards neighbors in borderland areas exert a considerable influence on leaving the country's own and the joint economic and social potential unused. The result of public consultations was identification of basic barriers which hamper this type of cooperation, including the following: legal and administrative (not acknowledging qualifications, differences in tax systems, social insurance and old-age pensions), languages, inhibited physical access (lack of infrastructure and integrated systems of public transport), lack of cooperation between public authorities as regards borderland problems, or economic differences (in job markets and pay, which lead to asymmetrical flows).

In the opinion of the majority of respondents (69%) who abide in the vicinity of the border between the CR and the RP, the neighborhood does not exert any influence on them (one of the highest indexes in Europe); another 24% declare that it does create more chances than limitations, while 4% of the examined acknowledge it to be an obstacle rather[18]. Difficulties relating to cross-border cooperation (at least one problem) were identified by 87% of the questioned, the language being the most frequently "chosen" barrier (with the average of 57% for the EU). The next obstacles which were listed in turn were as follows[19]: differences in social and economic spheres (47%, the EU average - 46%); legal and administrative obstacles (45% equaling the EU average); cultural differences (42%, the EU average – 32%) and availability (36%, the EU average – 30%).

The results of the EUROBAROMETER study in the sphere of CBC between the CR and the RP proved that only 43% of the respondents had heard (56% of them had no knowledge) of actions of the cross-border character, which were financed by the EU. The level of awareness in this area amounted to 51% in the CR, while in the RP - 34% (the EU average - 31%). Regarding the CR, the lowest level of awareness (43%) was found in the 40-54 age group, whereas in the remaining ones it was identified at a level between 50% (respondents over 55 years of age) and 57% (25-39-year-olds). The analysis of the results obtained in the RP did not reveal any substantial differences in the level of awareness in individual age groups (32%-36%)[20].

Trust in relations of the inhabitants of the Polish-Czech borderland is brought down to basically its lack (54% of the respondents chose the lack of trust in fact). The index of "mutual trust" differs extensively at the same time: 71% of the respondents on the Polish side of the border place trust in their neighbors, while in the reverse

[17] http://www.europarl.pl/pl/strona_glowna/eurobarometr.html%20 [online]. [cit. 2016-08-17].
[18] Eurobarometer Results - Programme Czech Republic-Poland, Regional and Urban Policy (2015), European Commission, p. 4 [online]. [cit. 2016-08-25]. Available: http://ec.europa.eu/regional_policy/sources/policy/cooperation/european-territorial/cross-border/eb_results/czech-republic-poland.pdf.
[19] Ibidem, p. 5.
[20] Cross-Border Cooperation in the EU. Report, June 2015, TNS Political & Social at the request of the European Commission, Directorate-General Regional and Urban Policy, 2015, p. 18.

relations it is only 57% of the examined in the CR. Merely 67% of the questioned would feel comfortable with a citizen from the partner country as a workmate, family member or manager. This is the second lowest level of trust among all of the borderland regions in the EU (the EU average – 82%). Only 47% of the respondents of the EUROBAROMETER CR-RP study pay visits to the country on the other side of the border (the EU average - 53%), evidently the most frequently chosen reasons for them being: tourism, recreation and purchase of goods and services (35% and 29%, respectively). Other reasons for the mobility, including: using public services, work/business, visits paid to family members or acquaintances, turned out to be of lesser importance.

5 Cooperation in the borderland of the Czech Republic and the Republic of Poland

The Polish-Czech borderland (covering the area of 47,097 square kilometers) makes a territory where cultures of neighboring nations interpenetrate and enrich each other. Constituting a coherent whole of a high social, economic and environmental value, one of the strong internal relations, it is characterized by numerous ties with adjacent territories and countries, which allows it to perform important functions on the bilateral and European planes[21]. Despite the long mutual history, it has suffered a violation of the continuity of mutual communication and cooperation, chiefly due to the events that took place in the 20th century[22]. The partnership and cooperation between the CR and the RP is a result of mutual interests defined through the states' membership of European and trans-Atlantic structures, geographical location, as well as existing natural bonds and contacts[23]. The beginnings of the cross-border cooperation in the Polish-Czech borderland, financed with the means of the ERDF, go back to 2004 (INTERREG IIIA). Within the framework of that Program it was both "heavy" investment projects (ones in the sphere of transport, environment or network structures) and "soft" ones (development of cooperation and structures of network entities of the public sector) were launched.

The program INTERREG V-A CR-RP takes into account long-term support of cooperation for development of borderland areas within the EU, which was accepted by the European Commission on 23 June 2015, with making reference to the programs of the previous years[24]. The cooperation between the RP and the CR under INTERREG V-A can be realized in the sphere of all four priority axes. The area of support provided by the Program covers selected Czech *kraje* (regions at NUTS 3 level) and Polish sub-regions (NUTS III), including 5 of them on the Czech side: Liberec, Hradec Kralove, Pardubice, Olomouc, Moravian-Silesian, and 6 sub-regions lying on the territory of 3 Voivodships (provinces): Silesian Voivodship: Bielsko and Rybnik, Tychy (exclusively Pszczyna County), Lower Silesia Voivodship: Jelenia Góra, Wałbrzych and Wrocław (exclusively Strzelin County), as well as Opole Province: Nysa and Opole.

The managing entity for INTERREG V-A CR-RP is the Ministry of Regional Development of the Czech Republic and the partner institution on the Polish side – the Ministry of Development. Both the joint Secretariat with its seat in Olomouc and voivodship offices based on the territory of the cooperation perform the function of contact (consultation) centers for interested entities and beneficiaries of the financial support. Regional entities of INTERREG V-A are the Marshal Office of the individual voivodship in the RP and the regional office of each individual *kraj* in the CR.

The condition to meet so that financing with the means of INTERREG V-A could be obtained is the requirement to satisfy at least three of the four criteria of cooperation, including in each case that of joint preparation and realization of the submitted project (in a similar way as stipulated in the case of INTERREG IV). The four criteria are as follows: joint preparation of the project, joint realization of the project, joint realizing staff and joint financing. Applicants and beneficiaries of projects can recruit, among others, from public authorities, their unions and associations, organizations established by public authorities, chambers, associations, unions and organizations representing interests of entrepreneurs and workers, as well as local economic and professional self-governments or institutions of the educational system and colleges of higher education[25]. Effects of the

[21] Strategia Rozwoju Pogranicza Polsko-Czeskiego (2000). Suplement do „Biuletynu Pogranicza Polsko-Czeskiego", nr 16, p. 55.
[22] Strategia Zintegrowanej Współpracy Czesko-Polskiego Pogranicza 2014-2020 (2014), ARLEG S.A. Agencja Rozwoju Regionalnego w Legnicy, Centrum Inwestycji, Rozwoju i Innowacji - Hradec Králové, p. 5 [online]. [cit. 2016-08-25]. Available: www.4cbc.eu.
[23] Protokół z XV posiedzenia Polsko-Czeskiej Komisji Międzyrządowej ds. Współpracy Transgranicznej (2009), Warszawa, p. 1, [online]. [cit. 2016-03-14]. Available: https://mswia.gov.pl/pl/wspolpraca-miedzynarod/wspolpraca-transgranic/miedzyrzadowe-rady-i-k/8258,Czechy.html.
[24] Podręcznik Wnioskodawcy, op. cit., p. 11.
[25] https://www.ewt.gov.pl/strony/o-programach/przeczytaj-o-programach/czechy-polska/[online]. [cit. 2016-06-12].

given project should be used by target groups on the other side of the border, also after completing its physical realization[26].

Program INTERREG V-A CR-RP will have at its disposal the sum of over EUR 226,2 million (the highest budget among all the cross-border programs in which Poland takes part). These means have to be complemented with indispensable co-financing at the height of 15% obtained from domestic sources. Co-financing with the means of the ERDF is possible up to the maximum of 85% of the total of the qualified expenses in connection with the given project. Czech partners are also expected to apply for co-financing with the means from the state central budget at the maximum height of 5% of the total of the expenses qualified as their part of the project[27]. As regards Poland, projects are not expected to be co-financed with means from the state budget (they can be granted solely to final receivers of micro-projects at the amount up to 10% of eligible expenses, as well as to partners within the framework of PA5, being 15% of the total of the qualified expenses)[28]. The following allocation of the means to realize enterprises within the scope of priority axes has been applied: PA1 - EUR 12,22 million; PA2 – EUR 135,73 million; PA 3 – EUR 10,18 million; PA4 - EUR 54,52 million.

The expected results of the realization of INTERREG V-A CR-RP have been defined as: rebuilding or modernization of 101 kilometers of roads; establishment of 24 rescue units and units of crisis management, as well as participation of 4,000 young people in joint educational and training programs directed at development of borderland regions in the sphere of employment, leveling educational opportunities, higher education system and programs raising professional qualifications.

6 Realization of enterprises within the frameworks of PA *Education and qualifications*

Cross-border cooperation between the Czech Republic and Poland in the sphere of education is realized within the frames of various programs and detailed projects. Because of a high unemployment rate in borderland regions, actions connected with PA3 called "Education and qualifications" (with the budget of EUR 10.2 million[29]) are addressed to current students (prospective graduates). The initiatives which are undertaken are meant to support raising professional qualifications of young people inhabiting these regions and to remove barriers which hamper their entering the job market (the investments have to be directly linked to educational actions). Elementary schools (in the CR elementary schools and in the RP – elementary and junior high schools) are not beneficiaries of the program. The program area is characterized also by the structure of population with a lower level of education than that in the country. Thus, the starting point is the need to increase innovativeness of the education system in the cross-border context in order to strengthen the position of people entering the cross-border job market[30]. The investment priorities are to encompass the following: investment in education, trainings, including vocational trainings to gain skills, lifelong learning through development and implementation of joint systems of education, vocational training and training courses. Projects relating to PA3 also deal with cooperation between educational institutions and those in the job market as well as with the development of language education within the education system. Supporting courses of the lifelong education character are not included in PA3 and actions launched by educational institutions in the area of mutual learning about one another, understanding and making contacts can be realized exclusively within the framework of PA4[31].

The project evaluation criterion is the accepted index of the product (the beneficiary has to choose at least one of them):[32] number of participants (persons) engaged for joint educational and vocational preparation programs with the aim to provide cross-border support of employment of youth, extension of educational possibilities, pursuance of higher education and professional preparation or the number of realized joint mechanisms in the scope of education.

In the period spanning the whole of 2014 until May 2015, the substantive, implementation-related and procedural questions were settled. They related to the program in the framework of a working group consisting of representatives of Managing Institution, National Institution as well as regional entities. As a result of including public opinion in the preparation (questionnaire-based research of about 700 entities active in the area covered by the Program) one of the principles of cooperation – partnership in program preparation – was

[26] Podręcznik Wnioskodawcy, op. cit., p. 22.
[27] http://www.umwd.dolnyslask.pl/ewt/czeski2014-2020/[online]. [cit. 2015-09-01].
[28] Podręcznik Wnioskodawcy, op. cit., s. 23.
[29] https://www.ewt.gov.pl/strony/wiadomosci/program-interreg-v-a-republika-czeska-polska-zatwierdzony/[online]. [cit. 2016-06-12].
[30] INTERREG V-A - Republika Czeska – Polska, wersja 1, 23.06.2015 r., p. 64.
[31] http://www.cz-pl.eu/program-pl.html [online]. [cit. 2016-09-01].
[32] INTERREG V-A - Republika Czeska – Polska, op. cit., p. 70.

fulfilled.[33] The first basic call for projects covered 3 categories: complete applications containing road projects (simplified applications of projects had already been submitted in 2004), complete applications containing flagship projects (the conceptions of flagship projects had already been submitted in 2004) and complete applications of umbrella projects being realized by the MF.

In June 2015, a call for submitting individual projects was announced within the framework of PA3, which was formally commenced on 11 September 2015 (lasting until 4 March 2016). The total value of its allocation amounted to over EUR 2.55 million from the means of the ERDF. Regarding the call for the so-called flagship projects (from 11 September 2015 to 11 October 2015) the total height of allocation with reference to PA3 was about EUR 1,018 thousand from the means of the ERDF. Apart from 6 micro-projects of the cross-section character (several priority axes) no other project was approved.

In September 2015, a call for projects PA2-4 (a two-stage call limited by time) and notification of submitting projects of road infrastructure were announced. The range of the flagship projects selected for financing in December 2015 (worth EUR 8.9 million) covered the whole Polish-Czech borderland, but concerned cooperation of fire brigades and police forces (cross-border cooperation of police units in the scope of fighting drug-related crime)[34].

Within the framework of INTERREG V-A PA3 *Education and qualifications* it was as early as in December 2015 when a call for proposals of individual projects was announced (complete project applications were submitted until 1 March 2016),[35] and on 29 April 2016 the first stage of eligibility control of applications in AP3 was concluded. All the applicants were sent calls for completing or confirmation of not fulfilling requirements of eligibility control[36]. The approved schedule and allocation of means for flagship projects (the deadline for submitting conceptions was set for 31 March 2016) assumed assigning EUR 1 million within PA3. On 29 March 2016, the Monitoring Committee of CR-PR Program accepted 2 of the 23 submitted applications. The selected projects will be allotted a total of over EUR 459 thousand from the ERDF[37].

The list of beneficiaries of support from INTERREG V-A CR-RP within PA3 (as on 30 June 2016)[38] is not too extensive – in the case of the two selected PA3 projects, the Leading Partner is an organization from the Czech Republic (Table 2).

[33] Annual report on implementation of the Program in 2014 and 2015 (2016). Monitored period: from 1 January 2014 to 31 December 2015. The juxtaposition generated in MS2014+, p. 4.
[34] https://www.ewt.gov.pl/strony/wiadomosci/program-interreg-czechy-polska-2014-2020-pierwsze-projekty-zatwierdzone-do-dofinansowania/[online]. [cit. 2016-06-12].
[35] http://www.projekty.us.edu.pl/konkurs-w-ramach-ewt-os-priorytetowa-3-edukacja-i-kwalifikacje/[online]. [cit. 2016-09-03].
[36] http://www.cz-pl.eu/novinky.html[online]. [cit. 2016-09-01].
[37] https://www.ewt.gov.pl/strony/wiadomosci/czechy-polska-wybrano-projekty-edukacyjne/[online]. [cit. 2016-06-12].
[38] Lista beneficjentów wsparcia z programu INTERREG V-A Republika Czeska-Polska (2016) [online]. [cit. 2016-09-04]. Available: www.cz-pl.eu/soubor.html?id=47133528.

Table 2 - Accepted projects relating to the priority axis *Education and qualifications within INTERREG V-A*

Specification	Project I – *Cross-border education of students of medical study majors*		Project II – *Practical program of educating personnel for development of economy in the borderland*	
Leading partner	Vyšší odborná škola zdravotnická a Střední zdravotnická škola Trutnov		Vysoká škola báňská - Technická univerzita Ostrava	
Polish partner	Karkonoska Państwowa Szkoła Wyższa w Jeleniej Górze (woj. dolnośląskie)		Wyższa Szkoła Biznesu w Dąbrowie Górniczej, Wydział Zamiejscowy w Cieszynie (woj. śląskie)	
Date of starting/finishing	2016-09-01	2018-08-31	2016-09-01	2019-08-31
Total qualified expenses	EUR 327,934.98		EUR 294,003.70	
Share of the EU funds	EUR 278,743.83		EUR 249,903.14	
Total budget of the project in the ERDF	EUR 257,764.99		EUR 201,627.22	
Type of project	standard		standard	

Source: own elaboration on the basis of: *Lista beneficjentów wsparcia z programu INTERREG V-A Republika Czeska-Polska*, as on 30 June 2016, www.cz-pl.eu/soubor.html?id=47133528; http://www.no-borders.eu/aktualnosci/czechy-polska-wybrano-projekty-edukacyjne-237.

Realization of Project I is designed to serve increasing attractiveness of graduates from medical study majors in the job market on both sides of the border through raising their competences and improving skills of caring for patients. The following actions are among the proposed ones in the Project:

- Internships abroad in institutions of medical and social care;
- Comparison of healthcare systems, exchange of information in the area of innovative methods and good practices;
- Language education.

The aim of Project II is to ensure practical vocational preparation of Polish and Czech schoolchildren and students to make use of the skill of managing energy and development of low-carbon economy while working for companies, local governments and other institutions which have an influence on the development of the borderland. Participants of the project are the following institutions: *Vysoká Škola Báňská - Technická Univerzita* in Ostrava, the non-governmental institution TRIANON of Czech Teshen and Cieszyn Branch of *Wyższa Szkoła Biznesu* (WSB) of Dąbrowa Górnicza. The Project will be realized with the study major of management and engineering of production at WSB, starting next academic year (2016/2017). It serves the purpose of improving energy security, quality of life and environment of the borderland through taking up and realizing educational actions in cooperation with partners in the CR: TRITIA Association, the cities of Cieszyn/Czech Teshen and energy engineering companies on either side of the border. Beneficiaries of the Project will be students taking advantage of extra forms of education, including, among others: trainings and internships, study visits, summer schools, e-learning, tutoring, mentoring and coaching. The aim of their introduction is to improve chances of a professional career in the energy engineering branch in the Polish-Czech borderland[39]. On 29 June 2016 the Monitoring Committee approved of 4 conceptions of flagship projects, including one related to raising language competences of graduates of colleges of higher education. Partners are expected to submit complete applications until 30 November 2016, being the deadline. Decisions of granting the funding will have been taken by 28 February 2017.[40] In August 2016, the Euroregional Steering Committee in Silesia Euroregion decided to grant finances for realization of 32 micro-projects, including 25 projects submitted by local applicants from Poland (the total amount of financing of over EUR 483 thousand) and 7 (the total

[39] http://www.wsb.edu.pl/dofinansowanie-na-ksztalcenie-w-zakresie-energii-odnawialnych-dla-cieszynskiego-wydzialu-wsb,new,wc,387.html,10163

[40] https://www.funduszeeuropejskie.gov.pl/strony/wiadomosci/czechy-polska-wybrano-projekty-edukacyjne/

amount of over EUR 147 thousand) from the Czech Republic. The chosen micro-projects will be realized also within the framework of PA3 *Education and qualifications*.[41]

Conclusion

The cross-border cooperation between the Czech Republic and Poland can be realized on many planes. Its foundation are not only the questions of geographical neighborhood, but primarily those of economic and social conditions. One of the key initiatives, financed with the means of the ERDF in the program INTERREG V-A in the perspective of financing until 2020. In the current market life cycle of the project one can observe its phase of introduction (innovations), in which "market pioneers" submit a limited number of project proposals. Only a few of them obtain a positive assessment and – in consequence – are granted funding. Regarding educational enterprises (Priority Axis 3 – *Education and qualifications*), the scale of interest in them is still low. The results of the SWOT analysis relating to the borderland areas as well as studies of EUROBAROMETER clearly point to an advantage of weak sides and limitations in the scope of shaping the cross-border cooperation. Initiatives of colleges of higher education based in the Polish-Czech borderland are an important form of its implementation.

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The Condition of Cooperation on the Polish and Czech Borderland Based on the Example of Prudnik Exhibition of Folk Artists and Crafts of the Polish and Czech Borderland

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Abstract
The neighbourhood of countries raises the question of cooperation between the societies separated by borders. The scope of their cooperation depends on the relationship between these countries at political, economic, social and cultural levels and historical events. Such cooperation may be reflected in culture, education, science, environmental issues, social interaction between organizations, institutions. The Authors were primarily interested in capturing the essence and presenting the effects of the initiative taken by the city and the municipality of Prudnik. Initiative aimed at deepening and improving the mutual cooperation with the neighbouring municipalities of the Czech Republic. Based on both a query of the local press, documents and directories of Prudnik Exhibition of Folk Artists and Crafts of the Polish and Czech Borderland as well as direct observation of one of the Authors, the Authors of the following paper investigate if the Prudnik exhibition, which has been organized for 19 years, contributed to strengthening the relationship between the inhabitants and the municipalities of the Borderland. The Authors verify if the exhibition has become a permanent bond of the relationship between the partner cities of Prudnik.

Keywords: *borderland, economy, exhibition, folk artists, trans-border cooperation.*

JEL Classification: *H79, R11, Z13, Z39.*

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1 Introduction - The border as a barrier. The inhibition of cross-border cooperation.

Maintaining the relationship between the border areas, which was stimulated by a specific governing policy was a typical mechanism in the history of countries. In Central Europe conditions shaped by the relationships formed in the Middle Ages and early modern times were revised by change in the expansion of Hohenzollern rulers of Prussia. Starting from the Silesian Wars in the years 1740-1763 barriers to free communication were enforced on the population separated by the new Austro-Prussian frontier. Efforts have been made to integrate the Prussian lands and territories separated from the Habsburg Empire. This process meant weakening the bonds between the territorial community split by the Prussian and Czech border, which temporarily functioned since the establishment of first countries in the area of Bohemia, Moravia and Silesia. (W. Musialik, 2016, pp. 170-196). Systematic Prussian policy was supported by concepts of mercantilism (T. Kulak, 2014, p. 38, p. 41). On the one hand the flow of the population was favored by the migration from agricultural to industrial areas, and on the other limited by the so-called Prussian deportations (E. Męclewski, 1971, p. 23, p. 51). In the 20th century the conditions of the borderland, which have been shaped for four centuries, deteriorated by the actions taken by totalitarian authorities, guided by the principles of social and national chauvinism. Countries which belonged to the Eastern Bloc enforced a "hermetic isolation of populations, enabling contacts only between a small group of privileged […]" (M. Sobański, 2008, p. 47). After the democratic transformations called The Autumn of Nations some attempts were made to follow Western model and encourage the evolution of population's attitudes on Polish and Czech Borderland. The actions were taken both at central and local levels. One of such events organized by the municipal authorities was the Prudnik Exhibition of Folk Artists and Crafts of the Polish and Czech Borderland.

2 Materials and methods

Based on both a query and analysis of the local press and directories of Prudnik Exhibition of Folk Artists and Crafts on Polish and Czech Borderland, as well as the direct observation and investigation of one of the Authors efforts were made to verify if the Prudnik Exhibition, which has been organized for 19 years, contributed to strengthening the relationships between the inhabitants and the municipalities of the Borderland. From the materials separated participants from the Czech Republic. Then an analysis of the group due to the frequency of their participation in the Exhibition, as well as the size of their place of residence and range of the border region. The authors also checked whether the exhibition has become a permanent bond of the relationship between partner cities Prudnik.

Definitions:

Two concepts of "cross-border cooperation" and "borderline" require clarification. The term "borderline" belongs to the geographical category and has a wide-ranging meaning. In the colloquial sense borderline is an area at the border, which creates a social and cultural entity (R. Bäcker). Along with the development of cross-border cooperation policy the term "borderline" was used interchangeably with the term "cross-border region" (W. Opioła, A. Trzcielińska-Polus). The term "borderline" was adopted for the area constituting a whole, in some respects, and is divided by the borders of at least two countries. The criteria of "identification and delimitation could include economic geographical, historical, ethnic, cultural and politico-administrative factors". The size of the area is set as a width of 20-40 km[42], calculated in a straight line from the state border (R. Radek).

[42] Within such a specific border zone two areas were identified. Tangent area covered the distance in lane of 10-20 kilometers in width from the border line. Buffer area – directly adjacent to the tangent area covered the area of 20 kilometers in width of municipalities. R. Radek, *The importance of cross-border cooperation in the development of local and regional communities*. The doctoral dissertation written under the supervision of

Due to the nature of the analyzed material Authors do not refer to other meanings of the term "borderline".

3 Results and discussion

3.1 Implications of cross-border cooperation

The so called Autumn of Nations – the social and economic transformation in early 1990s changed the overall philosophy of developing relationships in the border areas. In Central Europe the changes enabled the implementation of democratic principles of social life and legal regulations, which were formed in Western Europe after the Second World War. One of such regulations referred to the cross-border cooperation, initiated in the 1950s by the Norwegian, Swedish, Finnish, Dutch, German and French bordering regions. The preamble to the European Charter for Border and Cross-Border Regions also called The Madrid Convention (May 21, 1980) justified the need for such cooperation, defining the set of borders as the "scars of history" (W. Wojtasik, 2004, p. 56; W. Opioła, A. Trzcielińska-Polus, 2013, p. 7). In order to change this image and turn borders into purely administrative concepts the cooperation between borderland communities was encouraged. Establishment of such cooperation was justified not only by the various problems, but also by the development opportunities possible to initiate by the public institutions, which operate locally. (W. Wojtasik, 2004, pp. 55-56).

Cross-border cooperation aimed at the decentralization through the top-down projects and through shaping the formal legal and organizational framework. The cooperation was based on local authorities as well as the initiative of representatives of social and economic institutions (W. Wojtasik, 2004, p. 56).

3.2 Organizational forms of cooperation on the Polish and Czech borderland

Cross-border cooperation on Polish and Czech borderline started in 1991 when Euroregion Neisse, Nisa-Nysa was established. The Euroregion along with Polish and Czech borderland also included German borderland. Later, Euroregions Glacenis (1996), Praděd (1997), Silesia and Cieszyn Silesia (1998) and the Beskidy Mountains (2000) were established on the border with the Czech Republic.

Southern parts of the Opole province, together with the Czech municipalities from the areas of Bruntal and Jesenik became part of the Euroregion Praděd. Euroregion Praděd was formed to develop all forms of social and cultural life supporting the cross-border cooperation. On the Polish side the actions were inspired and taken by the city authorities and municipalities of Prudnik.

3.3 The organizational aspects of the Exhibition

In the second half of the 1990s the Municipality of Prudnik searched for an opportunity to invigorate entrepreneurship, and distinguish the city from other similar centers in the province. Therefore, the initiative of organizing business fairs was undertaken (Interview on 1.09.2016). The first of such projects was launched in 1996 under the name of Inter-Regional Entrepreneurship and Crafts Fair "House and Garden". The main idea of this event was to present industries from Polish and Czech borderland, which were related to the house construction and equipment, as well as garden development. For three days in September Fair's participants had the opportunity not only to present the final products, but also to show production capacities and technology. Presentations included windows and doors, furniture, insulation systems, flooring, sanitary fittings and decorative elements including painting, metalwork, sculpture, window decorations and ceramics. The event was repeated next year.

All of the above led to the establishment of a separate space for the presentation of products typical for handicrafts. That is also why the preparations for the Exhibition of Folk Artists and Crafts on Polish and Czech Borderland began. In February 1998 the Deputy Head of the Department of Spatial Planning, Promotion and Community Development in Prudnik sent individual invitations to the folk artists, craftsmen, chambers and guilds, as well as cultural organizations and local governments with information about the upcoming exhibition in Prudnik. The Governor of Opole and the Consul General of the Czech Republic were asked to support the project and both of them accepted the honorary patronage. (Exhibition, 1998, p. [1]). In the following years the patronage was taken by the Marshal of the Opole province, Consulate General of the Polish Republic in Ostrava, Consulate General of the Czech Republic in Katowice, Embassy of Czech Republic in Warsaw (Interview on 1.09. 2016). Financial resources for the preparatory work were obtained from the budgetary reserve of the city government in order not to burden exhibitors and visitors with the costs associated with the presence at the exhibition.

Prof. Jan Iwanek, University of Silesia Faculty of Social Sciences Institute of Political Science and Journalism, Katowice 2007, p. 211.

Without knowing the specific number of craftsmen and folk artists living in the area of Polish and Czech borderland, invitations were sent to all persons and institutions that might be interested in the project. 45 potential participants replied on over 1000 letters of invitation sent by post (Interview on 1.09.2016) and came to Prudnik to show their works and products during the Exhibition of Folk Artists and Crafts of Polish and Czech Borderland (12-14.06.1998 r.). Among this group eight exhibitors were from Czech Republic: Bedrichow, Rymařov, Šumperk, Vamberk and Úvalno. Polish hendicraft was represented by handicraftsmen from Opole province: Borki, Chruścice, Lisięcice, Niemodlin, Prudnik and Żywocice (Exhibition, 1998, p. [3],[4]). The interest in exhibited products exceeded predictions. Inhabitants of Prudnik benefited from buying selected handicraft (Interview on 1.09.2016).

The general positive reception of Exhibition encouraged the organizers to continue the project. In 2000 when the Exhibition was organized for the third time the number of exhibitors increased to 189 craftsmen and folk artists, enforcing the change of Exhibition's location. The Exhibition was moved from the hall provided by the Prudnik High School to the hall of the Sports and Recreation Centre in Prudnik, expanding the Exhibition's space to 3000m² (III Exhibition, 2000,], p.[22]).19 editions of Exhibition of Folk Artists and Crafts of Polish and Czech Borderland were held in Prudnik until 2016.

3.4 Variable: the participants

In the first decade of June three categories of participants attended the Exhibition of Folk Artists and Crafts of Polish and Czech Borderland. The first category was the official and honorary guests. Based on the example of Prudnik Fair for Entrepreneurs the honorary patronage was offered not only to the governor of Opole and the Consul General of the Czech Republic in Katowice. Since 1999 Marshal of the Opole province, and the Consul General of the Polish Republic in Ostrava joined this honorary group. In 2002 governor of Opole resigned from the honorary patronage and since 2009 Czech government was represented by the Ambassador of the Czech Republic in the Polish Republic in Warsaw. For three days Prudnik became the meeting place of the highest representatives of the local administration and the diplomats of two countries with local authorities, representatives of the partner cities and selected exhibitors (Exhibition directories in years 1998-2016). Their presence changed the status of the event from local to bilateral level.

Due to the formula of Exhibition the participants "from Polish and Czech borderland were expected among exhibitors". Table 1 shows the proportion of Czech exhibitors to the total number of people presenting handicraft in Prudnik.

Table 1 - The number of Czech participants of the Exhibition in Prudnik in the years 1998-2016

Participants	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Total	45	82	189	197	216	261	363	356	381	406	392	313	359	351	331	342	257	289	260	5129
The Czechs	8	18	34	13	23	15	31	34	23	41	21	22	28	29	23	18	11	11	6	409
% participation of the Czechs	17,8	22,0	18,0	6,6	10,6	5,8	8,5	9,6	6,0	10,1	5,4	7,0	7,8	8,2	6,9	5,3	4,3	3,8	2,3	8,0

Source: Own calculations based on directories of the Prudnik Exhibition of Folk Artists and Crafts of Polish and Czech Borderland in the years 1998-2016

For 19 years the number of Czech exhibitors has never been comparable with the number of Polish exhibitors. Czech exhibitors were strongly represented in 2005 and in 2007 when 36 Czech representatives were present at the Exhibition. At that time they represented respectively 9.6% and 10.1% of the total number of participants. Since then, however, their participation has gradually decreased. In 2016 the number of Czech exhibitors reached 2.3% of the total participants. On average they accounted for 8.0% of the total number of exhibitors (See: Table 1).

Czech exhibitors represented 118 towns and villages. In 63 cases participation in the Exhibition was a one-time decision. In 15 cases the decision to participate was made twice and in eight cases – three times (Exhibition directories). For 19 years of the Exhibition of Folk Artists and Crafts of Polish and Czech Borderland craftsmen and folk artists representing the Czech village have most frequently resigned from participating in the

Exhibition. In contrary, exhibitors from Czech cities repeatedly represented such cities as: Jesenik (36 expositions), Mesto Albrechtice (27), Zlate Hory (23), Ostrava (16), Šumperk (15), Staré Heřminovy, Horni Benešov and Krnov (13 each) and Liptán n. Osoblaha (11) (See: Appendix). Most of these villages are located no more than 40 km from the Polish border. Insignificant number of towns was out of the line known as the Polish and Czech borderland. For example, in 2001 Dolni Pěna located 227 km from Prudnik, but 11 km from the Austrian border was included into Polish and Czech borderline. In this way, territorial border was reformulated. However, such "transgressions" were more frequent on Polish side. In 2001 the presence of artists from the Polish and Slovak borderland was accepted (eg. Bystra Podhalańska 31 km away from the border).

The third group of participants were visitors. Unfortunately, the organizers did not take steps to determine the number of people from Czech Republic coming to Prudnik for the Exhibition. Lack of statistical data makes the analysis impossible. Authors rely on the claim of the organizers that such visits took place (Interview on 1.09.2016).

4 Conclusions

The presence of administrative representation during Prudnik Exhibition contributed to development of closer cooperation. The signing of partnership agreements with municipalities of Bruntal (2000) and Krnov (2002) reflected the enhancement of mutual trust. The agreements were designed based on cooperation agreements in other European cities due to which partner cities could use exhibition's booths to promote educational, cultural and social institutions located in their area. When organizing trips which could support cross-border cooperation towns could benefit from co-financing provided by the EU. Individuals could not benefit from EU funding as easily. Therefore, despite the lack of fees for exhibition space these trips were rather not attractive for individuals. They had to cover travel expenses (including lodging and meals) without generating large profits from the sale of handicraft. The formula of the Exhibition did not clearly resolve this issue, as a result contributing to charging exhibitors with tax penalties for not using cash registers (K. Strauchmann, 2013). After this incident the participation of individual Czech craftsmen in Prudnik exhibitions decreased dramatically (See: Table 1).

Relationships developed at the individual level and formed by informal bonds proved to be less durable. According to the network topology of Hite and Easterly (A. Chrisidu-Budnik, 2015, p. 15) it should be noted that the cross-border relationships between craftsmen and folk artists were driven by calculation (calculation-based networks) and inspired by the character of shared activities (identity-based networks). The decrease in participation of Czech exhibitors resulted in a search for the new formula of the Exhibition. In order to raise funds for the next edition organizers applied for funding to the European Agricultural Fund for Rural Development.

The aim of this article was to present the dynamics of changes in the development of Polish and Czech cross-border cooperation based on the example of Prudnik Exhibition of Folk Artists and Crafts of the Polish and Czech Borderland which has been initiated and organized for 19 years by the city authorities in Prudnik. The main goal of the local administration was to replicate patterns used in Western Europe to change the image of a border as a "scar of history." The city authorities also intended to highlight Prudnik against other similar cities in the Opole province.

The analysis was based on data from directories of the Exhibition of Folk Artists and Crafts of Polish and Czech Borderland, which contained the list of participants of the project. The data were supported by the query of the project's documentation, as well as the local press. Additional information was provided by interviews with people involved in organizing the Exhibition. The data on the participation of the Czechs in subsequent editions of the Prudnik Exhibition of Folk Artists and Crafts of the Polish and Czech Borderland was analyzed in detail. The collected data allowed to conclude that the municipal authorities achieved the desired results: during all editions of the Exhibition both Czech and Polish diplomatic representatives visited it periodically; more than

5100 exhibitors responded to the invitation. The organizers of the Exhibition succeeded at the level of institutional cross-border cooperation. However, at the individual level Czech participants did not cooperate with cultural, artistic or social institutions. The lack of sustainability in expenditure arose from participation in the Exhibition and not covered by the sale of goods discouraged individual craftsmen and folk artists, driven by the principle of economic calculation. The expectations for "added value" required applying for financial support which would compensate expenses. The procedures had to be changed. Therefore, the organizers of the Exhibition applied for funding to the European Agricultural Fund for Rural Development.

One must wonder why the original assumptions of the Exhibition's organizers have not yielded the expected results, e.g. have not strengthen ties between the inhabitants of the neighboring regions. Authors claim that the cooperation between these regions has been developed only at the institutional level.

According to the Authors this may be related to migration processes that affected indigenous peoples on both sides of the border. Firstly, different histories permanently discontinued earlier relationships which date back to the beginning of imperial Austria. Due to the page limitation it is impossible to explain this process in details.

Secondly, the widespread practice of maintaining business relationships via the Internet reduces the need for the presentation of the products offered in the exhibition space. However, further research is required to investigate these two theses.

At this point, the authors could only answer, prompting the organizers Exhibition to change the formula of the Exhibition. It was found that mapping practices of the French-German border for the Czech-Polish border has not produced the expected results at the level of primary (neighborhood) relationships.

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Appendix

Cities represented by Czech participants at Prudnik Exhibition of Folk Artists and Crafts of the Polish and Czech Borderland (1998-2016)

Item	City*	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
1.	Bedrichow	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
2.	Bernartice	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
3.	Babice nad Svitavov	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
4.	Bohumin	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	4
5.	Bor, Breznice	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
6.	Bouzov	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	2
7.	Bratřínov	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
8.	Breznice	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
9.	Brno	-	-	-	-	-	-	-	-	-	3	-	4	2	1	3	1	4	1	-	19
10	Bruntal	-	1	1	1	-	-	-	-	1	1	1	2	1	1	1	-	-	1	-	12
11	Bystrice nad Olsi	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	2
12	Česka Ves	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	3
13	Cerveny Kostelec	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3
14	Čehovice, Bedikost	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
15	Cotkytle	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
16	Debolin	-	-	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
17	Dolni Péna, Hradec	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
18	Dvur Kralove nad Labem	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
19	Frydek - Mistek	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
20	Havirov-Mesto	-	-	1	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-	-	4
21	Hodonin	-	-	-	-	-	-	-	-	-	-	-	1	1	2	1	-	-	-	-	5
22	Horni Benesov	-	-	1	2	2	1	3	1	-	-	-	-	-	1	-	-	-	-	-	11
23	Hradec Kralove	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	2
24	Hranice	-	-	-	-	2	-	-		-	-	-	-	-	-	-	-	-	-	-	2
25	Hustopece nad Becocvou	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
26	Izlemnice	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
27	Janovice u Rýmařova	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
28	Javornik, Jesenik	-	-	1	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	4
29	Jesenik	-	-	2	1	1	2	1	1	-	3	3	4	4	-	4	4	2	4	1	37
30	Jilemnice	-	-	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	6
31	Jindrichov na Slesku	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
32	Kandia, Láškov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
33	Karlovice	-	-	-	-	-	-	1	1	2	-	-	1	1	-	-	-	-	-	-	6
34	Klimkovice	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	2
35	Koprivnice	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
36	Kozmice,	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

	Bruntal																					
37	Krnov	-	3	-	-	-	1	1	3	3	1	2	1	-	-	1	-	-	1	-	17
38	Krepice	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
39	Křetin	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	2
40	Lichnov	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
41	Lipnik nad Becovou	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
42	Lipova Lázne	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
43	Liptan, Bruntal	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
44	Liptán, Osoblaha	-	-	-	-	-	-	3	1	-	1	1	1	1	1	1	1	-	-	-	11
45	Litovel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
46	Luzice, Sternberk	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
47	Máslovice, Vodochody	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
48	Mesto Albrechtice	-	2	4	3	2	1	4	1	1	1	1	1	1	1	-	2	2	1	1	29
49	Mikulovice	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
50	Miroslavské Knínice, Miroslav	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
51	Nowy Úupków	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
52	Nová Včelnice	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
53	Nydek	-	-	-	-	-	-	-	-	-	1	1	1	-	1	-	-	-	-	-	4
54	Oldřichovice (Třinec)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
55	Opava	-	3	-	-	-	-	2	4	5	-	-	-	-	-	-	-	-	-	-	14
56	Ostrava	-	1	-	-	-	-	1	-	-	4	1	-	2	1	2	1	1	1	1	16
57	Příbor	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
58	Plesov	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
59	Praha	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
60	Rapotin	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
61	Razová	-	-	-	-	-	1	-	1	1	1	-	-	-	-	-	-	-	-	-	4
62	Repisie	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
63	Rychlov	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
64	Rymařov	1		1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
65	Siroky Brod, Mikulovice u Jeseniku	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	2
66	Skotnice	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	2
67	Stare Město	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
68	Stara Ves nad Ondżejnici	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
69	Staré Heřminovy, Horni Benešov	-	-	-	-	1	1	-	2	2	2	1	2	2	2	2	1	-	-	-	18
70	Suche Lazce	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
71	Sulikov	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
72	Supikovice																			1	1
73	Štěpánov	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
74	Šumperk	4	1	1	-	1	2	1	2	3	1	2	-	1	-	-	-	-	-	-	19
75	Těpeře,	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	2

	Železny Brod																				
76	Tisek	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
77	Třebíč, Zamek	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-	-	5
78	Tremesna u Krnova	-	-	-	-	-	-	-	1	1	-	1	1	-	1	2	-	-	-	-	7
79	Uh Hradiště	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
80	Úralno	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
81	Vamberk	1	-	2	-	-	1	3	-	-	-	-	-	-	-	-	-	-	-	-	7
82	Valašské Meziříčí	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
83	Valšov, Bruntal	-	-	-	1	-	1	-	1	-	-	-	1	-	-	-	-	-	-	-	3
84	Velkan/Vel	-	-	1	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	3
85	Veseli nad Luznici	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
86	Vilemhice	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
87	Vizovice	-	-	-	-	-	-	-	-	-	3	1	1	1	-	1	1	1	1	1	10
88	Vojtovice, Žulová	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
89	Vlcnov	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
90	Vresina	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
91	Vrsovice	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
92	Vrzovice													1	-	-	-	-	-	-	1
93	Vysoké Mýto	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
94	Tatenice	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
95	Třemesná	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
96	Zadni Ves, Karlovice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
97	Zahreh na Morave	-	-	-	-	-	-	-	2	1	-	1	1	1	1	-	-	-	-	-	7
98	Žamberk	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	2
99	Zbudov, Klášterec nad Orlicí	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
10	Zlate Hory	-	2	2	3	3	1	2	2	1	1	-	-	1	1	1	-	-	1	-	21
	Razem	8	14	32	22	24	16	30	36	28	36	20	26	23	24	26	16	9	11	6	407

- The form of names is the same as in the records introduced by the editors of the directory of the Prudnik Exhibition of Folk Artists and Crafts of the Polish and Czech Borderland (1998-2016)

Source: [1.] - 19. The directory of exhibitors. The Prudnik Exhibition of Folk Artists and Crafts of the Polish and Czech Borderland 1998-2016

Wood Waste Gasification for Cogeneration

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Abstract
The paper reports on processes of woody biomass and agricultural residues as a renewable resource of energy by gasification. There is described realized measuring on technology of gasification with fixed-bed and fluid-bed gasifier, properties of produced gas, content of tar before and after conditioning. The aim is to utilize the produced gas in cogeneration unit to co-generate electricity and heat with gas engines.
In the current situation, biomass represents one of the most promising renewables in the Czech Republic and other countries in European Union. The biomass is an organic substance provided by plants and as such, it is a typical renewable energy resource representative. It may be an intended product or waste or residue material from agriculture, foodstuffs industry or municipal facilities. Traditional combustion processes generate only heat. For combined production of heat and electricity, it is necessary for the biomass to be gasified first, to be able to use the produced gas as a fuel for internal combustion engines or small turbines. Gases from biomass gasification contain impurities that prevent their direct use by engines or turbines.

Keywords: *biomass, gasification, total solid particles*

JEL Classification: *Q420, O310, Q550*

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1 Introduction

Current efforts to reduce CO2 emissions and the amounts used of fossil fuels are the cause of wider use of renewable fuels as well as waste. This leads to the arising of new installation using local fuel sources as well as with various types of process waste. Wastes are increasingly being used to produce electricity and heat. A high level of pollution in waste requires applying more efficient and resistant to different substances devices.

The current situation in the energy industry emphasize the desirability of implementation the small cogeneration systems to national grid. The interests in renewable energy sources as well as the use of waste generated in various processes are increasing. The cogeneration units must meet the both criteria – economic ones as well as demand for high reliability and low environmental impact.

The last decade has shown that the European Union is moving towards the use of fuels with high purity as well as renewable fuels. The Table 1, below presented information about fuel consumption and waste in the toe. Numbers of fossil fuels like coals, oil or fissile fuels are kept constant. However, clear tendency of increased demand for gases fuels about 10% and 41% of renewable fuels.

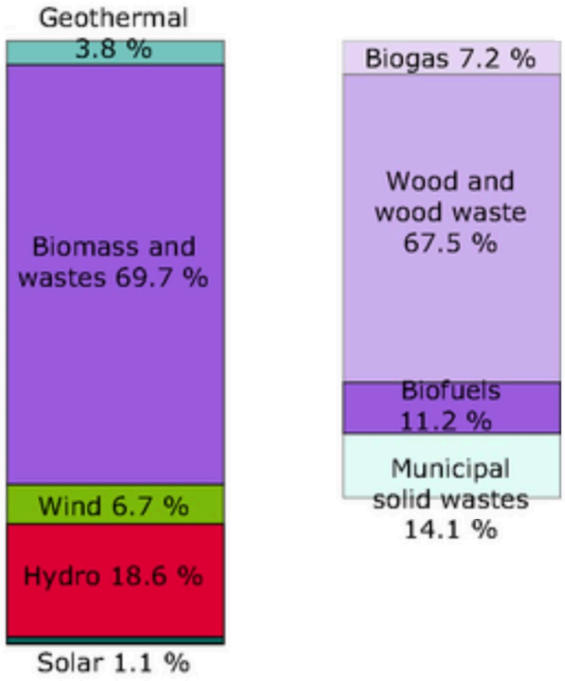
Table 1 - Total fuel consumption in EU27 in Mtoe **Chyba! Nenalezen zdroj odkazů.**

EU27 million toe	2000	2001	2002	2003	2004	2005	2006	2007	2008
Coal and lignite	321,1	321,9	320,9	331,9	330,0	319,5	325,1	331,2	305,8
Oil	659,9	675,0	667,9	674,0	676,4	676,5	673,1	656,9	656,6
Gas	393,4	404,1	406,0	425,9	435,7	446,0	438,0	432,4	440,7
Nuclear	243,8	252,5	255,4	256,9	260,1	257,4	255,3	241,3	241,1
Renewable	99,6	102,4	100,9	109,0	117,4	121,6	129,9	141,0	151,1
Other (industrial waste, net electricity imports)	6,6	7,0	6,7	5,3	4,3	4,6	4,1	3,5	3,6
Total (as reported)	1724,3	1762,9	1757,8	1803,0	1823,9	1825,6	1825,5	1806,3	1799

Calculating the percentage of those two types of fuels in the total balance is obtained about 1/3 share in the overall market. Gases fuels, by virtue of their nature, are also burdened with the political influence. Long-planned investments based on gas may prove to be unviable as a consequence. It leads to conclusion that is necessary to use locally available raw materials.

Renewable fuels such as biomass can for the local market fully satisfy the needs of its residents. Using energy crops, we can in a controlled way schedule delivery of raw materials, which is beneficial for the manufacturing process, the economics of investments as well as social peace. In wooded areas responsible forest management also brings tangible benefits. The contribution of renewable energy sources to gross energy inland consumption (GEIC) increased in the EU-27 from 4.4 % in 1990 to 8.4 % in 2008, it is presented on the chart below Figure 1.

