ISSN 1644-0757
eISSN 2450-047X

SCIENTIARUM POLONORUM

ACTA

Oeconomia

16 (4) 2017

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ISSN 1644-0757

ISSN 1644-0757
eISSN 2450-047X

ACTA SCIENTIARUM POLONORUM

Czasopismo naukowe założone w 2001 roku przez polskie uczelnie rolnicze
Scientific Journal established in 2001 by Polish Life Sciences Universities

Oeconomia

Economics

Ekonomia

16 (4) 2017

October – December

Bydgoszcz Kraków Lublin Olsztyn
Poznań Siedlce Szczecin Warszawa Wrocław

The printed version of Acta Scientiarum Polonorum Oeconomia is an initial version of the journal

Editorial staff
Anna Dołomisiewicz, Elżbieta Wojnarowska

ISSN 1644-0757
eISSN 2450-047X

Wydawnictwo SGGW, Nowoursynowska 166, 02-787 Warszawa
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e-mail: wydawnictwo@sggw.pl
www.wydawnictwosggw.pl

Print: ZAPOL sp.j., al. Piastów 42, 71-062 Szczecin

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Acta Sci. Pol.
Oeconomia 16 (4) 2017, 5–12
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.39

ORIGINAL PAPER

Received: 14.09.2017
Accepted: 14.12.2017

HOW UNIVERSITY STUDENTS PERCEIVE RUNNING A BUSINESS – SELECTED ASPECTS

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ABSTRACT

Nowadays when the knowledge-based economy is being built, running a business plays a significant role. A society in which entrepreneurial activities are taken up is the base for creating a modern and competitive economy. Forming an entrepreneurial society causes a situation in which setting up and running one's own company concerns a considerable part of citizens and each social group. The article was to present students' views on setting up and running their own business. Students' opinions were gathered by means of the method of diagnostic survey with the use of the technique of a standardized questionnaire. The outcomes of the study reveal that the respondents have a high willingness to take entrepreneurial actions (57.1%). Only 16.5% of them do not plan such an undertaking.

Key words: business activity, entrepreneurship, student

INTRODUCTION

In the source literature, entrepreneurship is tackled by representatives of numerous scientific fields, i.a. economics, sociology or psychology. They focus on slightly different aspects of this phenomenon. In many research approaches, especially those related to economics, entrepreneurship is associated with business activity. It is also frequently meant as setting up and running a company, analysed by means of economic benefits which can be gained thanks to taking up entrepreneurial activities in business entities, in local communities, in regions or in the national economy. Psychologists associate the term of entrepreneurship with a set of an individual's characteristics and they analyse internal mechanisms, called personality mechanisms, which form these characteristics and direct entrepreneurial behaviours. Nevertheless, sociologists analyse mechanisms which contribute to promulgating innovations in a particular society, the role that local leaders play in the process of diffusion and the influence that entrepreneurial activities have on local communities [Sikorska-Wolak 2008].

Entrepreneurship occurs as a common phenomenon in various forms, which in turn indicates this term ambiguity. In its vernacular meaning, entrepreneurship is the result of setting up and running business on one's own account. And one is usually an entrepreneur on the initial stage of their own company. When it increases and works better, running it is more often referred to as managing [Łoboda 2005].

The terms of entrepreneurship and entrepreneur have existed in economic literature for a long time and they have been a domain of classic economic authors' interests. J.B. Say was among the first ones who defined entrepreneurship. He described it as such an entrepreneur's behaviour which moves economic resources from

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an area of a lower capacity to an area of a higher capacity by increasing their utilization and benefits from them [Wawrzyniak 2007]. According to A. Smith, the ability to save and mobilize capital was one of the more important characteristics that an entrepreneur should have. Smith thought that an entrepreneur is an enterprise owner and capital provider, and their success comes after a quick adjustment to the events that take place in the economy [Piecuch 2010].

R. Cantillon indicated that the market system coordinates producers' and consumers' activities by means of their selfish personal interest, and an entrepreneur plays a key role in this system. Pursuing gains, an entrepreneur causes much better effects than those that would result from the state interference [Gaweł 2007].

According to P.F. Drucker, it is an inter-relation of entrepreneurial and innovative activities which makes it possible to reach one's goal – to succeed in a specific segment of the market or in a particular business [Drucker 1992]. An entrepreneur gains their knowledge and experience both from market successes and failures, which may result in taking up business initiatives.

J. Schumpeter emphasized the close relation between entrepreneurship in its macroeconomic meaning as the main factor of economic growth, and the microeconomic concept of an individual entrepreneur, who he called an innovator [Sikorska-Wolak 2008].

Entrepreneurship is also defined as a way of a person's behaviour in business activity [Janiak 1996]. It means particular people's pursuit of acting, seeking new solutions, introducing changes in their existing activity, taking opportunities and looking for additional and alternative sources of income [Bórawski 2004].

Generally speaking, one can assume that entrepreneurship means creating something new and valuable, bearing in mind a potential financial risk, but also assuming financial compensation or personal satisfaction [Hirisch and Pater 1989]. It is a special kind of activity of people who work individually or within an organization, and it consists in taking chances which appear in the environment and in carrying out undertakings (implementing innovations, creating new organizations or renewing the existing ones) which bring economic and (or) non-economic effects to both their performers and the environment [Kraśnicka 2002].

An entrepreneur acquires their knowledge from both the successes that they achieve in the market and the failures. Gaining experience requires humility and time, while a lack of experience causes fear and raises doubts. That is why education, starting from the lowest and finishing at the highest levels, is a significant element of entrepreneurship. Thanks to education, it is possible to form entrepreneurial attitudes by preparing an individual for business activity, encouraging them to watch the market, follow entrepreneurial activities, take up traineeships or seasonal jobs and finally run their own business. Its core is to invest today's resources in future expectations [Drucker 1992], which means a certain risk that cannot be removed even by extensive experience. However, thanks to knowledge, skills and experience, this risk can be minimized and even calculated so that it will not hazard the undertakings.

To sum up, the core and term of entrepreneurship is explained by means of listing the characteristics of its scope (kinds of activity). Entrepreneurial activities boil down to [Narski 2000]:

- joining factors of management (e.g. employees, energy, objects that are used to do the work or means of work) into non-conflicting functional systems;
- innovative behaviour which means improving particular elements of activity (techniques, technology, organization or economic activity), which, consequently, translates into new chances of management;
- diversification of production ranges or service types, their prices, particularly new and refined products;
- opposition against competitive managing entities or alliances with them to develop one's own business.

The growing competition and technological advancement are the reasons why the future will be in the hands of entrepreneurs who are open to changes and perceive them as a requisite for survival and development. Such perception of changes requires providing proper conditions which will boost entrepreneurship while using and developing the existing knowledge [Siuta-Stolarska and Siuta-Brodzińska 2011].

Speaking of entrepreneurship and people who create it (entrepreneurs), one needs to realize their significance. It manifests in various forms and occur in different periods of life. They change, develop and as a whole, they build wealth: new values create innovations, new jobs as well as the growth of a particular managing entity. Regardless of how new initiatives arise, entrepreneurship is becoming an important economic category [Janasz 2004].

MATERIAL AND METHODS

The main goal of the research was to get to know the attitudes of students (representatives of the young generation) towards running a business, what their career plans were and whether they were connected with running a business. The research was done in 2016–2017 among students of various specializations at Warsaw University of Life Sciences – SGGW. Students' opinions were gathered by means of the method of diagnostic survey with the use of the technique of a standardized questionnaire, which was the source of information necessary to accomplish the goal. The study covered 1,197 students, but after verifying the correctness of questionnaires which had been filled in, 1,189 respondents were qualified for the analysis. Respondents were selected randomly.

RESULTS AND DISCUSSION

To make a more effective presentation of the outcomes, the research population was analysed, inter alia, from the point of view of the following characteristics: gender, age and income sources.

Women were 64.2% of the respondents and men were 35.8%. The age of the respondents was as follows: up to 22 – 51.6%, 23–25 – 42.9%, over 25 – 5.5%. Although the study covered young people, the several years' difference in age can influence the perception of running one's own business. As far as the income source is concerned, 57.6% of the respondents were their parents' dependents, 35.4% were partly dependent on their parents and 7% declared that they were entirely financially independent.

Because of the research goal, the respondents were asked if they considered themselves enterprising. More than a half of the students considered themselves rather as enterprising (57.2%), while only 1.5% of the respondents thought they were not enterprising. The others marked partial responses. The detailed data are presented in Figure 1.

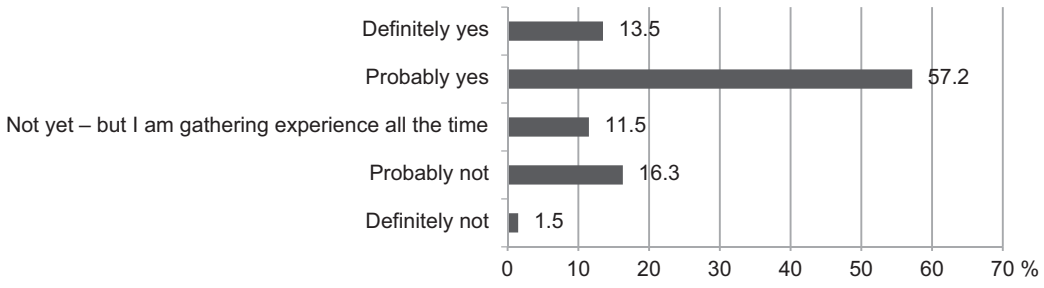


Fig. 1. Students' self-assessment as regards entrepreneurial attitude

Source: The author's own research outcomes.

Additionally, students were asked if their parents had ever run a business. The detailed data are presented in Figure 2.

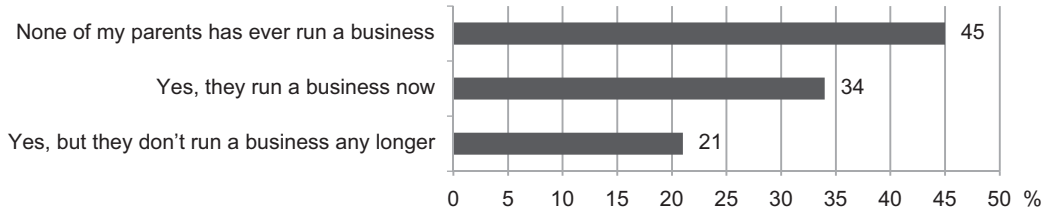
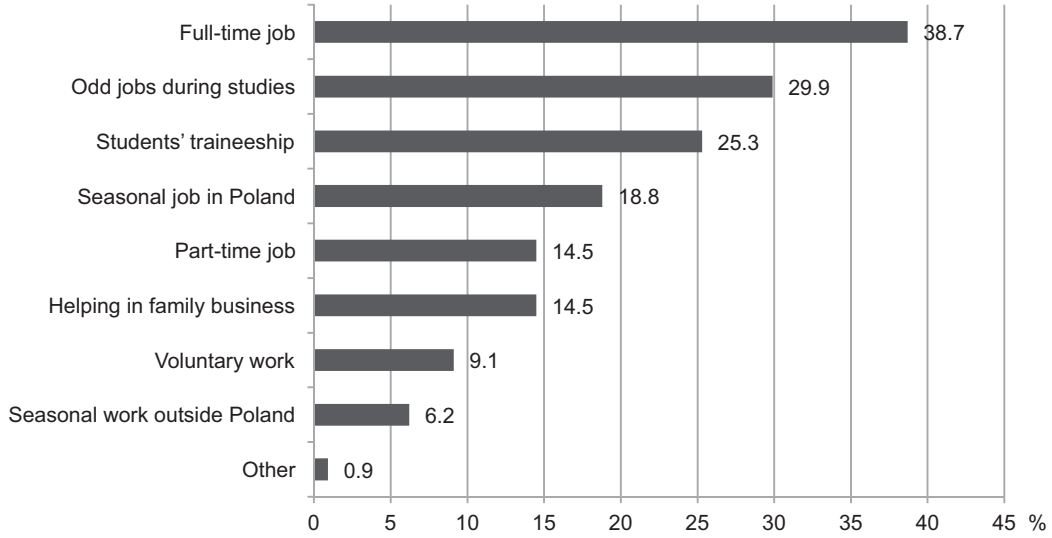


Fig. 2. Answers to the question: have your parents ever run their own business

Source: The author's own research outcomes.

Almost a half of the respondents declared that their parents had never run their own business, while 55% of the respondents indicated the positive answer. However, it must be pointed out that at present 34% of parents run their own company, and 21% did it in the past. The fact that parents have run their own business can have a significant influence on how their children perceive this type of career path.

At present work experience of potential employee candidates matters in the labour market. In the study, respondents were asked if they had any work experience despite their young age. Over 73% of respondents declared that they had (maybe small) experience related to doing a job. In the further part of the study, the students were asked to indicate the sources of their work experience. The detailed data on this aspect are presented in Figure 3.



A respondent was allowed to indicate more than one answer.

Fig. 3. Students work experience

Source: The author's own research outcomes.

Another aspect tackled in the research was the question if students considered the option of setting up their business. As many as 57.1% of the respondents declared that they did and 26.4% did not know yet, while 16.5% did not intend to set up their company. The students who planned to set up a business were asked when they wanted to do it. The data are presented in Figure 4.

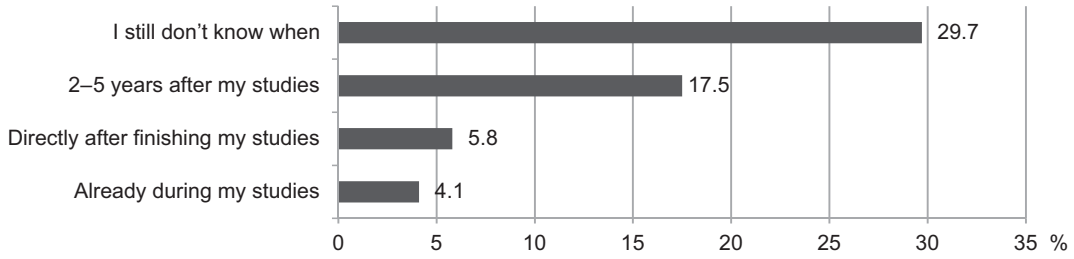
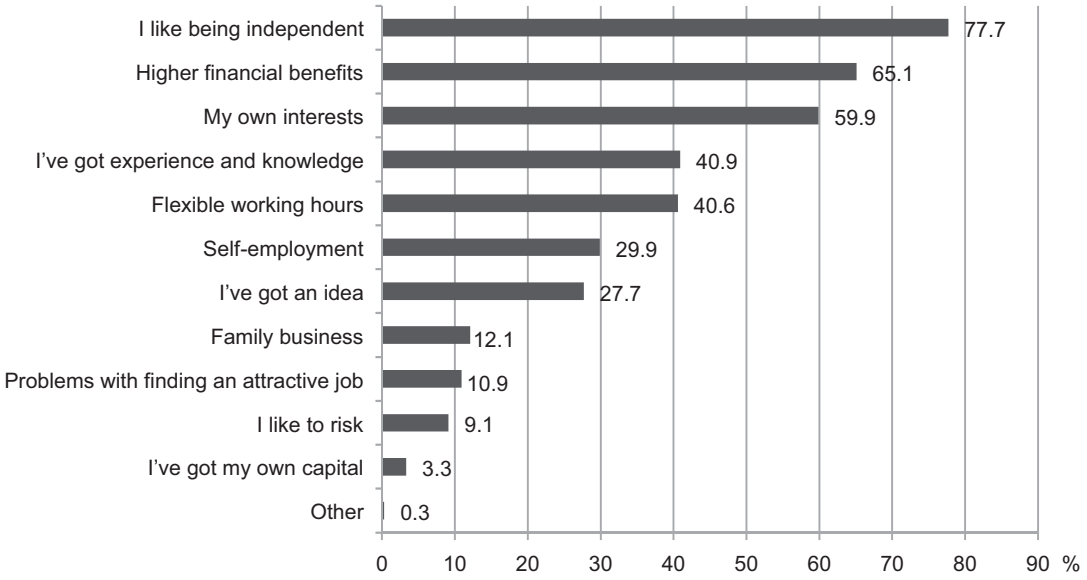


Fig. 4. Answers to the question when the respondents planned to set up their own business (in %)

Source: The author's own research outcomes.

The majority of those who declared setting up a business did not know when they would take necessary steps (29.7%), nearly 20% – 2–5 years after studies, while almost 10% wanted to take such an initiative already during the studies or directly after finishing them. Among the respondents, women declared more frequently that in the future they would like to have and run their own business – 31.6%, while in the group of men every fourth one responded in the same way (25.5%).

As far as the analysis of entrepreneurial activities is concerned, getting to know the motivation to set up and run one's own business seems to be significant. The data are presented in Figure 5.



A respondent was allowed to indicate more than one answer.

Fig. 5. Motivations of those planning to set up their own business

Source: the author's own research outcomes.

Over three quarters of the respondents indicated that the strongest factor that motivates them to set up and run their own company was the sense of independence. On the second place, higher financial benefits were mentioned, and one's own interests came third. Having one's own capital is not a factor motivating to set up

a business – this response was marked by merely 3.3% of the respondents. Slightly over 10% of the respondents indicated their fear that they would not find an attractive job. This reveals that students do not see running a business as a solution for unemployment.

Nearly one out of five students is not going to take steps towards setting up and running their own business. That is why in the study, the respondents were asked why they had made such a decision. The detailed data are presented in Figure 6.

A respondent was allowed to indicate more than one answer.

Fig. 6. Answers to the question why the respondents do not plan to set up their own business

Source: the author's own research outcomes.

As the study shows, a lack of an idea what kind of company to run is the greatest obstacle for students – 45.8% of the respondents stated this. Moreover, the students indicated that obstacles may also include too high risk which is related to one's own business (14.8%) as well as the willingness to have a steady and certain salary (13.7%), and stress (12.9%). Only 5% of the respondents did not think about their future yet. This means that the respondents think about their career already during their studies.

CONCLUSIONS

The results of the research on how students perceive running a business make it possible to find out if they consider themselves enterprising, what motivates them to take necessary steps towards setting up their own company and what their career plans are like.

The study reveals that respondents have a high willingness to take entrepreneurial actions (57.1%). Only 16.5% of them do not plan an undertaking of this kind. However, it must be pointed out that while there is a high willingness to set up a company, there is also a lack of idea what it could deal with (45.8%). This may be the beginning to emphasize this kind of obstacle in curriculums related to entrepreneurship. Nearly 60% of the respondents assessed themselves as enterprising, which may indicate that running one's own business is considered as a potential career path. The majority of the respondents reconciled studies with work, gathering their own work experience in this way. In the future it can be the basis for creating entrepreneurial attitudes.

The analysis of factors motivating people to take steps towards setting up their own company indicates that students want to be independent (77.7%). In this respect, it is significant that the respondents want to merge their interests with running a business, which may consequently translate into higher financial benefits.

However, while starting a business, it is important to analyse market trends, changes in the market and one needs to look for an appropriate moment, favourable for one's own undertaking.

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PROWADZENIE DZIAŁALNOŚCI GOSPODARCZEJ W ŚWIADOMOŚCI MŁODZIEŻY AKADEMICKIEJ – WYBRANE ASPEKTY

STRESZCZENIE

W obecnych czasach duże znaczenie w procesie budowy gospodarki opartej na wiedzy ma prowadzenie działalności gospodarczej. Społeczeństwo, w którym podejmowane są działania przedsiębiorcze, jest podstawą do tworzenia, budowania nowoczesnej i konkurencyjnej gospodarki. Kształtowanie społeczeństwa przedsiębiorczego przyczynia się do sytuacji, w której zakładanie i prowadzenie własnej firmy dotyczy znacznej

części obywateli i każdej z grup społecznych. Celem artykułu było przedstawienie opinii studentów na temat założenia, a następnie prowadzenia własnej działalności gospodarczej. Posłużono się metodą sondażu diagnostycznego z wykorzystaniem techniki ankiety według standaryzowanego kwestionariusza. Z wyników badań wynika, iż respondenci cechują się dużą skłonnością do podejmowania działań przedsiębiorczych (57,1%), jedynie 16,5% nie planuje tego typu przedsięwzięcia.

Słowa kluczowe: działalność gospodarcza, przedsiębiorczość, student

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 13–21
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.40

ORIGINAL PAPER

Received: 09.10.2017
Accepted: 19.12.2017

MODERNIZING POLISH AGRICULTURAL ECONOMICS TEACHING AND RESEARCH: AN EVALUATION OF ACADEMIC COOPERATION

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ABSTRACT

Twenty-five years ago in response to the collapse of communism in Poland, an academic consortium was formed around two Polish Universities of Life Sciences (formerly Universities of Agriculture) for a Tempus project. The consortium has expanded from a project to revise curricula in agricultural economics within a market economy to much wider educational and research interests. The consortium's main achievement has been in the organisation and accreditation of MBA programmes which has subsequently been augmented by a network for other educational and research programmes in a number of countries (AGRIMBA). This article explores the social net benefits of this example of investment in human capital relying on the concepts laid down by the Nobel Prize winners Theodore Schulz and Gary Becker.

Key words: Tempus, MBA, Human Capital, AGRIMBA, Cost Benefits of Education

INTRODUCTION

Shortly after the rise of the Solidarity movement in Poland, which led to the collapse of the communist regime and the adoption in 1989 of a market economy, initial discussions took place between the agricultural economics departments in the Scottish Agricultural College (SAC) at Aberdeen in Scotland and in the Warsaw University of Life Sciences – SGGW together with Lublin Agricultural University. Eventually, a larger European Union wide group was formed including the University College Cork in Ireland, Giessen University in Germany and Wageningen University in the Netherlands. This group submitted an application for an EU funded project within the Tempus program with the objective of assisting in the design of new curricula for Agricultural Economics teaching in the emerging Polish market economy. Over time this group expanded within Poland, to other Member States and to other (then) applicant countries, in the first instance the Czech Republic and Hungary.

The successful completion of the Tempus project, which began in 1992, was the foundation for several successive projects, which grew from earlier experiences over 25 years of co-operation in educational and research activities by both the initial and augmented consortia.

After 25 years of working together the consortium is in a unique position to evaluate what has been achieved for both students and staff – evaluation of the achievements grounded on the successful co-operation of the large academic consortium is the main objective of this paper. Since a large proportion of the consortium's activities

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was related to teaching, we also attempted in the paper to estimate payoffs for graduates of the Warsaw University of Life Sciences and MBA alumni.

A 25 year' long perspective makes it possible to comprehensively capture most of the direct economic benefits of the programmes. This has been attempted for the core achievements of the original Tempus Programme and the MBA at the Warsaw University of Life Sciences using the Nobel Prize winning concepts of investment payoffs in human capital by Schultz [1961] and Becker [1962]. Schultz postulates that the amount of investment by individuals and societies in education (and research) can be explained by the demand for new knowledge set against the extra costs of acquiring it [Schultz 1971]. The net payoffs have been used to estimate the extra earnings of students compared with the costs of provision by both the University and the students themselves. Becker's methods of estimating the financial returns from investments in college and high-school education in the United States are similar [Becker 1962, p. 9].

The benefits of hindsight over a long time period also make it easier to identify spin off and multiplier effects of the various programmes albeit in a mostly qualitative but nevertheless real way. These include the growth in the capacity of the staff in the consortium some of whom have had careers of great distinction, the replication of the MBA and the sharing of specialised knowledge. Cross-country research programmes have produced results of strategic importance.

THE JOURNEY FROM TEMPUS TO AGRIMBA[1]

The historical sequence of the achievements in the initiatives that followed the initial Tempus project is described in Table 1.

The 1992 Tempus supported project was concerned with the teaching of Agricultural Economics and Agribusiness Management in Polish agricultural universities. This was achieved by the project facilitating more than 60 staff members and some students from all partner institutions participating in an exchange program as an aid to the discussion and revision of all the curricula in Agricultural Economics faculties in Warsaw and Lublin Agricultural Universities. Teaching in both of these centres was modernized by both, revising course content and course delivery methods.

At the wrap-up meeting of the first Tempus project in 1994 the providers realised that they had created over three years a team of people from different parts of Europe who had proved that they could successfully and advantageously work together. Accordingly, to sustain this network the unanimous idea was to develop and run an International MBA in Agribusiness Management**.** At the time, the network was comprised of academics and committed educationalists from several different countries and the MBA concept fitted their collective experience and shared goals. They also believed that EU enlargement would create additional demand for skills of existing agribusiness managers that could be developed within MBA studies. This goal to launch the MBA degree program would later be called the "Big Idea"[2].

[1] For more information on the International Network for the MBA in Agribusiness and Commerce (AGRIMBA) see http://agrimba.net/

[2] The Big Idea, as it is called now, came about at the meeting ending the Tempus project in a small guest house in Kazimierz Dolny, away from our busy places of work before we had mobile phones and email. We had few distractions and so we had time for thought. A rare event? We were not chief executives or high fliers – ordinary teachers and researchers sufficiently confident that the institutions which employed us would back us in imagining what might be possible to make things better for our potential students. The Idea was not on the main agenda of our meeting – we could say it came up under "any other business" which occurred during informal activities, as many ideas do, when participants thinking while relaxed.

Table 1. Important milestones: on the journey from Tempus to AGRIMBA

Project	Period	Topics / Key issues
Tempus project	1992–1994	The teaching of agricultural economics and agribusiness management in Polish Agricultural Universities
Phare-TESSA[a] project	1994–1996	Training and education in strategically significant areas
Executive MBA programme launched at WUL-SGGW	1995/1996 February 1996	First group of students recruited – the International MBA Board established
Phare-ACE[b] research project	1995–1998	Evaluation of farm impacts of agricultural policy developments in the process of further integration in selected Visegrad and EU countries
MBA model introduced in other centres	1996	Modified MBA model introduced to other centres after curriculum adjustments (Prague Agricultural University, Kiev State Agrarian University)
Phare-FAPA[c] project	Year 2000	Coordination of the "Component A: Support to the MARD[d] in shaping the agricultural policies through the economic analyses"
AGRIMBA	2004–2007	Establishing a platform for future co-operation
Leonardo da Vinci Project[e]	2004–2006	Developing teaching materials and Quality Assurance Standards for the Network of MBA Programs in "Agribusiness Management"
AGRIMBA	Till present	Growth and broadening the scope of activities

[a] Assistance programme for restructuring the economies of Poland and Hungary and other eastern European applicant States to the EU.
[b] EU support for Actions for Cooperation in Economics.
[c] Foundation of Assistance Programmes for Agriculture.
[d] Polish Ministry of Agriculture and Rural Development.
[e] EU lifelong learning programme for vocational education and training.

Source: Own elaboration.

The first step in the development of the idea was supported by the Phare-TESSA programme, which funded the development of vocational curricula and teaching materials. The next step was to formalise the oversight of the MBA diploma by establishing an International Board in February 1996[3] which grew in importance for the purposes of validation and extending the number of centres offering an MBA in Agribusiness Management.

The idea of launching an MBA program focusing on the agri-food sector that was affordable for a large group of managers has also appealed to other life science universities in Central and Eastern Europe. Starting with the core group of executive MBAs in Warsaw, Debrecen and Prague the AGRIMBA network has expanded currently to 11 live high quality MBA programs under AGRIMBA's umbrella. The international input of the programs is taken care of by colleagues of partner universities. The quality is guaranteed by AGRIMBA's unique accreditation procedure, with the standing committee of the ICA[4] that makes the organisation a credible partner for Life Science Universities.

[3] The Board was composed of the following members: Graham Dalton and Garth Entwistle (SAC Aberdeen), Denis Lucey and Mary McCarthy (UCC Cork), Willem Heijman (Wageningen University), Robert Kowalski (CRDT, University of Wolverhampton), Stanislaw Gędek (Lublin Agricultural University), Stanislaw Stanko and Edward Majewski (SGGW (Warsaw University of Life Sciences).
[4] ICA: Association for European Life Sciences Universities.

For the future, increasing the number of MBA students through better marketing is one of AGRIMBA's priorities. There are plans to extend the network to other countries where large numbers of students with limited budgets are seeking high quality education at relatively low costs. Such a development may also create good opportunities to extend scientific cooperation within the network and add to the multiplier effects within an augmented AGRIMBA consortium.

In the past 25 years the AGRIMBA network has increasingly becoming a platform for the exchange of ideas. Since 2009 a bi-annual congress AGRIMBA-AVA has been held for scientists and students to present their work. Achievements have been made known to a broader public by means of a new quarterly journal APSTRACT, published in the University of Debrecen (Hungary) with an international editorial board.

The Leonardo da Vinci programme granted funds for vocational education and training in 2004. The funds were used for further development of teaching materials and quality standards for a network of MBA programs in agribusiness management in different countries. Subject workbooks, case studies and exercises were all developed and were put on shared websites for access by teachers and students from all academic institutions participating in the project.

The Phare-ACE project added to the research capacity of the respective University Agricultural Economics Departments in a new European era post the Berlin Wall and in preparation for EU enlargement. The main challenge for the whole of the agricultural sectors of all the applicant countries was to adapt to a more market led economy either in or out of the EU. These changes created new sources of competition in commodity and food markets as well as investment opportunities for firms and farms specifically but not exclusively in the existing Member States.

Three new partners were included in the ACE consortium (Szent Istvan University Gödöllö, the University of Bonn and Slovak University of Agriculture in Nitra). The common modelling approach assessed the potential impacts on models of typical farms of different types from extending and modifying the Common Agricultural Policy (CAP) for different assumed scenarios of macro-economic conditions and agricultural market prices for a larger group of countries after the 2003 EU enlargement.

The Phare-FAPA project supported the Polish Ministry of Agriculture and Rural Development (MAFE) by economic analyses of agricultural policies in a more direct way than ACE. Polish agriculture and the food and rural sectors were seen in the 1990s as one of the greatest obstacles to EU accession. One view of the best way to accede to EU membership was simply to harmonise domestic arrangements with the EU acquis without seeking amendments and accept whatever variant of the CAP was to be offered. This large project in contrast attempted to answer more fundamental questions about how the Polish agricultural, food and rural sectors could be more assured of prosperity under different policies or strategies. These strategies were evaluated within different contrasting scenarios which represented possible but uncertain future states of affairs such as exchange rates, economic growth rates, the terms of accession and ongoing changes in the CAP to meet World Trade Organization (WTO) and other conditions prior to and beyond accession. The main output presented at a large conference was a 568-page book with 50 contributions from Polish authors complemented by others from across the EU. It brought together the very best information and analyses that were then currently available using all the accumulated knowledge and European wide contacts known to us. Detailed market analyses of most of the main agricultural products produced in Poland were included.

Both, the Phare-ACE and Phare-FAPA projects contributed to the accession preparations and negotiations by providing strategic information about the sensitivity of quota levels, base areas and the extent of Less Favoured Areas (LFA) within the CAP. The potential impact of support arrangements by farm type and size were equally valuable.

Methodological advances including models of typical farms and algorithms to quantify the responses to new agricultural policies and market opportunities was also an outcome of this work. Younger researchers, including MSc students increasingly took part in important EU wide strategic studies where they benefited from wider

contacts, exposure to new ideas and methods and the opportunities for travel and new cultural experiences [Majewski 2010]. The benefits of student research projects were also apparent in Phare and follow on EU Framework projects. This experience chimes with the findings of Ishiyama [2002] and Walkington [2015].

ASSESSING THE IMPACT OF THE TEMPUS PROJECT

A historical evaluation over the 25 years since Tempus began is constrained by the existence and availability of appropriate data. This viewpoint has, nevertheless, the major advantage of highlighting real achievements including several unexpected outcomes and in some cases experiences that were not even considered. Today, for example, in the newly named Faculty of Economic Sciences at WULS-SGGW, four diploma programmes are taught (Economics, Management, Finance and Banking and Logistics) to about 4,500 students. The initial Tempus project was also the foundation for the international network of MBA programs, AGRIMBA, and for subsequent applied economic research.

A consortium life of 25 years has multiplied up most net benefits by far more than was ever envisaged. The providers have incurred the costs of provision, but from a more social perspective there were considerable enhanced capacity benefits over and above teaching and research functions. One of the main sources of this growth in capacity has been the willingness to share experiences among institutions and individuals within them and so achieve many benefits of specialisation for example, on the workings and impacts of the CAP in countries already members of the EU. There were also benefits in a reverse direction through analyses of the trajectory of CAP policy in an enlarged EU as well as assessments of the relative changes in competitiveness of agricultural and food sectors in all Member States as a result of EU enlargement.

The most direct outcome of Tempus has been more rewarding careers for students. Conceptually, quantitative estimates of aggregate net extra earnings of each year's cohort of Agricultural Economics students are required to work out the returns. A difficult task as we do not know what the pattern of base earnings would have been without the Tempus project and the largest cost of education, namely the earnings foregone while studying. A further complication is that according to the theory of "merit goods" the private perceived benefits of education are likely to be lower than they actually turn out to be and the external effects of more knowledge generate both short and long term spin offs and multiplier effects. Without the Tempus programme grants, higher costs and thus fewer students would have reduced both the degree and rate of adjustment by the faculty.

Economic evaluation consists of the comparison of the aggregate benefits with the incremental costs of Tempus itself both from a private and social point of view. A comprehensive evaluation has not been attempted because of the lack of all necessary data, but an examination of some of the main variables in a simple model provides some convincing insights.

Consider the first student cohort influenced by Tempus of 25 years ago: the total benefits are the number of students (N) multiplied by an estimate of their extra mean earned income per annum (R) since graduation[5] (for the 1992 cohort for 25 years and 1 year less for each subsequent year's cohort).

The sum for all cohort-years for 25 years is $\frac{C(C+1)}{2} = 325$.

If this model is simplified as far as possible so that R and N are taken as constant, the Present Value or Social Benefit (B) achieved so far, for all 25 years of student cohorts (C) can be estimated as follows:

$$B = \frac{C(C+1)}{2} RN$$

[5] The marginal income for a student graduating with an agricultural economics degree after Tempus (i.e. the change in income from an agricultural economics program without Tempus to a program with Tempus).

The total number of students benefiting from Tempus supported courses for the past 25 years was about 13,000 (counting only once those who completed studies on both, the BSc and MSc levels) or a mean (N) of 520 per year. Assuming an extra mean earned income per annum (R) was 15 PLN·year^{-1}, the total value of benefits (ignoring changes in money value in time) is 2,535,000 PLN.

To estimate the Net Benefit (NB) the costs for the providers (PC) and students opportunity costs (OC) should be deducted. Simplifying, assuming the Tempus grant is a proxy for the provider's additional costs (PC) and assuming the students opportunity costs of studying are zero in the assessment of Tempus impacts (the students would have been studying anyway) then the net benefit becomes:

$$NB = B - PC$$

Thus, after deducting the value of the Tempus grant of 600,000 PLN the Net Benefit equals 2,085,000 PLN.

It is to be expected that annual additional earnings would not have been constant over each part of each career and some students may have failed altogether over the years. We might expect a decay of the influence of Tempus with time and a skewed distribution of earnings[6]. The NB in real terms would need to be adjusted for inflation and the time value of money over 25 years.

To make the above simple calculations more realistic, the assumptions were relaxed accordingly:

- The extra incomes of the graduates over time (R) estimated at 15 PLN in the first year after graduation were decreased in geometric progression. It was assumed arbitrarily that the benefits to graduates were reduced by half of the initial value by year 7 and to zero by 12 years after graduation.
- The annual rate of average wage increase in the Polish Economy in the subsequent years over the 25-year period were used to estimate real extra incomes relative to the baseline year (1992). The value of this annual rate of average wage increase is 8.88%.
- Subsequently, for the estimated benefits accrued by the graduates, the amount spent on the Tempus project of 600,000 PLN was deducted in the first three years of the analyzed period.
- Next, for the entire 25-year period the Net Present Value (NPV) was calculated at 2017 values using as the discount factor the average annual rediscount rate of bills in the National Central Bank. The discount factor has a value of 12.05% (such a relatively high discount factor results from the fact that in the years 1992–1996 the inflation rate in Poland was at the level of about 30% on average).

Under such assumptions, the net aggregate benefits produce an NPV of 6.3 mln PLN at 2017 values, despite the fact, that the initial grant was discounted in first three years at a very high rate. Even though individual income benefits were set at a very low symbolic level, a large number of graduates generated the high, total aggregate. The break-even value of R which produces a zero NPV was estimated to have been 7.4 PLN.

The extra earned incomes due to the Tempus investment can be classified as the private benefits the graduates achieved as a result of an initial public investment. The assumed rate of annual earnings increase of 15 PLN which produces a high Net Benefit (despite very high discount rates in the 3 years of Tempus investments) is still a small amount in relation to base earnings and adds confidence to the overall conclusion of a positive payoff from the programme.

A 25 year perspective of Tempus shows up other unexpected or multiplier effects which, if they could be quantified would further offset some of the costs to the provider. Some staff have been able as a result of their Tempus experiences to move on to leadership roles in other accession related jobs. They include posts in the Ministry of Agriculture, in EU institutions and other academic centres and have thus contributed to the whole of society (both Polish and EU).

[6] In some very rare circumstances an outstanding individual could generate enough extra income to pay for the whole programme.

THE SPECIFIC POTENTIAL PAYOFF OF MBA

The Executive MBA course provides specialist teaching for fewer students. A larger increase in additional student earnings than in the Tempus project was needed to cover its costs, which was what the course was designed to do. The course reflected a qualitative appreciation of the financial situation of established agribusiness managers who it was assumed would not be able to afford giving up their employment for full time residential study. The delivery methods of distance and web based learning provision contained these costs. The benefits of meeting fellow students through networking and discussions were captured in short weekend courses and in study tours.

Worldwide the global perspectives for MBA Graduates are positive. Based upon a survey among 5,754 employers in 2014, the GMAC (Graduate Management Admission Council), a global non-profit education organization of leading graduate business schools, expected more than a doubling of nominal pay for the majority of MBA graduates in 2015. What is even more important, 72% of the respondents planned to hire MBA graduates in 2015 [Heijman 2016]. Similar general results to these have been recently found for Agri-MBA graduates (Table 2). Sample surveys of 48 former MBA students were conducted twice in the years 2008 and 2012.

Table 2. Graduate's assessment of satisfaction from completing Executive MBA program and salary increase (n = 48)

Item	Satisfaction from achieving MBA diploma	Acquiring new knowledge	Helpful for promotion	Increase from pre-MBA salary (%)
Mean on a scale of 1 to 4	3.34	3.48	2.52	106.5
Standard Deviation	0.96	0.95	1.17	150.1
Coefficient of Variation	29%	27%	46%	141%

Reference: Own elaboration based on the survey results.

A previous study showed that pre-MBA salary, jointly with the quality rank of the programme are key determinants of post-MBA salary and hence of the net benefits [Elliott and Soo 2016]. Likewise, the survey results (Table 2) show that a doubling of pre-MBA salaries is strongly associated with high satisfaction ratings of the overall course, the acquisition of new knowledge and to a lesser extent promotion prospects.

The same approach as in the calculation of the NPV for the Tempus project was used to estimate the economic payoff of the MBA. The key MBA program specific parameters were a 20-year period and total number of 166 students.

Our estimate of the benefits of the MBA degree assumed a mean pre course salary of 1,000 PLN in 1997 (3,877 at 2017 values) doubled in value over an 8-year period over and above the general increase in wages [GUS 2016]. This was achieved by compounding at a rate of 10 percentage points above the rate of increase in wage rates which was consistent with the survey result of an increase of pre-MBA salaries by 106.5% (Table 2).

The NPV of the additional earnings is 3.5 million PLN, having deducted the institutional costs of launching the degree, indicating a substantial social return which was further corroborated in more recent years when all the running costs of the course were financed by student fees.

CONCLUSIONS

The available evidence points to high private and social net returns to the original Tempus and the following AGRIMBA project. These projects demonstrate how large student numbers over a long time period need only attain small incremental private benefits to be considered valuable investments. Replication of projects and the MBA with departments in other countries added to the scale effects.

The robustness of our main conclusion is supported by reported extra earnings from MBA studies in the literature of around double base earnings together with evidence that the perceived high quality of the AGRIMBA programme will have contributed to the amount of additional earnings.

The distinction between a private and social perspective is most important in the feasibility of putting on a course. Providers have at least to cover their direct private costs and this was assisted by successful bids for EU grants to develop teaching material and methods so reducing required fee rates. Affordable private fee rates enabled students to join the course which may not have otherwise occurred despite their high potential returns to society.

Although estimates of the opportunity costs of study time were not included in the calculations of the net benefits, they were taken into account in the design of a part time MBA using distance learning techniques. Residential courses would have been infeasible for most potential students.

Even if the direct Tempus outcomes were small and qualitative in nature (which was probably not the case) follow-on strategic research projects with large potential consequences came later. The knowledge gained by both beneficiaries and providers was also utilised in other ways. Tempus is thus even more likely to have had a large ongoing net social benefit.

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MODERNIZACJA NAUCZANIA I BADAŃ W OBSZARZE EKONOMIKI ROLNICTWA W POLSCE: OCENA WSPÓŁPRACY INSTYTUCJI AKADEMICKICH

STRESZCZENIE

Dwadzieścia pięć lat temu w odpowiedzi na tzw. upadek komunizmu utworzono akademickie konsorcjum z udziałem dwóch polskich uczelni rolniczych celem realizacji projektu Tempus. Z czasem konsorcjum, w zwiększonym składzie poszerzyło swoje zainteresowania, przechodząc od projektu, którego celem była zmiana programów nauczania przedmiotów z obszaru ekonomiki rolnictwa do projektów badawczych i ogólniejszych projektów edukacyjnych. Głównym osiągnięciem konsorcjum była organizacja i akredytacja programów MBA, tworzących obecnie sieć AGRIMBA, składającą się z 11 programów MBA „Zarządzanie w agrobiznesie" prowadzonych w kilku krajach. Artykuł przedstawia analizę społecznych korzyści netto wynikających z tych przykładów inwestycji w kapitał ludzki według koncepcji określonych przez laureatów Nagrody Nobla Theodore'a Schulza i Gary'ego Beckera.

Słowa kluczowe: Tempus, MBA, kapitał ludzki, AGRIMBA, koszty i korzyści z edukacji

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 23–30
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.41

ORIGINAL PAPER

Received: 16.02.2017
Accepted: 20.11.2017

DESTINATION PROMOTING MOTIVES FOR YOUNG PEOPLE

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ABSTRACT

The objective of this paper is to present selected aspects of management information in regard to prospective tourist destinations for young Poles. The focus of the study is on the preferences of respondents in determining their destination choice. The verified hypotheses have indicated that there are several leading motives for their decision making, and they can be utilized as a foundation for marketing communication that targets young students. The results show that the crucial elements deal with comfort and convenience associated with the destination, along with the attractiveness of the destination.

Key words: tourism, marketing communications, young tourists, destination attractiveness

INTRODUCTION

Tourism is an important element of the contemporary economy. Income from this economic sector accounts for some 1,245 million USD. In 2014 tourism generated 9% of the world GDP and accounts for some 10% of employment [UNWTO 2015]. However, one can observe demographic changes [Olejniczak 2016] that cause substantial changes in the structure of tourists by age. Among others there is an substantial increase in the number of travels and an increase of expenditures by young people for tourism purposes [Demeter and Bratucu 2014].