Figure 1 - The renewable energy consumption by energy source in 2008, EU-27 **Chyba! Nenalezen zdroj odkazů.**



The article presents state of art and gained experience in VSB-TU Ostrava. The second part of the paper is focus on the characteristics of the plant used to produce electricity and heat using air biomass gasification process. A presented sheet date shows the results of measurements gas composition and efficiency of purification devices on waste biomass gasification technology.

2 Requirements of gasification process

2.1 Fuels in gasification process

The shape of the installation is determined of the fuel composition. The composition of fuel used in installation significantly affects the way of gasification and purification methods resulting gas. A main factor influencing the type of used reactor is moisture content. At low water content in the fuel in a simple way without pre-drying can be provide such fuel to reactor. For a downdraft reactor is the value to 20% W_a^r **Chyba! Nenalezen zdroj odkazů.**. For higher values of moisture should be used to fuel the drying process, however, replacing the classic updraft reactor **Chyba! Nenalezen zdroj odkazů.**, [6] it can avoid additional investments. Reactors of this type can be operated with fuel at a water concentration of up to 50% see Table 2. That high water content often found in fresh biomass or pre-processed sludge. However, attention should be paid to the concentration of tars in the gas caused by high moisture may be significant and occur up to several $g.m^{-3}_n$.

The second factor that affects the way of gasification is granulation of fuel. It influences at the way of transportation as well as the type of reactor. Otherwise, gasification technology will look like for chips and for rice hulls. The classic Imbert type reactor is able to work on fuel by only a lower limit of size. Below this value, the fuel will pour through the throat of reactor. Therefore, this type of device is optimal for fuels with high grain and also will not require the preparation of fuel. Fine coal plants are often highly energy intensive. Looking at renewable fuels, which are already available to small grain size like rise hulls, require updrafts reactors with low-speed gas flow or fluidized bed reactors. This type of fuel is a quality product that does not require either drying or grinding for appropriate granulation.

Table 2 - Technical and elementary analysis of biomass and other substances used for energy production

Parameters	Wood			Waste		
	Hardwood	**Softwood**	**Tree bark**	**MSW**	**Sewage sludge**	**RDF**
Moisture W_a^r[%]	11,3 - 66,1	41,6 – 55,8	0 – 71,2	25 - 40	0,2 – 83,9	5 - 35
Volatiles V^a[%]	-	-	76	22,4	47,8	-
Ash A^a[%]	0,35 – 15,21	0,17 – 1,77	0,34 – 9,53	5 - 25	14,25 – 42,66	1 - 10
Carbon %	43,7 – 45,2	42,8 – 53,4	47,8 – 56,9	under 8	39,2 - 58	-
Hydrogen %	4,35 – 6,2	5,42 – 5,86	4,8 – 6,4	5,37	5 – 9,2	-
Oxygen %	43,1 – 45,4	41,5 – 44,2	40	39,37	30.2	-
Nitrogen %			0,02 – 0,81	1 - 5	2,25 – 12,21	-
Sulfur %	0,03 – 0,15	0 – 0,02	0,02 – 0,12	0,1 - 1	1,02 – 5,33	0 – 0,4
Chlorine %	-	-	-	0,3	0,017 - 0,1	0 - 1
LHV MJ.kg^{-1}	4,6 – 14,7	6,8 – 18	16 – 21	4 – 11	12 – 25	13 - 19

2.2 Gasification agents

Gasification agent is an important factor and significantly affects the low heating value LHV generated gases. Effect of medium on the gas composition was shown in the following Table 3. In small installations is always used as a gasification agent air which does not require the preparation and is safe way to convert the fuel but 50% of content of nitrogen in generated gas lower the LHV. When it is using water steam as a agent, gasification process converts from autothermal to allothermal. Process required providing the necessary amount of processes heat. It may seem the best solution will be to apply oxygen, but it significantly affects the unit costs of installation as well as the process of gasification of the fuel. During the process there comes a phenomenon of melt slag. Currently, such facilities are not built based on biomass. The solution to this problem would be to use a mixture of O_2+H_2O. In the solution installation does not require such a large installation for the production of oxygen. At the same time steam which is in the agent acts as a shield and stabilize the gasification process, reducing the probability of ash slagging. Currently available are cheap plants for the production of sufficient oxygen purity of 92% and low rate of energy consumption.

Table 3 - Effect of gasification agent on the gas composition

Gas composition, % vol.	**Types of medium gasification**				
	O_2+N_2 (air)	**O_2**	**O_2+H_2O**	**H_2O**	**H_2**
H_2	8-16	10-25	28-40	35-40	34,8
CO	10-18	40-60	15-25	25-30	4,3
CO_2	12-16	15-30	20-40	20-25	10,1
CH_4	2-6	<3	5-8	9-11	50,2
N_2	45-60	<1	<1	<1	<1
>C_2	0,5-2	<0,5	<2	<5	-
Dust g.m^{-3}	1-1000	<20	<0,5	<20	-
LHV MJ.m$^{-3}_n$	4-7	9-18	10-14	10-16	>22

2.3 Experience of gasification of different fuels in different technologies

Table 4 below shows the results of many experiments carried out both on small laboratory installation in VSB-TU Ostrava as well as on the bigger pilot. In the table are presented the results of experiments of energy crops, wood biomass as well as waste biomass from agriculture. Each type of fuel will behave a little different and gave different final composition of the gas. In addition, in the table are presented the results from gasification in two different types of reactors (downdraft and fluid). Variation of the composition and finally LHV may be due to the longer response time of fuel in the process with agent in the fluid bed reactor.

Table 4 - Gas parameters from gasification of different plants and in different types of reactors

Biomass / Parameters	Amaranth	Birch	Beech	Corn	Spruce	Willow
Fluid reactor						
Gas comp. %						
CO	12,7	11,6	15,1	9,83	13,1	15,5
CO_2	15,8	12,6	15,5	18,3	15,6	12,8
N_2	48,9	53,2	55,5	52,3	58,2	48,4
O_2	0,72	0,62	0,82	0,29	1,63	0,19
H_2	18,9	18,7	8,29	15,6	10,0	13,5
CH_4	1,42	1,96	3,06	1,83	0,80	0,84
C_2-C_6	1,41	0,98	1,47	1,48	0,21	0,24
H_2S	0,01	0,01	n. d.	0,01	0,01	0,01
benzene	0,07	0,07	0,14	0,11	0,07	0,07
toluene	0,023	0,014	0,12	0,028	0,009	8,025
LHV MJ/m^3_n	5,62	5,23	5,03	5,18	3,34	4,08
Downdraft reactor						
Gas comp. %						
CO	13,4	20,3	18,4	11,2	17,9	19,5
CO_2	16,2	18,4	12,7	12,9	14,1	10,5
N_2	51,8	49,4	48,6	58,4	50,3	59,7
O_2	1,15	0,9	1,30	2,4	1,5	2,2
H_2	16,0	9,59	17,3	9,93	14,2	5,23
CH_4	1,09	0,98	1,40	3,15	1,083	1,33
C_2-C_6	0,16	0,21	0,23	1,22	0,31	0,44
H_2S	0,01	0,01	n. d.	0,01	0,01	0,01
benzene	0,04	0,14	0,02	0,04	0,05	0,1
toluene	0,008	0,004	0,007	0,14	0,007	0,009
LHV MJ/m^3_n	4,03	4,37	4,72	4,83	4,53	4,01

2.4 Comparison of gas composition in different technologies in Czech Republic and the world

Gasification process begins to return to its old glory and more institutions begin to deal with these issues on a larger or smaller scale. VSB operates a number of studies related to both the gasification of different fuels as

well as using different technologies [2]. The following Table 5, was presented the average ranges of concentrations of individual gas components of the technologies developed in the Czech Republic (DSK, Skoblia, VSB VT1 and VTP) and other works in the world. These are plants with efficiency to several hundred of kW, operating on the air. This is also due to a low calorific value LHV of gases. However, the considerable interest of small installations leads to the building of new units that use the fuel in place of its creation (sawmills, waste separation factor, etc.). VSB has a laboratory installation VT1 130 kW_t for biomass gasification, which is used to study properties of fuels and conditions of gasification process. Technology VTP is a pilot installation based on laboratory plants but on a larger scale. The installation was designed for a 100 kW_e working on contaminated wood after the initial separation. This installation is at the stage of performance tests.

Table 5 - Comparison of different technology in Czech Republic and the World

Installation	Gas composition, % vol.					LHV $MJ.m^{-3}_n$
	CO	CO_2	H_2	CH_4	N_2	
DSK	15,5-21,7	10,4-14,4	13,1-15,9	1,0-2,8	48-55	4,3-6,0
Skoblia	24,0-28,0	7,8-10	13,9-16,5	1,7-2,0	46-49	5,6-5,7
Bario	23,2-26,6	8,6-11,3	14,3-16,7	1,3-1,8	46,2-49,4	5,3-5,7
Mukunda	15,5-19,6	12,4-14,9	18,6-20,6	1,1-1,5	47,4-49,5	4,8-5,2
Reed, Gaur	22,1	9,7	15,2	1,7	50,8	5,8
Schenk	17,0-18,1	15,3-16,7	18,2-20	2,4	44-46	5,7-5,8
VSB VT1	16,0-19,0	11,0-14,0	13,0-18,0	1,0-3,5	49,0-52,0	5,2
VSB VTP	6,1-9,1	10,6-12,1	n.d	1,0-1,8	n.d.	4,3

3 Barriers to gas production

The main obstacle preventing the extension of gasification technologies is to meet the requirements for quality and purity of the produced gas. Impurities in the gas (TSP, tar, nitrogenous compounds, alkaline compounds, sulphur, chlorine) cause operational problems for the individual apparatus gasification technologies, clogging of pipes and fittings, and tar covering of work surfaces of engines and turbines, which can lead to serious disruption of operated facility **Chyba! Nenalezen zdroj odkazů.**.

Solid particles contained in the gas from the gasification reactor are defined as solid phase comprising unreacted fuel particles (semi coke), inorganic substances (ash), or fluidized bed material **Chyba! Nenalezen zdroj odkazů.**.

The main source of TSP is ash material. Wood contains 1-2% of inorganic material, straw of various cereals about 10% **Chyba! Nenalezen zdroj odkazů.**. Inorganic base of fuel remains in the bed and is discharged through the grid, or it is carry off from the reactor during biomass gasification. The concentration of solid particles in the gas depends on the generator design (type of reactor and gas speed in generator) and the ash content in fuel. Other major sources of solid pollutants are contaminants in the fuel (inert material incorporated into the fuel during its processing - such as soil, etc.) and incompletely reacted fuel – unreacted rest of carbon. Fuel particles during the gasification process in the reactor reduce its volume and subsequently there are drift by gas. Soot is also part of solid particles.

3.1 The quality requirements for the gas

Gas quality requirements vary by type of device using the produced gas and also by the specific manufacturer of the device. Finishing of the gas depends on its use and various types of equipments need the specific gas quality and purity see **Table 6**.

Table 6 - List of allowable gas pollution for various devices

Parameters and interrupts in gas	Fuel Cells SOFC	F-T Synthesis	Gas turbine	Piston engine
Temperature	400 - 600°C	200 - 350°C	< 100°C (for compressor)	< 50°C
Pressure	Atmospheric or higher	2,5 – 6 MPa	<2,5MPa	Atmospheric
Dust concentration	< 1 $mg.m^{-3}$ dp<1µm	~0,1 ppm (mass)	< 1-5 $mg.m^{-3}$ d_p<3-5µm	< 50 $mg.m^{-3}$ d_p< 10µm
Alkali	< 1 ppm (vol.)	< 10 ppb (vol.)	< 0,2 mg/m3	*-
Heavy metals	< 1 ppm (mass)	< 1 ppb (vol.)	*-	*-
H_2S	< 1 ppm (vol.)	< 1 ppm (vol.)	< 50 ppm (vol.)	*-
HCL + HF	< 1 ppm (vol.)	< 10 ppb (vol.)	< 5 ppm (vol.)	*-
NH_3 + HCN	-	< 1 ppm (vol.)	< 50 ppm (vol.)	*-
Tars	< 10 $mg.m^{-3}$*	* -	< 5 $mg.m^{-3}$*	< 100 $mg.m^{-3}$**
Purifications methods	High temperature ceramic filters	Low temperature and pressure or high temperature and pressure	High or low temperature filters	Low temperature filtration

* no fully specify – depending on the conditions

** only higher parts of tars (regardless on BTX)

Cogeneration units with internal combustion piston engines are the most common device used to produce electricity from gas produced by gasification of biomass **Chyba! Nenalezen zdroj odkazů.**. The main advantage of this system is its simplicity, high efficiency and the possibility of using commercially produced both petrol and diesel engines. The gas must be free of dust and tars before its entering to the combustion engine. Solid particles cause accelerated wear of moving engine parts. Tar is prone to condensation on cold parts of the engine and forming of stable aerosols in cold gas. Requirements of internal combustion engines manufacturers are inconsistent and often incomplete because they manufacturers they have very few practical or negative experiences with the engines operated on the wood gas.

3.2 Removing of TSP from the gas

Type of technology used is usually dictated by the requirements of the terminal equipment, the volume of gas, the concentration of particles in the raw gas, the properties of particles. The complexity of the purification process depends on the type of technology. Capital costs, operating and maintenance costs may be substantially different for different methods and are a determining factor in the final stage of selecting the appropriate device.

Technology of removal of solid particles from the gas, we can distinguish **Chyba! Nenalezen zdroj odkazů.**:

- inertial separators (for example cyclones),

- filters,

- electrostatic precipitators,

- scrubbers.

The chart below shows the fractional separation efficiency of various devices for removing solid particles from the gas **Chyba! Nenalezen zdroj odkazů.**, **Chyba! Nenalezen zdroj odkazů.**.

4 Results and Discussion

4.1 Description of fuel used in gasification process

In the plant is used fuel, which is waste from the production process of sawmills. The fuel is collected from several processes and stored in open containers for better drying. The resulting waste has a different size. Pieces of wood are from 2 to 10 cm thick, 5 cm wide and 5 to 20 cm in length. Such a particle size of fuel is appropriate for the reactor and allows it to contact the gasification agent throughout the reactor. The following Table 7 present the physical and chemical composition of the fuel used in the installation. Moisture content (16.7%) in the fuel is at a low level, within the limits of tolerance for a reactor. The high calorific value of 17.6 $MJ.kg^{-1}$ positive effect on the stability of the gasification process.

Table 7 – Quality of the fuel used in gasification installation

Parameters	**% mass**	**Wood**
Humidity W^a	% mass	16,73
Volatiles V^d	% mass	82,99
Fixed carbon F^d	% mass	16,71
Ash A^d	% mass	0,3
C	% mass	49,86
H	% mass	6,14
O	% mass	43,38
N	% mass	0,31
S	% mass	0,01
LHV	MJ/kg-1	17,59
HHV	MJ/kg-1	20,52

4.2 Description of the installation

The basis of the installation is modified Imbert reactor for biomass gasification. Developed unit generates over 660 kW with efficiency 87.4%. Fuel is supplied to the top of the reactor by trolley and poured through the hole.

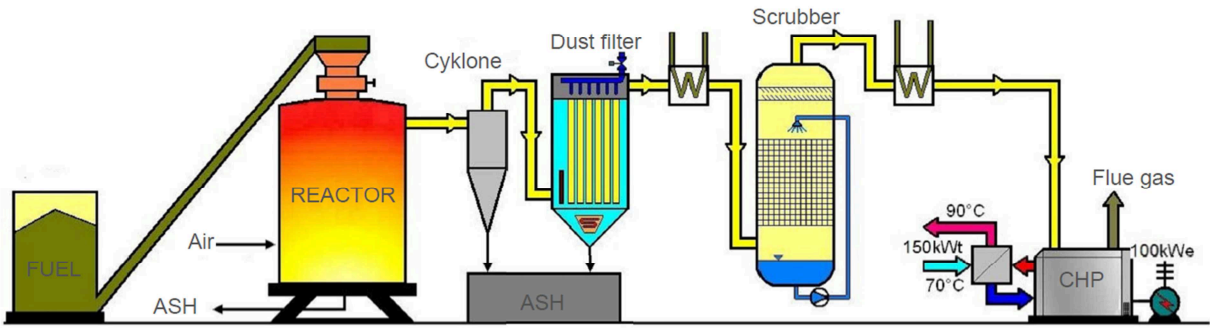
Figure 2 - Photo of modified Imbert reactor

Whole process is full automatist beginning from the main container. Filling level of the generator is controlled by ultrasonic range-finder placed above the inlet of the reactor. The measurement of the height fuel column is conducted at the time of opening the hatch for about 10 seconds. The amount of fuel measurement is made every 5 minutes. If it is low, trolley pure the reactor, if it is high, flap is closing in anticipation of further opening period.

Agent used in biomass gasification is air which is heated in a heat exchanger located on the outer coat of reactor to temperatures of 200-240°C. Localization of nozzles distributing agent in the reactor on two levels allow reducing levels of field temperature in neighborhood of nozzles. The reason of nozzles level division was fuel slagging often occurring in earlier version of gasifier. The good results obtained in modeling process of the vertical agent supplying pipe implementation will help further reduce the risk of clogging the reactor. The biomass gasification process in each type of fixed bed reactors looks different. In presented solution setting of zones sequence looks as following: first and the highest one is drying zone, second and lower is pyrolysis zone, next one is oxidation zone and the lowest in whole gasification process is reduction zone. The gasification process in Imbert reactor is autothermal and does not need the external sources of energy. The drying zone, pyrolysis zone and reduction zone are endothermic and consume heat energy from exothermic process. To reactor has been implemented an innovative method of recycling heat from hot gas from reduction zone flowing through the drying zone and giving back thermal energy. The gas is leaving the reduction zone with a high temperature around 850°C. It seems to be natural to turn such large quantity and high quality heat back to the gasification process. Gas passing through the fuel bed is initially cleared of dust and charcoal. 50% of dust flowed in the produced gas is a chemical energy that could be used back in gasification process. Even small part of chemical energy returning to process helps to improve the mass balance. In additional phenomenon effecting the process of gas flowing through the fuel is decreasing the tars concentration. The biggest problem that may occur in the properly operating is tars condensation in purification and utilization devices. In conjunction with the dust contained in the gas, it reduces the pipe clearance and cause accumulation of gas in installation

Figure 3.

Figure 3 – The Chart of the gasification technology



The gas at the reactor outlet still has a high temperature of 400°C. This condition helps to protect against the tars and water vapour condensation but require the implementation of advanced technology. In the first step gas is being purified form the dust by the cyclone and secondly by the material filters which removes remainder concentration.

A pulse-jet system was implemented in the dry filter to regenerate the working elements. In addition at working element is being created a layer of dust cake which helps both: to filter the dust and to protect the elements from erosion. Gas purification installation gains efficiency of the level of 99.3%.

In next step, gas was been cooled to temperature near 70°C and introduced to scrubber. Water was an agent used in scrubber. It purified gas from tars and water vapour. It helped to remove residues in gas and reduced temperature to required 30°C. Demister used in scrubber helped to remove all droplets contained in gas. The temperature of the produced gas is an important parameter required by the piston engine. Compressor was implemented to increase the engine power in the flow system. Gas prepared in that way was utilized in a cogeneration unit. In tested installation there was implemented modified piston engine form Tedom company,

with the efficiency η=0,35. Presented plant is able to produce from the gas, exhaust cooling and engine cooling block 350 kW of heat. Gas utilization allows producing 200 kW of electricity.

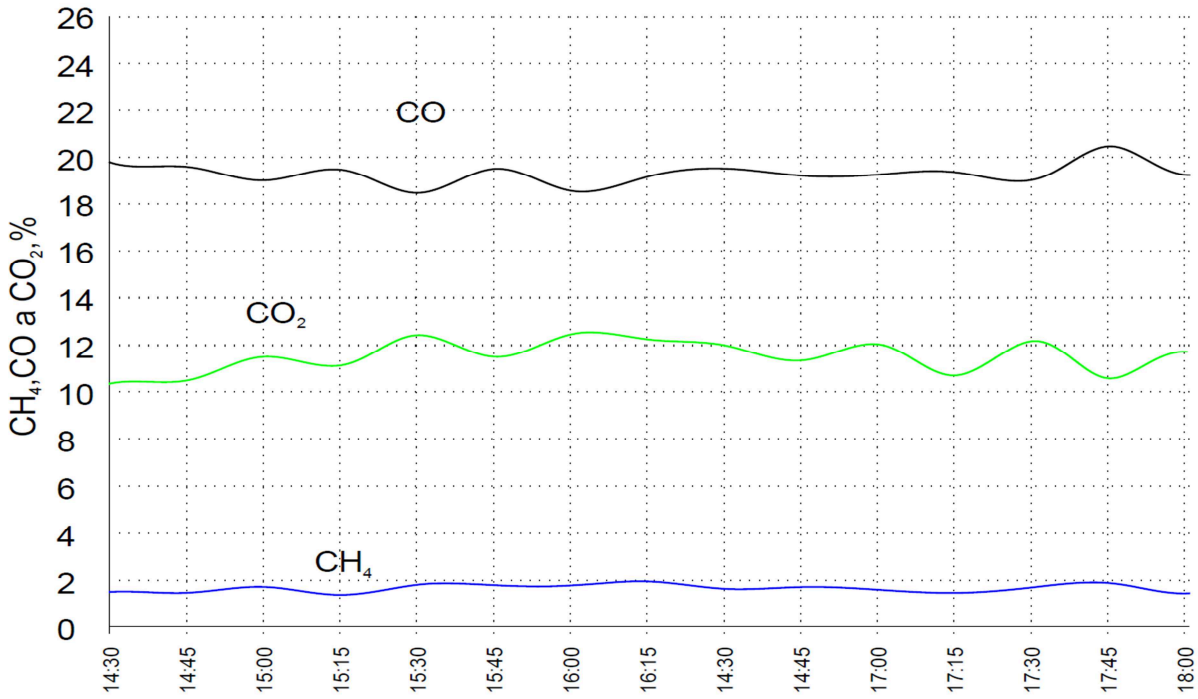
4.3 Measurement result

On the installation there were carried out a series of measurements which were taken to confirm the reasonableness of the modernizations, changes and installation settings. Ultimately, this allowed achieving optimal working conditions and maintenance-free. Measurements were made on partially modified plant that replaced the two cogeneration units with one but achieving the same gas producing capacity. The rest of the gas, which was not utilized in engine, was drained and burned in a fan flare. To maintain high efficiency of the reactor included in the installation of a fan.

4.3.1 Gas measurement methodology

The installation was conducted on two types of measurements: energetic parameters (gas and water flows, temperatures, pressures, electric power) and parameters of the gas (composition of gas, dust and tar content). Some of parameters were recorded by main computer, rest was measured and all were balanced. Measurement of the composition of the gas and tars were taken in two places but concentrations of dust were measured on individual elements of the gas purification system for determining the efficiency of individual devices. Measurement of gases was carried out in two methods, On-Line and Off-Line. Samples received from gas to tedlars allow conducting later detailed analysis of the gas. The results of the On-Line measurement of basic components (CO, CH_4, CO_2) and Off-Line were presented on the work achieved in the following Figure 4.

Figure 4 - Timing variability of CO, CO2 and CH4 concentrations produced gas



The above diagram presents the time course of methane, carbon monoxide, carbon dioxide concentrations which were measured after turn off the piston engine. Using huge triangles, circles and squares signs were shown places of Off-Line analysis. The rhombuses indicate the time when fuel was delivered to the gasifier. Visible changes in the concentration of individual components are caused by changes in the size of deposits and individual reaction zones occurring through bridging. However, 2 percent change in concentration of gaseous components (CO, CO_2) is acceptable for this type of reactor and it has little effect on the stability of the cogeneration unit, wider ranges of changes are caused by changing temperatures in bed. These changes are the results of delivery colder fuel to process and dislocation heat flows. Two shortcuts D1P and D2Z are showing the range time in which the samples of tars were taken.

A detailed analysis of the gas generator measuring in On-Line and Off-Line method helped to verify the values component obtained in biomass gasification. Table 1 presents the results of the analysis made on gas samples taken to tedlars. In presented summary of the main components occurs oxygen which is the result of a leak in the system for gasification or sampling installation. Its content is so small and does not cause danger to the whole devices. More than 50 percentage nitrogen is caused by using air as an agent in the gasification process. This is the simplest form of fuel gasification in which we obtain a gas with low calorific value 5,2 $MJ.m^{-3}$. Percentage part of flammable substances in gas is about 40% and depends on the temperature of the gasification process, equitable access medium, time of reaction, calorific value and fuel humidity.

Table 8 - The composition of the generated gas sampled to tedlars

Substances	Samples			
	14:04	15:11	16:12	17:08
	Content % vol.			
O_2 in sample	2,31	0,62	0,22	1,23
CO_2	7,68	10,33	11,49	12,57
H_2	16,91	15,66	17,76	15,36
CO	25,01	20,4	19,68	16,98
CH_4	0,52	0,88	1,49	1,23
N_2	49,21	51,94	48,72	52,97
Ar	0,58	0,64	0,58	0,68
ethane	0,001	0,001	0,004	0,003
ethylene	0,033	0,06	0,152	0,112
acetylene	0,043	0,068	0,105	0,079
benzene	0,009	0,015	0,017	0,016
toluene	0,001	0,001	0,001	0,001
Q_s, $MJ.m^{-3}$	5,59	5,03	5,54	4,74

4.3.2 TSP Measurement Methodology

The principle of measuring method is based on the isokinetic suction of the gas sample from the pipeline according to EN ISO 9096 which was placed in the output pipeline of tested device.

Gas temperature at the measurement point was measured with a thermocouple type "K" connected to the measuring unit. Differential and static gas pressure was measured using the Pitot tube connected to pressure sensors.

Sampling of the gas was carried out with probe that was connected to an electrically heated trap, where the filter from the glass micro-fiber captured most solid particles from exhaust gas

sample. After the capture of solid particles the gas was introduced into the condenser where the water vapor condensed. The cooled gas saturated of water vapour in the measured temperature was introduced into the volume measuring equipment and then into the air pump. The proper flow rate of the gas sample was adjusted by changing of pump speed and monitored using pressure sensors and temperature sensors.

The total amount of solid particles captured on the filter was determined gravimetrically as the weight difference of filter before and after the sampling. Mass concentration of solid particles was determined by dividing the amount of captured solid particles and exhausted volume of wet gas converted to normal conditions (0 °C, 101325 Pa) and it is expressed in $mg.m^{-3}{}_{n}$.

Measurements of solid particles concentrations were carried out on the gasification technology in two stages at different locations of technological complex.

In each measuring site two samplings (about 20 minutes long) were carried out for determining the concentration of TSP and the result is their average.

The main results are presented in tables. During the hole measurement campaign were researched the best conditions for gas purifying and good exploitation of installation. Scheme of installation shown in

Figure ure 3 is the last version of applied devices cogeneration installation based on biomass gasification.

Table 9 - Datasheet of measurements of TSP made on different settings of installation

Device	**First combination**	**Second combination**	**Third combination**	**Fourth combination**	**Fifth combination**
Reactor	1252 $mg.m^{-3}_{n}$	1252 $mg.m^{-3}_{n}$	1207 $mg.m^{-3}_{n}$	1207 $mg.m^{-3}_{n}$	1207 $mg.m^{-3}_{n}$
Rotary separator version 1	1047 $mg.m^{-3}_{n}$	1047 $mg.m^{-3}_{n}$	-	-	-
Rotary separator version 2	-	-	174 $mg.m^{-3}_{n}$	174 $mg.m^{-3}_{n}$	174 $mg.m^{-3}_{n}$
Dust filter	7,6 $mg.m^{-3}_{n}$	-	4,2 $mg.m^{-3}_{n}$	-	applied in installation
Scrubber	-	270 $mg.m^{-3}_{n}$	-	-	-
Scrubber with rotator equipment	-	-	-	6,8 $mg.m^{-3}_{n}$	0,44 $mg.m^{-3}_{n}$
Dry cooler	-	-	2,3 $mg.m^{-3}_{n}$	-	-

The average concentration of dust in the gas was on the level 1222 mg/m^{3}_{n}. The quantity of dust was half lower than before the purification. At the exit from the dry filter the average concentration was at the level of dust at 4,2 $mg.m^{-3}_{n}$. The device achieved efficiency at the level of 99.3%. Cogeneration unit manufacturers reduce the maximum level of dust in utilized gas to provide longer service of device. Currently, the permitted level of solid particles is at 5 mg/m^{3}_{n}.

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5 Conclusion

The results of the modeling are seems to be an interesting solutions, allowing thinking that conducted modification will increase the efficiency of the gasification process. Unfortunately, the gasification process is still an unrecognized phenomenon so that carrying out more complex operations may yield results varied from real conditions of working reactor.

The result of many hours of operation managed to set all relevant parameters is the installation working in a fully unmanned running. Automated process control system of biomass gasification, fuel supply, gas purification system is able to react with/on different parameters of fuel by changing the constants of characteristics. In addition, there was developed a technology for gas purifying from the dust which reaches more than 99.3% of efficiency. The increasing requirements of devices such as internal combustion engines, gas turbines and fuel cells requires lower dust limits in developing technologies with higher efficiency.

Experience gained in the operation of the presented technology of biomass gasification will help to create a fully commercial installation, permitting to supply the needs of heat and electricity from local sources.

Acknowledgements

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The Aging of the Labor Force Challenge for Labor Market Policy on the Example Poland and the Czech Republic

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Abstract
Demographic changes have significantly affected the structure of the population in many European countries. The growing share of elderly in the total population causes increases significance of professional activity of this social group. Available demographic forecasts predict intensification of aging European societies. As a result, changes in the employment rates of older workers will have a greater impact on overall employment rates. The aim of this article is on the one hand the analysis of the dynamics of the aging of the labor force in Poland and the Czech Republic, on the other hand the analysis of changes in professional activity of older people in the countries studied in the last decade. In addition, trying to bring solutions that have been undertaken in the studied countries in response to the aging of the labor force.

Keywords: *aging, demography, labor force, labor market policy*

JEL Classification: *J11, J14, J18, J21*

The Aging of the Labor Force Challenge for Labor Market Policy on the Example Poland and the Czech Republic

Anna Niewiadomska

1 Introduction

The process of aging of European societies has been the focus of researchers and politicians for several decades. The change of direction and dynamics of demographic processes creates new social and economic challenges. As a result, changing the reproduction model from the traditional one, i.e. with the high rates of births and deaths to the modern one characterized by the low rate of deaths and births, followed by the gradual change in the age structure of the population. The dynamics of this process vary across countries, but its direction is similar. Declining birth rates while simultaneously lengthening the average life expectancy translates into an increase in the share of older people in society. The new demographic situation determines the need to revise the socio-economic policy.

This article aims to identify the impact of aging populations on the Polish and the Czech Republic labor market policy. The following hypothesis was subject to verification: changing age structure of the labor force determines the need to increase efficiency in utilizing the professional potential of older people. The article relies on the statistics from the OECD and Eurostat databases.

2 The method of research proceeding

The aging of the population is on the one hand a dynamic process, on the other hand a predictable one because it develops over a long period of time and is preceded by a number of symptoms. That predictability should facilitate the political decision making in the area and, among others, in the labor market policy. Based on this assumption, the research goal which is to indicate the scale of the challenge for the state, related to the increasing dynamics of the aging of the labor force in Poland and the Czech Republic was adopted.

Consequently the considerations originated from the statistical analysis of real and forecast data illustrating the changes in the number and age structure of persons constituting the labor resources in the studied countries. Considering the quantitative and qualitative changes of labor resources, the current economic activity of people aged 55-64 was analyzed. Data available from the Eurostat database was used to that purpose.

The last part of the study contains considerations on labor market policy, including its essence and types. Based on literature of the subject it also outlines the solutions which have been undertaken in Poland and the Czech Republic to support older people in the labor market.

3 The age structure of labor resources in Poland and the Czech Republic - the current state and perspectives

While considering the aging of European societies it should be emphasized that it is a process which is the effect of the two trends. On the one hand, it is associated with a significant decrease in the fertility rate below the level which guarantees simple replacement of generations and, on the other hand, with increasing life expectancy resulting from declining mortality.

Assuming that the technological development will not, in a fundamental way, reduce the demand for manpower, it can be assumed that the size and structure of labor resources will invariably remain one of the crucial economic growth factors. In this context, it is understood that the direction of demographic change is the source of growing anxiety because it means the probable shortage and aging of the workforce. In Poland and the Czech Republic the phenomenon of not only low fertility rates but also periods of extremely low fertility rates was noticed[43]

In 2000-2005, the border of extremely low fertility rates has been exceeded, both in Poland and in the Czech Republic, reaching the minimum value of the coefficient equal to 1.27 and 1.19 respectivly (Table 1). The

[43] The conventional limit of low fertility is the total fertility rate equal to 1.5. The situation of extremely low fertility is when the fertility rate equals 1.3

fertility rates oscillating around the threshold level of extremely low fertility is disturbing, because the return to a higher fertility rate can be more difficult due to the so-called. "low fertility trap"[44]

Table 1 - The fertility rate in Poland and the Czech Republic in the years 1975-2100

Specification	**1975-1980**	**2000-2005**	**2005-2010**	**2010-2015**	**2015-2020**	**2020-2025**	**2045-2050**	**2095-2100**
Poland	2,26	1,27	1,33	1,41	1,48	1,53	1,72	1,84
Czech Republic	2,32	1,19	1,43	1,55	1,64	1,71	1,87	1,94

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2013) *World Population Prospects: The 2012 Revision*. New York: United Nations, pp.76-77.

The hypothesis of the low fertility trap assumes that the changes in the age structure caused by long-term low fertility may be so deep that the return to the level of fertility close to the replacement rate is impossible, and changes in the structure irreversible. The analysis of the forecast data contained in Table 1 suggests that the return to a higher fertility rate to prevent depopulation will not be possible in the countries included in the analysis.

It should be stressed that the process of declining fertility rates results from interrelated mechanisms: demographic, social and economic. In the case of the demographic mechanism, there is a dynamic feedback loop between the fertility rate and the number of births and age structure of the population. Declining birth rates will reduce the share of young people and, as a consequence, speed up the process of population aging. On the other hand, the older the age structure of the population, the smaller the number of births. These dependencies may lead, in the long run, to significant depopulation. In addition, the economic conditions come into play in the form of a higher burden placed on the current young generation than in the previous generations. This may result in a reduction of parental aspirations of the young generation and a reduction in the number of children.

According to sociologists, there also occurs a pattern of behavior, visible in the case of people with little sibling, or being an only child. This group of people is relatively more inclined to limit the number of their own children

The impact of the described mechanism has resulted in a significant decrease in the birth rates[45] in the past two decades, both in Poland and in the Czech Republic. Moreover, according to demographic projections, this trend will continue in the future (Figure 1, 2). Even if the fact that forecasts are burdened with errors is considered, maintaining the downward trend in birth rates seems highly probable. The rate of decline may be less, because most of the countries being aware of the demographic changes decides to take remedies However, in most of them, the so far recorded changes in the age structure are so advanced that a reversal of trends is impossible, and the impact on the future situation is limited. It does not mean that one should abandon efforts to improve the demographic situation, though.

[44] The mechanism of this trap was discussed in the work: W. Lutz, V. Skirbekk, M. R. Testa, *The low fertility trap hypothesis: forces that may lead to postponement and fewer births in Europe*, „VID Research Paper", Vienna Institute of Demography, nr 4, 2005.

[45] The birth rate is defined as the average annual percentage difference in population resulting from a surplus (or deficit) births over deaths corrected by migration balance.

Figure 1 Rate of natural increase (per 1000 population) in Poland and the Czech Republic in 1950-2015
Source: Own study based on: *Population Division* (2015). *World Population Prospects*: The 2015 Revision, United Nations, Department of Economic and Social Affairs

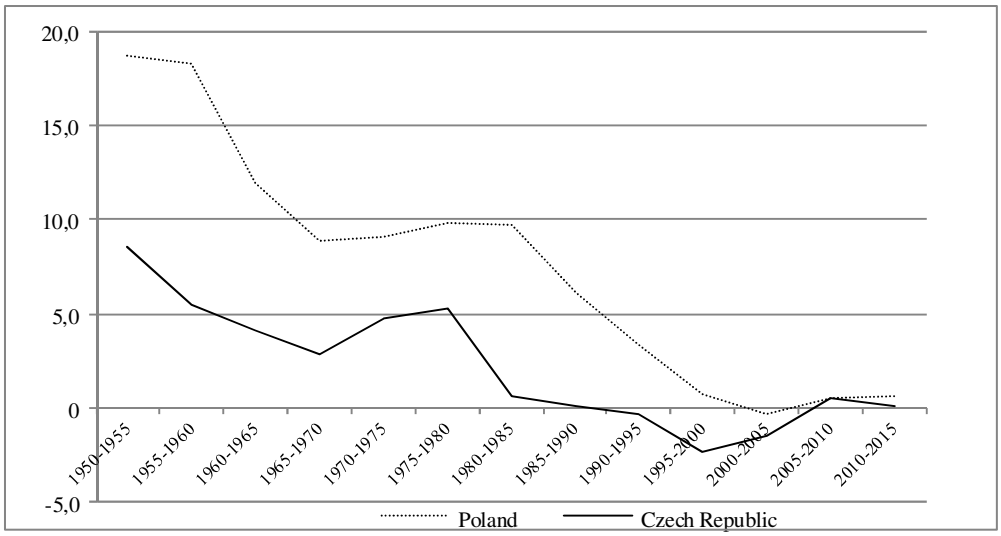
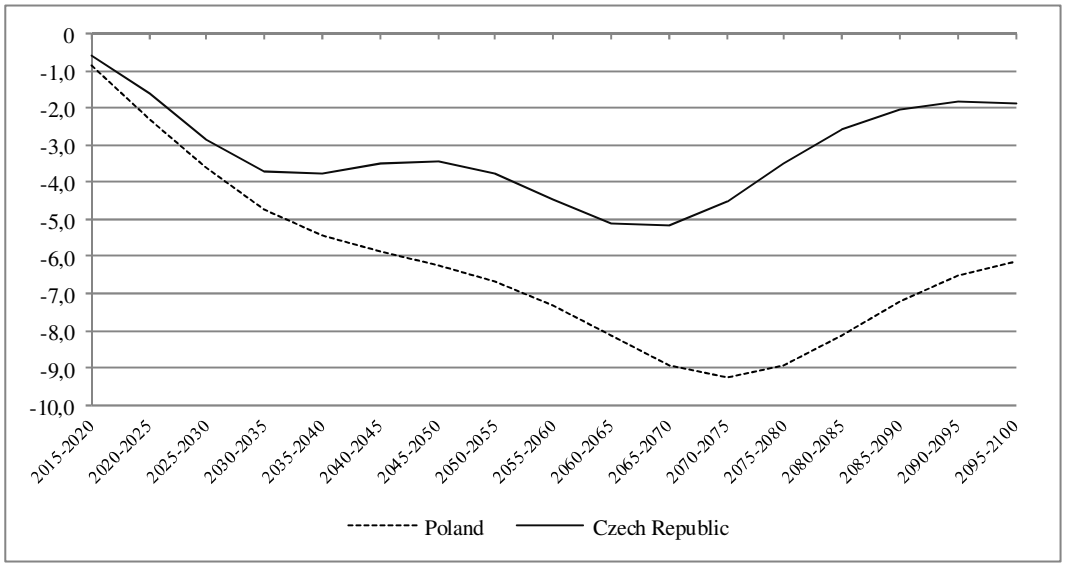


Figure2 Rate of natural increase (per 1000 population) in Poland and the Czech Republic in 2015-2100*
* medium variant of demographic projections
Source: Own study based on: *Population Division* (2015). *World Population Prospects*: The 2015 Revision, United Nations, Department of Economic and Social Affairs



Lowering fertility rates and increasing life expectancy of residents of Polish and the Czech Republic has its consequences for the labor market. On the one hand, there is a visible, gradual reduction in the size of labor resources (Table 2), on the other hand, their aging, whose symptom is an increase of the people in immobile productive age i.e. aged over 45 (Table 3).

The increase in the participation of older people in the labor resources, characteristic of most European countries stems, among others, from:

– lower inflow of young workers to the labor market, because of the smaller cohorts reaching working age and the subsequent entry in the working lives of Europeans because of the longer period of education;
- gradual reversal of the downward trend in the employment of older people.

Table 2 presents the data showing the estimated changes in the size of labor resources in Poland and the Czech Republic until 2060.

Table 2 - Main labour force assumptions for Poland and the Czech Republic in the years 2013-2060

Specification	**2013**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**Ch. 2013 - 2060**
Poland												
Working age population (15-64) (in thousands)	27151	26739	25455	24456	23864	23385	22511	21216	19779	18699	17951	**-9200**
Working age population (15-64) as % of total population	70,3	69,5	66,3	64,3	63,7	63,5	62,2	59,8	56,9	55,0	54,1	**-16,4**
Labour force 15-64 (thousands)	18296	18178	17732	17111	16668	16273	15699	14874	13890	13099	12557	**-5738**
Specification	**2013**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**Ch. 2013 - 2060**
Czech Republic												
Working age population (15-64) (in thousands)	7149	7028	6801	6797	6797	6788	6619	6388	6285	6235	6247	**-902**
Working age population (15-64) as % of total population	68,0	66,6	63,8	63,3	63,0	62,7	60,6	58,0	56,7	56,2	56,4	-**11,6**
Labour force 15-64 (thousands)	5215	5176	5075	5002	4982	4940	4830	4748	4696	4655	4680	**-535**

Source: *Population Division* (2015). *World Population Prospects*: The 2015 Revision, United Nations, Department of Economic and Social Affairs

Table3 People in immobile productive age in Poland and the Czech Republic in the years 2010-2060 (as% of those aged 15-64)

Specification	**2015**	**2020**	**2030**	**2040**	**2050**	**2060**
Poland	41,8	42,1	49,4	54,1	49,4	49,3
Czech Republic	41,8	45,2	51,9	51,9	40,1	40,8

Source: Own calculation based on: *Population Division* (2015). *World Population Prospects*: The 2015 Revision, United Nations, Department of Economic and Social Affairs

The analysis of the data contained in Table 2 shows that in the studied countries there will be a significant reduction in the number of people at working age. According to projections for 2060, the loss of that population in Poland will amount to nearly 34%, while in the Czech Republic 12.6%. It is anticipated that the depletion of labor resources will reach 31.4% in Poland and 10,26% in the Czech Republic respectively. In addition, as already mentioned, there will be a growing proportion of older people in the labor resources.

In the case of Poland since 2030 almost half of the labor resources will have been people aged 45 years. From the data presented in Table 3 that in the case of Poland the maximum participation of the more mature people in the labor resources will be in the year 2040, while in the Czech Republic a decade earlier, i.e. in 2030. Then, every other person creating labor resources will be at immobile age. Figure 3 and 4 presents the changes in the

age structure of labor resources in the countries studied in the near perspective, i.e. 2025. The analysis of the data presented clearly indicates that over the next decade there will be a rapid growth in the labor resources the number of people over the age of 45, with gradual reducing the population of the youngest. This creates particular challenges for labor market policy, which more should be directed to use the professional potential of the more mature people.

Figure 3 - The structure of labor resources by age in the Czech Republic in 2015 and the forecast for the years 2020, 2025 **Source:** Own study based on: *Population Division* (2015). *World Population Prospects*: The 2015 Revision, United Nations, Department of Economic and Social Affairs

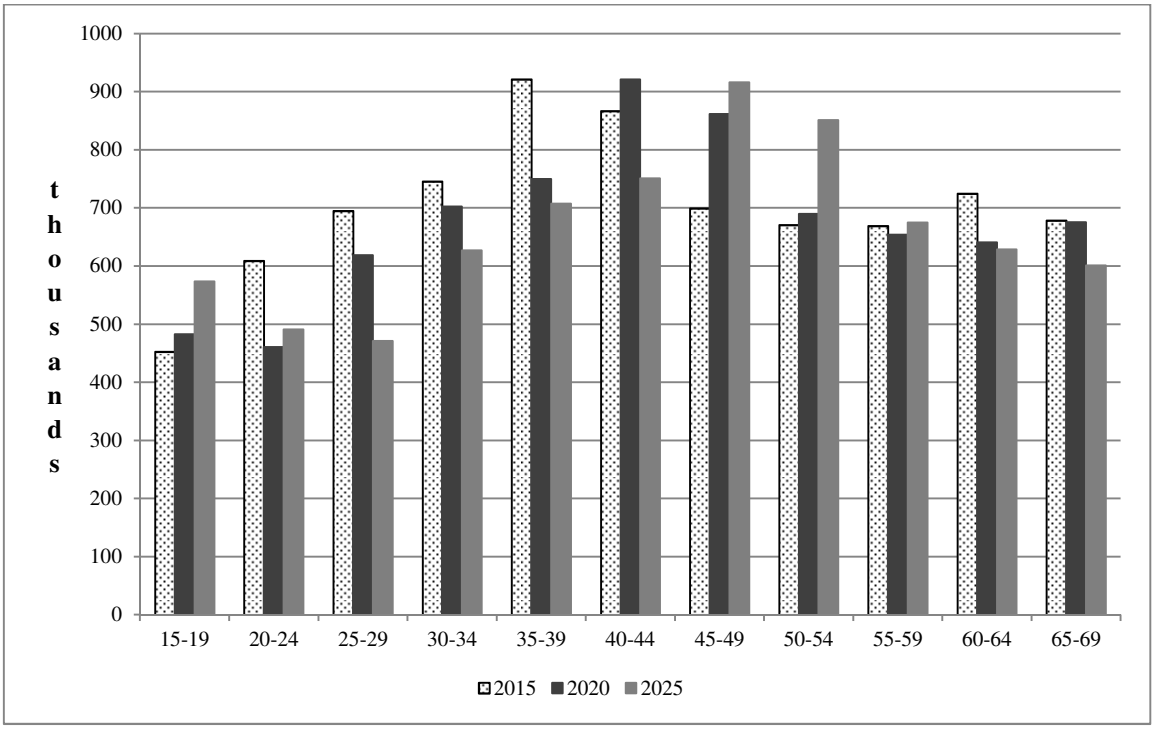
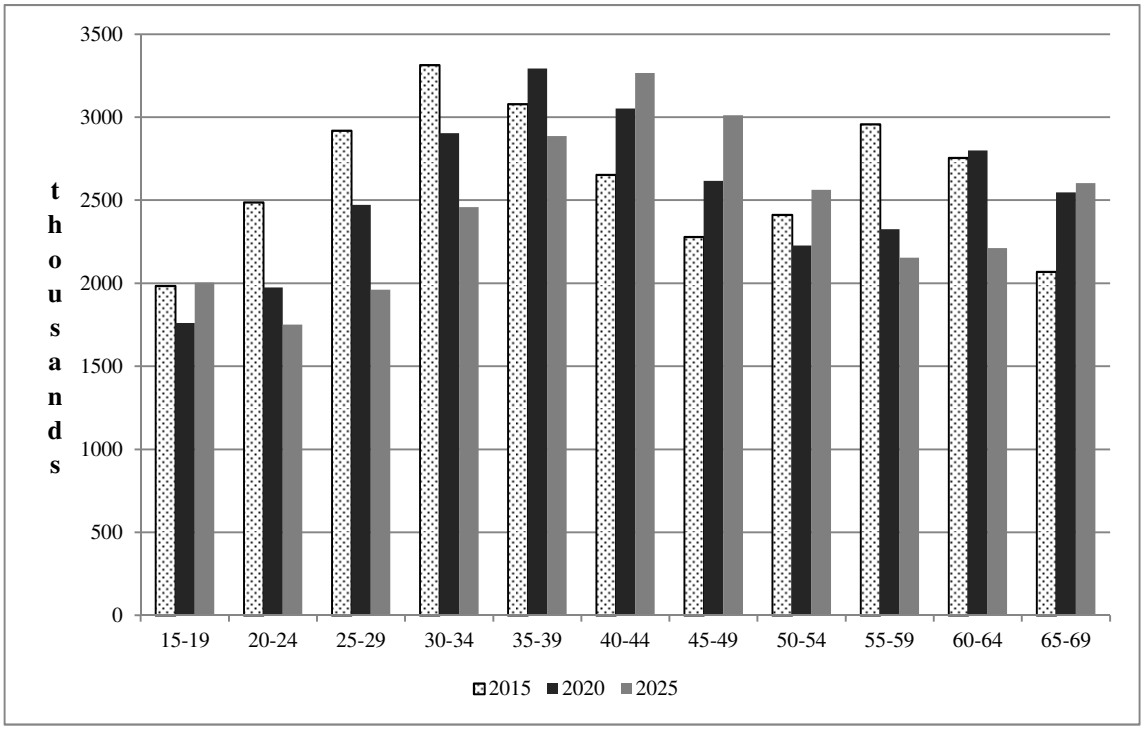


Figure 4 - The structure of labor resources by age in Poland in 2015 and the forecast for the years 2020, 2025
Source: Own study based on: *Population Division* (2015). *World Population Prospects*: The 2015 Revision, United Nations, Department of Economic and Social Affairs



To summarize the current considerations it should be noted that in the short run, migration can play an important role in helping to alleviate the demographic imbalances, e.g. by reducing shortages in the labor market. It is widely recognized, however, that one cannot change the aging demographic profile of the country only through the introduction of migrants, those who are to equalize the imbalance between people of working age and older people. But migrants will also get old soon and will be dependent on the rest of society. According to demographers, it seems unlikely that aging can be reversed without raising the fertility rate above the replacement rate of 2.1(*Aktywność osób starszych i solidarność międzypokoleniowa..2011,* p.31).

4 The professional activity of older people in the Czech Republic and Poland – identification of the phenomenon

The demographic data recalled clearly indicate that "reduction" of the youngest age groups in the population, which in the future will create resources work together with the increasing share of older people is one of the main challenges for labor market policies, both in Poland and the Czech Republic. Moreover, in the opinion of experts on the labor market, including E. Kotowska and A. Chłoń- Domińczak, with such deep changes in the age structure of the population which are projected for European countries, the reversal of the downward trend in the size of the potential of labor resources should not be expected, but only its alleviation (Kotowska, Chłoń Domińczak 2012 p. 24). In this context, a particularly important role is played by the economic activity of the elderly.

Its level is highly diversified in Europe. According to Eurostat data from 2015 it follows, that in the ranking of countries with the highest proportion of economically active seniors, the first place goes to Iceland. 87.6 per cent of its older inhabitants still function on the labor market. In the group of countries with high labor force participation of older people there is also Sweden with 78.7 per cent. Norway with 73.4 per cent. Netherlands with 61.7 per cent. In the case of the researched countries there is a decisively better level of activity of seniors in the Czech Republic. In 2015, 58 per cent of the Czechs were economically active while in Poland it was only 46.9 per cent.

From the analysis of the data contained in Table 4 it can be seen that in the countries studied a growing trend in the range of economic activity of people aged 55-64 persists. Throughout the analyzed period, the activity rates in this age group were slightly higher in the Czech Republic than the EU average. However, in the case of Poland the gradual increase in the activity of seniors helped to bridge the gap as compared to the EU average of more than 14 percentage points to over 10.

Table 4 - Activity rate* and employment rate** of people aged 55-64 in Czech Republic and Poland in the period 2005-2015 (%)

Specification	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Activity rate (%)											
EU(28 countries)	45,1	46,1	47,0	47,9	48,9	49,6	50,6	52,5	54,3	55,9	57,3
Czech Republic	46,9	47,7	48,2	49,5	49,6	49,7	50,6	52,4	54,8	56,8	58,0
Poland	30,5	30,7	31,8	33,3	34,5	36,7	39,6	41,8	44,0	45,6	46,9
Employment rate (%)											
EU(28 countries)	42,2	43,3	44,5	45,5	45,9	46,2	47,2	48,7	50,1	51,8	53,3
Czech Republic	44,5	45,2	46,0	47,6	46,8	46,5	47,7	49,3	51,6	54,0	55,5
Poland	27,2	28,1	29,7	31,6	32,3	34,1	36,9	38,7	40,6	42,5	44,3

* The activity rate shows the share of economically active population (employed and unemployed) in the total population aged 55-64
**The employment rate is calculated by dividing the number of persons aged 55 to 64 in employment by the total population of the same age group
Source: Eurostat

It is worth emphasizing, that the gradual increase in the professional involvement of the elderly is partly a result of the reorientation of the state policy in the labor market. In most Central European countries the policy of "pushing" the older generations to retire was promoted for a long time. Within its framework, a system of early retirement and liberal conditions for the acquisition of disability benefits was created (Samorodov 1999, p 8).

However, with the growing awareness of the costs of such solutions and the necessity to prepare for the new demographic trends, there began in Central Europe a move away from the process solutions facilitating early professional deactivation of the elderly, to promote their extended presence in the labor market. As a consequence a gradual increase in labor force participation of older Europeans was observed, also in this part of the continent, mainly as a result of increase in employment rates (Table.4).

In the years 2005-2015 in Poland, the employment rate for people aged 55-64 years increased by 17.1 percentage points, while in the Czech Republic by 11 percentage points.

It should be emphasized that in the various age subgroups, some other factors may determine the possibilities of increasing the employment rate. The review of literature indicates that in the case of persons aged (Grotkowska 2013, p.48):

- 50-59 years old, the solutions limiting the right to early retirement and other alternative benefits, and investment in skills, as well as activities at the company level to enable better use of the professional potential of older people are essential,

- 60-69 years, the essential role played by the rules on retirement age and the amount of benefit.

When it comes to the size of unemployment among older people, it is smaller than among young people. The latest data from Eurostat show that the unemployment rate among people aged 55-64 was at a similar level in the

case of Poland and the Czech Republic (Table 5). Moreover, in the analyzed period, the unemployment rate of older people in the countries studied was lower than the EU average.

Table 5 - Unemployment rate of people aged 55-64 in Czech Republic and Poland in the period 2014-2016 (%)

Specification	2014Q I	2014Q II	2014Q III	2014 Q IV	2015 Q I	2015Q II	2015 Q III	2015 Q IV	2016 Q I
European Union (28 countries)	7,9	7,4	7,0	7,3	7,4	7,0	6,7	6,8	6,9
Czech Republic	5,9	4,5	4,8	4,5	5,1	4,3	4,0	4,1	4,9
Poland	7,9	6,9	6,1	6,4	6,6	5,3	5,1	4,9	4,9
Males									
European Union (28 countries)	8,6	7,9	7,4	8,0	8,0	7,6	7,1	7,4	7,5
Czech Republic	5,7	3,9	4,4	4,2	4,4	3,9	3,6	4,1	4,9
Poland	8,5	7,4	6,1	6,5	7,2	5,8	5,2	5,4	5,7
Females									
European Union (28 countries)	7,1	6,8	6,5	6,5	6,7	6,3	6,1	6,1	6,3
Czech Republic	6,1	5,2	5,3	5,0	6,0	4,9	4,6	4,0	4,8
Poland	7,2	6,1	6,0	6,1	5,7	4,5	5,0	4,2	3,7

Source: Eurostat

Still it is worth noting that older people who have lost their jobs, face particular difficulties when returning to the labor market, often associated with their stereotypical perception of being less valuable employees. A manifestation of a relatively worse situation of older unemployed in the relation to the other unemployed, is a longer time of remaining without work. For this reason the need to increase the effectiveness of active labor market policies targeted at older unemployed should be emphasized.

5 Goals and tasks of labor market policy in the context of demographic challenges

The situation on the labor market is determined by many different factors which are related to both the demand side and the supply side of the labor market and the structural mismatches on the labor market. Among demand factors there are economic growth, direct foreign investment, labor productivity and technological progress, whereas the supply factors include the size of population and its age structure, the level of economic activity and migration. The mismatches in the labor market are associated with structural changes in the economy, the degree of flexibility and mobility of the labor market and labor market policy implemented (Kwiatkowski 2004, pp 87-88).

The intensification of the process of globalization, technical progress and demographic changes determine the specific tasks for the labor market policy, focused on solving structural problems in the labor market and improving the effectiveness of its functioning.

Developed countries fulfil the aforementioned policy through specific instruments, which on the one hand implement shielding functions and, on the other hand, are aimed at activating the unemployed to enable them to return to work.

Generally speaking, labor market policy includes the so-called active (ALMP) and passive labor market policy (PLMP). In the first case, it is about stability and long-term development of the parallel elimination of social inequality. Of particular importance are active employment programs, aimed mainly at preparing the unemployed to re-integrate into the work process. They are usually applied to groups that are most vulnerable in the labor market. Active labor market policy programs therefore serve the function of a "bridge" leading to future employment.

The passive policy ensures social protection of the unemployed who have lost their jobs and, because of the low demand, or lack of adequate qualifications cannot find it.

Active labor market policy (ALMP) should encourage increased employment i.e. bringing the state economy to the state close to complete utilization of production factors. The underemployment which exists in reality results from the failure of the labor market and includes occurring asymmetry of information, both on the supply as well as on the demand side.

Due to the fact that the employment of a new person in a position is usually associated with high initial costs, exceeding the benefits of their employment (including the need for training), entrepreneurs - not knowing the actual qualifications of the unemployed - are reluctant to employ them. If they decide to hire an unemployed person, they expect they will meet their expectations in relation to qualifications, without the need to refer such an employee to training courses (*Aktywne polityki rynku pracy*..2013).

An important problem of modern labor markets are the structural mismatches manifested by the mismatch between the structure of labor supply to the demand for jobs reported by employers. In addition, the labor market suffers from the problem of discrimination against certain groups of workers due to their age, sex, reducing the efficiency of the workforce The phenomenon of discrimination in the labor market is particularly visible among young people and the elderly.

EU member states have freedom in creating ways of impacting labor supply and labor demand. As a consequence there is a multiplicity of regulations and organizational solutions. This concerns, in particular, instruments, programs and spendings on labor market policy. It is worth emphasizing that the amount of financial resources allocated for the implementation of this policy stems not only from their availability, but also from the importance which is attributed to the programs of labor markets in the sphere of reducing unemployment.

Interest in the labor market policy realized, increases especially in the periods of high and long-term unemployment, which also affects older people. Then the discussion about the effectiveness of this policy gains momentum. Its opponents call into question the effectiveness of programs implemented in the labor market in terms of their impact on the reduction of unemployment. Its supporters point out that the ALMP is not "a golden mean" that allows to overcome the problems of employment, because it is not aimed at creating new jobs

Considering the objectives and tasks of labor market policy in the context of demographic changes, one can identify several challenges that are already visible in the majority of European countries, including Poland and the Czech Republic. These include:
- increasing the efficiency of labor market programs aimed at increasing labor force participation of older people,
- creating solutions conducive to longer presence of the elderly in the labor market,
- promoting and developing training and solutions allowing retraining of older workers,
- supporting local initiatives to increase employment of older people,
- rebuilding or strengthening intergenerational relationships in the local market, through the implementation of strategies for age management in companies.

These challenges are part of the concept of active aging, constituting an essential part of the strategy "Europe 2020" for jobs and smart, sustainable growth and inclusive, announced on 3 March 2010 (*Europa 2020*, 2010).

One of the five key indicators as defined in the strategy, is to achieve the employment rate in the EU-27 at 75% among the population aged 20 to 64 years by 2020. To attain this goal, a larger percentage of the population must remain in the labor market later in life. This is particularly important in the light of the forecasts presented, according to which the number of people at working age in the EU will begin to shrink and age.

Poland and the Czech Republic, similarly to other countries experiencing aging populations, decided to reform their pension systems. In the case of Poland one of the major changes, was to start the process of gradual improvement and equalization of the retirement age of men and women to 67 years. In addition, entitlements to early retirement were significantly reduced (Ustawa z dnia 28.03.2008 r. *o zmianie ustawy o emeryturach i rentach*, Ustawa z 19.12.2008 r. *o emeryturach pomostowych*).

In the Czech Republic it was also decided to raise the retirement age and limit the right to early retirement. An interesting solution is the differentiation of the retirement age of women which has been associated with the number of children. Moreover, as part of the pension reforms incentives were created to work after reaching the statutory retirement age. There are three possibilities (Hala, 2013):

1. the postponement of the benefit, which is associated with the increase in the future,
2. the transition to partial retirement, which is associated with receiving 50% of the pension in this period and continuing to work in the a reduced size and a higher level of performance in the time of transition to regular retirement,
3. the transition to regular retirement upon reaching the statutory retirement age and continuing working.

The indicated changes in the pension systems in Poland and the Czech Republic are part of the wider strategy corresponding to the needs arising from population aging. Narrowing the considerations to labor market policy attention should be paid to how to support older people in the labor market.

In Poland, the unemployed aged 50 and older, were classified into groups in a special situation on the labor market. As a consequence, when it comes to unemployed people over 50 years of age, the country job centers are obliged to prepare an individual action plan within 180 days from the date of registration. Under this plan, job seekers may expect a job proposal /other work, as well as various forms of activation, e.g. training, internship, vocational training of adults, subsidized employment - intervention works, public works.

The implemented policy of professional activation addressed to unemployed people aged 50 and older, but does not bring the desired results, in the form of finding permanent employment. The supervision of the Supreme Chamber of Control carried out in selected local employment offices showed that unemployed people over the age of 50 years participating in active forms counteracting unemployment do not have much chance of getting permanent employment. Most of them took up jobs for a specified period, and then re-registers itself in the labor offices (Niewiadomska 2015b, pp.163-171).

It should be emphasized that in Poland since 2008, the government program "Solidarity Between Generations has been implemented. The measures to increase the activity of people aged 50+" (*Program Solidarność Pokoleń*..2008). In addition, the legislator provided certain relief and exemptions for employers to encourage them to employ older people. Since 1st July 2009 there have regulations providing two types of relief in the payment of contributions to the Labor Fund (FP) and the Guaranteed Employee Benefits Fund (FGŚP) for employers employing older people.

The assumption that the employment of older people should be treated as one of the key factors in increasing the competitiveness of the Czech economy, was at the root of the last program "the National Action Plan Supporting Positive Ageing (NAPSPA) for 2013-2017" adopted in the Czech Republic. It identifies the main areas of actions that are relevant in the context of the use of professional potential of older people. It includes: lifelong learning, employment of older workers in relation to the pension system, volunteering and inter-generational co-operation, and healthy aging.

In respect to active ageing in employment, NAPSPA has the following general goals: revision of the pension system for increasing the motivation for longer employment of pre-retirees; support for the interests of the unemployed for self-employment with the necessary help and support; implementation of age-management strategies on different levels; and support to occupational medicine (Vidovicova 2014, p.18)

It is worth emphasizing, that in in the Czech Republic the decision was made not to create legal and financial instruments addressed to the beneficiaries on the basis of age. Hence the elderly are covered by the same support as other groups facing a specific labor market situation (Szukalski 2013, p.220).

Only in the context of passive labor market policy, can the unemployed aged 50 + count on longer paid benefits. The condition is at least 25 year of seniority. Besides "Plus" work clubs started in 2006 and focusing on the special needs of older people, it is difficult to point to the instruments of active labor market policy which would be directed to the older unemployed.

In the Czech Republic, as well as in Poland, the decision was made to create a system of financial support for employers, who create jobs for people in a difficult situation on the labor market, including people aged 50+. However, common practice is urging older workers to take early retirement. Such behavior is common practice among Czech companies, in order to rejuvenate their staff (P.O.E.P.L.E 2011).

The outlined actions show that the studied countries make efforts to increase the labor force participation of older people. Their effect is not satisfactory, though. Both in Poland and in the Czech Republic there are barriers to finding employment for people over the age of 50. On the one hand, there is a low level of human capital of older people, and low demand for older workers, which often leads to their exclusion from the labor market. On the other hand, the inability to keep a job or find employment by older people, is associated with discrimination on the grounds of age and stereotypical perception of older people as less valuable employees. As a consequence decreased motivation to work can be seen in this group (Doleželova 2007 Niewiadomska 2015a, pp.141-150).

To summarize the current considerations it can be stated that Poland and the Czech Republic will be forced to intensify their activities encouraging older people to work longer, and employers to hire them. The overview of literature indicates that increasing the use of professional potential of older people will require (Kryńska 2007, pp. 139-160):
1. improving the knowledge and skills of older people through lifelong learning,
2. offering development of flexible forms of employment on the part of employers,
3. increasing the attractiveness of work as a source of income to alternative sources.
4. eliminating the discriminatory behavior of employers,
5. implementing age management strategies in enterprises,
6. improving working conditions

6 Conclusion

Awareness of the consequences of demographic changes, but also the emerging belief that the potential of the elderly is an important basis for the further development, made both in the Poland and in the Czech Republic to increase the activity of the elderly was considered one of the priorities of state policy.

The analysis of statistical data carried out in this study, reflecting the changes in the age structure of labor resources in the surveyed countries has shown that in perspective, the even within the next decade the share of people aged 50 and older in the labor resources will increase. The aging of the workforce determines therefore new tasks for labor market policy

As apparent from the above data, the economic activity rate of older people growing in both countries is a positive phenomenon, mainly due to the increase in the employment rate. The lower than in the EU average unemployment rate of older people in Poland and the Czech Republic is also optimistic

Still, in both the countries, mature workers and older people seeking employment, face a number of barriers on the labor market. The highly dynamic changes taking place in today's labor markets, in particular the rapid development of technology, mean that senior workers' competences are insufficient. Often, this lack results from the inability or unwillingness to learn to acquire new skills. Lack of education, professional qualifications and competence, combined with poor health, all lead to a low level of employment possibilities of older people and their lack of attractiveness to employers. For this reason it is necessary to create opportunities and incentives for the professional activation of this social group. This requires raising the awareness among employers of the positive image of the older person as an employee.

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Human Capital as a Dimension of Sustainable Development of the Border Regions – the Example of Moravian-Silesian and Opole Regions

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Abstract
Human capital is a component of one of the dimensions of sustainable development. Due to the undeniable link between them the aim of this paper is to show the human capital dimension of sustainable development concept in the case of two cross-borderly cooperating regions in Czech Republic and Poland: Moravian-Silesian and Opole. The research was based on a "review of official document" by analyzing scientific achievements and documents from Opole Centre for Economic Development. As a result of the study it can be concluded that the official documents regarding development in the region poorly take into consideration the sustainable development aspect as evidenced by the incomplete under the terms of a SWOT analysis. Activities in the field of sustainable development implemented in the region are the result of available funds for this purpose and their own business initiatives / associations thereof that run the cluster projects in the field of sustainable energy and so on. Also, these initiatives are not coordinated on both sides of the border, taking into account the lack of agri-food industry as a common area of activity across borders, which is also important from the point of view of sustainable development consistent with the profiles of the two regions.

Keywords: *border regions, human capital, sustainable development*

JEL Classification: *J24, I125, O10*

Human Capital as a Dimension of Sustainable Development of the Border Regions – the Example of Moravian-Silesian and Opole Regions

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1 Introduction

Nowadays, in a globalized and highly competitive world, local and regional development is increasingly becoming associated with capital available in a given territory – i.e. potentialities for growth, development and carrying through investment projects, and socio-economic success. Each region has its own characteristics manifested in its individual elements such as environment, society and economy and in the relationships between them. These resources offer various opportunities and can be used to create an advantage. In a further development, factors like governance over territorial capital, cooperation between different actors, proactive approach to implementing innovative measures and processes of education seem to be crucial. According to the contemporary concepts of regional development, the quality of human resources and cooperation skills are perceived as the most significant factors behind it. Depending on their amount and quality, these factors can be either an essential barrier or a stimulus for development and education and continuous enhancement of qualifications of inhabitants are its important factors [20].

As the World Commission on Environment and Development (Brundtland Commission) concluded 20 years ago "humanity has the ability to make development sustainable." [16]. What does it take then to make it happen? Without a doubt, there can be identified the key role of people or in fact their knowledge, attitudes, health, vital energy, creativity and potential.

Recent challenges such as globalization, a knowledge-based economy, and technological evolution seem to prove it as they have promted many countries and organizations to seek new ways to maintain competitive advantage. In response, the prevailing sense is that the success depends in large part on the people with higher levels of individual competence. In the end, the people are becoming valuable assets and can be recognized within a framework of human capital [12].

Support for the social dimension of sustainable development is aimed at providing alternative sources of income, as well as developing economic activities which respect environment and preserve the natural landscape. Improvement of the social and technical infrastructure plays important role and all these activities should serve to lower the level of unemployment, in particular structural unemployment. The sustainable development is also associated, especially in case of rural areas, with a vision of their multi-functionality, providing conditions for varied economic activities which respect the environment, the development of social and cultural functions, as well as ensuring a good quality of life for the inhabitants.

At the same time development of human capital should take place via education, research, training and the provision of information. It is crucial activities in supporting the realization and success of a strategy for sustainable development [25].

The aim of this paper is to show the human capital dimension of sustainable development concept in the case of two cross-borderly cooperating regions in Czech Republic and Poland: Moravian-Silesian and Opole. The structure of this paper is as followed: presenting the concept of sustainable development, I will pass then to the human capital aspects, which in my opinion is fundamental and at the same time underestimated element of sustainability idea, refering to SWOT analysis announced in official documents [6]. In the conclusion I will underline another unnoticed dimension of analized regions' development, which is agri-food industry.

2 Material and Methods

The data used in this paper comes from the official analysis of Moravian-Silesian and Opole regions, which can be seen as formally announced vision of this cross-border unity: potential, development directions and political choices to realise. In this context, to asses the sustainable consciousnes and understanding of their complexity among the regional actors it is possible to use such a document as publicly announced expert's analysis. It is to represent in main points the official's view and to be agreed by them before the public presentation. Other documents describing the cooperating regions' present and the future, were not accessible. As a starting point, the most important for our initial analysis, were the scope and scale in which the documents reflect the sustainability idea and the human capital theme. The assumptions made as a basis for officially presented goals

and programs are to be confronted with statistical data describing the human capital reality of both observed regions. The comparison of main challenges image providing from Eurostat database and programming documents served to formulate the conclusions.

3 Results and Discussion

Development of cross-border cooperation is one of the priorities of the European Union. The main aim of the cooperation is to ensure the sustainable development of European border areas, reducing the negative consequences of the existence of borders as administrative barriers, legal and natural solution to common problems and better utilization of untapped potential. Between the Czech Republic and Poland there are strong social ties and economic holding a long tradition. An important precondition for economic growth on both sides of the border to help create a favorable environment for the creation and development of small and medium enterprises, which creates an important sector of the market economy of both countries. Operational Programme of Cross Border Cooperation Czech Republic - Republic of Poland 2007 - 2013 refers to the Community Initiative Programme INTERREG IIIA Czech Republic - Republic of Poland, which was implemented in the period from 2004 to 2006. The main objective of the program was to cross-border cooperation and development of the Czech-Polish border. The priority was to strengthen the relations of economic, social and cultural common concern for the natural resource, development of tourism, building resilient labor market and other areas of development. One of the priorities of the project "Cross-border network of cooperation for the development of entrepreneurship and the labor market" was to create efficient and resilient cross-border labor market [6].

Processes occurring in the world economy have a significant impact on the functioning of regions and enterprises, regardless of the scale of their business activity. One of the forms of partnership aimed at developing cooperation between enterprises, local governments, academic institutions and business environment institutions, located in immediate geographical proximity and representing related sectors are clusters[11].

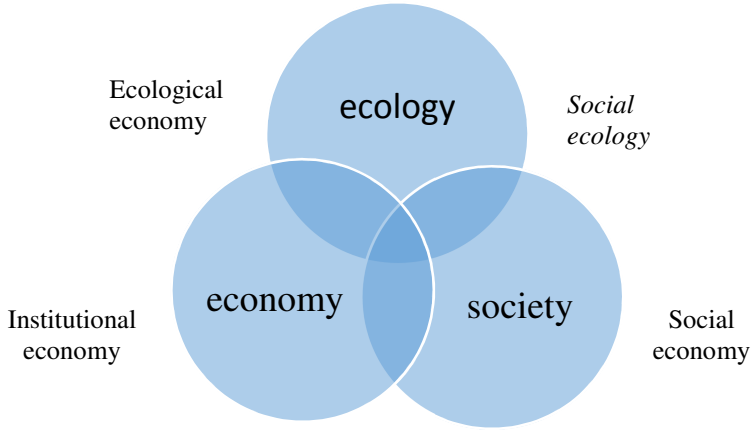
World Commitee of Environmental Development defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of needs, in particular the essential needs of the world’s poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs.”[46] [13].

Implementation of sustainable development should be based on a combination of three areas of human activity: economy, ecology and society. As J. Platje stated, different groups of people have different goals and interpretations of what sustainable development is. Business may interpret sustainable development as economic sustainability, focusing on profit, while environmental non-governmental organizations may interpret it as ecological sustainability. Making clear what interpretation of sustainable development different stakeholders use and what their priorities are, facilitates eventual negotiations and co-operation aimed at achieving sustainable development [17]. In general, however, it can be stated that sustainable development means social progress combined with economic growth without entailing a rise in the entropy of the natural environment [14], as all three components of sustainability seem equally important and complementary (Figure 1).

[46] It seems important to cite the Commission’s Communication on the CAP toward 2020 recommendation regarding strategic aims:
- to guarantee long-term food security for European citizens and to contribute to growing world food demand,
- to provide European citizens with quality, value and diversity of food produced sustainably, that is, in line with requirements of natural resources and public health,
- to maintain viable rural communities, thus contributing to employment and to territorial balance.

Based on these three aims, the European Commission has formulated three objectives:
- viable food production,
- sustainable management of natural resources and climate action,
- balanced territorial development [5].

Figure 1. Sustainability components. Source: own elaboration.



The first discussion on sustainable development referred primarily to global aspects. The cause of an increased interest in the idea of sustainable development are: intensified industrial activity, the negative changes occurring in the natural environment, and the exacerbation of social problems. However, sustainable development on a global scale must start from local and regional level.

The production of public goods and the protection of the environment require the commitment of the part of both the inhabitants and other entities functioning in these areas. A special role in the implementation of the rules of sustainable development is played by the local governments. Their decisions have an impact on the coherence, purposefulness, and efficiency of the undertaken actions, as well as on combining the social goals with the strategic vision of the development of a municipality [9]. Sustainable development depends not only on good environmental outcomes, but also on adequate employment and a well-functioning and equitable economic system and work and therefore human capital is an important dimension of sustainability. Human capital through people's skills, knowledge and attitudes is essential for the local areas, countries and therefore in global scale world to develop [2] (table 1).

The formal concept of human capital was developed in the 1960s by a group of economists associated with the University of Chicago although the idea that investment in education has a long-term economic and social payoff for the individual and society at large goes back to Adam Smith if not earlier. Human capital is defined as the aggregation of investments in such areas as education, health, on-the-job-training, and migration that enhance an individual's productivity in the labour market, and also in non-market activities [19].

Table 1 - Chosen definitions of human capital

Author(s)/year	Definition
J. I. Nakamura (1981)	Human capital as labour skills, managerial skills, and entrepreneurial and innovative abilities-plus such physical attributes as health and strength.
T. W. Schultz (1993)	Human capital as a key element in improving a firm assets and employees in order to increase productive as well as sustain competitive advantage. To sustain competitiveness in the organization human capital becomes an instrument used to increase productivity.
N. Bontis, N. C. Dragonetti, K. Jacobsen, G. Roos (1999)	Human capital as the human factor in the organization; the combined intelligence, skills and expertise that gives the organization its distinctive character. The human elements of the organization are those that are capable of learning, changing, innovating and providing the creative thrust which if properly motivated can ensure the long-run survival of the organization.
A. Mayo (2000)	Human capital as a capability, knowledge, skill, experience, and networking, with the ability to achieve results and the potential for growth.
P. N. Rastogi (2000)	Human capital is an important input for organizations especially for employees' continuous improvement mainly on knowledge, skills, and abilities.
OECD (2001)	Human capital as the knowledge, skills, competences and other attributes embodied in individuals that facilitate the creation of personal, social and economic well-being.
J. W. Walker (2001)	Human capital as the set of skills, knowledge, and capabilities organisations need to succeed in the new knowledge and technology economy.

J. McGregor et al. (2004)	Human capital embraces both the broader human resource considerations of the business workforce (traditionally known as the labour market) and the more specific requirements of individual competence in the form of knowledge, skills and attributes of managers and the people they manage
S. Gates, P. Langevin (2010)	Human capital refers to the knowledge, competencies, experience, and creativity of the workforce as well as their attitudes and motivation. By structuring the management and sharing of this knowledge, the organisation can develop key competencies that are difficult to imitate, and thereby gain a sustainable competitive advantage.
J. M. Unger et al. (2011)	Human capital as skills and knowledge that individuals acquire through investments in schooling, on-the-job training, and other types of experience.

Source: own study based on: AFIOUNI F. (2013). Human capital management: a new name for HRM? Int. J. Learning and Intellectual Capital, Vol. 10, No. 1 [online]. [cit.2016-08-28] Avaliable: http://www.academia.edu/1597200/Human_Capital_Management_A_new_name_for_HRM, VAN LEEUWEN B. (2007). Human Capital and Economic Growth in India, Indonesia, and Japan. A quantitative analysis, 1890-2000 [online]. [cit.2016-08-28] Avaliable: http://www.iisg.nl/indonesianeconomy/humancapital/pdf/proefschriftbvl.pdf, KUCHARČÍKOVÁ A. (2011). Human capital – definitions and approaches. Human Resources Management & Ergonomics. Volume V 2/2011, p. 61, MARIMUTHU M., AROKIASAMY L., ISMAIL M. (2009). Human capital development and its impact on firm performance: evidence from developmental economics. Uluslararası Sosyal Aratırmalar Dergisi The Journal of International Social Research Volume 2 / 8, p. 266 [online]. [cit.2016-08-28] Avaliable: http://www.sosyalarastirmalar.com/cilt2/sayi8pdf/marimuthu_arokiasamy_ismail.pdf

Although all definitions presented in Table 1 refer to knowledge, skills, capabilities and experience of individuals, they also differ in some aspects. In some (Bontis, Dragonetti, Jacobsen and Gross as well as Gates and Langevin) there is also mentioned intelligence, creativity and attitudes which makes them more dynamic. Schultz's and Unger's definitions refer to the process that includes education, training and other types of experience to increase the level of knowledge, skills and abilities and therefore competitiveness of human capital. Also more recent definitions seem to be more outcome oriented comparing to the former ones and connected with structuring management and sharing knowledge to develop key competences hard to imitate in order to gain sustainable competitive advantage. For instance, A. Mayo refers to potential growth and definition by OECD mentions economic well-being.

Usually with an increase in a share of population with a higher education, there is also an increase in an economic potential –areas with better-educated citizens are characterized by a larger number of economic entities, lower rate of unemployment and higher revenues (table 2). One of the characteristics for developed countries is the availability of workforce representing high level of human capital. Human Capital Index can be used to capture and track the state of human capital development. The Index includes four pillars: education, health and wellness, workforce and employment, enabling environment.

Table 2 - Tertiary education attainment, age group 25-64 by NUTS 2 regions (% of total population)

No.	**Name of the region**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
1	Moravian-Silesian region	9,9	10,6	11,4	11,7	11,9	14,1	15,4	15,4 b	16,2	17,6	16,7 b	18,8
2	Opole region	13,1	14,3	15,1	15,7	17,5	16,2	18,0 b	18,1	20	20,9	23,1 b	24,8

b - break in time series

Source: Eurostat, http://ec.europa.eu/eurostat/data/database (access: 25.11.2016)

In both observed regions the tertiary education attainment quite doubled between 2004 and 2015, but still is not satisfactory, what can compromise the realisation of regional projects, requiring the high individual competency levels to successfully cooperate and quickly respond the changing environments. Also, filling a gap between the level of education of employees, which is an indicator of the level of development of the region, in the Opole region and the Moravian-Silesian will be difficult to achieve based solely on the education of children and young people, because in both regions, their number decreases. (table 3.)

Table 3 - Pupils and students in all levels of education (ISCED 0-6) by NUTS 2 regions (% of total population)

No.	Name of the region	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Moravian-Silesian region	21,9	22	21,6	21,5	21,5	21,5	21,6	21,6	20,2
2	Opole region	23,3	22,9	22,3	21,6	21,1	21	20,5	20	19,7

Source: Eurostat, http://ec.europa.eu/eurostat/data/database (access: 25.11.2016)

Moravian-Silesian and Opole regions are combined in one of the seven cross-border programs in which Poland participates. Their aim is primarily to build ties between communities across borders. Implementation of these projects under the European Territorial Cooperation[47] has created a kind of "bridges" between different regions and countries. It also gave the opportunity to create a common European identity to inhabitants of the border regions.

A key factor for the success and proper execution of the projects co-financed from the ETC is a partnership of all institutions involved in the project. However, the specifics of partnerships mean that the first step in preparing for the implementation of the project is to initiate and support cooperation among multiple entities, which will result in a permanent partnership able to realize a project financed with the ETC. To make this possible, the animation work is necessary in environments that can potentially deliver projects on both sides of the border.

According to V. Poreisz' observation, the border regions behave in two ways: they maintain the status of margin areas or contrary, they dynamically improve. The latter, advantageous situation prevails in Czech Republic and Southern Polish areas, which are economically stable. Usually cross-border cooperation programs help further integration economically, and socially. Besides supporting cross-border cooperation and helping dynamic cities' cooperation, programs helping openness and collaboration should be organized for the society, further improvement and development of regions could be enhanced this way. ETC is designed to protect and improve transport accessibility and also the use of cultural and natural resources of Czech-Polish border areas [7].

These activities are to be complemented by promotion of the common values of the region. All initiatives are to serve to increase the importance of tourism all over the border and the creation of new jobs. There are also planned other activities in the field of education, increasing qualifications and diplomas recognition in order to reduce unemployment. Learning neighbors' language is also promoted. All these projects are closely related to build as well as efficient use of human capital of border regions. Also there is other important field supported by the program, which is safety. Its goal is to strengthen the compatibility and to link emergency systems in Poland and Czech Republic, for instance through cross-border emergency and law and order services training or the purchase of equipment necessary for joint intervention. To make the priorities of the program more complex there is also planned to undertake activities to support the cooperation of public institutions, local communities and non-governmental sector. Those activities in areas such as: culture, safety, education and spatial planning, are addressed to a wide audience. They are supposed to stimulate creativity, solidarity and spirit of cooperation between Polish and Czech society and contribute to development of the region and its inhabitants [18].

The human capital of a region seems extremely important in case of cross-border cooperation of peripherial regions. Both, Moravian-Silesian and Opole regions can be qualified as peripherial, with all of paradoxal phenomenons accompanying thre areas outside metropolies, such as:

- Natural increase in population is negative in big cities, which are the poles of development and growth for the demand for labor.
- Natural increase in population is positive in peripheries, especially in the countryside, where there is a lack of jobs and economic development factors.

The logical consequence of the above should be migration from peripheral areas, especially from rural to metropolitan areas (table 4.). Excessive emigration would result in 'leaching' development factors: migration of active, better educated people, which reduces the opportunities for development of peripheral areas. We can observe that phenomenon in both regions from more than decade, but still, there is a need for regional development policy in these areas [21].

[47] The status of implementation of the first edition of the European Territorial Cooperation programs is very advanced. Program Phare CBC, preparing for membership in the European Union and the Community Initiative INTERREG III is another series of programs for building a common European space. The next step is to bring in a consistent and competitive in the European Union. In the 2014-2020 financial perspective the main emphasis will be placed on the objectives of the Europe 2020 strategy, and further integration will take place under Objective II of the cohesion policy as a continuation of the European Territorial Cooperation (ETC). Cooperation between the border areas of Poland and Czech Republic is one of those programs.

Table 4 - Crude rates of population change by NUTS 2 region per 1000 person

No.	Name of the region	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1	Moravian-Silesian region	-2,9	-2,8	-2	-0,2	-0,3	-2,8	-3,6	-3,3	-3,3	-3,9	-3,4
2	Opole egion	-3,9	-3,9	-5,2	-4,7	-3,9	-1,9	-2,4	-3,5	-3,5	-6,2	-3,5

Source: Eurostat, http://ec.europa.eu/eurostat/data/database (access: 25.11.2016)

The question if the regional authorities are aware of that challenges linked with the human capital can be partially replied by the verification of SWOT analysis content (table 5.). We can see that many of regional problems are taken in consideration in that analysis, but some are lacking – especially those connected to human capital and sustainable development as well.

Table 5 - SWOT analysis

Strenghts	Weaknesses
Competitive industries (wood industry, construction, etc.)	Economically weak regions
The increasing cross-border cooperation of representatives of the economic sphere	Lack of expert craftsmen in the region
Growing number of mutual meetings of Czech and Polish businessmen (conferences, meetings "business to business")	Complicated legislation when setting up the company
Quality agriculture and food (mainly in Poland)	Lack of cross-border financial assistance to entrepreneurs from European funds or other
The improving quality of environment	The mentality of entrepreneurs - concerns about foreign competition (especially in Poland)
A variety of natural resources (a large number of nature reserves, protected areas and forests)	Lack of border crossings (not enough bridges)
Attractive recreation areas and a spa with a rich tradition	Faulty cross-border communication system (cabotage)
Rich cultural and historical heritage	High share of financial subsidies from the EU's on so-called "soft projects" (projects of a non-investment grade)
The similarity of the languages of both countries	Insufficient mutual information about tourist attractions
	The language barrier (more on the Czech side)
Opportunities	**Threats**
Construction of the road I/57 connecting high-speed A4 motorway in Poland	The ongoing outflow of young and educated population of the border and the consequent overall decrease in population
Harmonization of cross-border communication system	Long-term unemployment of the residents
Adapting education to the needs of the labor market in the region (focused on trades and crafts)	Insufficient link between fields of education and labor market needs
Supporting the development of economic activities with high added value and helping pro-export entrepreneurs	The decrease in public and private investment in the region
Cooperation in the field of training - promoting craft, technical and vocational education	The devastation of cultural and historical heritage (decrease of tourist attractiveness)
Supporting cluster initiatives and other forms of cooperation	Growing competition of entities in the field of tourism
Increasing the share of financial subsidies from the EU's on so-called "hard projects" (projects of investment)	Increasing language barriers
The use of fertile agricultural soil in the osoblazsky spit	
Mutual promotion of services and tourist traffic between the two regions (the huge tourism potential)	
Improving mutual knowledge of the two regions	

Source: Hruška L. et al.(2014). Analiza istniejących transgranicznych działań gospodarczych na terenie okręgu morawsko-śląskiego i województwa opolskiego. Cel 3, 2007-2013, Europejski Fundusz Rozwoju Lokalnego.

Przekraczamy granice, Studium opracowane w ramach projektu „Zapewnienie analizy istniejących transgranicznych działań gospodarczych na terenie okręgu morawsko-śląskiego i województwa opolskiego", jak również podstawowego dokumentu dla realizacji projektu „Transgraniczna sieć współpracy na rzecz rozwoju przedsiębiorczości i rynku pracy" nr ewidencyjny CZ.3.22/2.1.00/12.03440, współfinansowany ze środków EFRR i budżetu państwa w ramach Programu Operacyjnego Współpracy Transgranicznej Republika Czeska – Rzeczpospolita Polska 2007 – 2013. Dokument opracowany przez spółkę PROCES – Centrum pro rozvoj obcí a regionů, s. r. o.

The Moravian-Silesian and Opole regions cooperation program refers to SWOT analysis [6], in which mentioned aspects of sustainable development can be found. As for economy it is seen as a source of opportunities by adapting education to the needs of the labor market needs of the region and supporting development of economic activities with high added value and helping pro-export entrepreneurs. But that not necessarily means the higher education levels to attain for the regions employees. The results of the programs are not satisfactory, because the unemployment levels still are high – as for long-term unemployment (table 6).

Table 6 - Long-term unemployment rate (12 months and more) by NUTS 2 regions [% of active population]

No.	Name of the region	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1	Moravian-Silesian region	8,8	8,5[b]	7,5	4,9	4,3	3,7	4,6	4,4[b]	4,5	4,9	4,2	4,5
2	Opole region	10,0[b]	8,7[b]	5,8	3,9	2,0[bu]	2,1[u]	2,5[bu]	2,5[u]	3,1[u]	3,3[u]	2,7[u]	2,0[u]

b=break in time series u=low reliability
Source: Eurostat, http://ec.europa.eu/eurostat/data/database (access: 25.11.2016)

Ecological aspects are represented by strengths and weaknesses. For the first are improving quality of natural environment and various natural resources (big number of reservations, protected areas and forests). For the later there is insufficient mutual information about tourist attractions. And last but not least is the social dimension. On one side it generates an opportunity by increasing mutual knowledge about both regions. On the other many threads can be caused by progressive outflow of young and educated population of the border and the associated decline in the total population, long-term unemployment of residents, insufficient adjustment of training courses with the needs of the labor market and the devastation of cultural – historic heritage (decrease of tourist attractiveness). These threads can be considered on two levels: labor market and awareness of entrepreneurs. These threads are to some extent balanced by strengths, such as: increasing cross-border cooperation of representatives of the economic sphere, a growing number of mutual meetings of Czech and Polish businessmen (conferences, meetings, business to business) and rich cultural and historical heritage.
Possibilities created by the cross – border cooperation of two mentioned regions are finding their emanation in existing clusters initiatives. Namely it is a quite wide range of industrials projects focused on sustainability, such as energy saving or alternative energy sources (Spółdzielnia ENVICRACK, Klaster Budownictwa Energooszczędnego "TERMOMAX"), environment protection and tourism (Śląski Klaster Przedsiębiorstw Dorzecza Górnej Odry), recycling and reuse (Klaster Zielony Horyzont s.o.) [23, 24]. Their number is twice greater in the Moravskoslezsky Region than in Opolskie Voivodship, even if the scale is not comparable, that signalize the difference of the business leading conditions between Polish and Czech legal systems.

Thanks to the cluster approach it is possible to recognize and strengthen the infrastructure supporting companies in a more efficient manner than in the case of supporting independent objects. Cluster approach combines the ability of the system, such as education, research, development and innovation, support entrepreneurship, investment, real estate industry, the development of supply chains and last but not least sustainable development. These capabilities make the clusters effective instrument for improving the competitiveness of the economy of border areas. Precondition for the successful functioning of the cluster strategy is the involvement of the private sector. Cluster policy in Poland is specific and distinct role in the play is primarily soft factors with the lack of trust between trading partners regarded as a major barrier. One of the objectives of the Polish national strategy is removing or at least reducing the influence of soft factors on economic cooperation. The combination of the economic and science sphere is absolutely essential for a successful cooperation of cluster initiatives. Czech-Poland trade cooperation in both countries has a long and rich tradition. Every year takes place the traditional Czech-Polish meeting of entrepreneurs, which is the most prestigious event in the area of promoting Czech-Polish entrepreneurship. Czech and Polish entrepreneurs regularly exchange their knowledge and experience (know-how) during those meetings. However, in the field of cluster policy significant cross-border cooperation still hasn't been achieved. Czech-Polish cluster initiatives still lack a common orientation on the result, which would be beneficial for both parties.

4 Conclusion

European integration is carried out every day in various initiatives - from infrastructure development through environmental protection, up to projects for cultural exchange and mutual contacts of youth. Implementation of transnational projects is a unique opportunity to support projects important for several countries. Apart from economic and social stimulation there is also benefit in strengthening of bonds between communities. In case of Poland and Czech Republic there are such bonds of cooperation in the border regions. However, they require further undertakings in order to enhance economic, social and cultural cooperation. There's also a need of overcoming economic difficulties and also further human capital development as it is the factor which determines the development of these areas. Though in the Moravian-Silesian Region and the Opole province, there are several clusters and cluster initiatives, but they operate or only in the Czech or only on Polish territory. In 2014 in the surveyed regions has not hosted any functioning cross-border cluster initiatives and efforts of their creation was rather sporadic. In the field of agriculture and food there was no cluster functioning despite the fact that in the Opole province agriculture and food production are highly developed.

As a result of the study it can be concluded that the document describing the vision of offical development in the region do not take into account the aspects of sustainable development as evidenced by the incomplete under the terms of a SWOT analysis and not correspond exactly to the main problems of the analysed regions, challenging the periferiality conditions. Activities in the field of sustainable development implemented in the region are the result of available funds for this purpose and their own business initiatives / associations thereof that run the cluster projects in the field of sustainable energy and so on. These initiatives are not coordinated on both sides of the border, taking into account the lack of agri-food industry as a common area of activity across borders, what lowers the growth potential of existing cluster inititatives and their competitivness, as also the regional development possibilities. Also, tle lack of food clusters, even acting separately (within a country), which ignores not only the profile of the region, but also the recommendations arising from the CAP.