Young adults are becoming a more attractive group for tourism agencies and to those responsible for regional development. Therefore, more information is warranted in order to have a chance to more effectively recognize their preferences, wants, needs, and constraints. Results of investigation of associated aspects can be used to optimize a tourist firm's position capturing the desires of this age group. In order to address such aspects it is imperative to answer some questions that originate from the logistics associated with efficient marketing communications. For example:

1. How do students seek information about a destination when planning a voyage?
2. How do they utilize the Internet resources while planning a voyage?
3. What are the most influential factors impacting their decision to book a trip?

These questions stem also from the effectiveness of marketing communication. It is essential to know what the main criteria is for customers when they are making the purchase decision to provide an effective marketing. Concurrently it is required to know which sources the customer uses to retrieve information: it seems the Internet is typically the main source for information about destinations for young adults [Dębski and Nasierowski 2015]. In this paper, we focus on the third question. The working hypotheses are:

- H1: There are specific motives that have a greater impact on one's choice of destination. These aspects should be emphasized in marketing campaigns.

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- H2: The main items that impact upon the selection of destination that can form the basis for marketing campaigns are comfort (and convenience), and the attractiveness of the destination.

To answer research questions and to verify research hypotheses the following structure of presentation has been adopted. In part two selected aspects determining tourism destination choice have been described based on the literature review. Part three presents results of the examination of key sources of information that is an impulse for the selection of destination. Based on examination of the average values of the responses to questions from the questionnaire preferences for destination choice are presented. Such analysis has been deepened by factor analyses, and the conclusions from the analysis can be used as the basis for marketing campaigns relative to promotion of destinations. Part four of the report summarizes the conclusions from the study and depicts directions for further studies.

FACTORS THAT DETERMINE TOURISM DESTINATION CHOICE – THEORETICAL BACKGROUND

Young adults are an attractive target market in the tourism industry; in 2009 it was estimated that this group had contributed some 190 billion USD to the market value which has since increased to 286 billion USD in 2014: this indicates a high dynamic of changes. It is estimated that by 2020, young tourists will contribute 400 billion USD to the tourism sector [UNWTO 2016].

There are distinct characteristics and patterns that should be noted when examining aspects of youth travel. Young people have more "free time" which leads to longer and more expensive trips. There appear to be evidence that young people choose to take time off from their studies or work in order to travel, which may result in above average expenditures. In the literature, it is noted that young adults have a tendency of taking time off from study or work to travel [Yoon 2014]. An additional motive for youth travel is a desire to learn more about foreign locations and cultures. This is concurrent with the notion that young tourists seldom return to the same tourist venue. Young people are prone to seek novelties, and are frequently pioneers in identifying attractive destinations. They are less discouraged because of social unrest, diseases, natural disasters, or terrorist threats [Vukic et al. 2015], e.g. the case of Turkey, or Egypt that may negatively impact a destination. On the contrary, young travelers have a higher probability to return since they have more years of life ahead of them.

When examining characteristics that are responsible for the demand related to a chosen destination, Niezgoda [2012] has indicated several items that may be pivotal for the selection of the destination: economic, legal, geographical, socio-psychological conditions, and the role of mass media. These items are characterized by many elements that impact their competitive position. As pointed out by Panasiuk [2015], beyond traditionally recognized tourism agencies, there are institutions and local authorities that shape the "tourism" site. They are responsible for the creation of the destination offer by their tourist friendly climate.

Dwyer and Kim [2003] specified some 120 items of competitiveness for a destination and grouped them into categories: endowed resources, created resources, supporting factors, destination management, situational conditions, market performance indicators. Enright and Newton [2005] have specified two aspects of competitiveness for a destination, whereas only one directly related to tourism (Table 1). Factors called business environment related or general factors – like labor cost and skills, the level of retail sector development, the level of technological advancement or strategies of local companies are important for marketing the destination but at the same time they are independent from people and to agencies that are responsible for the creation of tourism policies and contribute to the tourism experience.

Aspects of competitiveness for tourism destination were addressed by many researchers: Vanhove [2002], Dwyer and Kim [2003], Hadzik et al. [2010], Mechinda et al. [2010]. It was emphasized that the proper management of the destination site is important, and it must include marketing and promotion [Grzinic and Saftic 2012]. These elements correspond to the customers' preferences. There were also attempts to link elements of competitiveness with the demand for the specific products. For example, Kaushik et al. [2010] examined tour-

Table 1. The competitiveness factors of tourist destinations

Associated with tourism market / specific factors	Business environment related/general factors
Architecture	Labour cost and skills
History	The level of retail sector development
Local people	The level of technological advancement
Cultural pecularities	Strategies of local companies
Events (festivals, concerts etc.)	Political stability
Museumsand galleries	Anti-corruption policy
Concert halls and theatres	The level of educational system
City nightlife	Strong currency and steady prices

Source: Enright and Newton [2005].

ism related habits of the Hindu people and assumed the existence of relationships between such variables as age, sex, background of the tourists, occupation, income, and their impact upon the selection of the destination. The key elements related to the choice of destinations are: "communication, objectivity, basic facilities, attraction, support services, distinctive local features and psychological and physical environment" [Kaushnik et al. 2010]. Research related to the motives of decisions to travel has also been carried out in Europe; for example, a study by Holiday Barometr, or the study Global Advisor [Rosa 2002] and in Poland [Bosiacki 2012].

A big group responsible for the generation of tourism income are young people as they are motivated by their interests in the world and education [*Youth*… 2008]. The definition of youth tourism proposed by World Tourism Organization (WTO) also indicates such motives. It says that "youth travel includes all independent trips for periods of less than one year by people aged 16–29 which are motivated, in part or in full, by a desire to experience other cultures, build life experience and/or benefit from formal and informal learning opportunities outside one's usual environment" [Dionysopoulou and Mylokanis 2013].

Young adults are an attractive target group for the tourism market, therefore it is important to find effective methods to connect with them and attract them to visit a selected city or country. A vital element for marketers is to select an adequate communication channel(s) to reach them. Concurrently it is essential to share an attractive message to stimulate them to accept the offer. Moreover, it is crucial to identify these decisive factors that capture the tourist's attention to and to emphasize them during promotional efforts.

MATERIAL AND METHODS

The results from an analysis of the findings achieved based on a questionnaire study conducted between January and July 2015, are here reported. Amount of 235 responses were collected in Poland, with 201 being further analyzed (the rejected responses were by respondents above 35 years old). Share of 70% of respondents were below 25 years old. Share of 56% were residents of Warsaw, and the remaining portion mainly from neighboring cities. Warsaw, from the viewpoint of tourism, can be regarded as a very attractive place, with a host of cultural events and sites. It is a city with many administrative facilities, the headquarters for several large companies, including multinational companies, as well as many universities. These institutions are important because young travelers may seek unique attractions to diversify their experiences compared to what is available home. For the respondents, traveling to destinations that have different cultural characteristics and attractions is relatively easy because of the geographical proximity of other tourist destinations. Travel may often be considered a symbol of status for this group.

The examination of collected data was supported by factor analysis: this effort has been done to isolate motives for going to a specified destination, city, or region. This can be done because value of Determinant of Cor-

relation Matrix is very low (0.019, and concurrently value of KMO (Kaiser–Meyer–Olkin) Measure of Sampling Adequacy (0.742) is acceptably high. The optimum number of factors was determined based on the examination of the scatter plots. To use a simple interpretation of factors, the Oblimin rotation was used.

RESULTS

A pivotal element in the process of marketing communication rests with the content of the marketing message which should mirror the motives for traveling. Respondents were asked 17 questions, with answers in the scale of 1 (not important) to 5 (very important) in the selection of a destination for travelling (to the selected city, or region). Evaluation of elements important to the selection of destination is presented in Table 2.

Table 2. Elements important in the selection of a destination by respondents (averages)

Factor	Value	Factor	Value
Journey costs	4.42	Clubs, theme parks, entertainment	3.48
Climate	4.37	Quality and efficiency of local transport	3.46
Easy access to attractions	4.30	Special events, festivals	3.23
Variety of leisure and recreation offered (swimming pools, cinema, parks, playgrounds)	4.16	Architectural attractions, museums	2.96
Quality of accommodation and facilities	4.13	Opportunity for practicing a specific sport and related facilities	2.93
Quality of catering/restaurants facilities	4.06	Destination brand (known, popular)	2.77
Easy access	3.98	Folk art of a specific area	2.38
Flora, fauna and natural environment	3.91	Presence of places of religious worship	2.04
Quality and accessibility of shops	3.68	Average	3.54

Source: Own study.

The most important item for respondents when selecting a destination is the cost of the journey, followed by climate, easy access to attractions, and the variety of leisure and recreation offered and quality, especially accommodation one [Wojciechowska-Solis and Mazurek-Kusiak 2016]. Similar results were obtained by Buchta and Skiert [2012] when examining students' preferences: cost of the journey, sight-seeing and climate received the highest scores. Young people are active, have the desire to travel, are under 25 years old, and do not have enough money to achieve all the objectives associated with traveling, especially when they use their own resources. This aspect constitutes an important constraint for youth travel, especially when they have no other financial support. As suggested by Panasiuk [2014] tourism satisfies higher level needs and calls for consumption funds. Furthermore, dealing with the tourism activity of students, the "cost of the offer" and "scenery and climate" received the highest scores among motives for traveling.

The interpretation of the results from the factor analysis suggests the existence of two factors: comfort (and convenience), and attractiveness. The interpretation of these constructs may be as follows: Comfort: "something that brings aid, support, or satisfaction. An appurtenance or condition furnishing mental or physical ease" [*Websters*… 1986]; Convenience: "A favorable or advantageous condition, state, or circumstance. Something suited

to ones material wants, freedom from difficulty, discomfort, or trouble" [*Websters*… 1986]. Attractive: "able to cause to approach by influencing the will or appealing to the senses. Having qualities that arouse interest, pleasure, or affection in the observer" [*Websters*… 1986].

Table 3 presents items that form the scale of comfort (and convenience), and attractiveness along with their factor loadings (Pearson correlation coefficients that denote the strength of relations among variables). Some items from the questionnaire have been eliminated from further analysis either because of low values in Anti-Image Correlation Matrix – AICM (below 0.5) or because of low value of factor loadings (below 0.5).

Table 3. The selection of elements that create the scale of comfort (and convenience), and attractiveness of respondents

Comfort (and convenience)	Value
Quality of accommodation and facilities	.538
Journey costs	.597
Quality and accessibility of shops	.680
Variety of leisure and recreation offered (swimming pools, cinemas, parks, playgrounds)	.614
Quality and efficiency of local transport	.666
Easy access	.529
Quality of catering/restaurants facilities	.676
Easy access to attractions	.575
Clubs, theme parks, entertainment clubs	.510
Attractiveness	
Architectural attractions, museums	.623
Flora, fauna and natural environment	.585
Folk art of a specific area	.652

Source: Own study.

The strength of these relations can be regarded as average. This model explains 34.7% of the variance; unidentified elements are responsible for the remaining portion of the variance. This is a relatively low value. These results may be the consequence of the formulation of questions in the questionnaire: they were not focused enough, or they might have been interpreted differently by respondents. The first category (comfort and convenience) deals with the infrastructure of the location, how easy it is to get there, and the costs associated with the journey. The second relates to the specific features of the destination (attractiveness). For the respondents "destination brand (known, popular)" is not an element of "comfort". Such results allow us to conclude that the hypothesis H2: "it is possible to isolate these elements in the selection of destination, that are universal to respondents" – is confirmed. As well, it can be concluded that the hypothesis: H1: "there are the leading motives that are decisive to the choice of the destination" is confirmed.

Certainly, an issue of interpretation of these constructs – comfort, convenience, attractiveness – is open for discussion. These constructs are very broad, and their interpretation depends upon many elements: family status, age, wealth, education, preferences, and many more. Items describing these constructs may overlap.

It is interesting to note that "climate" that is one of the key items associated with the choice of destination (based on examination of average responses) has a very low index of importance in the factor analysis – it is eliminated because of the low value of factor loading.

"Destination brand (known, popular)", "folk art of a specific area", and the "presence of places for religious worship" are not important to respondents when aspects of importance is examined based on average values (Table 2), nor important when factor analysis results are used. These items were excluded from examination of factor analysis because of low values in AICM and low factor loadings (below 0.5). These are not important elements for respondents, and therefore there is no need to include information associated with these elements in the marketing campaigns. However, it is interesting that "variety of leisure and recreation offered (swimming pools, cinema, parks, playgrounds) and "opportunity for practicing a specific sport and related facilities" were not among crucial areas of importance, as per results from the examination of factor analysis.

CONCLUSIONS

The results of the study answer the research questions, especially the third which was related to motives for selecting a destination. Critical aspects in the decision to choose a destination have been presented in Table 2. The discussion of elements important to customers, specifically young Polish students, have been extended to factor analysis which may be regarded for a means of further verification of results. The identified motives should be included in communicating them to customers.

Equally important is the selection of the proper communication channels. Young people seek information mainly via internet. To a lesser extent, they use 'professional' sources such as brochures, advertisements in the press, subway, radio/TV). Characteristically, they use 'social platforms'. This may suggest their need to verify formal sources with personal and less formal opinions. Respondents use a wide palette of sources of information [Dębski and Nasierowski 2015].

The study results allowed us to answer research questions: what are the factors that are of prime importance to young tourists and key ways to communicate efficiently with them. The critical elements related to the selection of the destination of travel by the respondents, young people and students planning a trip, in our study have been presented in Table 3. The most frequently mentioned items are the cost of travelling and the overall variety and quality of the product. Thus, an examination of their preferences (wants, needs, constraints) may be adequate promotion – keeping in mind their preferences and not rely on travel agencies leaders to be correct. It is also important to identify an efficient means to communicate with clients – while not the main idea of this paper, this was already explained [Dębski and Nasierowski 2015]. Respondents use professional brochures or published advertisements to a much lesser extent compared to their older counterparts. They are more comfortable and experienced with the world-wide web than older clients.

These results show that comfort (and convenience) and attractiveness of the destination are most important. For a substantial portion of students, the key reason for traveling is to relax [Ryan and Zhang 2006]. There are also items associated with convenience when travelling such as "seeing and learning", "fun and entertainment", and "adventure and thrill" [Kim et al. 2007] that are related to an interest in leisure (attractiveness). Consequently, managing a tourism offer to gain special attention must be reliant on comfort and attractiveness; our results do not allow the isolation the pivotal, detailed elements of comfort and attractiveness that are decisive to success.

It is important to remember that attractiveness is the factor that will result in the final decision of a destination. Attractiveness contributes to satisfaction. However, it seems that comfort (and convenience) have a stronger impact. This observation has serious implications. Attractiveness should be emphasized in marketing communication, and comfort should be promoted to build customer loyalty which is key for customer retention (destination and travel agency). Such a line of reasoning is even more justified when "seeing and

learning" constitute a strong motivation in selecting a destination. Tourists who have already seen natural or cultural attractions in a given destination may lose interest in returning, which results in a decreased importance of attractiveness.

Presented results should be regarded as preliminary: a test study of the methodology for further studies. However, at this stage there are some valuable results. First, it can be concluded from our report, even if not explicitly stated, that further studies in this area are warranted. There may be an information gap between young tourists and travel agencies as they currently operate. The issue, whether such conclusions may be important for those responsible for regional development, is a topic for another investigation. As well, there are several very strong indications that suggest:

- A more comprehensive questionnaire, with more sharp questions is recommended.
- We observe that a structured interview with representatives from travel agencies may be useful, at least with respect to the verification of their opinions about the possible preferences of prospective customers.
- In any further study on the subject, there is the perceived need to expand the section related to the characteristic features of the respondent: e.g. family status (single with family, with children, etc.), sources of income or sources of funding the trips.
- It may prove interesting if future research to consider the differences in preferred times of the year young people can, and wish to travel.

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MOTYWY PROMOCJI DESTYNACJI TURYSTYCZNYCH WŚRÓD MŁODYCH LUDZI

STRESZCZENIE

Celem artykułu jest zaprezentowanie wybranych aspektów zarządzania komunikacją marketingową dotyczącą destynacji turystycznych, a skierowaną do młodych Polaków. Treść opracowania koncentruje się na preferencjach respondentów, które determinują ich decyzje wyjazdowe. Zweryfikowane hipotezy wskazują, że istnieje wiele wiodących motywów wyboru dokonywanego przez turystów. Powinny być one wykorzystywane w treści przekazu marketingowego, który jest adresowany do badanej grupy. Wyniki badania pokazują, że do kluczowych czynników należą komfort i wygoda pobytu wraz z atrakcyjnością destynacji.

Słowa kluczowe: turystyka, komunikacja marketingowa, młodzi turyści, atrakcyjność destynacji

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 31–40
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.42

ORIGINAL PAPER

Received: 24.09.2017
Accepted: 13.12.2017

LONG-TERM RELATIONSHIP BETWEEN WAGES AND LABOUR PRODUCTIVITY IN AGRICULTURAL AND MANUFACTURING SECTOR IN POLAND

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ABSTRACT

This paper investigates the long-term relationship between labour productivity and real wages in agricultural and manufacturing sector in Poland in the years 1991–2016. In order to establish the long-run dynamics, autoregressive distributed lag framework (ARDL) is applied. Long run causality running from labour productivity to wages in both sectors is confirmed. The yearly speed of adjustment following change in labour productivity is smaller in agricultural than in manufacturing sector and amounts 24 and 37% respectively. Increase of 1% in labour productivity leads to 0.4% higher wages in agriculture, and to 0.64% higher wages in manufacture.

Key words: wages, labour productivity, ARDL model

INTRODUCTION

The key issue in well-balanced economy is the relationship between production factors and their productivity. The productivity of labour factor is a measure of how well a country or enterprise uses its human resources in the production of goods and delivering the services. In the macroeconomic or sectoral perspective it is related to effective allocation and distribution of resources. Therefore, labour productivity is one of the factors determining the stable economic development, resulting in respective differences in the level of wealth among the sectors of the economy.

Changes in productivity are associated with movements of real wages. This relation has always been crucial economic and legal concern. The Convergence Report [ECB 2016] highlights that the increase of real wages in harmony with labour productivity is a necessary precondition for long macroeconomic stability. This link is a key determinant of the distribution of income between labor and capital [Feldstein 2008]. In the long perspective, raising productivity is the way to improve standard of living, with real wages being the most direct mechanism through which the benefits of productivity growth are transferred to employed population [Schwellnus et al. 2017]. Though, if wages increase faster than labour productivity, workforce gets greater part of national income and incentives to invest in capital decrease. In the aftermath, technological development in the sector slows down and in long-term both, labour productivity and wages, decrease.

The research problem that forms the basis for this study is the adjustment of wages to changes in labour productivity. I hypothesize that real wages and productivity are cointegrated, which means there is a statistically significant long-run relationship between them. This relation, however, differs depending on the economic sector.

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I focus on two distinctly different sectors, namely agriculture that represents primary sector[1], and manufacture that denotes the secondary sector.

The aim of this paper is to reveal and quantify the long-term relationship between labour productivity and wages in Polish agricultural[2] and manufacturing[3] sector since the economic transition. The market economy and structural reforms started to be introduced in 1990, thus the research period of this study is 1991–2016. In order to establish the direction of causation between wages and productivity and then their long-run dynamics, I apply autoregressive distributed lag framework. All estimations were performed in EViews.

The remainder of the paper is organised as follows. Section 2 explains the theoretical background. Section 3 includes an overview of wage levels and labour productivity in Poland. Section 4 describes data and methodology. Section 5 presents empirical results. The paper ends up with conclusions.

THEORETICAL BACKGROUND

In the literature, there is a consensus regarding a positive relationship between labour productivity and the level of real wages. There are few basic theories in this scope.

Standard microeconomic theory suggests that wages correspond to the marginal productivity of labour and can be derived from the profit-maximising behaviour of entrepreneures. In the short term, if productivity per unit of labour increases, while labour supply remains constant, the increased labour demand would result in higher pay, until a new profit-maximising equilibrium is reached. In the long-run, enterprises can modify not only the employment levels, but also their capital stock. As a consequence, changes in the wages and/or the price of capital may lead to substitution of labour for capital or other way around. However, yet again, higher wages would result from labour productivity growth. Thus, the main implication from this theory is that wages follow the development of productivity [Meager and Speckesser 2011].

In contrast to the theory above, the efficiency wage theory argues that causality runs from wages to productivity. The idea of this approach is that companies may benefit from paying employees a wage higher than their marginal revenue product. Higher salary denotes a higher cost of potential job loss for workers. Thus, when employees earn more, they exert greater effort to avoid losing the job [Storm and Naastepad 2007], this in turn results in better productivity.

In the macroeconomic approach a major part of wage analysis are based on the Philips curve [Phillips 1958] or the wage curve [Blachower and Oswald 1994]. Therefore, in most studies wages are explained by unemployment. However, in case of Poland there are empirical evidences that the level of wages corresponds more to the changes in productivity than in unemployment [Nikulin 2015].

But in what proportion to each other wages and productivity move? In the Cobb–Douglas function, the marginal product of labor is proportional to the average product of labor, i.e. to productivity. In this case, the wage level is expected to rise at the same rate as the rise in productivity. Nevertheless, considering different technologies, the marginal product of labor is not necessarily proportional to productivity. If new invested capital causes a rise in productivity and the elasticity of substitution between capital and labor is greater than one, the marginal product of labor will rise proportionately less than productivity. This implies that the wages and productivity do not move proportional [Feldstein 2008]. It is also worth drawing attention to the fact, that the relation between wages and productivity is affected not only by changes in technology, but also

[1] There-sectors theory developed by A. Fisher, C. Clark and J. Fourastie in the 1930s. divides economies into three sectors: primary: extraction of raw materials, secondary: manufacturing, tertiary: services.

[2] Section A of classification of business activities in Poland (PKD 2007) that includes agriculture, forestry and fishing and coresponds to primary sector.

[3] Section C, D, E of PKD 2007.

by different factors, such as the changing composition of the workforce, the changing cost of capital or wage negotiations.

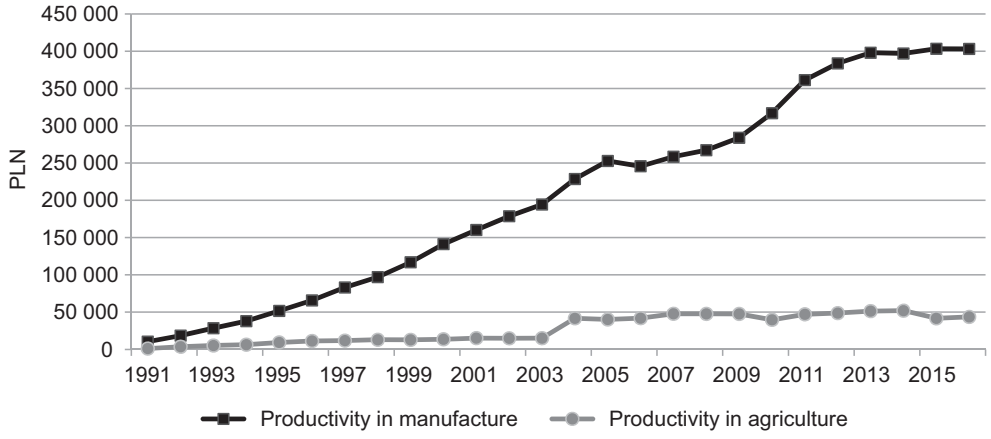
Since this study contains the comparative analysis of two sectors, it is relevant to point out several factors that generate differentials in the link productivity-wage among the sectors. A first factor is explained by differences in human capital [Haltiwanger and Krizan 1999]. A great number of studies focuses instead on the role of technological adoption. Another listed factor is dispersion in prices of equipment [Koeniger and Leonardi 2007]. Finally, many studies explain these differentials by imperfect labor market mechanisms and different government policies. In Polish context, here can be mentioned collective bargaining in case of mining industry or EU subsidies in agriculture.

Summing up, standard microeconomic theory underlines a clear relationship between wages growth and productivity, with wages adjusting to changes in productivity, whereas in the long run the elasticity of substitution between capital and labor is relevant. More sophisticated theories, like efficiency wage theory allow for the possibility that, even in the short-run, increase of wages may cause higher productivity and it may be efficient for entrepreneurs to set wages at levels different from that implied by the simple microeconomic theory. In any case, it is assumed that favorable situation for the economy, is when increase of wages does not cause increase of unit cost of production, as it hinders competitiveness [Adamczyk 2007, Rembisz 2016]. Therefore, the rise in labour productivity ought to be at the higher rate as the rise in wages.

WAGES AND LABOUR PRODUCTIVITY IN POLAND

This section discusses the dynamic of wages and labour productivity in manufacture and agriculture sector in Poland in the years 1991–2016. Figure 1 presents the labour productivity in both sectors, while the Figure 2 the average real wages.

Due to transition of the economic system from centrally planned to market economy in 1989 and related to this change economic shocks, the values of the wages and labour productivity at the beginning of the research period were very low. At that time many enterprises faced a problem of overstaffing. During the next years, because of implemented structural changes and market oriented policies, the systematic increase of labour productivity and wages was observed. Among all sectors, manufacture demonstrated the highest growth of productivity.



The sudden growth in agriculture labour productivity in 2004 was substantially related to the change in GUS methodology of measuring working persons in agriculture.

Fig. 1. Labour productivity in manufacture and agriculture sector in the period 1991–2016

Source: Own elaboration based on GUS data.

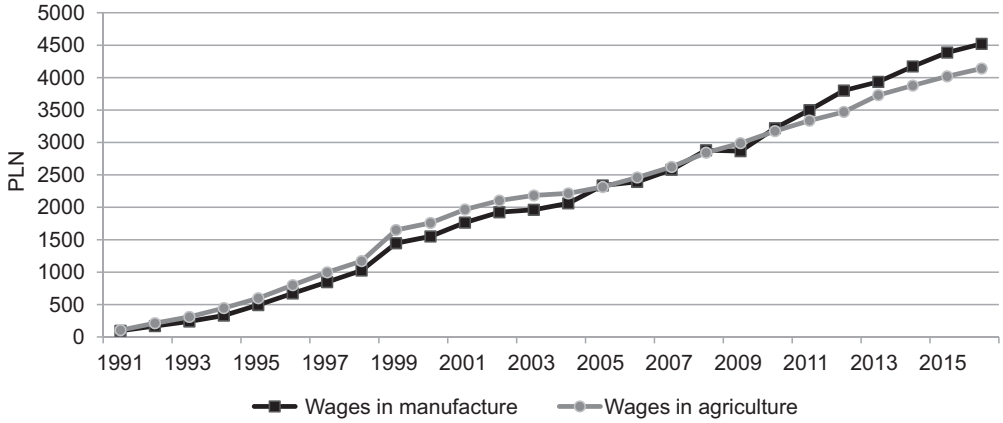


Fig. 2. Average real wages in manufacturing and agricultural sector in the period 1991–2016

Source: Own elaboration based on GUS data.

The sizable increase of manufacturing production in those years was possible mainly as the result of the use of unutilised capacity in those enterprises, which were restructured in the years 1990–1991 as the response to the demand shocks [Zienkowski 2000]. High growth of productivity in manufacture was also the result of changes in the general economic environment, privatization and new management approach of entrepreneurs.

Comparing labour productivity in manufacture and agriculture it can be notice that the latter has much lower values. While productivity in manufacture continuously and distinctly increases since 1991, the agricultural productivity is characterized by steady but very low growth. Thus, the disparity between labour productivity in these two sectors becomes bigger. It has been already stated that in EU countries labor productivity is higher in nonagriculture than in agriculture sector, but empirical studies show that this applies much more to less developed countries like Poland [Cai and Pandey 2015]. Moreover, labour productivity in the Polish agriculture is many times lower than in the remaining sectors of the economy [Jarka 2016]. This results mainly form high level of labour resources in agricultural enterprises, still a considerable share of small, not effective farms as well as from exogenous factors like market condition resulting from restrictions on exports.

Agriculture is a highly labour-intensive activity but some people working in this sector have non-farm occupation at the same time. Moreover, as self-employment is often in agriculture, underreporting of some income tends to bias downward true value of production. Since accession to the European Union in 2004, Poland closed 27% of the productivity gap[4] with the EU-15. Despite the progress, Poland's comparative labor productivity remains low in few key sectors, including agriculture and manufacturing. In these sectors the productivity gap is 56 and 54%, respectively [Bogdan et al. 2015].

Analyzing the level of wages in both sectors, no big differences can be noticed. Moreover, the empirical evidences indicate that, opposite to other sectors of economy, in agriculture the wage rate exceeds the level of productivity[5] [Rembisz 2016]. This argument implies that, firstly, regarding allocation of resources, agriculture is on the privileged position and takes advantage of intersectoral allocation [Rembisz 2016]. Secondly, there are other, than labour productivity, sources of pays. These are mainly EU direct payments to farmers and transfers of values from other sectors. As an example, in 2004 EU direct payments constituted on average of 13.5% of farm income, while already in 2010 this share exceeded 60% [Kruszewski and Sielska 2012]. This results in low competitiveness of this sector and dependence on subsidies.

[4] Ratio between the productivity of Poland and EU-15. Productivity is measured as value added per employee.

[5] Measured as value added per employee.

DATA ESTIMATION AND METHOD

Data

I use annual data for the period 1991–2016. All data are collected from the Central Statistical Office of Poland. Table 1 presents the list of variable names applied in this research and their definitions. In the analysis I use log form of variables to deal with heteroscedasticity, and also because of more convenient interpretation.

Table 1. The list of the variables

Time-series variable	Definition
agri_wages	real average monthly wage in agriculture sector
manu_wages	real average monthly wage in manufacturing sector
agri_lab_productivity	agricultural labor productivity
manu_lab_productivity	manufacturing labor productivity

Source: Own elaboration.

Wages are expressed by average monthly real wages[6] in Poland in manufacturing and in agricultural sector. Real wages are obtained by using the Consumer Price Index (CPI). Labour productivity is calculated as the ratio between output and input use. The output can be measured either by global production or gross value added. Taking into account data availability for the years 1990–2016 and the fact, that there is usually a strong correlation between these two measures, I calculate labour productivity in agriculture as the global production produced by working person[7]. In case of manufacturing sector I take into account marketed production[8] obtained from each employee.

Method

In order to determine relationships among time series variables regarding wage and labour productivity, for agriculture and manufacturing sectors separately, I adopt the autoregressive distributed lag (ARDL) framework, popularized by Pesaran and Shin [1995]. The ARDL model is a dynamic model in which the effect of a regressor x on y occurs over time rather than all at once and that provides results both for the long-run and short-run relationship. The model can be formulated as follows:

$$\Delta y = \beta_0 + \sum_{i=0}^{n} \beta_1 \Delta y_{t-1} + \sum_{i=0}^{n} \beta_2 \Delta x_{t-1} + \sum_{i=0}^{n} \lambda_1 y_{t-1} + \sum_{i=0}^{n} \lambda_2 \Delta x_{t-1} + \varepsilon \quad (1)$$

where: y – depended variable;
x – regressor.
The first part of the equation with the β terms represents the short-run dynamics, whereas the second part with the λ terms represents the long-run relationship. Δ is the operator of the first difference.

[6] Calculated by GUS methodology and include avarage monthly wages of employed persons.
[7] Includes working persons in the farms of natural persons, farms of legal persons and entities without legal personality (for methodology see GUS).
[8] Global production in section A and marketed production in industry calculated by GUS.

ARDL approach is appropriate for not large samples and applicable irrespective of whether the regressors are purely integrated of order zero: I(0), or of order one: I(1), or a mixture of both. However, there is still a requirement that none of the explanatory variables is of I(2) or higher. Therefore, as a first step, I test for the stationarity status of all variables to determine their order of integration. I apply Dickey–Fuller Test with GLS Detrending (DF-GLS) on each of the concerned variables. The presence of unit root indicates that it is a non-stationary process. Further, if the unit root can be removed after a time-series variable is first-differenced, then it can be confirmed that the time-series variable is an I(1) variable [Hamilton 1994]. By applying unit root test it is necessary to determine the length of the lagged Δy_{t-i} term. I specify the lag length by employing the Schwarz Information Criterion (SIC) automatic selection method with a maximum lag length of 2. The results of the unit root tests are reported in Table 2.

Table 2. Results of unit root test (ADF-GLS test)

Time series variables (in natural logarithms)	Levels (with intercept)	1st differences	Order of integration
Agricultural wage	1.58	–4.24***	I(1)
Manufacturing wages	1.68	–3.96***	I(1)
Agricultural labor productivity	–1.47	–2.38**	I(1)
Manufacturing labor productivity	1.70	–2.12**	I(1)

H_0: has unit root (non-stationary).

, * – indicate rejection of unit root at the 5 and 1% level of significance, respectively.

Source: Own elaboration.

The results indicate that all the time-series variables are not stationary at levels but their first differences are stationary at 1 or 5% level of statistical significance, meaning that they have the same integration order I(1)[9].

Having established that none of the variables is I(2), ARDL model is performed to examine the possible presence of cointegration among the variables, and to estimate the long-run coefficients, if such cointegration does, indeed, exist. First, I conduct bounds test for the null hypothesis of no cointegration. If the calculated *F*-statistic exceeds critical value, the null hypothesis can be rejected. If cointegration is confirmed, then the next step is to estimate the long-run coefficients by the ARDL approach. Then I perform residual diagnostics including autocorrelation, normality and heteroskedasticity tests.

RESULTS

The estimates of ARDL bounds tests are summarized in Table 3. The first model includes the examination of possible cointegration between considered agricultural variables, while the second model between manufacturing variables. In order to select the optimal lag length for each variable in both models, I use Schwartz Bayesian Criterion (SBC) with the maximum lag length of 3 in both models as I deal with annual data and not large sample.

[9] For the confirmatory purpose two other unit root test are conducted: ADF (augmented Dickey–Fuller) and PP (Phillips–Perron). The results are consistent with the findings under the DF-GLS unit root test.

Table 3. ARDL bounds tests estimates

Time series variables	F-statistics
Model I: ln(agri_wages), ln(agri_lab_productivity)	34.39 ***
Model II: ln(manu_wages, ln(manu_lab_productivity)	93.74***

H_0: no long run relationships exists; *** – rejection of H_0 at the 1% level of significance.

Source: Own elaboration.

In both models the null hypothesis of no cointegration is rejected at 1% of statistical significance. This indicate the long-run relationship between real wage level and labour productivity in agriculture as well as in manufacturing sector. Next, I estimate the ARDL models. The outcomes of model I referring to agricultural sector are listed in Table 4.

Table 4. Estimates of ARDL(1,3) model I

Depended variable	ECM term	Short run coefficients			Long run coefficients	
		Δ(agri_wages) (–1)	Δ(agri_lab_productivity)	C	agri_lab_productivity	C
agri_wages	–0.24***	0.75***	–0.03 (*i* = 1) 0.09 (*i* = 2) –0.08 (*i* = 3) 0.13**	0.96***	0.40***	4.00***

*** – 1% level of significance. Optimal lag length (1,3) selected by SBC; i – lag's number; ECM – error correction parameter; adj. $R^2 = 0.99$.

Source: Own elaboration.

Firstly it is necessary to look at the error correction term, that refers to the last-period deviation from a long-run equilibrium and influence short-run dynamics. Thus, it shows the speed with which model returns to equilibrium following an exogenous shock (in this case change in labour productivity). The negative and significant value of this term indicates long run causality running from independent to depended variable. The results reveal that there is a long run causality running form labour productivity to the wages in agriculture. The system corrects its previous period disequilibrium at a speed of 24% of disequilibrium correction yearly. In short-run the agricultural labour productivity variable with lag 3 is highly significant and affects wages (coefficient 0.13).

Further, the results indicate, that the long run relationship between wages and labour productivity in agriculture sector is given as follows:

$$\ln(agri\_wages) = 0.40 \ln(agri\_lab\_productivity) + 4.00 \quad (2)$$

This means that the long run elasticity of agriculture wages is 0.40. In equilibrium a 1% increase in the agriculture labour productivity increases wages by about 0.4%.

The estimates of the second model that includes manufacturing variables are reported in Table 4.

Table 4. Estimates of ARDL(1,0) model II

Depended variable	ECM term	Short run coefficients			Long run coefficients	
		manu_wages(–1)	manu_lab_productivity	C	manu_lab_productivity	C
manu_wages	–0.37***	0.62**	0.24***	0.99	0.64***	–0.003

*** – 1% level of significance. Optimal lag length (1,0) selected by SBC; ECM – error correction parameter; adj. $R^2 = 0.99$.

Source: Own elaboration.

Error correction term is negative and siginificant indicating long run causality running from labour productivity to the wages in manufacturing sector. The speed of adjustment is 37% of disequilibrium correction yearly. The short-run results in model II reveal that labour productivity significantly influence manufacturing wages in *t*-period (coefficient 0.24).

The long run relationship between wages and labour productivity in manufacture sector can be formulated as follows:

$$\ln(manu\_wages) = 0.64 \ln(manu\_lab\_productivity) \quad (3)$$

From the equation it can be concluded that, in the equilibrium real manufacturing wages increase by 0.64% if labour productivity in manufacture increases by 1%.

Finally, the residual diagnostics on ARDL model I and II is applied. I perform diagnostics including Langrange Multiplier (LM) autocorrelation test, normality test, and heteroskedasticity test. The results of both models show that there is no evidence of non-normal distribution, autocorrelation or heteroskedasticity effect in the residuals.

CONCLUSIONS

The relationship between labour productivity and real wages is well-documented in the theoretical literature. The main purpose of this study is to contribute to the existing empirical evidences by investigating the cointegration between real wages and labour productivity in two different sectors, agricultural and manufacturing, in Poland after introducing the free market economy.

Labour productivity in manufacturing is much higher than in agricultural sector. While the former demonstrates continuous and distinct growth since 1991, the latter is steadily characterized by very low values. However, with regard to the level of wages there are no essential disparities between these two sectors. Agriculture is on the privileged position and takes advantage of intersectoral allocation of resources.

The results of ARDL models reveal that the dynamic interactions among wages and productivity in Poland are consistent with the theoretical expectations. There is a long run causality running from labour productivity to wages in both sectors. The results do not confirm the opposite causality (i.e. from wages to labour productivity). This relation, however, differs depending on the economic sector. The yearly speed of adjustment following change in labour productivity is smaller in agricultural than in manufacturing sector and amounts 24 and 37% of disequilibrium respectively. Furthermore, the labour productivity affects real wages to a lesser degree in agriculture than in manufacture. Increase of 1% in labour productivity leads to 0.40% higher wages in agricultural, and

to 0.64% higher wages in manufacturing sector. The short-run analysis for both sectors is quite different as well, with the results that labour productivity positively affects wages in period *t*-3 in agricultural (coefficient 0.13) and in *t*-period in case of manufacturing (coefficient 0.24) sector.

The results emerge that in both sectors labour productivity rises at higher rate than real wages what is advantageous for the economy. This is in line with existing evidences [Jarka 2016, Rembisz 2016]. But in case of agricultural sector, labour productivity affects wages slower and to a lesser extent than in manufacture. Very low agricultural labour productivity in Poland in comparison to other EU countries may suggest low rationality of management in agriculture taking into account producer's equillibrium, what results in low competitiveness of this sector and dependence on EU direct payments to farmers.

Relation between wages and productivity is likely to be affected by other factors as well, such as changes in technology, composition of the workforce, cost of capital or wage bargaining. Given the specificity of the aim of my research, and data availability these factors are not considered in this research. Nevertheless, in future this study can be further extended by including other relevant variables.

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DŁUGOOKRESOWA ZALEŻNOŚĆ MIĘDZY POZIOMEM WYNAGRODZEŃ A WYDAJNOŚCIĄ PRACY W SEKTORACH ROLNYM I PRZEMYSŁOWYM W POLSCE

STRESZCZENIE

Celem artykułu jest zbadanie długookresowej zależności między poziomem realnych wynagrodzeń a wydajnością pracy w sektorach rolnym oraz przemysłowym w Polsce w latach 1991–2016. W celu określenia długookresowej dynamiki zastosowano model autoregresyjny z rozkładem opóźnień (ARDL). Potwierdzono wpływ wydajności pracy na poziom wynagrodzeń w obu sektorach. Wzrost wydajności na poziomie 1% powoduje zwiększenie się realnego wynagrodzenia o 0,40% w rolnictwie i o 0,64% w przemyśle. W następstwie wzrostu wydajności pracy roczna prędkość osiągnięcia stanu równowagi przez wynagrodzenia wynosi 24% w rolnictwie i 37% w przemyśle.

Słowa kluczowe: wynagrodzenia, wydajność pracy, model autoregresyjny z rozkładem opóźnień

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 41–50
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.43

ORIGINAL PAPER

Received: 07.11.2017
Accepted: 11.12.2017

IMPACT OF FOOD INDUSTRY MARKUPS ON SECTORIAL BUSINESS CYCLE AND FOOD INFLATION IN POLAND

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ABSTRACT

The main goal of this paper was to examine relationships between markups, output, and food inflation in the Polish food sector in the period 2000–2013. Levels of the monopolistic markups were calculated as an inversed labor share in the output value with a modification regarding overhead labor, whereas value of production was used as an indicator of sectorial business cycle. In order to analyze the relationships in question such methods as cross-correlations, Granger test, and VAR analysis were employed. It turned out that markups have behaved procyclically regarding the sectorial business cycle, and can be regarded as a lagged indicator for output and as a predictor for food inflation. A positive impact of the markups on the food inflation is likely to be one of the reasons for relatively weak joint changes of output and inflation, what may affect responses of the Polish economy to the monetary policy measures.

Key words: markups cyclicality, inflation, food sector

INTRODUCTION

A monopolistic markup, which is a gap between a price that firm charges and its marginal cost, has various economic meanings. While in microeconomics it indicates market power, represents a welfare loss to society, or is an incentive for investment and technological change, in macroeconomics it is mostly used as an argument in discussions about the character of cyclicality of real wages and is a key exogenous variable in the inflation models and general equilibrium models. Consequently, three main dimensions of markups impact on monetary policy can be considered.

Firstly, the assumption about markups cyclicality is present in the majority of DSGE models build in the New Keynesian spirit used by central banks when making decisions on directions of monetary policies. They assume that if prices are sticky, an increase in demand should raise prices less than marginal cost, leading to a fall in markups. Even with sticky wages, most New Keynesian models still predict a fall in markups [Nekarda and Ramey 2013]. For example, in the model by Rotemberg and Woodford [1992], an increase in government spending causes both hours and real wages to rise, because imperfect competition generates countercyclical markups. In a textbook New Keynesian model, sticky prices combined with procyclical marginal cost imply that an expansionary monetary shock, or government spending shock, lowers the average markup [Goodfriend and King 1997]. Such result also holds in the leading New Keynesian models with both sticky prices and sticky wages [Smets and Wouters 2003, Christiano et al. 2005]. Also the National Bank of Poland (NBP)

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relies on the result of a DSGE model assuming that monetary policy and government spendings influence the economy through their impact on markups [Grabek et al. 2007].

Secondly, markups can be useful in elaborating business cycle barometers. The first one was developed by Axe and Flinn [1925], and afterwards Burns and Mitchell [1946] distinguished three different types of business cycle indicators such as leading, coincident, and lagging indicators of economic activity. A leading indicator informs about future development of economic activity. It usually shows increases and decreases in the activity few months ahead with regard to GDP or other measures of economic activity. A coincident indicator measures current level of economic activity and is lagged by a few months compared to a leading indicator. A lagging indicator of economic activity is such a set of statistics, which with some delay relative to GDP, or the coincident indicator shows changes in economic activity. Although a lot of studies proved cyclical behavior of markups, there is no agreement if they are pro, counter, or acyclical (see an overview in Nekarda and Ramey [2013]). Also, the economic theory does not provide a definite answer (see more: Phelps and Winter [1970], Rotemberg and Saloner [1986] or Chevalier and Sharfstein [1996]). This is probably because the relative stickiness of wages and other costs to prices differs among countries, reflecting the different structures of labor and product markets [Klein 2011]. Regarding Polish studies, Gradzewicz and Hagemejer [2007] indicated procyclical behaviour of markups in the case of the sectorial cycle and countercyclical regarding the macro cycle. Moreover, a price to labor costs ratio is enumerated among leading indicators for the Polish economy.