It's hard to resist the impression that some activities are only declaratory and lacking in references to the most fundamental determinants of determining the activation of human capital, especially in the simplification of legislation, when setting up the company (especially on Polish side). This results in discouraging young people to start their own economic activities and consequently even the outflow of human capital out of the country.

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Knowledge and Mutual Perception of Czechs and Poles – Synthesis of Surveys from 2013 and 2015

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Abstract
The article deals with the cultural, historical and social interrelations and knowledge between the Czech Republic and Poland. The evolution in the field of sustainable development and transfrontier cooperation between the Czech Republic and Poland in some measures is influenced and depends upon an interpersonal perception between partners. The findings about to the interpersonal perception and the neighbour state knowledge were construed by the analysis of realized researches. Thus the presented conclusion summaries and assesses the factual opinions, perception, relations and the knowledge, and could conduce to the other possibilities of the bilateral cooperation diffusion.

Keywords: *bilateral cooperation, relationship between Czechia and Poland, knowledge of a neighboring state*

JEL Classification: *A130, A140, J000, Z130*

Knowledge and Mutual Perception of Czechs and Poles – Synthesis of Surveys from 2013 and 2015

Karel Plunder

1 Introduction

Meanwhile I was choosing a topic for a conference "Theoretical and practical issues of development of the Czech-Polish border," I got the idea that I will try to exceed the theme, or rather prevented it. Each cooperation and its development is to some extent influenced by the perception of the other partner. In this particular case, the opinions, perceptions, relationships and knowledge leading to the expansion of bilateral cooperation between the Czech Republic and Poland, respectively. Poland and the Czech Republic. The paper presents the theoretical aspects of risks that may affect their own cooperation and subsequently analysed research prejudices and stereotypes, as well as knowledge and mutual perceptions between Czechs and Poles, as a tool readiness for further cooperation.

If I choose not to talk about geographical aspects, such as the fact that the Czech-Polish border length is less than 800 kilometers, I'd just said that they are analysed in the paper and then evaluated two studies, one of which examines the perceptions of residents of Cieszyn Silesia and the second then Euroregion Neisse.

The first evaluated study provides the evidence in the survey between Czechs and Poles. Respondents were students of secondary and high school at age 16 to 27 years, in the count of 400, and research was carried out in 2013. The aim of this project was to assess the knowledge of the neighboring nation.

The second evaluated work deals with the relations between the majority population of Czech nationality and the minority of Poles living in the region of Cieszyn Silesia in the Czech Republic. The aim of this research was to determine the current state of bilateral Czech-Polish relations in the region and to explore the information that is reflected in these relationships. This work is an assessment by a special method of research MCA on a sample of four respondents who represent four types of population in the region.

The aim of this paper is a synthesis of Czech-Polish relations and knowledge, based on the above analytical research work. The result should be the evaluation of their knowledge and perceptions of the neighboring state.

2 Prejudices and stereotypes - theoretical part

All of us and specially ours behaviour is influenced by experiences. These drew either own experiences, or observing the behaviour of individuals or society. This chapter describe how perceptions and behaviours affect prejudices and stereotypes.

2.1 Prejudices

Whether we like it or not, prejudices are part of each of us, and we hold the codes through which we perceive and evaluate World. It is true that certain prejudices may be true to some extent. Prejudices acquired in the family, are transmitted to us by the social media, and also we absorb them by own experiences. For examples, it is possible to state that "Africa is poor", "Italy's messy and wild," "Scandinavians suppress emotions" - the information and experience generalise and become stereotypes. In today's society it is natural that such stereotypes exist and are natural, therefore, since some people can expect certain behaviour. Human perception is the use of stereotypes faster and easier way to understand and classify the world around them. However, it is necessary to have on mind, because these stereotypes often become prejudices, as the author Kosek "... the boundaries between the two terms is permeable." [1] Other authors, however, assessed that the content of the stereotype is often statistically verifiable essence, or- If the "stereotypical character is inherent in the observed object." [2] Our knowledge can enrich, but also also limit, while prejudices work, realise it and admit it. After filling up these phases can be changes. Prejudices are not an obstacle, but must not become a perverse ideas about which we firmly believe. This leads to xenophobia and extremist attitudes.

2.2 Stereotypes

"The stereotype is, according to the testimony of dictionaries at best something very general, abstracted, mechanical, mostly automatically recall, trivial, simplificated, empty, if not false. Its content features are almost always associating the idea any expectation: what kind of response, what response can be expected in those

carriers which stereotypical characteristics; There is also a interpretation stereotypes as automatism, innervation, which reacts to certain situations psychopath. ", describes the concept as follows Reed [2].

Jan Kosek [1] clearly demonstrates the concepts of prejudice and stereotype in several experiments in social psychology, which uncovered racism on a subconscious basis. The first one was made by Claude Steele and Joshua Aronson in 1995. Those invited students of the white and black races to test the language skills. But first they had to fill out a questionnaire which included questions such as date of birth, interests, etc. White and black students, however, were still (without knowing it) to be allocated into two groups, with half the students of every race should questionnaire item in addition - had to bring racial jurisdiction. One of these four groups achieved significantly worse results than the other three groups. And a group of black students who had to state their race. This experiment refers to a phenomenon in social psychology called "self-fulfilling prophecy." As noted Kosek [1], each existing group affiliation is bound since childhood, with some expected, which translates into around him and with whom the individual, whether he wants to or not, confronts a variety of ways to adapt to them. "We helped create a stereotype, directs, and we bring it to the attention of those who ascribe to him; so to speak, it slaves, contributing to become a functioning reality." [2]

"The issue of stereotypes and prejudice is very important not only within individual companies or cultural spheres, but also in terms of the whole globalised and multicultural world." [1] There are many views on multiculturalism. It is indeed one of the hottest and most controversial topics at the same time today.

If we look at the present moment on the territory of the Czech-Polish border, an area which, although officially divided between two states, but on a human territory injustices, wars and hatred inhabited by representatives of both nations, it is clear that the coexistence of these entities with entails a number of prejudices and stereotypes. [3]

3 Resources of relationship between Polish and Czechs

This part of the presented study provides concrete conclusions of individual studies and my own assessment of the analysis of these two works as already covered. The first part is a survey of students from the area Euroregion Nisa and the second section focuses on coexistence in Cieszyn Silesia, as shown below.

Prejudices are, have been and will be - people are in fact very different. They look differently, speak differently, they think differently. They have different history, based on the most diverse cultures and peoples etc. diversity and differences are so great a number that it can hardly be summarised as a kind of basal form. And these varieties give rise to prejudice and stereotypes.

Generally, we can conclude that the barrier between Polish and Czechs are not cultural foreignness. We have a common border, which we can freely cross, the two cultures are to some extent quite similar, and the language barrier is not an insurmountable obstacle. Nor can we say that there are greater differences in the appearance of one of the entities or way of life. Despite these facts are contacts of our countries most intense, the cause can be seen as indifference with indifference. Slachciwová assessed that the relations between Czech and Polish are unjustifiably referred to as cold and neighbourhoods are built on the basis of minimum knowledge about neighbours, prone to stereotypical thinking and a general lack of sympathy.

We must take into account that each sign of stereotypes about other people's image of being seen through the prism of the nation - evaluator. Another view would have on Czech and Polish, differently it will be seen differently Italian, and it will evaluate the Japanese. The evaluation include the culture of the nation - evaluator, as well as historical events shaping his character, norms and values that every nation and every ethnic group may be different. Czech-Polish stereotypes are formed over a long period of time varies with time, as well as with the place. Statistically would probably come other values, we examined the opinion of Polish on the west side of the Republic, where people come to them too exposed, or on the east side of the Republic, which directly borders with Poland. [4]

3.1 Evaluation of knowledges and perception

For the evaluation of knowledge about the other nation and mutual perceptions among citizens of the Czech Republic and Poland, it was based on two studies - conducted research, which also deal with this issue. The first one tries to evaluate requests from various fields, such as what the association in relation to their neighbours the Polish and what the Czechs to what extent we are affected by stereotypes, how together we can communicate as Slavs, what is the relative degree of knowledge and interest in culture, evaluation mutual likes and dislikes, etc.

3.2 Survey

This section provides the specific results of the questionnaire survey conducted among young Czech and Polish in the areas of knowledge and mutual perceptions.

Research of the mutual knowledge of the neighbouring nation was carried in 2013, among 400 students of secondary schools and universities, aged 16-27 years, in the Euroregion Nisa. The research was conducted through a questionnaire survey, and included the question with the order, closed questions, open questions and graphical questions. Brief summary that reflects my own analysis is indicated below.

3.2.1 Spontaneous Association retrofitting as dominant with the word "Czech"/ "Polish"

The results of the research can be concluded that most respondents Polish youth research participated Czech mean that they are Slavs and southern neighbours who make good beer and have a car brand Skoda / these answers have emerged, particularly in men / . Women stated Golden Prague and dumplings. It's a small country, for approximately 10% of the recalls in connection with tourism. "Jozin z bazin" - a song of Czech Banjo Band, one of the most popular songs in the '70s and early 21st century, recalls in connection with the Czech Republic, 20.4% of people, while the hero of the popular bedtime Rumcajs only 17.9% of respondents, and "Good soldier Svejk" know 2% of respondents.

Whereas for Czech youth, subjected respondents, Polish are known like northern neighbours, who belong to the same family of Slavic nations. About such association speaks 67% of respondents. Additionally, 10% say Krakow as a place that equips them with regard to Poland. Polish are not perceived as a nation, whose attribute is tourism, but winter sports, with their best representatives as Justyna Kowalczyk and Adam Malysz, they are featured 4% of respondents. Important is that 8% of the sample has no association in connection with northern neighbors. Icons of Polish history have when the first association for the Czech great importance, eg., Only 4% said John Paul II.

3.2.2 The characteristic of the "Polish"/ "Czech"

Result answer to this question can determine what causes spontaneous associations neighbour, which thematic areas such associations concerned and what the youth of both countries dominating.

The collected thoughts and associations have created some associative chain. Links such as these ideas are on the subject, is demonstrated during analysis may result in a state that Polish perceive the Czech as a nation that speaks "the language of the ridiculous" that he lives comfortably and has a sense of humor. Another area of perception of Czech is a way of life. About 10% of respondents showed a penchant for tourism and their pragmatic approach to life revealed 3.8%. Nearly 9% of those surveyed did not know how to characterise neighbours. When we accept that it is a relatively permanent and simplified stereotype, even if not entirely false, mental schema used by individuals to navigate in the surrounding social environment, it can be stated that many young Polish perceive their neighbours rather stereotyped. It is due to the fact that respondents, although they were available to open-ended questions where they could bring their own association, prefer to call one of these, just formulaic answers.

And how Polish are seeing by czech? The opinion of the Polish is quite uninteresting. Czech perceive their neighbours, especially in terms of their national defects such as alcoholism and messiness. Pointed out that most of the answers. Almost half but it appreciates neighbours for patriotism, humor, bravery and prone to risk popular hiking and individualism. Compared to the Polish, Czechs other states, the inherent characteristics of Polish. They perceive a strong Catholicism, stressing piety and strong faith. Some see the Polish megalomaniac who have excessive confidence in their value. Individual respondents cited agriculture, the poor condition of roads, poor quality food, selfishnest, noise and stealing.

3.2.3 Knowledge of the neighbour state

a) flag

All Polish respondents know perfectly national colours of the Czech Republic, that means white, blue and red. It notes must be the fact that nobody was mistaken and pointed to a white-red-green flag of Bulgaria. But not everyone is able to correctly identify the Czech flag it correctly marked 95% of respondents, ie. not exactly known colour arrangement and leads to confusion with the flag of Slovakia and Croatia.

Similarly, the national colours (red and white) identify young Czech, who showed a 100% white and red, but 14% of Poland's flag correctly recognise it and confuse it with the flag of Indonesia and Belorussia, which points out that the unfamiliar arrangement of colours.

b) the national emblem

Poles are familiar emblem of the Czech Republic? On this question correctly answered 65% of respondents. Maybe it comes from the fact that the questionnaire was left to the choice of the so-called. Small national emblem of the Czech Republic. Here it should be noted that the Czech Republic has two national emblems: large and small. Practice to have two characters based on heraldic tradition. Small national emblem consists of a silver (white), two tailed lion rampant with gold claws and gold crown. The emblem consists of a red field. This is a traditional emblem of the Czech Republic.

The results represent a much better understanding of the national emblem of the Republic of Poland between Czechs. 88% correctly pointed to the eagle with a crown, a symbol of the neighbouring country. The national emblem of the Republic of Poland is a white eagle with a golden crown on his head turned to the right, with outstretched wings, golden beak and claws on a red shield

c) the national emblem

Another symbol of Czech statehood is the national anthem titled "Where is my home?". Unfortunately, he knows only a small number of people. 78% of the respondents perhaps anthem heard, but can not get to know her, she does not know the words or the tune.

Likewise Czech youth does not know the Polish national anthem. Only a quarter of respondents had heard and can identify Poles national anthem - "Mazurek Dąbrowskiego" from the 1797th

d) leaders

With the assumption that young Czechs and Poles political affairs of their neighbours do not care, they were asked only one question: Do you know who is the President of the Republic of Poland / Czech Republic?

The survey results show that slightly more than half of Poles, most respondents (55%) can correctly state the name and surname of the person who holds the highest office in the Czech Republic. For 27.5% is President Vaclav Klaus continues. Here we should add that the Head of State in March 2013. 17.5% of respondents said office continues connects with the already not alive first president of the Czech Republic Vaclav Havel.

Slightly more Czechs (64%) know that the President of the Republic of Poland Andrzej Duda. 10% of respondents confuse the prime minister and the president says Donald Tusk and 26% can jokingly say that time has stopped and considered the head of state Aleksander Kwasniewski.

3.2.4 Population and religion

Polish youth knows not only that the Czech Republic is a relatively small country, but also that lived here over 10 mil. Inhabitants, on what points to the fact that 66% of respondents answered the question of the number of inhabitants of the Czech Republic correctly.

The number of Poles living in Poland is estimated based on the last (2011) census, at 36 miles. These statistics knows 76% of Czech youth.

Religion in the Czech Republic, like Poland, has its roots in the Christian tradition, but given the historical conditions, the Czechs are generally Christian and a religious nation. This fact knows about a third of Polish respondents. But 29.3% said that it is a Catholic nation. Perhaps it stems from the fact that Christianity came to Poland just in this country and this religion can identify Bohemia. A little more, and 34.1% considers Czech neighbours for Protestants, which also has its historical reasons when we recall the Hussite movement, which in the 15th century led to a revolt against the Catholic religion in this country.

Here it is necessary to add that the Czech Republic is one of the most atheistic countries in the world. According to the census of 2011, the faith professed by 20.6% of the Czech population, while only 13.9% belong to a church or religious organization. As "infidel" is considered 34.2% of respondents. 45.25% of the population did not know how or did not want to define their relationship to religion.

Regarding the knowledge of Czechs religion of their neighbours, so the vast majority, 92%, considered by Poles as Catholics. It is in line with the 2012 survey, according to which 93.1% of Poles considered as such. Over the past seven years has increased the percentage of people who describe themselves as "without religion", atheists or agnostics (from 1.5 to 4.2%).

3.2.5 History of neighbouring state

In this area, it was asked whether respondents knew when was the current Czech state after the split with Slovakia, and also on whether it knows how long to work and when Czechoslovakia was established. Regarding the question of creation of Czechoslovakia, and most of this fact equipped with a period after the first world war, which is true. Almost the same number of respondents knew that the 1st January 1993, the peaceful division of

Czechoslovakia into the Czech Republic and Slovakia. Others, ie. 41.5% reported later date. In summary, the results of the questionnaire concerning the knowledge of some events from the history of Bohemia, it can be stated that the majority of Polish youth is very much unknown, although some personalities or events were also linked to the history of Poland. Asked whether they would like in the future of their knowledge of the Czech Republic surveyed Poles deepen answered 56% of respondents think so.

First and foremost, the question was posed regarding the recent history of Poland. On the question of the completion of the communist regime and created a free Poland, that is, cease to exist when the Polish People's Republic, correctly answered the majority of respondents (68%). 28% of respondents think that it was after the second world war. Another question concerned the Solidarity (Solidarnosc), ie. Independent self-governing trade union NSZZ Solidarność - nationwide trade union, which was established in 1980 to defend the rights of employees to 1989, one of the main centers of opposition to the government of the People's Poland. In this case, the union solidarity knew 64% .. In the case of the Czechs was the answer to the question of whether they would like in the future of their knowledge about Poland deepen, the response was positive only 48%

3.2.6 Geography of neighbouring state

Quite different are the youth knowledge about the geographical location of neighbour. Many respondents could not pinpoint the States bordering the neighbouring state. It concerns both Czechs and Polish. But it must be emphasised that the majority of respondents are well versed in geographical location neighbouring countries.

Some Polish are assigned to neighbouring countries Hungary (19.5%), and some confuse Slovakia with Slovenia (7.3%). None of the respondents did not happen as neighbouring Romania. Right, the possible combinations neighbours Czech Republic, 73.2% of those questioned answered. The fact that the Czech Republic is divided into three historical territories: Bohemia, Moravia and Silesia Czech knows more than half (58.5%) of respondents. Other areas assigned to historical and Slovakia.

Regarding the same knowledge, but also concerning Poland, and the majority (68%) can correctly name the neighbouring states of Poland. With knowledge of the historical territory of Poland on the Czech respondents ill when the current arrangement knows about a third of respondents.

3.2.7 Tourist attractions

Respondents are very well oriented, with regard posts considered tourist particularly attractive. The most commonly reported in Prague, and in more than 40%. Another city that respondents reported in 6.3%, Karlovy Vary - spa epitome of elegance, beautiful promenade, exclusive spas and beautiful location. Also beautiful mountains, which are located a few kilometres from the Polish border perceives the other, a large group of respondents. Czech Paradise Rock City, Giant Sněžka one of the places that are particularly attractive for Poles. As a popular tourist was introduced and the city: Liberec - 4.8%, Brno - 1.2%, Dvur Kralove - 1.2%, 1.2% Trutnov. I Ostrava is increasingly identifiable cultural and entertainment center full of life, especially through the famous "Street that never sleeps". 1.8% of respondents said this particular district as attractive. Interviewees also cited the length of completed roads. Czechs most often stayed at a neighbour many times, but it was a one-day stays, with 54% of those surveyed, with one overnight 18%, and several days said 26% of respondents. Only 2% of Czechs have never been in northern neighbours, their homeland.

For Czechs, the most attractive Krakow, which provides 27% of respondents. Second city, which is attractive for Czech, is Wroclaw. 13.5% said the Polish capital, Warsaw, and Auschwitz (13, 5%) and Lodz (5.4%). Wealth of Polish coastline with beautiful beaches appreciates 2.7% of respondents like the Mazurovy lakes and Krkonos or Owl Mountains (over 2.7% of respondents). Regarding the length of stay, and the vast majority of Polish visited the Czech during day trips - 61.7%. 13.4% there for two days, and 14.9% more days. 20 persons have never oversteps our southern neighbours

3.2.8 Linguistic understanding

Most of the people interviewed (61.2%) had no problem communicating with their neighbours. For others, it was no obstacle, because they did not need to communicate (29.4%) and communication problems admitted only 9.5% of respondents.

From this analysis it can be concluded that, even though we belong to the same family of Slavic languages, so young Polish understand so much the Czech language. Only 9% of respondents stated that it fully understands the language of neighbours, 33% means that the language of about half and only slightly 39.8%. More than 30 people (17.4%) stated they do not understand at all. Accordingly, another question was asked for the language that young people traveling to the Czech Republic communicates. Most people responded that they speak in their mother language, and their companions in an interview in his and have no problem to understand each other

(61.7%), though you do not fully understand well. A large group of young people used in contacts with the Czechs in English, which is 14.9%. German uses 3.5%, and well spoken Czech 4% of respondents. There were also people (14.9%) reported that they do not need to communicate with their neighbors. None of the respondents did not use an interpreter.

Very similar communications from the Czech side. Also, about 60% of those surveyed have no problem to arrange. For others, it was no obstacle, because they did not need to communicate (20%) and communication problems admitted only 16% of respondents. It also reflects the analysis of other issues related to the degree of understanding of the Polish language. Virtually all understood 12% of those surveyed, 34%, and half did not quite understand 12% of respondents. Nearly half would be in a weak extent managed to communicate with neighbors (42%) was the dominant group in this survey. During his stay in Poland, the Czechs prefer to use the mother tongue (45%) or English (41.2%). German uses 4.7% of respondents to a perfect knowledge of Polish accorded to 3.5% of respondents, which allows them to communicate in this language.

3.2.9 Mutual of visitors

The majority of Polish respondents visited southern neighbour many times. It was over 78% of respondents. Once in the Czech Republic was 26 people, which is 12.9% and 18 surveyed in this country not even once (9.0%).

Similarly, it looks with Czech respondents. Almost half of the respondents have been in Poland many times, up 48%, 38% several times, once the Polish frontier exceeded 12%, and 2% have not been in Poland once.

3.2.10 mutual sympathies and antipathies

The highest degree of sympathy scale from 1 to 10 include, from the Polish to their southern neighbours: the Czech and Slovak (6.8 and 6.3). The lowest degree of sympathy among German (4.8) and Russian (4.5). In terms of antipathy picture is symmetrical, ie. nations that have the most sympathy, antipathy have the lowest Czech and Slovak 2,7 3,1. At the other end were the German (5.5) and Russian (5.1). Of course the views of respondents were not correct and did not give the exact sum of 10. This survey is more or less identical to a public opinion survey undertaken by CBOS (Centre for Public Opinion Survey) in early 2013. For the third time in a row, top the list of most favourite nations, the Czechs, the sympathy which declares 59% of respondents. In second place are the Slovaks, for which a positive relationship reflects 58% of respondents

If we talk about czech, they mostly like the Slovak, although these nations have reported a loud divorce - it means the division of Czechoslovakia after several decades of co-existence in one state. In second place are Austrian, German on the third and last place among the Polish. This fact is related to a number of negative associations, which inspire Polish with southern neighbours like megalomania, alcoholism or theft. The degree of antipathy to the neighbouring nation is like a negative measure of sympathy, so the lowest is to Slovak, slightly higher for the Austrian, followed by German and Polish to the top. [5]

3.3 Investigations by method of Meaning Constitution Analysis /MCA/

This section evaluates the mutual Czech-Polish relations in the area of Cieszyn Silesia. Four respondents have been selected, aged 23-35 years. These were selected and divided based on nationality and the place where they lived, or are living, and also the selected population groups which they represent. This generation is not affected by the Czech and Polish Tesin relationship contradictions anymore and can objectively evaluate the current situation. This research was conducted in 2015.

Another part of the synthesis and subsequent evaluation of research in the field of mutual perceptions between the people from Czech and Poland is evaluated by Meaning Constitution Analysis, a method based on Husserl's concept of person as part of his transcendental phenomenology. Person is in this concept is characterised by an active relating to objects of the natural world and an understanding of these objects as important, therefore having significance. People shares habitat with other entities and participate with them in joint activities, and that share a common horizon of meaning, at least partially common understanding of the world and each other. How a person specifically constituted significance is not only its essential characteristics (that makes humans what it is), but also created a network of meanings based his understanding of other objects. It is therefore a method that examines the experience of subjects given the particular circumstances of the natural world in which they are located. Now such research in mutual perceptions and prejudices and stereotypes, were subjected to other respondents, with respect to the content of the contribution mention only the research conclusions.

I. respondent (Czech Republic)

Respondent states that he has good relationship with polish. His perception towards them is the same as towards other neighbours, even among my friends. With the Polish language as such are met, and that's because the

Polish minority in the Czech Republic since childhood learning Czech. The respondent also mentions joint Czech-Polish dialect called. "Po našymu" which is considered a factor connecting Czech people with the Polish people. In conjunction with the Polish minority it has a negative effect one thing, and that is introduced by the Polish inscriptions eg. At train stations that respondents deemed unnecessary waste of money, because in his words, is one of the local needs. The respondent did not discoloured Polish arouse emotions, takes a neutral point of view. In connection with temporality, which is expressed with the recurring effect, it is clear that the respondent takes the Polish for granted, as something that is natural for the world. Polish are the respondent's statement mentioned only in connection with the Czech language, which is taught from childhood, which he said contributed to the fact that Polish living in neighbourhood always perceived as all other neighbours.

II. respondent (Czech Republic)

His "entirely positive relationship" with them attributed to the fact that between them have few friends. All of its position within this entity expresses confidently without hesitation. However, all are communicated with neutral engagement and involvement, even a negative one. Similarly, the emotion or affectation in all cases except one neutral, wherein it presents a negative emotion. This fact is contrary to what a completely positive attitude. Respondent lived on the territory of Cieszyn Silesia, and therefore, according to his words met with older citizens with Polish nationality and their opinions. In the negative staining talks respondent senior citizens with Polish nationality who "still" take - apart from the younger generation - the idea that they are oppressed and discriminated against. Further, respondent points to the fact that it was this older generation that although he refers to as the Poles, already due dialect can not even Polish language. It is evident that the problems of the "past" respondent has not considered in its current generation. Her friends from these series are considered citizens of the Czech and Polish language considered an advantage, but do not use it as "a tool to promote their interests." Czech-Polish relations respondent therefore considers seamless, formulate mostly neutral stance. Within the time they are authentic expressions respondent, permanent, long. As with the previous respondent can say that the daily confrontation and coexistence with the Polish minority interviewer daily bread over which it does not show significant emotions.

III. respondent (Polish)

States that she belong to the Polish living in Cieszyn, has Polish nationality as well as both her parents. Her relationship to the Czech described as neutral, which is reflected in the modalities referred to the appropriate statements. Further there but discovers phrase "Czech", which is already in respondent written notice within quotation marks. The respondent suggests that doubts about the nationality of those mentioned, "the Czechs". Now about those "Czechs" is expressed in negative affect, according to her words, it bothers this group of people. For the respondent is an important distinction when talking about the Czechs in the true sense of the word, ie people with Czech nationality, and when a so called "Czechs", which refers to the representative of the Polish minority, who, according to her, for her "past ashamed." Respondent at the beginning of his text says: "I think our mentality is same like Czech ...", though the question is targeted about czech, respectively. What would you think of Czech, as perceived and what their mutual relations. While her response defines the mentality of Polish, which it is then compared to the Czech mentality. In the rest of the respondent's testimony already deal with issues already mentioned "the Czech", who according to her are the Polish, just behind its origins seem ashamed or deny it in other ways. “czech", who was always a Czech, I do not mind a bit. It bothers me, "czech", which used to be a Polish. "And with these" czech "a respondent problem. The fact that about those people still referred to as" the Czech "and not like the Polish, along with negative trends in their testimony proves that to them occupies a total distinctly hostile attitude, it condemned. More details are defined as people who themselves went to Polish schools, can not altogether a Czech language, but their children yet sent to Czech schools and talking with them at home Czech, thus apparently its bad Czech. According to the respondent, thereby robbing their children of knowledge of another language. In contrast, the respondent highlights some of their "intelligent" friends, as she calls, who are aware that their children can enjoy a free additional foreign language, and although they are it often "true" Czechs, send their children to Polish schools. the school plays in respondentčině text dual role. the Polish school for her to represent neutral to positive environments where there sees the benefits of the teachings of the Polish (Czechs ie second) language and a smaller number of pupils class. Czech schools are negatively perceived her environment, which accuses Polish parents to send their children to Czech schools, in which the respondent sees the effort to deny its origins.

IV. respondent (Polish)

Observations of the respondent are absolutely certain, specific, time is always valid. The respondent's involvement in the issue are divided between positive and neutral engagement. The Czechs have according to his words very positive relationship. This is reflected in positive thinking and emotions, which is inserted into the testimony. Respondent through entity I experienced things that are "them", the Czechs. Specifically, this manifests itself in a sentence: "I love the lifestyle and culture." This is a direct confrontation respondent's

feelings and experience something strange, in this case, positive confrontation. But the real significance is such that while talking about the Czechs a very positive staining, does not associate with them himself. In the experience of respondents appear to have no negative aspect. It highlights the particular humour, namely the art of making a fun of everything and laugh and ourselves. This is combined with the lifestyle and culture, which he described saying: "Can you enjoy life." Further, respondent notes that the Czechs appreciate their free time, especially the fact that they spend with their family and friends. Feel confident giving respect to something Czechs own. [6]

4 Conclusion

The synthesis of two scientific papers has been carried out. First, the research conducted on more than 400 respondents aged 16 to 27 years and from Euroregion Nisa, has used the questionnaire and was primarily focused on mutual understanding/knowledge. The second work dealt with the mutual perceptions and prejudices in the Czech-Polish relationship. In this case, four respondents were investigated using a special method - MCA analysis, the respondents were of age 23-35 years, and represented four groups of population of the region. Hereby are the conclusions of the conducted synthesis. Poles treat Czechs with greatest level of sympathy of all their neighbours, do not know enough about the Czechs, however they are not interested in any particular way to deepen that knowledge, they can communicate with Czechs despite a diversity of languages, they know the places of touristic importance of its neighbor, they link Czechs with a beer, Skoda and dumplings, and they recall a Mole and Rumcajs from their childhood memories. Conversely, the Czechs have the lowest level of sympathy towards their northern neighbours and their culture and history, they do not know much and do not perceive the deepening of knowledge as crucial, they can communicate and agree well with Poles if it is needed, and if they wish. Czechs link Poles with the church, strong faith and religion. From films Czechs know "only" Bolek and Lolek", in Czech eyes Poles are generally connected with connotations such as untidiness, poor quality of roads, megalomania and alcoholism.

However, a certain need for bilateral recognition of one another's neighbour exists. That should be bring information, especially from the fields of culture and history. Mutual contacts should be in a form of interpersonal exchange, by establishing closer contacts and by building of the mutual communication. Children in schools and kindergartens should already be acquainted with the language of the neighbor in the form of games, songs and film auditions, so that the neighbours language does not seem ridiculous and strange to them. The process of mutual discovery can be also strongly supported by joint problem solving - possibly in the form of workshops or seminars or conferences.

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Implementation of the Concept of Silver Economy in the Context of Demographic Challenges in Poland and the Czech Republic

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Abstract
Demographic transformations taking place during last decades have very dynamic character. At the same time, the pace of changes varies among particular continents, as well as within them. Demographers forecast that in the course of incoming few decades, Europe will be a continent facing the fastest process of ageing societies. This inevitably leads to significant changes, both social and economic. Possible consequences of such changes can be unfavourable for economies but can be also a chance for the development of currently not used or even not perceived potential. The aim of research presented in this article is to highlight possibilities and advantages resulting from the introduction of the silver economy concept into the economical system in the situation of forecasted demographic changes. The work analyses the situation of Poland and Czech Republic with respect to the European Union. The elaboration uses the desk research method.
Basing on the presented data, we have to state that the demographic transformation will be milder in Czech Republic compared to Poland. It concerns changes in the overall population as well as more detailed measures, including fertility rate, median age, and life expectancy at birth or indexes depicting the situation of older people on the labour market. The major part of analysed data concerning both Czech Republic and Poland exhibits the same direction of changes present in these countries but Czech economy in the perspective till 2100 will better manage the process of ageing, according to predictions of demographers.

Keywords: *aging population, demographic changes, social and professional inclusion, silver economy, the elderly*

JEL Classification: *J11, J14, J21, O52*

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1 Introduction

Demographic transformations taking place during last decades have a very dynamic character. At the same time, the pace of changes is various in particular continents, as well as within them. Demographers forecast that in the course of incoming few decades, Europe will be a continent facing the fastest process of societies ageing. This inevitably leads to significant changes, both social and economic. Possible consequences of such changes can be unfavourable for economies but can be also a chance for the development of currently not used or even not perceived potential. Such potential can be older employees or the market of goods and services aimed meeting needs of seniors. The new demographic reality can be a chance for a development basing on changing conditioning. A lack of perception of economical and social possibilities resulting from such changes can turn out to be disastrous, for example due to a possible deficiency of labour force, problems in the field of functioning of retirement systems or health care systems.

Up against demographic forecasts and considering the aspirations of economies to maintain the economical growth and balanced development, based e.g. on the engagement and use of the existing human resources and social potentials, one must perceive also the concept of the silver economy. This concept focuses on chances resulting from a growth of engagement of elder society members, for the good of the economy as well as to improve the quality of life of this part of the population. On the one hand, it is possible by professional and over-professional engagement of elder people, what may result in a growth of the percentage of professionally active persons, as a response to changing demographic proportions. On the other hand, a growth of the social engagement of seniors as a way of their social inclusion, resulting in possible benefits for themselves, other social groups and tangible economical advantages. Thirdly, the silver economy emphasises growing needs of elder people and resulting possibilities of rendering services, including arousing of new companies offering services and manufacturing goods addressed e.g. to meeting special needs of the people from *silver* segment. Thus, we have to assume that demographic changes during incoming years will be a challenge for modern economies.

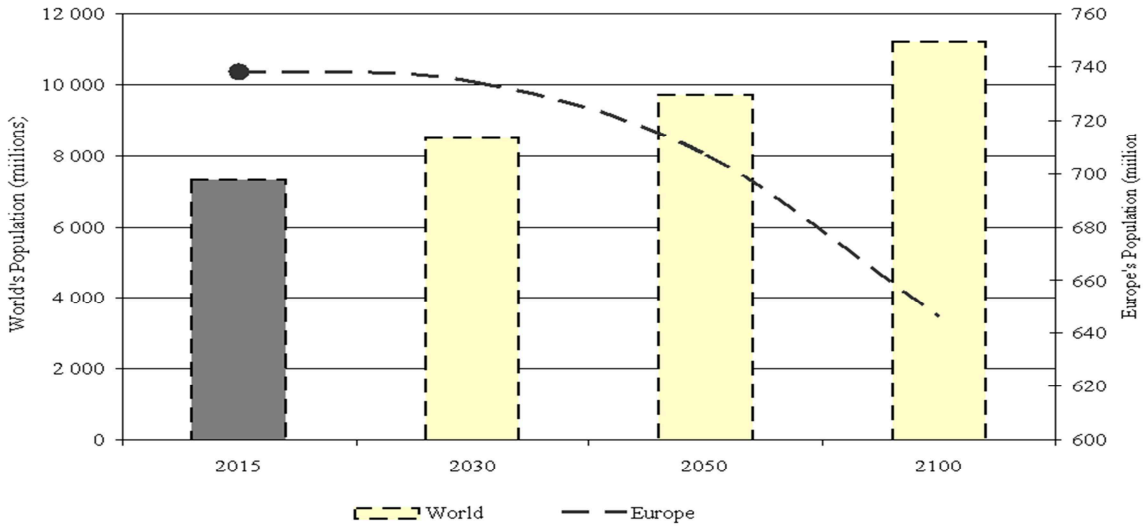
The silver economy is not only another new idea. Recommendations concerning the necessity of considering economical and social consequences of demographic transformations are expressed in numerous strategic documents of the European Union, at the same time being guidelines for national economies, what will allow to decrease and/or to avoid negative results caused by demography. It seems that this concept may be related with win-win effects. In this case, we speak about benefits related with an improvement of the quality of life of seniors, advantages for the branch of service and manufacturing, due to the possibility of developing new services and for the economy, due to e.g. a growth and extension of the professional activity, creation of new work places, reduction of pension costs and expenditures related with health care.

The research aim of this article is to present possibilities and advantages resulting from the introduction of the assumptions of the silver economy concept into the economical system in the situation of forecasted demographic changes. The work includes an analysis of the situation of Poland and Czech Republic with respect to the European Union as far as the demographic transformations and labour market situation are concerned. The elaboration uses the desk research method, using data obtained from international statistics, especially data from Eurostat and United Nations. What is more, research methods used in the work include the description method and the critical analysis of national and foreign sources, including documents and literature of the subject.

2 Demographic transformations in Poland and Czech Republic in view of Europe

According to UN forecasts, till 2100, the number of people living on Earth is to be higher by about 4 billion people in comparison to 2015. The highest percentage gain will take place in Africa and the lowest in Asia. Europe is to be the only continent where a drop of population will take place, what could be observed from about 2030 (Figure 1).

Figure 1 - The prediction of the global population and in Europe (medium variant). Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP.241.



Despite the fact that Europe as a continent will experience a significant drop of the number of people and proceeding ageing process, this process will have a various character in particular countries, in accordance to demographic forecasts. As far as forecasted changes in the number of people, Europe can be divided into two groups, i.e. countries in which there is a noticeable decreasing trend and those in which a growth of population is forecasted. Till 2080, a drop of the number of citizens is to take place e.g. in Germany, Poland, Portugal, Slovakia, Lithuania, and Hungary. A significant population growth should be observed in Belgium, Denmark, Ireland, Spain, France, Italy, Austria, Finland, Sweden, England, Norway, Switzerland, and Czech Republic (Table 1). A quick analysis of data from Table 1 allows one to state that in the scope of forecasted changes of the population, Poland and Czech Republic are in definitely various situations. The rate of the population drop in Poland will be around 23% and in Czech Republic, the expected growth is about 4.4% in the years 2015 – 2080. It means that the population policy in the analysed countries is and will be realised in completely different conditions.

Table 1 - The population in selected European countries in the period 2015-2080. Current state and forecast (main scenario)

Country	2015	2030	2040	2050	2060	2070	2080
Belgium	11 336 943	12 885 338	13 918 014	14 758 714	15 400 272	16 027 593	16 614 305
Czechia	**10 536 043**	**10 778 136**	**10 905 139**	**11 072 795**	**11 081 326**	**10 996 260**	**10 998 397**
Denmark	5 649 584	6 055 858	6 276 457	6 417 094	6 536 806	6 667 645	6 792 190
Germany	80 709 056	79 758 182	77 811 398	74 721 315	71 021 529	67 929 656	65 378 410
Ireland	4 602 854	4 556 903	4 680 654	4 964 968	5 239 211	5 522 959	5 895 992
Spain	46 390 269	44 524 313	44 611 491	45 543 565	46 117 126	46 490 103	47 599 370
France	66 175 754	70 396 105	72 767 166	74 297 319	75 599 180	77 109 937	78 842 668
Italy	60 944 960	64 115 332	66 212 289	67 058 919	66 344 759	65 456 936	65 059 083
Lithuania	2 901 039	2 201 947	1 997 167	1 910 327	1 835 498	1 806 837	1 841 709
Hungary	9 863 193	9 679 364	9 520 475	9 350 126	9 165 291	8 910 068	8 685 213
Netherlands	16 876 904	17 556 995	17 653 370	17 397 786	17 083 919	16 875 280	16 718 275
Austria	8 551 081	9 272 212	9 605 887	9 747 249	9 698 711	9 629 453	9 562 386
Poland	**38 499 953**	**37 525 745**	**36 241 010**	**34 842 067**	**33 293 791**	**31 465 728**	**29 582 117**
Portugal	10 367 550	9 777 538	9 386 339	8 862 900	8 228 392	7 618 571	7 113 878
Slovakia	5 416 851	5 314 025	5 111 991	4 869 970	4 574 335	4 218 590	3 868 254

Finland	5 478 486	5 880 844	6 057 554	6 160 986	6 239 956	6 322 737	6 381 733
Sweden	9 721 642	10 998 167	11 737 728	12 446 286	13 054 199	13 594 803	14 110 527
United Kingdom	64 643 370	70 469 762	73 841 524	77 177 523	79 951 846	82 535 019	85 148 887
Norway	5 177 196	6 364 369	7 106 447	7 689 383	8 132 298	8 518 979	8 851 414
Switzerland	8 223 903	9 555 778	10 311 607	10 882 224	11 249 587	11 568 716	11 870 552

Source: Eurostat.

The demographic situation depends on numerous factors, which often mutually act on each other. One of very essential measures imaging the demographic situation is the fertility rate, presenting the number of births per one woman. It is assumed that this index should oscillate within 2,1 in order to provide so called simple demographic renewal (Szukalski, p. 59). Analysing data included in Table 2, we must notice that in cases of Poland and Czech Republic, this index does not provide simple reproduction. Despite the fact that forecasts indicate a systematic growth of this index till 2080, it will still be too low to achieve the state of simple reproduction. Nevertheless, we have to state that in this scope, Czech Republic is in a better situation that Poland, currently as well as in the whole forecasted period.

The situation of the net migration index is quite various in Poland and Czech Republic. In 2013, in Poland there was noted a negative net migration index, what means that there were more emigrants than immigrants in that year. On the other hand, forecasts for 2020 indicate that the situation will change and the migration index will have positive values. This change can result e.g. from the EU migration policy concerning refugees. From 2040, the index rapidly increases, while decreases in 2060, however, in Poland, we will still have a positive migration balance. In Czech Republic, this index was negative in 2013, while it will be positive during the whole analysed period, to achieve 40 thousand in 2040. Comparing the net migration with the population number in particular countries, we must notice that forecasts indicate that in case of Poland, the net migration as % of population will come only to 0,1% (in the years 2040-2050). In Czech Republic, this index will be the highest in 2040s (0,4%).

Table 2 - Demographics of Poland and Czech Republic according to EU projections in the period 2013-2060

Detailed list	Country	2013	2020	2030	2040	2050	2060
Population total (mln)	Poland	38,5	38,4	37,5	36,2	34,8	33,2
	Czech Republic	10,5	10,7	10,8	10,9	11,1	11,1
Fertility rate	Poland	1,32	1,39	1,47	1,53	1,58	1,62
	Czech Republic	1.52	1,63	1,72	1,77	1,79	1,80
Net migration (thousand)	Poland	-15,6	2,9	-0,9	25,4	29,5	11,6
	Czech Republic	-1,3	28,0	35,8	40,7	25,5	21,2
Net migration as % of population	Poland	0,0	0,0	0,0	0,1	0,1	0,0
	Czech Republic	0,0	0,3	0,3	0,4	0,2	0,2

Source: own study based on: The 2015 Ageing Report. Economic and budgetary projections for the 28 EU Member States (2013-2060), European Economy 3/2015, European Commission, 2015

We can speak about population transformations also basing also on the life expectance at birth and median age indexes. The first of them depicts changes in the length of life from the moment of birth. In the analysed period, i.e. from 1950 to forecasted data for 2100, one must notice systematic extension of the life length. In case of whole Europe, the length of life will increase by 25 years, while in East Europe, this will be 22 years. In the analysed period, life length in Poland will increase by 27 years, while this index in Czech Republic will amount to nearly 23 years. The life expectancy at birth index for Czech Republic in the whole analysed period has higher values than in Poland. What is more, it is worth to mention that with respect to Eastern Europe, both in Poland and in Czech Republic, the life expectancy at birth will be higher by over 6 years, according to forecasts.

The median age indicates the limit of age, which is already exceeded by a half of a particular population, while not reached by the second half. A growth of this index means that the society is ageing. The value of this index is systematically growing in each analysed case. In case of Europe, its growth is possible by about 18 years in the period of 1950-2100. According to the forecast, the analysed index will be lower than in Czech Republic till 2030. In 2100, a half of Polish citizens will be at least 51 years old, what is almost a twice higher value than for 1950 (Figure 2 and 3).

Figure 2 – Life expectancy at birth in Eastern Europe on the background of Europe in the years 1950-2100. Source: own study based on: United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP.241.

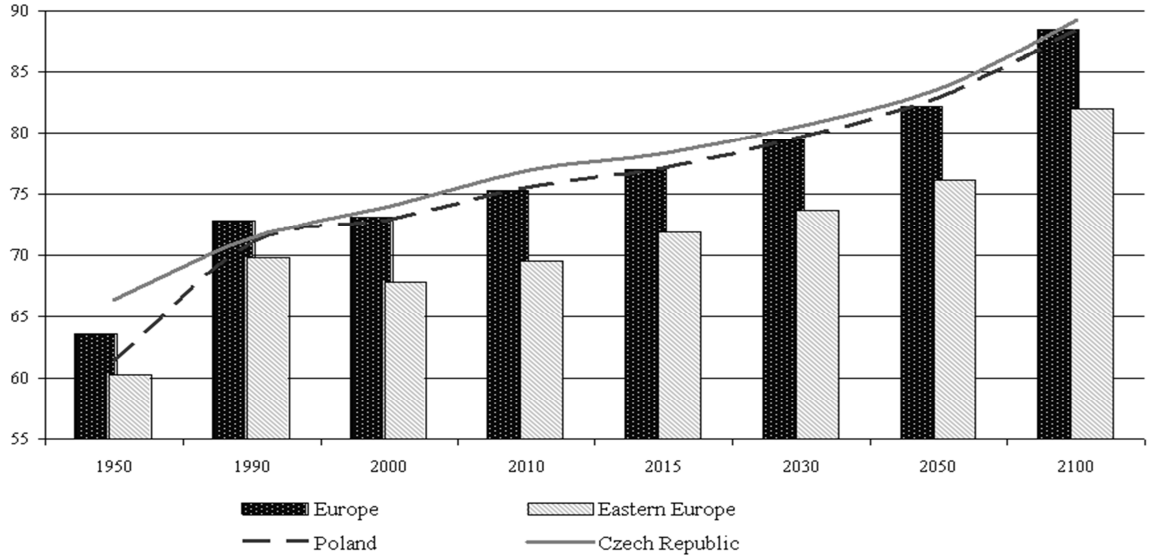
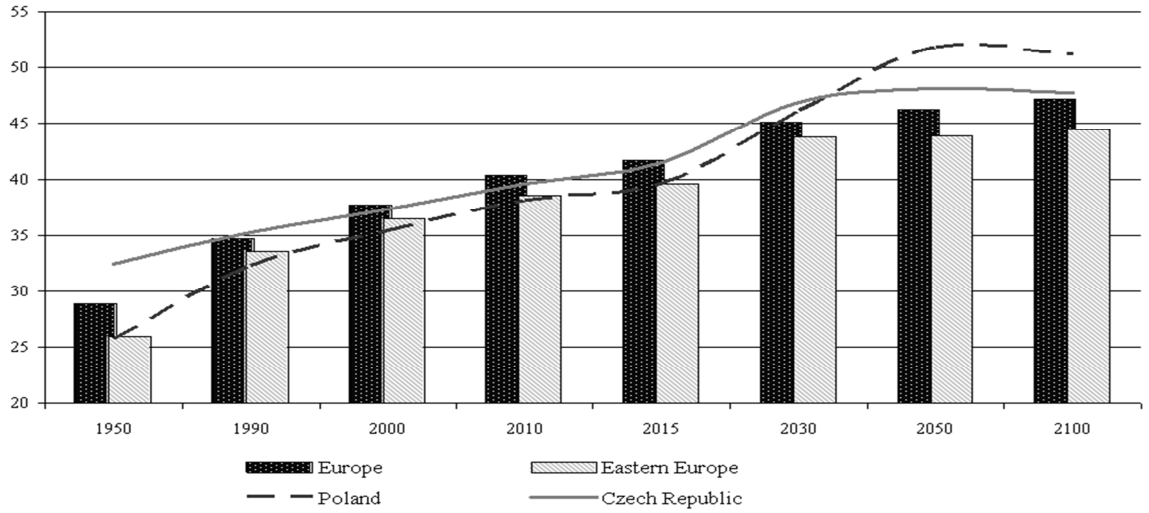


Figure 3 – Median age in Eastern Europe on the background of Europe in the years 1950-2100. Source: own study based on: United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP.241.



Shrinkage of labour resources and their ageing are two basic problems of the labour market, which have to be faced by economies struggling with demographic problems, consisting in e.g. the society ageing. Professional activity and the rate of employment of people at the pre-retirement age are an important issue up against forecasted changes, at the same time a difficult and sore point in a social perception. Extending the retirement age is most often not approved by the society, despite the fact that many economists and politicians express their point of view that there is no other solution to maintain the functioning of the current retirement system. On the other hand, existing regulations, e.g. in Poland, enabling retiring before the legal retirement age, resulted in the situation when the real retirement age was significantly lower than the formal one.

From the perspective of chances for the economy resulting from the implementation of the silver economy, the issue of the professional activity and activation of seniors obtains a great importance. Analysing the situation of Poland and Czech Republic in view of EU states in the scope of shaping the economic activity rate of people aged 55-65, one can observe its systematic growth. In Poland in 2005, this index was definitely lower than in

Czech Republic (by about 16%), while in 2015 this difference decreased and amounts to about 11%. At the same time, we must note that the discussed index in Czech Republic was higher form the EU average almost the whole analysed period. The situation of Czech Republic in the field of professional activity of seniors is more favourable than in Poland. In 2015, this index in Poland had the value of the one for Czech Republic in 2005 (Table 3).

As far as the employment rate of people aged 55-64 is concerned, dependences between shaping of this index in Poland and Czech Republic has the same direction as in the case of the economic activity rate (tab. 3). This index in the whole analysed period is lower than the economic activity rate by about 3 percent. Poland achieved the value of the employment rate in 2015 nearly as the one perceived in Czech Republic in 2005. It is a clear signal for politicians of the labour market concerning the insufficient efficiency of used activation programs for seniors. One the other hand, we have to look for reasons of such state of the attitude of employers to hire seniors, thus to promote age management activities.

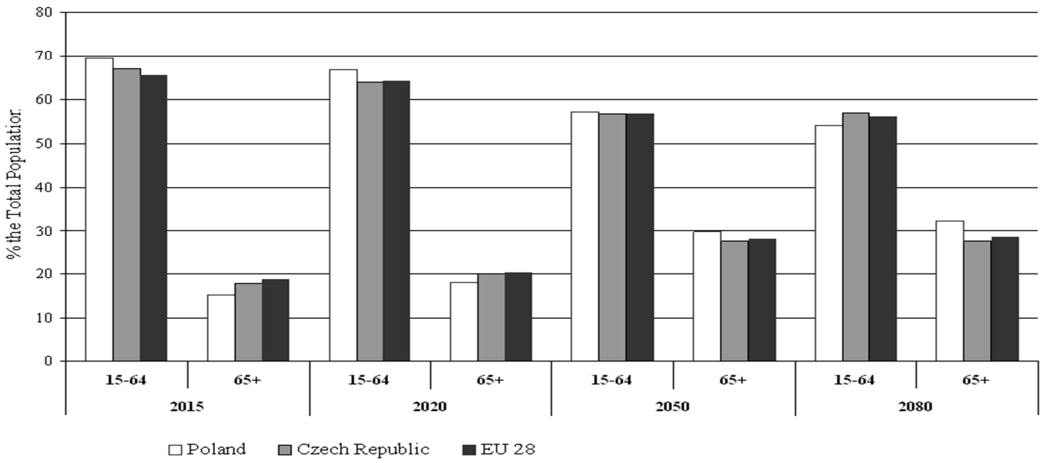
Table 3 – Situation on labour market in Poland and Czech Republic in the period 2005-2015 [%]

Detailed list	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Economic activity rate of people aged 55-64											
EU 28	45,1	46,2	47,1	47,9	49,0	49,6	50,7	52,6	54,3	55,9	57,3
Poland	30,5	30,7	31,8	33,3	34,5	36,7	39,6	41,8	44,0	45,6	46,9
Czech Republic	46,9	47,7	48,2	49,5	49,6	49,7	50,6	52,4	54,8	56,8	58,0
Employment rate of people aged 55-64											
EU 28	42,2	43,3	44,5	45,5	45,9	46,2	47,2	48,7	50,1	51,8	53,3
Poland	27,2	28,1	29,7	31,6	32,3	34,1	36,9	38,7	40,6	42,5	44,3
Czech Republic	44,5	45,2	46,0	47,6	46,8	46,5	47,7	49,3	51,6	54,0	55,5

Source: own study based on: Eurostat.

Data presented in figure 4 depict the current state and the forecast concerning the population size in the years 2015-2080, considering the working age and the post-working age. The presented data show that in Poland and in Czech Republic and in average all over the EU, in the analysed period, the percentage of working age people will be decreasing, while the percentage of people aged over 65 will be increasing. We must mention that the initial situation is most favourable in Poland, i.e. there is the highest percentage of people aged 15-64 and the lowest of those aged over 65. Nevertheless, in 2080, the situation will significantly change, in accordance to forecasts by Eurostat. Poland will be in the situation in which the percentage of people in post-working age will be higher than in Czech Republic (by 5%) and the EU average. This forecast is a warning signal against changes which the continent has to face.

Figure 4 - Forecast of the working age population (15-64) and post-working (65+) [%]. Source: own study based on: Eurostat.



Demographic changes taking place in recent years and demographic predictions allow e.g. an evaluation of the influence of transformations on the economical situation of countries. One of the key tasks of a state is providing citizens with an access to a health care system, payment of retirement allowance or social support for people in special life situation. In cases when forecasts indicate an ongoing process of ageing, one should expect a growth of public expenditures related with the necessity of the state to provide allowances for the citizens. At the same time, a growth of burden results from a drop of the population as well as from decreasing of labour resources. In fact, it can be revealed in an increase of the indexes of the burden by elder people. One of the basic indexes depicting the burden with elder people is the share of older population, presenting the share of people aged 55-64 in the group of people in working age (15-64). In Poland, in the period of 2013-2050, this rate is increasing, and after that, becomes to decrease. On the other hand, in Czech Republic, this rate is growing by 2040, and then it starts to drop, to achieve the lower value in 2060 than in 2013. We must note that the situation in this field is better in Czech Republic than in Poland and the EU average.

The share of 65+ population in the working age population (old-age dependency ratio) increases in the whole analysed period, regardless the country. However, differences in shaping of this rate between Poland and Czech Republic are very clear. In accordance to forecasts, the burden of working age people by the post-working age population in 2060 in Poland will be higher than in Czech Republic and the EU average by about 11%. This means that in 2060, in Poland, there will be 2 people in post-working age per 3 persons in working age. The analysis of the total dependency ration shows that there will be about 4 persons in post-working age per 5 persons in working age.

The demographic trends, including those concerning shaping of the burden rates, justify the threats over the economical situation of states, especially including the situation on the labour market, functioning of the retirement system, and the level and quality of life of older people. Assumptions on which the silver economy bases enable the possibility of noticing inevitable changes and undertaking activities, which in such demographic situation will allow the most efficient way of using available resources.

Table 4 – Dependency ratios in Poland, the Czech Republic and the EU 28. Current state and forecast [%]

Country	2013	2020	2030	2040	2050	2060
Share of older population*						
EU 28	19,2	21,0	22,1	21,4	20,8	19,8
Poland	20,3	19,9	19,0	25,3	24,5	20,0
Czech Republic	20,3	19,1	21,7	23,8	21,3	17,8
Old-age dependency ratio**						
EU 28	27,8	32,1	39,4	46,1	49,5	50,1
Poland	21	28	36	40	53	61
Czech Republic	25	32	35	41	48	50
Total dependency ratio***						
EU 28	51,4	56,5	63,8	71,2	75,8	76,6
Poland	42	51	57	61	76	85
Czech Republic	47	57	59	65	76	77

*Share of older population = Population aged 55 to 64 as a % of the population aged 15-64
**Old-age dependency ratio = Population aged 65 and over as a % of the population aged 15-64
***Total dependency ratio = Population under 15 and over 64 as a % of the population aged 15-64
Source: own study based on: The 2015 Ageing Report. Economic and budgetary projections for the 28 EU Member States (2013-2060), European Economy 3/2015, European Commission, 2015.

In European countries, including Eastern Europe states, the issues of ageing are becoming more often subjects of discussions and analyses. It results mainly from dynamic demographic transformations taking place in this part of Europe, which are also becoming more predictable and credible. Low birth rate, longer length of life, increasing emigration are symptoms of changes taking place during last decades. These changes significantly influence the economical and social situation of economies.

3 Ideas and assumptions of the silver economy concept

Human resources are one of four the basic economic resources next to capital, soil and technology. The population is playing the important rule in all basic economic activities as consumption, production and change. And characters of these activities have a strong contexture on the population size and development. The ageing process is one of the very important population structural matter. Age is basic structural characteristic on the field of demographic analysis (Šotkovský 2012, p. 351).

Demographic transformations which we currently observe and forecasts in this scope for future decades imply the necessity of searching for new solutions, concepts or models of economical growth. A lack of maintaining the demographic *status quo* in Europe should be a such clear signal for economists and politicians that they started to perceive new possibilities and chances resulting from forecasted changes.

At the turn of the previous century, when demographic transformation became more visible, the European Union stated that the population ageing was one of the key challenges of the 21st century. A justification for the rank of the related challenges was publishing by the European Commission of the Green Paper *Confronting demographic change: a new solidarity between the generations* (Commission of the European Communities 2005). In 2006, the European Commission published the document called *Demographic future of Europe – from challenge to opportunity,* in which it was stated that the society ageing can be regarded as a way to increase the competitiveness of the European economy, assuming that enterprises will use the possibilities resulting from the population ageing (Niewiadomska, Sobolewska-Poniedziałek 2015, p. 72). Ascertainment included in those documents allows us to state that they include an outline of the silver economy concept.

European Commission (2015) in document *Growing the European silver economy* defines silver economy as: "covers the existing and emerging economic opportunities associated with the growing public and consumer expenditure related to population ageing and the specific needs of the population over 50".

The concept of silver economy means an adaptation of the economy to future needs of the growing number of older people. The phenomenon of the ageing of societies is strictly related with creating new market possibilities and economies should be able to use them properly, depending on their capabilities and development sources (Radvansky, Palenik 2011).

According to S. Golinowska (2016), the silver economy concept is one of answers to occurring demographic transformations and related challenges. According to the politically engaged definition, this concept means inclusion of economical branches and economical activity in meeting needs of older generations in order to maintain and extend its activity and to have an influence on a better quality of life. In the near future, seniors will be more active as employees, producers and most of all consumers earlier than it was before. There will be formed markets of goods (products and services) for older consumers, new jobs and new technologies.

The American Association of Retired Persons (AARP)'s defining silver economy, which is determined as the "*longevity economy*" indicates some of its characteristic features, which include (Bank of America 2014, p. 40):

1. Every dollar spent by consumers, companies, and governments on products, services and activities that enhance the quality of life as people age.
2. The employment, personal income, corporate revenue and profit, personal and corporate paid taxes, and other macroeconomic multiplier benefits associated with the value chain and supply chain of development, launch, sale/delivery of products and services benefiting the 50+.
3. The productivity increases that result from production and service delivery changes that integrate the physical capabilities and behaviours of workers aged 50+.
4. The value creation by new 50+ entrepreneurs.
5. The value creation enabled by new and modified products based on design for all principles.
6. The tangible and intangible benefits of older skilled workers.

On the basis of current literature, one can state that the silver economy is a concept to meet expectations of transformations inevitable for economies, trying to have an influence to create new possibilities and potential of new conditions. It mainly consists in the potential of older people but also the market potential related with the expansion of the service and production sector in the course of the appearance of new needs determined by demographic changes.

Authors of „*New waves of growth*" made an analysis, on the basis of which they evaluated the influence of the silver economy on the economical growth and employment in three countries: USA, Germany and the United Kingdom. Results of that analysis are as follows:

- United States: USD 442bn added to GDP in 2020, 5 million additional jobs,
- Germany: EUR 61bn added to GDP in 2020, 1.5 million additional jobs,
- United Kingdom: GBP46bn added to GDP in 2020, 1.3 million additional jobs.

US "*longevity economy*" is estimated at USD7.1tn, making it the world's third economy, and it is expected to grow to account for 52% of US GDP by 2032 (Bank of America 2014, s. 47). This shows the extreme importance and huge impact the silver economy will have on the whole economy in just few years, which makes current studies on the silver economy and its implementation crucial.

R. Wilson from Institute for Employment Research, University of Warwick claims that „Aging of the population should not simply be regarded as a 'problem'. It can open up many possibilities that the innovative and entrepreneurial can take advantage of". In turn, F. Wendenburg from The Linde Group believes that: „The future competitiveness of our economy depends, to a great extent, on how we develop skills throughout life and retain older people in the workforce" (New waves .., pp. 36-38).

Implementation of the silver economy concept and active ageing faces difficulties related with general traits of the unreliableness of a state, the regulative and supporting roles of which are fundamental. In Polish conditions, these difficulties are more visible. The highest dynamics of ageing in Europe in the upcoming years is combined with weakening mechanisms of a stable social protection and relatively low expenditures of health care. The state policy is mainly focused on political aims and does not address incoming challenges (Golinowska, 2016).

4 The silver economy concept as a solution to economical and social consequences of society ageing

The inevitability and irreversibility of the European societies ageing process must imply particular political and economical decisions. It is required by the economical reason of each state. It is obvious that functioning in a variable environment requires searching for solutions which will be a chance for economical prosperity. Economical problems coming into sight within next few years, based on demographic transformations towards depopulation and ageing are perceived in the silver economy concept. Thanks to the growth of the professional and social participation of people aged over 50 it is possible to achieve measurable benefits. Such benefits do not have to concern only an improvement of the labour market situation but also an improvement of public finances, including a decrease of social expenditures, an increase of the pension system profits or an increase of the tax incomes.

Basing on the above presented data, we have to state that the demographic transformation will be milder in Czech Republic than in Poland. It concerns changes in the overall population as well as more detailed measures, including fertility rate, median age, and life expectancy at birth or indexes depicting the situation of older people on the labour market. The major part of analysed data concerning Czech Republic and Poland has the same direction of changes but Czech economy in the perspective till 2100 will better manage the process of ageing, according to predictions of demographers. Obviously, forecasting the demographic future in the perspective of over 80 years, one has to also consider random factors, which can have a correcting influence on the social and economical situation. One example can be the situation in Europe called the immigration crisis.

Expecting particular population transformations, economies must undertake activities which will prepare them for incoming changes. Thus, the role of states and regional and local administration bodies is essential. It concerns informative and education policies but also creating conditions favouring a development of new forms of markets. It is worth to mention the fact that regional development strategies more often focus on the necessity of considering the silver segment.

Undoubtedly, not every economy should direct its future to the activity of branches and sectors related with services for older people. Nevertheless, if we have or will have to deal with a growth of the percentage of older people, we have to consider assumptions of this concept. One must also remember that each re-orientation requires resources, thus, looking at the example of North Rhine-Westphalia in Germany, it is necessary to try to evaluate advantages resulting from this idea implementation.

As it was already mentioned, the silver economy offers possibilities of the development of new markets, employment of seniors in newly formed companies. We should also stress that the size and structure of labour supply depends mainly on demographic factors (Cichorzewska and others 2015, p. 20). Observed demographic trends strictly depict a growth of the population of older people during incoming decades in both analysed countries. A growth of engagement of older people seems to be indispensable also because the average length of life is increasing, what creates possibilities of extending social and professional activity period.

Many economists and politicians regard the silver economy as a chance to promote employment and achievement of economical growth. Such possibility is not limited only to Europe, despite the fact that for other continents another direction of transformations, i.e. a growth of populations is predicted. Ageing is a global phenomenon, however, becoming old takes place in other time and pace in various parts of the world. Considering the fact that all main trade partners of the EU face the problem of ageing and some of them will suffer from very rapid ageing, new solutions, products and services can have their own potential as far as export to third countries is concerned, especially to developing countries (Štefánik 2013, p. 12).

Apart from benefits resulting from the implementation of the silver economy assumptions, one of the main threats for its creation may be a deeper polarisation of incomes. Such situation is related with the crisis of

indebtedness in the EU, stagnation of salaries and ambiguous approach to a reform of the pension system, is not a proper space to create a consumption demand of seniors. What is important, these problems are present in old and new EU membership states (Pauhofova, Dovalova 2015, p. 190).

Population ageing will pose both major social and economic challenge and opportunity, as old-age dependency or support ratios are already low in developed markets, and are expected to continue to fall in the coming decades with ensuing fiscal pressures on public and private support systems for older persons. This can be compounded by higher levels of poverty, non-communicable diseases, and disability among older persons, especially occurring in developing markets. In this situation older persons are becoming an engine for economic growth (Bank of America 2014).

A key matter for the development of senior economy seems to be the issue of activities aimed at increasing the professional activity of people in pre-retirement age. Nevertheless, another essential activities are those supporting a development of skills of older people and promoting the idea of lifelong learning. On the other hand, one important issue seems to be a struggle against stereotypical treating of older people as tired, ill, hardly adapting to new conditions or not interested in education and development. Popularisation of the age management concept among employers can have an influence on limiting potential discrimination due to the age.

According to B. Urbaniak (2016, p. 289), the future of ageing societies depends on perspectives which will be created for the silver economy, understood as a social and economical system, directed in the economical, social and political spheres towards the realisation of the paradigm of active ageing in good health. Demographic transformations and their consequences are perceived as more important, creating strategies and plans concerning senior policies, at the international, community and national levels. Their efficiency can be evaluated only in several years, but we have to think that coherent, multi-sector activities in the scope of public policies concerning unfavourable demographic trends will result in at least a decrease of the scale of unfavourable transformations.

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Comparison of the Population Development of Moravia-Silesia Region with Silesian and Opole Voivodeships

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Abstract
The paper deals with an analysis of the population development in three European cohesion regions (Moravia-Silesia region, Silesian voivodship and Opole voivodeship) for the last more than twenty years. The main goal is to analyse their natural increase and migration behaviour. This problem we solve with the help of official statistical data from national statistical offices and Eurostat. We would like to explain territorial differences of the natural and migration movement using demographic indicators as natural increase, net migration and crude rates of natural increase and net migration.

Keywords: *Moravia-Silesia region, natural increase, net migration, Opole voivodeship, Silesian voivodship*

JEL Classification: *C46, J11, J13, J14, R23*

Comparison of the Population Development of Moravia-Silesia Region with Silesian and Opole Voivodeships

Ivan Šotkovský

1 Introduction

The main aim of this paper is to compare differences of the population development between three European cohesion regions (NUT 2 regions). Moravia-Silesia region, Silesia voivodeship and Opolskie voivodship are border areas of the Czech Republic and Poland.

The Nomenclature of Territorial Units for Statistics (NUTS) was established by Eurostat more than 25 years ago in order to provide a single uniform breakdown of territorial units for the production of regional statistics for the European Union. The NUTS classification has been used since 1988 in Community legislation. The NUTS is a three-level hierarchical classification. Some NUTS regions appear at several levels (example: Luxembourg appears as the country and at levels 1, 2 and 3). At the regional level NUTS 2, the administrative structure of the Member States generally comprises two main regional levels (Länder and Kreise in Germany, régions and départements in France, Comunidades autonomas and provincias in Spain, regioni and provincie in Italy, etc.). At a more detailed level, there are the districts and municipalities. These are called "Local Administrative Units" (LAU) and are not subject of the NUTS Regulation.

Table 1 - Recomended thresholds of the population size of the NUTS regions and their delimitation.

Territory	Number and size of NUTS regions and units LAU					
	NUTS 0	NUTS 1	NUTS 2	NUTS 3	LAU 1	LAU 2
EU - 28	28	99	272	1,316	3,596	120,975
Czech Republic	1	1	8	14	77	6,249
Poland	1	6	16	45	379	2,478
Minimum pop.		3 million	800,000	150,000		
Maximum pop.		7 million	3 million	800,000		

Source: author (EUROSTAT data)

The third NUTS level (NUTS 2) consists of 272 cohesion regions or equivalent units in the 28 EU Member States (table 1). Depending on the variable concerned, regional statistical data at one or more of the 3 NUTS levels is available in publications and databases. Many variables and time series for regional data in different domains are available on the Eurostat website.

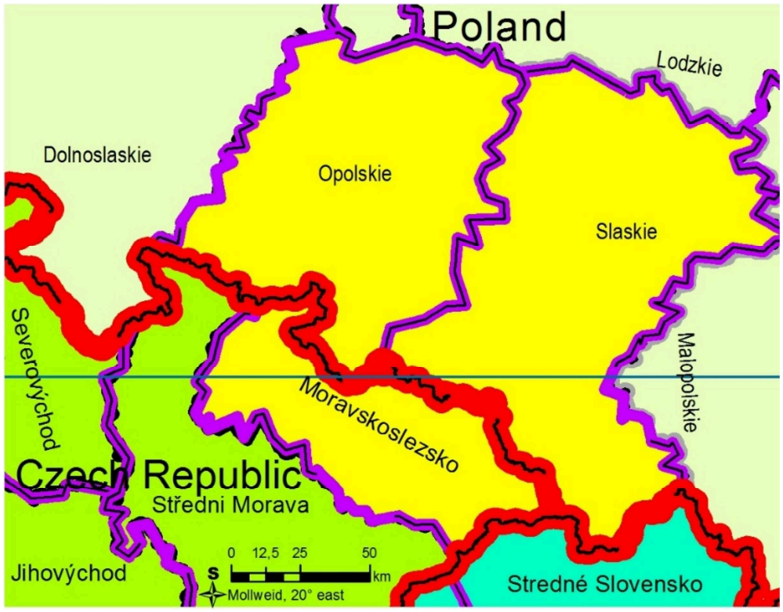
The papers is deals to the field of the social development. The key component of this field is population development, especially natural increase, net migration and total population increase. Monitoring of the population size is one of the long-term necessity of the mankind. The general analysis explore three NUTS 2 territories on the Czech Republic and Poland area (table 2), strictly speaking regions Moravia-Silesia (Czech Republic), Silesian Voivodship (Poland) and Opolskie Voivodship (Poland).

Table 2 – Basic informations about chosen NUTS 2 territories.

NUTS 2						
Code	Name origin	Name English	Country	Area (km^2)	Population	Density
CZ080	Moravskoslezsko	Moravia-Silesia	Czech Republic	5,427	1,213,311	224
PL22	Województwo Śląskie	Silesian Voivodship	Poland	12,333	4,570,849	371
PL52	Województwo Opolskie	Opolskie Voivodship	Poland	9,412	996,011	106

Source: author (EUROSTAT data, population 1st January 2016)

Figure 1 – Cohesion regions on the Czech, Poland and Slovak boundaries.



Source: author

The territory of the three cohesions regions (figure 1) has area 27.172 thousands square kilometres. This area is comparable with area of Albania or Macedonia in Europe. But in Albania live only 3 millions and in Macedonia 2 millions and on our analysis territory lives nearly 7 millions people (density 250 inhabitants to one square kilometre).

2 Analytic approaches to study development of the population size

The natural increase is the rise in population caused by the birth rate (***B***) exceeding the death rate (***D***) and excludes any population change due to migration. Crude rate of natural increase (***CRN***I) is the number of persons added to the population due to the natality and mortality over a given time period (e.g., 1, 5 or more years) and divided by the total mid-year population (***P***) and multiplied by 1,000 (1). We can say that ***CRNI*** is equal to the difference between the crude birth rate (***CBR***) and the crude death rate (***CDR***).

$$CRNI = \frac{NI}{P} \cdot 1{,}000 \text{ [‰] or } CRNI = \frac{B - D}{P} \cdot 1{,}000 \text{ or } \quad (1)$$
$$CRNI = CBR - CDR$$

The population change (Šotkovský, 2008) in an area is determined partly by the level of natural increase (***NI***) and partly by the level of net migration (***NM***).

The difference between the numbers moving in (immigrant, ***I***) and moving out (emigrant, ***E***) is net migration (***NM***) (2). **Net migration** is the difference between immigration to and emigration from a given area during the year (net migration is positive when there are more immigrants than emigrants and negative when there are more emigrants than immigrants). Since many countries either do not have accurate figures on immigration and emigration, or have no figures at all, net migration has to be estimated. It is usually estimated as the difference between the total population change and the natural increase during the year. Net migration gives no indication of the relative scale of the separate immigration (***I***) and emigration (***E***) flows to and from a country; a country may report low net migration but experience high immigration and emigration flows.

$$NM = I - E \quad (2)$$

Crude rate of net migration (***CRNM***) is simply the ratio of net migration (often including statistical adjustment) in a year divided by the total population at mid-year and multiplied by 1,000 (3). The value is expressed per 1 000 inhabitants.

That is:

$$CRNM = \frac{NM}{P} \cdot \quad 1{,}000 = \frac{I - E}{P} \cdot 1{,}000\,. \qquad (3)$$

In migration statistics, data are compiled by the age, gender, marital status, native language, country of birth, and region of arrival and departure of migrants. The population change (the total population increase, ***TPI***, *Chyba! Nenalezen zdroj odkazů.*) over time can be quantified as the number aggregate of the natural increase (***NI***) and net migration (***NM***):

$$TPI = NI + NM \qquad (4)$$

In many cases it is better to work with the relative weight of this process. We can use indicator "crude rate of total population increase" – ***CRTPI*** (().

$$CRTPI = \frac{NI + NM}{P} \quad 1{,}000 \text{ or } CRTPI = CRNI + CRNM \qquad (5)$$

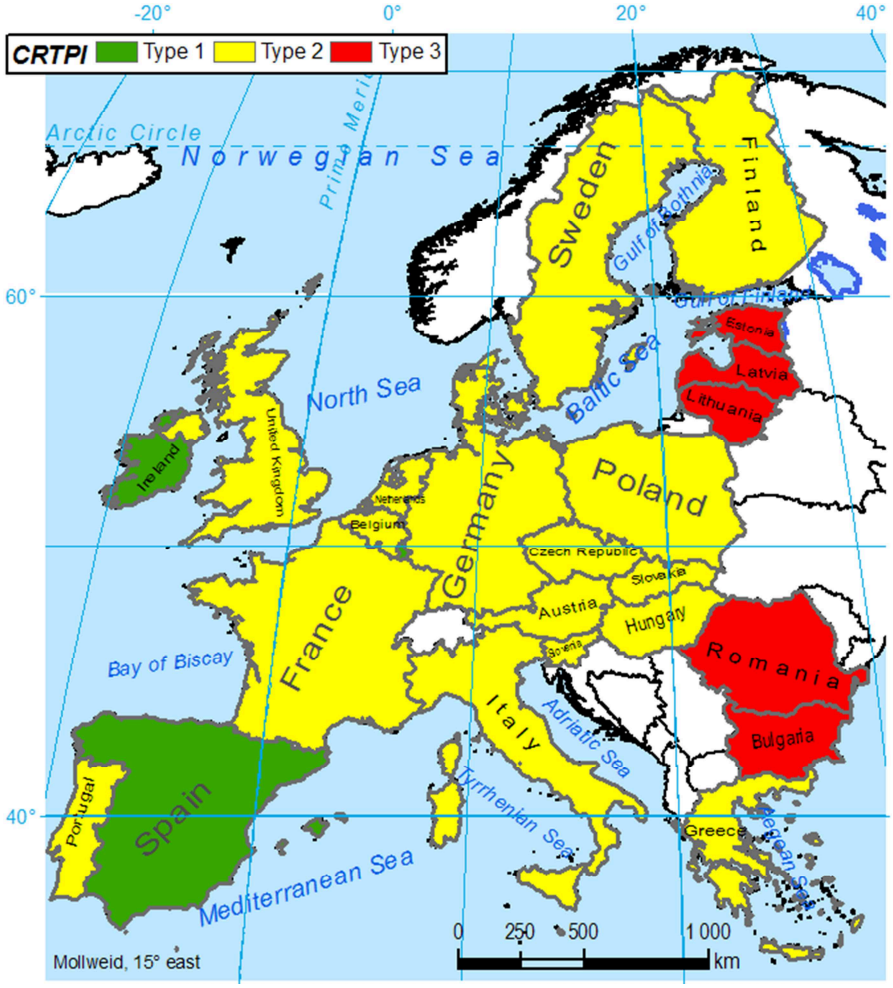
For references territory diversity values of the natural increase, net migration and total population increase we will use cartogram method. All using data come from the statistical office of the European Union (EUROSTAT), their section "Statistics" and the theme "Population and social conditions" (part „Population").

3 The analysis of the Total Population Grow on the EU Territory

The maximum of the total population growth on the EU territory was achieved during the period from 2002 to 2008 (around 4.4 ‰). The mean of the crude rate of the total population increase in the whole period from 1990 to 2015 was nearly 4 ‰ in the European Union. If we analyse the total population change by means of the crude rate of total population increase (***CRTPI***) in a longer-term perspective of the last 25 years, we can distinguish three groups (**Figure 2**).

1) The ***first group*** of the population size change is the area of the four countries (**Chyba! Nenalezen zdroj odkazů.**): Cyprus, Luxembourg, Ireland and Spain. Their population growth was more than 10.0 ‰ by year (**Chyba! Nenalezen zdroj odkazů.**).
2) The ***second group*** are countries with more remarkable growth between 1.0 and 5.0 ‰ (Belgium, the United Kingdom, Denmark, Finland, Sweden, France, Austria, Italy, Portugal, Greece, Malta, the Netherlands, the Czech Republic, Slovenia, Poland, Slovakia, Germany and Hungary).
3) Only Malta, the Netherlands and France were countries with more weight of the natural increase. This means that more than eight EU members grew due to net migration. But we can say that the size of the natural increase in Malta, the Netherlands and France is significantly affected by a long time positive net migration.
4) Only a negligible growth is stated in the following countries: Germany, Slovenia, Slovakia, the Czech Republic and Poland. But Germany significantly change own population growth because of strong immigration from Islamic countries during last two years.
5) We can indicate the territory of Romania, Lithuania, Bulgaria, Estonia and Latvia as critical regions (**third group**). Their population decrease for a long time (nearly two decades).

Figure 2 – Cartogram of three types of CRTPI in EU countries (1990 - 2015).



Source: Eurostat data

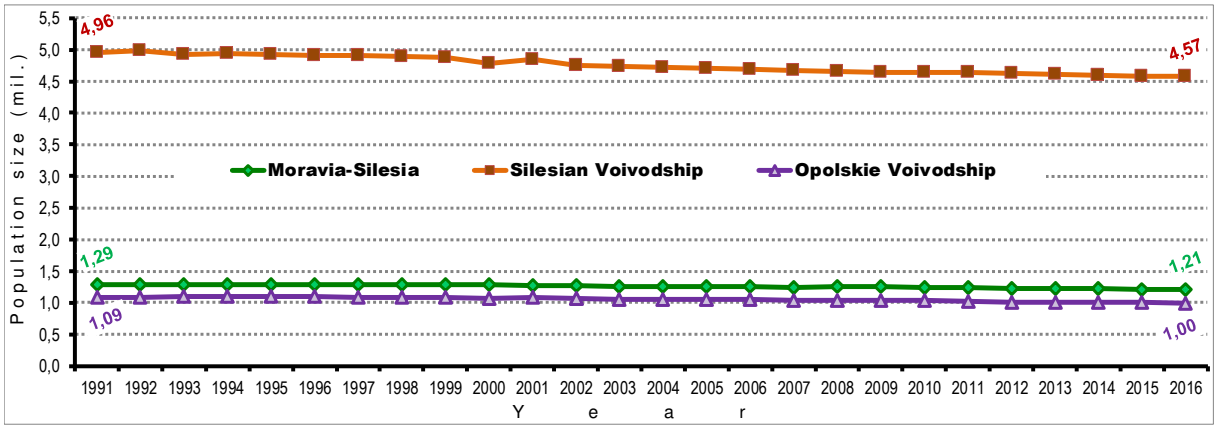
Sixteen countries from northern, western a southern Europe grew more intensively than the whole EU. Beyond eleven countries from the central and south-eastern Europe (Šotkovský, 2008) had no or very soft population growth (Germany, Slovenia, Slovakia, the Czech Republic and Poland) or visible decrease of population (Hungary, Romania, Lithuania, Bulgaria, Estonia and Latvia). The worst situation was observed on the territory of Baltic States with annual decline indicator ***CRTPI*** on the level of -7.2 ‰ with present value between -4 and -5 ‰.

4 Change of the Population Size of the Selected Cohesion Regions

Human population has an essential impact on the environmental quality. This impact depends on the ***population density*** (partly on the population size), affluence or per capita consumption and technology. This means that the population growth is very important and reliable matter of research. The importance of reducing the population growth is not equally appreciated especially on the European Union territory.

The population of the present area of the three cohesions regions (Moravskoslezsko, Silesia, Opolskie) decreased about 0.55 million people from 7.33 million in 1991 to nearly 6.78 million in 2016. This means decline population number about 7.5 % (figure 3). The most relatively decrease population number was in Opolskie voivodship (8,3 %), then Silesia voivodship (7,8 %) and Moravia-Silesia (6 %) for the last 25 years. This trend is very similar for this three cohesion regions. But it is true that a little worse situation is on Poland cohesion regions.

Figure 3 – Development of the population size.

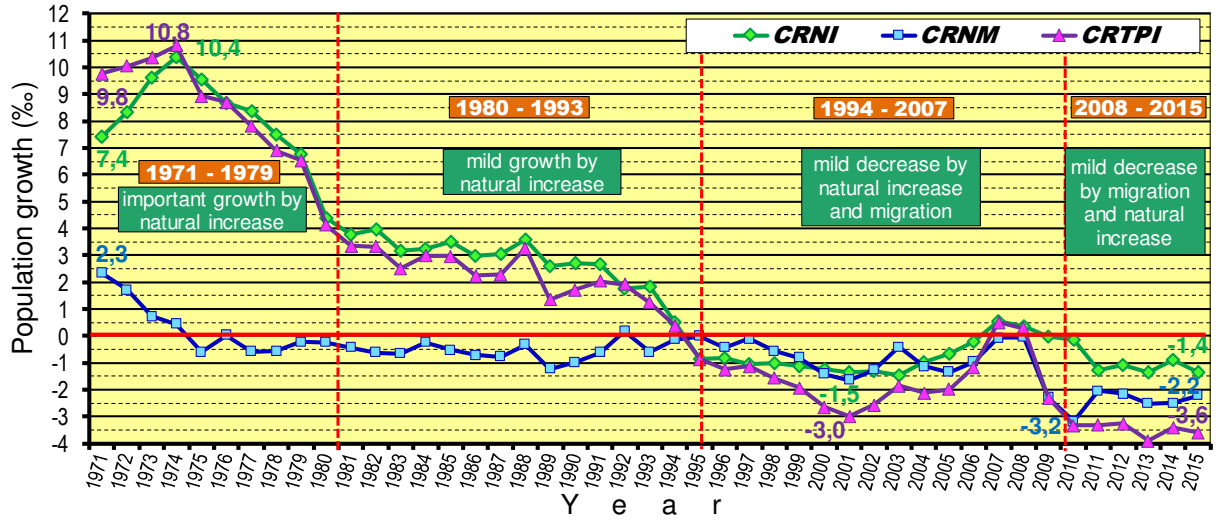


Source: author (national statistical offices data)

Population of the Silesian Voivodship decrease about 386 thousands, the Opole Voivodship about 90 thousands and Moravia Silesia region about 70 thousands for the last 25 years. But rate of the population decrease was very similar between the three cohesion regions. A little worse situation was in Opole Voivodship.

But mostly European countries has increasing population number if they ***CRTPI*** is positive between 1.0 to 9.9 ‰ by year. Population decrease has only Hungary, Romania, Lithuania, Bulgaria, Estonia and Latvia where ***CRTPI*** is negative between 1.0 to 5.0 ‰. Similar situation have our three analysis cohesion regions. The value of ***CRTPI*** **2.8 ‰** in the European Union today and will be almost -2 ‰ around the year 2060 according to the medium variant of the population projection. Migration is decisive for the evaluation of the population growth in the European Union (Bosswick, Husband, 2005) with its weight of the two-thirds now. This mean that situation on Moravia-Silesia, Silesian Voivodship and Opolskie Voivodship is totally different.

Figure 4 – Population growth of the Moravia-Silesia cohesion region after year 1970.

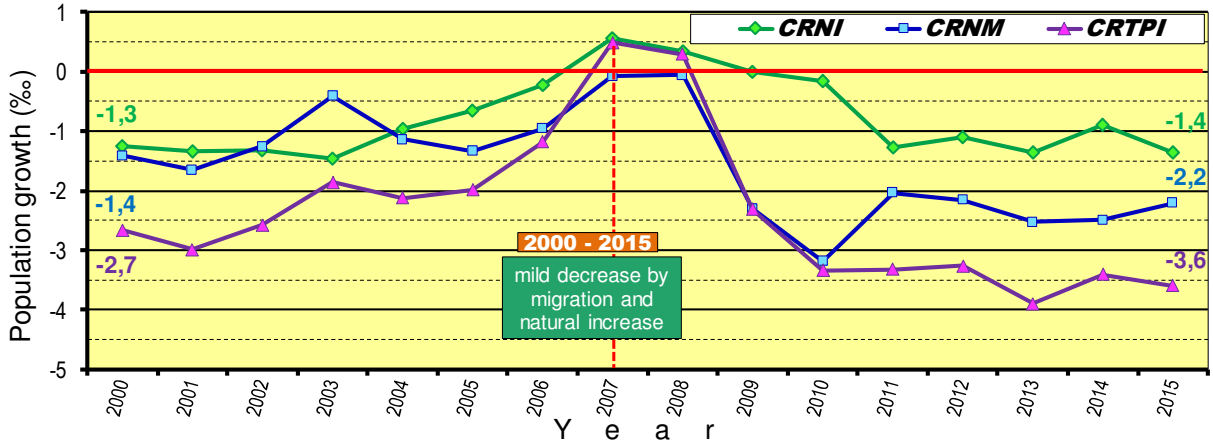


Source: author (national statistical offices data)

Top of the Moravia Silesia population size was reached at the end of the year 1990. Their population decrease between -3 ‰ and -4 ‰ by year during last decade. The total population decrease was beginning from the year 1995 in the Moravia Silesia. More influence on this downtrend has migration (approximately two third).

We can compare change of the population size only for the last fifteen years because of using only official statistical data from national statistical offices and Eurostat. We will analyse natural increase, net migration and total population increase between years 2000 and 2015.

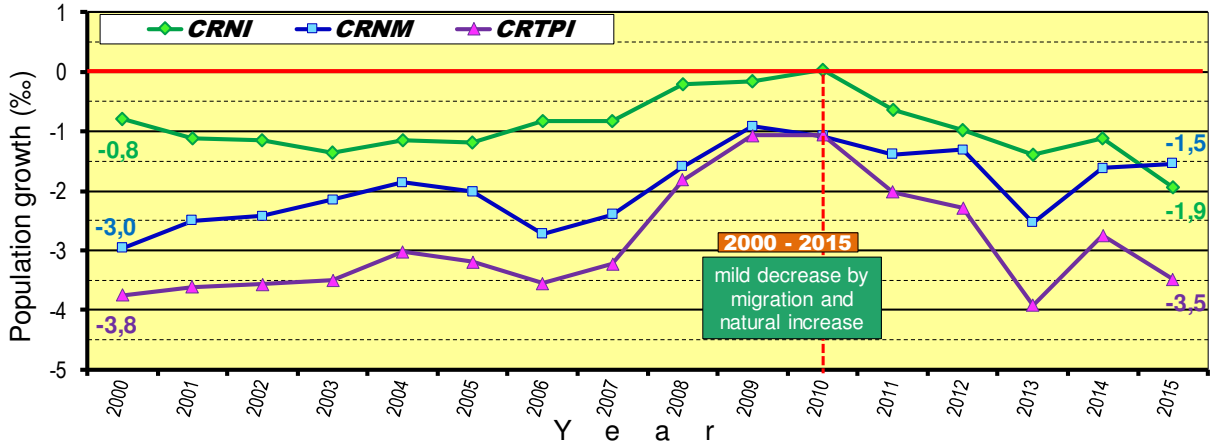
Figure 5 – Development of the population growth rates of the Moravia-Silesia region from year 2000.



Source: author (national statistical offices data)

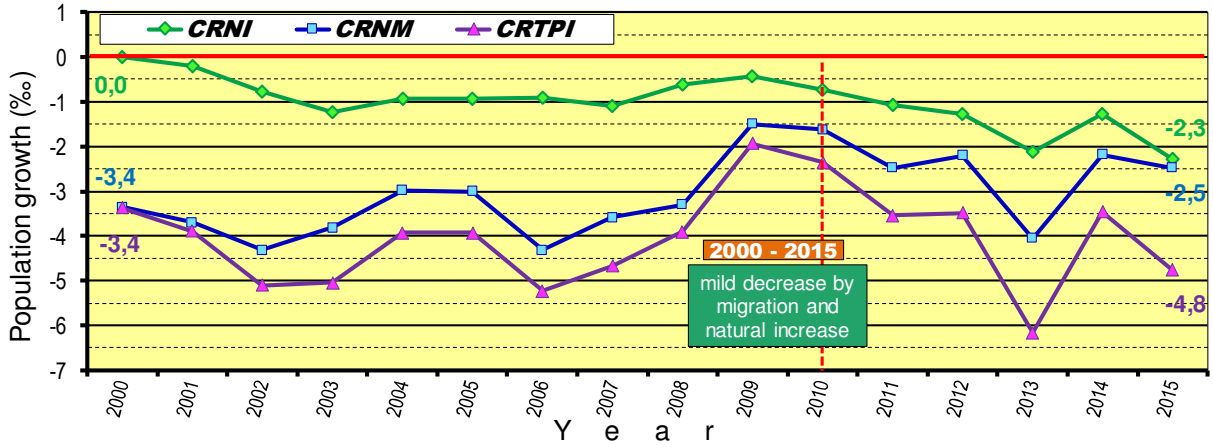
Development of the population size in Moravia Silesia region is very similar to that of the development of both Poland Voivodship (**Figure 5**, **Figure 6**, **Figure 7**). The period of the last 15 years we can named as the ear of the ***mild decrease by migration and natural increase***.

Figure 6 – Development of the population growth rates of the Silesia Voivodship from year 2000.



Source: author (national statistical offices data)

Figure 7 – Development of the population growth rates of the Opolskie Voivodship from year 2000.



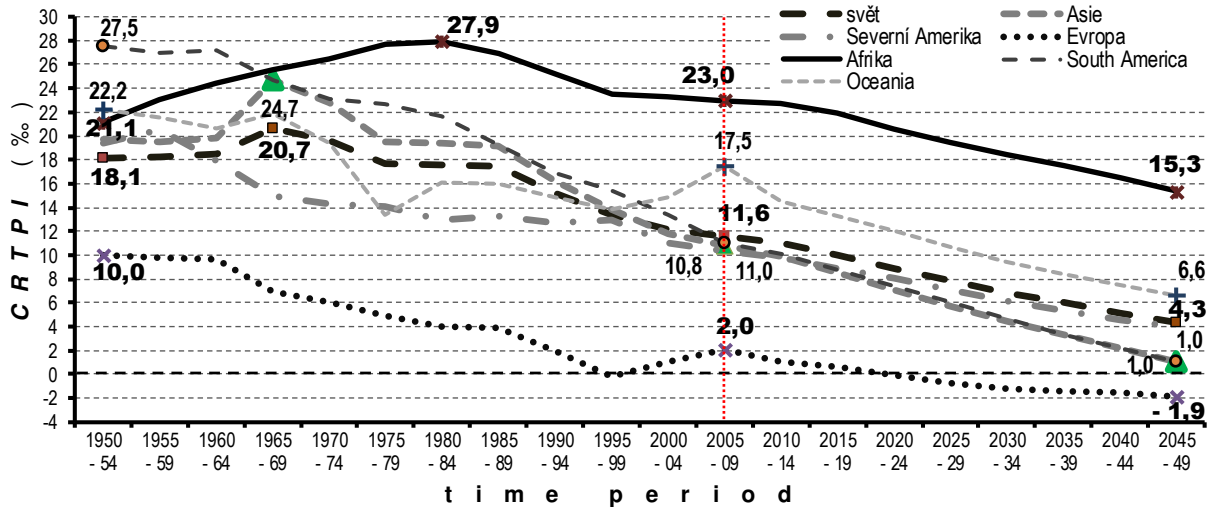
Source: author (national statistical offices data)

5 Conclusion

Almost two-thirds of European Union members must define the migration policy, especially immigration policy. They are affected by the flow of international migration and therefore the European Commission has made proposals for developing this policy, most of which have now become EU legislation. The main objective is to better manage migration flows by a coordinated approach which takes into account the economic and demographic situation of the EU. Not only economic migration is consequential problem but demographic situation too. Immigration into a country significantly contributes to the total population growth, as it is in most of the European Union countries. For a sparsely populated country, population growth can bring real benefits. But beyond a certain point the continued population growth caused by the net migration has a potential to create tensions and even conflicts among groups within countries and between countries. It is not the same when population growth results from the natural increase or net migration. Both have different impact on the size of the certain point (Šotkovský, 2011, 2012).

It is true that the population growth is diminishing due to the demographic transition and the peak of the world population size will be probably achieved during the 22nd century (around 2130) against 2015 Revision of World Population Prospects (official UN population mid-projection). The peak of the European Union population must be achieved much earlier (around 2035). But the big problem can be the migration behaviour, namely the international migration (Zlotnik, 1998).