The third area of the markups impact refers to their positive correlation with price inflation [Chirinko and Fazzari 2000, Bowlder and Jansen 2004], which appeared also in the New Keynesian models, e.g. Steinsson [2003], although some studies indicate negative sign of correlation, e.g. Banerjee and Russell [2005]. Markups cyclicality is enumerated among causes of lack of a clear link between production and prices, next to a high inflation persistence partly caused by inflation expectations, changes in exchange rates and their relatively strong and fast pass-through on prices, the fact that downturns (upturns) of business cycle are often connected with downturns (upturns) of exchange rates as well as an evolution of goods' prices [Klein 2011]. During business cycle downturns, the fact that inflation does not fall so much as it would without markups changes, diminishes influence of decreasing the interest rates on economic activity, what may deepen the economic downturn and delay the recovery. On the contrary, during business cycle upturns a decrease in markups reduces inflation pressure, letting central banks delay introduction of a more restrictive monetary policy. From this perspective, studying the relationship between markups and inflation seems to be particularly important for food prices forecasting as well as predicting the effects of monetary policy. Considering such a framework, the research question addressed in this paper is whether the Polish food sector markups influence related output and inflation.

The food sector was chosen for analysis as being – not only in Poland – one of the most regulated, traditional, and considered to be strategically important for the whole economy. The Polish food sector is characterized by high shares in employment, exports and the GDP. In 2012, 17% of the employed in the whole manufacturing industry worked in this sector. In the period 2003–2012 food exports increased 5 times, from 4 to 20 billion EUR, of which three fourths were directed on the EU markets. Considering total value of agricultural production, Poland is at the 7th place in the EU.

The market structures in the agro-food sector constantly change. They are carefully monitored and analyzed because of their importance in terms of incomes of agricultural producers and welfare of food consumers. Especially, the concentration processes are the matter of interest, because they may potentially lead to the uncompetitive behavior of entities dominating certain branches, such as exercising market power in the price setting process. In 2010 large companies (hiring more than 250 workers) constituted only 1.7% of all 16 thousands companies in the Polish food sector, but they had a share of 36.9% in the total employment and provided 54.1% of the total production value [Szczepaniak 2012]. Examining the relationships between levels of markups and phases of the business cycle and inflation levels seems to be particularly important for food

prices forecasting as well as predicting effectiveness of monetary policy, especially when taking into account that in 2013 a share of food products and non-alcoholic beverages in the CPI basket in Poland amounted to 24.33%.

DATA AND METHODS

Markups were calculated with a method that uses a labor input margin to estimate marginal cost, as this method produced the strongest evidence of countercyclical markups and has been the most popular in the New Keynesian literature [Nekarda and Ramey 2013]. Under an assumption of Cobb–Douglas production function and excluding overhead labor as not increasing with the number of working hours and therefore not influencing markups, labor markup is expressed as follows:

$$\mu = \frac{P}{MC} = \frac{P \cdot MPL}{W_A} = \frac{P \cdot \frac{Y}{hN - \overline{hN}}\alpha}{W_A} = \frac{\alpha}{s'}$$

where: MPL – the marginal productivity of labor;
W_A – an average wage;
Y – production;
h – number of hours per worker;
N – number of workers.

The expression $\overline{hN}$ represents overhead hours, hence $s' = \frac{W_A\left(hN - \overline{hN}\right)}{PY}$ is a labor share of non-overhead labor. Because knowing the markups dynamics is sufficient for answering the research question, it was assumed that elasticity of output with respect to labor remains fixed over time, so only natural logarithms of inversed labor shares were calculated. In order to calculate non-overhead labor, the costs of wages and salaries was multiplied by the ratio of all costs minus costs of management and sales, to the total costs. Afterwards, in order to measure inversed labor share, value of production was divided by calculated in this way cost of non-overhead labor. Markups were estimated using data provided by the Central Statistical Office of Poland (CSO) regarding operations of companies hiring more than 9 workers reported using special forms the (SP and Z-O6) and aggregated at the food processing sector level. The data have been collected on annual basis for the period 2000–2013.

The business cycle, similar to Gradzewicz and Hagemejer [2007], was considered at both the sectorial and macroeconomic levels. Single indicators regarded as the most popular and appropriate for analyzing the considered relationships were used. Specifically, at the sectorial level this was value of production expressed in real terms (yearly data), whereas at the macro level it was real GDP (quarterly data). Inflation was expressed with two kinds of indices calculated on the quarterly basis, namely, food inflation index and consumer price index (CPI). All these data were sourced from the CSO. Because of temporal inconsistency and statistical properties of the collected time series data some transformations of them were made. Both the markups and the sectorial output numbers (value of production) were interpolated into quarterly data with the use of Chow and Lin method [1971], so that the analysis could be performed with the quarterly observations.

Such variables as the GDP, and inflation have exhibited significant seasonal components, therefore their time series were adjusted for seasonality with the use of X-12-ARIMA method [*X-12-ARIMA*… 2011]. All the variables were transformed into logarithms (natural logs). Before estimation of the examined relationships, the Augmented Dickey–Fuller test (ADF) was employed to check the order of integration of the time series [more

about test can be found in: Tsay 2010]. The obtained ADF test statistics indicated that all the variables were non stationary[1], thus trends were eliminated from the logs of the seasonally adjusted data. Cyclical components[2] were extracted applying two different methods, that is by taking first differences and using the Hodrick–Prescott (HP) filter with a parameter $\lambda = 1{,}600$.

In order to explore interactions between the cyclicalities of markups, food sector output, the GDP, and inflation rates the cross-correlations were calculated as well as the VAR modeling was applied. The cross correlations allowed to capture connectedness between markups and the sectorial and macro business cycle indicators lagged by a certain number of periods. General formula for a VAR model is as follows [Tsay 2010]:

$$Y_t = A_0 + A_1 Y_{t-1} + A_2 Y_{t-2} + ... + A_p Y_{t-p} + B_i X_t + \varepsilon_t$$

where: Y_t – stochastic processes collected in $n \times 1$ vector;
A_0 – deterministic variables parameters;
A_i, B_i are coefficient matrices;
p – order of the VAR model;
X_t – exogenous variables.

The number of lags was chosen using the Akaike's Information Criterion (AIC). Causal impacts were depicted with the impulse response functions (IRF). Results of testing for the Granger causality are summarized with the F-statistic values. The VAR models dynamics were also assessed by the variance error decomposition (VED).

RESULTS AND DISCUSSION

Cyclical fluctuations appeared to be present in all the analyzed seasonally adjusted time series. Figure 1 presents cyclical components obtained using the HP filter. It can be noticed that the length of the cycles is about four years. The years of relative prosperity for the sector (measured by output) and the whole economy (measured by the GDP) were: 2000, 2004–2005, 2007, and 2011–2012. Fluctuations in economic activity in the food industry are greater than the fluctuations in the whole economy. This is particularly visible since 2008, that is after the financial world crisis emerged.

Cross-correlation coefficients between cyclicality of food sector markups and both the macro and the sectorial business cycles as well as with consumer price inflation (CPI) and changes in the price levels of the food basket (CPIFood) are depicted in Figure 2. The sectorial business cycle is positively correlated with the macro business cycle, and the highest cross-correlation coefficient (0.56) refers to the simultaneous relationship. As expected a strong relationship exists between the CPI and CPIFood. Cross-correlation coefficient between the deviations from the HP trends of the CPI and the CPI Food is the highest with no lag, amounting to 0.82. This observation suggests that looking for how the sector markups are connected with its output and food inflation may lead to some interesting findings in the context of shaping monetary policy in Poland.

[1] ADF test statistics with corresponding p-values for model with constant and for model with constant and trend are as follows: l_Markup ($\tau = -0.80$, $p = 0.82$ and $\tau = -2.19$, $p = 0.49$); l_GDP ($\tau = -0.44$, $p = 0.89$ and $\tau = -1.57$, $p = 0.79$); l_Output ($\tau = -0.32$, $p = 0.91$ and $\tau = -3.29$, $p = 0.07$); l_CPI ($\tau = -0.72$, $p = 0.84$ and $\tau = -3.04$, $p = 0.12$); l_CPIFood ($\tau = -0.06$, $p = 0.96$ and $\tau = -2.69$, $p = 0.24$). Further analysis performed on the first differences of logged series allows us to conclude that all series are integrated in order 1 at the 0.05 significance level.

[2] ADF test allows us to reject the null hypothesis of a unit root in all seasonally and trend adjusted series at the 0.05 significance level.

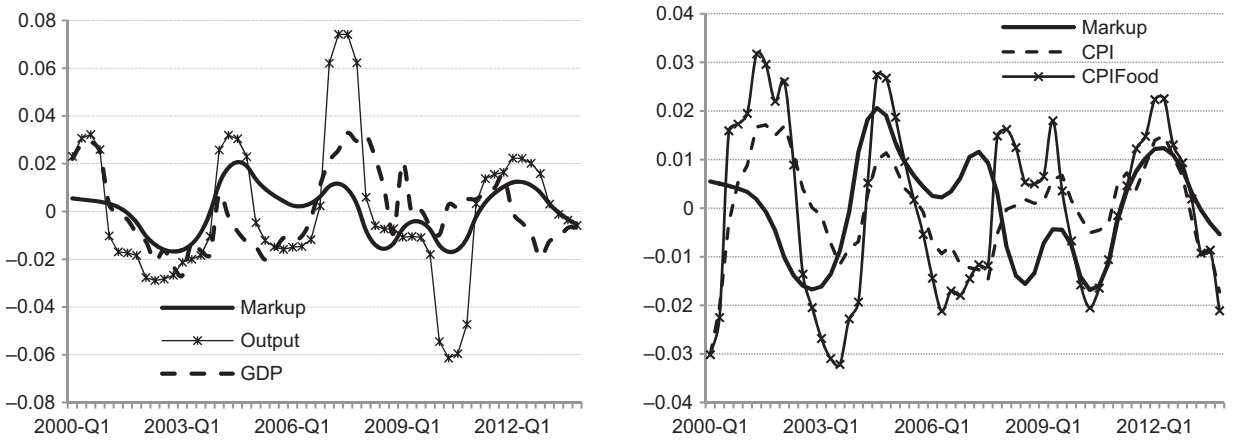

Fig. 1. Cyclical behavior of the Polish food sector markups, the sectorial and macro business cycles and the sectorial and macro inflation rates in the period 2000–2013 (HP filter)

Source: Own elaboration based on the CSO data.

It appeared that markups are positively correlated with calculated in real terms production value of the food sector. The highest positive coefficient (regardless the method of data transformation applied) is for 0 lag (0.71). The contemporaneous correlation of the food markups cyclicality with the sectorial business cycle is much stronger than with the macro business cycle and markups (0.18).

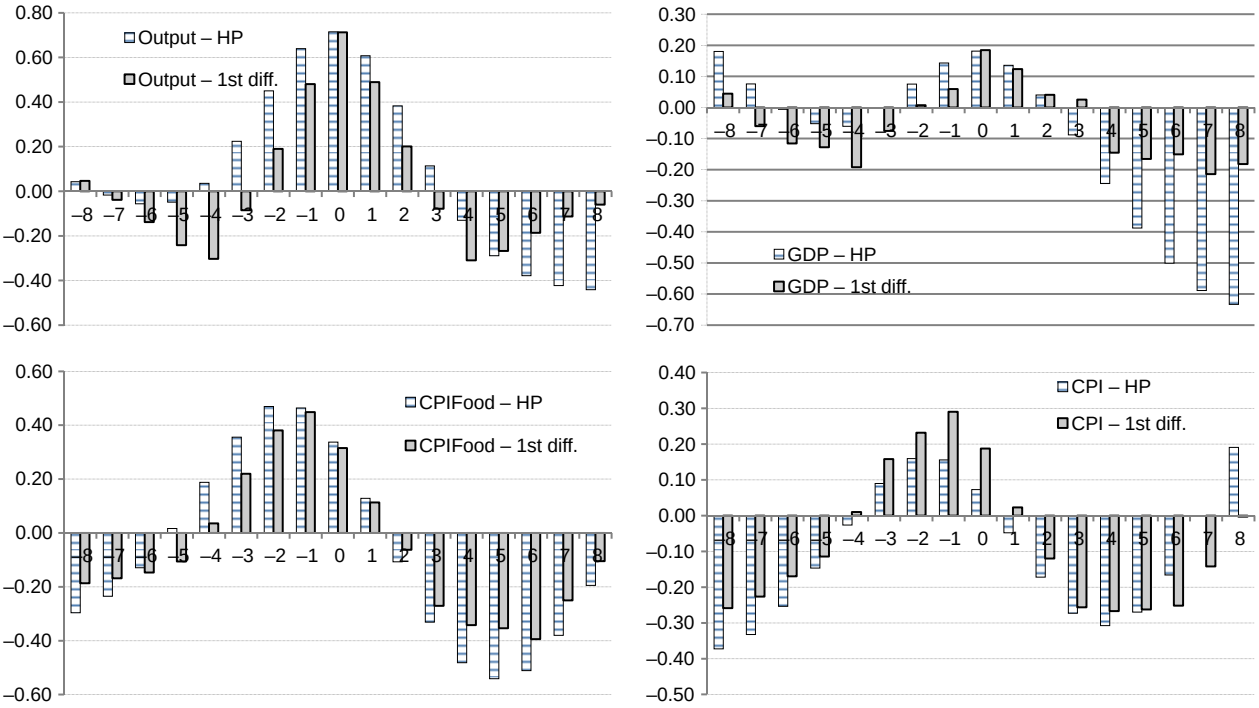

Fig. 2. Cross-correlations of the food sector markups to the leads and lags of business cycles indicators and inflation rates

Source: Own elaboration based on the CSO data.

The food markups seem to be negatively correlated with the real GDP led by 2 years (–0.63), although a strong correlation is seen only regarding results obtained with the application of the HP filter. Also, the markups are stronger correlated to the CPIFood than to the CPI. The highest values of positive cross-correlation coefficients between markups and food inflation are for markups led by 1–2 quarters, what indicates procyclicality of the Polish food sector markups as regards to the sectorial business cycle.

The relationships between the markups and both the business cycle and inflation rates were analyzed also using VAR models with the GDP and CPI treated as control variables[3]. All the time series had a unit root, but the first differences as well as series of deviation from HP trends appeared to be stationary. The seasonal fluctuations were removed from the GDP, CPI and food inflation series using the X-12-ARIMA method. Twelve VAR models, representing different combinations of endogenous and exogenous variables as well as methods of cyclical components extraction were estimated. Their specifications and the results of Granger causality testing are presented in Table 1.

The basic VAR models include two endogenous variables, that is markups and business cycle (the sector output or the real GDP – model 1 and 2, respectively). Next, these models were extended by inflation in the sector (CPI_Food) or inflation in the whole economy (CPI) – model 3 and 4, respectively. Model 5 includes markups and the sectorial cycle as endogenous variables (Y_t) and GDP as an exogenous variable (X_t). Model 6 includes three endogenous series (sectorial) and two exogenous variables representing the macro business cycle and the consumer inflation.

Table 1. Specification of the alternative VAR models and results of the Granger causality testing[a]

Model	Variables	First differences	HP filter adjustment	Additional remarks
1	Y_t (Markup, Output)	Output → Markup F = 8.91 (0.001) Markup → Output F = 6.13 (0.004)	Output → Markup F = 6.24 (0.001) Markup → Output F = 3.02 (0.039)	–
2	Y_t (Markup, GDP)	GDP → Markup F = 0.87 (0.427) Markup → GDP F = 0.27 (0.764)	GDP → Markup F = 2.20 (0.084) Markup → GDP F = 0.230 (0.878)	–
3	Y_t (Markup, Output, CPI_Food)	Output → Markup F = 8.68 (0.001) Markup → Output F = 5.75 (0,006)	Output → Markup F = 8.03 (0.000) Markup → Output F = 2.34 (0.086)	The CPI_Food is influenced by output and markups
4	Y_t (Markup, GDP, CPI)	GDP → Markup F = 2.23 (0.099) Markup → GDP F = 0.19 (0,901)	GDP → Markup F = 2.32 (0.074) Markup → GDP F = 3.10 (0.026)	The CPI is an effect of the GDP and markups
5	Y_t (Markup, Output) X_t (GDP)	Output → Markup F = 11.423 (0,000) Markup → Output F = 6.71 (0.003)	Output → Markup F = 7.57 (0.000) Markup → Output F = 3.72 (0.018)	Significant and positive impact of the GDP on output and markups
6	Y_t (Markup, Output, CPI_Food) X_t (GDP, CPI)	Output → Markup F = 12.58 (0.000) Markup → Output F = 6.01 (0.005)	Output → Markup F = 7.75 (0.000) Markup → Output F = 3.55 (0.023)	The CPI_Food is an effect of the GDP and markups

[a] p-values are presented in parenthesis, number of lags was 2 or 3 for the first differences and 3 or 4 for HP adjustment case.

Source: Own elaboration based on the CSO data.

[3] VAR models were applied because of a lack of clear results regarding existence of a cointegration relationship among variables in different model specifications (Table 1). For models 1, 3, 4 the Johansen test indicates existence of one cointegration vector. In the remaining cases lack of cointegration was stated. This, and the fact that we are interested in cyclical behavior of series, justifies application VAR methodology.

It appeared that Granger causality between markups and the sectorial cycle is bidirectional and the F statistics indicated that the impact of the past shocks in the output on the markups seems to be stronger than vice versa. Moreover, both the markups and the sector output are Granger causes for the food inflation (CPI_Food). Consequently, the following direction of the Granger causality can be indicated: sectorial business cycle → markups → food inflation. The GDP variable was significant in all equations, while the CPI variable was significant only in the equation for the CPI_Food.

In the next step of the analysis, using ordering of the considered variables, the impulse response functions (IRF) were generated. Figure 3 presents cumulative IRF for the models estimated on the sectorial data transformed using the HP filter (results regarding control macro variables were omitted). IRF analysis indicates a positive reaction of output to a shock in markups, so the increase of profitability leads to the intensification of production (entries of new firms, an increase in efficiency). On the other hand, a positive shock in output

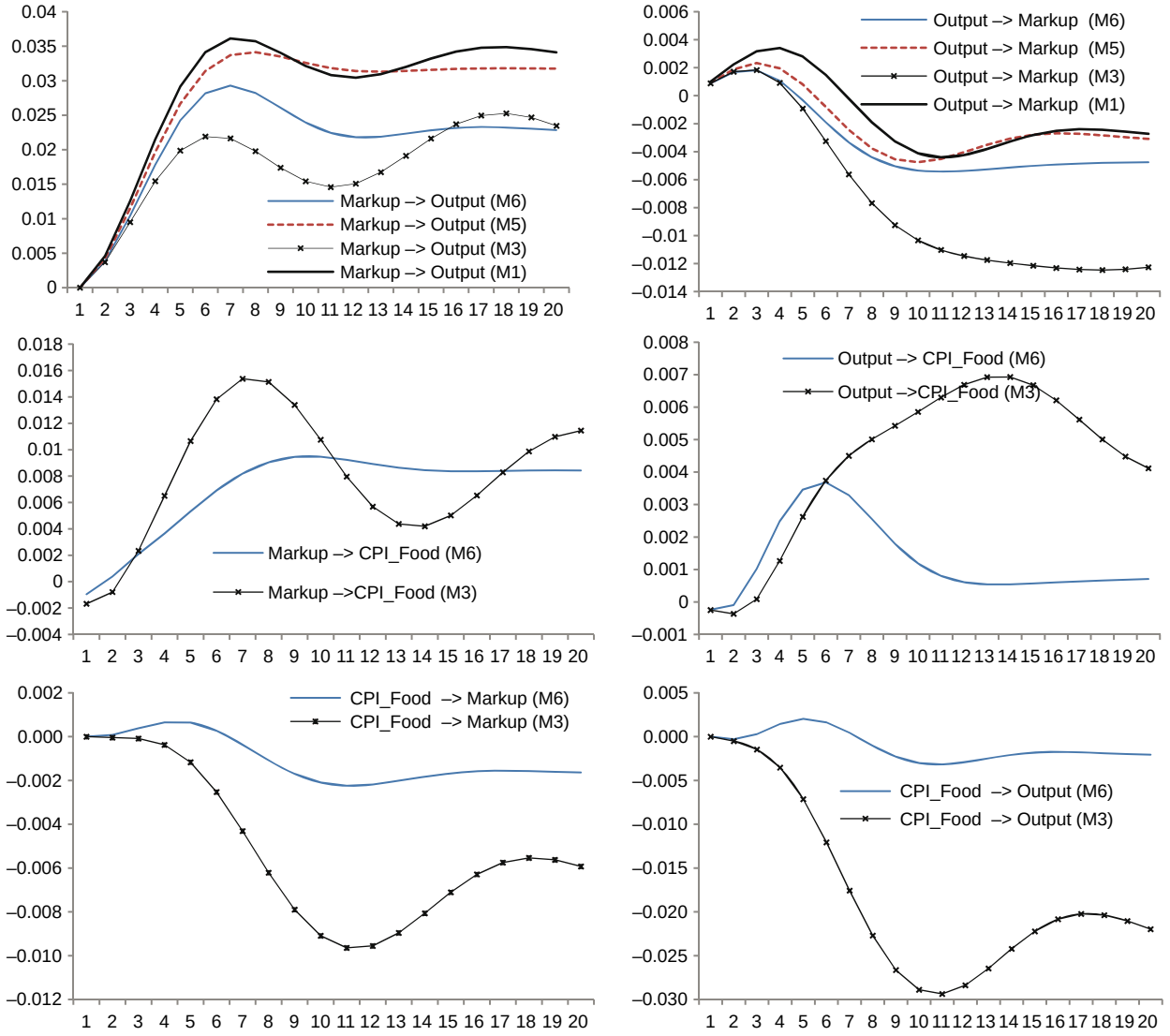

Fig. 3. Cumulative impulse response functions for selected models (based on deviations from the HP trends)

Source: Own elaboration based on CSO data.

after 5–7 quarters is followed by a decrease in markups. This shows a delayed countercyclical reaction of markups to changes in the sectorial business cycle, comparing to the procyclical simultaneous behavior. As to prices, it seems that they play an important role in shaping the relationship between markups and the business cycle. The IRF analysis shows that positive shocks in output as well as in markups lead to increase in sectorial inflation (model 3 and 6). Shocks in the food prices have a negative effect on markup and output, although according to model 6 a short run effect (up to six quarters) might be positive. Moreover, an inclusion of exogenous variables (GDP and CPI) in model 6 mitigates the effects of a shock in food prices as compared with model 3.

In order to assess a relative influence of an identified market shock, the variance error decompositions (VED) were performed. Results of the VEDs for chosen models are presented in Table 2. They show that the contribution of the markups shock to the variability of output in the horizon of 20 quarters varies between 19% in model 3 and 36% in model 1 and 6. In contrast, the contribution of the output shock to the variability of markups is lower and varies in the range of 11–25%. This confirms conclusions drawn from the causality testing. The VEDs also confirm an important role of markups in determining the food inflation. The contribution of a shock in markups to the variability of food inflation after 5 years amounts to ca. 37%, whereas a shock in output has a smaller impact on food inflation.

Table 2. Variance Error Decomposition for the selected models (based on deviations from the HP trends)

Model	Model 3			Model 6		
SE shock in	Markup	Output	CPIFood	Markup	Output	CPIFood
No of quarters	VED of Markup					
4	93.79	5.98	0.23	94.61	4.96	0.43
8	62.95	25.62	11.43	83.45	14.67	1.88
12	58.49	26.76	14.75	82.87	14.55	2.58
16	57.43	25.73	16.84	82.72	14.57	2.70
20	57.48	25.45	17.07	82.71	14.58	2.71
No of quarters	VED of Output					
4	17.04	81.84	1.12	28.21	71.36	0.44
8	16.83	67.96	15.21	34.35	64.49	1.16
12	16.90	66.11	16.99	35.64	62.80	1.56
16	18.51	63.48	18.01	35.68	62.68	1.64
20	18.83	63.07	18.10	35.69	62.67	1.64
No of quarters	VED of CPIFood					
4	20.40	1.11	78.49	25.21	10.89	63.90
8	30.73	2.84	66.42	38.11	12.48	49.41
12	34.48	2.60	62.91	37.36	14.64	47.99
16	35.19	2.65	62.16	37.52	14.61	47.87
20	36.49	2.98	60.53	37.52	14.62	47.86

Source: Own elaboration based on CSO data.

The results regarding a relationship between food industry markups and the macro business cycle are not so obvious and clear. Model 2 estimates (based on first differences) suggest no linkage between markup and GDP (in the Granger sense). On the other hand, model 4 (in both variants) and model 2 with the HP deviations show an existence of a relationship between these variables. Three out four model specifications detected that the macro business cycle is in Grange sense a cause for the food industry markups at 0.1 significance level (in one case among the four there impact was opposite). It is worth mentioning that in the VAR model estimated for three endogenous variables: output, the GDP and markups (not presented here), the macro business cycle was not statistically significant and had no causal impact both on the output and markups. Therefore, we do not present a detailed analysis for models with GDP assuming no clear linkage.

CONCLUSION

The purpose of the paper was to investigate whether the Polish food sector markups influence output and inflation in the Polish food sector. Markups estimated as inversed non-overhead labor share appeared to be procyclical in regards to sectorial cycle, what is in accordance with the results obtained for the Polish industry markups by Gradzewicz and Hagemejer [2007]. In the period analyzed markups were predictors for changes in food inflation, but not in output, as the sectorial business cycle changes seem to precede changes in markups by 1–2 quarters. The indicated positive correlation between markups and inflation is in accordance with studies performed by Chirinko and Fazzari [1999] or Bowlder and Jansen [2004]. The mechanism is as follows: a positive shock in output causes a decrease in markups, and a negative shock in markups causes a decrease in food inflation, which is strongly correlated with CPI. Positive impact of markups on food inflation seems to contribute to a week joint movement of business cycle and inflation, because without the markups response the shock in output raises food inflation. As indicated Klein [2011], such behavior of markups may impact the monetary policy. More specifically, during downturns, when markups increase, inflation does not drop as much as it would have without markups movement, what weakens the efforts of the National Bank of Poland (NBP) to stimulate economic activity by lowering the interest rate, and eventually may delay a recovery. On the contrary, during upturns a decrease in markups limits inflation pressure, what lets the NBP to delay its actions. As the share of food in the CPI basket in Poland accounts for well above 20%, it seems important to take into account the behavior of the Polish food sector markups when making monetary policy decisions. The main limitation of the study is quarterly interpolation of markups due to the lack of primary quarterly data. Concerning future research checking whether markups in particular food sector branches can serve as indicators for the Polish business cycles would be an interesting finding.

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WPŁYW MARŻ MONOPOLISTYCZNYCH W PRZEMYŚLE SPOŻYWCZYM NA KONIUNKTURĘ SEKTOROWĄ I POZIOM CEN ŻYWNOŚCI W POLSCE

STRESZCZENIE

Celem głównym niniejszego opracowania było określenie związków między marżami monopolistycznymi, produkcją oraz inflacją żywności w polskim sektorze spożywczym w latach 2000–2013. Poziom marż monopolistycznych oszacowano jako odwrotność udziału pracy produkcyjnej w wartości produkcji. Wartość produkcji w przemyśle spożywczym przyjęto jako podstawę do oszacowania sektorowego wskaźnika cyklu koniunkturalnego. W celu oceny zależności wykorzystano współczynniki korelacji wzajemnych, test przyczynowości Grangera oraz model VAR. Z badań wynika, że marże zachowują się procyklicznie w odniesieniu do sektorowego cyklu koniunkturalnego i mogą być postrzegane jako opóźniony wskaźnik dla produkcji i jako predyktor cen żywności. Pozytywny związek marż i inflacji żywnościowej jest prawdopodobnie jedną z przyczyn relatywnie słabej współzależności zmian produkcji i inflacji, a tym samym słabych reakcji polskiej gospodarki na działania polityki pieniężnej.

Słowa kluczowe: cykliczność marż, inflacja, sektor żywnościowy

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 51–59
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.44

ORIGINAL PAPER

Received: 27.10.2017
Accepted: 19.12.2017

ECONOMIC ROLE OF AGRICULTURAL COOPERATIVENESS IN POLAND FROM THE PERSPECTIVE OF CHANGES IN THE FOOD CHAIN

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ABSTRACT

A food supply chain integrates three important economic sectors: agriculture, food processing, and distribution sectors. Integration processes are one out of different ways of efficiency's improvement of supply chains; they are also the key challenges of contemporary management in the global economy. Common activities of partners in a supply chain can take different forms, starting from general agreements in supply operations, common forecasting and planning of production to cooperation in the field of design and implementation of new products. The aim of the study is to investigate an economic role of agricultural cooperatives in Poland from a perspective of changes in food supply chains. In order to realize it, data of the *General Agricultural Census 2010*, the Ministry of Agriculture and Rural Development as well as the ranking of the top 500 companies in Poland by "Rzeczpospolita" (2017, 19th edition) were applied. Research results show that a significant number of cooperatives stopped their activities or limited their scale or range after 1989. However, some cooperatives have been developing and as for example dairy cooperatives belong to the top 500 companies in the Polish economy. There is also an increasing trend of establishment of agricultural producer groups, often in a form of cooperatives, that have been observed recently.

Key words: cooperative, food supply chain, agricultural producer group

INTRODUCTION

Food production takes place in all national economies in the framework of a subsystem determined as food economy. Food economy, considered as one of the most important and complicated segments of national economy, consists all material processes connected directly and indirectly with food production and distribution. A way and rules of a food flow from a farmer to a costumer are formed by agribusiness links, which establish a food supply chains. As a result, a supply chain can be defined as a "network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer" [Christopher 1992, p. 18]. As it is stressed in the state-of-the-art, "in a broad sense a supply chain consists of two or more legally separated organizations, being linked by material, information and financial flows. These organizations may be firms producing parts, components and end products, logistic service providers and even the (ultimate) customer himself" [Stadtler 2014, p. 3].

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A supply chain is characterized by significant diversity of participating entities. It involves producers, suppliers, transport companies, wholesalers and retailers, service organizations and costumers [Gołębiewski 2007]. They establish a network of entities producing and providing goods and services for final costumers [Rutkowski 2005]. Uneven economic power of entities engaged in food production and distribution is a specific feature of food supply chains. There is especially a lack of balance between bargaining power of agriculture and non-agricultural sectors. This unbalance is deepened by globalization and concentration process, especially at the level of retail. The progressing globalization brings a wide range of challenges for different entities operating on the market, including food producers. Within the conditions of trade liberalization leading to strengthening the economic rivalry the role of ensuring the food producers' competitiveness is increasing on both international and internal markets [Braja and Sawicka 2017].

In such a situation, transformations of food supply chains have to take place, particularly development of integration is necessary. Establishment of agricultural cooperatives can be an answer for these challenges as it strengthens competitive position and possibilities comparing to concentrated links of food processing and distribution. Over the last years, a growing interest in co-operatives can be observed and the real economic dimensions of co-operatives worldwide are increasing [Virlanuta and Zungun 2015]. Dworniak and Pietrzak [2014] display two economic reasons for establishment and existence of cooperatives in agriculture: limitation of market failure and strengthening of bargaining power of dispersed farmers towards concentrated costumers (countervailing power).

The paper makes at least two contributions. Firstly, a review and evaluation of development of cooperatives from different fields as well as their current situation are characterized. Then, statistical data together with microeconomic data from the current diagnosis of economic situation of enterprises are applied. As a result, we are able to asses a situation of cooperatives not only comparing them with each other but also on the background of top companies operating in Poland.

MATERIAL AND METHODS

The aim of the study is to investigate an economic role of agricultural cooperatives in Poland from a perspective of changes in food supply chains. Particular attention was paid to general presentation of the Polish sector of cooperatives operating in agriculture and running agricultural products' marketing as well as determination of a role of cooperatives in the agri-food chain.

The following sources of information were used in the research:

- scientific literature on food economy and supply chains,
- publications contributing to characterization of agriculture and the cooperative sector in Poland, including results of the *General Agricultural Census* 2010,
- information developed and published by the Ministry of Agriculture and Rural Development,
- ranking of the top 500 companies in Poland by "Rzeczpospolita" (2017 19th edition).

The monographic method was applied. Statistical data was presented using tables and graphs.

Typology of agricultural cooperatives in Poland

According to the Cooperative Law "a cooperative shall be a voluntary association of an unlimited number of persons, of variable membership and variable share fund, which conducts joint economic activity in the interests of its members. A cooperative may conduct social, educational and cultural activities for the benefit of its members and their community" [Act of 16 September 1982 Cooperative Law]. It operates as an enterprise – its members are its stakeholders and has a democratic management system. Helmberger and Hoos [1962] indicate that a cooperative consists of entities conducting their own enterprises. It uses production factors, produces goods and services as well as sell them. Differences lie in organizational structures and management.

Taking into account functions as well as activities conducted by cooperatives, we can distinguish four types of cooperatives operating in Poland after 1990:

- supply and sale cooperatives – supply their members with means of production and sell their products; the most popular examples include: "Peasants' Self-Help" (Polish *Samopomoc Chłopska*) communal cooperatives as well as horticultural and apiarian cooperatives;
- processing cooperatives – process agricultural raw materials and sell final products using own shops or a distribution system already existing on the market; diary cooperatives are typical examples of such activities,
- service cooperatives – supply their members with different kind of services, for example mechanical (farmers' cooperative association), banking, insurance or social; cooperative banks can be popular examples,
- agricultural production cooperatives – engaged in plant as well as animal production; they also sell self-processed products (for example fodder, fruit or vegetable products) and have their own retail network, tourist infrastructure, etc.

Cooperatives played an important role for production and services in agriculture in Poland till 1989. Their proportion, at the level about 60%, was comparable with cooperative rate in countries of EU-15 nowadays [Boguta et al. 2014]. However, economic transformation decreased their role.

Political decisions on liquidation of central and regional associations of cooperatives contributed considerably to cutting traditional institutional relations in the cooperative sector. Then, difficulties with adjustments to new conditions of functioning on the free market as well competitiveness of foreign companies contributed to decrease of cooperatives' role in the economy. Nowadays, there are about 2.6 thousand of cooperatives functioning in Polish agriculture and its environment (Table 1).

Table 1. Basic statistical data on Polish agricultural cooperatives

Specification	Number of active cooperatives			Number of members (thousand)	Number of employees (thousand)	Turnover (billion PLN)
	1989	2000	2013	2013	2013	2013
Supply and sale cooperatives	1 912	1 648	1 192	160	65	8
Diary cooperatives	323	238	142	138	24	24
Horticultural and apiarian cooperatives	140	128	64	6	1.2	0.6
Agricultural production cooperatives	2 089	1 024	698	23	26	9
Farmers' cooperative association	2 006	1 063	526	19	5	–
Total	6 344	4 101	2 622	346	121.2	–

Source: Own elaboration based on Boguta [2014].

A role of agricultural cooperatives in a food supply chain

Dairy cooperatives

Dairy cooperatives play the most significant role in services for agriculture in Poland. There are about 138 thousand of milk producers and this sector successfully adjusted to conditions of the market economy. One of the most modern base for dairy processing and potential for competing on the European as well as world market are results of modernization processes after 1990. It is indicated that those of them which

managed to implement modern management systems after transformation, are now able to succeed on the market [Krysiak 2006]. Only few dairy plants were merged by foreign capital whereas weaker ones joint with stronger. In 2013, dairy cooperatives had about 75% share in the market of milk purchase and processing, and employed about 24 thousand persons. Their turnover was at the level of 24 billion PLN [Boguta et al. 2014].

There are about 140 dairy cooperative plants in Poland. A group of leaders of a significant operation scale and economic potential comparable with the biggest domestic and foreign companies formed out as a result of consolidation and concentration processes. In 2016, there were 5 dairy cooperatives in the group of the top 500 companies in Poland. Their main characteristics are presented in the Table 2.

Table 2. Economic results of the biggest dairy cooperatives in Poland in 2016

Specification	Cooperative				
	Grupa Mlekovita, Wysokie Mazowieckie	Spółdzielnia Mleczarska Mlekpol, Grajewo	Okręgowa Spółdzielnia Mleczarska, Łowicz	Okręgowa Spółdzielnia Mleczarska, Piątnica	Okręgowa Spółdzielnia Mleczarska, Sierpc
Sales revenue (thousand PLN)	4 114 232	3 199 473	1 401 515	1 014 118	474 378
Change in sales revenue 2016/2015 (%)	5.96	5.54	4.00	11.41	21.27
Proportion of export in sale (%)	30.00	15.00	22.10	1.00	8.70
Net profit (thousand PLN)	68 133	23 009	334	7 339	14 410
Investments (thousand PLN)	165 361	71 104	7 317	55 770	8 522
Average employment	2 823	2 328	1 263	777	431
Gross wages (thousand PLN)	nd	126 729	55 871	55 214	28 193
Return on sales	–	1.02	0.02	0.81	3.78
ROE	–	2.50	0.15	2.15	7.15
ROA	–	1.53	0.08	1.48	5.08
Position in 2016	83	107	224	288	496
Position in 2015	88	113	228	298	–

Investment input – purchase of intangible and legal assets as well as elements of tangible fixed assets; employment – average number of employees; wages – gross wages of employees resulting from of employment relationship, contracts for specific work, mandate contracts, and agency contracts; ROE – return on equity; ROA – return on assets.

Source: Ranking of the top 500 companies in Poland by "Rzeczpospolita" (2017 19th edition).

Agricultural production cooperatives

Agricultural production cooperatives are important elements of cooperative activities in Poland. According to present law regulations they can conduct common farms and run activities supporting individual farms of their members. They can also conduct other economic activities. In 2013, about 700 of agricultural production cooperatives operated, involving about 23 thousand of members. Their turnover was estimated at the level of about 9 billion PLN [Boguta et al, 2014]. Their share in use of agricultural land can be a measure of their production role in agriculture and food supply chain (Fig. 1).

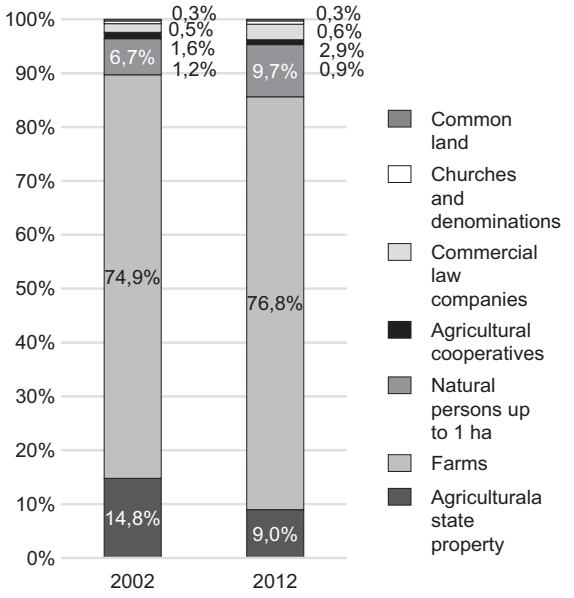

Fig. 1. Changes in the structure of agricultural land use in Poland in the period 2002–2012

Source: Own elaboration based on Głębocki [2014].

A significant reduction took place in the analysed period regarding land used by agricultural cooperatives. It decreased from 1.2% in 2002 to 0.9% in 2012. In 1990, their area was 636.6 thousand ha, in 2002 – 223.8 thousand ha and only 154.9 thousand ha in 2012. Moreover, the share of cooperative agriculture varies regionally – it is more important in such voivodships as: Wielkopolskie, Opolskie, Dolnośląskie and Zachodniopomorskie (generally western part of the country) whereas it is least developed in such voivodships as: Łódzkie, Pomorskie and Lubuskie – there were only 6,014 ha of agricultural land managed by cooperatives in these three regions [Głębocki 2014]. These differences can occur because of different reasons, as various areas, structures and directions of agricultural production in particular regions. For example, in the cases of Pomorskie and Lubuskie, it can result from a general low share of agricultural land there as these regions are rich in forests. For further regional investigations, some relative measures of development of cooperatives can be applied as absolute numbers do not take into account reference area or population differentiated across Polish regions. An example of relative measures – cooperative development coefficients – were proposed for example by Kata [2016].

Horticultural and apiarian cooperatives

Transformation of the economic system in Poland after 1989 caused also significant changes in horticultural and apiarian cooperatives. They traditionally associated farmers, apiarists, fruit and vegetable producers so representatives of widely understood special branches of agricultural production. However, marginalization of horticultural and apiarian cooperatives took place after 1990. Decrease in their number was observed – from 144 in 1989 to 64 in 2013. Their share in purchase of fruit and vegetable estimated for over 60% decrease to only 2% during the second decade of 21st century [Boguta et al. 2014]. Nevertheless, it should be stressed that there exist cooperatives able to competing on the domestic as well as international markets, for example Apiarian Cooperative in Lublin – a leader of mead production in Poland and an important exporter for European markets and the USA, Horticultural Cooperative in Grójec – a leader in apple export, and others specialized for example in mushroom production [Brodziński 2014].

Supply and sale cooperatives

Cooperatives play a significant role and hold a considerable share in agricultural product distribution from farms to final consumers [Deller et al. 2009]. In Poland, about 1.1 thousand of supply and sale cooperatives operated in 2013. They run about 9 thousand shops, 400 wholesale entities, 500 processing plants (including bakeries, feed mixing plants, meat processing plants, mineral water producing plants), 1,800 warehouses, 4 health resorts and 6 training centres. It is estimated that a number of members in such kinds of cooperatives decreased from about 1 million in 1989 to about 160 thousand in 2013 whereas a number of employees from 468 thousand to about 65 thousand. Their turnovers were estimated at the level about 8 billion PLN in 2013 [Boguta et al. 2014]. Cooperative retail networks and purchasing groups have quite good position on the market, as for example cooperative retail network "Tęcza" (Wielkopolskie Voivodships) or a purchasing

cooperative "Agrocoop" in Olsztyn. Apart from typical retail activities, supply and sale cooperatives develop also food production (bakeries, production of sweets or cold meats) directed mainly for local markets.

Farmers' cooperative association

In the past, farmers' cooperative association concentrated their activities mainly on mechanical services for farms but now they look for new possible fields of operation. As a result of the economic transformation they changed considerably the range and scale of operation. Many of them sale farm inputs, run petrol stations, garages as well as provide public utility services as well as local transport. Their engagement in services for agriculture is not significant. In 2013, only 500 of such cooperatives operated on the market, whereas in 1989 there were 2,000 of such entities [Boguta et al. 2014].

Agricultural producer groups as a new form of cooperation in the food supply chain

Common operations, which allow to compete on the market, are the basic idea of establishment of agricultural producer groups. Farmers benefit from better organization and adjustments of production to costumers' requirements in case of quality, volume and assortment. They follow environmental rules during all production phases, storage and distribution of agricultural products. It allows to gain a better position on the market as well as higher and more stable income. The Act of 15 September 2000 on agricultural producer groups and their associations and on changing other acts is a legal base for organization of agricultural producer groups in Poland. It determines also requirements which have to be filled in order to get support. On the one hand, it was necessary to adapt to the regulation of the Common Agricultural Policy and to compete with better organized and equipped producers from EU countries, on the other hand, there were possibilities of using public resources for investment goals, and resources addressed to producer organizations [Chlebicka 2015].