Figure 8 – Development of the population growth the world continent.



Source: author (United Nations statistical offices data)

Now the migration in the European Union is twice higher than the natural increase. Net immigration is now and is projected to continue to be the main cause of population growth. Since the 1980s, the political decisions concerning the migration increase consider the destabilizing effects of migration on domestic integration and represent a danger for the public order. The Third Pillar on Justice and Home Affairs, the Schengen Agreements, and the Dublin Convention most visibly indicate that the European integration process is implicated in the development of a restrictive migration policy and the social construction of migration into a security question. However, the political process of connecting migration to criminal and terrorist abuses of the internal market does not take place in isolation. It is related to a wider politicization in which immigrants and asylum-seekers are portrayed as a challenge to the protection of national identity and welfare provisions.

The population growth and especially the migration are very important matters when considering the human luxury on the planet Earth. The population change evoked by international migration (not the population growth caused by natality) can contribute to political instability and conflicts. The main cause of population growth in European Union in recent years is immigration, not natural increase. And this situation will be very probably a decisive power for whole 21 century in the Europe and especially in the European Union countries. The migration behaviour will be even more significant in the case of natural decrease of population. The influence of the natural increase on the population size of all European countries is less and less. Beside this the net migration has increasing tendency. The situation on the three European regions is different only partially. Their population

decrease by natural change during last two decades have some European countries and regions too. The Europe average is between 1 or 2 ‰. This is very low stage if we compare world continents (**Figure 8**)

The basic knowledge about population development are following:

- The annual value of total population growth is 2.7 ‰ in the European Union today and will be almost -2 ‰ around the year 2060 according to projection of Eurostat.
- Net migration is decisive for the evaluation of the population growth in the European Union with its weight of the two-thirds now.
- Net migration is decisive for the change of population size in the analysing three European regions too, but its weight is negative (emigration is higher than immigration).
- Almost two-thirds of European Union members must define the migration policy
- The influence of the natural increase on the population growth is less and less. Beside this the net migration has higher signification (positive or negative).
- The "median-variant" scenario of the U.N. Population Division remains almost the same as before - predicting a world with 9.2 billion people by mid-century, up from nearly 7.3 billion today. This means annual population growth at the level 3.4 ‰ in 2050 and this is the same level as in European Union today. It is true that population growth is diminishing due to the demographic transition and the peak of the world population size will be probably achieved at the beginning of during the 22nd century (around 2130). The peak of the European Union population must be achieved nearly one hundred years earlier (around 2030). But the big problem can be migration behaviour, namely international migration. Migrants, refugees and asylum-seekers cross into Europe each day. Without increased aid to the front line states in the Middle East and the Mediterranean, more engagement from other nations, and a plan to integrate the influx of new arrivals in Europe, the Europe's migration crisis cannot be solved.
- Population development of the three analysis regions (Moravia-Silesia region with Silesian and Opole Voivodeships) is very similar. Their population development trends are opposite to basic trends in Europe or European Union now.

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The Differences in the Structure of Agricultural Production in EU Countries

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Abstract
The main aim of this paper is to classify EU countries regarding specialization and competitiveness of agricultural production. The analysis was based on classic and dynamic shift-share analysis which enabled a classification of EU countries regarding changes of production and also an assessment of structures of production related to the reference space, i.e. regional area of the EU countries. The performed research also allowed the identification of agricultural production structures characterized by specialization and competitiveness of production.

Keywords: *agricultural production,EU, structure*

JEL Classification: *Q13, C23, R12*

The Differences in the Structure of Agricultural Production in EU Countries

Agnieszka Tłuczak

1 Introduction

Agriculture constitutes a very important sector of the EU economy. Political and economic changes that are taking place in European Union have created new opportunities and posed challenges for agriculture and rural areas. They are connected with the necessity to restructure and modernize the European agricultural sector as well as the need to enhance social and economic cohesion. The accession of new member to the European Community became a condition for those changes48.

The meat sector is one of the most important in European Union (EU) agriculture. Together the four main meat types: beef and veal meat, pigmeat, poultrymeat, and sheepmeat/ goatmeat, account for one quarter of the total value of agricultural production. Half of all EU farms have livestock. Some 90 % of farmers with ruminant animals (cattle, sheep and goats) are specialist livestock producers. Meat is a major source of protein and constitutes an important part of the European diet. EU policies in the meat sector are designed to encourage the production of safe, nutritious and affordable meats. Recent changes to the common agricultural policy (CAP) underline these aims. Policies are geared increasingly towards meeting the needs of consumers, livestock producers and the environment in a balanced way [1, 4, 7].

With the production of cereals significantly exceeding 200 million tons of grouping the EU ranks among the largest grain producers in the world. The structure of plant production is: wheat -over 47%, barley - approx. 25% and corn -18%. These are the crop they are giving the biggest grain yields and dominant in international trade turnover. Other cereal species represent only 10% of global cereal production. The largest producer of cereals within the EU group is France, which with a little more than in Poland, areas planted with cereals, but with incomparably greater fertility reaches harvest within 63-68 million tons, ie. 2.5-3 times higher. Further in terms of production are Germany (44-46 million tonnes), United Kingdom (22-24 million tonnes) and Italy (19-21 million tonnes), Spain (18-22 million tonnes). A total area of these countries produce about 80% of the total cereal production groups. Income support agricultural producers in the European Union, as in many other developed countries, is one of the main objectives of agricultural policy of this group.

Making structural changes in agriculture manifested, among others, in increasing the area of farms, but farmers' incomes continue to shape significantly below the income earned outside agriculture and agricultural policy actions are necessary because their absence would lead to the rapid expansion of the existing disparities of income. The key importance of cereals in the diet of the population makes it of particular concern agricultural policy is the economy cereal and cereal producers' incomes.

Today's economic conditions related to the operation and regional development within the European Union make it necessary to take on new diagnostic tests for the prospects of economic development of regions [8]. In this study, one of the spatial methods was used to diagnose spatial dynamics of changes: spatial and dynamic shift share analysis. The main aim of this article was to analyze changes in the structure of agricultural production in the EU countries in the years 2005-2014 by using the shift share method. The study assesses the pace of change in the size of the phenomenon.

2 Literature review

The shift share method was described as an analytical technique for understanding the regional development of a national economy by Dunn in 1960 [24]. According to Dunn [10], the main feature of shift share analysis is the computation of geographical shifts in economic activity. The analysis has been used extensively since its formal inception in the fields of regional economy, political economy, urban studies, geography and marketing in the last 40 to 50 years [12, 13, 14, 15, 16, 17]. The technique is generally used to describe historical growth trends, forecast regional growth, analyze the effects of policy initiatives, or develop strategic planning for communities [18].

[48] M. Roman, K. Nuszkiewicz, Changes in Agricultural Production in Poland After Accession to the European Union, Problemy Rolnictwa Światowego, 2013, t. 13(28) z. 4, s. 156-161.

With Isard's [19] finding that any spatial unit is affected by the positive and negative effects transmitted from its neighboring regions, numerous extensions and modifications were attempted to make up the drawbacks of standard shift-share analyses. Cliff and Ord [20, 21, 22] studied the problem of spatial autocorrelation. Hewings [23] included the spatial interaction in the shift-share model. Nazara and Hewings [24] and Mayor and Lopez [25] considered interregional interaction in the decomposition analysis by incorporating a spatial structure within shift-share analysis. Fernandez and Menendez [26] used spatial shift share analysis in measuring employment growth in Spain. The technique was applied to tourism in China, based on international tourism receipts from 1995 to 2004 [27]. The study aimed at probing into the spatial competitiveness of international tourism in Jiangsu Province in comparison with its neighbors.

3 Materials and Methods

The subject of this research is structure of agricultural production, which was divided into wheat, rye, potatoes, beef and veal meat, milk and pork meat. The adopted time range of research covers the period 2005–2014. The analysis covers 26 EU countries. The necessary statistical information was obtained from Eurostat database. Structural and geographic analysis of agricultural production was conducted by using classical and dynamic shift-share analysis. In addition, with using Esteban-Marquillas model, the allocation effect was calculated [9, 10, 11, 12, 13, 14, 27, 28, 29, 30, 31].

Shift-share analysis represents a research tool that allows determining the rate of changes related to total agricultural production in each EU member countries at the background of reference area, i.e. the European Union [15, 16, 17, 18, 19, 20, 32, 33, 34]. Shift-share analysis of agricultural production in the EU countries allowed for specifying structural and competitiveness the size and type of agricultural production changes grouped according the types of agricultural product by positive and negative values of effects, as well as by specialization and competitiveness – the components of allocation effects [21, 22, 23, 24, 25, 26].

4 Results and discussions

Table 1 shows that in the analyzed period, the largest share in agricultural production was milk (38.8% in 2005, 35.0% in 2014) and wheat (35.3% in 2005 and 33.5% in 2014). The changes that have taken place in the structure of production were small. This is mainly due to the fact that these changes are characterized by a slow pace.

In the structure of agricultural production in the Czech Republic in 2005, the biggest part was wheat (48%) and milk (33%). Other products, which were taken under consideration, not have a significant share in the total agricultural production. This situation continued in subsequent years. In Poland, the structure of agricultural production presented similarly, milk and wheat and potatoes dominate in the agricultural production.

Table 1 - Structure of agricultural production in EU in 2005-2013 (%)

Countries	EU		Czech Republic		Poland	
Year	2005	2014	2005	2014	2005	2014
wheat	35,30%	33,50%	47,99%	54,85%	23,88%	27,23%
rye	2,00%	12,10%	2,28%	2,05%	9,27%	9,64%
potatoes	16,20%	13,10%	11,73%	6,27%	28,23%	20,41%
beef and veal meat	2,10%	1,70%	0,94%	0,76%	0,84%	1,11%
milk	38,80%	35,00%	32,66%	33,24%	32,46%	36,51%
pork meat	5,60%	5,10%	4,40%	2,84%	5,32%	5,10%

Source: author's own calculation based on Eurostat database.

Table 2 presents the effects of changes in structure of agricultural production which allow identifying the economy sectors exerting key impacts on the EU countries' economic growth in the period 2005–2014. Net structural effects were defined by means of decreasing gross effects in terms of agriculture production growth

rate in European Union. The largest production rate occurred in rye sector (+31,3%). This large increase it was due to increased production in Germany, Denmark and Netherlands. Decreasing of rye production, in this same time in Poland and Czech Republic, could be observed. the biggest decrease in agricultural production concern to potatoes (-11,0%). In the analyzed period in all EU countries fall in production of potatoes was recorded.

Table 2 - Results of classic shift-share analysis with regard to the effects of meat production changes in the sectors grouped according to types of meat.

Effects of meat production changes in EU countries (in %)		2014/2005
Total effect (growth rate of meat production in EU)		+1,8
Net structural effect	Wheat	+3,8
	Rye	+31,3
	Potatoes	-11,0
	Beef and veal meat	-10,3
	Milk	-0,1
	Pork meat	+1,3

Source: author's own calculation based on Eurostat database.

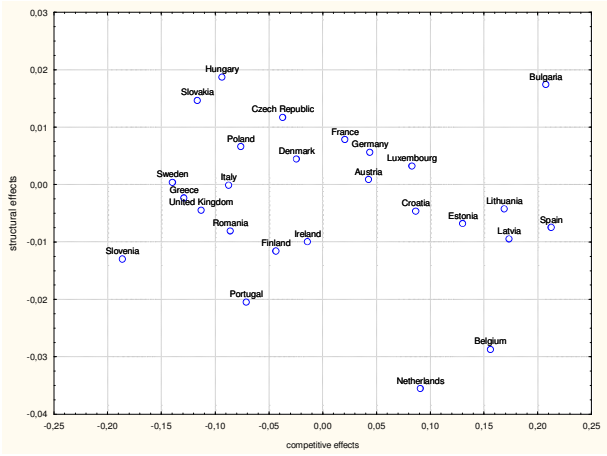
Table 3 and Figure 1 illustrate the classification of EU countries with regard to aggregated structural and competitive effects. The first class covered those countries in which sectoral agricultural production structure has a positive impact on rate growth of the products concerned and economic sectors are characterized by higher dynamics of production size fluctuations compared to other regions. This group includes five countries. In this class Bulgaria stands out as characterized by very strong positive effects, both structural and competitive ones, definitely higher than in the other countries covered by this class. The second class characterized by a positive value only of the structural factor lists six countries. The most favorable changes in meat production structure observed in this class in the analyzed period occurred in Hungary. This region was characterized by the highest structural effects and the lowest competitive effects. In this group we can find Poland and Czech Republic. At the same time the effects are higher for the Czech Republic than in Poland.

Table 3 - Classification of EU countries by positive and negative aggregated effects values: structural and competitive (dynamic shift-share analysis 2014/2005).

Criterion of division	Countries	Number of countries
effects: structural (+) competitive (+)	Bulgaria, France, Germany, Luxembourg, Austria	5
effects: structural (+) competitive (-)	Hungary, Slovakia, Czech Republic, Poland, Denmark, Sweden	6
effects: structural (-) competitive (+)	Lithuania, Croatia, Estonia, Spain, Latvia, Belgium, Netherlands	7
effects: structural (-) competitive (-)	Italy, Greece, United Kingdom, Romania, Ireland, Finland, Slovenia, Portugal	8

Source: author's own calculation based on Eurostat database.

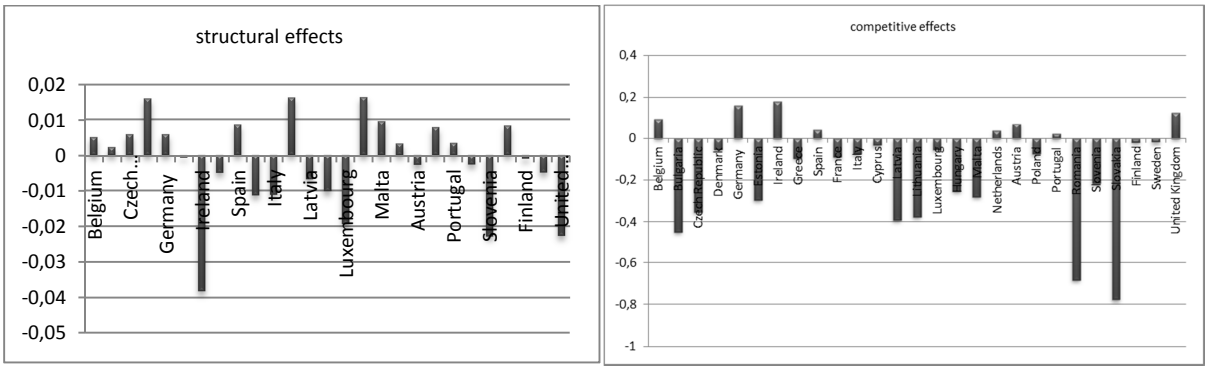
Figure 1 – Aggregated structural effects vs. aggregated competitive effects.
Source: author's own calculation based on Eurostat database.



The third class, featuring positive influence of only the competitive factor, covered seven countries. In this class Lithuania was characterized by definitely the least favorable changes in structure of agricultural production. The fourth class covers the countries in which both agricultural production structure and internal competitive development determinants exerted negative impacts. This is the most numerous class including eight countries. The most unfavorable competitive effects of agricultural production changes were observed in this class with reference to portugal whereas the least favorable structural changes were recorded in Slovenia too.

Figure 2 presents the values of aggregated structural and competitive effects arranged according to the decreasing values calculated for 2005–2014. As it can be observed, in the analyzed period competitive factors exerted a much larger impact on agricultural production changes than the structural ones. The most favorable changes of agricultural production determined by structural effects occurred definitely in Hungary and Bulgaria. The biggest negative influence on structure in production changes was observed in Netherlands and Belgium.

Figure 2 – Aggregated structural and competitive effects for EU countries in 2005-2014. Source: author's own calculation based on Eurostat database.



5 Conclusions

(1) Since 2005 EU countries recorded a increase in agricultural production by 1,8%. the changes in rye production resulted in an average rate by 31,3% in 2005-2014.

An increase in wheat production (3.8%) and pork meat (1.3%) also was recorded. In the case of other products which were taken under consideration, the decrease of share in total agricultural production it was observed.

(2) The most favorable changes related to structural factors in agricultural production occurred in Hungary, Bulgaria and Slovakia. In this countries the biggest share of rye in total agricultural production could be observed. In this sector the changes were the biggest in these countries.

(3) The most favorable competitive effects took place in Spain, Bulgaria and Latvia, whereas the least favorable ones in Greece, Sweden and Slovenia. In a general ranking of the 26 countries due to changes in the structure of

agricultural production due to competitiveness factor Poland and the Czech Republic are in the second half of the rate; Poland occupies 18th position and the Czech Republic - 15.

(4) It should be noted that structure of agricultural production depend on agricultural prices. In 2005-2014 the downward trend of pig meat production could be observed, because of low supply of pork and beef. In 2014 due to the improvement of the economic situation in EU countries, as well as due to a decrease in crop prices, the future for meat sector seem to be better.

(5) Finally classic shift-share analysis and dynamic shif-share analysis aproved to be a useful method in identifying changes related to structure and dynamics of size of agricultural production in EU countries.

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Cooperation between Czech and Polish Entities in the Context of Cross-Border Cooperation in the Euro Region Silesia

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Abstract
The paper is focused on the evaluation of entities cooperation on both sides of the border between the Czech Republic and Poland, through their involvement in specific projects of cross-border cooperation in the framework of the Operational Program cross-border cooperation of the Czech Republic - Poland in the period 2007 - 2013. It is about use of support from the Fund of micro-projects for the territory of Czech - Polish borderlands on the territory of the Euro region Silesia. The support of cooperation was determined by the priority axis aimed on support of cross-border cooperation in the development of interpersonal relationships, social, cultural and leisure activities and cooperation between public administrations and organizations providing public services.

On the basis of information on activities and management of Fund of micro-projects is this paper focused on concrete results of submitted, respectively implemented projects. The source of analysis was the information on individual supported projects and their basic parameters. Article affects the structure of the recipients of subsidies, industry focus and structure of the supported projects in terms of their financial volume and on based of the analysis further specifies selected issues, which were noticed in the monitored period.

Keywords: *cross-border cooperation, projects, Euro region, subsidies*

JEL Classification: *H71, F36*

Cooperation between Czech and Polish Entities in the Context of Cross-Border Cooperation in the Euro Region Silesia

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1 Introduction

The coexistence of countries within the European Union is supported by various forms and programs which are implemented by the European Union. One of the directions of the implemented support is the support for cooperation of entities that are located near the conjoined borders of individual countries and thus aims to overcome the barriers of borders. This form of cooperation is known as cross-border cooperation in the Czech Republic (CR) and this cooperation take place with all the neighboring countries.

This paper focuses on one area of cross-border cooperation - on cooperation between the Czech Republic and Poland, and especially to the territory, which constitute the Silesia Euro region.

The aim of this paper is to evaluate the cooperation between players on both sides of the border through their involvement in specific projects of cross-border cooperation, in terms of domains of realized projects and in terms of the size of the projects implemented in the framework of cooperation between players from the Czech Republic and Poland. It is about the use of support from micro-project Fund for the territory of the Czech-Polish borderlands on the territory of the Euro region Silesia in the period 2007 to 2013.

This support of cooperation is delimited by the priority axis focused on promoting of cross-border cooperation in the field of interpersonal relationships development, social, cultural and leisure activities and cooperation between public administrations and organizations providing public services.

1.1 The focus of support of cross-border cooperation

The global objective of the Operational Program of cross-border cooperation between Czech Republic - Poland for period 2007-2013 (hereinafter Program) was the support of socio-economic development of the territory of the Czech-Polish borderlands by strengthening its competitiveness and cohesion, and promoting of partner cooperation of its inhabitants. This global objective was met through four priority axes. The fund for micro-projects is one of the area of Priority Axis III intervention, namely Cooperation support between local communities. Program resources are provided by the European Regional Development Fund.

Fund for micro-projects is a flexible instrument for the realization of the smallest projects of Program, which focuses on small non-investment or even small investment projects with cross-border implications. The fund for micro-projects was designed especially for projects in Priority Axis III of Program, but could be also used for submission of small projects thematically falling under I. and II. priority axis.

1.2 Financing of cross-border cooperation in the Euro region Silesia

For fund of micro-projects was allocated 20% of resources of the Program, for a total amount of 43,891,869 EUR for the whole programming period. This amount was then divided into allocations for territories of individual administrators that are entities operating in the borderlands areas of the CR. For the territory within the Euro region Silesia was allocated for the whole programming period for projects a total of 5,918,550 EUR, of which:

- Czech part 2,603,550 EUR,
- Polish part 3,315,000 EUR.

Different amounts of funds between the two countries have been given by the respective sizes of supported territory. For individual projects that could be funded by the Program, the grant was defined by a minimum of EUR 2 000 and a maximum of EUR 30 000. The total eligible costs of the project could be up to double the maximum amount of a grant from the Fund. Financing of micro-projects on the Czech side was done by the form of subsidies of max. 85% and 15% of the applicant's own resources, on the Polish side in the form of subsidies max. 85%, 10% from the state budget of the Republic of Poland and 5% of the applicant's own resources.

1.3 Definition of the area and of the potential supported entities

Support within the Euro region Silesia has been on the Czech side carried out in the districts of Opava, Novy Jicin and Ostrava cities in Moravia-Silesia region and the Polish side this area includes: region Opolski - province Opolskie - district głubczycki, region Rybnicki - province Slaskie - districts raciborski, rybnicki, wodzisławski, grodzki.

Suitable applicants are legal entities of public or controlled by public legal entities or established not for profit. Conditions are met by the following entities: State (Czech Republic), respectively. state organizational units, local government (and its organizational units and contributory organizations), voluntary associations of municipalities, professional self (e.g. chambers), educational legal entities, public universities, Czech Television, Czech Radio, the Railway Infrastructure Administration, public benefit corporations (where the majority of the Board members are appointed by public legal persons), associations of legal persons, associations, foundations and endowment funds, churches, state-owned enterprises, stock companies and limited liability companies (where at least 80% of the capital share have a public persons), high private school, European grouping of territorial cooperation.

The obligation of every applicant is to have a foreign partner or partners for the project. Foreign partner must be an entity on the list of eligible applicants of the country and should be identical or similar nature, such as the applicant.

1.4 The project selection process

The function of the manager of fund is performing by euro-regions, respectively associations, which forms national parts of the Euro regions. Thu function of the manager and withal the administrator of the Fund in the Euro region Silesia perform on the Czech side the Euro region Silesia - CZ (lead partner, respectively fund manager) and on the Polish side the Stowarzyszenie Gmin Dorzecza Górnej Oder.

The evaluation process of applications for support begins by delivery of the request to the Fund Manager and ends with the decision of Euro regional Steering Committee. The process includes the following sub-steps.

Stage 1 - formal check and acceptance check and registration of the project.

Stage 2 - evaluation of financial and factual quality and cross-border aspects. Evaluation of financial and factual quality and cross-border aspects of the project is carried out by independent regional experts having experience with EU programs; they know the language and are trained by fund manager.

Stage 3 - project selection, notification to applicants. Euro regional Steering Committee is governed by the rules of procedure and discusses projects. It is composed of 22 voting members (11 Czech and 11 Polish) from the representatives of municipalities and cities of the relevant Czech-Polish border region, representatives of the relevant region and province, representatives of both the fund managers and representatives of other entities with non-profit character, each entity may be represented by only one member.

1.5 Examples of recommended implemented projects

For the realization of cross border cooperation projects were recommended for example these types of projects:

- Restoration and protection of cultural heritage and historical heritage e.g. small monuments,
- Enlargement, modernization of tourism infrastructure e.g. cycling paths and bike trails, horseback riding trails, hiking trails and paths, ski trails, local (forest) roads and bridges (banks), including equipment with furniture,
- Ensuring the availability of year-round tourist area, development of marking the of tourist attractions and routes,
- Support and promotion of traditional and new tourism products,
- The organization of joint cultural events (festivals, performances, exhibitions, art workshops),
- Promotion of micro-projects to local communities in the social, cultural and leisure,
- Micro-projects aimed at integrating communities in the border area,
- Preparation of analyzes, studies, strategies, programs, etc. to meet the needs of socio-economic development of the border area,
- Preparation of plans and documentation of joint projects (project documentation, zoning plans),

- Care for nature and landscape (restoration of ecosystems and landscape elements, biodiversity conservation, environmental monitoring),
- Cooperation in improving of environmental education (educational events, exchange of experience),
- Creation of joint systems for flood prevention and early warning systems,
- Promotion of cross-border cooperation and territories (e.g. the preparation of publications, websites) also outside supported territory,
- Organization of courses focused on acquiring, improving professional skills and qualifications, language skills, including support for developing joint degree programs,
- Cross-border cooperation between schools, youth organizations, youth exchange, students, pupils, scientific and teaching staff, including small infrastructure projects necessary for the fulfillment of the objectives of the promotion,
- Promotion of leisure and recreational activities (e.g. sports events),
- Support the activities of preserving the identity and traditions of local communities,
- The development of information and communication systems (information kiosks and boxes, creation of common databases).

2 Analysis of supported projects under the Silesia Euro region

Based on basic assumptions about the activities and management of fund of micro-projects is this paper focused on concrete results of given respectively implemented projects. The source analyses were reports about supported projects, about their substantive focus, about applicants of support and in terms of the size of the support.

Table 1 - General overview of resources, grant applications and supported projects by the Fund within Euro region Silesia

	CZ side	**PL side**	Suma
Allocations from ERDF to micro-projects (EUR)	2 603 550	3 343 900	**5 947 450**
Number of meeting of EŘV	15		
Number of current treatments	6		
The number of registered applications	250	372	**622**
The number of rejected applications	19	12	**31**
The number of applications registered	231	360	**591**
The number of approved applications	199	306	**505**
Number of unapproved applications	30	52	**82**
Approved amount of subsidies from the ERDF (EUR)	3 242 143,74	4 314 854,19	**7 556 997,93**

Source: own processing based on [3]

The fundamental basis for the evaluation of the results of cross-border cooperation were the individual projects, discussed and approved at meetings of Euro regional Steering Committee or possibly in the form of current treatments. It was thus about 505 projects submitted to both sides of the border, from them have been submitted by the Czech side 199 projects and 306 projects from the Polish side (see Table 1).

The ERDF funds sought for 86 more projects than were granted subsidies, however, given that these projects did not meet any of the conditions for granting subsidies were not supported. During each session for granting subsidies were only assessed the set conditions given by the fund, i.e. the individual rounds there was not limited amount of funds intended to support. So the reason for not granting the subsidy could be both low-scoring of individual projects by evaluators (boundary was set at least 60 points out of 100 possible), and then also the content of some projects if they did not meet Program objectives. By the project approval there was given an opportunity to applicants to the work out the project in case of partial unsatisfactory.

2.1 Analysis of subjects which received project support

Within the program guideline were defined areas of suitable applicants; however research watched the real rate of applicants. For the analysis there was chosen distribution of applicants in the following groups:

- Kindergartens and elementary schools,
- Secondary schools and universities (although projects submitted by universities has been very little)
- Municipalities etc., entities on the Polish side,
- Organizations established by municipalities and by the State (other than educational facilities)
- Non-governmental non-profitable organizations (NGOs).

The results of the analysis of the number of supported projects (see Table 2) in terms of applicants indicate that the main beneficiaries of the resources were municipalities and in the conditions of Poland "gminy", second largest group were kindergartens and elementary schools of municipalities, next other organizations founded by municipalities possibly by the State, next secondary schools, as well as non-governmental non-profitable organizations respectively associations.

Table 2 - Supported projects from fund of micro-project of Silesia region - the division in terms of types of beneficiaries

	Municipalities etc.	Kindergartens and elementary schools	Organizations established by municipalities	NGOs	Secondary schools and universities	Suma
The share of applicants in %	40,7	20,8	14,9	13,0	10,6	100

Source: own processing based on [4]

Many projects which have been realized in the form of cooperation on both sides of the border, it was the very first steps of cooperation between actors (cooperation was often established only on the basis of that project). Other entities have already started cooperation sooner and in the framework of this project this collaboration could expand.

2.2 Analysis of projects based on the sectorial focus

The spectrum of recommended projects (see above) is quite extensive. For grasp actually submitted projects there was created 9 circuits of projects. It concerns the following headings projects: culture, sports, security (incl. fire protection), education and science, tourism, nature (incl. environment), health, gastronomy and the rest are other projects elsewhere classified. The supported projects were divided into 9 groups according to the prevailing focus; in some cases it was not possible to clearly assign the project to the group, and therefore the project was included in multiple groups. On the basis of the frequency there was done evaluation in percentage (the evaluation results are shown in table 3).

Submitted projects in its factual focus related to activities performed by the applicants. However, the possibility thus provided grant resources encourages new activities of applicants, which would probably not be realized even in the simplified view for its own scope of applicants (without the cooperation with the entity on the other side of the border).

The largest part of the projects was focused on the area of culture. For a closer look at this area it can be said that in many cases it is e.g. about existing cultural traditions that have been through this project expanded and promoted from the local level in a wider area, i.e. also on the other side of the border, which leads to mutual enrichment in these areas of cross-border cooperation. Examples include projects on history, song festivals, film festival, festival of children's orchestras, dance dialogue, library etc.

Other areas of projects are various sport and competitive races of teams and individual participants as well as non-competitive sports activities on both sides of the border. These were projects in these sports: cycling, soccer, cycling, table hockey, motorcycling, archery, inline skating, volleyball, etc.

In the field of security and fire protection most of projects focused on cooperation of fire brigades by form of competitions and exchanges of experience and other areas were dealing with flood protection system, security in the border regions, education of policemen, etc.

In the field of education and science there were presented a number of school projects focusing on education, learning and language learning for children and students from both sides of the border. In science field then e.g.

there were cooperation projects aimed at energy recovery of waste, the use of mathematical methods, and the use of alternative energy sources.

In the area of tourism projects were focused for example to research of tourist offer in the border region, exploring the borderland, edition of promotional calendars with objects from the Euro region, religious tourism, etc.

In the area of nature and the environment there were projects such as environmental workshops, environmental education, exploring the landscape on both sides of the border etc.

In the health sector there were supported projects about the activities of anti-aging of seniors, healthy lifestyle, health-park, problems of persons with disabilities, children's eye examination, first aid, etc.

In the field of gastronomy there was made several festivals, regional cuisine and wineries like.

Other projects were focused in business activities, which may include projects such as organizing fairs, clusters cooperation, the evaluation of the export potential in border areas, cooperation between local action groups and the like.

Table 3 - Supported projects by sectorial focus

	Culture	Sport	Security	Education, science	Tourism
focus of projects in percent	40,0	24,4	8,2	6,1	5,7
	Nature	Health	Gastronomy	Others	Suma
focus of projects in percent	3,8	3,6	2,7	5,5	100,0

Source: own processing based on [4]

2.3 Analysis of the project according to the size of the budget

For the size of submitted projects in the Euro there was setup by the program the limit size of subsidies to individual projects and it was to 2-30 thousand Euro. Based on the supported projects there was done evaluation of the size of individual projects by the division into four size groups. As the boundaries of these groups were chosen values 10, 20 and 30 thousand Euro and then has been detected the frequency of projects in these size groups.

The largest number of supported projects falls within the allowance range from 10 to 20 thousand Euros and it was 40% of the total number of supported projects (results shown in Table 4).

Table 4 - Projects supported by the size of the budget

In thousand Euro	Less than 9.99	10 - 19.99	20 - 29.99	30 and more	Suma
Count of projects in %	23,2	40,3	25,7	10,8	100,0

Source: own processing based on [4]

From the values of submitted projects by given limit 30 thousand Euro of the support size it resulted only a small number of projects that exceeded the size of the project to the extent that the limitation of the size of the support was reducing the maximum share of the support below 85%. This shows that the maximum value of the support for projects is suitable because border of size of projects over 30 thousand Euro, exceed just a small number of projects.

In terms of project funding there is then a problem with other issues rather than project size. It is about the method of financing of the project with the necessity of pre-financing to applicant, which does not derive only from the analysis, but there must also be considered aspects of the financial conditions of individual types of applicants (for details see below).

3 Results and Discussion

The paper shows the results of implementation of support of cross-border projects in the Euro region Silesia. Results showed that the average project supported by the micro-project fund is a project of the municipality or municipal organization is focused on culture and its financial volume varies in volume from 10 to 20 thousand Euros.

In this context, one may question the reason of non-involvement of other types in a greater extent in cross-border cooperation. A likely explanation is related to the issue of funding these projects. The thing is that applicants of the support will be influenced by the possibility of own resources for pre-financing of projects. In terms of the grant recipients if the subject does not have enough resources or does not have strong enough partner behind (or founder) there is problem for project implementation that there are no advance payments; grant recipient then fully implements the project from its own resources. Grants from the fund is paid up to the end user after the completion of the project on the basis of request for payment for the project, and based on documentation.

The time lag between completed project and implemented payment by recipient is given by the following steps. Within 60 calendar days administrator will check the eligibility of expenditure. In the case of incompleteness of documentation administrator prompts the end user for their completion. After checking, the manager will issue a certificate of expenditure eligibility for the project. The competent fund manager collects tested and approved requests for payment for projects and no more than once every three months he gives the declaration of expenditure to the competent supervisor of national section. After inspection by national supervisors there is then by the administrator of the fund subsequently given a request for a payment from the fund (for the Czech and Polish sides together). Upon approval of the application by the Centre for Regional Development of CR and subsequently by the Ministry for Regional Development of CR, the National Fund of the Ministry of Finance do a control and then sends a payment to the fund manager account (Euro region Silesia). Then after payment receiving is made the respective payment on the accounts of end users.

The timetable of these activities has resulted in a long time (over a year) from the completion of the project to its reimbursement, which for those entities without sufficient own resources significantly reduces the possibility of submitting the project in terms of its financing.

In effect, these projects cannot give any non-profit organizations if they have only their own resources and do not want some form of debt because their own resources are insufficient to implement the project. These own resources however usually have neither non-profit organization backed by their founders (e.g. the municipality, or state). Even if it is a non-profit organization established e.g. in CR by municipalities or the state, usually the budget in terms of income and expenditure is not strong enough to make this a cushion for pre-financing of project, so that without the contribution of its founder (e.g. in the form of loans to this organization) would not have been able to implement the project. Or then such project is directly implements by e.g. municipality, even it could be implemented by non-profit organization established by municipality.

Therefore, it is clear from the research, the involvement of municipalities and their organizations. The survey showed that 76.4% of organizations participating in this program are municipalities or organizations established by them (or to a smaller extent the organization of the state). So even if all non-profit organizations have equal access to the resources, the real conditions of financing of supported projects these equal conditions greatly limit.

4 Conclusions

This contribution pointed to the real conditions of support providing for projects of cross-border cooperation in specific Euro region Silesia in the period 2007 to 2013. In this program were all of the available funds of projects run out. And it was not possible to register a significant overhang of requirements for the grant before the number of supported projects. However, the conclusions show that the real framework of supported entities differed from the spectrum of potential candidates, and that a substantial part of the grant recipients consisted of municipalities, respectively organizations established by them (especially schools).

View at the issue of financing of these projects then uncovered other possible causes of absence of other entities and it in following to the necessity of pre-financing of projects, which for most non-profit organizations is a major problem.

This shows that this form should be made accessible to other types of non-profit organizations, i.e. to adjust way of pre-financing at least by the possibility of granting advances for projects. That would probably bring more submitted projects from other entities than just from organizations of municipalities or State and thus more choices (resp. competition) among the applicants of support.

Despite these reservations the support of cross-border cooperation can be encouraged. This form of support will be implemented in the programming period 2014 - 2020, however, access to the support is thematically focused

on three priority axes, consisting of: Developing the potential of natural and cultural resources to support employment (allocation range of 35%), Education and skills (5% of the funds) and the Cooperation of institutions and communities (approximately 65% of resources). This division may significantly restrict the direction of the submitted and supported projects, as well as with sufficient resources if the projects are not submitted in all priority axes sufficiently, it may cause reduction of resources. In the new period then there is putted more emphasis on joint development, joint implementation, joint financing and joint staff in the implementation of cross-border projects. A novelty is the introduction of flat rates for preparatory, overhead and personnel costs.

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The Right to Information on the Environment

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Abstract
The paper discusses the characteristics of environmental law, concerned legislation which sets out the rights and obligations of both public authorities and the subjects who have the right to obtain objective information about the state of the environment. Environmental law is a set of legal norms, system of managerial and executive activities of administrative authorities that are aimed at environmental protection. Environmental law is a branch of law intersecting with public, private and international law. Legal relationships that are created, change or cease to exist in the civil society in the environmental field consequently affect and define the action of the subjects involved, both in a direct and an indirect manner. The latter entities are representatives of the society that have the right to organize, manage and control relations, mechanisms and processes in public administration. In this management of public affairs, public administration that is regulated by environmental law is involved. The aim of this paper is to verify how the authorities fulfil a legal obligation to inform the public about the state of the environment.

Keywords: *administration, citizen, environment, law, policy, public service*

JEL Classification: *K32*

The Right to Information on the Environment

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1 Introduction

The content of this paper is to characterize the environment, pay attention to some of the respective legislation which sets out the rights and obligations of public authorities to objective information related to the state of the environment. Environmental law is the branch of law that represents a set of legal norms, system of management and executive activities of administrative authorities aimed at protecting the environment. This branch intersects with the public, private and in international law. The legal relationships that are created, change or cease to exist in the civil society in the area of environment then directly or indirectly affect and define the actions of the subjects. These entities are representatives of the society who have the right to organize, manage and control the respective relations, mechanisms and processes in public administration. The aim of this paper is to verify the fulfillment of the obligations of the public authorities in concern arising from legislation and to inform the public about the state of the environment on the basis of available statistical data.

1.1 Subsection

Environmental protection is not an accidental thing, the Czech Constitution in Article 7 defines the role of the state, providing that "the State shall ensure prudent use of natural resources and protection of natural wealth." To fulfill the letter of the law, appropriate institutions and mechanisms of their functioning have been created for the fulfillment of this obligation. The competence of the Ministry of the Environment (hereinafter referred to as ME) is mainly the state supervision, management and coordination in the area of environment and it also includes the state environmental policy and ensuring a uniform information system. Water protection, hunting, fishing and forest management is managed by the central government body, the Ministry of Agriculture. The protection of public health is managed by the Ministry of Health, the Ministry of Regional Development applies its authority in the area of spatial planning and building regulations and so on. Fragmentation of environmental protection at the level of central state administration, as indicated, is fully reflected in lower structures of state administration and multiplied by the redeployment of state administration to local government units. It is necessary to pay attention to this issue because of the mentioned lack of clarity and mainly the complexity of the system of organization of the public administration in the field of environmental protection. Execution of the state administration in the area of environmental protection is further exercised in delegated powers by the authorities of municipalities and regions as local authorities. Only the law can define which local authorities shall perform the delegated power and in what extent49. It should be noted here that in this case performance of state administration in environmental protection is connected with a significant amount of legislation, in addition to a considerable extent of adaptation of the Czech law to the European law. However, it is undisputable that the responsibility for the quality of the environment is to a certain extent up to each of us50.

1.1.1 ***Some of the selected legislation in concern within the framework of organization of environmental management in the Czech Republic***

We live in a legal state, it is therefore obvious that the legal relationships between entities are created, change and disappear and they are governed by the legislation. Legislation can generally be divided according to various criteria, substantive and procedural, general and specific, national and international. The basic structure of the legislation in the area of environment is divided into general and specific legislation. General legislation of the supreme legal power is undoubtedly the Constitution of the Czech Republic and the Charter of Fundamental Rights and Freedoms. This category of general legislation includes the one that defines the function, principles, competence, subjects, their rights and duties. Procedural legislation governing the procedure while dealing with

[49] See Article 105 of the Constitution of the Czech Republic

[50] Ján Bahýl, Několik poznámek k organizaci veřejné správy na úseku ochrany životního prostředí. http://www.law.muni.cz/sborniky/dp08/files/pdf/sprava/bahyl.pdf

request for information is the Act no. 500/2004 Coll., Administrative Procedure Code and the Court Administrative Procedure Code.

As a special part of the legislation of the environmental law consists of, among others, the legislation to protect air, water, natural resources, soil, forests, nature and landscape and last but not least, waste management.

Tools for regulation of the environment of the European Union (hereinafter referred to as EU) are regulations, directives, resolutions and last but not least, recommendations and standpoints. The environment is regulated in Title XX of the Treaty on the Functioning of the EU. In accordance with Article 4 of the cited Treaty, the environment is included among the areas where shared competence among the Union and the Member States is applied. At this point, it is also necessary to mention the action programs issued by EU. The objectives to be achieved are set there.

The important conventions of the EU in the area of environment include the Berne Convention on the Protection of European Fauna and Flora of 1979 United Nations Framework Convention on Climate Change agreed at a conference in Rio de Janeiro in 1992 and also so-called Kyoto Protocol of 1997 and the Aarhus Convention of 1998.

The administrative bodies bearing responsibility for the quality of the environment include, among others, the Czech government, ministries, especially the Ministry of Environment, municipalities and regions. The Czech Government is the supreme body of public authority, it organizes the activities of the public administration. To execute the law within its limits, the Government of the Czech Republic issues orders without a special authorization contained in the law.

The Czech government in accordance with Section (§) 12 of Act No. 123/1998 Coll. regulating the right to information on the environment, as amended, is obliged to consider and approve the report on the environmental situation of the Czech Republic once a year. The report shall contain, among others, information on the quality of the environment and the burdens influencing the environment. Upon consideration and approval, the Government of the Czech Republic shall submit it to the Parliament. Upon approval of the report by the Parliament of the Czech Republic, the report shall be published not later than three months from such an approval.

The Ministry of Environment (hereinafter referred to as ME) founded on 1st January 1990, the central state administrative body, is also the supreme supervisory body in environmental matters. Its powers include, among others:

- protection of water resources, groundwater and surface water, air, nature, landscape and agricultural land,
- performance of the state geological service, protection of geological environment, including protection of mineral resources and groundwater, geological works and environmental supervision over extraction,
- waste management,
- hunting, fishing and forest management in national parks.

Within the framework of environmental matters, ME also coordinates all procedures of the ministries and other central administrative bodies of the Czech Republic. Furthermore, it makes accessible the list of information the compulsory entity shall have at disposal stating through what compulsory entity can be obtained information, international treaties and agreements, the European Union legislation, laws and other regulations in the field of environmental protection and reports on their implementation and compliance, if they have been processed (if the information is already demonstrably accessible via devices enabling remote access, the compulsory entities may refer to such published information).

An important entity in the area of environment is local governments - municipalities, and regions. The Czech Republic is divided into municipalities, which are the basic local authorities, and regions, which are the higher territorial units. Local governments are territorial communities, which have the right to self-government51.

Act No. 128/2000 Coll. regulating Municipalities (Municipal Establishment), as amended, among others, stipulates that the municipality cares about all-round development of its territory and needs of its citizens. When carrying out its tasks it also protects the public interest. Duties may be imposed by the municipality upon a generally binding applicable ordinance to protect local matters of public order; in particular, it may state:

- which activities could disturb public order in the municipality,

[51] Article 99 and Article 100 of the Constitution of the Czech Republic

- or may be in contrary with good morals, protection of safety, health and property, it may be conducted only in places and at times stated by the generally binding ordinance,
- that in some public areas in the municipality such activities are prohibited to ensure the maintenance of cleanliness of streets and other public areas, to protect the environment, green spaces in urban areas and other public green areas and use of the facilities of the municipality serving the needs of the public.

Act no. 129/2000 Coll. regulating Regions (Regional Establishment), as amended, among others, stipulates that a region is a territorial community of citizens who have the right to self-government. The region cares for all-round development of its territory and needs of its citizens within the exercise of independent and delegated powers to protect the public interest.
Other specialized bodies in the environmental field are e.g.:

- The State Environmental Fund,
- Nature Conservation Agency of the Czech Republic,
- Czech Environmental Information Agency,
- Czech Environmental Inspection.

1.1.2 Proceedings in the case of the right to access information on the environment

The right to access to information on the environment, support of making information accessible to the public by compulsory entities is defined by Act no. 123/1998 Coll. regulating the right to information on the environment, as amended, the Act regulates in detail, among other things:

- conditions for exercising the right to timely and complete information about the environment,
- public access to this information, the deadlines for disclosure of information, as well as the reasons for which the compulsory entities52 may refuse to provide information
- access to spatial data by the means of network services through the National Geoportal INSPIRE,53
- education and awareness in the field of environmental protection.

If a citizen is interested in obtaining information on the environment, he/ she should contact the compulsory entity with a request. The request for information from the area of environment and its execution shall include the following elements. In the request, which can be made in writing electronically, or in other technically feasible forms, the applicant shall specify:

- what should the information include,
- who submitted it.

If the request is incomprehensible or too general, the applicant is obliged to remove the defect within 15 days from the date of receiving the notice. If the applicant fails to remove the defects within 15 days of receipt of the notice, it is understood that he/ she desisted from his/ her request.

If the request is directed to the provision of published information, the compulsory entity shall disclose the place of providing information enabling search and obtaining the published information. If the applicant is not able to

[52] The compulsory entities are, among others administrative offices and other organizational units of the state and municipal authorities, counties, legal or natural persons who perform public administration activity related directly or indirectly to the environment.

[53] The Ministry of Environment manages Geoportal, which is a public administration information system and it is accessible through the portal. Compulsory entities make accessible through the Geoportal the data that the compulsory entities create, receive, update, and manage or which fall within the public administration tasks. Furthermore, the information on the data, codes and technical classifications, which are necessary to ensure compliance with technical requirements are made accessible as well. Among others, ME through the Geoportal provides access to data, services based on spatial data, e-commerce services, sharing of spatial data in the public administration, information on the use of Spatial Data Infrastructure.

obtain the published information in another way, the compulsory entity shall provide him/ her with information. The applicant may also propose a form or method while making the information accessible. If the applicant requires disclosure of information via a data carrier, he/ she is obliged to pay the price or attach a technically usable data carrier to the application.

The compulsory entity shall handle the matter of the applicant without undue delay, within 30 days of receiving the request. In case it is necessary to deal with important issues, the matter may be handled within 60 days of filing (the applicant shall be notified of this before the expiry of the 30 day period). Upon receiving the request, the compulsory subject may refuse access to information if it concerns, iter alia, protection of:

- confidential information,
- personal data and protection of privacy,
- intellectual property,
- business secrets.

The compulsory entity may also refuse to disclose information when it relates to, for example, not yet processed or not evaluated data or if the request is formulated in a clearly provocative manner.

The compulsory entity shall issue resolution on refusal to disclose the information. The applicant has the right to file an appeal against the decision to refuse access to information, after the exhaustion of remedies extraordinary remedies may be used.

Everyone has the right, within the stated opening hours of the relevant compulsory entities to inspect documents and take copies or extracts. Everyone also has the right to make copies of documents if it is operationally possible. The compulsory entity is authorized to require reimbursement in accordance with the tariff of payments. It shall be in the amount not exceeding the costs associated with making copies, obtaining technical data carriers and sending information to the applicant.

The compulsory entities shall process information related to their competencies and create conditions for active disclosure of information. Information is also disclosed especially in a manner enabling remote access, as well as through the editorial and publishing activity itself. Furthermore are disclosed in particular:

- strategies, plans and programs related to the environment and reports on their implementation, reports on the state of the environment,
- administrative resolution in the event that its issue is subject to issuing a standpoint on the assessment of impact of the intention on the environment,
- assessment of risks related to the environment, if they are processed.

2 Material and Methods

The practical part of the paper discusses the use of legal means to obtain information related to the state of the environment. For this purpose, statistical data from the survey carried out in May 2015 by the Center for Public Opinion Research of the Academy of Sciences of the Czech Republic (Centrum pro výzkum veřejného mínění SOÚ AV ČR), v.v.i., addressing the topic of environmental protection in the Czech Republic has been used. The research involved 1,043 respondents.

The data revealed some very interesting facts. If we are interested in the general assessment of how the Czech Republic cares about protecting the environment according to the public, the research results show that the absolute majority of respondents, 51% expressed the view that the care of the Czech Republic for the environment is appropriate.

A lack environmental protection in the Czech Republic was indicated by two fifths of respondents, i.e. 41%, and only 2% of respondents expressed that the state cares about the environment too much. The relationship of various groups to the environment is generally seen as bad - in the case of all items without exception prevails more or less negative assessments concerning the assessment of the behavior of citizens, businesses and the state.

As shown by further results of the survey, the majority of the Czech population is satisfied with the state of environment both in the place where they live and the country as a whole. The environment in the place of their residence is perceived positively by almost three quarters of Czechs, 74%, while 18% of them are "very satisfied" with it and 56% "rather satisfied". Opposite evaluation was expressed by little more than a quarter of

respondents (26%), of which 18% is in their own words "rather dissatisfied" with the environment at the place of their residence and 8% then even "very dissatisfied".

The environmental situation in the Czech Republic is assessed more positively by people who consider their living standards good and the people of the South Moravia Region, the Olomouc Region and the Vysočina Region. The environment in the Czech Republic is perceived more critically by the inhabitants of the Central Moravia Region and Moravia-Silesia Region, where the respondents consider their living standards bad.

Satisfaction with the state of the environment at the place of residence has been expressed more frequently by residents of smaller towns and villages (up to 2000 inhabitants) and people living in the South Bohemia, Hradec Králové, Pardubice, South Moravia, Olomouc and Zlín Regions and in the Vysočina Region. The respondents indicating their standard of living as a good one were also more satisfied. While dissatisfaction is expressed by the inhabitants of the Moravia-Silesia and Ústí Region, people living in cities ranging in size from 30 to 80 thousand inhabitants and respondents considering the standard of living in their household as poor.

Environmental protection in the Czech Republic is more frequently assessed as an appropriate one by men, furthermore by people considering the standard of living of their household as a good one, then inhabitants of the Vysočina Region, respondents who are satisfied with the environment in the Czech Republic in general and in their place of residence, but also by those who are admitted that they are not interested in information about the environment in the Czech Republic. It was assessed as insufficient by people who consider their standards of living poor, respondents from the Central Bohemia and Moravia-Silesia Region, respondents dissatisfied with the environment in the Czech Republic and in their place of residence and those who claimed that they were interested in information about the environment in the Czech Republic.

In other parts of the questions, the research focused in detail on the behavior of citizens, business entities, organizations and the state in relation to the environment. The relationship of various groups to the environment is generally bad - for all items without exception prevails more or less negative assessments regarding the assessment of the behavior of citizens, businesses and the state.

3 Conclusion

The aim of the paper the authors focused on was to define the protection of the environment and introduce some of the legislation in concern. Furthermore to introduce the role of public authorities called upon to objectively inform the public, as well as individual applicants about the state of the environment.

The paper has shown that the legal relationships that are created, change or cease to exist among the compulsory entities, applicants and the public. The principle of the two levels an unsuccessful applicant filing ordinary and extraordinary remedies is authorized to use was also mentioned. The practical part of the paper presented research results based on available statistical data where it has been clearly documented that the administrative bodies fulfill the obligations arising from legislation to inform the public about the state of the environment.

When verifying compliance with statutory obligations in practice, it is at this point appropriate to draw attention to the need for education for the general public in relation to the environment. The administrative bodies are the compulsory entities responsible for creating conditions for the implementation and development of environmental education and awareness.

A significant role in this area will be played by the Ministry of Environment, the Ministry of Education, Youth and Sports, municipalities and regions with separate competencies promoting environmental education and awareness.

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[12] Ján Bahýl, Několik poznámek k organizaci veřejné správy na úseku ochrany životního prostředí. http://www.law.muni.cz/sborniky/dp08/files/pdf/sprava/bahyl.pdf

[13] The authors verified the provision of publicity of the conveyed research. It was found out that the Public Opinion Research Centre of the Sociological Institute of the Czech Academy of Sciences v. v. i. published in its research of May a press release under a sign "oe150608". There, the results of research of state of environment were published. The press releases of the Sociological Institute of the CAS are published on the website, there are transmitted to central press and media. The details concerning the research were released in the peer-reviewed journal Naše společnost (ISSN 1214-438X) published twice a year by the Public Opinion Research Centre. The respondents were interviewed about their satisfaction or dissatisfaction with the state of environment in the Czech Republic and in the place of residence, and besides the general state, they evaluated also some other aspects, such as purity of the surrounding nature, availability of open space nature, air purity, surface water purity, quality of drinking water, degree of noise or density of traffic. Next, the research examined whether the people are interested in information on state of environment and whether there are specific activities in the Czech households aimed at the environmental protection.

The Efficiency of Capacities of Basic Schools of the Statutory City of Ostrava

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Abstract
This contribution deals with capacity of basic schools in the context of technical efficiency. The object of studying consists of 55 basic schools established as allowance organizations by individual Municipal Districts of the Statutory City of Ostrava. To evaluate technical efficiency, the input- and output-oriented Data Envelopment Analysis model with constant returns to scale (CCR DEA) was selected. The aim of this contribution is to evaluate technical efficiency of all 55 basic schools of the city of Ostrava with the focus on their capacities, and that in relation to the actual number of pupils for the school year of 2015/2016. Two inputs were selected – the number of classes and the capacity of a school, and one output – actual number of pupils. Based on results, it can be stated that, from the perspective of both input- and output- oriented CCR DEA models, 52 basic schools were inefficient, and only three basic schools were efficient according to both models.

Keywords: *basic schools, capacity, efficiency, number of pupils, allowance organizations*

JEL Classification: *H7, I2, C4*

The Efficiency of Capacities of Basic Schools of the Statutory City of Ostrava

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1 Introduction

Basic schools are an instrument of the public interest and an object of funding of public budgets. In the Czech Republic, the state and the local government guarantee and implement legitimate tasks of factual and institutional nature while providing compulsory school attendance[54] and considering legitimate needs of the public in a given area. Nevertheless, requirements of the society, both quantitative and qualitative, on the level and accessibility of education at all its stages vary. According to Conroy and Arguea (2007), limited public resources and changing needs of inhabitants, given by the change of demographic structure of population, cause political and civil discussion on the topic of rational changes of institutional provision of basic schools – their reasonable number in relation to the need of a given area. According to Kučerová (2012), the existence and mission of a school in municipality, especially in a small municipality, has broader – multidisciplinary dimension, and therefore the decision-making on cancellation of a basic school cannot be justified by economic arguments only.

Under conditions of the Czech Republic, there is an excess supply (capacity of schools) over demand (number of pupils and future pupils) excluding satellite towns, especially in the area of the Central Bohemian Region or huge agglomerations such as the capital city of Prague. This phenomenon – the excess supply over demand, is particularly topical under conditions of the Statutory City of Ostrava. Demographic trend (generally towards an aging population) and migration of people (especially into economically or environmentally attractive localities) belong to fundamental factors of this situation.

Basic schools are being merged or cancelled because of the insufficient number of children, and these procedures of establishers do not always meet the agreement or understanding of citizens (especially parents) of given Municipal Districts of the Statutory City of Ostrava. There is an example in form of referendum from 30 April 2016 in Ostrava-South District, which was started by citizens disagreeing with the merger of two schools located in close proximity (on the same street). Administration of the district had economic arguments for the merger – especially low utilization of capacities of these schools, (Stoh, 2015).

Economical justification of the need for changes in institutional provision of basic schools under conditions of the Statutory City of Ostrava from the perspective of technical efficiency is a subject of this contribution.

The aim is to evaluate technical efficiency of all 55 basic schools of the city of Ostrava with the focus on their capacities, and that in relation to the actual number of pupils for the school year of 2015/2016.

The efficiency is a key parameter of economic performance of organizations, those providing public services included (see Jackson, 1993), and it is mostly being expressed depending on assessed variables. Hollingsworth, Peacock (2008), Dooren, Bouckaert and Halligan (2010), Bečica (2016) determine economic efficiency, and technical and allocation efficiency within it. Economic efficiency is an ability of organization to produce set amount of production using a given technology, with minimal costs. Abdourahmane, Bravo-Ureta and Rivas (2001) determine technical efficiency as an ability of organization to produce maximal amount of output with given amount of inputs, using a given technology; while they confirm the definition of efficiency according to Debreau (1951, in Kroupová, 2010). Farrell (1957) defined technical efficiency as an ability of production units to maximize output at given level of inputs; or to minimize inputs by reaching the required level of outputs. Technical efficiency is an object of the DEA - Data Envelopment Analysis.

The use of the DEA method while evaluating technical efficiency of schools is numerous and individual cases show that the DEA method in its various forms can be used to evaluate both internal and external issues at all

[54] School attendance shall be compulsory for a period of nine (9) years, however no longer than until the end of the school year when a pupil reaches seventeen (17) years of age (Section 36, paragraph 1 of Act No. 561/2004 Coll., on Pre-school, Basic, Secondary, Tertiary Professional and Other Education (the Education Act)).

levels of schools or education systems. Chakraborty, Biswas and Lewis (1999) studied possibilities of measurement of technical efficiency in education with the focus on qualitative parameters under conditions of 40 districts of the State of Utah in the US. Authors as Hussain, Mehmood, Siddique and Afzal (2015) also used the DEA model (VRS and CRS models) and the Malmquist index to evaluate efficiency and productivity of public schools of 12 regions (DMUs = 12) in Pakistan for the period of years 1993 – 2012. Conroy and Arguea (2007) evaluated technical efficiency of the fourth and fifth grade classes of 1,256 basic schools of the State of Florida in the US, using Frontier production function.

2 Materials and Methotds

The subject of studying is represented by efficiency of capacities of 55 basic schools (DMU1 – DMU55) – allowance organizations of Municipal Districts of the Statutory City of Ostrava (or the City Districts, see Figure 1). The capacity of a school is understood, in corresponding measuring units (the number of pupils), as the number that represents optimal state of fullness of a given school or facility in compliance with all effective regulations and legislative measures (Methodological instruction of MEYS for determination of capacity of a school ref. n. 21 419/2000-21). The capacity of a school corresponds to the size and equipment of school buildings, and subsequently to the funding requirements of operation of such school on public resources (on the budget of establisher).

The number of pupils in a class is determined depending on the school type[55] or specialization of the class (children with disabilities). For common classes, the minimal capacity is set at the number of 17 pupils (on average per school) per one class, and maximal capacity at the number of 30 pupils in one class, nevertheless, according to paragraph 4, Section 23 of the Education Act, the establisher can allow an exception[56].

The data regarding the number of schools, their addresses and their capacities, was obtained from public database of the Ministry of Education, Youth and Sports – Register of schools and educational facilities (version 2.61). The data on the number of inhabitants of Municipal Districts of the Statutory City of Ostrava was obtained from public database of the Czech Statistical Office. The data on actual numbers of pupils of basic schools for the school year of 2015/2016 (to the date of 1 September 2015) was obtained from internal materials of the Statutory City of Ostrava.

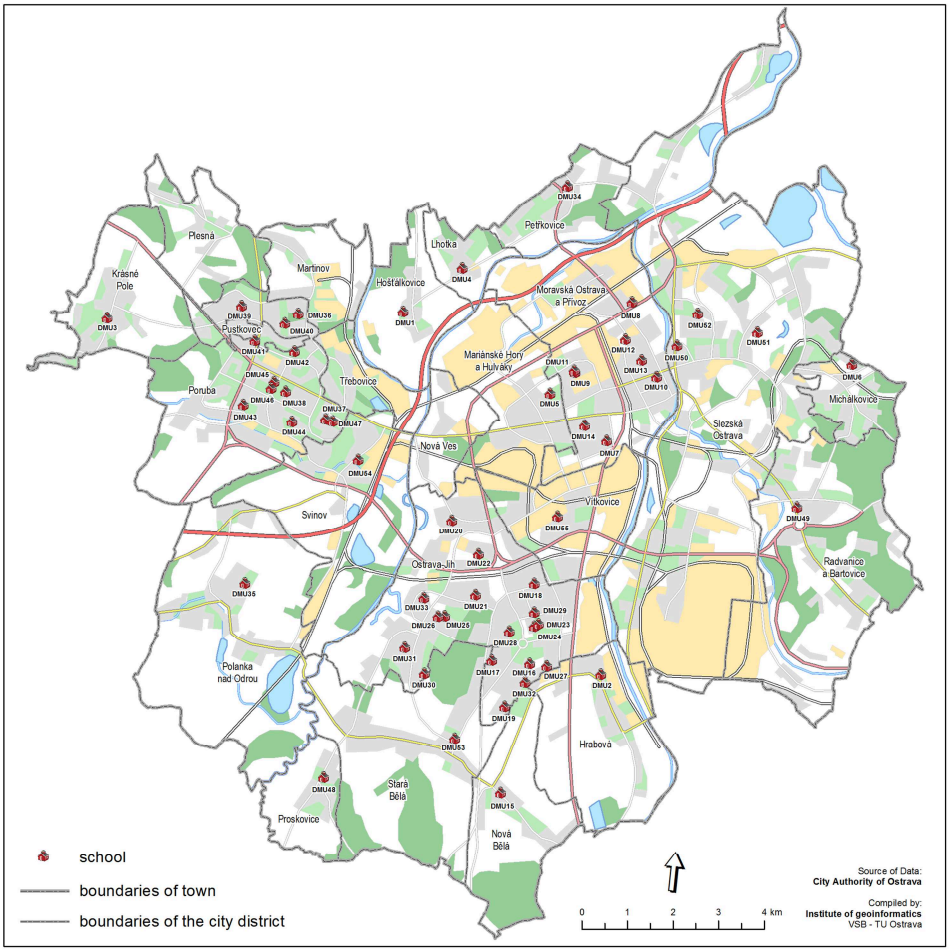
The Statutory City of Ostrava consists of 23 autonomous Municipal Districts, it has 296 thousand inhabitants, and it is the third largest city in the Czech Republic. The biggest Municipal District of Ostrava is called Ostrava – South (106.9 thousand inhabitants), followed by Municipal District Poruba (66.6 thousand inhabitants), Moravian Ostrava and Přívoz (38.8 thousand inhabitants) and Silesian Ostrava (21.2 thousand inhabitants). Complete data on the number of inhabitants and inhabitants in the age group of 0 – 14 years, on the number of basic schools and their capacities for all Municipal Districts of Ostrava is shown in Table I. in Appendix. Locations of 55 basic schools in the area of the city of Ostrava are shown at the map in Figure 1.

In the area of the Statutory City of Ostrava, there are also 12 private and church basic schools (with total capacity of 1,834 pupils) participating in the provision of compulsory school attendance, beside 55 studied basic schools with total capacity of 32,171 pupils, (Register of schools and educational facilities, state to the date of 1 September 2015).

[55] According to paragraph 2, Section 46 of the Act n. 561/2004 Coll. (as amended): Basic education at basic schools shall consist of nine (9) grades and shall be divided into a first level (primary education) and a second level (lower secondary education). The first level shall consist of the first five grades and the second level shall be from the sixth to ninth grades. In locations where there are not conditions for establishing all nine (9) grades at basic school, basic school not having all grades may be established.

[56] Establisher of the school can allow an exception in the lowest number of children, pupils and students set by this act and implementing regulation on condition that he pays increased expenditures on education activity of the school, and that above the amount set by regional direction.

Figure 1 - Territorial localization of 55 basic schools of the city of Ostrava. Source: Own processing according to the data of the Ministry of Education, Youth and Sports – Register of schools and educational facilities (to the date of 1 September 2015)



2.1 Comparison of optimal utilization of capacities of basic schools

The comparison of utilization of capacities of basic schools traces to what extent actual numbers of pupils of schools in the school year of 2015/2016 suit the optimal (maximal possible) number of pupils of these schools. For evaluation of optimal utilization of capacities, it is desirable that actual capacities are equal or as near as possible to the optimal (determined) number of pupils of a school.

The optimal utilization of capacities (OUC) can be calculated as quotient of actual (resp. real) number of pupils (A_{np}) and optimal number of pupils (O_{np}), that is the set capacity of a school, according to formula (1):

$$OUC = (A_{np}/O_{np}) *100 \quad (1)$$

Based on the calculations of OUC, the three-level scale of utilization of capacities of 55 basic schools of Ostrava was created for the school year of 2015/2016. The first level (1) in the range of 99.33 – 80.18 % reached by 18 basic schools; the second level (2) in the range of 78.50 – 60.50 % reached by 20 basic schools, and the third level (3) in the range of 56.67 – 41.65 % reached by 17 basic schools.

2.2 Technical efficiency: The DEA model

Primary input-oriented CCR DEA model with constant returns to scale maximizes the proportion of the evaluated unit U_q expressed as a proportion of weighted inputs and weighted outputs with sticking to the terms that (1) weights cannot be negative; (2) the proportions of efficiency of all other units are less or equal 1, i. e. z =

1. Each unit obtains via weights for inputs $v_i = 1, 2, \ldots, m$, the virtual input and via weights for outputs $u_i = 1, 2, \ldots, r$, the virtual output (Jablonský, Dlouhý, 2004):

the virtual input = $v_1x_{1q} + v_2x_{2q} + \ldots\ldots + v_mx_{mq}$,
the virtual output = $u_1y_{1q} + u_2y_{2q} + \ldots.. + u_ry_{rq}$.

The model for unit U_q is by the means of Charnes – Cooper transformation transferred from the problem of linear divided programming into the standard problem of programming, can be defined as follows (2).

maximize $z = \sum_i^r u_i\, y_{iq}$, (2)

subject to $\sum_i^r u_i\, y_{ik} \leq \sum_j^m v_j\, x_{jk}$, $k = 1, 2, \ldots, n$,
$\sum_j^m v_j\, x_{jq} = 1$,
$u_i \geq \varepsilon$, $i = 1, 2, \ldots, r$,
$v_j \geq \varepsilon$, $j = 1, 2, \ldots, m$.

where u_i is the weight given to output i, y_{iq} is the amount of output i produced by school establishment q, v_j is the weight given to input j, x_{jq} is the amount of input i produced by school establishment q.

The DEA model identifies a group of optimally performing schools that are defined as efficient, and assigns them a score of one, i. e. $z = 1$. For efficiency units, the efficiency scores are less than one, but greater than zero, i. e. $z < 1$.

Primary output-oriented CCR DEA model with constant return to scale is based on the same assumptions as above model. In this model, again the technical efficiency score is determined by the ratio of the weighted sum outputs and inputs, but the weights are set so that the score is greater than or equal to one.

The general mathematical formulation for an output-oriented model (3) is:

minimize $g = \sum_j^m v_j\, x_{jq}$, (3)

subject to $\sum_i^r u_i\, y_{ik} \leq \sum_j^m v_j\, x_{jk}$, $k = 1, 2, \ldots, n$,
$\sum_i^r u_i\, y_{iq} = 1$,
$u_i \geq \varepsilon$, $i = 1, 2, \ldots, r$,
$v_j \geq \varepsilon$, $j = 1, 2, \ldots, m$.

where u_i is the weight given to output i, y_{iq} is the amount of output i produced by school establishment q, v_j is the weight given to input j, x_{jq} is the amount of input i produced by school establishment q.

2.3 Model of technical efficiency of basic schools of Ostrava

Types of chosen inputs and outputs including the orientation of the DEA model are shown in Figure 2. Technical efficiency of all basic schools (DMUs = 55) is modelled according to the input- and output-oriented DEA model with constant returns to scale (CRS). The input-oriented model generates efficient (e = 1) and inefficient (e < 1) DMUs; in case of inefficient units, the limit of efficiency is reached by lowering inputs while keeping the current level of outputs. The model traces one period – one school year – 2015/2016, two inputs (x1 and x2) and one output (y1); statistical characteristics of inputs and output are stated in Table 1.

Figure 2 - Parameters of the CCR DEA model. Source: Own processing.

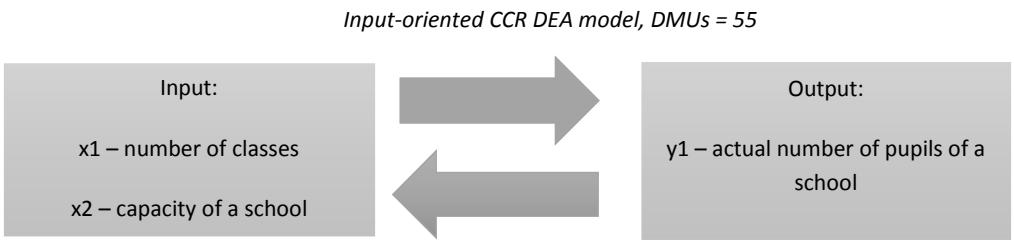


Table 1 - Statistical characteristics of inputs and outputs of the CCR DEA model

DMUs = 55	School year 2015/2016			
	mean	maximum	minimum	standard deviation
x1 – number of classes	18	34	4	5.8
x2 – capacity of a school	585	1050	80	202.2
y1 – actual number of pupils	393	759	68	142.7

Source: Ministry of Education, Youth and Sports – Register of schools and educational facilities [online, 2016], the Statutory City of Ostrava (2016).

As shown in Table 1, the number of classes in studied 55 basic schools ranges from 4 to 34. In the school year of 2015/2016, one class in basic schools of Ostrava, established by the city of Ostrava, had 21 pupils on average.

3 Results

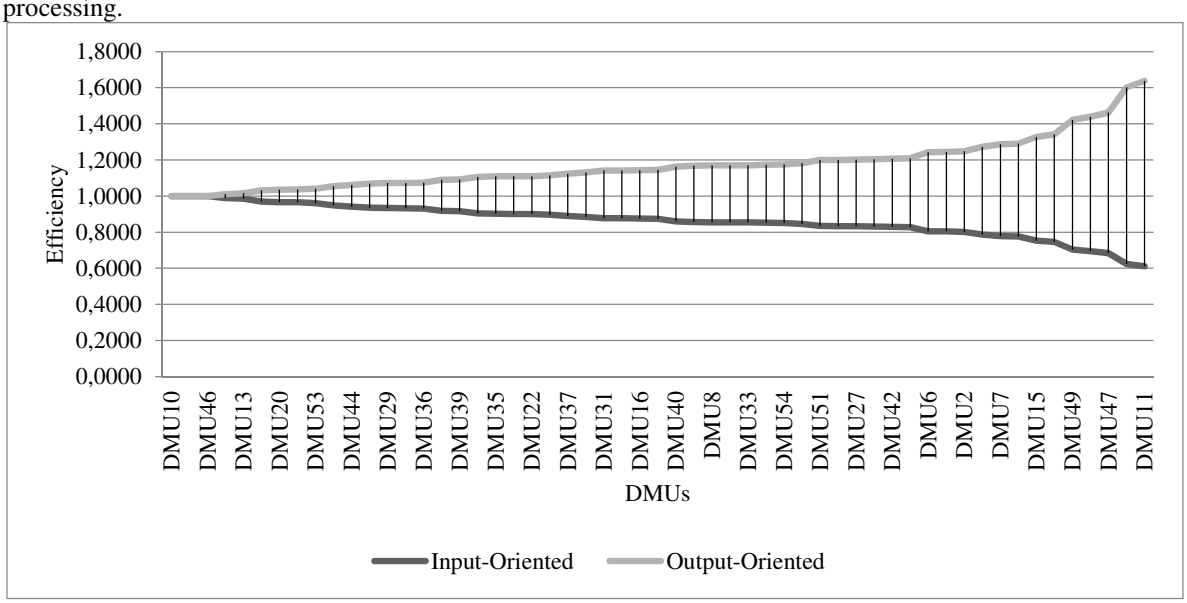
Technical efficiency was analysed by all 55 basic schools – allowance organizations established by the city of Ostrava (resp. by its Municipal Districts) for the school year of 2015/2016 with the focus on efficiency of capacities of these schools. Results show that the majority of schools (95 %) established by the city of Ostrava is, from the perspective of utilization of their capacities (the maximal number of pupils), rather inefficient. The value of inputs – number of classes and capacities of schools, exceeds the value of output – actual number of pupils of basic schools. The input-oriented DEA CCR model indicates to increase efficiency by lowering the inputs – classes and capacities. The output-oriented DEA CRS model indicates to increase efficiency by increasing the outputs – increase of the number of pupils. The extent of inefficiency is not the same by all basic schools, the least efficient school is the one represented by DMU11. Results of input- and output-oriented DEA models are comparable, as it is shown in Table II. in Appendix and in Figure 3. below, where DMUs are ordered from the best to the worst according to the results of efficiency. Aggregate results of input- and output-oriented models are displayed in Table 2.

Table 2 - Aggregate results

DMUs = 55	CRS Efficiency (Input-Oriented)	CRS Efficiency (Output-Oriented)
efficient units (e=1)	3	3
the worst unit	0.6107	1.6376
number of inefficient units (e < 0 or e > 0)	52	52
mean	0.8628	1.1734
standard deviation	0.0911	0.1396

Source: Own processing

Figure 3. Results of efficiency according to input- and output-oriented DEA CRS models. Source: Own processing.



4 Conclusion and discussion

This contribution dealt with an example of 55 basic schools established by the city of Ostrava, in terms of the period of the school year of 2015/2016, and it was focused on the partial issue of basic schools in the Czech Republic, which is the efficiency of their capacities. Based on the results of modelling of technical efficiency according to input- and output-oriented CCR DEA model, it can be stated that the utilization of disposable capacities of basic schools was in the school year of 2015/2016 rather inefficient. Only three basic schools were using their capacities in an efficient way, namely the basic school from the Municipal District Moravian Ostrava and Přívoz, and two basic schools from Municipal District Ostrava Poruba. The rest of basic schools were using their capacities in rather inefficient way. Nevertheless, there are significant differences among inefficient schools, as it was indicated by simple comparison according to the formula (1) that compares actual number of pupils with set capacities of schools. The results also show that inefficient basic schools are from large as well as from small Municipal Districts. Beside basic school from the Municipal District Hošťalkovice, there are also basic schools from the districts Moravian Ostrava and Přívoz, and from Ostrava Poruba belonging to the least efficient. The fact that both, efficient and the least efficient utilization of capacities of basic schools, can be found in the same Municipal District, indicates issues of possible differentiations in the field of professional and technical quality of individual basic schools.

The improvement of technical efficiency of capacities of basic schools can be considered in two ways. The first one is rationalization of capacities by merging of schools or by cancellation of a school. This solution is from the perspective of preservation of accessibility of compulsory school attendance more suitable in larger Municipal Districts such as Ostrava – South, Ostrava Poruba or Moravian Ostrava and Přívoz that have higher number of basic schools. The second one is rationalization of capacities by administrative reduction of capacities of basic schools (reduction of number of pupils in a class, e.g. for the reason of inclusion).

In the context of studied topic, it is necessary to mention that current network of schools and educational facilities in the Czech Republic and their capacity range were being formed during last decades when they were reflecting the number of children of the society at school age. However, this network had to cope with significant changes in age structure of population in recent years. It is also possible to anticipate decreasing trend of the number of children at school age in next decades. This fact is taken into account also in the Strategy for Education Policy of the Czech Republic until 2020, which identifies number of pupils as a key parameter of performance of basic education.

Acknowledgements

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Appendix:

Table I. Basic characteristics

Municipal Districts	number of inhabitants	children thereof (0-14yrs)	number of schools	number of classes	capacity (maximal number of pupils)
Hošťálkovice	1 599	229	1	9	300
Hrabová	3 622	505	1	18	700
Krásné Pole	2 731	421	1	12	270
Lhotka	1 192	194	1	4	80
Mariánské Hory and Hulváky	12 270	1 691	1	18	550
Martinov	1 496	166	0	0	0
Michálkovice	2 985	452	1	17	550
Moravian Ostrava and Přívoz	38 661	5 195	8	172	4 843
Nová Bělá	1 763	273	1	5	120
Nová Ves	676	109	0	0	0
Ostrava-South	106 974	14 466	18	332	13 022
Petřkovice	2 916	406	1	18	400
Plesná	1 262	206	0	0	0
Polanka nad Odrou	4 698	736	1	16	540
Poruba	66 601	8 377	12	247	6 940
Proskovice	1 212	193	1	5	100
Pustkovec	1 129	168	0	0	0
Radvanice and Bartovice	6 492	978	1	24	560
Silesian Ostrava	21 161	3 276	3	52	1 630
Stará Bělá	3 760	614	1	19	550
Svinov	4 301	592	1	19	420
Třebovice	1 805	237	0	0	0
Vítkovice	6 916	1 152	1	20	596
Ostrava in total	296 222	40 636	55	1 007	32 171

Table II. Order of basic schools (BS) according to their efficiency (from the best to the worst)

Order	Municipal District	DMU		Efficiency Input-Oriented	Efficiency Output-Oriented
1	Moravian Ostrava and Přívoz	BS - Matiční 5/1082	DMU10	1.0000	1.0000
2	Poruba	BS - Josefa Valčíka 4411/2	DMU41	1.0000	1.0000
3	Poruba	BS - Porubská 12/832	DMU46	1.0000	1.0000
4	Petřkovice	BS - Hlučínská 136/237	DMU34	0.9891	1.0110
5	Moravian Ostrava and Přívoz	BS - Ostrčilova 10/2557	DMU13	0.9855	1.0147
6	Mariánské Hory and Hulváky	BS - Gen. Janka 1208	DMU5	0.9687	1.0323
7	Ostrava-South	BS - Horymírova 2978/100	DMU20	0.9654	1.0358
8	Poruba	BS - Gen. Škarvády Por. 10	DMU45	0.9651	1.0362
9	Stará Bělá	BS - Junácká 700	DMU53	0.9614	1.0401
10	Poruba	BS - Dětská 915/2	DMU38	0.9489	1.0538
11	Poruba	BS - L. Štúra 8/1085	DMU44	0.9418	1.0618
12	Proskovice	BS - Staroveská 62	DMU48	0.9362	1.0681
13	Ostrava-South	BS - Provaznická 831/64	DMU29	0.9331	1.0717
14	Krásné Pole	BS - Družební 336/125	DMU3	0.9321	1.0728
15	Poruba	BS - Aleše Hrdličky 1638/1	DMU36	0.9311	1.0740
16	Poruba	BS - Komenského 668/13	DMU43	0.9173	1.0902
17	Poruba	BS - Ivana Sekaniny 1804/15	DMU39	0.9163	1.0914
18	Ostrava-South	BS - Srbská 450/2	DMU30	0.9041	1.1060
19	Polanka nad Odrou	BS - Heleny Salichové 1053	DMU35	0.9020	1.1087
20	Ostrava-South	BS - B. Dvorského 1049/1	DMU17	0.9008	1.1101
21	Ostrava-South	BS - Jugoslávská 2906/23	DMU22	0.9006	1.1104
22	Moravian Ostrava and Přívoz	BS - Zelená 42/1406	DMU14	0.8974	1.1144
23	Poruba	BS - Bulharská 1532/23	DMU37	0.8901	1.1234
24	Ostrava-South	BS - Františka Formana 268/45	DMU19	0.8844	1.1307
25	Ostrava-South	BS - Šeříková 682/33	DMU31	0.8764	1.1410
26	Ostrava-South	BS - Březinova 1383/52	DMU18	0.8764	1.1410
27	Ostrava-South	BS - A. Kučery 1276/20	DMU16	0.8748	1.1431
28	Silesian Ostrava	BS - Pěší 1/66	DMU52	0.8734	1.1449
29	Poruba	BS - J. Šoupala 6/1609	DMU40	0.8600	1.1628
30	Lhotka	BS - Těsnohlídkova 99	DMU4	0.8557	1.1686
31	Moravian Ostrava and Přívoz	BS - Gebauerova 8/819	DMU8	0.8546	1.1702
32	Ostrava-South	BS - Klegova 1398/27	DMU24	0.8545	1.1703
33	Ostrava-South	BS - Volgogradská 2600/6B	DMU33	0.8545	1.1703
34	Silesian Ostrava	BS - Bohumínská 72/1082	DMU50	0.8523	1.1733
35	Svinov	BS - Bílovecká 1	DMU54	0.8509	1.1752
36	Ostrava-South	BS - Kosmonautů 2218/13	DMU26	0.8461	1.1819
37	Silesian Ostrava	BS - Chrustova 24/1418, Škrobálkova 300/51	DMU51	0.8338	1.1994
38	Ostrava-South	BS - Kosmonautů 2217/15	DMU25	0.8336	1.1996
39	Ostrava-South	BS - Krestova 1387/36A	DMU27	0.8325	1.2012
40	Moravian Ostrava and Přívoz	BS - Nádražní 117/1217	DMU12	0.8303	1.2044
41	Poruba	BS - Karla Pokorného 1382/56	DMU42	0.8284	1.2071
42	Moravian Ostrava and Přívoz	BS - Gen. Píky 13A/2975	DMU9	0.8275	1.2085
43	Michálkovice	BS - U Kříže 28	DMU6	0.8047	1.2427

44	Ostrava-South	BS - V. Košaře 121/6	DMU32	0.8040	1.2439
45	Hrabová	BS - Paskovská 46/53	DMU2	0.8018	1.2473
46	Ostrava-South	BS - Chrjukinova 1801/12	DMU21	0.7861	1.2721
47	Moravian Ostrava and Přívoz	BS - Gajdošova 9/388	DMU7	0.7776	1.2860
48	Ostrava-South	BS - Klegova 1169/29	DMU23	0.7754	1.2897
49	Nová Bělа	BS - Mitrovická 389/75	DMU15	0.7528	1.3283
50	Vítkovice	BS - Šalounova 394/56	DMU55	0.7453	1.3417
51	Radvanice and Bartovice	BS - Vrchlického 401/5	DMU49	0.7035	1.4215
52	Ostrava-South	BS - Mitušova 1115/8	DMU28	0.6950	1.4387
53	Poruba	BS - Ukrajinská 1533/13	DMU47	0.6835	1.4632
54	Hošťálkovice	BS - Výhledy 210	DMU1	0.6238	1.6030
55	Moravian Ostrava and Přívoz	BS - Na Mlýnici 611/36	DMU11	0.6107	1.6376

An Economic Analysis of Alternative Dispute Resolution – Case Study: Mediation in Poland

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Abstract
The topic of this paper is economic analysis of mediation in civil, commercial, labor, family and administrative matters. Main aims are focused on: 1) to present mediation as a viable, reasonable and faster alternative to judicial dispute resolution; 2) to analyse social costs of mediation; 3) the analysis of the use of mediation in Poland and its effectiveness. In the article have been used desk research analysis and analysis of statistical data on the number of cases referred to administrative courts and common courts and the number of cases referred to mediation. The results of the study confirm that mediation is much cheaper and cost-efficient compared to the dispute resolved by a court. Although mediation often provides a speedy resolution to a specific dispute, the level of use of mediation both in administrative and common courts is low. The number of cases referred to mediation does not exceed even 1% of all cases considered by the Polish courts. It becomes apparent that mediation is not utilized as much as traditional adjudicative processes.

Keywords: *alternative dispute resolution, litigation, mediation, social costs of mediation*

JEL classification: *K400, K410, K490*

An Economic Analysis of Alternative Dispute Resolution – Case Study: Mediation in Poland

Ewa Wójcicka

1 Introduction

For many years, mediation has been the centre of interest of the European Union and the Council of Europe, which encourage Member States to introduce alternative dispute resolution in their national legislation. One of the most popular is mediation, the essence of which is based on seeking by parties, with the aid of an impartial mediator, such settlement of a dispute which will be satisfactory for them. In legal systems of such European countries as Germany, France, Belgium, the Netherlands, Finland, Sweden and Norway mediation has been successfully operating since the 1980s, enjoying significant acceptance of the legal community and society. In Poland mediation is also one of the fastest growing form of alternative dispute resolution. It can be used in civil, commercial, labor law, family and administrative matters.

Mediation proceedings are a multifaceted phenomenon and their comprehensive study requires analyses with the application of different methods, including an economic method. The assumption underpinning economic analysis of law is that a man is an economically rational being, therefore he chooses adequate measures to achieve his objectives, maximising his utility within the constraints of available goods. The basic normative claim of economic analysis is that law should be economically efficient (Stelmach, Brożek, Załuski, 2007, p. 17-19; Stroiński, 2005a, p. 484). The prime task of economic analysis of law is to study whether a given law determines an economically effective system of allocation of goods, stimulating the affluence of society through minimising social costs and limiting the phenomenon of the waste of economic values (Cooter, Ulen, 2009, p. 508; Stroiński, 2005b).

The issue of economic analysis of mediation has not been yet the subject of a broader interest of the Polish researchers. Although the analysed problem is essential for effectiveness of law, there is lack of its study in scientific literature. There is therefore a need to review accepted solutions and effectiveness of this type of alternative dispute resolution. Main aims of presented contribution are focused on the following topics: 1) to present mediation as a viable, reasonable and faster alternative to judicial dispute resolution; 2) to analyse social costs of mediation; 3) the analysis of the use of mediation in Poland and its effectiveness.

2 Data and methods

In the article have been used the following research methods and data sources:

1. desk research analysis, inter alia normative acts on mediation: the Act of 30 August 2002 the Law on Proceedings before Administrative Courts (Journal of Laws 2016, Item 718), the Act of 17 November 1964 Code of Civil Procedure (Journal of Laws 2014, Item 101) and the Act of 6 June 1997 Code of Criminal Procedure (Journal of Laws of 1997, No. 89, Item 555), research and scientific studies on the state of mediations in Poland;

2. analysis of statistical data on the number of cases referred to administrative courts and common courts (district and regional) and the number of cases referred to mediation.

The analysis of the state of mediation in terms of statistics was conducted in administrative courts and common courts (regional and district courts) and it was divided into categories according to the applicable area of law: commercial, civil, family, labour and administrative law. The analyses were based on reporting data for years 2006-2015, generated by the Ministry of Justice (available from https://ms.gov.pl/pl/dzialalnosc/mediacje/; http://mediacja.gov.pl/Badania-analizy-i-statystyki-.html) and the Supreme Administrative Court (available from http://www.nsa.gov.pl/sprawozdania-roczne.php).

3 Mediation as alternative dispute resolution

3.1 Definition

The idea of alternative dispute resolution was created in the 1970s in the USA. Rise to the development of ADR was a long waiting period for judicial resolution, high litigation costs as well as dissatisfaction of the parties with

the classical judicial proceedings. ADR guaranteed a quick settlement of a dispute, a significant costs reduction related to the reduction of judicial costs and the expenditure on a preparatory inquiry, the informalisation of a procedure through focusing on interests and expectations of the parties. ADR also allowed to submit to a method focused on a solution to a problem rather than on a dispute itself (Kalisz, Zienkiewicz, 2009, p. 26-27).

Alternative dispute resolution means many different methods for solving a dispute with the help of a neutral and impartial third party (Morek, 2004, p. 1). According to Jakubiak-Mirończuk (2008, p. 19), ADR is "any, apart from procedural, possibilities or forms of proceedings in a dispute, based on the idea of solution rather than on the idea of settlement of disputes". ADR offers a simple, fast and low-cost solution to disputes between parties (Shavell, 1995). From among many different types of ADR the following types are distinguished most often: arbitration, mediation and conciliation. Other types are usually a compilation of these three forms called mixed or hybrid, which include among others: mini-trial, summary jury trial, Elary Neutral Evaluation, private judging (rent-a-judge), baseball arbitration, ombudsman (Gmurzyńska, 2007, p. 10-30).

A special alternative dispute resolution is mediation as a voluntary and confidential procedure to regulate conflicts independently from a court. The notion of mediation comes from Greek, e.g. terms: "mesitis", which refers to a female mediator, and "mesitaes", which refers to a male mediator. In Latin there is also a range of terms related to mediation, such as: "mediare", "medius", meaning of which is „standing in between" (Bahtiri, Qerimi, 2014, p. 293). Mediation is considered to be the most suitable option for litigants and these circumstances include those situations where parties desire to maintain an amicable relationship (Newman, 2000, p. 181). According to Oxford Dictionary of Law, mediation is "a form of alternative dispute resolution in which an independent third party assists the parties involved in a dispute or negotiation to achieve a mutually acceptable resolution of the points of conflict". However, a mediator, who may be a lawyer or a specially trained non-lawyer, has no power to decide for the dispute and cannot force the parties to accept a settlement since a settlement of the dispute depends on the agreement of the parties (Martin, Law, 2009, p. 348).

Though there is no one specific definition of mediation, it is possible to identify certain specific features that are characteristic of this institution. Basically, mediation is based on principles such as party autonomy, client-centredness and choice, confidentiality and a focus on interests and needs rather than rights and positions. The process is also voluntary, which means that parties are not required to make any decisions or to reach agreement (Alexander, 2009, p. 15). Another important principle of mediation is the principle of neutrality of mediator. This means that mediator as a third party, neutral and authorized, mediates between the two parties intending to resolve disagreements and is obliged to be independent and unbiased from any kind of influence (Bahtiri, Qerimi, 2014, p. 303).

3.2 Legal framework of mediation in Poland

There are two types of mediation. The first one is a contractual mediation (private mediation), which is completely independent from judicial proceedings and it often takes place without any subsequent court proceeding. The second one is mediation in the pending court proceedings. A court, when appropriate and having regard to all the circumstances of the case, refers the parties to mediation, but cannot force the parties to do so. This paper describes the efficiency of mediation in court proceedings, because statistical data on private mediation are not available.

Mediation, as an alternative – in relation to trial – way of resolving disputes, was introduced into Polish legal system under the Act of 26 June 1991 on Resolution of Collective Disputes (Journal of Laws No. 55, Item 236). In 1997 mediation was adopted for criminal proceedings and in 2004 for administrative matters. In the following year the Polish legislator enacted a detailed and complete legislation on mediation in civil and commercial disputes. At present, mediation can be used in respect of the following matters: civil, commercial, labor law, family, juvenile, criminal and administrative. The table No. 1, in a synthetic way, presents the relevant characteristics of each type of mediation.

Table 1 - Characteristics of mediation in Polish law

Relevant characteristics	Criminal matters	Juvenile matters	Administrative matters	Civil, family, labor law and commercial matters
Legal basis	Article 23a of the Act of 6 June 1997 – the Code of Criminal Procedure.	Article 3a of the Act of 26 October 1982 on proceedings in juvenile matters.	Chapter 8. sec. III of the Act of 30 August 2002 – Law on proceedings before	Article 183^1–183^{15} of the Act of 17 November 1964 Code of Civil Procedure.

			administrative courts.	
Parties	Aggrieved party and accused.	Aggrieved, juvenile and his parents or a legal guardian. If the aggrieved is a juvenile – also his parents or a legal guardian.	Complainant and public administrative body whose action or inaction is the subject of the complaint.	Claimant and respondent (in contentious proceedings). Applicant and participant (in non-contentious proceedings).
The goal	The goal is not specified directly.	The goal is not specified directly.	The goal of mediation is to investigate and consider the factual and legal circumstances of the case, and to enable the parties to agree upon the methods of resolving it under law.	Settlement of the case or some of the points of dispute; reconciliation of parties without a formal settlement.
Referral of a case to mediation	On the basis of decision of a court or a law clerk, at the request of parties or with the consent of victim and defendant.	On the basis of decision of a court, at the request of parties or with the consent of victim and juvenile.	A mediation procedure may be carried out upon an application of the complainant or the body. The administrative court may instigate ex officio mediation proceedings.	On the basis of decision of a court, at the request of parties.
Cases for which mediation may be appropriate	There are no formal restrictions.	There are no formal restrictions. The matters whose relevant circumstances do not raise any doubts, are in particular referred to mediation.	There are no formal restrictions.	Mediation is acceptable in cases in which settlement is permitted by the law. Mediation is not acceptable in incapacitation, ascertainment of the acquisition of an inheritance, in payment-order proceedings, writ-of-payment proceedings (unless the charges were effectively brought), proceedings for pronouncing the sample contract clauses to be abusive.
Stage of the proceedings at which mediation can be initiated	At any stage of the proceedings.	At any stage of the proceedings.	An application must be submitted prior to court hearing.	At any stage of the proceedings.
Mediator	Institution or an authorized person.	Institution or a trustworthy person.	A judge or a court referendary.	Mediator is commonly chosen by the parties or appointed by a court, taking into account persons on the regular mediators' list in the first place.

The period of mediation	No longer than one month.	It is not specified directly.	It is not specified directly. A court sets a deadline for reaching an agreement.	No longer than three months. On a joint application by the parties or because of any important reasons the period of mediation might be prolonged if it will foster a settlement.
A result of an agreement	A settlement does not replace a court judgment and is not binding on the court.	A settlement does not replace a court judgment and is not binding on the court.	A settlement terminates the proceedings. A court does not confirm it.	Settlement, after its approval by a court, is formally valid like a settlement concluded before a court and it terminates the proceedings. In a case of divorce and separation, mediation might end with reconciliation or agreement.
Costs of mediation	The costs are covered by the State Treasury.	The costs are covered by the State Treasury.	Does not apply.	The costs are borne by the parties.