The term of "agricultural producer group" does not mean a legal form of operation (they can exist for example as cooperatives, companies, associations) – it only indicates a character and functions filled by this kind of organization on the market. Agricultural producer groups join market producers of particular goods or a group of products (for instance potatoes, cereals). They aim at concentration and standardization of supply, its adjustment to market requirements, especially regarding quality and quantity, as well as positive influence on market organization. Their goal is to sell goods produced on members' farms. They have to provide agricultural products, which are unprocessed or only preliminarily processed. However, agricultural producer groups differ from commercial activities. A group is a private company owned by individual agricultural producers who manage its operations after accession to it. An agreement of producers convinced about common marketing as a way for improvement their market positon is a necessary condition for establishment of a new group. In the period 2001–2015, 1,308 agricultural producer groups were established in Poland (Fig. 2).

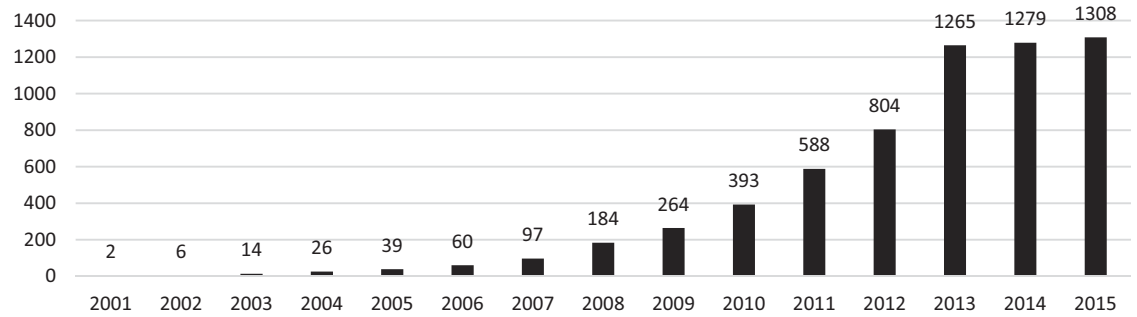

Fig. 2. Number of new registered agricultural producer groups in the period 2001–2015

Source: Own elaboration based on data of the Ministry of Agriculture and Rural Development.

As agriculture is a sector diversified regionally regarding its different characteristics [Drejerska 2015], a current number of agricultural producer groups is also diversified regionally. The highest number of them operates in Wielkopolskie, Dolnośląskie and Kujawsko-Pomorskie (Fig. 3).

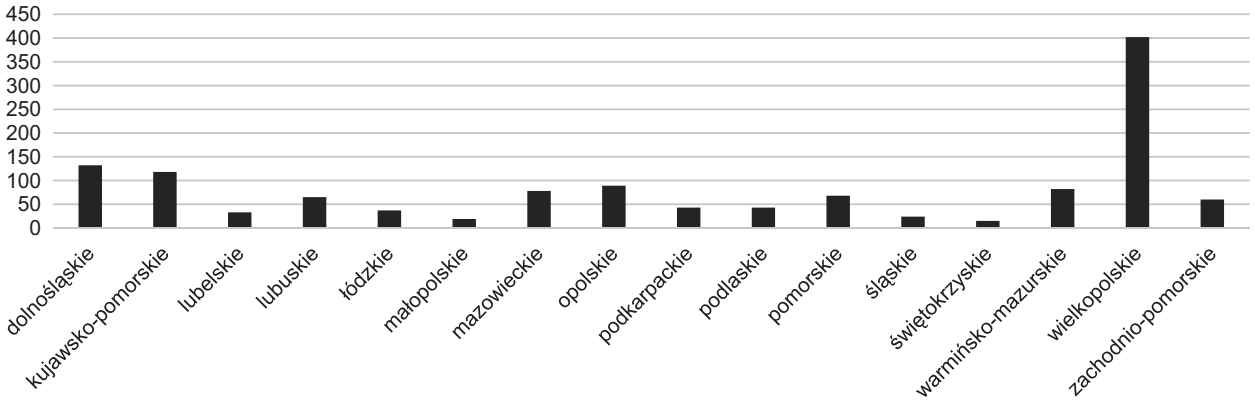

Fig. 3. Number of agricultural producer groups in Polish voivodships

Source: Own elaboration based on data of the Ministry of Agriculture and Rural Development.

According to legal regulations on agricultural producer groups and their associations, agricultural producer groups operate as legal entities. A limited liable company is the most popular form chosen by agricultural producer groups. Cooperatives represent 32% of entities established in the period 2000–2015 (Fig. 4).

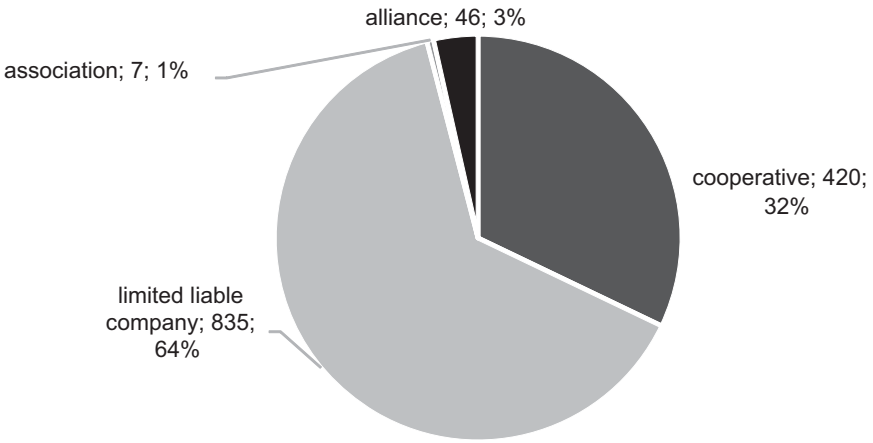

Fig. 4. Structure of agricultural producer groups according to their legal form

Source: Own elaboration based on data of the Ministry of Agriculture and Rural Development.

These basic numbers describing the process of establishment of agricultural producer groups prove that it is a popular trend in Poland. Moreover, cooperation in the form of cooperatives can be an important part of food supply chain.

CONCLUSIONS

The processes of the socio-economic transformation in Poland after 1989 considerably influenced agricultural cooperativeness. Many cooperatives finished their activities or limited a scale or range of their operation. However, some cooperatives have been developing and as for example dairy cooperatives belong to the top 500 companies in the Polish economy. On the local level, cooperatives are still important providers of services for agriculture as well as food products for costumers.

Data on development of agricultural producer groups proves that Polish farmers realized that they had to cooperate in order to be able to compete on the international and global markets – an increasing trend of establishment of agricultural producer groups can be observed. According to legal regulations they can operate in different forms but it should be stressed that a cooperative is the second one among the most popular legal forms. This is a clear evidence that cooperativeness is an useful way of cooperation in agriculture in evolving conditions of a food value chain.

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ZNACZENIE EKONOMICZNE SPÓŁDZIELCZOŚCI ROLNICZEJ W POLSCE W KONTEKŚCIE ZMIAN W ŁAŃCUCHU ŻYWNOŚCIOWYM

STRESZCZENIE

Łańcuch dostaw żywności łączy trzy ważne sektory gospodarki: rolnictwo, przetwórstwo spożywcze oraz sektory dystrybucji. Jedną z form poprawy efektywności łańcuchów dostaw są procesy integracji. Integracja łańcuchów dostaw jest obecnie jednym z kluczowych wyzwań współczesnego zarządzania w warunkach globalnej gospodarki. Wspólne działania partnerów w łańcuchu dostaw przyjmują najróżniejsze postacie: poczynając od umów ramowych w zakresie zaopatrzenia, wspólnego prognozowania i planowania produkcji, kończąc na współpracy w dziedzinie projektowania i wdrażania nowych produktów. Celem artykułu jest ocena roli ekonomicznej spółdzielni rolniczych w Polsce w kontekście zmian w łańcuchach dostaw żywności. Wykorzystano dane *Narodowego Spisu Powszechnego 2010*, informacje z Ministerstwa Rolnictwa i Rozwoju Wsi oraz dane z 19. edycji Listy 500 – rankingu największych firm działających w Polsce w 2017 roku, opracowywanego corocznie przez „Rzeczpospolitą". Wyniki badań wskazują, że znaczna liczba spółdzielni ograniczyła lub zaprzestała działalności po roku 1989. Jednakże niektóre spółdzielnie, np. mleczarskie, są prężnie rozwijającymi się przedsiębiorstwami, o czym świadczy to, że pojawiają się na Liście 500 „Rzeczpospolitej".

Słowa kluczowe: spółdzielnia, łańcuch żywnościowy, grupa producentów rolnych

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 61–70
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.45

ORIGINAL PAPER

Received: 27.10.2017
Accepted: 19.12.2017

INNOVATION ACTIVITIES OF INDUSTRIAL ENTERPRISES IN POLAND IN THE LIGHT OF PUBLIC STATISTICS

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ABSTRACT

Intensive promotion of innovative activities, especially in companies, has forced the creation of international monitoring systems. In Poland, the Central Statistical Office [GUS] and the Statistical Office [US] in Szczecin are currently investigating statistical innovations. The article attempts to evaluate the innovative activity of industrial enterprises in Poland in 2005–2015. Attempts were made to answer the following questions: have the innovative activity of industrial enterprises increased in the period of Poland's full membership in the EU structures, what are the effects of this activity, or are there visible trends in growth? The results of the research on the innovative activity of industrial enterprises in Poland, implemented in accordance with the Oslo methodology under the Community Innovation Survey (CIS), were used to achieve this objective. The level of enterprise innovation in Poland is lower than in most EU countries. Improving the performance of innovation requires, on the one hand, greater involvement of enterprises and, on the other hand, public sector support, which plays a key role in creating the right knowledge and skills.

Key words: innovative activity of industrial enterprises, Oslo methodology, Community Innovation Research (CIS), innovation inputs and outputs

INTRODUCTION

In recent years, science, technology and innovation have been considered as the main factors determining the improvement of competitiveness of economies. This leads to a systematic increase in the interest in scientific and technical indicators describing this aspect of the economy.

In Poland, the first statistical research on science and technology, including innovation activity, was conducted as early as in the 1950s. At the time, however, in the studies of the Central Statistical Office of Poland (CSO – GUS), the term "production renewal" was used. The concept of innovation activity appeared in the CSO terminology in the 1990s in connection with the processes of adjustment of Polish statistics to the methodological recommendations of the OECD and the European Union. Intense promotion of innovation activity, especially in enterprises, resulted in the emergence of international monitoring systems. The first attempts to develop the international methodology of researching innovativeness of enterprises date back to the 1960s. The Organisation for Economic Cooperation and Development (OECD) has made the greatest contribution to the development of this methodology and the development of research on innovativeness [Kozioł 2009, p. 130]. In 1963, in the Italian town of Frascati, the first version of the *Proposed Standard Practice for Surveys of Research and Development*, known as the *Frascati Manual*, was created. To date many editions

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of this manual have been published. The cooperation of the OECD with other international and regional organisations and groups, including the EU, has caused the methodology of *Frascati Manual* to became the worldwide standard [*Frascati Manual* 2002]. The effect of cooperation is, first and foremost, the development of a comprehensive research methodology which is described in a series of methodological manuals called colloquially the Frascati Family.

The most important manual of the Frascati Family concerning statistical research of innovation activity is the *Oslo Manual*: *Proposed Guidelines for Collecting and Interpreting Technological Innovation Data*. The first edition of this manual was released in 1992 and was developed by the OECD and the Nordic Industrial Fund. The manual concerned innovations introduced in the industry. The second edition was published in 1997 as a result of cooperation between the OECD and Eurostat. That edition contained the definitions and methodology updated on the basis of the conducted research, which was supposed to facilitate better understanding of the innovation process and incorporating a broader spectrum of types of activity, including in particular the study of innovation activities in the services sector. The third edition of the *Oslo Manual* – 2005 – is currently in use. The Polish version of this manual was published by the Ministry of Science and Higher Education in 2008.

The methodology of research on innovativeness is constantly being developed and improved, but it is still far from expectations.

Studies on innovativeness in the countries of the European Union are based on recommendations arising from the Frascati Family manuals, above all the *Oslo Manual.* The European Statistical Office (Eurostat) is responsible for collecting, analysing and publishing statistical information on science, technology and innovation.

Two basic studies of innovativeness are conducted in the European Union [*Nauka i technika w 2009 r.*, p. 123]:

- *CIS* (*Community Innovation Survey*);
- *EIS – European Innovation Scoreboard.*

National statistical offices or relevant ministries conduct statistical research in the individual countries participating in the *CIS*. In Poland, within the framework of official statistics, the CSO and the Statistical Office of Szczecin conduct statistical research on innovation. The research on innovativeness conducted by the CSO include industrial enterprises and companies in the sector of services which are included in the Statistical Survey Programme of Official Statistics under 1.43.02 – *Innovation in the industry (PNT-02)* and *1.43.13 – Innovation in the sector of services (PNT-02/u)*.

The European Innovation Scoreboard (EIS) is the other, apart from the CIS, source of information on the level of innovativeness of countries, including innovation activities of European enterprises. The EIS uses a large part of the data derived from the CIS. In 2010, the EIS was replaced by the new *Innovation Union Scoreboard 2010, IUS-2010* [Innovation Union Scoreboard 2010. The Innovation Union's … 2011, p. 3]. Methodological differences as well as the division and comparison of indices contained in the EIS and the IUS reports can be found in the works of: Roszko-Wójtowicz and Białek [2016], Innovation Union Scoreboard [2015], Hollanders and Tarantola [2011].

The main aim of the authors of the paper is an attempt to assess innovation activities of industrial enterprises in Poland in the years 2005–2015, in particular the effects of these activities. To achieve this objective, the results of research on innovation activities of industrial enterprises provided by public[1] statistics, including the results of the latest research carried out in 2016 by the CSO and Szczecin SO for the years 2013–2015, are used.

[1] In the paper the term "public" statistics is used interchangeably with the term "official" statistics.

INNOVATION ACTIVITIES OF INDUSTRIAL ENTERPRISES

Constantly changing market conditions, strong competition, and ever increasing requirements of customers who expect products of specified quality force enterprises to conduct innovation activities. In accordance with the Oslo methodology used by the CSO: "innovation activities consist in engaging in various scientific, technological, organisational, financial and commercial activities which actually, or are intended to, lead to the implementation of innovations.

Innovation activities of enterprises can be [*Działalność innowacyjna przedsiębiorstw w latach 2013–2015, 2016*, p. 17]:

- successful, resulting in the implementation of an innovation (although it does not necessarily have to be associated with commercial success);
- ongoing – when the process of implementation has not yet been completed;
- discontinued prior to the deployment of an innovation.

The above-presented situation means that enterprises conducting innovation activities can be:

- innovative;
- innovatively active.

An innovative enterprise is an enterprise which in the period of analysis (usually three years) introduced into the market at least one innovation which was new at least for the said company. The term "innovatively active enterprise" is a broader category. It encompasses enterprises that in the analysed period introduced at least one innovation or implemented at least one innovative project which was interrupted or abandoned during the period of analysis or was not completed (i.e. it is still ongoing) [*Działalność innowacyjna przedsiębiorstw w latach 2013–2015, 2016*, p. 41].

In both cases, we are dealing with enterprises conducting innovation activities, that is, enterprises which have incurred expenditure on this type of activity, though not all of their endeavours have been successful. Therefore there may be differences in terms of effectiveness of innovation activities between an innovatively active enterprise and an innovative enterprise.

These methodological notes indicate the need to take into account in the evaluation of innovation activities of enterprises indicators that describe both the expenditure on and the effects of the said activities [Witkowski and Weresa 2006].

EXPENDITURE ON INNOVATION ACTIVITIES

Expenditure on innovation activities is one of the main indicators in the assessment of innovativeness. The funds expended for this purpose by enterprises are diverse in terms of types of innovation activities financed and sources of financing.

The data presented in Table 1 indicate that in the years 2005–2015 the share of enterprises conducting innovation activities did not exceed 40%. The highest percentage (38.2%) was recorded in 2005, a slightly lower level of 37.3% was observed in the following year. The record low share, only 16.9%, was observed in 2008. In the remaining years of the analysed period, the share of enterprises incurring expenditure on innovation activities fluctuated around 30%.

In the years 2005–2015, expenditure on innovation activities in industrial enterprises employing more than 49 persons increased in nominal terms by 101.8% (from PLN 14,329.1 million in 2005 to PLN 28,920.7 million in 2015), while actual growth was at 87% (Fig. 1). The record level of expenditure on innovation activities in the industry of PLN 28,920.7 million (actual expenditure: PLN 26,928.0 million) was observed in 2015, which meant, compared with the previous year, the increase of more than 27%. Regrettably, that was a unique situation. It is difficult to say whether this is the beginning of a new upward trend. In previous years, the expenditure

Table 1. The share of industrial enterprises incurring expenditure on innovation activities in the years 2005–2015

Years	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	The share of enterprises[a] incurring expenditure on innovation activities (%)										
	38.2	37.3	31.8	16.9	29.6	29.6	29.8	28.8	29.6	29.5	30.0

[a] Employing more than 49 persons.

Source: *Nauka i technika w 2007 r., Informacje i opracowania statystyczne*, GUS, Warszawa 2009; *Nauka i technika w 2010 r., Informacje i opracowania statystyczne*, GUS i US – Szczecin, Warszawa 2012; *Nauka i technika w 2015 r., Informacje i opracowania statystyczne*, GUS i US – Szczecin, Warszawa 2016.

level was definitely lower, and the most difficult situation, i.e. expenditure reductions, was observed in the year 2009, 2011 and 2013. The largest decline of up to 14.4% (compared to the preceding year) occurred in 2011. In 2009 the decline of 11.1% was recorded, while in 2013 the decline amounted to 2.6%. Analysing the amount of expenditure on innovation activities of industrial enterprises, the lack of a clear upward or downward trend can be seen. Therefore, to better illustrate the dynamics of the expenditure, the geometric mean has been calculated and it turns out that during the period 2005–2015 expenditure on innovation activities grew annually on average by 6.5%. Unfortunately this is not growth that allows Poland to close the gap separating it from European leaders of innovation.

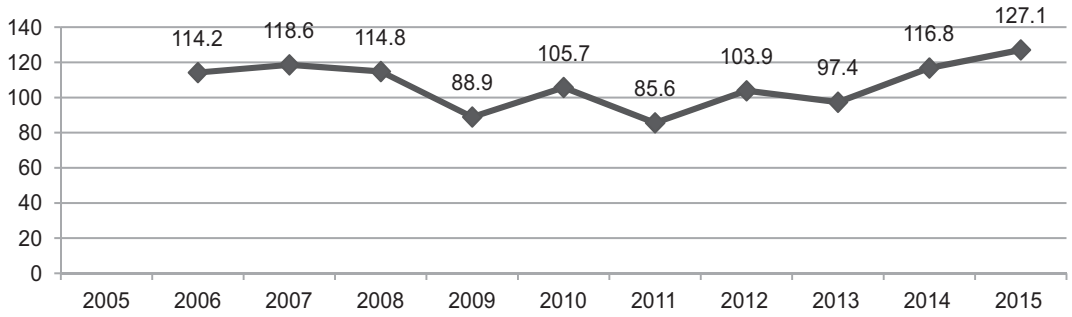

Fig. 1. The dynamics of expenditure on innovation activities in industrial enterprises employing more than 49 persons in the years 2005–2015 (fixed prices)

Source: Own elaboration based on the CSO *Statistical Yearbooks of Industry 2006–2016*.

Among industrial enterprises, enterprises employing 250 persons and more incurred the largest expenditure on innovation activities. Their share in total expenditure on innovation incurred by industrial enterprises was not only very high (75% in 2015), but increased in relation to 2014 (70.1%) [*Działalność innowacyjna przedsiębiorstw w latach 2013–2015, 2016*, p. 79].

The level of expenditure on innovation activities should be considered in conjunction with their intended purpose (Table 2). During the entire analysed period, investment expenditures on the purchase of machinery, technical equipment and means of transport dominated in the structure of expenditure on innovation activities. The share of this kind of expenditure ranged from 51.4% in 2015 to 62.2% in 2009. Investment expenditure on buildings, structures and land ranked second (15.1–27.7%).

Table 2. The structure of expenditure on innovation activities in industrial enterprises in Poland in the years 2005–2015 (%)

Items	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	Expenditure on R&D activity										
	9.6	9.2	8.1	8.1	10.2	14.6	13.5	17.4	19.9	19.6	16.7
	Expenditure on the purchase of knowledge from external sources and software										
	2.4	2.0	1.7	1.1	2.9	6.1	3.5	5.1	2.8	2.7	2.0
	Investment expenditure on machinery, technical equipment, tools and means of transport										
	58.6	58.8	58.8	57.0	62.2	52.3	58.5	58.5	54.5	57.3	51.4
	Investment expenditure on buildings, structures and land										
	24.1	22.8	24.2	27.7	21.8	22.5	18.9	15.1	19.9	16.7	25.7
	Expenditure on staff training and marketing new or significantly improved products										
	2.3	3.1	3.5	3.3	1.8	2.4	2.6	2.5	2.6	2.5	1.6
	Other expenditure										
	3.0	4.0	3.8	2.7	1.1	2.1	2.9	1.4	0.3	1.2	2.5
	Total expenditure on innovation activities										
	100	100	100	100	100	100	100	100	100	100	100

Source: Own elaboration based on the CSO *Statistical Yearbooks of Industry 2005–2016*.

In the structure of expenditure on innovation activities, the dominance of investment expenditure (on machines and equipment, buildings, structures and land) is maintained, their total share in the analysed period amounted to on average 79%.

R&D expenditure, important for innovation activities, in the years 2005–2015 ranged from 8.1 to 19.9% of the total expenditure. A relatively small share of expenditure on R&D and a high percentage of investment expenditure (on machinery and equipment as well as buildings and structures) in the total expenditure on innovation activities are characteristic traits of innovation activities conducted in enterprises in underdeveloped, the so-called catching-up, countries. Such enterprises seek to reduce the technological gap as soon as possible through the absorption of external tangible technology. Analysing the data in Table 2, positive changes in this area can be observed. At the beginning of the analysed period, i.e. in the years 2005–2008, expenditure on R&D activity did not exceed 10%, and since 2010 the share of expenditure on this kind of innovation activities clearly increased, reaching approx. 20% in 2013 and 2014.

The lack of significant interest in the implementation of innovation processes within the surveyed enterprises is also indicated by a small share of expenditure on staff training and marketing new and improved products. During the analysed period, the share of the expenditure ranged from 1.6% (2015) to 3.5% (2007). The significance of the other types of expenditure is smaller.

In an attempt to assess innovation activities of industrial enterprises in Poland, one cannot forget about sources of funds for financing the said activities.

Enterprises' own funds were the main source of financing of expenditure on innovation activities. During the analysed period 2005–2015, those funds accounted for on average 73.5% of all the incurred expenditure for this purpose in industrial enterprises. The largest share of expenditure on innovation activities (79.7%) financed from enterprises' own resources was recorded in 2006, while the lowest (63.6%) in 2015. Since 2011 a decline in the share of enterprises' own funds in the total expenditure can be observed.

Table 3. The structure of expenditure on innovation activities in industrial enterprises in Poland according to the sources of funding in the years 2005–2015

Years	Total	Funds:					
		own	received from the state budget	obtained from abroad (non- refundable)	bank loans	obtained from venture capital funds	others
2005	100.0	76.3	1.7	1.0	13.6	0.0	7.5
2006	100.0	79.7	1.6	1.5	14.0	0.0	3.2
2007	100.0	74.8	1.1	1.1	14.3	0.0	8.7
2008	100.0	72.1	1.2	1.6	20.5	0.2	4.5
2009	100.0	69.7	0.8	2.7	25.4	0.0	1.4
2010	100.0	77.3	1.0	7.2	7.3	0.0	7.1
2011	100.0	76.2	1.2	6.9	9.0	0.0	6.7
2012	100.0	75.0	1.9	6.6	5.9	0.0	10.5
2013	100.0	72.2	1.5	6.9	6.8	0.0	12.7
2014	100.0	72.2	1.6	6.0	8.6	0.0	11.7
2015	100.0	63.6	1.8	4.6	10.9	0.0	19.1

Source: Own elaboration based on the CSO *Statistical Yearbooks of Industry 2005–2006*.

Other sources of funding of innovative activity were used by industrial enterprises to a significantly lesser degree. The financial resources obtained from venture capital funds were the least-used source of innovative activity financing. The share of funds obtained from the state budget ranged from 0.8 to 1.9%. In the case of this source, no clear upward or downward trends can be observed.

The use of bank loans to finance innovative activities fluctuated significantly in the period of analysis. Entrepreneurs most frequently made use of bank loans in 2009, when their share in the financing of innovative activity was more than 25%, but in 2012 this source accounted for only 5.9% of the total expenditure. The annual average share of bank loans in the financing of innovative activities of industrial enterprises amounted to 12.4%. Since 2010 the significance of this source was clearly reduced.

The analysis concerning sources of funding of innovative activity conducted by enterprises very often points to funds obtained from abroad. In the first four years of the analysed period, this source was of minor importance, as its share did not exceed 1.6%. In the subsequent years, the share of funds obtained from abroad significantly increased, reaching a maximum of 7.2% in 2010.

Summarising the analysis of the structure of expenditure on innovation activities in industrial enterprises by funding sources, first of all the high autonomy of enterprises in financing these activities with their own funds and the relatively low use of resources from external sources should be noted. The likely cause of insufficient use of external resources is the lack of knowledge about their existence and complicated procedures of obtaining such funds. The reduction, in recent years, of the share of bank loans in financing innovative activities of industrial enterprises is compensated by an increase in the share of non-repayable financial resources obtained from abroad, which is probably related to an increase in the availability of such resources.

Using public statistics, one should note the limitations arising from the lack of important statistical data which prevent the in-depth analysis regarding changes in the structure of expenditure on innovation activities. The CSO also distinguishes (apart from: enterprises' own funds, funds received from the state budget, funds

obtained from abroad, funds obtained from venture capital funds, and bank loans) the so-called other funds. The share of those funds significantly increased in recent years (Table 3), and in 2015 it amounted to 19.1%. In the years 2011–2015, the other funds constituted a by far more important source of innovative activity funding than bank loans. The other funds are a broad category with such a level of aggregation that does not allow one to draw far-reaching conclusions.

EFFECTS OF INNOVATION ACTIVITIES CONDUCTED BY INDUSTRIAL ENTERPRISES

When deciding on financing innovation activities, entrepreneurs are governed by their expected profitability, i.e. the widely understood profit motive.

The incurred expenditure on innovation activities should result in the implementation of new or significantly improved products and processes, and these products and processes should be new at least from the point of view of the enterprise introducing these innovations [*Nauka i technika w 2009 r.*, p. 119]. The introduced innovations allow one to include enterprises into the groups of innovative enterprises or innovatively active ones. The share of innovative enterprises in the industry according to the number of persons employed presents Table 4.

Table 4. Innovatively active and innovative enterprises in the industry in Poland according to the number of persons employed

Items	2004–2006	2006–2008	2008–2010	2010–2012	2012–2014	2013–2015
	% of analysed companies					
Total number of innovatively active enterprises[a]	–	22.0	18.1	17.7	18.6	18.9
Total number of innovative enterprises[a]	23.2	21.4	17.1	16.5	17.5	17.6
Innovative enterprises according to the number of persons employed						
10–49	13.9	14.5	9.6	9.6	10.7	10.6
50–249	37.4	33.3	30.2	29.4	31.3	31.3
250 and more	65.5	60.9	55.8	56.2	57.8	57.9

[a] Employing more than 9 persons.

Source: *Działalność innowacyjna przedsiębiorstw w latach 2006–2015*. GUS, Warszawa.

As shown in Table 4, in the years 2004–2006, innovative enterprises in Poland accounted for only 23.2%, which was the highest share. In the subsequent periods of analysis, this share was even lower, and 2010–2012 it amounted to only 16.5%. In industrial enterprises, not all implemented innovative projects were successful, i.e. resulting in the introduction of a new product or process, and therefore the share of innovatively active enterprises is higher than the proportion of innovative enterprises. Fortunately, this difference is not large, as it ranges from 0.6 p.p. in 2006–2008 to 1.3 p.p. in 2013–2015. Analysing the data in Table 4, we reach a sad conclusion. During the period of Poland's full membership in the EU structures, the lack of a clear increase in the number of companies that meet the criteria of an innovative company is evident, as more than 80% of enterprises were not innovatively active enterprises. Thus, in terms of innovativeness measured by the share of innovatively active and innovative enterprises no significant progress was made. These indicators were higher in the run-up to integration, which probably was closely associated with the processes of adjustment to the EU standards implemented by companies in Poland.

To better illustrate innovation activities of enterprises, it is worth comparing the results achieved by industrial enterprises in Poland with the results achieved by enterprises in other countries. In the assessment of Poland's position in the international arena, data on innovativeness published by Eurostat can be used. The share of innovatively active industrial enterprises in Poland in the years 2010–2012 was 17.7%, while among the countries of Europe in which the study was conducted the highest share of innovatively active industrial enterprises was recorded in Germany (61.5%) and the lowest in Romania (7.5%) [*Działalność innowacyjna przedsiębiorstw w latach 2009–2011*, p. 25]. Previously, the situation also looked similarly. In the years 2008-2010, the number of innovatively active enterprises in Poland amounted to 18.1%. The number of such enterprises at the time was the highest in Germany – 69.8%, and the lowest in Romania – 16.2%.

The level of innovativeness of enterprises in the industry in Poland was lower than in most EU countries.

The data contained in Table 4 clearly indicate that innovation activity is associated with the size of the enterprise, measured in terms of the number of employees. Process and product innovations were most often introduced by entities employing 250 and more persons.

In the years 2013–2015, the share of small innovative enterprises (10–49 employees) was more than 5 times smaller than the share of large companies and nearly 3 times smaller in comparison with the share of medium-sized ones.

In accordance with the international methodology used by the CSO, the share of the revenue from the sale of new or significantly improved products launched onto the market in the last three years in the total sales revenue is treated as an indicator of the assessment of the effects of innovation activity of an enterprise. This points to changes with regard to modernisation of the range of products and their competitiveness [*Działalność innowacyjna przedsiębiorstw w latach 2013–2015*, p. 71]. The evolution of this indicator in Poland in the years 2008–2015 is presented in Figure 3. In this case, due to the lack of comparable data, the period of 2005–2007 is not included.

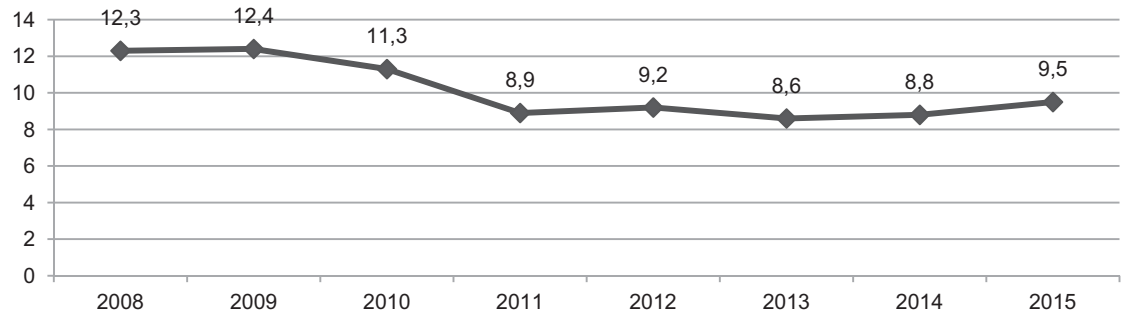

Fig. 2. The share of net revenue from the sale of new or significantly improved products launched onto the market in the last three years

Source: *Działalność innowacyjna przedsiębiorstw w latach 2008–2015*. GUS, Warszawa.

During the analysed period, the net revenues of industrial enterprises in Poland from the sale of new or significantly improved products accounted for, at most, 12.3% of total sales revenue. The maximum level of this indicator was recorded in the year 2008, that is, at the beginning of the period of analysis. Unfortunately, in the next three years a decline was recorded, and then in the years 2011–2015 stabilisation at a level not exceeding 10% was observed.

In the context of the analysed effectiveness of innovation activity in the industry, the presented data do not provide grounds for optimism.

CONCLUSIONS

The paper is an attempt to assess innovation activities of industrial enterprises in Poland in the years 2005–2015. The answers to the following questions have been sought: did the level of innovation activities conducted by industrial enterprises rise in the period of Poland's full membership in the EU structures, what are the effects of these activities, and can the upward trend be seen? The evolution of selected indicators considered in public statistics, in accordance with the standard Oslo methodology, as important indices of innovation activities of enterprises in the industrial sector was analysed.

During the analysed period, expenditure on innovation activities (fixed prices) in industrial enterprises grew on average by 6.5% on an annual basis. Entrepreneurs see therefore innovation as a factor conducive to business growth and increased competitiveness. However, interest of enterprises in innovation activities was limited, as only 38.2% of companies employing more than 49 people conducted such activities incurring certain related expenditure.

In the structure of expenditure on innovation activities, the dominance of expenditure on the purchase of material technologies in the form of innovative machines and equipment needed for manufacturing new products and implementing new processes is visible. Entrepreneurs were reluctant to use the intangible technology in the form of purchase of ready knowledge from external sources, but their interest in the creation of knowledge in the context of R&D grew. Since 2010 the share of expenditure on research and development activities clearly increased.

Enterprises' own funds, which in the years 2005–2015 constituted on average up to 73.5% of the total expenditure on innovation activities, were the main source of innovation financing. The share of loans in the financing of expenditure on innovation activities was diverse and ranged from 5.9 to 25%. This means that entrepreneurs rarely used modern forms of financing innovation. Small positive changes in this area are evidenced by a decreasing share of enterprises' own resources and bank loans in the financing of innovation activities. However, the lack of appropriate statistical data does not allow to specify the share of which financial resources is increasing, apart from non-refundable funds obtained from abroad.

It is difficult to positively assess the effects of innovation activity conducted by industrial enterprises in Poland. Both the share of innovatively active enterprises and innovative enterprises was higher immediately after Poland's accession to the EU than in the following years. The level of innovativeness of enterprises in Poland was lower than in most EU countries. More than 80% of enterprises employing more than 9 persons are not innovatively active enterprises, while in the countries that are innovation leaders the share of such companies amounts to approx. 30%. No upward trend is also noticeable in terms of the share of net revenue from the sale of innovative products in the total sales revenue.

Acknowledgements

The views and opinions expressed in this paper are those of the authors and do not necessarily reflect the views and opinions of the National Bank of Poland.

The project entitled *Discussion Forum – Measurement and Evaluation of Economic and Social Phenomena* (MASEP2017) is implemented in cooperation with the National Bank of Poland within the framework of economic education.

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DZIAŁALNOŚĆ INNOWACYJNA PRZEDSIĘBIORSTW PRZEMYSŁOWYCH W POLSCE W ŚWIETLE BADAŃ STATYSTYKI PUBLICZNEJ

STRESZCZENIE

Intensywne promowanie działalności innowacyjnej, zwłaszcza w przedsiębiorstwach, wymusiło powstanie międzynarodowych systemów jej monitorowania. W Polsce, w ramach statystyki publicznej, badaniami statystycznymi innowacji zajmuje się obecnie GUS i US w Szczecinie. W artykule podjęto próbę oceny działalności innowacyjnej przedsiębiorstw przemysłowych w Polsce w latach 2005–2015. Starano się odpowiedzieć na pytania: czy w okresie pełnego członkostwa Polski w strukturach UE aktywność innowacyjna przedsiębiorstw przemysłowych wzrosła, jakie są efekty tej działalności, czy są widoczne tendencje wzrostowe. Do realizacji powyższego celu wykorzystano publikowane przez GUS wyniki badania działalności innowacyjnej przedsiębiorstw przemysłowych w Polsce, które są realizowane zgodnie z metodologią Oslo w ramach wspólnotowego badania innowacji (CIS – ang. *Community Innovation Survey*). Poziom innowacyjności przedsiębiorstw w Polsce jest niższy niż w większości krajów UE. Poprawa wyników działalności innowacyjnej wymaga z jednej strony większego zaangażowania przedsiębiorstw, z drugiej zaś – wsparcia sektora publicznego, odgrywającego kluczową rolę w tworzeniu odpowiednich zasobów wiedzy i umiejętności.

Słowa kluczowe: działalność innowacyjna przedsiębiorstw, metodologia Oslo, wspólnotowe badania innowacji (CIS), nakłady i efekty działalności innowacyjnej

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 71–81
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.46

ORIGINAL PAPER

Received: 18.09.2017
Accepted: 07.12.2017

SPATIAL CONCENTRATION OF BUSINESSES WITH FOREIGN CAPITAL IN THE CAPITAL CITIES OF THE POLISH VOIVODESHIPS AND THEIR AGGLOMERATIONS FROM 1995–2016

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ABSTRACT

Foreign investments play an important role in fostering local development. This article is aimed at evaluating the inflow of FDIs to the capital cities of the Polish voivodeships in 1995–2016 and their closest agglomerations. Data on the number of businesses with foreign capital used in this article originate from the Local Data Bank of the Polish Central Statistical Office. To capture a spatial concentration of businesses with foreign capital and its change from 1995–2016, a method used in analysing regional convergence, among others, was employed. The spatial distribution of FDIs in relation to the capital cities of the Polish voivodeships was analysed using Quantum GIS software and calculations in STATA 14. Conclusions arrived at showed a divergence in the number of FDIs in communes and municipalities in Poland from 1995–2016 as well as a diverse spatial pattern of FDI locations in relation to the capital city of the voivodeship.

Key words: foreign direct investment, FDI, locational determinants, agglomeration, metropolis, capital cities of voivodeships

INTRODUCTION

According to Cieślik [2005], increased internationalisation of national economies has a significant impact on the development of cities and regions of those countries and, in particular, on the processes of location and concentration of economic operators in their area. As Latocha suggests [2002], of great importance for regional business location is a progressive consolidation of national economies. Investors most frequently locate their new businesses in economically strong regions: urban and industrial centres, the so-called growth poles. This results in the flow of mobile production factors from peripheral regions to the centre and (gradually) induces the growth of neighbouring, less-developed regions [Latocha 2005].

Foreign Direct Investments are a crucial driver of regional development, which can be observed particularly in less-developed communes, municipalities, and voivodeships. Investment attractiveness is determined by location factors. Areas with the optimum combination of location factors are more attractive in terms of investments since they allow for a decrease in capital expenditures and current costs of running the business, they enable to maximise profits and reduce the investment failure risk due to the special features of the area where an economic activity is conducted.

Effects of the inflow of FDIs may vary depending on the features of the area where they are located and on the investor [Czaplewski and Karaszewski 2012]. The impact of FDIs on the economy of the region can be either

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positive or negative and can be of a direct or indirect nature. However, it is assumed that the benefits of FDIs outweigh their adverse effects and are a driver for the development of the regional economy.

This article is aimed at evaluating the inflow of FDIs to the capital cities of the Polish voivodeships in 1995–2016 and their closest agglomerations. In addition, the coverage of the agglomeration of businesses with foreign capital from the largest cities in Poland was identified. According to the research hypothesis, the number of businesses with foreign capital in communes and municipalities over 1995–2016 became divergent.

SPATIAL CONCENTRATION OF BUSINESSES WITH FOREIGN CAPITAL – AN OVERVIEW OF THEORIES AND EMPIRICAL STUDIES

There exists a range of theories explaining FDI development and the internationalisation of businesses. They tackle such issues as internationalisation factors, product life cycle, business competitive advantages and diversification of investment risk [Buckley and Casson 1976, Hymer 1976, Rugman 1979, Vernon 1966]. The eclectic Dunning's OLI Framework [1980] takes into account all the determinants (inflowing and outflowing) of FDIs. The Ownership–Location–Internalisation Framework presents an FDI as a result of the combination of (i) business's ownership (oligopolistic) advantages, (ii) the existence of favourable location factors, and (iii) greater benefits for the business arising from internationalisation rather than from externalisation of its activities.

The location theory suggests that an FDI depends on the competitive advantages of a given country (region) that drive business development. When analysing the location of FDIs in regions, the following factors are important. According to Misala [2003], these include mainly: spatial distribution of resources (natural resources, human capital, and other) and markets; productivity and quality of work; replacement costs, especially in relation to transport and communications; nature and extent of intervention of the state and regional authorities; investment climate (political, social, economic, and legal and administrative climate), quality of economic and transport infrastructure; psychological "distance" (linguistic and cultural differences) and economies of scale (production, sales, R&D) [Umiński 2012]. Dziemianowicz [1997] defines location-dependent competitive advantages as location factors. They offer businesses in foreign market ownership advantages, price advantages and economies of scale.

It is important to identify location factors that shape the overall investment climate for FDIs. They include economic factors, i.e. market, production resources and their costs, legal circumstances (economic laws and regulations), social background (e.g. lifestyle), regional culture, knowledge of foreign languages and political determinants (political stability and the related investment risk in a given country) [Rymarczyk 2008, Lizińska 2012, Nazarczuk 2013]. However, business location in the region is determined primarily by its qualitative location factors, i.e. regional business environment institutions (finance, insurance, information, training, consulting, promotion) [Olesiński and Predygier 2002], advanced global transport and communications infrastructure and even the beauty of the landscape [Gorzelak 2002]. Similar location factors taken into account when choosing the form and purpose of individual FDIs can, however, have different weights.

It is generally accepted that the effects of the activities of businesses with foreign capital are beneficial for the host country at a national level. Such effects may vary across regions. Uneven distribution of those businesses in Poland may limit the positive effects of their activities related to the inflow of capital, transfer of technology and foreign knowledge diffusion to regions where such businesses are located. As a result, the existing regional disparities can increase or become difficult to eradicate instead of eliminating them [Cieślik 2007].

The analysis of location factors for businesses with foreign capital in Poland is aimed at better understanding what makes foreign investors choose a given location for their businesses. The spatial concentration of businesses with foreign capital in certain relatively well-developed regions of the country is associated with insufficient investment incentives from the state, encouraging investors to locate their businesses in poorer and less-attractive parts of Poland. Empirical research carried out to date shows that fiscal incentives affect location

decisions of businesses only to a marginal extent [Wells 1986, Mintz 1990, Devereux and Griffith 1998, Head et al. 1999]. Hence, the geographical concentration of businesses may be a consequence of various benefits of agglomeration, uneven distribution of technical infrastructure and many other factors, as suggested in the literature on urban economics and the new economic geography as having an impact on location decisions made by businesses [Fujita and Thisse 2013].

Cieślik [2007] employed an analytical framework related to the location theory, originating from the pioneering papers of Launhardt [1882] and Weber [1909], in the empirical analysis of the business location factors nationwide. Those papers are part of the so-called German tradition in the location theory which investigates the problem of spatial location of an economic operator operating in several markets and acquiring resources from various sources. In the traditional Laundhart–Weber model, both the production volumes and expenditure were considered as provided in advance, thus the whole issue was about finding the best location to minimise the total transport costs. Economists noted that such an approach does not entail considering microeconomic circumstances when making location decisions. The Laundhart–Weber model did not describe how prices, forms of competition among companies or market structures are defined; it also failed to explain how individual businesses should make location decisions or how their decisions could affect each other and lead to the spatial concentration of businesses [Krugman 1997].