Source: own study.

In the further parts of the article, attention will focus on the analyse of mediation in civil, commercial, labor law, family and administrative matters. Mediation in this area of law has certain characteristic features that make it quite distinct from mediation in criminal and juvenile matters. Namely a settlement resulted from mediation terminates legal proceedings, which significantly reduces the costs of resolving a dispute. A result of the termination of proceedings is not caused by a mediation agreement in criminal matters and in cases involving juveniles. A settlement reached during mediation does not replace a court judgment and is not binding on the court, however the court should honour the content of the decision at the close of the proceedings. It is also worth noting that in criminal matters and in cases involving juveniles the parties do not pay the costs of mediation – these are covered by the State Treasury.

4 Economic analysis of mediation

There is a widespread view that mediation is much cheaper and cost-efficient compared to resolution of a dispute by a court. First of all, it should be emphasised that it is difficult to estimate the cost of solving a dispute through an adjudicatory process. There will be both the costs borne by society as a whole (expenditure on ensuring dwellings for courts, equipment, remuneration for judges and government employees) and the costs borne by the parties (Cooter, Ulen 2011, s. 549).

The amount of court costs and the cost of mediation proceedings are not subject to the court's discretional decision. The rules of determination are stipulated in number of legal acts, among which the most important are the following: the Act of 28 July 2005 on court fees (Journal of Laws 2005, No. 167, Item 1398), the Regulation of the Council of Ministers of 16 December 2003 on the amount and detailed rules concerning charging of a duty in administrative courts proceedings (Journal of Laws 2003, No. 221, Item 2193) and the Regulation of the Minister of Justice of 30 November 2005 on remuneration for mediators and reimbursable expenses in civil proceedings (Journal of Laws 2005, No. 239, Item 2018).

From the point of view of the parties to the proceedings the main sources of costs of judicial proceedings are: court fees (among others cost of bringing an action to a court, costs related to court proceedings including a clerical fee, the amounts due to witnesses, expert translators, interpreters), bailiff fees and legal aid fees. As a general rule, a participant in the given legal proceedings is obliged to pay the amount determined in regulations before taking an action. The costs of court proceedings depend on a type of a proceeding and on a particular case and the value of the subject of dispute. For exemple, in commercial law the cost of bringing an action to a court is 5% of the value of the subject of dispute, but not less than PLN 30 (EUR[57] 6,8) and not more than PLN

[57] The amount of fees were converted into euro at the average exchange rate on August 1, 2016, announced by the National Bank of Poland (EUR 1 = PLN 4,37).

100000 (EUR 22883). It is estimated that an average litigation cost in relation to the value of the object in dispute (EUR 200000) is 23,5%, and an average mediation cost in relation to the value of the object in dispute is 5% (The Cost of Non ADR, 2010).

If the proceedings relate to property, the mediator's remuneration is 1% of the value of the subject-matter of the dispute, but not less than PLN 150 (EUR 34) and not more than PLN 2000 (EUR 458) for all mediation proceedings. In cases concerning property rights mediator's remuneration is 1% of the value of the subject of dispute, however, not less than PLN 150 (EUR 34) and not more than PLN 2000 (EUR 458) for the entire mediation proceedings. In cases concerning non-property rights and in a property law case, when the value of the disputed claim cannot be established, mediator's remuneration for the first mediation session amounts to PLN 150 (EUR 34), and per each following session – PLN 100 (EUR 23), but in total not more than PLN 450 (EUR 103). Pursuant to Article 1041 of the Code of Civil Procedure, the costs of mediation conducted due to referral by a court and completed with a settlement abolish each other unless the parties have agreed otherwise. Thus, the rule is that mediation costs are borne by the parties on equal terms.

Moreover, if the proceedings have resulted in a settlement before the commencement of a hearing before the court of first instance, 100% of the court fees will be refunded to the party. If a settlement was reached before a mediator after the commencement of a hearing, 75% of the court fees will be refunded to the party who brought the matter before the court.

On the basis of the above comparison, the costs of a settlement reached in mediation proceedings are significantly lower than the costs of resolving a dispute by a court. Taking into consideration an average monthly gross wage and salary in enterprise sector in June 2016 (PLN 4252, EUR 973, Notice of the President of the Central Statistical Office on July 18, 2016), as also the minimum income in 2016 (PLN 1850, EUR 423), mediation appears more accessible than traditional judicial dispute resolution.

A settlement agreement is most desirable not only from the point of view of the parties, but also from the perspective of a court. Thereby, the implementation of a number of procedural steps will be redundant, which contributes to the reduction of proceedings costs both for the citizens and for the state. It should be noted that in Polish court proceedings there are no statutory limits as to the number of hearings, though a court should aim at limiting the number of hearings and, if it is possible, a court should resolve the case during the first hearing. As a result, the number of hearings is one of significant factors of costs. There is no doubt that a larger number of hearings increases the costs related with proceedings (lawyer's fee, expenses of the parties, witnesses and experts). When a settlement agreement is reached, in the majority there are no parties' expenses for travelling to a court, costs of a journey, accommodation and loss of income or witnesses' revenue, remuneration and recovery of costs for experts and translators as well as costs of examining other evidence.

In assessing the utility and effectiveness of this dispute resolution method, it should be taken into account the duration of mediation proceedings. There is general agreement that the time needed to resolve a dispute by mediation is shorter than resolution of a case by a court.

Slow pace of court proceedings is one of the primary challenges of the Polish justice system. The average time required to prepare and carry out legal proceedings in Poland is 540 days, and the average time to implement a judgement is 145 days. In respect of the average duration of legal proceedings from the day of the first registration to the day on which the judgment in the court of first instance has become final is almost 9 months (Ministry of Economy, 2015). However, the assumed time of mediation proceedings in civil matters is 3 months. On a joint application by the parties or for other important reasons the time limit for mediation may be extended if this will foster settlement. Practice proves that the average time of civil mediation is approximately 42 days. Economic mediation usually lasts not longer than 6 weeks (Ministry of Economy, 2015).

It follows from the above that mediation can provide a cost-effective and quick extrajudicial resolution of disputes. The possibility of a prompt completion of the legal proceedings should be viewed in a positive light. An earlier end of a dispute has a fundamental importance for the proper functioning of justice. This solution saves time of judges, proxies and the parties themselves by providing more efficient allocation of resources of all participants to the proceedings. It contributes to the increase of judges' work efficiency relieving them from cases which – instead of being resolved in a court – will be settled amicably.

One should also draw attention to an important aspect: agreements resulting from mediation are more likely to be executed voluntarily. Thus, instigation of enforcement proceedings, which generate high costs (among others: a retainer fee, fees for services or per hour of bailiff's work), will be unnecessary.

Moreover, the agreement parties are more likely to preserve an amicable and sustainable relationship. These benefits are even more pronounced in commercial disputes, because such settlement of a dispute does not destroy relations between entrepreneurs and gives both parties a chance to continue the business cooperation.

Mediation can therefore contribute to more sustainable economic and social trends in preserving the relationship between the parties, in contrast to the often disruptive effects of solving a dispute by a court.

It should also be noted that there are potential benefits to the budget of the state due to a reduction of judicial proceedings. ADR contributes to a reduction of expenditure on compensation for the parties on account of delays in legal proceedings. An earlier end of a dispute between business entities improves the competitiveness of the economy, and, consequently, is also beneficial for an increase in tax revenues. Therefore, it can be concluded that mediation generates low social costs and reduces the phenomenon of the waste of economic values, contributing to the more effective allocation of resources.

5 Statistics of mediation and its effectiveness

A considerable number of cases pending before the Polish courts, the length and costs of court proceedings suggest that the choice of an amicable settlement of a conflict should be an attractive alternative. However, the statistics of mediation proceedings in all matters reflect their very low absolute number despite the noticeable growth rate.

Table 2 - Statistics of mediation and its effectiveness in 2006-2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
civil matters										
the number of cases referred to mediation	1448	1399	1455	1842	2196	2514	2844	3251	3272	4123
proceedings were discontinued as a result of the approval of a settlement reached before a mediator	93	111	119	90	148	159	252	275	281	321
the effectiveness of mediation	6,4%	7,9%	8,2%	4,9%	6,7%	6,3%	8,9%	8,4%	8,6%	7,8%
family matters										
the number of cases referred to mediation	270	326	427	716	1092	1149	1342	1283	1335	1932
the settlement was reached	127	155	216	340	439	471	559	521	574	856
the effectiveness of mediation	47%	47,5%	50,5%	47,5%	40,2%	41%	41,7%	40,6%	43%	44,5%

commercial matters										
the number of cases referred to mediation	256	258	210	540	848	1429	2354	2812	3096	5744
proceedings were discontinued as a result of the approval of a settlement reached before a mediator	51	64	43	98	169	253	422	535	547	640
the effectiveness of mediation	19,9%	24,8%	20,5%	18,1%	19,9%	17,7%	17,9%	19,0%	17,7%	11,1%
labor matters										
the number of cases referred to mediation	33	74	107	252	197	66	284	326	306	512
proceedings were discontinued as a result of the approval of a settlement reached before a mediator	5	8	7	22	26	22	39	57	59	120
the effectiveness of mediation	15,2%	10,8%	6,5%	8,7%	13,2%	33,3%	13,7%	14,5%	19,3%	23,4%
administrative matters										
the number of cases referred to mediation	172	87	36	21	11	23	25	8	10	8
proceedings were discontinued	66	17	16	3	2	8	4	5	4	1

as a result of a settlement										
the effectiveness of mediation	38,4%	19,5%	44,4%	14,3%	18,2%	34,8%	16%	62,5%	40%	12,5%

Source: own study based on reporting data generated by the Ministry of Justice and the Supreme Administrative Court.

Statistical data for years 2006-2015 indicate that the use of mediation is related to the type of case. The use of mediation is considerably higher than average in commercial matters. It is worth noting the growing tendency in the number of mediation referrals. Statistical data show that in year 2015, 2042 cases were referred to mediation (2244% of all cases referred to mediation in 2006). Altogether, in the years 2006-2015 the judges decided to refer the commercial cases to mediation 17547 times.

Similarly, in the case of civil law proceedings conducted by common courts we observe a systematic growth of cases referred to mediation. In 2015, 4123 cases were referred to mediation, meaning the growth by almost 285% when compared to 2006.

Mediation is rarely used in cases dealing with labour law. Altogether, in the years 2006-2015, only 2157 cases were referred to mediation. Statistical data for year 2015 indicate a slightly higher level of use of mediation tools. The court judges have referred 512 cases to mediation, which constitutes 167% of all cases referred to mediation in year 2014.

Statistical data for years 2006-2015 show that mediation has not proved attractive for the bodies and complainants. During the analysis period the level of use of this measure in voivodeship administrative courts has consistently decreased. In 2006, 172 mediation proceedings were initiated before first instance courts, and 66 cases were resolved in this mode. In 2015, eight mediation proceedings were initiated before voivodeship administrative courts, and only one case was resolved. Ipso facto, mediation was not broadly applied in administrative cases.

However, the absolute number of mediation referrals provides just an initial picture of the situation. An overview of effectiveness of mediation and the number of referrals in the context of the number of cases taken to courts will allow to get the reliable and comprehensive picture of the situation.

As for effectiveness of mediation, understood as signing of a settlement agreement, one should point at wide variation depending on the type of case. The value of this indicator is the family matters. The percentage of mediations concluded with a conciliation agreement hovers around 40%. In years 2006-2015 the effectiveness of mediation remained similar – the percentage of mediations concluded with a conciliation agreement ranged between 35,3% and 50,5%. In accordance with the data of the Ministry of Justice (2016), in 2015 mediation turned out to be the most effective tool in cases concerning awarding alimony (199 cases closed as a result of the use of mediation). As for non-judicial proceedings, the highest number of cases concluded in 2015 as a result of mediation concerned applications for contact with a minor and applications for amendment of contact orders (504 cases – which is the largest category of cases concluded by a court decision through mediation), and, to a lesser extent, determination of the place of residence of a minor (62) and termination, suspension or limitation of parental custody (53).

The value of this indicator maintains a downward trend in commercial matters. The percentage of mediations concluded with a conciliation agreement ranged between 24,8% in 2007 and 11,1% in 2015. With regard to business law, mediation turned out to be the most effective tool in cases concerning: claims due to contracts for services, claims due to sales contracts and claims due to contracts for construction works. A visible share of effective mediation was also recorded for claims due to lease or rental agreements.

The effectiveness of mediation in civil matters is about 7,4% on average. As for civil law cases, most cases concluded as a result of mediation were associated with claims concerning the legitimate proportion of inheritance, as well as claims associated with various types of agreements (in total, for sales contracts, contracts for specific work, contracts for construction works, lease or rental, loan agreements and mandate agreements). In non-judicial proceedings, mediation is utilized, first and foremost, in matters connected with division of joint property and inheritance. Moreover, civil law mediation is most effective in the case of divorce and protection of personal interests. It would be difficult to determine clear trends in this regard. However, in general, effectiveness of mediation as an alternative dispute resolution method in solving civil law cases should be assessed as low.

A measure, by means of which the use of mediation may be examined, is the percentage of cases referred to mediation in relation to the number of cases altogether handled by a court. Detailed data relating to registered cases and the number of cases referred to mediation in 2011-2015 are presented in table No. 3.

Table 3 - The total number of cases in common and administrative courts and number of cases referred to mediation in years 2011-2015

	2011	**2012**	**2013**	**2014**	**2015**
I. The number of cases brought before common courts:					
The number of civil cases	8085791	8277470	9013781	8460422	5554342
including the number of cases referred to mediation	2514	2844	3251	3272	4123
the percentage of cases referred to mediation	**0,031%**	**0,034%**	**0,036%**	**0,038%**	**0,074%**
The number of family cases	1321993	1347716	1406613	1396338	1406330
including the number of cases referred to mediation	1149	1342	1283	1335	1932
the percentage of cases referred to mediation	**0,087%**	**0,099%**	**0,091%**	**0,096%**	**0,127%**
The number of labor law cases	111560	120402	120021	156572	104728
including the number of cases referred to mediation	66	284	326	306	512
the percentage of cases referred to mediation	**0,059%**	**0,236%**	**0,272%**	**0,195%**	**0,489%**
The number of commercial cases	1295324	1444597	1594363	1533800	839585
including the number of cases referred to mediation	1429	2354	2812	3096	5744
the percentage of cases referred to mediation	**0,110%**	**0,163%**	**0,176%**	**0,202%**	**0,684%**
II. The number of cases brought before administrative courts	69851	72160	81634	84162	83529
including the number of cases referred to mediation	23	25	8	10	8
the percentage of cases referred to mediation	**0,033%**	**0,035%**	**0,009%**	**0,012%**	**0,009%**

Source: own study based on reporting data generated by the Ministry of Justice and the Supreme Administrative Court.

The statistics clearly show that the use of mediation in common and administrative courts was very limited. Against a background of all cases considered by administrative courts, the percentage of cases referred to mediation was marginal.

In administrative courts the percentage of cases referred to mediation in years 2011-2015 ranged between 0,009% and 0,035%. Experience over the last years shows that mediation has not been adopted in administrative judiciary. In 2015, only eight mediation proceedings were initiated before first instance courts, and only one case was resolved in this mode. In many voivodship administrative courts there were no mediation proceedings. To compare, in 2015, voivodship administrative courts handled 83529 complaints. As mentioned earlier, statistical data indicate that the use of mediation depends on the type of case. In administrative matters mediation is not used so often, because this kind of cases is mostly resolved in a form of an administrative body's decision. It may be difficult for the parties during mediation proceedings to make arrangements from equal position or in a flexible way.

Reported data show that mediation is also marginalised in common courts (district and regional). In years 2011-2015, there were about 40 thousand cases referred to mediation. However, it still represents a tiny proportion of all cases adjudicated by Polish common courts. The percentage of cases referred to mediation in years 2011-2015 ranged between 0,005%-0,136%.

In 2015, in civil matters, the judges decided to refer a case to mediation 4123 times, which constitutes as little as 0,074% of all court proceedings in this area of law (5554342 cases in 2015).

In year 2015, common courts referred the total of 5744 commercial law cases to mediation, which constitutes only 0,684% of all litigations. The total number of commercial mediations initiated by courts in years 2011-2015 was 15435, whereas courts registered in this period over 6,7 mln commercial cases. It means that this alternative dispute resolution method was used for 0,23% of all cases.

In labour law litigations, the percentage of cases referred to mediation in years 2011-2015 ranged between 0,059% and 0,489%. This level was the highest in 2015. At that time referral to mediation was recorded 512 times, which means that this alternative dispute resolution method was used for 0,489% of all cases. In the period of five years, 1494 cases were referred to mediation, which constitutes only 0,24% of all cases in this area of law.

As for family law cases considered by district courts in year 2015, 1932 of these were referred to mediation, which constitutes as little as 0,127% of all cases. On the average, courts referred 1400 cases to mediation each year, which constitutes 0,1% of all proceedings.

6 Conclusion

Mediation is the main form of alternative dispute resolution and it could bring benefits that are not available through the litigation process. Mediation, in contrast to solving a dispute through judicial proceedings, can provide a cost-effective and quick resolution of disputes. One of the main benefits of using this type of proceedings is avoiding litigious confrontation, reducing the costs of litigation and growing the efficiency and transparency of justice, in particular the decreasing backlog of cases in courts.

High litigation costs and uncertainty about the final judgment should be a sufficient incentive to solve disputes by mediation. The statistics show that in years 2006-2015 the number of cases resolved by mediation increased. However, several thousand cases still represent a tiny proportion of all cases adjudicated by courts. As clearly follows from the above data, the level of use of mediation both in administrative and common courts is low. This conclusion is applicable to all areas of law – the percentage of commercial law cases referred to mediation in 2015 constituted 0,684% of all court proceedings, for family law – 0,127%, for civil law – 0,074%, for labour law – 0,489% and for administrative law – only 0,009%. The analysis of statistical data indicates that mediation is not utilized as much as traditional adjudicative processes. The number of cases referred to mediation does not exceed even 1% of all cases considered by the Polish courts. One might risk putting forward the thesis that in Poland this method is not considered as a real alternative.

If only the number of mediation proceedings and the mediation's effectiveness measured in terms of the number of concluded settlements were concerned, this institution appears to be imperfect and inefficient. But it is necessary to bear in mind that a settlement agreement is not the only aim of mediation. The nature of mediation is different from the nature of court proceedings. Its conduct and effect is directly connected with the level of conflict between the parties, their attitude and readiness to communicate. A value in itself is the restoration of communication between the parties and enabling them to see whether a settlement agreement is possible in a given situation. Statistics do not measure the level of parties' emotions. Experience shows that even if there is no settlement, parties' attitude towards each other and the dispute changes.

Despite a clear advantage of mediation, parties extremely rarely use this kind of dispute resolution, choosing instead much longer and more expensive judicial proceedings. The most important factors which have a negative impact on the interest in mediation in Poland are: insufficient knowledge of ADR, both among lawyers, judges and the general public, low level of social acceptance and the lack of a conscious need to use mediation (Rudolf, Cichowicz-Major, Matysiak, Pałka, Pieniążek, Przybył, 2015).

In order to encourage the parties to use ADR, Polish legislator has introduced a number of changes in mediation proceedings. On 1 January 2016, the Act of 10 September 2015 on changes of certain laws in connection with supporting alternative dispute resolution entered into force. Its aim is to expand and increase the use of mediation in civil matters, especially among entrepreneurs. The effect of the changes is to use mediation more broadly and frequently and, consequently, to shorten and improve judicial proceedings and to reduce the costs of disputes on both the side of the citizens and on the side of the state.

First of all, the judges have a duty to make an assessment whether a dispute can be solved by mediation. They may also direct the parties to mediation – more than once – at any stage of the proceedings. Therefore, if the judge conducting the case perceives that there is a chance for reaching an agreement on the settlement of dispute with the assistance of a mediator, the court should stay the proceeding and direct the parties to mediation. Moreover, the costs of mediation due to a referral by a court have been classified among judicial costs, which will enable to exempt the indigent persons from bearing them. Finally, in district courts the office of a coordinator for mediation has been created, whose activities are intended to promote and use mediation in a much wider way.

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Differentiation of Demographic Processes in the Regions of the Polish - Czech Borderland and their Socio-Economic Implications

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Abstract
Global and irreversible, in many parts of the world, character of demographic transformations in the form of population decline, as well as progressive ageing process, have contributed to the fact that more attention is now directed towards the demographic determinants of socio-economic development. The changes in the numbers and structures of the population not only require re-modelling of economies and regions but, above all, generating completely new social tasks that would lead to a more intense relationship between the demographic growth, both economic and social, as well as the need for actions to harmonize them. This article aims at showing the nature of the population transformations taking place in the Polish-Czech borderland regions within the NUTS III, and their social and economic implications. Despite the spatial differences in the intensity of changes, the same transformations direction provides the grounds for closer cooperation of the territorial units of different levels and, in particular, demographically similar in the scope of solving social and economic issues.

Keywords: *border, cooperation, NUTS III, population*

JEL Classification: *A11, A19, J10, J11*

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1 Introduction

Demographic phenomena and processes, taking place in the contemporary world, characterized by differentiated intensity in time and spatial heterogeneity are getting increasingly important determinants of development of particular areas. The Poland – Czech Republic borderland is the area where the population processes specifics of the past were shaped by many factors, which include political factors such as modification of borders and political systems, or demographic factors (demographic transitions and economic factors).

An analysis of the demographic situation in selected years, within various territorial units of this area, is to present differences in the demographic processes that generate different social issues and economic problems. Whereas a forecasting approach towards selected aspects of population that give an overview of the future volumes of the potential demand and transformations of its structure resulting from consumer preferences should constitute an indicator for the development of a social and economic grounds and, above all, identify similar problems as a platform for vertical and horizontal cooperation of the trans-regional, cross-border and individual units'dimensions. The chronological caesura covers period of 2000- 2014 and forecasts of 2030 and 2050. This analysis applies the data of the Czech Statistical Office and the Polish Central Statistical Office.

2 Term research area

The Polish-Czech Republic border is 796 km long. This means that the area stretching along the border is vast and characterized by great landscape diversification. At the Polish side, the border with the Czech Republic runs across three voivodeships (NUTS II) and includes Lower Silesia, Opole voivodeship and the Silesian voivodeship. At the Czech side, there are: Severovýchod, Stredni Moravaand Moravskoslezko. The study has covered the area of the tangential territorial units of the Polish and Czech border at the level of NUTS III. Thus, the study includes thefollowing sub-regions: Jeleniogórski and Wałbrzyski (Lower Silesia), Nysa (Opole voivodeship), Rybnik and Bielsko (Silesia), as well as, the following countries:Liberecky, Kralovehradecky, Pardubicky (Severovýchod), Olomoucky (StredniMorava) and Moravskoslezko (belonging to both NUTS II and NUTS III).

One of the basic conditions for the selected area of research is the geographical location including, among others:

- The intersection of important routes of national and international importance;
- Openness of the area thanks to membership in the European Union,
- Location within the transit area of North-South Europe and West-East Europe, [10]

which also constitutes a field of an important economic activity of the two countries that, in turn, is of major importance for the European integration. This stands for an area of a "new (orange) banana" covering the area from the Baltic Sea through Central Europe and the Balkans to the Adriatic coast, as a newly developing core part of Europe [13].

The total area of these units is 40 691 km2;the Czech Republic part covers29.3% of the total area of the Czech Republic; the Polish part is 5.6% of the total Polish area. In 2014 the population of these areas was amounted to 5646.3 thousands people, constituting 31.7% and 7.5% of the total population of the Czech Republic and Poland respectively.

3 Demographic changes - selected aspects

Population changes within the territory of the borderland will be presented from the point ofresources and fluxes. The former will show the changes in the population numbers in the selected time spans while the latter - changes in natural and migration developments [4]. The chronological caesura adopted, covering the period of 2000 – 2014, includes the important breakthroughs associated with the results of the demographic transition in both countries in the 80's and 90's that were additionally reinforced by the ongoing transformation of the political systems (political, economic and social in 1990), accession to the European Union (2004), globalization along

with the consequences of the global economic and social crisis (2008) that contributed to the current demographic image of the Polish-Czech borderland.

Unequal strength and direction of the impact of these factors are reflected in the population dynamics within the Polish-Czech borderland regions (Table 1) presenting negative population dynamics in 2014 as compared to the year 2000 within six out of10 units described: Jeleniogórskisub-region, Wałbrzych sub-region, Nysasub-region, Olomoucky country Moravskoslezský country. The largest population loss occurred at the Polish side and Nysa sub-region was the sub-region with the highest depopulation

(-5.6%). A slightly smaller drop was recorded in the Moravian-Silesian country (–4.8%). The highest population growth occurred in Bielsko sub-region(by 3.2%) and kralowohradecki(by 2.2%).

Table 1. Population of the Polish-Czech borderland regions in 2000 – 2014 (in thousands) and its dynamics Forecast I (by NUTS III)

Sub-regions Regions	Years					2030	2050
	2000	2005	2010	2014	Dynamics 2010-2014 2000 =100	Dynamics 2014=100	Dynamics 2014=100
Jeleniogórski	592,8	584,1	584,0	573,3	96,7	90,6	74,5
Wałbrzyski	704,2	687,8	685,6	669,8	95,1	89,2	72,3
Nyski	400,5	393,6	385,1	378,1	94,4	89,5	72,3
Rybnicki	648,0	640,5	640,2	637,4	98,3	92,9	80,7
Bielski	641,7	647,5	660,8	665,2	103,2	98,7	93,2
Liberecky	429,1	428,2	439,4	438,8	102,2	99,3	95,7
Kralovehradecky	550,7	547,3	554,8	551,5	100,1	97,2	91,3
Pardubicky	508,5	506,0	517,1	516,3	101,5	98,6	94,5
Olomoucky	641,5	638,9	641,6	635,7	99,0	96,2	88,7
Moravskoslezky	1278,0	1250,7	1243,2	1217,6	95,2	92,8	80,9

Source: Główny Urząd Statystyczny, BDL , Warszawa; https://bdl.stat.go.pl/BDL,Prognoza ludności Polski według podregionów GUS Warszawa 2014

Cesky Statisticky Urad, Regionalni Statistiky;
https://www.czso.cz/csu/czso/regiony_mesta_obce_souhrn, Projekce obyvatelstva v Ceskiej Republice do 2050 roku

The demographic situation results from the formation of two components such as natural and migratory movements [11]. The importance of both, in shaping the population numbers in the described units, has indicated distinctive differences.

Table 2. Birth rate (per 1000 persons) within the Polish–Czech borderland in 2000 – 2014, according to NUTS III

Sub-regions / Regions	Years			
	2000	2005	2010	2014
Jeleniogórski	-0,6	-1,4	-0,9	-2,5
Wałbrzyski	-2,3	-2,6	-2,6	-3,6
Nyski	-0,1	-1,2	-0,8	-2,0
Rybnicki	1,4	1,4	2,2	0,8
Bielski	1,0	0,3	1,4	0,8
Liberecky	-1,0	-0,1	2,0	0,2
Kralovehradecky	-1,5	-0,6	0,8	-0,2
Pardubicky	-1,0	-0,5	0,8	0,6
Olomouncky	-1,9	-0,5	0,3	-0,1
Moravskoslezky	-1,2	-0,7	-0,2	-0,9

Source: BDL, GUS Warszawa;https://bdl.stat.gov.pl
Regionalni Statistiky CSU;https://www.czso.cz/csu/czso/regiony_mesta_obce_souhrn

Analysing the values of birth-rate indicators, such as the difference of births and deaths per 1000 inhabitants within selected time spans of the period analysed, it has been noticed that their permanent negative level was observed in the following sub-regions: Jeleniogórski, Wałbrzyski, Nysa and Moravskoslezský (moravskoslezky) country. In this context, Rybnik and Bielsko sub-regions stand out with their positive birth-rate (per 1000). In the other regions, the years 2000 and 2005 indicated negativebirth-rate that was also noted in 2014 in Kralowohradecki (Kralovehradecky) country and Ołomucki (Olomoucký) country. In case of Liberec (Liberecky) and Pardubice (Pardubicky) the years2010 and 2014 marked a positive birth-rate per 1000 population. However, a decreasing value shall be noted in these areas. In the period of free movement of people at the international level, with its consequences for countries and regions, the inflow and outflow of population is getting increasingly more importance from the economic, social and political perspective within particular territorial units. For this reason, the phenomenon of migration, as the second component of the population state, simultaneously indicating the investment attractiveness of a given area, constitutes an important element of a demographic analysis.

The second component of the population state, which is composed of migrations within particular years, is also characterized by an uneven course within the studied area. The application of population “net” value, which is the migration balance, is justified by the fact that the final balance of multidirectional flows of population, its size and nature (positive or negative) has a direct impact on the population volumes in a given territory, their increase or decrease [15].

Table 3. Net migrations of people in the Polish-Czech borderland in 2000 – 2014, per 1000 persons

Sub-regions / Regions	Years			
	2000	2005	2010	2014
Jeleniogórski	-1,3	-2,0	-1,5	-2,8
Wałbrzyski	-2,3	-2,1	-2,2	-2,7
Nyski	-2,4	-2,7	-2,4	-2,8
Rybnicki	-4,4	-3,4	-1,9	-1,9
Bielski	1,5	1,8	1,8	0,7
Liberecky	1,3	3,3	0,1	0,3
Kralovehradecky	-0,1	2,5	-0,1	-0,4
Pardubicky	0,7	2,0	0,8	0,2
Olomoucky	0,4	0,1	-0,8	-0,9
Moravskoslezky	-1,4	-1,3	-3,2	-2,5

Source: as in Table2

The balance of net migration, as quoted in Table 3, assuming negative values in all the years compared, indicate an out flowing nature of most regions. Only three units of the described territory (Bielsko, Liberec and Pardubice) have indicated the influx surplus over the outflow. Taking into account the fact that the ratio of the population inflow to the out flow constitutes an index of investment attractiveness of the area with the values exceeding 1 attest to its attractiveness (the higher the ratio, the higher the investment attractiveness), it is evident that the majority of units (with the exception of the three mentioned above) are characterized by low investment attractiveness.

By comparing the birth rate per 1000 of the population with a value of the overall migration balance per 1000 of the population, we can observe a relatively high impact of migration on population fluctuations changes in the level and structure of the population.

The population out flow not only reduces the size of the population but also brings an additional negative effect such as a transfer of the population growth beyond the region. The both result in a deepening decline in births, which was anyway conditioned by the reduction of women's fertility as a result of a demographic transition [9] consequently leading to significant changes in the age structure. A clear change concerns the relationship between the biological age groups (Table 4).

Table 4. People of the NUTS III regions of the Polish-Czech borderland by biological age groups and their dynamics in 2000- 2014

Sub-regions / Regions	Years		
	2000	2014	Dynamics 2000=2014 2000=100
Jeleniogórski			
People age: 0-14 years	100,9	78,1	71,1
15-64 years	409,0	408,0	99,7
65 or above	73,9	87,2	117,9
Wałbrzyski			
People age: 0-14 years	122,2	87,5	71,6
15-64 years	486,7	471,8	96,9
65 or above	95,2	110,3	115,8
Nyski			
People age: 0-14 years	77,7	51,9	66,7
15-64 years	272,8	266,9	97,8
65or above	49,9	59,3	118,8
Rybnicki			
People age: 0-14years	124,1	94,8	76,3
15-64 years	464,3	448,1	96,5
65or above	59,5	94,4	158,6
Bielski			
People age: 0-14 years	123,8	102,1	82,4
15-64 years	440,3	460,6	104,6
65or above	77,6	106,2	136,8
Liberecky			
People age: 0-14 years	72,5	68,7	94,7
15-64 years	301,4	292,8	97,1
65or above	86,1	77,3	140,2
Karlovehradecki			
People age: 0-14 years	90,1	82,9	92,0
15-64 years	380,5	363,9	95,6
65or above	86,1	104,7	121,6
Pardubicky			
People age: 0-14 years	85,6	78,6	91,8
15-64 years	351,3	344,6	98,0
65or above	71,5	93,0	130,0
Olomuncky			
People age: 0-14 years	105,6	94,8	89,7
15-64 years	448,1	424,9	94,8
65or above	87,3	115,8	132,6
Moravskoslezky			
People age: 0-14 years	219,3	179,5	81,8
15-64 years	901,1	824,7	91,5
65or above	157,5	213,3	135,4

Source: as in Table 2

The birth decrease and migration contributed to a significant reduction in the size of the youngest age group of 0-14 years in 2014, as compared to 2000. The range of decreases in this group in the Polish-Czech borderland zone regions ranged from 5.3% to 33.3%. The greatest decline in the population volume was at the Polish side where the drastic decline was several times higher than on the other side of the border. Differences between the Polish sub-regions reached 15.7% and concerned Nysa sub-region where the youngest biological group in 2014 accounted for 66.7% of that in the year 2000, as well as Bielsko sub-region, where this value reached 82.4%. Incomparably smaller decline and smaller variation in the formation of the group aged 0-14 years occurred in the Czech Republic regions, where the extreme values occurred in the Moravian-Silesian country (-18.2%) Liberec (-5.3%).

A few percent decline in the age group of 15-64 years was recorded almost throughout the whole borderline area concerned, with the exception of Bielsko sub-region, where the value of indices increased in 2014, as compared to 2000, by 4.6%.Observing (based on Table 4) the growth rate dynamics of people aged 65 years and above, an increase in the aging process has been noted for the Polish-Czech borderline population, confirmed by the evolution of the percentage of people aged 65 and over, which is one measure of old age and aging (Table 5).

4 Spatial variation of population aging process and its consequences

As there is no single, widely recognized and applied definition, of old age or its scope, for research purposes, as well as for taking action, there have been the following old age boundaries defined:

- Chronological, designated by the calendar age,
- Biological and psychological, as defined by the fitness tests,
- Economic, specifying the ability to work age i.e. working age
- Legal, specifying the pension rights [8].

Given the age limits defined, designated by the calendar age, the age of 65 years has been assumed the old age limit, although the division of this stage of man's life changes with the progression of life expectancy. Among the most frequently cited age periodization, the most frequently adopted is the one defined by World Health Organization (WHO), according to which the phase of old age is preceded by the pre-old-age of 45-59 years; the old age is then divided into:

- Ageing age called an early old age (60-74 years old)
- Old age (75-89 years old)
- Longevity, which applies to those aged 90 years or above [12].

The described area was characterized by varied degrees of advancement of old age and aging process.

Table 5. Percentage of people of the Polish-Czech borderline regions aged 65 or above in years 2000 – 2050, according to NUTS III

Sub-regions / Regions	Years					
	2000	2005	2010	2014	2030	2050
Jeleniogórski	12,4	13,2	12,9	15,2	26,3	36,9
Wałbrzyski	13,5	14,6	14,3	16,4	27,5	37,5
Nyski	12,4	13,6	13,6	15,6	25,8	36,8
Rybnicki	9,1	11,5	12,9	14,8	23,5	32,9
Bielski	12,0	13,2	13,7	15,3	22,8	31,7
Liberecky	12,8	13,1	14,6	17,6	23,7	30,6
Karlovehradecky	14,5	14,8	16,4	17,6	25,3	32,3
Pardubicky	14,0	14,5	15,7	18,0	25,3	32,3
Olomucky	13,6	14,2	15,7	18,2	24,8	32,8
Moravskoslezky	12,3	13,3	14,8	17,5	24,7	32,8

Source: as in Table 1

The confirmation of the intensification of the aging process of the population of the study area and its component units of NUTS III constitute another measure of old age, which includes an ageing index, indicating the number of older people (65 and above) per 100 persons aged 0-14 years [6]. In 2014, at the Polish-Czech borderline there has been noticed an imbalance of the relationship between the oldest age group, the "grandparents" and the youngest group, the "grandchildren" (Table 6). The projected ageing index values of the borderline regions, in the selected time points, indicate a more dynamic aging process taking place in four units where the level of the ageing index reaches the values close to the ratio denoting that per one grandchild, in the last year of the 2050 forecast, there shall be nearly three grandparents. These units include: Jeleniogórski sub-region, Wałbrzych sub-region, Nysa sub-region and Moravskoslezský country. In two regions, the forecast ageing index will differ significantly from the others because of the relatively lower values forecast in 2050: 184.8 in Bielsko sub-region and 197.7 in Rybnik sub-region.

Table 6. Ageing index according to NUTS III in the Polish-Czech borderline

Sub-regions / Regions	Years		
	2014	2030	2050
Jeleniogórski	113,3	240,3	273,6
Wałbrzyski	127,3	199,7	276,6
Nyski	112,1	187,7	280,3
Rybnicki	100,1	142,1	197,7
Bielski	100,1	132,0	184,8
Liberecky	112,5	173,6	225,2
Karlovehradecky	126,4	193,6	248,3
Pardubicky	126,4	193,6	248,3
Olomucky	122,1	193,9	261,9
Moravskoslezky	118,9	194,6	270,3

Source: as in Table 1

One of the features of the demographic aging process, that has major importance from the point of the regional social policy, is – along the presented special differentiation of the aging process – the double aging (the other include: singularisation, feminization, health condition, level of education, place of residence, family situation) i.e. the increase of the participation of the aged - aged within the group of the elderly, as an indicator of increasing in the older age groups volumes. Entering the old age (according to WHO) as the next stage of old age is associated with high dynamics of the growth in the percentage of the aged 75 years or above within the projected total population, as shown in Table 7.

Table 7. Projected share of the population of the Polish-Czech borderland regions aged 75 years and above, in % of the total population

Sub-regions / Regions	Years	
	2030	2050
Jeleniogórski	12,8	18,9
Wałbrzyski	13,5	19,4
Nyski	12,2	19,0
Rybnicki	11,0	17,1
Bielski	11,0	16,0
Liberecky	12,9	16,8
Kralovehradecky	12,5	18,2
Pardubicky	12,5	18,2
Olomoucky	13,1	17,9
Moravskoslezky	12,7	18,4

Source :as in Table 1

Identifying this old age phase is important due to increasing disabilities within the older age groups. Within units characterized by the outflow abroad, of a particular importance is the issue of elderly people –the parents' of children who have gone abroad.

A radical transformation of the population age structure concerns an important (from the economic perspective) structure by economic groups of the population. Major changes within this group will lead to an increase in the economic total dependency ratio, youth dependency ratio , old- age dependency ratio, that indicates which part of the non-production population concerns the population of working age (Table 8).

Table 8. Total depency ratio within the Polish-Czech borderland regions (NUTS III) in 2014 and their projected values in 2050.

Sub-regions / Regions	Years	
	2014	2050
Jeleniogórski	56,6	115
Wałbrzyski	58,0	116
Nyski	57,2	122
Rybnicki	57,2	124
Bielski	60,5	127
Liberecky	49,9	99
Kralovehradecky	51,6	98
Pardubicky	51,6	94
Olomoucky	49,6	97
Moravskoslezky	47,6	96

Source :as in Table 1

Doubling these values in the year that constitutes the forecast horizon shows the scope of problems that examined territories are to face. They are resulting from a decline of both the absolute and relative numbers of the pre-productive people group and a rapid growth (exceeding the declines in the volume of the pre-production group) of the group of people in the retirement age with simultaneous "shrinking" of the potential of labour-age population resources (Table 9).

Table 10. The working age population (potential labour resources) in the Polish-Czech borderland sub-regions in 2014 and 2050. (Forecast)

Sub-regions / Regions	Years		
	2014	2050	Dynamics 2014-2050
Jeleniogórski	370,8	233,4	62,9
Wałbrzyski	429,3	261,1	60,8
Nyski	243,1	151,3	62,2
Rybnicki	419,2	347,9	82,9
Bielski	408,8	284,8	69,6
Liberecky	274,7	215,1	78,3
Karlovehradecky	341,6	253,3	74,1
Pardubicky	322,1	250,1	77,6
Olomucky	399,7	285,4	71,4
Moravskoslezky	775,1	501,6	64,7

Source: Prognoza ludności Polski według podregionów GUS Warszawa 2014,
Projekce obyvatelstvav Ceskiej Republice do 2050 roku

Ensuring a sustainable and harmonious development of every individual will require compensating the loss, the size of which some regions of the described area can reach in 2050.It could be the value exceeding 30% of the state in 2014, as in the case of the sub-regions of Jelenia Góra, Walbrzych, Nysa and Moravian country. In other regions the decreases will range from 17.1% (in Rybnik) and 28.6% in Ołomuc. Compensation can be done through (excluding substitution of the technological progress towards the living labour, the productivity growth) changes in the migratory movements that bring about an increase in the labour resources as a result of the inflow exceeding the outflow and/or an increase in the professional activity. As the problem of the population aging and declining labour resources concern, albeit unevenly, the whole European Union, in the Europe 2020 Strategy (that assumes economic growth by achieving mutually interrelated priorities such as: smart growth, sustainable

growth and the growth of favourable for the social inclusion) the emphasis was laid on professional activation that should result in an increase of the employment ratio in the age group of 20-64 years up to 75% [3]. According to Eurostat 2014, in Poland and the Czech Republic, these indicators reached respectively 66.5% and 73.5% [2]. However, in the context of the population aging, including the decrease in labour resources and their aging, solutions favouring the prolongation of professional activity are required.

In light of continued process of ageing and its effects on the social and economic sphere, all the countries of the European Union adjust the retirement age to demographic changes. These activities are crucial to ensure the performance of pension systems. Pay as you go character of the pension systems means that they are based on compulsory insurance in the form of intergenerational contracts. The increase in the percentage of pensioners and the extension of the period of time when they collect pension, while labor resources decrease, the age of entering into the labor market for young people gets delayed and fertility rates get lower, requires increasing subsidies from other taxes. The retirement age in Poland is currently 67 years, regardless of sex and its achievement is scheduled for 2020 for men and 2040 for women. Group of the countries that have recently increased the retirement age to 67, includes also Czech Republic. Activities in this field are dependent on the rate of aging of the population in different countries. Even more worrying in Poland is the return to a lower age for retirement for men 65 years and women 60 years despite the intensification of the process. This will not only increase the burden on the state budget but also decrease of pensions, which now account for only 32% of the European average. Average amount of pension in Poland is 474 euro for men and 358 for women in the Czech Republic respectively 502 euro and 432 euro.

5 Legal basis of Polish - Czech cooperation

The area of the Polish-Czech borderland is characterized by diverse demographic trends. The presented changes and their scope show that fewer and fewer working people will have to keep a growing proportion of the population, which is synonymous with the emergence of a whole series of complex challenges in the scope of socio–economic politics on every scale, especially in Poland where the current demographic situation and its projection for 2050 seem to be far less favourable than in the Czech Republic. Its diversity in the regions and smaller units - NUTS III in the Polish-Czech borderline – indicates the scope for cooperation within various territorial systems. The Polish-Czech bilateral cooperation is regulated by relevant documents (Treaty between the Republic of Poland and the CSRF of good neighbourliness, solidarity and friendly cooperation dated 6 October 1991, applies to the Czech Republic because of the political continuity. In the light of the international law, the Agreement between the Governments of the Republic of Poland and Czech Republic on cross-border cooperation of 18 August 1994, the Agreement between the Republic of Poland and the Czech Republic on minor border traffic, done in Prague 17 January 1995 and ratified by Poland in February 1996) as amended with documents of lower rank, with the crucial role of the Governmental Committee for the Trans-Border Cooperation and the Euro-regions, established in 1994, which significantly contributed to the accession of both countries to the EU and to finding solutions to the many problems at the local level [1]. One of the activities implementing a long-term objective of the cooperation in a form of its institutionalization through seeking to create (based on the EU decisions)) in this part of the European Grouping of Territorial Cooperation (EGTC) is to develop a strategy document in the form of *An Integrated Strategy for Cooperation in the Czech - Polish borderland 2014- 2020*.It constitutes an important tool, but the content of the document points to the inadequate treatment of the demographic factors as crucial determinants for achieving a global goal, formulated as follows: "a competitive region with a healthy natural environment, advanced infrastructure, high level of education, efficient labour market, developed tourism and a high level of public services "[14].

6 Conclusions and recommendations

Presentation of the selected demographic processes at the Polish-Czech borderland in a retrospective context, and its prospective development requires efforts, as comprehensive and integrated at all levels and in all dimensions, to halt the adverse trends. It is an imperative conditioning the future development of this area and its urgency results from the generational nature of changes taking place in the population processes.

Depopulation that is prevailing in the most part of the described territory, which in the forecast period till 2050 will cover the entire area, taking place thanks to the development of negative birth rate and negative migration balance, changes in the population structures having a significant impact on the intergenerational relations and the deepening process of the population aging, decrease and aging of the labour resources – all these require some effects mitigating solutions. In the situation of free movement of people at the international level, and its consequences for countries and regions, the activities aiming at increasing the investment attractiveness of a given area, are becoming more and more important not only in terms of its further economic and social development but also in political context.

Aging of the population of this entire territory in question, regardless of certain differences in the intensity of this process that is taking place between the different units, raises broad implications in the social sphere that apply to all the issues, ranging from health care, through education, the labour market, up to social security.

Changing intergenerational relations that causes, on one hand "increase in value" of senior citizens as voters, consumers or employees, and on the other, frequent manifestations of ageism – discrimination based on age requires education at all levels and in all dimensions.

Changing the consumer age structure that is manifested with an increase in participation of elderly people with specific needs resulting from their age, health condition, place of residence, and financial situation makes it necessary to take measures to adapt the economies of the individual territorial units that have diverse character of the aging process, to the volume and structure of the needs of the elderly, within the framework of implementing the silver economy concept.

Decreasing and aging of the labour force, as well as the increasing economic burden of the working population with the non-working population is, hence, related to the concept of active and productive aging process, as well as recognizing the merits of the management technology application at every level of economic activity, i.e. the age management.

All of these issues provide the basis and define the scope of a possible cross-border cooperation in various scales that should fit into the concepts of active and healthy aging. The nature of actions within the senior policy field of the units in question should lead to improvement of the health condition of the population of the aging persons, aiming to offset by a few (to several) years, the limits of the biological aging characteristics, which is closely linked to preparing them for a long aging process within a few fields of activity: professional work, health, relationships with others, securing adequate standard of living, and education.

The above-mentioned results of the demographic transformations call for the cooperation of the Polish-Czech borderland units to give such a cooperation a proper weight, but also the appropriate dynamics.

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