According to Cieślik [2007], the contemporary theoretical models are built on micro-economics and describe the spatial concentration of businesses as a result of the process affected by agglomeration- (concentration-) and deglomeration-oriented forces. In a state of equilibrium, since these forces are balanced, businesses do not see any reason for changing their locations and the spatial structure of the economy consolidates. A neoclassical analysis shows that the most significant force for the dispersion of economic activity are transport costs, whereas a force for the concentration of economic activity are agglomeration benefits, which are exogenous variables.

Krugman and Fujita [Krugman 1996, Krugman 1998, Fujita et al. 2001, Fujita and Krugman 2003] emphasised various forces of spatial business concentration and deglomeration. The business concentration forces include natural benefits of location, i.e. convenient geographical location, benefits associated with the size of the market comprising demand and supply interrelations and specialist labour market, as well as pure external effects, i.e. diffusion of knowledge. The business deglomeration forces include production costs and the impact of such non-market factors as congestion and environmental pollution.

Empirical research on factors affecting location decisions of businesses using the formal methods of statistical analysis started in the early 1980s with the pioneering paper of Carlton [1983]. His (and subsequent) experiments [Bartik 1985, Luger and Shetty 1985] confirmed the thesis that the benefits of agglomeration are statistically relevant factors affecting the choice of an optimum location for an economic activity. Nowadays, most empirical studies are based on this theory to a lesser or greater extent by assuming that when investors look for the optimum location, they are driven by the possibility to maximise their profits, which is affected by the features of the region where they locate their businesses. Such features can be interpreted as measures of the agglomeration- and deglomeration-oriented forces through their impact on profits earned and costs borne by investors in a given region.

The paper of Head and Ries [1999] could serve as an example of an analysis of the investing reasons for foreign businesses that closely combines practice and theory by deriving the estimated regression equation directly from the theoretical model. They applied the formal model of agglomeration to a wide range of businesses, in which the endogenous externalities, the economic base of the region, the infrastructure variables, the conditions on local labour markets and the fiscal incentives in the form of Special Economic Zones may influence the location decisions of foreign investors. Head and Ries [1996] argued that the profits of foreign investors locating their businesses in a given region would be directly proportional to the number of possible suppliers of goods and services (which is linked with the size of the economic base of the region), the prices of finished goods and services depending on the transport infrastructure of the region, the overall productivity of the region also

depending on other types of infrastructure, geographically determined fiscal incentives as well as the effects of externalities related to the number of foreign businesses already operating in the region. On the other hand, high production costs will have a negative impact on the profits of businesses investing in the region. By being aware of the impact of FDIs on the labour market and employment in the region, as well as of the importance of FDIs for transfer of technology, business competitiveness and links with local businesses and communities, local authorities should encourage foreign investors to locate their businesses in the region.

MATERIALS AND METHODS

Data on the number of businesses with foreign capital compiled on the basis of information gathered in the REGON database and used in this article come from the Local Data Bank of the Polish Central Statistical Office. Even though the database is limited to a certain extent, it is the official source of information on the number of businesses with foreign capital operating in communes and municipalities in Poland from 1995–2016.

In order to capture the spatial concentration of businesses with foreign capital and its change over 1995––2016, a method used in analysing regional convergence, among others, was employed (analysis of the initial level as compared to the dynamics of the phenomenon being analysed, expressed on a logarithmic scale and then presented on a scatter diagram) [Wójcik 2007].

In addition, to understand the heterogeneity of the distribution of the number of businesses with foreign capital in relation to the individual capital cities of the voivodeships, distances of individual communes and municipalities (their centroids) were calculated in relation to the capital city of a given voivodeship. The calculations were made using Quantum GIS and the results were subsequently used in a descriptive analysis after their aggregation using STATA 14.

RESULT AND DISCUSSION

The growing internationalisation of economies of individual countries has an impact on the location and concentration of FDIs implemented in their area. Of interest seems to be a spatial dimension of the operation of international corporations in Poland. However, the influence of the inflow of FDIs may vary depending on the features of the area where they are located and on the investor. According to Cieślik [2007], the concentration-oriented forces include primarily natural benefits of location that include: a convenient geographical position, e.g. the availability of a port or a transport hub, and the benefits related to the market size, including the supply and demand interrelations and the specialist labour market.

Figure 1 shows the regional diversification of FDIs in Poland in 2016. One of the most important factors allowing for the concentration of businesses is the convenient location of important transport routes along roads or at the crossing of crucial international transport channels. Cities in western Poland are more likely to attract FDIs due to their convenient location (proximity to foreign markets, a well-developed communication network) when compared to the east of Poland. Thus, the largest aggregations of FDIs in Poland include: Katowice, Cracow, Poznań, Wrocław, Szczecin, Gorzów Wielkopolski, Zielona Góra, Trójmiasto and Warsaw.

The road infrastructure and, therefore, easier access to national and international roads significantly enhance efforts of local authorities to provide incentives to foreign investors. Some of the regions of Poland have a lower chance of attracting FDIs since their economies are primarily based on agriculture and their infrastructure, especially transport infrastructure, is poorly developed, making them less connected to larger cities. That is why FDIs agglomerate mostly in selected regions of a given voivodeship, but first and foremost in the large capital cities of voivodeships.

Apart from a few large agglomerations, areas attractive for tourists and some of the Western border, Polish regions are at risk of peripheralisation. Currently, only big cities, i.e. Warsaw, Poznań, Cracow, Wrocław,

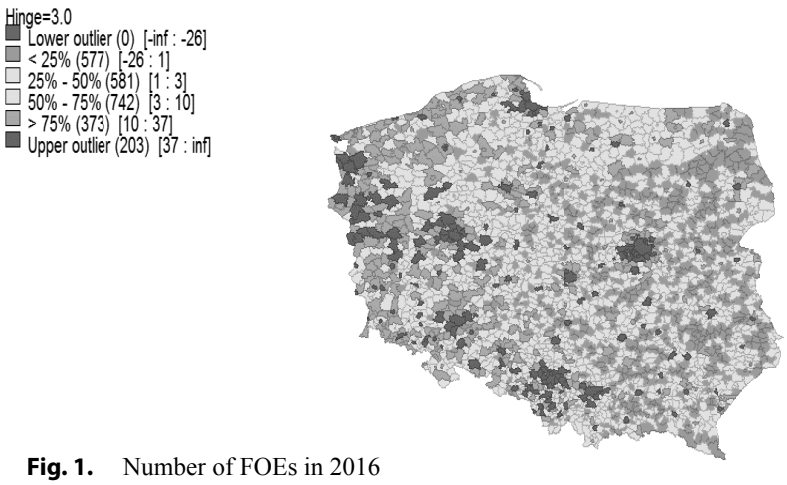

Fig. 1. Number of FOEs in 2016

Source: Own elaboration.

Trójmiasto, with diversified economies, connected to Europe thanks to relatively well-developed transport and telecommunications infrastructure, with research and development institutions and inhabited by well-educated people are able to attract foreign capital. Large agglomerations, which are scientific and research centres, are one of the reasons behind locating investments in them. Investors more frequently look for locations whose attractiveness is connected with people, i.e. the so-called creative assets, which include a whole spectrum of phenomena – from technological advancement to skilled manpower.

When it comes to the regional policy, of great relevance is the identity of cities which can be the so-called growth poles, i.e. rapidly growing centres that foster the development of the region or the sub-region. Over the years 1995–2016, the number of businesses with foreign capital in Poland increased. The concentration and increase in the number of businesses with foreign capital in specific regions of the country may result from opinions of Polish and foreign companies already operating there. As the research of Lizińska [2012] suggests, the core source of information on the conditions for operating an economic activity in Poland are assessments made by foreign and domestic businesses. When making a location decision in a region, of greater significance are institutions providing support to investors. Initiatives undertaken by local authorities are also important in attracting FDIs. It may encourage investors to locate investments in specific locations. Insufficient initiatives by local authorities may result in lower interest of businesses with foreign capital in locating their investments in a given region. Babuchowska and Kisiel [2006] argued that the laws and regulations applicable in Poland equipped local authorities with instruments to shape the economic structure of their commune or municipality. Communes and municipalities may choose to support economic initiatives or not; they can also encourage external entities to locate their investments in their area. Actions undertaken affect business development as well as foster the creation of new businesses and jobs.

Lizińska [2012] found that the main reasons behind choosing Poland as a place of business included the economic situation of the country, the situation on the labour market, the size and absorptive power of the market and the presence and experience of businesses with foreign capital already operating in Poland. Decisions to choose a region for a place of business were made by entities with foreign capital first of all based on the situation on the labour market, and then taken into account were the condition of infrastructure, the presence of businesses with foreign capital already operating there and the size and absorptive power of the market. When selecting a particular commune, municipality, town or city for a place of businesses, the same factors were taken into consideration as when selecting a region for a place of business, though their weights were different when

compared to each other. Lizińska and Nazarczuk [2008] studied the involvement of local authorities in attracting new (domestic and foreign) investors and concluded that local authorities use various instruments to encourage investors to invest in their commune or municipality. Most often, communes and municipalities employed tax relief for that purpose. Other incentives used by local authorities consisted in helping to find vacant land or premises and improving technical infrastructure. Another important form of support for investors was an accommodating attitude of officials and local communities towards them.

One of the crucial aspects of business location is the present concentration of foreign entities in specific locations. Entities operating in a big city or a metropolis take advantage of the typical benefits of agglomeration (concentration): urbanisation and shared location benefits, which are external costs and benefits. Businesses gain additional profits without additional expenditures. They can share technical infrastructure, including road infrastructure, waterworks and sewerage infrastructure, environmental protection infrastructure (sewage treatment plants, landfills, and waste incineration plants), as well as social infrastructure (educational and health care institutions, culture centres, universities and R&D facilities), etc. Easy access to the foregoing allows businesses quicker implementation of innovations and facilitates access to markets where their products and services may be sold. The co-location benefits refer both to production and services. Businesses are capable of exploiting the specialist labour market to a great extent and diversity. Such capabilities will also result from easy access of businesses to administrative, consulting and specialised institutions offering, for example, consulting in advanced technologies, R&D, as well as financial, banking and insurance services, but also inspection and certification institutions.

According to Pietrzyk [2004], metropolises and zones of organised production will achieve the greatest successes in attracting FDIs. For metropolises, these are primarily benefits of the concentration of various economic activities, while for zones of organised production, those include effects of spatial concentration of businesses of similar profiles. Urban agglomerations, metropolises, and recently separated metropolitan areas are considered to be areas more developed than peripheral areas and they can more successfully attract foreign capital. The impact of a metropolitan area on the socio-economic development of the region where it is located is diverse and depends on many features of the economy, i.e. on the production structure, the quality of spatial development, the ability of authorities to cooperate, the socio-economic characteristics of the entire region, the specifics of economies of neighbouring areas, the level of entrepreneurship in the region, the networks of towns and cities, but first and foremost on internal cohesion and transport accessibility. Gaczek [2013] argued that the geographical proximity – undoubtedly a decisive determinant of the benefits of agglomeration – is one of the conditions sufficient for the formation of industrial as well as industrial and services clusters. The size of the market in an agglomeration and better and easier access of businesses to knowledge and skills sought on the labour market result in attracting cooperating sectors as well as competitors.

In 1995–2016, when the number of businesses with foreign capital in Polish communes and municipalities was analysed, a divergence in their number at the local level was observed (Fig. 2). On average, communes and municipalities which in 1995 hosted a greater number of businesses with foreign capital (logarithmic values) showed an increase in their number between 1995 and 2016 (logarithmic values). In addition, the positive slope at a logarithmic value of businesses with foreign capital in 1995 (*lnkz_95*) confirms the increasing divergence in the number of businesses with foreign capital between 1995 and 2016.

When analysing the distances between the locations chosen by investors with foreign capital for their places of business and the capital city of the region, one may note a tendency that most FDIs were located at a distance of 0–15 km from the capital city of the voivodeship. It was best observed in the Mazowieckie Voivodeship where 83.5% of all the companies registered there were located up to 15 km from Warsaw. The next were the Małopolskie voivodeship (81.7% of all the companies located up to 15 km from Cracow) and the Łódzkie voivodeship (71% of all the businesses with foreign capital located near the city of Łódź). The lowest concentration of businesses around the capital city of the voivodeship was observed in Olsztyn in the Warmińsko-Mazur-

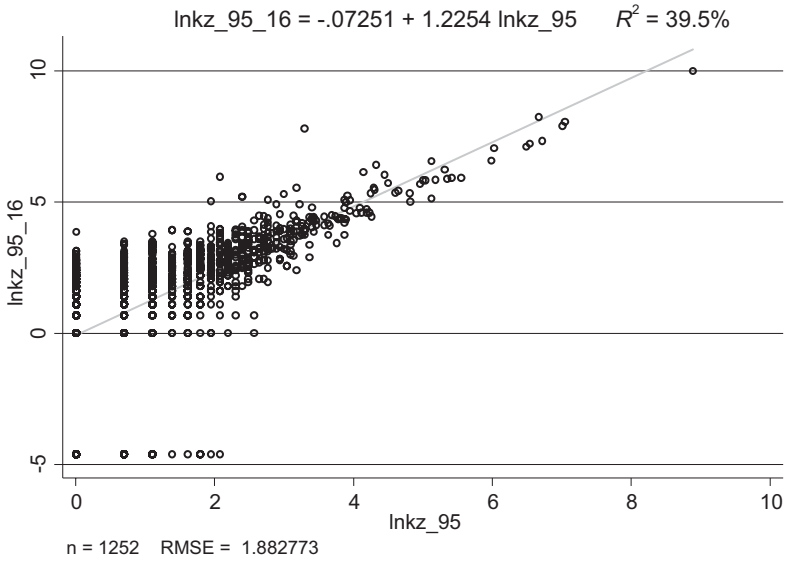

Fig. 2. Number of firms with foreign capital in 1995 vs. increment in the FOEs number between 1995–2016

Source: Own elaboration.

skie voivodeship (32.3% of all the FDIs in the entire voivodeship), in Rzeszów in the Podkarpackie Voivodeship (37.4%), and around Katowice in the Śląskie voivodeship (40.3%).

Relatively more FDIs in the region in the case of Gdańsk (26.7%), Katowice (21.7%), and Opole and Zielona Góra to a lesser extent, were located around a wider ring (15–30 km) from the capital city of the voivodeship. However, one has to remember that the results achieved for FDIs at a larger distance from the capital city of a voivodeship may be affected by the structure of the settlement network of a region and the proximity of other large urban areas and their conurbations (Table 1).

Cieślik [2007] argued that the analysis of location factors for businesses with foreign capital in Poland is aimed at better understanding what makes foreign investors choose a given location for their businesses. In particular, it is important as far as implications for the economic policy are concerned, whose purpose is to improve the investment attractiveness of the least developed regions of the country. It is often argued that the spatial concentration of businesses with foreign capital in certain relatively well-developed regions of the country is associated with insufficient investment incentives from the state, encouraging investors to also locate their businesses in poorer and less attractive parts of Poland.

On the other hand, fiscal incentives are often believed to be ineffective in attracting FDIs. They cannot overcome other disadvantages of possible locations for foreign investments (e.g. difficult access to infrastructure or complex legal procedures). The impact of fiscal incentives on decisions on locating foreign investments gets worse the more common such incentives become in other countries/regions. The use of tax exemptions may, however, be necessary for attracting investors to peripheral areas or regions lagging behind in economic development [Nazarczuk and Kisiel 2013].

Instruments employed by communes and municipalities to make investors locate their businesses in their areas are additional, non-decisive determinants. More important determinants in choosing a regional location are sites prepared for investments and the condition of the existing technical infrastructure. Of major importance are also such qualitative locational determinants as skilled specialists and the possibility of collaborative production. As the research of Nazarczuk and Krajewska [2017] suggests, of relevance is also the proximity to,

Table 1. Share of the no. of firms with foreign capital by distance from the city in 2016 (km)

Town/City	0–15	15–30	30–45	45–60	60–75	75–90	90–105	105–120
Wrocław	54.8	7.6	4.1	8.3	8.7	5.2	9.8	1.6
Toruń	61.3	9.5	11.5	15.0	1.6	0.0	0.0	0.0
Lublin	53.8	3.2	3.8	4.4	9.2	8.3	12.2	4.7
Zielona Góra	41.2	11.8	27.9	16.2	2.8	0.0	0.0	0.0
Łódź	71.0	6.3	2.7	12.3	2.6	2.5	0.0	0.0
Kraków	81.7	5.0	4.4	1.8	5.8	0.9	0.4	0.0
Warsaw	83.5	11.6	1.6	0.6	1.4	1.1	0.1	0.0
Opole	44.7	17.1	21.2	14.9	2.1	0.0	0.0	0.0
Rzeszów	37.4	4.3	11.6	15.2	30.9	0.4	0.1	0.0
Białystok	62.1	2.4	5.8	3.3	8.1	4.7	0.1	12.2
Gdańsk	48.9	26.7	6.9	3.1	5.0	2.2	0.8	5.9
Katowice	40.3	21.7	7.3	16.3	14.2	0.3	0.0	0.0
Kielce	55.2	3.2	22.4	14.1	4.5	0.6	0.0	0.0
Olsztyn	32.3	3.5	12.9	26.4	9.1	5.3	6.7	2.2
Poznań	58.2	9.6	5.5	8.8	8.8	6.1	2.9	0.0
Szczecin	49.7	7.1	8.8	8.8	2.7	2.3	2.2	8.4

Source: Own elaboration.

among others, the capital city of a voivodeship, a Special Economic Zone, an airport, communication networks and the borders. The proximity of the borders and the capital city of a voivodeship ensures access to national and international markets, and especially in the case for the latter – they ensure access to well-educated employees. Nazarczuk and Krajewska highlighted one of the most significant locational determinants – the proximity of markets and the pro-export orientation of businesses with foreign capital, which affects their location decisions in the context of future sales. What is more, they also emphasised the role of the structural factors of local economies and the availability of skilled specialists.

However, territorial concentration, specialised economic activity, knowledge transfer and dissemination and use of advanced technologies contribute to increased competitiveness of local economies. The concentration of businesses allows them to share infrastructure and, by imitation, to implement new technical and organisational solutions applied by competitors.

CONCLUSIONS

This article was aimed at evaluating the inflow of FDIs to the capital cities of the Polish voivodeships in 1995–2016 and their closest agglomerations. Between 1995 and 2016, there was a larger absolute growth of FDIs observed in communes and municipalities which in the past hosted a great number of foreign investors, which resulted in greater differences in their number locally. Businesses with foreign capital most often located their headquarters in close proximity to the big capital cities of voivodeships which offered a wide

variety of specialists, well-developed technical infrastructure, and other businesses in vicinity. It is large agglomerations with R&D institutions that might attract investments. Currently, only big cities with diversified economies, connected to Europe thanks to well-developed transport infrastructure, with research and development institutions and inhabited by well-educated people, are able to attract foreign capital.

Local authorities should improve the economic base and infrastructure of cities, particularly in regions which are in a less favourable situation, in order to improve their attractiveness in the eyes of foreign investors. The selection of locations for FDIs (as regards to markets), indicates that their potential impact is limited in that regard. Hence, local authorities should implement smart initiatives to determine the investment climate in their area, i.e. they should create and develop infrastructure that makes it easy to run and develop an economic activity (as part of a local specialisation), promote it and provide detailed information to possible investors, render reliable and professional administrative services, establish favourable circumstances for conducting and expanding business, e.g. through public aid.

Urban areas can also grow faster due to more favourable climate for innovation. Spatial differentiation of the inflow of FDIs – when it comes to the new economic geography – is determined by the intensity of the impact of centripetal forces fostering concentration and of centrifugal forces causing dispersion. A more difficult situation of communes is an effect of worse access to production factors, remoteness from large urban centres, and the lack of basic economic and social infrastructure. The situation may be improved by investments in transport infrastructure which will improve connection to medium-sized and large cities and major transport corridors.

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PRZESTRZENNA KONCENTRACJA FIRM Z UDZIAŁEM KAPITAŁU ZAGRANICZNEGO W MIASTACH WOJEWÓDZKICH POLSKI I ICH AGLOMERACJACH W LATACH 1995–2016

STRESZCZENIE

Inwestycje zagraniczne odgrywają istotną rolę w dynamizowaniu rozwoju na poziomie lokalnym. Celem artykułu jest ocena skali napływu BIZ do miast wojewódzkich Polski i ich najbliższych aglomeracji w latach 1995–2016. W pracy wykorzystano dane na temat liczby firm z udziałem kapitału zagranicznego zaczerpnięte z Banku Danych Lokalnych GUS. W celu uchwycenia przestrzennej koncentracji podmiotów z kapitałem zagranicznym oraz jej zmian w latach 1995–2016, posłużono się m.in. podejściem stosowanym w analizie konwergencji regionalnej. Przeanalizowano przestrzenny rozkład liczby BIZ względem miast wojewódzkich z wykorzystaniem aplikacji Quantum GIS i obliczeń w STATA 14. Uzyskane wyniki wskazywały na dywergencję w liczbie BIZ na poziomie polskich gmin w latach 1995–2016, a także zróżnicowany przestrzenny wzorzec lokalizacji BIZ względem miasta wojewódzkiego.

Słowa kluczowe: bezpośrednie inwestycje zagraniczne, BIZ, determinanty lokalizacji, aglomeracja, metropolie, miasta wojewódzkie

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 83–91
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.47

ORIGINAL PAPER

Received: 17.10.2017
Accepted: 13.12.2017

FUTURE PROGRESSIVE: THE NEED FOR A PROFESSIONAL DOCTORATE – AN INTERNATIONAL DOCTOR OF BUSINESS ADMINISTRATION

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ABSTRACT

The purpose of Higher Education is increasingly under scrutiny as are its previous shortcomings. The last bastion of academic hegemony, the PhD, is being reconstructed, moving from a discipline focused degree intended to extend abstract, universal knowledge through the presentation of a thesis towards an emphasis upon the development of the skills of the researcher. Furthermore, the recognition that knowledge can be generated in realms other than academia has concurrently seen the emergence of Practitioner Doctorates, based upon Action Research, that are designed to develop researching professionals.
The paper poses the question whether it is appropriate to extend the model developed for an International Master of Business Administration into the provision of an International Doctor of Business Administration?

Key words: Action Research, DBA, Dewey, Knowledge, Practitioner Doctorate, Research skills

INTRODUCTION

In the brave new world of 1990 I doubt if any of us could have anticipated the remarkable changes that were about to come about. The core motivation behind them was the expansion of free-market capability in the transition economy countries. But my own interest was in promoting curriculum development processes in the widest sense, and not just for those partners. I was personally motivated by the statement that: "The changing economic situation in a free market economy will enforce the need for rapid responses in the form of appropriate modifications to training programmes. Universities must also pay greater attention to nurturing in students certain personality traits, including the ability to think creatively and to act independently, with initiative and in the spirit of enterprise" [Wieczorek 1992, p. 64].

In an earlier existence, as an ecologist, I used to think in terms of the Red Queen Hypothesis in reference to Lewis Carol's *Through the Looking Glass* – where the queen of hearts had to run as fast as she could in order to stay on the same spot. So having made substantial ground to align curricula for Business Administration it is time to take stock and ask what the future might hold. In response to this I want to be typically provocative.

A suitable point from which to begin a review of imminent prospects is that of purpose. What is the purpose of Higher Education? As Bauman and Donskis [2013, p. 142] noted: "the mission of education, since it was articulated by the Ancients under the name of paidea, was, remains and probably will remain for the duration the

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preparation of newcomers to society to life in the society they are preparing to enter." But in an era of constant change this tautology contains more than a hint of potential stagnation particularly under the caution of The Saber Tooth Curriculum [Benjamin 1939].

Now, as I have argued elsewhere [Kowalski 2014], the Higher Education Sector throughout the world has traditionally viewed itself as an indisputable universal good. The result was the acceptance of a philosophy that valued knowledge for its own sake and gave almost total freedom to academics to define for themselves those aspects of knowledge that were to be pursued as well as promulgated through teaching. This self-serving indulgence drove the Higher Education system into two *cul-de-sac*; discipline based curricula and separation from its constituencies, thereby laying the foundations for its subversion.

This failure to really examine why community resources were being invested in Higher Education came to an end with the economic difficulties of the early 1970s. Criticism mounted, primarily motivated by the concerns of commerce, as Schmitt [1987] lamented the American educational system put little emphasis on the values of the marketplace and focused mostly on academic values which emphasise optimum solutions, and Smith [1990] continued this theme when he averred that our educational systems are permeated by a minimalist outlook which is undemanding and, expecting very little of people, is neither surprised nor disappointed when little is achieved. Undoubtedly curricula have progressed during the last two decades, characterised by high relevance to the world of work, up-to-date content and modern methods of teaching (including web-based learning) and assessment – as evidenced by the results of evaluation. But nevertheless challenges remain.

Indeed, at least in the UK, there has been a radical re-focusing towards a functional curriculum [Warren-Piper 1985], and now some would suggest that we have gone too far in this direction, as Doring [2002, p. 140] noted: "the higher education system is being encouraged to transfer its allegiance from the academic to the operational" such that it primarily serves commercial interests, commodifies students and emphasizes technical knowledge (technē) over phronesis.

Moreover, there is growing concern about a widespread departure from the essential values of education, as Hunter and Geddes [2000, p. 5] noted: "the university seems increasingly the locus of high-level scholarly endeavors, but the structures of university life have led some to wonder whether the academy has rendered 'the life of the mind' irrelevant to the larger American society, by turning broad-minded intellectuals into narrowly specialized 'technicians', with critical faculties so refined that they often can gain no purchase on the pressing issues facing contemporary society."

Furthermore, Geddes [2012, p.2] commenting upon the rise of "the corporate professor" noted that: "professors themselves have bought into or been shaped by the corporate culture of the university and seem strangely inarticulate about the purposes and worth of higher education." Indeed, Lasch [1996, p. 98] commented that the market turns: "scholarship into professional careerism, social work into the scientific management of poverty." Indeed, Mohan [2011, p. 131] lamented that: "temples of knowledge and learning have fallen to corporate ethics," and has led Bauman [2000, p. 56] to observe that: "For a couple of centuries now academia had no other world to catch in its conceptual nets, to reflect upon, to describe and to interpret, than the one sedimented by the capitalist vision and practice." Causing Geddes [2012, p. 2] to comment that: "If professors can't articulate what they do or why it matters in terms not beholden to the market, then who can? What resources are there for re-envisioning and re-articulating the purposes of higher education in a way that responds to the rapid and far-reaching cultural changes taking place in our world today and that resists the commodification of knowledge, scholarship, attention, and reflection?".

Leading Doring [2002] to argue that the role of academics has shifted from being agents of change to being victims of change; from being at the heart of "a centre of learning" to being just a cog in another „business organization".

THE CASE FOR CHANGE

There has been mounting criticism of Higher Education globally in two key areas. The first is the abject failure of leadership the world over to rise to the challenge of environmental sustainability, despite the fact that most of the leaders who attended the World Summit for Sustainable Development in Johannesburg have a higher education degree from the world's most prestigious universities [Martin and Jucker 2005]. So, we must ask why is it that the people who contribute most to exploiting poor communities and the Earth's ecosystems are holders of higher degrees and doctorates? [Orr 2004]. Why is the seeming ignorance of our politicians about how the world works as a living system so widespread? Why is it that our leaders so rarely demonstrate respect for the biosphere, wisdom and precaution, or the capacity to challenge unethical actions? [Martin and Jucker 2005].

Secondly, as evidenced by the largely unpredicted collapse of financial systems in 2008, it seems that some of the most fundamental issues at the heart of free-market capitalism have been overlooked and are absent from general macro-economics' curricula [Fullbrook 2016]. As Shutt [1999, p. 198] recognized, "*Amid so many signs that the existing world economic and political order is becoming unsustainable, it is remarkable that there is so little overt questioning of its ideological basis,*" and Söderbaum [2012, p. 109] maintained that "*university departments of economics continue to protect neoclassical theory*." Such that we might agree with Rahman [1993, p. 219] that: "*The 'educated' have not proved to be any more 'enlightened' or capable of wise and responsible decisions and conduct than the 'uneducated'*." and conclude that surely Higher Education institutions should be operating as hotbeds of problem setting and problem solving that are fully embedded in their communities, acting as conduits of resources and operating as environments for the growth of the sort of change agents that embattled humanity require. Not just paying passing acknowledgement to the challenge[1] but actually being transformational.

Another aspect over which universities have been criticised is research. Fundamentally we appear fixated upon the question "How?" because of the way that technology has contributed to economic expansion, and neglected those questions that underpin the deployment of that technology and the distribution of the wealth and harm that it creates. At the heart of Higher Education's difficulties is a tradition of organizing knowledge into discreet subject areas[2]. As Mohan [2011, p. 127] argued: "*The knowledge paradox has deepened the crisis by creating silos of disciplines that do not creatively communicate with each other*." Such a structure is entirely artificial, smacking of *Objectivism* rather than *Constructivism* [Laurillard 1993][3], and has encouraged the dislocation of ways of knowing that hinders a multi-disciplinary attack on the problems of the real world. The appropriate view, as Stacey [2001, p. 189] suggested: "*is an evolutionary concept of knowledge as meaning continuously reproduced and potentially transformed in action*."

Six characteristics of knowledge distinguish it from information [McDermott 2000, p. 23]:

- Knowing is a human act;
- Knowledge is the residue of thinking;
- Knowledge is created in the present moment;
- Knowledge belongs to communities;
- Knowledge circulates through communities in many ways;
- New knowledge is created at the boundaries of old.

[1] Another University's mission statement aspires to being: "a truly international university, which is also a major contributor to the economic, social and cultural transformation of [our home] city (…) and (…) region."

[2] For example, a current university mission statement refers to: "offering students the full range of disciplines."

[3] For example, another university claims that: "The mission of our University is the creation, dissemination and curation of knowledge." – begging the question – How could that get past scrutiny by an academic board?

The misrepresentation of knowledge as occurring in discreet disciplines and the behaviours associated with an Objectivist perspective of knowledge have also contributed to the distancing of Higher Education from its community constituents (including commercial interests) that is typified by the epithet "ivory tower" [Levin and Greenwood 2001]. As Rahman [1993, p. 12] expressed it: "we intellectuals have been educated only to form and to join a class of our own, aspiring for recognition by the international brotherhood of intellectuals, but alien from our own society". This is also maintained by the traditional approach to research which, contrary to popular perceptions, is not the only, nor even the most sensible, methodology to apply to problem solving. Indeed, Pieterse [1999, p. 77] lamented that: "Interdisciplinary research is more widely applauded than practiced."

In traditional research the researcher is effectively neutral (not necessarily objective), off the time-line, able to scan the widest span, though not necessarily the detail, of unfolding events – usually enacted by others – and generating propositional knowledge (E-theory) that can be reported and shared [McNiff and Whitehead 2003], as illustrated in Figure 1 below. This may also be captured by the concept of the Technical Rationality model that is "embedded in the institutional context of professional life" and which Schön [1983] characterized as: "research is institutionally separate from practice, connected to it by carefully defined relationships of exchange. Researchers are supposed to provide the basic and applied science from which to derive techniques for diagnosing and solving problems of practice. Practitioners are supposed to furnish researchers with problems for study and with tests of the utility of research results. The researcher's role is distinct from, and usually considered superior to, the role of the practitioner".

The false dichotomy of theory and practice, which had seen the arrogation of research by institutions of Higher Education, has led to a knowledge generating process that had little impact upon everyday practice, especially in professional endeavours such as teaching, management and social work. Dewey was very critical of this divide, as Argyris et al. [1985] noted: "Dewey was eloquent in his criticism of the traditional separation of knowledge and action, and he articulated a theory of inquiry that was a model both for scientific method and for social practice." Indeed, positivist methods and the simple position of the objective observer were clearly perceived to be inappropriate for researching social phenomena.

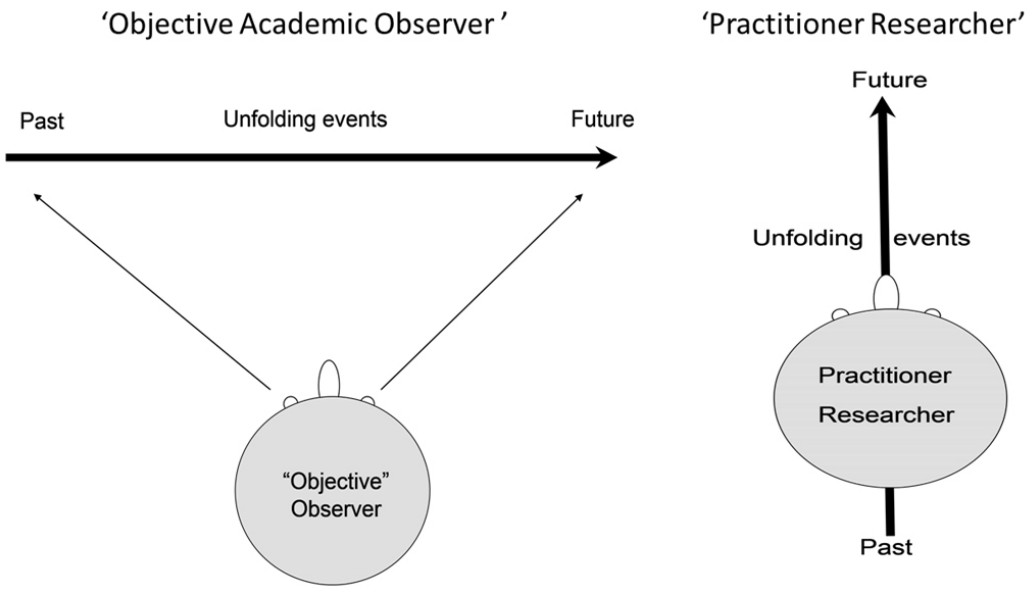

Fig. 1. The alternative positions of the "researcher" (looking down upon their head, as it were)

Source: Own elaboration.

Now we must compare this with those circumstances where the practitioner researcher engages with their constituents in action research, as shown in Figure 1, being fully associated with the unfolding events, on the time-line, and having to respond and use developing knowledge in the management of the situation in the here and now – and generating more tacit knowledge, more particular knowledge, and more narrative knowledge that others must seek to generalise into their own contexts as seems best to them (I-theory[4]), which McNiff and Whitehead [2003, p. 22] described as: "theories which are already located within the practitioner's tacit forms of knowing, and which emerge in practice as personal forms of acting and knowing." such research, carried out in the actual settings of social practice, allows any research findings to be seamlessly projected into practice.

As Stringer [1996, p. 10] noted: "Action Research is a collective process, engaging people who previously have been the subjects of research in the process of defining and redefining the corpus of understanding on which their community or organisational life is based." Indeed, Burnes [2004, p. 984] observed that: "Lewin's view was very much that the understanding and learning which this process [of Action Research] produces for the individuals and groups concerned, (…,) is more important than any resulting change as such."

Definitively, Levin and Greenwood [2001, p. 103] commented that: "Universities, as institutions charged with the generation and transmission of knowledge, have created a variety of conditions inimical to the practice of action research and thus to competent knowledge generation, thereby producing poor quality of knowledge and isolating themselves unproductively from the societies they claim to serve".

ACADEMIC VERSUS PROFESSIONAL DOCTORATES

Within Higher Education's acquisition of the research domain came the right to confer associated qualifications. As such the Doctor of Philosophy (PhD), initiated in nineteenth century Germany, was dependent upon an epistemological position that academically valid knowledge must be abstract and, to all intents and purposes, universal [Lester 2004], and which was considered to provide an appropriate pre-service training for research professionals [Park 2005] founded upon "the Humboldtian belief" that academic staff and also the students are in higher education "for the sake of science and scholarship" [Becher et al. 1994].

In recent years the fitness for purpose of this doctoral qualification has been widely questioned [Park 2005]. Increasingly the PhD has been seen as insular, esoteric and irrelevant to the world outside academia. Gilbert [2004] listed the following shortcomings of the PhD:

- consumers of research outcomes are demanding closer attention to problems generated in the practices of everyday life;
- multi-disciplinarity as a research context is most productive of innovation and discovery;
- changing conceptions of knowledge challenge the compartmentalized approach to research training which has been institutionalized in university academic structures;
- traditional university processes are being tested by the increasing pace and dispersal of knowledge production and innovation, including the increase in research activity outside the university sector;
- new roles are proposed for academics, experts and intellectuals, derived from ideas of entrepreneurship, knowledge work, the public intellectual and advocacy for science and research;
- forms of the doctorate are increasingly diverse, with an increase in the role of portfolios and the establishment of professional doctorates in many fields;
- debates over competing research paradigms and methodological issues have created tensions which complicate the construction of the doctoral curriculum;

[4] Where McNiff and Whitehead [2003, p. 22] have describe I-theory as: "a dialectical form of theory, a property of an individual's belief system".

- concerns for the outcomes of doctoral research training have produced a widespread focus on the development of generic or transferable skills.

Furthermore the pursuit of a doctorate seems to have become longer and more difficult, for example McAlpine and Norton [2006] drew attention to the high attrition rates in Australia, Canada, the United Kingdom and the USA and their implications for the institutions, individuals and societies concerned. Consequently, there has been a general shift from the focus upon the thesis product of the PhD to a more student development approach emphasising skills. There is a new demand from funding bodies and potential employers that training within PhD programmes should be more structured and better coordinated, that it be broadened to embrace key or transferable skills as well as research skills, be compulsory rather than optional, and be more sensitive to issues of employability that extend beyond simply creating new academics.

In the United Kingdom, as a result of the benchmarking work of the Council for Graduate Education, the Quality Assurance Agency has suggested a set of outcomes for doctoral awards [QAA 2011] as follows:

1. Knowledge-based:
   - K1 – systematic acquisition and understanding of a substantial body of knowledge which is at the forefront of an academic discipline or area of professional practice;
   - K2 – creation and interpretation of new knowledge, through original research or other advanced scholarship, of a quality to satisfy peer review, extend the forefront of the discipline, and merit publication;
   - K3 – detailed understanding of applicable techniques for research and advanced academic enquiry.
2. Research skills:
   - R1 – the general ability to conceptualise, design and implement a project for the generation of new knowledge, applications or understanding at the forefront of the discipline, and to adjust the project design in the light of unforeseen problems;
   - R2 – make informed judgements on complex issues in specialist fields, often in the absence of complete data;
   - R3 – able to communicate their ideas and conclusions clearly and effectively to specialist and non-specialist audiences.
3. Attitudes:
   - A1 – continue to undertake pure and/or applied research and development at an advanced level, contributing substantially to the development of new techniques, ideas or approaches.
4. Professional skills:
   - P1 – have the qualities and transferable skills necessary for employment requiring the exercise of personal responsibility and largely autonomous initiative in complex and unpredictable situations, in professional or equivalent environments.

Note that this constitutes a radical change of emphasis from the contribution of new knowledge as the primary objective to the generation of new researchers who have undergone "training" in research and new knowledge generation.

There is also a clear recognition that new knowledge can also be generated outside of academia – predominantly in professional practice, underwriting the emergence of the Professional or Practitioner Doctorates. Thus the growth of professional doctorates represents the arrival of the "student-development" approach at the doctoral level. Such professional doctorates place the highest development of the student at the heart of doctoral study, compared with the PhD which has the highest development of the discipline at its heart.

The practitioner doctorate challenges the PhD-based orthodoxy since it is explicitly concerned with practical knowing and doing, and does not set out to license researchers. It suggests a need for conceptualizations that are not defined by academic research and knowledge generation. In a practitioner doctorate research is undertaken with a particular aim in mind, and new knowledge is generated for a purpose, even if it is subsequently disseminated through publication. Graduates of a practitioner doctorate will necessarily be able to

operate as practitioner-researchers, but they are foremost capable and thinking practitioners. This enables doctorates to be conceptualized in terms of the kind of high-level thinking and action needed to create significant and considered change and development in complex practical situations [Kowalski and Kaminski 1999].

Professional doctorates now form an established alternative to the PhD, both in the UK, the USA and Australia. The culmination of this development is represented by what might be termed practitioner doctorates, based on development projects that result in substantial organizational or professional change and a significant contribution to practice. Such programmes present a challenge to traditional conceptions of what constitutes doctoral work based on research. Nevertheless, they are constituted in a way that is both robust academically and appropriate for the complex and far-reaching problems encountered in contemporary society. In particular the knowledge generated is to be validated on the basis of "what works" rather than the objectivity of data gathering, or some such. Thus the "traditional" Doctor of Philosophy degree is intended to develop professional researchers, the practitioner doctorate is designed to develop researching professionals. That the two types of doctorate are indeed distinctly different and that the new practitioner doctorate meets a very different need can be seen through comparisons set out in Table 1.

Table 1. Various aspects of the provision of the traditional and practitioner doctorates are compared

Aspect	Traditional Doctorate	Professional Doctorate
Topic	Any within reason	Limited in focus often agreed with employer
Taught elements	Possible but not prescribed	Prescribed and extensive
Start date	Whenever registered	Fixed (usually biannually)
Relationship to other students	Individual within a departmental group	Part of a cohort of students
Assessment	Thesis and *viva voce* Or body of published work and *viva voce*	Course work (products, portfolios, published papers), thesis and *viva voce*
Research focus	Episteme; E-theory; Mode 1	Techne; Phronesis; I-theory; Mode 2 [Gibbons et al. 1994]
Research Methods	Experiment; Objective 3rd party data gathering	Action Research; Subjective involvement in generating data
Career	Pre-service	In-service
Contribution	To a body of knowledge	To professional practice
Audience	Academic colleagues (Peers)	Community of Practice

Source: Neumann [2005].

CONCLUSION

Thus, just as in 1995, we find the provision of Business Administration qualifications at the edge of a great opportunity wondering whether as an international academic community we can and should grasp it with both hands. Can we create an International Doctorate of Business Administration? One that is multi-centred, peripatetic and which will support the development of business leaders in agriculture and related enterprises?

The AgriMBA offered by SGGW is uniquely placed to provide a basis and template for such a development. Its strengths are that:

1. It is truly international in content and intention.
2. It is in-service – so highly practice oriented.
3. It involves the mixing of staff and students from partners across Europe.
4. It is founded upon breaking with traditions.
5. It is unpretentiously eclectic.

Nevertheless, we have to be cautious in our advocacy of change. The philosophical positions outlined above also require that individuals have to find meaningful solutions which are appropriate for their own context. In this respect it is vital that changes are brought about and implemented by the staff of the institutions concerned. They cannot be driven from above, nor from outside. We must remember that although it is the external grain of sand which causes the pearl to form, it is the oyster itself which does the making. Those farsighted, entrepreneurial academics who drove the AgriMBA are not in a position to drive forward an AgriDBA, but they represent a resource of experience to support those who would.

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CZAS „PRZYSZŁY CIĄGŁY": POTRZEBA ZAWODOWEGO DOKTORATU – MIĘDZYNARODOWEGO *DOCTOR OF BUSINESS ADMINISTRATION*

STRESZCZENIE

Cel kształcenia na poziomie akademickim jest w coraz większym stopniu przedmiotem weryfikacji, podobnie jak szkolnictwo wyższe analizowane pod kątem niedociągnięć systemu. Ostatni bastion hegemonii akademickiej – doktorat, rekonstruuje się z formy rozprawy teoretycznej do dysertacji, w której doktorant rozwiązuje praktyczne problemy badawcze. Przekonanie, że wiedza może być generowana w domenach innych niż akademickie doprowadziło do pojawienia się koncepcji zawodowego doktoratu. Byłby on realizowany w trybie tzw. badań w praktyce działania (ang. *action research*). W artykule postawiono pytanie, czy właściwe byłoby rozwinięcie modelu MBA (ang. *master of business administration*) do modelu DBA (ang. *doctor of business administration*).

Słowa kluczowe: badania w praktyce działalności, *action research*, doktorat *business administration*, Dewey, wiedza, umiejętności badawcze

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 93–101
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.48

ORIGINAL PAPER

Received: 16.05.2017
Accepted: 22.11.2017

PRO-ENVIRONMENTAL ACTIVITIES IN POLAND IN 2015 (REGIONAL STUDY)

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ABSTRACT

The author of the article sets out to perform two tasks. The first is an attempt to present the construction techniques of a ranking of items (in this case – voivodships) in terms of the level of a complex phenomenon, and then to present a method of division of items into groups with similar values of the synthetic variable.
The second goal is to present the condition of pro-environmental activities in Poland in 2015 in the regional system. In order to implement this objective, diagnostic variables have been selected, describing the condition of activities for environmental protection. Based on the following criteria: substantive and sufficient variability, 11 diagnostic features have been selected. These variables constitute the basis for multiple criteria evaluation of a complex phenomenon (pro-environmental activities).
Based on the described procedures, a ranking of voivodeships has been created on the basis of the status of pro-environmental activities in Poland. The set of items (voivodships) has been divided into 3 groups: group I – voivodships with a high level of pro-environmental activities, group II – voivodships with an average level, and group III with a relatively low level. The quantitative proportions of voivodships in particular groups are as follows, respectively: 4 : 6 : 6.

Key words: environmental protection, voivodship, diagnostic variable, synthetic variable, ranking

INTRODUCTION

The first ideas related to the need for environmental protection were created in the 2nd half of the 19th century. In this period, the USA and Europe observed a rapidly progressing process of industrialisation along with migration of the population from rural areas to industrial centres. The cities quickly increase the number of their inhabitants and their surface area. Completely new municipal centres also appear. All the above causes growing concerns in the face of destruction of natural resources as well as creation of hazards to life and health of the population. This problem raised the interest of the luminaries of science and literature. The word "ecology" was for the first time introduced to the terminology of natural sciences by a German biologist Ernst Haeckl (1834–1919). It took place in the 2nd half of the 19th century. In the USA, one of the first people to take interest in this issue was David Thoreau.

In Poland, the process of industrialisation that progressed quickly after World War II provided many new jobs, opening possibilities of social advancement for many young Poles, but in its initial phase, the damages it causes to the natural environment were not taken into account. These events were also connected with the growing urbanisation of the country. All the above, after the initial euphoria of the rulers and the media acting on their referral, induced the general society to seriously reflect on the issues of environmental hazards. A number

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of initiatives were undertaken, the purpose of which was to counteract the progressing process of its degradation. Currently, the state and the local government authorities allocate significant funds for pro-environmental activities. Pro-environmental activities and their numerous aspects are described in more detail in the work of Matczak [2000].

The primary purpose of this article is to perform a synthetic evaluation of all pro-environmental actions undertaken in particular voivodships of our country. It has been assumed that pro-environmental activities are a phenomenon so complex that it should be described by means of more than ten variables, hereinafter referred to as diagnostic variables. The research uses methods within the scope of multi-dimensional comparative analysis. The final result of the applied procedures is creation of a ranking of voivodships on the basis of the level of a complex phenomenon, namely the undertaken pro-environmental activities. Therefore, the author wanted to show any possible regional disproportions in this respect.

Selection of diagnostic features

Selection of diagnostic variables (features) in the process of construction of a ranking of items on the basis of the level of a complex phenomenon is an extremely important activity, as it radically affects its structure.

The s of diagnostic variables (X_1, …, X_s) selected from among their greater number are to describe the level of the examined complex phenomenon in r items (0_1, …, 0_r). Therefore, the value of the j-th variable in i-th item is marked as x_{ij}. When selecting diagnostic features, two criteria have been taken into account:

- substantive, taking account of the importance of the feature in the characteristics of the complex phenomenon,
- sufficient variability of a feature classified to the set of characteristics describing them.

The criterion of sufficient variability is defined by two conditions that the selected feature must simultaneously meet: $V(X_j) > 0.1$ and $I(X_j) > 2$.

Whereas:
$$V(X_j) = \frac{S(X_j)}{\overline{X}_j}, \qquad \overline{X}_j > 0, \qquad (j = 1, \ldots, s) \tag{1}$$

and
$$I(X_j) = \frac{\max_i x_{ij}}{\min_i x_{ij}}, \qquad \min_i x_{ij} > 0, \qquad (i = 1, \ldots, r) \tag{2}$$

The following variables have been selected on the basis of the aforementioned criteria:

X_1 – the share of legally protected areas in the voivodship's surface area (%),
X_2 – the surface area of legally protected areas per 1 inhabitant (m^2),
X_3 – the share of industrial and municipal sewage drained through the sewerage network in the overall volume of industrial and municipal sewage (%),
X_4 – the share of non-treated industrial and municipal sewage to treated industrial and municipal sewage (%),
X_5 – outlays for sewage management and water protection per 1 inhabitant (PLN),
X_6 – outlays for waste management per 1 inhabitant (PLN),
X_7 – selectively collected waste per 1 inhabitant (kg),
X_8 – outlays for protection of air and climate per 1 km^2 (PLN),
X_9 – outlays for reduction of noise and vibrations per 1 km^2 (PLN),
X_{10} – outlays for public sewage treatment plants per 1 inhabitant (PLN),
X_{11} – outlays for fixed assets used for environmental protection per 1 km^2 (PLN).

METHOD OF CONSTRUCTION OF A RANKING OF ITEMS ON THE BASIS OF THE LEVEL OF A COMPLEX PHENOMENON

Bearing in mind that each complex phenomenon is described by several diagnostic variables: at least two – definition of a complex phenomenon [Kukuła 2000] – these features varied in terms of size and dimension should be unified. It is also necessary to remember that the aforementioned features may differ in nature, i.e. growth in some positively affects the level of evaluation of a complex phenomenon, and growth in other variables negatively impacts the evaluation of the examined phenomenon. The former variables belong to the set of *boosters* (*S*), while the latter form the set of *dampers* (*D*). There are also features that behave like boosters only up to a certain value, and from a certain level of the value the act as dampers. Those variables are *neutral variables* (*N*). This study features only variables that are boosters or dampers.

The identified features, with regard to their nature, still have various dimensions and size ranges, so they cannot be directly compared and added. In order to make them comparable and additive, the procedure of standardisation of diagnostic features should be used through one of the standardisation methods. There are several standardisation methods [Hellwig 1968, Pluta 1977, Borys 1978, Nowak 1990, Strahl 1990]. Nonetheless, a procedure meeting all standardisation conditions that are imposed on methods of linear ordering is *the zero unitarisation method* (abbrev. ZUM).

Assuming that, after selection, we have *p* of selected diagnostic variables in *r*, of items, this piece of information can be presented in the form of an **X** matrix:

$$\mathbf{X} = \left[x_{ij}\right] = \begin{bmatrix} x_{11} & x_{12} & \ldots & x_{1p} \\ x_{21} & x_{22} & \ldots & x_{2p} \\ \ldots & \ldots & \ldots & \ldots \\ x_{r1} & x_{r2} & \ldots & x_{rp} \end{bmatrix}, \quad \begin{pmatrix} i = 1, \ldots, r \\ j = 1, \ldots, p \end{pmatrix} \tag{3}$$

where: x_{ij} – value of *j*-th diagnostic variable in *i*-th item.

Standardisation consists in transformation of feature X_j into variable Z_j deprived of dimension and meeting specific conditions.

Standardisation of booster features ($X_j \in S$) in ZUM is performed using the following formula:

$$z_{ij} = \frac{x_{ij} - \min\limits_i x_{ij}}{\max\limits_i x_{ij} - \min\limits_i x_{ij}} \tag{4}$$

While damper features ($X_j \in D$) are standardised by means of the following formula:

$$z_{ij} = \frac{\max\limits_i x_{ij} - x_{ij}}{\max\limits_i x_{ij} - \min\limits_i x_{ij}} \tag{5}$$

Features standardised using formulas (4) and (5) meet all the conditions of comparability and additivity, since their values have a constant interval of variability:

$$z_{ij} \in [0, 1] \tag{6}$$

For boosters:

$$z_{ij} = 0 \text{ when } x_{ij} = \min_i x_{ij}$$

$$\text{and} \quad z_{ij} = 1 \text{ when } x_{ij} = \max_i x_{ij} \tag{7}$$

While for dampers we have:

$$z_{ij} = 0 \text{ when } x_{ij} = \max_i x_{ij}$$

$$\text{and} \quad z_{ij} = 1 \text{ when } x_{ij} = \min_i x_{ij} \tag{8}$$

The transformed original values of diagnostic variables according to the formulas (4) and (5) form a matrix of standardisations:

$$\mathbf{Z} = \left[z_{ij}\right] = \begin{bmatrix} z_{11} & z_{12} & \ldots & z_{1p} \\ z_{21} & z_{22} & \ldots & z_{2p} \\ \ldots & \ldots & \ldots & \ldots \\ z_{r1} & z_{r2} & \ldots & z_{rp} \end{bmatrix}, \quad \begin{pmatrix} i = 1, 2, \ldots, r \\ j = 1, 2, \ldots, p \end{pmatrix} \tag{9}$$

Standardisations of diagnostic features contained in the formula (9) meet the principle of additivity. Therefore, they allow for determining the value of the synthetic variable (Q_i) for each item with the use of the following formula:

$$Q_1 = \frac{1}{p}\sum_{j=1}^{p} z_{ij}, \qquad (i = 1, \ldots, r) \tag{10}$$

Values of the synthetic variable designated this way constitute multiple-criteria evaluation of each of the r of examined objects. On the basis of these evaluations, the construction of a ranking can commence, classifying items from the best one $\left(\max_i Q_i\right)$ – the first item in the ranking – to the weakest one, holding the last r-th position in the ranking $\left(\min_i Q_i\right)$ It is worth mentioning the fact that synthetic variables also have standardised values:

$$Q_j \in [0, 1], (i = 1, \ldots, r) \tag{11}$$

Later, the range of the synthetic variable should be determined using the formula:

$$R(Q_i) = \max_i Q_i - \min_i Q_i \tag{12}$$

Items that are contained in the ranking are ordered non-ascendingly, according to the attributable value of synthetic variable. Our goal is to divide the set of r items into k groups: G_1, G_2, …, G_k. The group number is marked with the l symbol, where ($l = 1, 2, \ldots, k$) and $k \leq r$. Assuming that the empirical distribution of the synthetic variable Q is similar to the uniform (rectangular) distribution, division of all items included in the ranking into k groups has been proposed, in a manner which is described by the general formula:

$$G_l \text{ for } Q_i \in \left[\min_i Q_i + \frac{k-l}{k} R(Q_i),\ \min_i Q_i + \frac{k-l+1}{k} R(Q_i) \right], \quad \begin{pmatrix} l = 1, 2, ..., k \\ i = 1, 2, ..., r \end{pmatrix} \tag{13}$$

In our research, with a relatively small set of items ($r = 16$ voivodships), it was deemed purposeful to divide them into 3 groups ($k = 3$). Using the general formula (13) for division into groups, the ranges of the synthetic variable values relevant for each of the three groups have been determined:

- G_1 – the group with the high level of the examined phenomenon;
- G_2 – the group with the average level of the phenomenon;
- G_3 – the group with the low level of this phenomenon.

And so:

$$G_1 \text{ for } Q_i \in \left[\min_i Q_i + \frac{2}{3} R(Q_i),\ \min_i Q_i + R(Q_i) \right] \tag{14}$$

$$G_2 \text{ for } Q_i \in \left[\min_i Q_i + \frac{1}{3} R(Q_i),\ \min_i Q_i + \frac{2}{3} R(Q_i) \right] \tag{15}$$

$$G_3 \text{ for } Q_i \in \left[\min_i Q_i,\ \min_i Q_i + \frac{1}{3} R(Q_i) \right], \quad (l = 1, 2, 3) \tag{16}$$

RESULTS OF THE STUDY

When evaluating the results of the conducted study, it is impossible to ignore the results defining the degree of variability of selected diagnostic features. The highest degree of variability from among the eleven selected variables have been found in 4 features:

- X_9 – outlays for reduction of noise and vibrations (PLN·1 km^{-2}), [$V(X_9) = 1.64$; $I(X_9)9 \cong 42$];
- X_4 – percentage share of industrial and municipal sewage drained through the sewerage network in the overall volume of treated sewage, [$V(X_4) = 1.65$; $I(X_4)1 \cong 83$],
- X_8 – outlays for protection of air and climate (PLN·km^{-2}), [$V(X_8) = 0.95$; $I(X_8)\ 6 \cong 9$];
- X_6 – outlays for waste management (PLN·person^{-1}), [$V(X_6) = 0.99$; $I(X_6) \cong 40$].

The aforementioned features most heavily differentiate particular voivodships and therefore are variables desired when constructing their ranking. This ranking is supposed to assess the degree of involvement of voivodships in pro-environmental activities in their area.

Another action that has been undertaken is standardisation of original variables contained in Table 1. Using formulas (4) and (5), they have been standardised. Original features are unified with regard to size, without dimensions, and are additive. Thus they can be added. As a result of application of the formula (10), values of the synthetic variable Q_i have been determined. This variable is a multiple criteria evaluation of each of the sixteen voivodeships. The greater its value, the higher position the given voivodeship holds in the ranking. Synthetic variables ordered non-ascendingly are the basis for construction of the ranking of voivodships due to the pro-environmental activities undertaken by these units. Their ranking is presented in Table 1.

Table 1. Ranking of voivodships on the basis of the level of pro-environmental activities in 2015

Rank	Voivodship	Values of the synthetic variable Q_i	Group
1	Małopolskie	0.519	$Q_i \in [0.432; 0.519]$ I (4 voivodships)
2	Śląskie	0.493	
3	Lubuskie	0.459	
4	Pomorskie	0.448	
5	Mazowieckie	0.409	$Q_i \in [0.346; 0.432]$ II (6 voivodships)
6	Łódzkie	0.403	
7	Wielkopolskie	0.392	
8	Podlaskie	0.357	
9	Opolskie	0.352	
10	Kujawsko-Pomorskie	0.350	
11	Dolnośląskie	0.339	$Q_i \in [0.259; 0.346]$ III (6 voivodships)
12	Warmińsko-Mazurskie	0.334	
13	Podkarpackie	0.309	
14	Świętokrzyskie	0.300	
15	Lubelskie	0.266	
16	Zachodniopomorskie	0.259	
	$I(Q_i)$	2.004	

Source: Prepared by the author.

Later, the voivodships have been divided into 3 groups using the procedure described with formulas (13–16):

- Group I contains items with a high level of pro-environmental activities;
- Group II contains items with an average level of pro-environmental activities;
- Group III contains items with a relatively low level of pro-environmental activities.

The first group, characterised by a relatively high degree of involvement in pro-environmental activities, includes 4 voivodships: Małopolskie, Śląskie, Lubuskie and Pomorskie.

The second group, with the average level of pro-environmental activities, includes 6 voivodships: Mazowieckie, Łódzkie, Wielkopolskie, Podlaskie, Opolskie, and Kujawsko-Pomorskie.

The third group, with the relatively low level of pro-environmental activities, also contains 6 voivodships: Dolnośląskie, Warmińsko-Mazurskie, Podkarpackie, Świętokrzyskie, Lubelskie, and Zachodniopomorskie.

Analysis of Figure 1, illustrating the spatial layout of voivodships due to the examined complex phenomenon, induces to formulate three questions:

1. Is the intensity of activities for environmental protection in Poland spatially diverse?
2. What is the evaluation of the degree of these differences?
3. What is the spatial distribution of the level of pro-environmental activities between voivodships?

With regard to the first issue, it should be stated that the level of pro-environmental activities in particular voivodships demonstrates some differences. Are these differences substantial? To answer the second issue raised, a quotient of extreme values of the synthetic variable Q_i has been used, calculated according to the formula (2). According to the obtained result [$I(Q_i) \cong 2$], the result for the Małopolskie Voivodship, holding the first position in the ranking, is slightly over twice as high as the result for the Zachodniopomorskie Voivodship, which is the last one in the ranking. When comparing results of other rankings [Kukuła 2014a, b, Kisielińska 2016], it should be stated that this degree of diversity is moderate or even low. This equalisation of levels of pro-environmental activities found in the examined items is an expression of the authorities of particular voivodships treating problems related to environmental protection seriously.

Fig. 1. Groups of voivodships due to the level of pro-environmental activities in 2015

Source: Prepared by the author.

In order to advance to the spatial analysis of the examined phenomenon, it is necessary to take a look at Table 1. It can be easily noted that voivodships of group I (the best one) are relatively small in number (4 items). Three of them (Małopolskie, Śląskie and Pomorskie) are strongly urbanised and industrialised units, emitting high amounts of harmful substances, in both liquid and gas form. Therefore, it is logical that they try to neutralise the negative effects of their business operations to some degree. One item left from this group is the Lubuskie Voivodship. This item is characterised by the greatest degree of forestation in Poland and is one of the cleanest voivodships. Therefore, it is observed that the authorities of this voivodship take care to ensure the quality of the natural environment, which can be seen in the form of outlays for improvement in its quality.

Group II, with the average level of pro-environmental activities, consists of 6 items. These are the following voivodships: Mazowieckie, Łódzkie, Wielkopolskie, Podlaskie, Opolskie, and Kujawsko-Pomorskie. These items have similar characteristics to items in the first group, but the degree of industrialisation is slightly lower than in the aforementioned group.

Group III also contains 6 items. This group includes the following voivodships: Dolnośląskie, Warmińsko-Mazurskie, Podkarpackie, Świętokrzyskie, Lubelskie, and Zachodniopomorskie. These items belong to voivodships with low degree of pollution (apart from Dolnośląskie Voivodship), and thus spend less funds on pro-environmental activities.

CONCLUSIONS

Considering the recommendations arising from the Polish legislation within the scope of environmental protection, the spatial distribution of shaping of this sphere of activities should be analysed. Construction of the ranking of voivodships constitutes an up-to-date image of the condition of pro-environmental activities implemented in particular voivodships in 2015 (Table 1). Completion of the research induces to formulate several conclusions and observations of a more general nature.

1. In the regional research of complex phenomena, including research related to evaluation of pro-environmental activities, an important, invaluable role is played by multi-dimensional comparative analysis, fragments of which are presented in this thesis.
2. As a result of application of the concerned research apparatus, it has been determined that some differences occur in the level of activities for environmental protection undertaken by particular voivodships.
3. The degree of diversification of voivodships due to the discussed phenomenon should be assessed as relatively low [$I(Q_i) \cong 2$]. This opinion is confirmed in the results of the study on spatial distribution of pollution in Poland [Kukuła 2000]. In this case, the quotient of extreme values of the synthetic variable is at a significantly higher level, reaching the value of over 33.
4. In the set of 16 examined voivodships ordered due to the discussed complex phenomenon, a small their number (only 4 items) was qualified to the first group with high involvement in environmental protection activities. The remaining two groups, each containing 6 voivodships, represent an average and a low level of pro-environmental activities.
5. The obtained spatial distribution of the synthetic variable should be assessed negatively despite their relatively even scores in particular voivodships. This raises a question: is this relatively equalised level of pro-environmental activities in particular voivodships appropriate in confrontation with very large diversity in the degree of their pollution [Kukuła 2014a].
6. In order to obtaining proper proportions between the level of pro-environmental activities in voivodships and the degree of their pollution, we should, on the one hand, gradually eliminate the reasons for pollution emission, while on the other hand, increase efforts related to pro-environmental activities in voivodships which are the greatest polluters of the natural environment.
7. Implementation of this postulate will result in deepening of the degree of diversification of voivodships due to the undertaken pro-environmental activities, i.e. increase in the value of parameter $I(Q_i)$.

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DZIAŁALNOŚĆ PROEKOLOGICZNA W POLSCE W 2015 ROKU (STUDIUM REGIONALNE)

STRESZCZENIE

Autor artykułu stawia przed sobą dwa zadania. Pierwszym jest próba przedstawienia techniki budowy rankingu obiektów (tu województw) ze względu na poziom zjawiska złożonego, a w dalszej kolejności prezentacja metody podziału obiektów na grupy o zbliżonych wartościach zmiennej syntetycznej. Drugim celem jest ukazanie stanu działalności proekologicznej w Polsce w 2015 roku w układzie regionalnym. Do realizacji tego celu wyselekcjonowano zmienne diagnostyczne opisujące stan działalności na rzecz ochrony środowiska. Według merytorycznych oraz dostatecznych zmienności wybrano 11 cech diagnostycznych. Zmienne te stanowią podstawę wielokryterialnej oceny badanego zjawiska złożonego (działalność proekologiczna). Na podstawie opisanej procedury stworzono ranking województw ze względu na stan działań na rzecz środowiska w Polsce. Zbiór obiektów (województw) podzielono na 3 grupy: grupa I (G_1) województwa o wysokim, grupa II (G_2) województwa o przeciętnym i grupa III (G_3) o relatywnie niskim poziomie działalności proekologicznej. Proporcje ilościowe województw w poszczególnych grupach kształtują się następująco: $G_1 : G_2 : G_3$ jak 4 : 6 : 6.

Słowa kluczowe: ochrona środowiska, województwo, zmienna diagnostyczna, zmienna syntetyczna, ranking

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 103–112
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.49

ORIGINAL PAPER

Received: 08.10.2017
Accepted: 06.12.2017

DIFFERENCES IN INCOME DISTRIBUTIONS FOR MEN AND WOMEN IN POLAND – AN ANALYSIS USING DECOMPOSITION TECHNIQUES

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ABSTRACT

In the paper, we compare income distributions in Poland, taking into account gender differences. The gender pay gap can only be partially explained by differences in men's and women's characteristics. The unexplained part of the gap is usually attributed to the wage discrimination. The objective of the study is to extend the Oaxaca-Blinder decomposition procedure to different quantile points along the income distribution. We utilize such decomposition methods as the residual imputation approach, the reweighting approach and the RIF-regression method to describe differences between the incomes of men and women along the two distributions. We evaluate the strength of the influence of personal characteristics onto the various parts of the income distributions. The analysis is based on data from the EU-SILC data for Poland in 2014.

Key words: wage gap, differences in distributions, decomposition methods

INTRODUCTION

Recently there has been an increase in interest in the studies of income (wages) inequalities. Numerous empirical studies tend to focus on the gender wage gaps. The findings of these studies show that males earn substantially higher wages than females. Women are paid only a part of what men with similar characteristics are paid.

A variety of techniques of income inequalities decomposition are becoming more popular. Many procedures go far beyond the simple comparison of average values proposed by Oaxaca [1973] and Blinder [1973]. They allow to decompose the variance or the differences along the whole distributions. These techniques are useful in studying differences of income distributions for various groups of people. The past studies in Poland concentrated mainly on the decomposition of the average values for incomes [Słoczyński 2012, Śliwicki and Ryczkowski 2014]. Only a few analyses go beyond the simple mean-decomposition [Rokicka and Ruzik 2010, Landmesser et al. 2015, Landmesser 2016]. The aim of this work is to study differences between income distributions for men and women in Poland in 2014. The empirical investigation is based on data from the European Union Statistics on Income and Living Conditions project for Poland.

To decompose the differences between two distributions one uses the so-called counterfactual distribution, which is a mixture of a conditional distribution of the dependent variable and a distribution of the explanatory variables. Such a counterfactual distribution can be constructed in various ways [DiNardo et al. 1996, Donald et al. 2000, Machado and Mata 2005, Fortin et al. 2010]. We will examine the differences in the entire range of income values by the use of the residual imputation approach (JMP-approach) [Juhn et al. 1993] and the reweighting approach [DiNardo et al. 1996]. It will also be found how the men's and women's characteristics

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(the explanatory variables in estimated models) influence various ranges of income distributions using the *RIF*-regression method (recentered influence function) [Firpo et al. 2009].

METHODS OF THE ANALYSIS

Let Y_g denote the outcome variable in group g (e.g. the personal income in men's group, $g = M$, or in women's group, $g = W$) and X_g the vector of individual characteristics of the person in group g (e.g. age, education level, number of years spent in paid work). The expected value of y conditionally on X is a linear function $y_g = X_g\beta_g + v_g$, $g = M, W$, where β_g are the returns to the characteristics. The Oaxaca-Blinder decomposition for the average income inequality between two groups at the aggregate level can be expressed as

$$\hat{\Delta}^{\mu} = \bar{Y}_M - \bar{Y}_W = \bar{X}_M\hat{\beta}_M - \bar{X}_W\hat{\beta}_W = \underbrace{\bar{X}_M(\hat{\beta}_M - \hat{\beta}_W)}_{\hat{\Delta}^{\mu}_{\text{unexplained}}} + \underbrace{(\bar{X}_M - \bar{X}_W)\hat{\beta}_W}_{\hat{\Delta}^{\mu}_{\text{explained}}} \tag{1}$$

The first component, on the right side of the equation, called the unexplained effect, is the result of differences in the returns to observables. This is the result of differences in the estimated parameters, and so in the "prices" of individual characteristics of group representatives. It can be interpreted as the labor market discrimination. The second term gives the effect of characteristics and expresses the difference of the potentials of people in two groups (the so-called explained effect). Also the detailed decomposition may be calculated. A drawback of the approach is that it focuses only on average effects which may lead to a misleading assessment if the effects of covariates vary across the wage distribution.

Let $F_{Y_g}(y)$ be the distribution function for the variable Y in group g, which can be expressed using the conditional distribution $F_{Y_g|X,D_g}(y|X = x)$ of Y and the joint distribution $F_{X|D_g}(X)$ of all elements of X ($D_g = 1$ if $g = M$; $D_g = 0$ if $g = W$):

$$F_{Y_g|D_g}(y) = \int F_{Y_g|X,D_g}(y|X = x) \cdot F_{X|D_g}(X)\,dx, \qquad g = M,W \tag{2}$$

Now, we extend the mean decomposition analysis to the case of differences between the two distributions using the counterfactual distribution $F_{Y_W^C}(y) = \int F_{Y_W|X_W}(y|X) \cdot dF_{X_M}(X)$ (distribution of incomes that would prevail for people in group W if they had the distribution of characteristics of group M):

$$F_{Y_M}(y) - F_{Y_W}(y) = \underbrace{[F_{Y_M}(y) - F_{Y_W^C}(y)]}_{\substack{\hat{\Delta}^{\mu}_{\text{unexplained}} \\ \text{(structure effect)}}} + \underbrace{[F_{Y_W^C}(y) - F_{Y_W}(y)]}_{\substack{\hat{\Delta}^{\mu}_{\text{explained}} \\ \text{(composition effect)}}}. \tag{3}$$

The counterfactual distribution can be constructed using the residual imputation approach [Juhn et al. 1993]. In this method, we estimate the two equations: $y_{Wi} = X_{Wi}\beta_W + v_{Wi}$ and $y_{Mi} = X_{Mi}\beta_M + v_{Mi}$, $i = 1, \ldots, n$. Then, the wage y_M form the group M is replaced by a counterfactual wage y_W^C, where both the returns to observables and residuals are set to be as in group W. The implementation of the procedure is as follows:

1. The residuals are replaced by counterfactual residuals under the assumption of the rank preservation: $y_{Wi}^{C,1} = X_{Mi}\beta_M + v_{Wi}^{C,1}$, $i = 1, \ldots, n$, where $v_{Wi}^{C,1} = F^{-1}_{v_W|X}(\tau_{Mi}(X_{Mi}), X_{Mi})$ and $\tau_{Mi}(X_{Mi})$ is the conditional rank of v_{Mi} in the distribution of residuals for M.
2. The counterfactual returns to observables are imputed: $y_{Wi}^{C,2} = X_{Mi}\beta_W + v_{Wi}^{C,1}$, $i = 1, \ldots, n$.

Another way of estimating the counterfactual distribution is to replace the marginal distribution of X for group W with the marginal distribution of X for group M using a reweighting factor $\Psi(X)$. This reweighting approach was introduced by DiNardo, Fortin and Lemieux [1996]. The counterfactual distribution (distribution of incomes that would prevail for women if they had the distribution of men's characteristics) is constructed as

$$F_{Y_W^C}(y) = \int F_{Y_W|X_W}(y|X)\Psi(X)dF_{X_W}(X) \text{ with } \Psi(X) = dF_{X_M}(X)/dF_{X_W}(X) \quad (4)$$

where: $\Psi(X) = \frac{dF_{X_M}(X)}{dF_{X_W}(X)} = \frac{\Pr(X|D_M = 1)}{\Pr(X|D_M = 0)} = \frac{\Pr(D_M = 1|X)/\Pr(D_M = 1)}{\Pr(D_M = 0|X)/\Pr(D_M = 0)}$.

The reweighting factor value $\hat{\Psi}(X)$ can be computed for each observation by estimating a logit or probit model for probabilities of belonging to groups M and W ($\hat{\Pr}(D_M = 1|X)$ and $\hat{\Pr}(D_M = 0|X)$) and using the sample proportions in two groups ($\hat{\Pr}(D_M = 1)$ and $\hat{\Pr}(D_M = 0)$). Then the probability density function can be estimated using kernel density methods.

A limitation of the residual imputation approach and the reweighting approach is the difficult way to extended it to the case of the detailed decomposition. The detailed decomposition can be easy performed by the RIF-regression method [Firpo et al. 2009]. This method is similar to a linear regression, except that the variable y is replaced by the recentered influence function of the statistic of interest. We define the recentered influence function as:

$$RIF(y,Q_\tau) = Q_\tau + IF(y,Q_\tau) = Q_\tau + \frac{\tau - \mathrm{I}\{y \le Q_\tau\}}{f_Y(Q_\tau)} \quad (5)$$

where: $IF(y, Q_\tau)$ – influence function corresponding to an income y for the quantile Q_τ of the distribution $F_{Y;}$
I $\{y \le Q_\tau\}$– indicator variable for whether the income y is smaller or equal to the quantile Q_τ.

The conditional expectation of $RIF(y, Q_\tau)$ can be modeled as a linear function of the explanatory variables $E[RIF(y, Q_\tau | X)] = X\beta_\tau + \varepsilon$, where the parameters β_τ can be estimated by OLS. In the approach, we first compute the sample quantile $\hat{Q}_\tau$ and estimate the density $\hat{f}_Y(\hat{Q}_\tau)$ using kernel methods. Then, we estimate the linear probability model for the proportion of people with income less than $\hat{Q}_\tau$, calculate the *RIF* of each observation and run regressions of the *RIF* on the vector X. The aggregated and detailed decomposition for any unconditional quantile is then:

$$\hat{\Delta}^\tau = \bar{X}_M(\hat{\beta}_{M,\tau} - \hat{\beta}_{W,\tau}) + (\bar{X}_M - \bar{X}_W)\hat{\beta}_{W,\tau} = \sum_{j=1}^{k}(\bar{X}_{jM}(\hat{\beta}_{jM,\tau} - \hat{\beta}_{jW,\tau}) + (\bar{X}_{jM} - \bar{X}_{jW})\hat{\beta}_{jW,\tau}) \quad (6)$$

DATA BASIS

The empirical data used have been collected within the European Union Statistics on Income and Living Conditions project for Poland in 2014 (research proposal 234/2016-EU-SILC). The sample consists of 5,177 men and 4,727 women. Each person is described by the following characteristics: *age* (in years), *educlevel* (education level, 1 − primary, . . ., 5 − tertiary), *married* (marital status, 1 − married, 0 − unmarried), *yearswork* (number of years spent in paid work), *permanent* (type of contract, 1 − permanent job/work contract of unlimited duration,

0 − temporary contract of limited duration), *parttime* (1 − person working part-time, 0 − person working full-time), *manager* (managerial position, 1 − supervisory, 0 − non-supervisory), *big* (number of persons working at the local unit, 1 − more than 10 persons, 0 − less than 11 persons). The sample features presents Table 1.

Table 1. The selected sample features

Characteristic		Men	Women	Characteristic	Men	Women
Number of observators		5 177	4,727	average *age*	42.07	42.36
average *income*		7 165.94	5 900.21	average *yearswork*	20.09	18.46
educlevel	= 1	4.91%	3.89%	*married* = 1	71.53%	69.60%
	= 2	1.45%	0.55%	*permanent* = 1	70.60%	71.63%
	= 3	68.57%	47.32%	*parttime* = 1	4.31%	10.09%
	= 4	2.55%	7.91%	*manager* = 1	18.68%	15.74%
	= 5	22.52%	40.32%	*big* = 1	82.91%	80.18%

Source: Own calculations.

The annual net employee (cash or near cash) incomes of men were compared with those obtained by women. Employee income is defined as the total remuneration payable by an employer to an employee in return for work done by the latter during one year. The net employee income corresponds to the gross employee income (mainly wages and salaries paid for the time worked or work done in the main and any secondary job(s), remuneration for the time not worked, enhanced rates of pay for overtime, payments for fostering children, supplementary payments (e.g. thirteenth month payment)) but the tax at source, the social insurance contributions are deducted. In our empirical decomposition analysis the logarithm of the annual income (*log_income*) constitutes the outcome variable.

EMPIRICAL ANALYSIS

Results of Oaxaca-Blinder decomposition for differences in mean log incomes

Table 2 presents the results of the aggregate and detailed Oaxaca-Blinder decomposition of inequalities between men's and women's log incomes in 2014. The mean predicted log income for men equals 8.670 (annual net income = 5,825.50 Euro), and for women equals 8.483 (annual net income = 4,831.92 Euro). There is a positive difference between the mean values of log incomes for men or women (the mean log income differential is 0.186). The difference between the mean log income values was decomposed into two components: the first one explaining the contribution of the different values of models coefficients (the unexplained part) and the second one explaining the contribution of the attributes differences (the explained part). The unexplained effect is huge and positive (0.212), but the explained is very low and negative (–0.026), which means that the inequalities examined should be assigned in the majority to the coefficients of estimated models (rather than to the differentiation of individual characteristics).

The detailed decomposition, which was also carried out, made it possible to isolate the factors explaining the inequality observed to a different extent. The strong effect of different education levels of men and women can be noticed (Table 2). The negative value of the adequate component (which equals –0.087) means that the difference of the average log incomes between men and women is mostly reduced by the women's

Table 2. The Oaxaca-Blinder decomposition of the average log income differences

Specification	Value	Detailed decomposition		
Mean log income men	8.670	Variable	Unexplained component	Explained component
Mean log income women	8.483	*age*	–0.170	0.000
Raw differential	0.186	*educlevel*	–0.095	–0.087
		married	0.094	0.001
		yearswork	–0.052	0.021
Aggregate decomposition		*permanent*	–0.049	–0.004
Unexplained effect	0.212	*parttime*	–0.006	0.031
Explained effect	–0.026	*manager*	0.015	0.007
% unexplained	113.98	*big*	–0.010	0.004
% explained	–13.98	*cons*	0.486	0.000
		Total	0.212	-0.026

Source: own elaboration using the Stata command 'decompose'

higher education levels. On the other hand, the values of *yearswork* and *parttime* attributes possessed by men and women increase the inequality in the average log incomes (see the positive component values 0.021 and 0.031). A different "evaluation" of personal characteristics (the unexplained component) allow the conclusion that women are discriminated against men (but not because of the education levels).

Results of the aggregate decomposition using the residual imputation approach

Since the Oaxaca-Blinder technique focuses only on average effects, next, we present the decomposition of inequalities along the distribution of log incomes for men and women using the *JMP*-approach. The results of this decomposition are shown in Table 3, where the inequalities are expressed in terms of percentiles. The symbols p5, p10, …, p95 stand for 5th, 10th, …, 95th percentile (e.g. the 5th percentile is the log income value below which 5% of the observations may be found). For each of the seven percentiles the total differences between the values of log incomes for men and women were computed (the 2nd column). Then these differences are expressed as the sum of the unexplained and explained components (the 3th and 4th column).

Table 3. The results of aggregate decomposition using the *JMP*-approach

Percentile	total difference	unexplained		explained	
p5	0.336	0.177	52.56%	0.160	47.44%
p10	0.285	0.196	68.76%	0.089	31.24%
p25	0.132	0.207	157.32%	–0.075	–57.32%
p50	0.140	0.202	143.59%	–0.061	–43.59%
p75	0.166	0.180	108.56%	–0.014	–8.56%
p90	0.212	0.166	78.59%	0.045	21.41%
p95	0.281	0.175	62.29%	0.106	37.71%

Source: Own elaboration using the Stata command 'jmpierce'.

There are positive differences between the values of log incomes for men and women along the whole log income distribution. The unexplained effect (effect of coefficients) is bigger and the explained (effect of characteristics) is lower, which indicates the importance of the "labor market value" of men's and women's attributes. Going across the rows to compare quantile effects shows that gender differences in characteristics increase the income inequalities at the bottom (below the 10th percentile) and at the top (above the 90th percentile) of the log income distribution (the 4th column). We can see that the share of the unexplained part is high (between 53 and 157 percent) and the effect of coefficients is positive in the whole range of the income distribution and is larger in the middle of the distribution (see the 3th column). This is the result of differences in the "market prices" of individual characteristics of men and women (interpreted as the labor market discrimination).

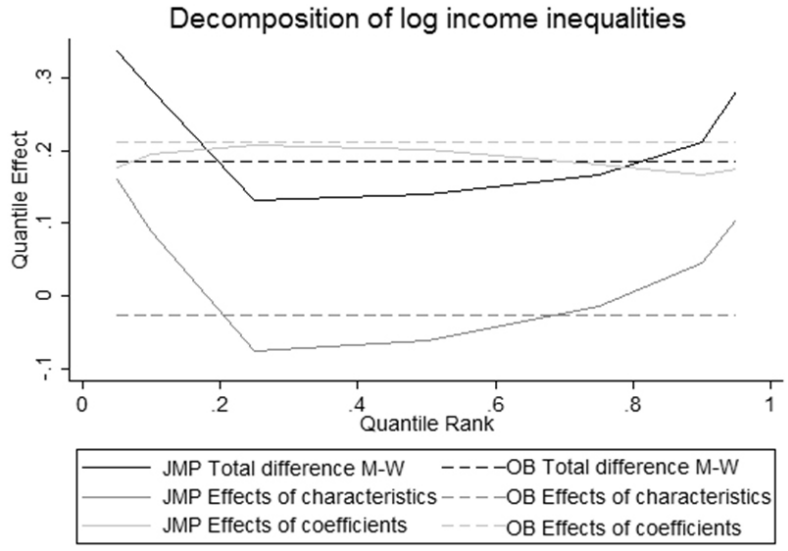

Fig. 1. The differences between the log income distributions for men and women calculated using the JMP-approach

Source: Own elaboration.

Figure 1 contains the differences between the log income distributions for men and women vs. quantile rank. The total effect is U-shaped. The positive values indicate on higher log income values for men than for women. The explained differential, first, is falling and, then, is growing as we move toward the top of the income distribution. We can see, that the effect of characteristics is positive at the bottom and at the top of the income distribution. The positive values observed mean that the different values of characteristics of men and women increase the income inequalities in these income ranges. In the middle of the distribution the effect of characteristics is negative, which means that the properties possessed by both people's groups decrease the inequalities.

Results of the aggregate decomposition using the reweighting approach

Looking at differences between the pairs of densities also provides a broad description of differences in the men's and women's incomes. The results of the decomposition using the reweighting approach are presented in Figure 2. Figure 2a plots the smoothed differences between men's log income density and the counterfactual density (density for incomes that would prevail for women if they had the distribution of men's character-

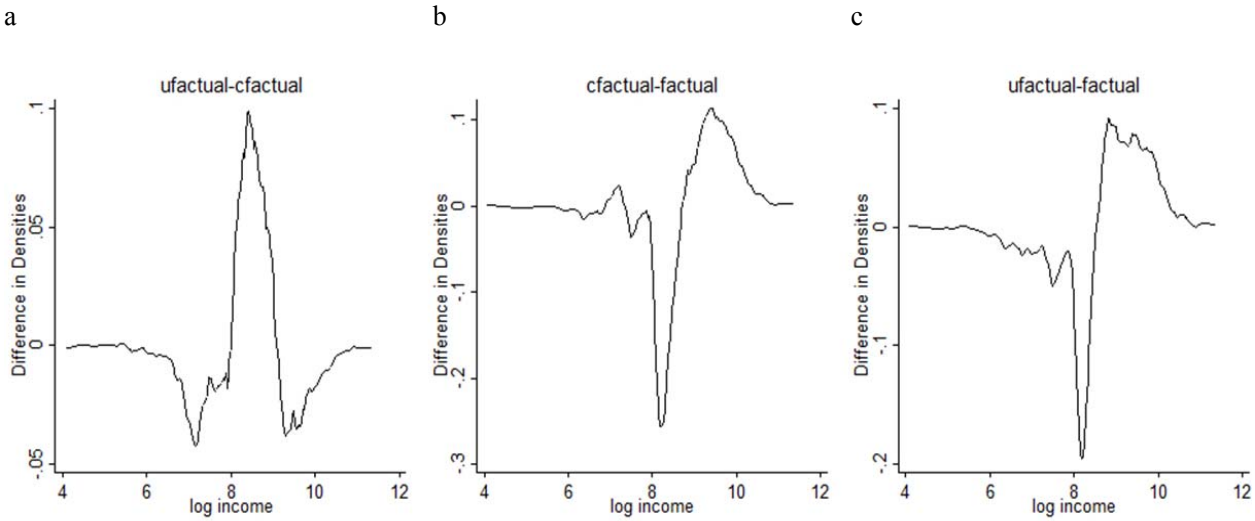

Fig. 2. The results of the decomposition using the reweighting approach

Source: Own elaboration.

istics). Figure 2b plots the smoothed differences between the counterfactual density and women's log income density. Figure 2c illustrates the estimated differences between the men's and women's log income densities (the estimated raw gap using the kernel densities).

We can notice that unexplained (Fig. 2a) and explained (Fig. 2b) effects play a large role in changes in overall wage inequality. One of the most important feature of the difference between the two distributions is the tall "hump" in Figure 2a, which presents the income discrimination on the labor market, which occurs mainly in the middle of the income distribution (the lower and upper tails of the distribution do not indicate discrimination). On the other hand, the deep down for the middle incomes in Figure 2b indicates that the different characteristics of men and women in this income group decrease the inequalities. The course of Figure 2c is compatible with the fact that the mass of men's income density is shifted to the right and the mass of the women's density is shifted to the left.

Results of the detailed decomposition using the RIF-regression approach

Now, for the same sample we change the method of the analysis to the RIF-regression approach. This method enables us to extend our analysis to the case of the detailed decomposition. Table 4 shows one of many results obtained of the detailed decomposition of inequalities along log income distributions.

These are only the results for 50th percentile of log income distributions (for the median log incomes; please do not confuse this with the results of decomposition for average log incomes presented in Table 2). In all, nine detailed decompositions for each decile were carried out (the results for the remaining eight deciles and the bootstrap errors are not presented here due to lack of space).

For better understanding of the results obtained and in order to formulate general conclusions, in Figure 3 we drew the values of explained (a) and unexplained (b) components for each variable and for each decile group (vs. quantile rank), for the log income inequalities observed between men and women. The ordinate axes present: on the panel (a) the values $(\overline{X}_{jM} - \overline{X}_{jW})\hat{\beta}_{jW,\tau}$ (detailed explained effects) and on the panel (b) the values $\overline{X}_{jM}(\hat{\beta}_{jM,\tau} - \hat{\beta}_{jW,\tau})$ (detailed unexplained effects).

Table 4. The example results of the RIF-regression approach – for 50th percentile only

Specification		Detailed decomposition		
		Variable	Unexplained component	Explained component
		age	–0.312	0.002
Raw differential	0.141	*educlevel*	–0.316	–0.077
		married	0.110	0.003
		yearswork	–0.041	0.016
Aggregate decomposition		*permanent*	–0.034	–0.002
		parttime	0.000	0.014
Unexplained effect	0.171	*manager*	0.018	0.009
Explained effect	–0.030	*big*	0.006	0.005
		cons	0.739	–
		Total	0.171	–0.030

Source: Own elaboration using the Stata command 'rifreg'.

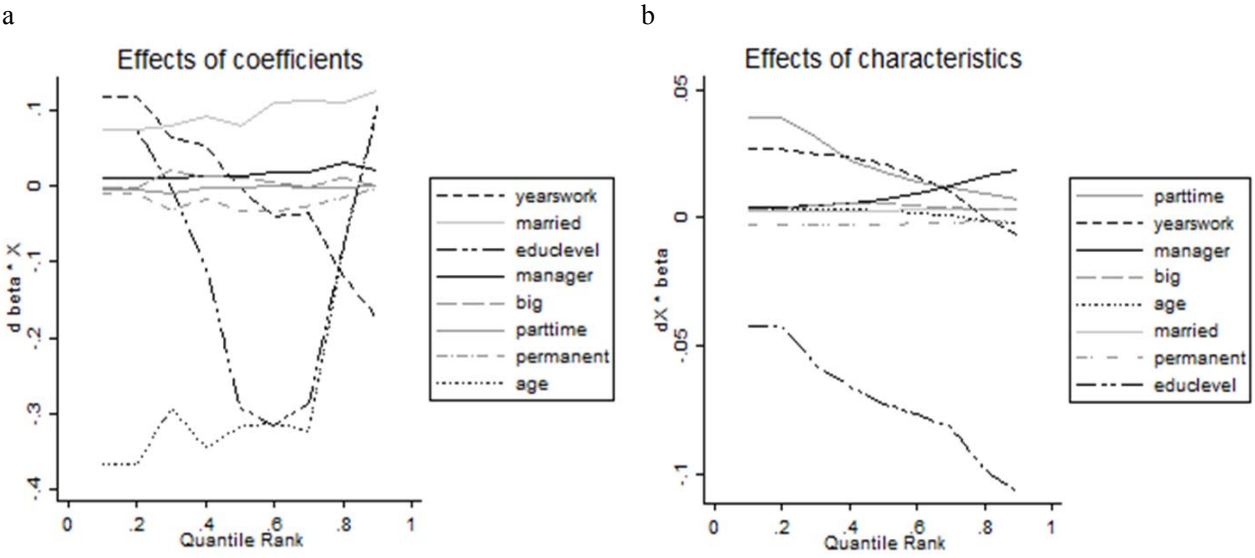

Fig. 3. The results of the RIF-regression approach for the detailed income inequalities decomposition

Source: Own elaboration.

The most important are effects related to the variables *educlevel* , *parttime* and *yearswork*. The *educlevel* has the greatest reduced influence on the differences between the log income distributions for men and women. It means that on average higher level of education among women decrease the income inequalities, especially as we move toward the top of the income distribution. For the variables *parttime* and *yearswork* we observe the influence, which enlarges log income differences but increasingly less as we move toward the top of the income distribution. The importance of both characteristics – *parttime* and *yearswork* – decreases with the size of income. The variable *manager* is less important, which has a stronger impact on higher quantiles of wage distribution. That indicates a shift of big incomes towards men. The influence of other variables is insignificant. The calculated values of unexplained effects for each variable and for each decile are presented in Figure 3b.

The changes in the returns to the attributes often have, unfortunately, insignificant effects. The effects of "prices" of variables: *married* (increasing income inequalities), *age* (decreasing) and *educlevel* (mostly decreasing) are noteworthy (and mostly significant).

CONCLUSIONS

The goal of this paper was to present the decomposition of inequalities between log incomes for men and women in Poland. We started with the decomposition of the average values for log incomes by using the Oaxaca-Blinder method. As has been documented in the previous research, we also found that there is a positive difference between the mean income values for men and women. The unexplained effect was big, but the explained was low. The decomposition showed the influence of the men's and women's attributes on the average log income differences. The most analyzed variables had the positive influence (that means they increased the inequalities observed). The variables with negative impact are *educlevel* and *permanent* what indicates that the difference of mean log incomes between men and women was reduced by women's higher education levels and more frequent permanent job contracts.

Then, we decomposed the inequalities between log incomes along the whole distribution using the JMP-residual imputation approach. The total effect was U-shaped. The explained effect was low again. An additional description of differences in densities of men's and women's incomes provided the reweighting approach, which captured the discrimination effect on the labor market and the effect of uneven mass distribution in both groups.

Many decomposition methods for distributional statistics other than the mean, allow only for the aggregate decomposition (like the JMP-residual imputation approach or the reweighting approach). The RIF-regression method allows the detailed decomposition and provides the approximation for the effect of various factors on changes in the distribution of the outcome variable. In our research the method of RIF-regression provided a way of showing the detailed decomposition of income inequalities and helped to exhibit the influence of the attributes on the whole log income distribution. The explained effects for most variables were statistically significant. The variable *educlevel* exerted the greatest reduced influence on the differences between the income distributions for men and women. Higher average levels of education among women decreased the income inequalities. The importance of *educlevel* characteristic increased with income. The part-time work enlarged the income differences but importance of this characteristic decreased with the size of income. Likewise, higher number of years spent in work increased the inequalities between men's and women's incomes (but the effect was weaker as the income grew). We also observed strong impact of managerial position in higher quantiles of income distribution, which indicates a shift of big incomes towards men.

It is noteworthy to mention that the procedure applied yields not only a presentation of where various factors have their greatest impact in the distribution but also can be used to explain of the processes occurring on the labor market. Our analysis confirmed that the gender wage gap in Poland can be poorly explained by gender differences in observable characteristics of people. The conducted decomposition showed that the discrimination component quantitatively dominates. The gender discrimination may lead to considerable loss in productivity and wealth, therefore inequalities induced in this way pose a serious challenge for politicians and society.

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RÓŻNICE W ROZKŁADACH DOCHODÓW MĘŻCZYZN I KOBIET W POLSCE – ANALIZA WYKORZYSTUJĄCA TECHNIKI DEKOMPOZYCYJNE

STRESZCZENIE

W pracy porównano rozkłady dochodów w Polsce, biorąc pod uwagę różnice zachodzące ze względu na płeć. Luka płacowa może być tylko fragmentarycznie wyjaśniona przez różne charakterystyki mężczyzn i kobiet, a jej niewyjaśniona część wiąże się z tzw. dyskryminacją płacową. Celem badania było rozszerzenie procedury dekompozycji nierówności Oaxaca-Blindera na różne kwantyle wzdłuż całego rozkładu dochodów. Opisu różnic między rozkładami dochodów dokonano wykorzystując takie metody dekompozycyjne jak podejście polegające na imputacji reszt, metodę ważenia oraz metodę zdecentrowanej funkcji wpływu. Oceniono również siłę oddziaływania charakterystyk osób w różnych fragmentach rozkładu dochodów. Wykorzystano dane z badania EU-SILC dla Polski w 2014 roku.

Słowa kluczowe: luka płacowa, różnice w rozkładach, metody dekompozycji

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 113–121
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.50

ORIGINAL PAPER

Received: 18.08.2017
Accepted: 19.12.2017

ORGANIC FARMING IN POLAND IN THE LIGHT OF MULTIVARIATE COMPARATIVE ANALYSIS

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ABSTRACT

Organic farming is an environmentally-friendly production system, which has been dynamically developing since 2004. The study attempts to conduct a spatial assessment of the development of this management method. The analysis covered data at the level of voivodships, originating from GIJHARS[1] and from the Central Statistical Office (GUS) from 2014, concerning producers respecting the production in the environmentally-friendly system. They include characteristics such as: average surface area, proportion of the area of arable lands, number of processing plants, production volume of: milk, cereals, vegetables, and fruit. The analysis uses the method of linear ordering of a set of objects, based on the created synthetic variable. The results of the study suggest that Polish voivodships are generally characterised by an average or low level of development of organic farming. A positive phenomenon is observed in the fact that organic farming develops in voivodships with a more fragmented agrarian structure.

Key words: organic farming, methods of linear ordering, diversity

INTRODUCTION

Organic farming fits within the concept of sustainable development. The strategy that should pursue social, economic and environmental objectives. It combines, as written by Kahl et al. [2010], actions which are to satisfy the basic needs of the society, improve the quality of life, and ensure appropriate quantity of goods and services with activities aiming at improvement in the condition of the natural environment and protection of its resources. Zegar [2012] emphasises the fact of the growing belief that the paradigm of industrial agriculture is an out-of-date concept, and the present challenge set for the agriculture is to feed the world, while simultaneously preserving biodiversity and the capacity of the global ecosystem to provide environmental services, and relieving the humanity of threats resulting from the overuse of synthetic chemical substances and other artificial growth-inducing substances.

Organic farming, as compared to integrated farming and conventional farming, is a form of management and production the most heavily related to the quality of the natural environment. It has more than a hundred years of history around the world. The basic purposes of organic farming are holistic and refer e.g. to production of high-quality food, implementation of activities supporting and preserving fertility and biological activity of soil, maintenance of genetic diversity of ecosystems, production of renewable raw materials, as well as

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support of local and regional production and distribution [Kreisberg 2006]. The base criteria of organic farming, which have become the basis for preparation of the first international regulation on organic farming and labelling of its products, were developed by the International Federation of Organic Agriculture Movements (IFOAM), created in 1972[2]. IFOAM adopted the following underlying principles, on which organic farming is based: health, ecology, fairness, and care.

Production of ecological food is developing both in well-developed countries, as well as in developing countries, which see the development of this type production as the source of export opportunities, a chance for workforce surplus management, an increase in incomes, as well as development of poor agricultural farms [Willer and Yussefi 2007]. The growing consumer expectations with regard to quality and health-improving qualities of food cause the growth in demand for organic products, and, at the same time, in opportunities for development of agricultural production generated using ecological methods [Komorowska 2014]. The organic food market, as written e.g. by Łuczka-Bakuła [2007], Runowski [2012], is developing in numerous countries around the world, but, above all, in wealthy countries, since the prices of organic products are usually explicitly higher than conventional products.

In Poland, organic farming has over half a century of tradition. Significant growth in the number of organic farms as well as the acreage of their crops was recorded after farmers had been directly covered in 1999 by financial support and after introduction of legal regulations in 2001. Poland's accession to the EU has created greater possibilities of financial support for organic producers and has opened sales markets, thus contributing to the increased interest in this agricultural system. Financial support of this production system is justified by the need to minimise the private risk of business operations related to [Łuczka-Bakuła 2013]: incurring additional costs of farm relocation, losses caused by reduction in yields, low acceptance of the price of organic food by consumers. The policy of supporting production and market of organic food, as stated by Komorowska [2006], is an important factor influencing the development of organic farming in Poland. It is also necessary to emphasise, as stated by the author, the utilisation of export opportunities, the combination of ecological production with the development of agritourism, or the development of entities integrating dispersed production.

Currently, the framework for all levels of production, distribution, control, and marking in the European Union is determined by the Council Regulation (EC) 834/2007[3], which is being continuously updated by regulations amending this Regulation. In Poland, the most important legal act is currently the Act of 25 June 2009 on Organic Farming[4], which is also subject to amendments and is published in subsequent legal acts. Since 2014, tasks related to the development of organic farming and the organic food market are implemented in Poland also in accordance with the Framework Action Plan for Organic Food and Farming for 2011–2014, prepared by the Ministry of Agriculture and Rural Development[5]. It is assumed that implementation of the planned activities (market development, promotion, information, production principles, control and certification, testing, environmental protection, cooperation) will lead to development of the whole eco-sector.

Agriculture in Poland is characterised by significant regional diversity. It is determined to a great extent by history. Also important is the impact of other environmental, demographic, economic, as well as sociocultural factors [Klepacki 2006]. Typological assessment of the development level of regions according to

[2] International Federation of Organic Agriculture Movements.

[3] Council Regulation EEC 834/2007/EC of 28 June 2007 on organic production and labelling of organic products. Official Journal of the EU of 2007, No 189, item 1, as amended.

[4] Act of 25 June 2009 on Organic Farming. Journal of Laws 2009. No 116, item 975.

[5] http://www.minrol.gov.pl/Jakosc-zywnosci/Rolnictwo-ekologiczne/Ramowy-Plan-Dzialan-dla-Zywnosci-i-Rolnictwa-Ekologicznego-w-Polsce (accessed on 1.08.2017).

Wysocki [2010] can be used as a tool for regional programming. The study covered a spatial analysis of the development of organic farming in Poland. For the purpose of comparison, groups of voivodships were distinguished, which are similar owing to the performed agricultural functions. The analysis used the method of linear ordering of a set of objects based on a synthetic variable, selected from an initial list of methods. The synthetic indicator allowed for arranging voivodships in terms of the development level of organic farming, as well as for selecting groups of similar objects.

MATERIALS AND METHOD OF STUDY

The analysis was conducted on the basis of data originating from Reports on the condition of organic farming in Poland[6], as well as Yearbooks of Agriculture[7]. The study covered Polish voivodships. Taking account of substantive and statistical premises, as well as the availability of data for the analysis the development level of organic farming, the following indicators were selected: average surface area of an organic farm[8] [ha] (X_1); number of processing plants of organic products and production of fodder and/or yeast (X_2); share of the area of arable lands (AL) of certified organic farms in total AL [%] (X_3); production volume of milk [million l] (X_4); production volume from certified organic cultivations, respectively: cereals [thousand t] (X_5), vegetables [thousand t] (X_6), fruit [thousand t] (X_7). All variables may be qualified to a set of stimuli[9]. It was assumed in the study that each variable is a stimulus and contributes the same portion of information to the evaluation of the examined objects, and that the weights of all variables are the same and amount to one.

In the first stage of the study, seven methods of linear ordering were selected, based on the synthetic variable[10], which are often used and, in the author's opinion, have are commonly found in the subject literature, and then rankings[11] of the examined objects were prepared with the use of each of them:

- model methods: R1 – Hellwig's method, standardisation of features with the use of variable standardisation; R2 – TOPSIS method, standardisation of features with the use of variable standardisation; R3 – positional method, standardisation of features with the use of positional standardisation with the Weber's median;
- non-model methods[12], taking account of standardisation of features with the use of: R4 – variable standardisation[13]; R5 – zero unitarisation method; R6 – Strahl's method; R7 – Nowak's method.

In the second stage of analysis, from among the prepared rankings (and thus the applied methods), a ranking most similar to the other ones was selected, namely one for which $\overline{u}_p$ is the highest [Kukuła, Luty 2015], when:

[6] http://www.ijhar-s.gov.pl/index.php/raporty-o-ekologii.html (accessed on 01.08.2017).

[7] http://stat.gov.pl/obszary-tematyczne/roczniki-statystyczne/roczniki-statystyczne/rocznik-statystyczny-rolnictwa-2016,6,10.html (accessed on 01.08.2017).

[8] An ecological farm is understood as an agricultural producer after the end of the conversion period (certified) or during the conversion period.

[9] A stimulus is a variable, high values of which are a desired phenomenon from the point of view of the object, while low values of which are undesirable.

[10] The aforementioned procedures were used and discussed e.g. in the work of Kukuła and Luty [2015].

[11] In the further part of the paper, the methods (or rankings prepared with their use) will be marked, respectively: R1, R2, R2, R3, R4, R5, R6, R7.

[12] A synthetic variable is determined as an arithmetic mean of sums of standardised values of diagnostic variables.

[13] Standardised Value Sums method (SVS).

$$\overline{u}_p := \frac{1}{v-1}\sum_{\substack{q=1 \\ p\neq q}}^{v} m_{pq}, \qquad p, q = 1, 2, ..., u \tag{1}$$

where: v – number of rankings,
n – number of objects,
m – number of diagnostic variables;

$$m_{pq} = 1 - \frac{2\sum_{i=1}^{n}\left|c_{ip} - c_{iq}\right|}{n^2 - z},$$

where: c_{ip} – position of the i-th object in the ranking with number p,
c_{iq} – position of the i-th object in the ranking with number q,

$$z = \begin{cases} 0, & n \in P \\ 1, & n \notin P \end{cases}, \text{ and}$$

P – set of even natural numbers.

The method selected in the manner described above is the basis for preparation and interpretation of the ranking of examined objects. Within the ordered set, a topological classification of similar voivodships was conducted as follows:

- I – high level of development: $Q_i \in \left\lfloor \overline{Q} + S(Q);\ \max_i Q_i \right\rfloor$,
- II – average level of development: $Q_i \in \left[\overline{Q};\ \overline{Q} + S(Q)\right)$,
- III – low level of development: $Q_i \in \left[\overline{Q} - S(Q);\ \overline{Q}\right)$,
- IV – very low level of development: $Q_i \in \left\lfloor \min_i Q_i;\ \overline{Q} - S(Q)\right)$,

where: Q_i – value of the synthetic indicator being the basis for preparation of the ranking,
$\overline{Q},\ S(Q)$ – respectively, the arithmetic mean and the standard deviation of the value Q_i.

RESEARCH RESULTS

On the basis of data from 2014 published by GIJHARS and GUS, an analysis was conducted covering indicators typical of producers respecting production in the environmentally-friendly system, which were used to assess Polish voivodships in terms of the development of the examined phenomenon.

The first indicator considered in the analysis, characterising the agrarian structure of organic farms, is the average size, which is a determinant of production and specialisation capacity. The average size of organic farms in Poland in 2014 was at the level of 26.3 ha (Table 1) and was greater by 4.3 ha than in 2004. In voivodships, this figure ranged from 11.3 ha to 44.1 ha and was characterised by average diversity (Table 2). The smallest average surface areas were recorded in farms in south-eastern Poland (Małopolskie, Świętokrzyskie, Podkarpackie, Lubelskie, Podlaskie). The largest average surface area was recorded in the Opolskie Voivodship (44.1 ha), where the number of organic farms was the smallest.

Table 1. Variables describing organic farming in Poland in 2014

Specification	Diagnostic features						
	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Dolnośląskie	35.4	21.0	3.6	1.1	15.3	1.2	0.8
Kujawsko-Pomorskie	28.9	18.0	1.0	0.7	3.9	2.4	1.0
Lubelskie	16.5	48.0	2.4	0.1	8.1	5.7	11.2
Lubuskie	38.9	9.0	10.1	0.2	10.5	2.6	0.2
Łódzkie	22.1	34.0	0.9	0.3	4.1	1.3	4.1
Małopolskie	11.3	38.0	2.7	8.0	2.6	2.5	3.2
Mazowieckie	25.4	107.0	2.7	0.8	11.4	3.5	7.5
Opolskie	44.1	5.0	0.5	0.0	0.9	0.2	0.2
Podkarpackie	15.9	30.0	3.6	3.6	3.3	4.1	8.0
Podlaskie	18.9	14.0	4.8	0.7	11.6	3.8	1.7
Pomorskie	34.6	27.0	3.4	1.9	5.5	1.6	0.8
Śląskie	33.9	21.0	1.9	0.1	1.4	0.1	0.2
Świętokrzyskie	13.1	12.0	2.4	1.0	4.1	5.8	4.1
Warmińsko-Mazurskie	27.7	12.0	9.0	2.2	15.9	6.2	1.0
Wielkopolskie	43.6	57.0	2.1	0.1	10.6	2.4	2.2
Zachodniopomorskie	36.7	31.0	13.9	4.2	22.8	3.9	2.3
Poland	26.3	484.0	3.8	25.2	131.9	47.3	48.5

Source: Prepared by the author.

Table 2. Basic numeric characteristics of selected variables describing organic farming in Poland in 2014

Numeric characteristics	Diagnostic features						
	X_1	X_2	X_3	X_4	X_5	X_6	X_7
maximum value	44.1	107.0	13.9	8.0	22.8	6.2	11.2
minimum value	11.3	5.0	0.5	0.0	0.9	0.1	0.2
arithmetic mean	27.9	30.3	4.1	1.6	8.2	3.0	3.0
median	28.3	24.0	2.7	0.8	6.8	2.5	1.9
Weber's vector coordinates	28.5	24.5	3.8	1.5	7.5	2.6	2.3
standard deviation	10.4	24.2	3.6	2.1	6.0	1.8	3.2
variability coefficient	0.4	0.8	0.9	1.3	0.7	0.6	1.0
quotient of extreme values	3.9	21.4	27.3	–	26.1	56.5	66.6

Source: Prepared by the author.

The second indicator considered in the study is the number of organic processing plants, the number of which is still low, whereas the interest in ready-made organic products increases. In total, in 2014, Poland had 484 processing plants (in 2004, they amounted to 55), 22.1% of which were located in the Mazowieckie Voivodship. Their number constitutes only 1.9% of all organic producers. On the other hand, in the Opolskie Voivodship, only five organic processing plants were registered. Half of the voivodships (Mazowieckie, Wielkopolskie, Lubelskie, Małopolskie, Łódzkie, Zachodniopomorskie, Podkarpackie, Pomorskie) had at least 27 organic processing plants within their administrative borders.

The third very important feature is the share of arable lands of certified organic farms in the arable lands of all farms. Despite the fact that, in 2006–2014, this share increased in Poland over eight times, it is still very small and reaches the level of 3.8%. The Zachodniopomorskie Voivodship has the highest share of AL in all AL managed using ecological methods (13.9%).

Two voivodships should be distinguished: Lubuskie and Warmińsko-Mazurskie, where this indicator is at the level of, accordingly: 10.1% and 9.0%. In other voivodeships, the value of this feature ranges from 0.5% up to 4.8%.

The subsequent four indicators refer to production as the source of organic milk and selected organic cultivations (cereals, vegetables, fruit). In 2014, 252376.6 hectolitres of organic milk were produced in Poland. Most of that amount was produced in organic farms of the Małopolskie Voivodship (31.9%). Great volumes of organic milk are also produced in the following voivodships: Zachodniopomorskie (4.2 million l), Podkarpackie (3.6 million l), Warmińsko-Mazurskie (2.2 million l), and Pomorskie (1.9 million l). In other voivodeships, this production is at a level not higher than 1.1mln litres, and in six of them (Opolskie, Śląskie, Wielkopolskie, Lubelskie, Lubuskie, Łódzkie) it does not exceed the value of 0.3 million litres. This feature is characterised by the largest variability (130%).

In 2014, the production of cereals in organic farms after the end of the conversion period was the highest in the Zachodniopomorskie Voivodship (22,000 t), and the smallest in the Opolskie Voivodship (900 t). Over 10,000 tons of cereals in the examined year were produced in the following voivodships: Lubuskie (10,500 t), Wielkopolskie (10,600 t), Mazowieckie (11,400 t), Podlaskie (11,600 t), Dolnośląskie (15,300 t), and Warmińsko-Mazurskie (15,900 t). This indicator is characterised by moderate variability (70%).

47,300 t of vegetables originated from production of organic cultivations in Poland in 2014, wherein potatoes constituted 36.1%. On average, the voivodship produced 3,000 tons of vegetables, the majority of which came from the following voivodships: Warmińsko-Mazurskie, Świętokrzyskie and Lubelskie.

The diversity of fruit production in certified organic farms in voivodships in 2014 was high. The value of this production ranged from 200 t (Śląskie, Opolskie, Lubuskie) to 11,200 t (Lubelskie).

As a result of application of the aforementioned methods, based on the selected set of features, the voivodships were hierarchised according to the values of synthetic indicators. Ordinal arrays differ significantly. Extreme ranks differed by seven positions. The largest similarity characterises a pair of rankings obtained with the use of two non-model ordering methods, where the standardising formula was, respectively, the variable standardisation method and the zero unitarisation method (m_{45} = 0,984). On the other hand, the largest diversity characterises a pair of rankings obtained with the use of the TOPSIS method and the positional method (m_{23} = 0,713). The ranking constructed with the use of the positional methods turned out to "stand out" the most [Kukuła and Luty 2017] among other rankings. Using the procedure supporting selection of the linear ordering method [Kukuła and Luty 2015] to perform gradation and typology of Polish voivodships in terms of the development level of organic farming, the standardised values method was chosen (Fig. 1, Fig. 2).

The highest classification was given to the Zachodniopomorskie Voivodship, for which nearly all (except for fruit production) indicators taken into consideration in the analysis exceed the average values set for all voivodships, additionally reaching maximum values in two indicators (percentage of AL, cereals production).

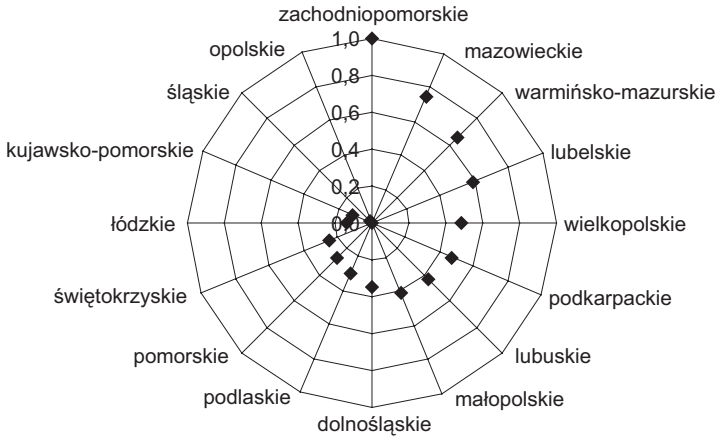

Fig. 1. Gradation of Polish voivodships due to the development level of organic farming in 2014

Source: Prepared by the author.

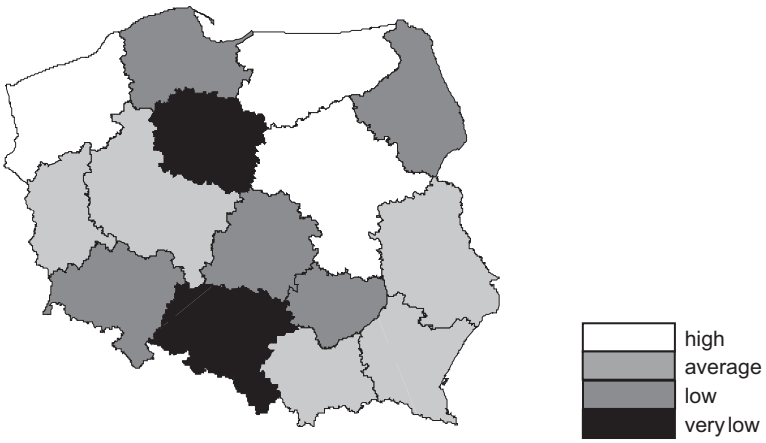

Fig. 2. Polish voivodships according to the development level of organic farming in 2014

Source: Prepared by the author.

The lowest classification was given to the Opolskie Voivodship, for which as many as five indicators reached the minimum value.

Based on values of the synthetic variable, Polish voivodships were divided into four classes. The first class – with a high level of development of the examined phenomenon, included three voivodships: Zachodniopomorskie, Mazowieckie and Warmińsko-Mazurskie.

A characteristic feature of voivodships of this class are the most beneficial values of all partial indicators covered by the analysis. At least four indicators significantly exceed the average values. The second class, characterised by an average level of development of organic farming, covers five voivodships: Lubelskie, Wielkopolskie, Podkarpackie, Lubuskie, Małopolskie. Three values of the analysed features exceed the voivodships' average. Low level of development characterises voivodships from group III, to which the following voivodships were classified: Dolnośląskie, Podlaskie, Pomorskie, Świętokrzyskie, Łódzkie. The development of organic farming was assessed as particularly unfavourable in voivodships from group IV, i.e. in the following voivodships:

Kujawsko-Pomorskie, Śląskie and Opolskie. These voivodships are characterised only by above-average size of organic farms. The other features are below the average values. For the purpose of comparison, the spatial diversity was assessed in terms of fulfilment of the agricultural functions, using the same algorithm (Fig. 3). The assessment was based on the following set of variables: average surface area of a farm [ha], share of arable land in the surface area of AL [%], share of large-area organic farms in the total number of organic farms [%], livestock in LSU. As indicated by the research results, organic farming is also developing in areas with fragmented agrarian structure. Selection of this management system may be a good direction for further transformations.

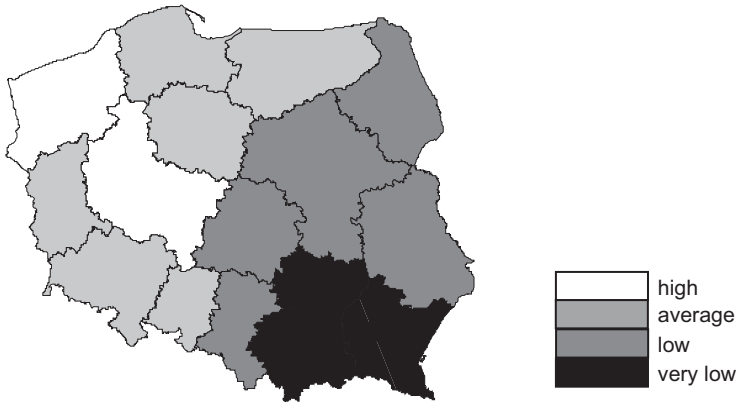

Fig. 3. Polish voivodships according to the level of performed agricultural functions in 2014

Source: Prepared by the author.

CONCLUSIONS

Organic farming is an environmentally-friendly production system of food with guaranteed quality. Creation of the idea of sustainable development leads to visible positive effects. The image of the development of organic farming in Poland is affected by many factors. Poland, being a member of the European Union, not only uses the support systems, but must also respect guidelines concerning the production methods and organisation. An important role in creation of this development is played by state institutions. Their goal should be not only to provide financial support from the national budget, but also to constantly increase the ecological knowledge, both among the producers and the consumers, as well as to create relations and organise cooperation between producers, institutions.

In 2014, organic farms in Poland constituted 97.6% of all organic producers. On average, they had a greater surface area of arable land than average agricultural farms. A positive phenomenon is the growth in the number of organic processing plants in the recent years. Their spatial distribution is not even. The percentage of surface area of arable lands where organic production is conducted distinctly exceeds the level of 5% only in three voivodships (Zachodniopomorskie, Lubuskie, Warmińsko-Mazurskie). A considerable part of organic agricultural producers conducts plant production, where production of vegetables and fruit, for which the demand increases, constitutes ca. 42%.

The analysis was based on selected conditions, which may determine the level of organic farming in the examined regions. However, the presented spatial structure should be still considered unsatisfactory, requiring actions aiming towards increase in the importance of organic farming. Polish voivodships are generally characterised by an average or low level of organic farming. A positive phenomenon is observed in the fact that

this alternative to the conventional management system is developing in voivodships with fragmented agrarian structure, where the percentage of people employed in agriculture is high.

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ROLNICTWO EKOLOGICZNE W POLSCE W ŚWIETLE WIELOWYMIAROWEJ ANALIZY PORÓWNAWCZEJ

STRESZCZENIE

Rolnictwo ekologiczne to przyjazny środowisku system produkcji dynamicznie rozwijający się od 2004 roku. W opracowaniu dokonano próby oceny przestrzennej rozwoju tego sposobu gospodarowania. Analizie poddano dane na poziomie województw, pochodzące z GIJHARS i GUS z 2014 roku, które dotyczą producentów respektujących produkcję w systemie ekologicznym. Uwzględniają one cechy, takie jak: średnia powierzchnia, udział powierzchni użytków rolnych, liczba przetwórni, wielkość produkcji: mleka, zboża, warzyw i owoców. W przeprowadzonej analizie wykorzystano metodę porządkowania liniowego zbioru obiektów, opartą na utworzonej zmiennej syntetycznej. Wyniki przeprowadzonego badania wskazują na to, że województwa Polski charakteryzują się na ogół średnim lub niskim poziomem rozwoju rolnictwa ekologicznego. Pozytywnym zjawiskiem jest, że rolnictwo ekologiczne rozwija się w województwach z bardziej rozdrobnioną strukturą agrarną.

Słowa kluczowe: rolnictwo ekologiczne, metody porządkowania liniowego, zróżnicowanie

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 123–132
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.51

ORIGINAL PAPER

Received: 04.10.2017
Accepted: 30.11.2017

FINANCES OF MUNICIPALITIES GOVERNMENTS IN POLAND AND TURKEY

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ABSTRACT

The paper is dedicated to the analysis the financing situation and level of decentralization in the municipalities in Poland and Turkey. The analysis covers years 2012–2016. Due to decentralisation reforms in both countries the basic level of subnational governments are municipalities. The decentralization process includes three categories: political, administrative, and fiscal. Because of above the municipalities in Poland and Turkey are various with the number of units, average municipal area, average municipality size, sources of the revenues and directions of money spending.

Key words: subnational government, municipalities, financial independence, own revenue, grants and subsidies, credits and loans, debt, Poland, Turkey

INTRODUCTION

Subnational government (SNGs) in Poland and Turkey have been reconstructed in order to provide effective and productive delivery of the services by local governments, in parallel with European practices. This restructuring process brings very important changes to the functional, institutional, fiscal, and the manpower structures of local governments. The main objective of subnational governments including municipalities, is to provide favorable conditions for the functioning and development of the local communities by satisfying their needs. The implementation of this objective requires ensuring a constant inflow of financial resources necessary to finance the appropriate level of public goods and services necessary to meet the needs of these communities and development projects. The municipality budget is the basis of the autonomy of the local government, aimed at satisfying the public's local community's needs [Guziejewska 2008, Kotarba and Kołomycew 2014, Sayan and Óvgun 2014].

Municipalities which are closest to the citizens in the management structure are lowest level of subnational governments. Municipalities bring about indispensable and important elements of public administration in all countries. There are so important in terms of democracy that they are indispensable administrations that are providing management of local services which aiming at efficiency. The financial structures of municipalities that are the most important components of the local governments is one of the most important factor that determine the quality and dimension of the services that are given by the town. Important is to determinate qualified local incomes, the transfer by the central government, the level of sources created by leanings as well as the efficiency and productivity of expenditures have an important place in the formation of financial structure [Dylewski et al. 2011, Kablan 2013, Staszel 2016].

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MATERIAL AND METHODS

The aim of research was to evaluate and compare financial independents of municipalities and level of decentralisation of subnational governments in Poland and Turkey. Due to the research interest of authors, the municipalities in Poland and Turkey are an object of financial investigation. Analyses, carried out, cover the period of 2012–2016. The research time is influenced by the legal changes which took place in Turkey in 2012.

The data about theoretical and financial issues were taken from the official sources: the applicable literatures, legal acts, the Ministries of Finances, Central Statistical Offices and the OECD Data. The descriptive and comparative methods were used in the research paper, as well as the simple statistical method and selected financial indicators in order to analyse the problem from the economic point of view.

The paper starts with the presentation of the main legal principles and financial issues of municipalities in Poland and Turkey. In the last part, the evaluation of financial situation, financial independence of municipalities and applicable conclusions are offered.

RESULTS AND DISCUSSION

Legal issues of municipalities in Poland and Turkey

Due to decentralisation reforms Poland has a three-tier system of subnational government, enshrined in the Constitution ratified in 1997. Municipalities, re-established in 1990, are divided into three categories: urban municipalities, rural municipalities and mixed municipalities [Parlińska 2014]. Turkey has two-tier system of subnational governments which are regulated by the 1982 Constitution, followed by a string of Laws on subnational governance in 2004 and 2005. In 2008, the Scale reform Act reduced the number of municipalities from 3,225 to 2,950. Implemented in March 2014, the Local Government Act further reduced the number of municipalities to 1 396 are divided into three categories: provincial or district municipalities, town and metropolitan municipalities [Sozen 2012, Akilli and Akilli 2014].

The data in the Table 1 presents the difference of municipalities in Poland and Turkey with their competences and size. The municipalities in Poland and Turkey various with the number of units, average municipal area and average municipality size. Poland has bigger number of municipalities with smaller average number of inhabitants (15,530) and average municipal area (126 km^2). More than 60% of Polish municipalities has between 5,000 to 19,999 inhabitants. In the same time Turkish municipalities are bigger almost 3.5 times with the average number of inhabitants and 4 times with average municipal area.

In Poland the Law of 8 March, 1990 of Municipalities gave large responsibilities in terms of spatial planning, infrastructure development including local roads, bridges and public transport, utilities (water supply and sewerage, waste management since 2013, energy), municipal housing, social services (including family benefits since 2004), pre and primary education, environmental protection, basic healthcare, recreation and culture. During decentralisation reforms municipalities in Turkey received wider range of competences.

Law No 5393 on Municipalities regulates the duties, authorities, debts and obligations of the municipalities in the provinces, districts and town. Their responsibilities are urban infrastructure facilities (town planning, water supply and sewage, local transport), geographic information systems, environmental and public health issues, urban traffic, parks and recreation, housing, social and cultural services, economic development and construction and schools maintenance. Metropolitan municipalities have additional responsibilities such as urban planning, urban police or disaster management.

The municipalities need to generate income in order to run the public services efficiently in the boundaries of the towns. The growth and diversity of local services made income sources important. Income of municipalities in Poland are laid down in the Law of 2003 on Local Government revenue. The 2004 reform profoundly modified the financial relationship between the central government and subnational governments giving more fiscal

Table 1. Characteristic of Municipalities in Poland and Turkey

Description		Poland	Turkey
Year of municipalities creation and important changes		1990/1998/2003	1924/2004/2012
Number of municipalities		2 478 Within: 1 559 rural municipalities 616 mixed municipalities 303 urban municipalities	1 397 Within: 970 provincial and district municipalities 397 town 30 metropolitan municipalities
Average municipality size (number of inhabitants)		15 530	53 940
Median municipal size (number of inhabitants)		7 540	8 595
Municipalities by population size class (% of municipalities)	Less than 2000	1	7
	2 000 to 4 999	24	32
	5 000 to 19 999	61	23
	20 000 or more	14	37
Average municipal area (km^2)		126	550
Competences		• Public transport • Social services • Housing • Environment • Culture • Pre-school and primary education	• Urban planning • Water supply and sewage • Transport • Environment and environmental health • Hygiene • Police, fire fighting, emergency, rescue and ambulance services • Urban traffic • Funerals and cemeteries • Parks and green spaces • Housing • Culture and tourism • Youth and sports • Social services and assistance • Weddings • Vocational and skills training • Services for economic and commercial development

Source: Own study of Act of Law No 5393 Municipality Law, Act of Law of 8 March 1990 on Local Governments, data from Subnational Governments in OECD countries – Key Data from 2016 and Local and Regional Governments in Europe Structures and Competences from 2016.

autonomy to them. The incoming revenues include following types of sources: own source revenues, shares in revenues from central taxes, general subsidies, grants and others from foreign sources and European Union budget. Within the own source revenues can be pointed out: local taxes, fees for services, revenues from selling or renting local governments' property. Municipalities are free to set tax rates within limits set out in law and to allow certain exemptions. Shared tax revenue come from the share of the PIT and the CIT which are respectively

Table 2. Incoming revenue of municipalities in Poland and Turkey

Description	Poland	Turkey
Own income	Taxes: • Property tax on land and buildings • Agriculture land tax • Forest tax • Transportation tax • Receipts from lump sum taxation • Tax on inheritance and gifts • Tax on civil law transactions Fees: • Stamp duty • Market fee • Local fee • Administrative fee • Exploitation fee – law on geology and Mining: • Waste fee • Advertising fee • Other municipal incomes paid due to separate regulations Others revenue: for example: • Incomes collected by municipal budget units and incomes from municipal budget companies • Incomes from municipal possessions • Inheritance, bequests and donations to municipality • Incomes from fines specified in separate regulations	Taxes: • Property tax • Electricity and natural gas consuption tax • Environmental tax • Publication and Advertising tax • Entertainment tax • Communication tax • Fire insurance tax Fees: • Occupancy fee • Building construction fee • Development related fees • Other fee incomes • Working in free days licence fee • Natural spring water fee • Brokerage fee • Butchering, controling supervision of animal fee • Control of measuring and weighing tools fee • Registration and copy fee • Inspection, licence and report fee • Healt certificate fee Others: • Participation shares to road expenditures • Participation shares to drains expenditures • Participation shares to water systems
Shares from State Revenues	Shares in the state taxes: • 37.42% for PIT • 6.71% for the CIT	Shares from the General Budget and State Revenues • ratio of the shares allocated to municipalities has been accepted as 9.25%
State Aids	Grants: • Grant from state budget or appropriated funds for: government administration-related tasks, own tasks, tasks realized on the basis of agreements with bodies of the government administration or other tasks on the basis of self-government agreements Subsidies: • General subsidies are transferred from the state budget for supplementing own revenue which are used to finance municipalities' tasks among which the most important are educational tasks. • Compensatory • Equalizational • Educational	• Municipal Fund • Local government's fund • Fuel consumption fund • Preventing environmental pollution fund • Municipalities zoning application fund • Municipalities fund development applications • Slum fund • Zoning amnesty fund • Fund of the Ministry of Culture • Aid to municipal government of tourist regions fund • To help the families of soldiers who need fund • Developing traffic services fund • The aids which are transferred to locale municipalities which have priority in development within SPO.

Source: Own study of Act of Law No 2464 Law on Municipal Revenues and Act of Law 13 November 2003 on the income of local governments.

37.42% for PIT, and 6.71%. for the CIT. Own sources revenue determined the financial independence and investment opportunities of community. General subsidies and grants provide complementary revenue and allow municipalities to finance their own and contracted responsibilities.

The income system of the municipalities in Turkey operates in a central dependent structure. Municipalities have three types of financial income. One of the sources is core incomes that are obtained from local incomes. According to 2,464 number of Law of Revenues Municipality these are revenues generated through sale and rental of real property owned by municipalities, operating profits and the authority to collect taxes, fees, co-payments. The second and third sources serve has the quality of transferred income. These sources consist of transfers in the form of aid and debt and the shares from central government incomes. The incoming revenues of municipalities in Poland and Turkey were pointed out in Table 2.

In Poland the 2009 Public Finance Act already stipulated to balance local current budgets and strengthened debt limitations requiring that the sum of loan instalments and interest payments must not exceed 15% of total debt. From 2014 onwards, the mode of calculation for debt ratios is changed in order to reduce SNG debt: the debt limit – outstanding and debt service – which will no longer be set based on revenue but rather on gross savings calculated over a three-year period. Moreover, SNG debt should not exceed 60% of GDP [Parlińska 2014, Satola 2015]. Subnational governments in Turkey are able to borrow funds under the provisions of Law 4749 (regulation on public finance and debt management) to finance investment projects only (golden rule). In addition, there is a series of borrowing limits and procedures. In particular, domestic borrowing is limited to an amount of 10% of previous year's revenues modified with the revaluation rate. Total outstanding debt stock (including external debt) cannot exceed the revaluated amount of the latest annual budget (Table 3).

Table 3. Deficit and debt regulation of municipalities in Poland and Turkey

Description	Poland	Turkey
Financial sources	• Credits and loans • Issue of municipal bonds • Surplus form a previous years	• Domestic Loans • Municipal Bonds • Foreign Loans via Project Financing (through Export Credit Agencies-Export Credit Banks) • Program Loans: These loans, which do not depend on any specific Project, are typically used for filling current year's financing gap. Program credits can be utilized in unspecified projects, debt refinancing, new investments etc. • Supplier Credits • Financial Leasing • Guarantees to Municipal Affiliates and Subsidiaries
Limits of deficit and debt	Since 2013: • Max level of local governments debt – 60% of incoming revenues • Interests and instalments – 15% of incoming revenues From 2014: • Individual indicator depending on the size of the operating surplus • Total public debt max 60% GDP	• Domestic borrowing is limited to an amount of 10% of previous year's revenues modified with the revaluation rate • Total outstanding debt cannot exceed the revaluated amount of the latest annual budget

Source: Own study Act of Law of 27 August 2009 on Public Finance and Act of Law No 4749 on Regulating Public Finance and Debt Management.

Financial situation of municipalities in Poland and Turkey

During the year 2012–2016 Turkish municipalities incoming revenue increased by 79.5% and reached the level of 80.99 billion TL. In the same time their expenses were presented faster growth dynamics which resulted in a five-fold increase in deficit. Turkish municipalities represent the lion's share of subnational governments incoming revenue and expenditure (respectively 90.58 and 92% in 2016). However within the Polish municipalities incoming revenue and expense were observed slower growth dynamics. This caused that since 2014 all municipalities closed budget with the surplus (Table 4).

Table 4. The municipalities budget in Poland and Turkey in 2012–2016

Specification		2012	2013	2014	2015	2016
			Poland			
Incoming revenues	million PLN	78 407.48	80 043.42	84 548.98	87 667.24	101 794.83
Incoming revenue' dynamics	(previous year = 100)	103.4	102.1	105.6	103.7	116.1
Municipalities incoming revenues/all local governments' incomes	%	44.2	43.6	43.5	44.0	47.6
Expenditure	million PLN	78 491.4	79 442.5	85 070.1	85 944.4	98 175.1
Expenditure dynamics	(previous year = 100)	98.5	101.2	107.1	101.0	114.2
Municipalities expenditure/ /total local governments' expenditure	%	43.5	43.2	43.2	43.8	47.6
Budget result,	million PLN	–83.9	600.9	–521.2	1 722.9	3 619.8
Budget result/incoming revenue,	%	–0.1	0.8	–0.6	2.0	3.6
			Turkey			
Incoming revenues	million TL	45 131.5	53 931.3	62 544.8	72 159.8	80 994.4
Incoming revenue' dynamics	(previous year = 100)	110.8	119.5	116.0	115.4	112.2
Municipalities incoming revenues/all local governments' incomes	%	78.39	77.30	89.74	89.91	90.58
Expenditure	million TL	46 988.11	59 964.44	63 266.22	73 756.96	91 269.96
Expenditure dynamics	(previous year = 100)	114.2	127.6	105.5	116.6	123.7
Municipalities expenditure/ /total local governments' expenditure	%	80.3	80.0	90.2	90.7	92.0
Budget result,	million TL	–1 856.59	–6 033.16	–721.42	–1 597.12	–10 275.55
Budget result/incoming revenue	%	–4.11	–11.19	–1.15	–2.21	–12.69

Source: Own calculation on the base of Information on the implementation of budgets of Local Government Units. Ministry of Finance in Poland and Turkey 2012–2016.

The structures of incoming revenues and expenditures of Polish and Turkish municipalities in the year 2012–2016 were presents in Figure 1. It can be observed diversified structures of revenues. In both countries 1/3 part of municipalities revenue come from taxes, fees and property income. The primary Turkish municipal tax is property tax on land and buildings providing around 50% of tax revenue, followed by the electricity and gas consumption tax and environmental cleaning tax. There are also minor taxes (publication and advertising tax, entertainment tax, communication tax, etc.). Turkish municipalities are responsible for collecting prop-

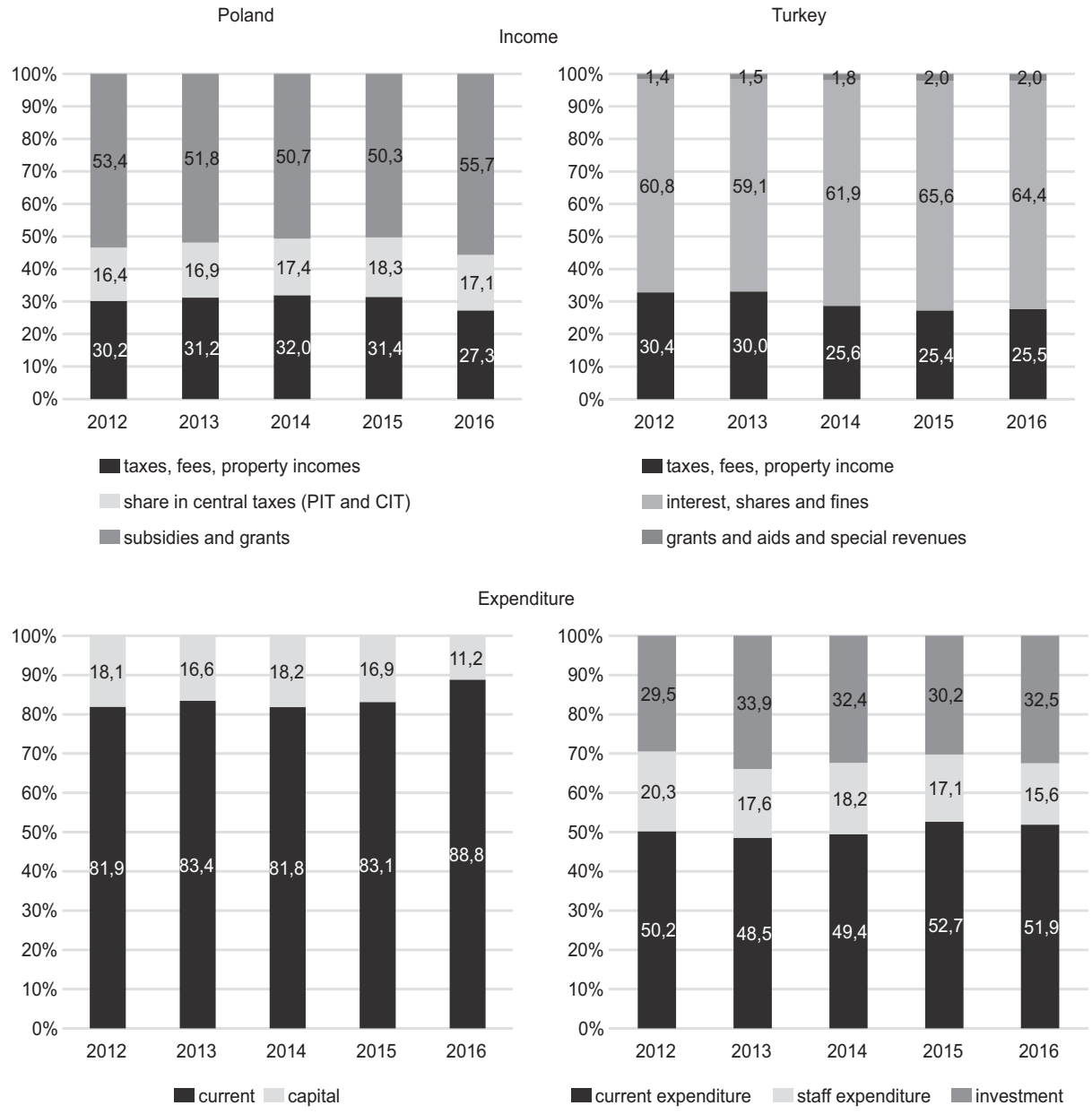

Fig. 1. Budget structure of municipalities in Poland and Turkey

Source: Own calculation on the base of Information on the implementation of budgets of Local Government Units. Ministry of Finance in Poland and Turkey 2012–2016**.**

erty tax but they cannot set the tax rate which is determined by the central government. In the same time Polish municipal own-source taxes include a property tax on land and buildings, an agriculture land tax and a forest tax. These three tax on immovable property accounted for 43% of tax revenue in 2016. Polish municipalities are free to set tax rates within limits set out in law and to allow certain exemptions. Other municipal taxes includes a transportation tax, a tax on vehicle registration, etc.

In Poland and Turkey within municipal financial source can be noticed the shares in central taxes. However the system of Turkish national tax revenue sharing (PIT, CIT and VAT) is the most important component. It represents around 60% of total municipal revenue. In Poland shared tax revenue come from the share of the PIT (16% of municipal revenue) and the CIT (0.9% of municipal revenue), which are redistributed according to a fixed percentage of the total proceeds collected in their respective area.

Central government transfers in Turkish municipalities come from different sources: Central Government Budget Agencies, special State programmes and the system of national tax revenue sharing which is the most important component. These funds are redistributed according several criteria: population (80%) and a "development index" (20%) for the municipalities. In Polish system the general grant (non-earmarked) con constitutes the most important grant. It is made up of several shares, including the education share, the equalisation share and the balancing share.

The education share is by far the largest, accounting for over 20% of municipal revenues. It aims at covering educational expenses, including teacher's salaries, but it is not earmarked. The equalisation share (7% of municipal revenue) is allocated to all municipalities with below-average tax capacities. The blending share aims at financing social expenditure. Earmarked transfers include specific transfers for central government delegated tasks (e.g. social spending), capital expenditure, etc. A reform of the equalisation system is currently being explored.

In the research time in both countries the current expenditures have a biggest share in municipalities budgets. The most important were the expenses connected with employed staff. However within Turkish municipalities can be observed bigger part of investment expenditures. In the same time Polish municipal primary area of spending is education, as municipalities are responsible for both capital and current expenditure including teachers and staff remuneration. Education is followed by healthcare and economic affairs/transport and then by social protection. In addition, SNGs are responsible for the large majority of overall public spending in the areas of environmental protection, housing and community amenities and recreation and culture (over 75% of public spending). In Turkey for municipalities, the main budget items are economic affairs, housing and environmental protection, general administrative services representing 85%. About 31% of municipal budget is dedicated to investment.

CONCLUSIONS

The municipalities' governments in Poland and Turkey experienced decentralization reforms and adapted national law to EU. However can be notice the differences within the municipalities competences, numbers, size and the budgets structures.

The municipal income in total income ratio, the shares given from general budget revenues constitutes 50% in Turkey and 17% in Poland. Auxiliary incomes expressed as; fines, municipal property income, special assistance, funds and other incomes by taking second place reaches a rate of 30%. Within both countries municipalities' revenues, the most important are local taxes on the property. However Turkish municipalities (in contrast to Polish municipalities) cannot set the tax rate which is determined by the central government.

Comparing the main incomes of municipality in researched countries with state aids which is transferred to municipalities by ignoring the factor of loaning lead to the conclusion that the municipalities in terms of financing are dependent on central government. As confusion it has been observed that financing of municipali-

ties are provided by the central government largely. This situation constitutes an obstacle to the administrative and financial autonomy of local governments.

Structures of the municipalities' expenditure are determined by the numbers and types of competencies. During decentralisation reforms municipalities in Turkey received wider range of competences then Polish one. In both countries the current expenditures have a biggest share in municipalities budgets. The most important are the expenses connecting with employed staff. However Polish municipal primary area of spending is education especially connected with teacher's salaries. In the same time within Turkish municipalities can be observed bigger part of investment expenditures.

In Poland and Turkey the municipalities faced problems of deficit and debt. Both countries regulations introduced the limitation of deficit and debt ratios. In Poland from 2014 onwards, the mode of calculation for debt ratios was changed and it helped to reduce municipalities deficit. In Turkish municipalities increased deficit level can be observed. In both researched countries most of financial outstanding debt comes from loans.

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FINANSE SAMORZĄDÓW GMINNYCH W POLSCE I TURCJI

STRESZCZENIE

Artykuł przedstawia porównawczą analizę finansową samorządów gminnych w Polsce i Turcji. Analiza obejmuje lata 2012–2016. Celem autorów jest ocena poziomu samodzielności finansowej i poziomu decentralizacji podstawowych jednostek samorządu terytorialnego w wybranych krajach. Reformy decentralizacyjne w obu krajach spowodowały, iż podstawowym poziomem samorządów terytorialnych są gminy. Proces decentralizacji obejmuje trzy kategorie: polityczne, administracyjne i podatkowe. Z tego powodu gminy w Polsce i Turcji różnią się od siebie liczbą jednostek, średnią powierzchnią i średnią wielkością, źródłami przychodów i kierunkami rozdysponowania środków budżetowych.

Słowa kluczowe: samorząd terytorialny, gmin, samodzielność finansowa, dochody własne, dotacje i subwencje kredyty i pożyczki, dług i deficyt, Polska, Turcja

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 133–140
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.52

ORIGINAL PAPER

Received: 25.10.2017
Accepted: 01.12.2017

EFFECTIVENESS OF CENTRALIZED MECHANISM OF LABOR RESOURCE ALLOCATION – EXPERIMENTAL TESTS

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ABSTRACT

In the article the issue of labor resources allocation in the context of the emerging field of economic sciences known as "market design" was discussed. The assumptions for the designed experimental environment were discussed. An experimental variable and variables dependent on it were defined. The main objective of the paper is to develop a matching mechanism for participants in the experiment as a basis for a broader, centralized resource allocation system in the labor market. The study confirmed the hypothesis that fulfilling the assumptions of stable allocations theory improves the matching efficiency in the labor market and thus reduces the frictional unemployment.

Key words: experimental economics, market design, labor market

INTRODUCTION

The issue of labor resource allocation is usually considered in several approaches. At the enterprise level it can be understood as the allocation of labor resources to different stages of the production process, and at the global level, it can be considered as a study of the relationship between labor demand and supply, as well as the study of the variables influencing such interactions. The matching of individual labor market participants divided into two disjoint sets, employers and job seekers, can also be examined [Parlińska and Pietrych 2016].

The literature analysis in the field of game theory also allows for specifying certain submarkets that have a specific character. This specificity is manifested, among others, in that the processes of matching employees and employers resemble marriage contracts [Stankiewicz 2013]. In this case, the salary is not the main factor conditioning the market balance. In game theory such a market structure is called a bilateral search market or a two-sided market. The theory of stable allocations applies to the adjustment of labor market mechanisms, while the process of intervening in free market mechanisms based on assumptions of this theory is referred to as the design of markets.

The aim of the paper is to develop a matching mechanism for the participants of the experiment as the basis for a broader centralized resource allocation system in the labor market. A hypothesis has been made that fulfilling the assumptions of stable allocations theory improves the efficiency of matching in the labor market and thus reduces the frictional unemployment.

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MATERIAL AND METHODS

The theory of stable allocations deals with finding stable relationships between individuals or groups in markets where simple market rules fail and prices are not a determinant of resource allocation [The Royal Swedish Academy of Sciences 2012]. The theory of stable allocations uses the tools of game theory, experimental economics and mathematical economics. It also has broad practical applications in modeling many economic phenomena, primarily in two-sided markets [Fleiner 2003].

The concept of stable association was introduced into the literature by Gale and Shapley. Stable allocation means such allocations of *n*-pairs in which none of partners will attempt to permanently split another pair in that set. The authors present the mathematical definition in their article from 1962 [Gale and Shapley 1962].

In the literature, the two-sided matching market is often used, which refers to the problem of associations of market participants. Markets with two-sided preferences consist of two disjoint groups of participants, e.g. job-seekers and employers. The word matching refers to the bilateral nature of exchanges in these markets [Roth and Sotomayor 1992]. An essential feature of such market structures is that not only the salary clears the market, i.e. it is not a primary criterion for resources allocation. The following objects, which are subject to research within the framework of stable allocations theory, such as schools, hospitals, laboratories, form the so-called marketplaces, and the institutions operating on them can play an important role in clearing the market (centralized markets) [Roth 2010].

The aim of the experimental study was to present the matchmaking processes between its participants taking into account competition, both among the participants representing the employees and the employers, and the congestion on the market. Of course, the presented experimental market is a generalization of complex processes taking place in the labor market. However, as Kagel and Roth state [2000], the advantage of this type of research is the generalization of some important elements common to many markets, while on the other hand, emphasizing the importance of variables desirable in the study.

The experimental market was composed of 16 participants. Half of them were randomly assigned the role of "employer", while the other half received the role of "job seekers". Each round of the experiment is understood as the matching market. For each participant the preferences for the participants from the opposite group were randomly generated.

In experimental research, it is important to understand the behaviour of the respondents and to determine precisely what premises influenced the decisions they made. In order to provide motivation for a fair presentation of their subjective preferences and their distributions, the payoffs in the shape of Experimental Monetary Units (EJM) were used [Pais et al. 2011].

The first dependent variable was the shared profit. The participants in each round received a payoff depending on the outcome of the game. Mismatched companies and job seekers received zero EJM in a given round. Entrepreneurs who were associated with employees received a payoff depending on ranking position of the associated employee. Therefore, the higher the ranking position, the higher the individual payoff. The same principle of the level of pay in relation to the position in the ranking was applicable to jobseekers matching the companies. All participants could be matched with at most one player from the opposing team.

The next dependent variable was the level of matching costs. It was determined mainly by lack of matching, i.e. the longer search for work. Each market (round) was divided into three periods, symbolically attributed to the numbers 1, 2 and 3, which served as the equivalent to the amount of costs attributed to the period (measured in EJM). This means that if the match did not occur in period 1, then the market generates a cost of 1 EJM for the employer. If the association did not occur in period 2, costs increased to 2 EJM, but if the association did not occur also in period 3, costs increased to 3 EJM. In addition, the level of costs was increased by 1 EJM in the case when the employer/employee was associated with an object positioned at the last three places on the preference list.

The third dependent variable was the number of optimal associations, which was summed at the level of each period for each round.

As an experimental variable, the deferred acceptance algorithm (DA) was defined, leading to stable matchings [Roth 2008]. To identify this variable, the markets (experimental environment) were divided into two types [Echenique et al. 2009]:

- decentralized market, i.e. the market on which the processes of matching employers and job seekers are random. Additionally, it is assumed that companies can offer one job offer in a given period if they are not matched yet. Similarly, employees may accept at most one job offer that is most preferred by them. Each participant learns only on the basis of his own offers and payoffs;
- centralized market (it is assumed that there is a top-down mechanism that coordinates the allocation of labor resources). This mechanism can be defined as such a function f that f: $P \rightarrow M$, i.e. one that assigns a match to each preference profile. In addition, the mechanism is stable if it meets the following assumption $f(P') \in S(P')$ for each $P' \in P$.

The experiment consisted of two parts. The first ten successive rounds formed decentralized markets. After ten rounds, there were ten rounds for the centralized markets (each consisting of three periods). This is a typical factorial plan in which several combinations of levels and types of experimental variable were repeated several times [Sanko 2001] – Table 1.

Table 1. The design of experimental study

Market properties	Specification	
Type of market	market with two-sided preferences	
The size of the experimental group	16 people divided into two equal groups	
Number of rounds	20	
Preference profile	random, sharp	
Experimental variable	DA algorithm	
Dependent variables:	decentralized labor market	centralized labor market
Shared profit	yes	yes
Matching costs	yes	yes
Number of matches	yes	yes

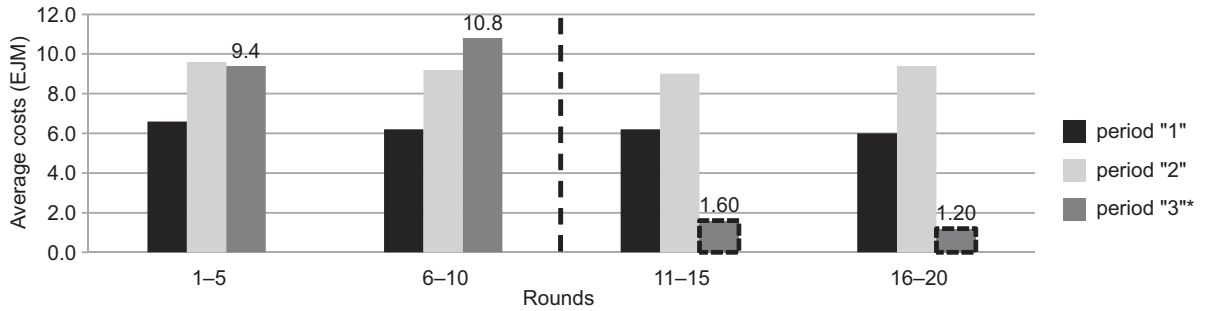
Source: Pietrych [2017].

The technical side of the experiment was developed on the basis of the guidelines provided on the LEE website (Warsaw University). The study was conducted by the Internet on a group of 16 students. During the experiment the players played the labor market participants (employers and job seekers). Their job was to decide whether to choose a workplace or an employee based on a pre-generated list of preferences. According to Krawczyk [2012], most of the economic experiments is carried out with the participation of students and he simultaneously presents the advantages of using such research sample, but he also enumerates some counterarguments.

FINDINGS

Cost level

Figure 1 shows the average costs for each round, divided into rounds 1–5, 6–10, 11–15, 16–20, and taking into account different matching mechanisms. The columns represent the mean values calculated for each of the five rounds.



* The DA mechanism is marked with a dashed line.

Fig. 1. Average costs depending on rounds and periods

Source: Calculations and own study.

In the case of a decentralized labor market (rounds 1–10), the average costs of market functioning in the range of 6.2–10.8 EJM, depending on the period, can be observed. These costs increased in the next period (except rounds 1–5). The greatest increase occurred between the first and second period for which a test for the two populations mean showed that the null hypothesis of equality of average costs in the first and second period should be rejected at the significance level of 0.05. This hypothesis was rejected for average costs in both rounds 1–5 and 6–10. For the second and third period this test showed that the null hypothesis should be left unchanged since there is no statistically significant difference between the mean costs for the analyzed observations (Table 2).

Table 2. Test for two populations means – "cost level" variable

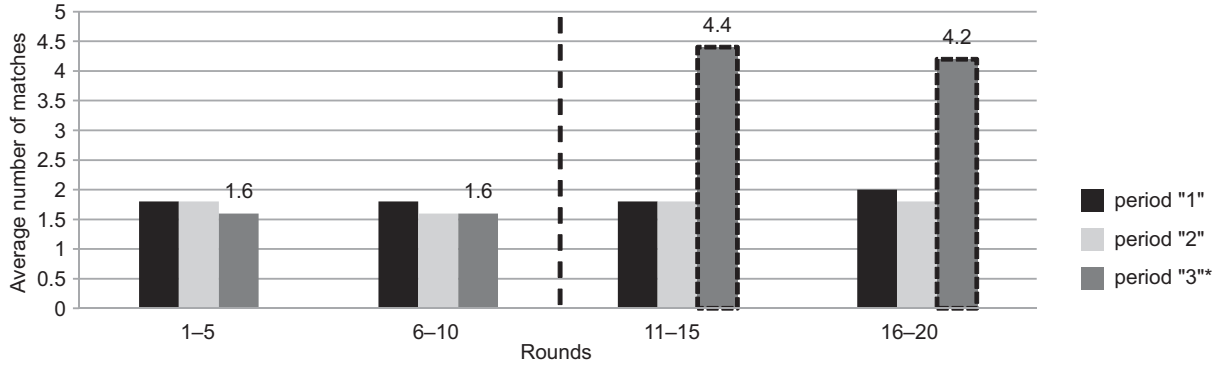
Period	Rounds 1–5		Rounds 6–10		Rounds 11–15		Rounds 16–20	
1	$t = -2.52$ $p = 0.04$		$t = -2.76$ $p = 0.02$		$t = -1.63$ $p = 0.14$		$t = -4.19$ $p = 0.00$	
2		$t = 0.09$ $p = 0.93$		$t = -0.91$ $p = 0.30$		$t = 4.36$ $p = 0.00$		$t = 10.6$ $p = 0.00$
3								

Source: Calculations and own study.

In the case where on the designed labor market the DA matching mechanism was implemented, the average cost was reduced from 9.0 to 9.4 EJM in the second period to 1.6 and 1.2 EJM in the last period, in the 11–15 and 16–20 rounds. This decrease was statistically significant. The test for the two populations mean showed that the null hypothesis of equality of average costs in the second and third period should be rejected with the probability of 0.95 for both periods. There was also a significant drop in the *p*-value with respect to the results of the previous rounds.

Number of matches

Figure 2 shows the average number of matches for each round, divided into rounds 1–5, 6–10, 11–15, 16–20, and taking into account different match mechanisms. The columns represent the mean values calculated for each of the five rounds.



*The DA mechanism is marked with a dashed line.

Fig. 2. Average number of matches depending on rounds and periods

Source: Calculations and own study.

On the decentralized labor market, which operated in the case of rounds 1–10, the average number of employee and employer associations in the range of 1.6–1.8 was observed, depending on the period. Thereupon, these values were not subject to large deviations. It is also difficult to observe any regularity between consecutive periods and the average number of matches. Therefore, it can be assumed that the period's number does not affect the number of associations. Confirmation of this conclusion are the test results for the two populations means presented in Table 3. The probability values allow to apply the null hypothesis of mean equality in successive periods.

Table 3. Test for two populations means – "number of matches" variable

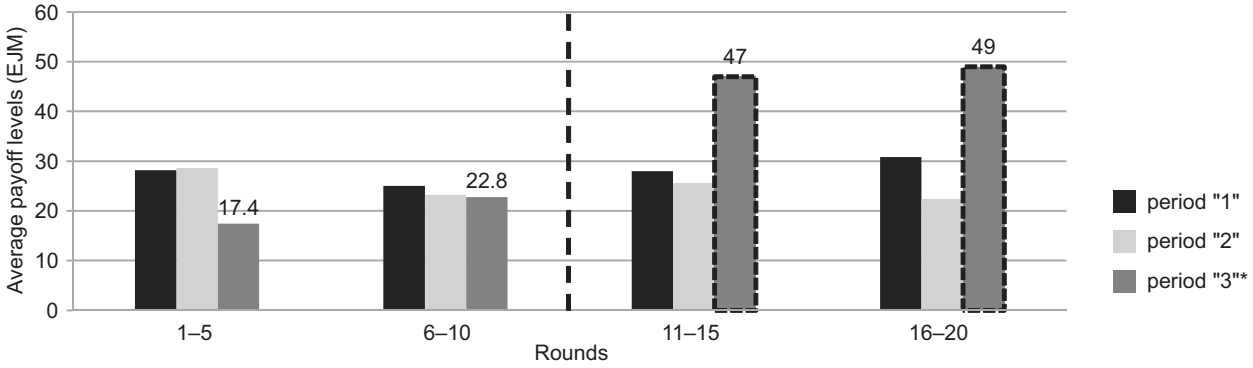
Period	Rounds 1–5		Rounds 6–10		Rounds 11–15		Rounds 16–20	
1	$t = 0.00$ $p = 1.00$		$t = 0.45$ $p = 0.67$		$t = 0.00$ $p = 1.00$		$t = 0.34$ $p = 0.74$	
2		$t = 0.45$ $p = 0.67$		$t = 0.00$ $p = 1.00$		$t = -2.74$ $p = 0.03$		$t = -3.89$ $p = 0.00$
3								

Source: Calculations and own study.

In successive rounds, when the DA mechanism was introduced to the designed market, the average number of matches increased to 4.4 and 4.2, respectively in rounds 11–15 and 16–20. This increase was statistically significant. The test for the two populations mean showed that the null hypothesis of equality of average costs in the second and third period should be rejected with the probability of 0.95 in both cases.

Shared profit – payoffs

Figure 3 shows the average level of payoffs for each period divided into rounds 1–5, 6–10, 11–15, 16–20, and taking into account different matching mechanisms. The columns represent the mean values calculated for each of the five rounds.



*The DA mechanism is marked with a dashed line.

Fig. 3. Average payoff levels depending on rounds and periods

Source: Calculations and own study.

In the case of rounds 1–10, during which the decentralized market was active, the average profit sharing between employees and employers was in the range of 17.4–28.6 EJM depending on the observed period. It should be noted however, that in the sample these observations clearly differed from the mean value calculated for the shared payoff, i.e. they were subject to a large standard deviation. For the first ten rounds there was no statistically significant difference between the total average payoffs for the respective periods (the confirmation are the results of two populations means test presented in Table 4). The probability values allow to apply the null hypothesis of mean equality in successive periods.

Table 4. Test for two populations means – "payoffs" variable

	Rounds 1–5		Rounds 6–10		Rounds 11–15		Rounds 16–20	
Period 1	$t = -0.03$ $p = 0.98$		$t = 0.25$ $p = 0.81$		$t = 0.23$ $p = 0.82$		$t = 0.91$ $p = 0.39$	
Period 2		$t = 0.94$ $p = 0.37$		$t = 0.06$ $p = 0.95$		$t = -1.74$ $p = 0.12$		$t = -3.51$ $p = 0.01$
Period 3								

Source: Calculations and own study.

In the successive rounds, when a DA-based matching mechanism was introduced, the average payoffs amount increased to 47 and 49 EJM in rounds 11–15 and 16–20, respectively. This increase was statistically significant only in the second period. Taking into account the above and the high standard deviations for the observations obtained also in these rounds, the results should be interpreted with some caution.

SUMMARY

The problem of imbalance in the labor market does not only exist on the supply side but also on demand side. Results of empirical research conducted so far indicate that employers also have problems with filling the vacancies offered [Sadowska-Snarska 2006]. Consequently, the issue of solid and satisfying match for jobseekers and potential employers is of growing importance. Stable matching of these two groups will increase the sustainability of employment. The research conducted so far emphasize the significance of the effective matching problem in the labor market, indicating that longer time spent as unemployment resource reduces the likelihood of employment [Jackman and Layard 1991].

The results of the comparison of decentralized and centralized labor allocation mechanisms justify the conclusion that in decentralized markets the rate of labor allocation depends on the size of the market. With the increase in the size of the labor market, there is a need for greater interaction between market participants, i.e. greater mobility and activity of market participants in order to achieve a stable allocation. However, this task is related to the prolongation of the searching period and the increase of costs.

In the case of a centralized mechanism of labor allocation based on the deferred acceptance algorithm, three variables were applied, ie the costs of matching employees and job seekers, the number of matches and the shared payoff amount. The implementation of the DA algorithm on the designed labor market showed that average costs were reduced and that change was statistically significant. The number of matches in the experimental study increased what should also be considered statistically significant. The results for the third variable, i.e. shared profit, were less clear due to the large deviations of the variable in the test. However, it should be noted that the statistically significant increase in the average value of the shared profit was noted.

It should be stated that it is possible to develop a centralized recruitment system for jobseekers based on, for example, the algorithm of deferred acceptance and meeting the assumptions made under the theory of stable allocations. However, it is necessary to deepen the understanding of this problem and to broaden the consideration of the organization and management theory.

Due to the low level of interest in the design of labor markets in Poland, empirical research presented in this article may provide a starting point for further studies of the analyzed phenomenon. In times of structural mismatch of labor supply and demand, the labor allocation system would be a significant facilitator, both for job seekers and employers.

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EFEKTYWNOŚĆ SCENTRALIZOWANEGO MECHANIZMU ALOKACJI ZASOBÓW PRACY – BADANIA EKSPERYMENTALNE

STRESZCZENIE

W artykule podjęto problematykę alokacji zasobów pracy w kontekście rozwijającej się dziedziny nauk ekonomicznych, jaką jest projektowanie rynków. Omówiono założenia dla zaprojektowanego środowiska eksperymentalnego. Zdefiniowano zmienną eksperymentalną i zmienne zależne od niej. Głównym celem artykułu jest opracowanie mechanizmu dopasowującego uczestników eksperymentu, jako podstawy dla szerszego, scentralizowanego systemu alokacji zasobów na rynku pracy. Wyniki badań potwierdziły hipotezę, według której spełnienie założeń teorii stabilnych alokacji przyczynia się do poprawy efektywności dopasowania na rynku pracy, a tym samym do zmniejszenia bezrobocia frykcyjnego.

Słowa kluczowe: ekonomia eksperymentalna, projektowanie rynków, rynek pracy

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 141–149
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.53

ORIGINAL PAPER

Received: 19.10.2017
Accepted: 08.12.2017

THE ROLE OF INTERNATIONAL ORGANIZATIONS IN INTERNATIONAL ECONOMIC RELATIONS IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

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ABSTRACT

The research problem addresses the question, whether activities of global organizations towards quality have been significantly shaping international economic relations (IER), in line with the paradigm of sustainable development. The paper's aim is to characterize and evaluate to-date activities of the top three global organizations in the shaping of products' quality aspects in international trade and to determine the organizations' ex ante role. Apart from the introduction and summary, the paper is divided into four parts. The first three parts characterize these global organizations whose activity has direct and indirect influence on both the quality and safety of products in international trade, namely: ISO, FAO, and WHO. The fourth part is a presentation of these organizations' expected role in the shaping of international economy in the future. Final part gives a summary and conclusions.

Key words: global organizations, IER, product quality, sustainable development

INTRODUCTION

Representatives from newly emerging economic streams (e.g. new institutional economics, sustainable development economics, economics of moderation) stress that we are in urgent need of institutions stabilizing long-term development of the world economy [Mączyńska 2010]. According to Kołodko [2014] these should be inclusive institutions. We are convinced that such institutions are embedded in broadly understood quality (of products, processes, organizations, innovations, etc.), i.e. they are rooted in quality. "Given the above, a question arises whether activities of global organizations towards quality so far have indeed, through institutions, been regulating products turnover in global trade, in line with the paradigm of sustainable development?[1]

A thesis has been put forward, that society's growing expectations related to the improvement of the quality of life[2] will strengthen the role of these global organizations (present, and emerging in the future), in the develop-

[1] The three-sphere framework of sustainable development stands for growth that is sustainable in the economically, socially, and ecologically [Kołodko 2014].

[2] The quality of life is a complex category which includes the shaping of appropriate proportions of generating, satisfying, and fulfilling economic, social, and natural needs, as well as self-fulfillment [Skawińska et al. 2016]. This paper limits the constituents of the above category to quality, health, and safety of products (goods and services), the quality of environment, and health of the society.

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ment of IER, which will focus on activities that have direct and indirect impact on the improvement of product quality [3] and the well-being of entities in world trade. In this paper, the term International Economic Relations shall be understood in its narrower sense, equating international trade in finished goods and services. In its broader sense, the term means also forms of capital exchange (tangible, financial, know-how), technological progress, as well as other aspects of international economics [Bożyk 2008, Budnikowski 2017].

The purpose of this paper is to characterize and evaluate the top three global organizations which have impact on product quality, including its safety for the consumer, in IER, and determination of the ex ante role of these organizations. It is an attempt to describe how the quality of products, currently described by means of different parameters, standards, or norms by global organizations, influences the quality of life of the society, and consequently the degree of sustainable development.

To achieve the goals of the paper we used desk research, deduction, visualization, and description.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

The International Organization for Standardization (ISO) is an organization composed of various national standards' organizations founded in London in 1946. As a rule, each country is represented at ISO by only one organization, usually an NGO. However, some countries are or were represented by government organizations, e.g. the Polish Committee for Standardization up until 1994. Consequently, ISO is somewhere between the state and private sector. ISO's work is coordinated by its Central Secretariat based in Geneva, Switzerland. Each member state has one vote.

ISO members, representing 162 countries (as of 2015) are divided into three categories. The categories have different rights and obligations, reflecting the ability to participate in strategy-creating processes and developing standards by participating in the works of ISO structures. Member bodies (119) have voting rights. The other two categories: correspondent members (38 countries) and subscriber members (5 countries) have the status of observers. However, correspondent members can use ISO standards and promulgate the Organization's published works. International ISO standards create a network of regulations which apply to the society, safety and security, the quality of processes, goods and services, ones which support internal and international trade, environment protection, etc. They are based on collective experience and knowledge of previous generations, as well as new advances in science and world technology. They are used in the work of various ISO Technical Committees (www.iso.org/structure.html). According to ISO's website data, the main goals of this organization are:

- creation of international standards, and other documents,
- update of earlier set standards,
- sales of current standards,
- promulgation of international standards' problems by publishing books, organizing conferences, running scientific research, etc..

ISO activities are funded from membership fees which are aligned to the GDP of membership countries. Additional revenue comes from the sales of published materials in the form of standards, textbooks, guides, compendiums, and periodicals informing about current and planned work of the organization.

Membership countries' organizations and enterprises are encouraged to apply ISO standards and other documents which promote the free flow of goods and services, which reduces transaction costs in domestic and international trade. The importance of ISO standards for the economy is significant, as supported by different papers. For example, 8.2 billion GBP worth of GDP growth in the UK in 2013 was directly tied to different

[3] Quality, understood as excellence, has been considered in literature both from an objective perspective, and a subjective perspective in accordance with the sustainable development agenda). In that work, Authors stress that an organization must to take into account both aspects, if it is aiming at sustainable development [Hamrol and Mantura 2006]

ISO standards [The Economic Contribution 2015]. The use of ISO standards Canada in the years 1981–2014 increased revenues by ca. 91 billion USD [Getting Aligned 2015]. ISO standards are of strategic importance for companies, serving as road maps that help resolve the most pertinent problems. The application of these standards helps companies to:

- reduce cost of operations by improving business systems and production processes;
- improve consumer satisfaction by increasing product and process safety and quality;
- access new markets by ensuring product and service compatibility;
- reduce environmental footprint.

Out of many standards, management standards have significant impact on company and corporation image and market share. One of the first ones was ISO 9001 – Quality Management Systems – Requirements [Manders 2015]. On the other hand ISO 14001 – Environmental management system has positive impact on the environment, its protection and use by companies [de Vries et al. 2012]. National governments use ISO standards to solve issues related to safety and security, health, environment protection, international trade, and many other problems. Since its founding, up until the end of 2015 ISO has published 21,133 standards, and 1500 in 2015 alone (Table 1).

Table 1. Breakdown of ISO standards as at the end of 2011, 2013, and 2015

Specification	2015	2013	2011
Number of standards in total, and by sector			
Number of standards implemented in 2015	1 505	1 103	1 208
Total number of standards	21 133	19 977	.
of which (%)			
Engineering technologies	27.2	27.3	25.2
Material technologies	22.6	22.9	17.8
Electronics, ITT	17.6	17.0	16.2
Transport and distribution	10.7	10.6	11.3
Infrastructure, science, services	9.1	9.2	16.1
Agriculture and food processing	4.7	5.7	3.5
Healthcare, safety, environment	4.0	4.1	5.5
Construction	2.5	2.4	4.1
Special technologies	0.8	0.8	0.6

Source: Own compilation on the basis of ISO on-line reports.

Currently, as many as 82 standards addresses different different aspects of management, according to ISO's website data. Over 20,000 ISO standards apply to nearly all problems and issues of current economic activities and consumer lives. Therefore the Organization appointed a Committee on Consumer Policy. Its role is to provide opinion on draft standards, in particular in sectors strongly tied to consumer rights, like safety of means of transport, toys, medical equipment, cleanliness of the atmosphere, water and soil quality, quality of food, and many others.

As is apparent in the above table, the share of engineering technological, material, and ITT standards is increasing, the share of standards related to transportation shows a slight decrease, with the highest decrease visible in infrastructure, science, and services.

On the other hand, in 2015 over 1.5 million companies had at least one implemented certified management system. The above data undergo continuous change: some companies implement management systems, other, due to financial reasons, or after such systems have been permanently entrenched in the organization, decide not to recertify them. The most popular management standards in companies relate to organization management in terms of product quality (ISO 9000-R[4]), environment quality (ISO 14000-R), employee safety (ISO 18000-R), IT services quality (ISO 20000), food safety (ISO 22000-R), corporate social responsibility (ISO 26000-R), continuity of operations (ISO 22301), risk management (ISO 31000-R), and energy management (ISO 50001).

Direct and indirect influence of ISO on sustainable development and IER is obvious. ISO is commonly embraced, and influences business efficiency operations at micro-, mezo-, and macro-levels. Moreover, it increases the quality of life of societies and drives demand. It also stimulates the supply of goods and services by helping enterprises to access markets. It also influences environmental protection by the regulations' network quality in globalization processes. Consequently, it shapes IER towards sustainability.

However, the effectiveness of ISO impact is limited, since enterprises or corporations use many of the standards on a voluntary basis. Following are the key drawbacks in ISO's operations [Douglas et al. 2003, Zalewski 2008]:

- high costs of implementation, maintenance, and recertification of management systems;
- lengthy implementation time and necessity of frequent standard update;
- high workload imposed on employees with tasks ensuing from the developed system;
- feigned standard implementation (e.g. driven by PR effects).

Some standards, like ISO family 13040 on air cleanliness (emission of contamination) were ignored by many companies and even whole countries. Despite many world conferences this problem is far from being solved. While the United States of America signed an applicable agreement – COP21, in June 2017 they withdrew from it.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Food and Agriculture Organization of the United Nations, FAO was created on the initiative of 44 countries. The signing of FAO's founding agreement in the form of its constitution took place on 16 October 1945 in Quebec, Canada. The organization is headquartered in Rome, Italy. According to FAO's website data, main goals this organization's are to:

- improve the production and distribution of agricultural, forestry and fishery products;
- improve the nutrition of people; fight hunger and malnutrition;
- improve living conditions of people in rural areas;
- enable required financing of agriculture and food production;
- sign agreements on international trade in agricultural products;
- fund scientific and research projects and provide technical assistance;
- check impact of agriculture on the environment;
- collect and disseminate information about the condition and achievements of agriculture in member states.

[4] The symbol R stands for a family of standards.

Table 2. Current themes FAO

Animal husbandry and fisheries	**Social problems**
Animal health and husbandry	Indigenous peoples and migrations
Livestock production and environment	Agricultural institutions
Fishery	Children's work in agriculture
Global food situation	Fair employment
Food chain crisis, food loss, malnutrition and famine	Family farming and city farming
Trading in food	Social protection
Sustainable food and farming	Agricultural ecology
Agriculture vs. development and resilience to disasters	Corporate responsibility for the environment
Support of development processes	**Engineering**
Perspective studies – climate change and biodiversity	Biotechnology
Climatically intelligent agriculture	Mechanization
Resources	Assistance in investments
Energy and water	Technical cooperation programs
Genetic resources and seeds	

Source: Compilation on the basis of FAO's website data.

Many of these goals have not lost their currency during more than 70 years of FAO's existence. Earlier goals and objectives, however, had to be modified, as with the scientific and technical development of recent years new challenges are emerging [FAO of the UN, 2015]. The topics FAO is currently addressing are, in a short form, given in Table 2. They are discussed at length on the Organization's website.

At present, FAO has 194 regular members, along with the European Union (as a member organization). Each member has one vote. However, there are two more associate members (Faeroe Islands and Tokelau), which have no voting rights nor functions in the Organization. FAO operations are financed from membership fees, but also from grants from the United Nations, and many other international organizations.

The outcomes of FAO's work are published jointly with OECD in the form of annual reports on the farm and food situation in the world [OECD-FAO] and discuss, e.g. innovation in family farming (2014), or change of climate, agriculture, and food safety (2016). The reports present forecasts over a 10 year horizon.

Conclusions ensuing from these studies are used to draft guidelines for member countries. Furthermore, FAO undertakes, coordinates, and implements or participates in implementation of many different global and regional programs aimed food quality and safety in the world. Since 1960s, on UN's initiative, FAO runs the World Food Programme. The Programme's aim is to provide food assistance to developing countries, and countries suffering from natural disasters. It should be noted that FAO runs also many projects to protect the environment and water resources. In addition, it promotes various initiatives focusing on new farming technologies (like city farms illuminated with computer controlled LEDs).

In the implementation of its program and guidelines, and in the area of providing information, FAO works hand in hand with global financial (e.g. IMF) and trade (e.g. WTO) organizations. Consequently, it influences trade from the quality and safety perspectives. Thereby, it shapes international economic relations (volume and structure of trade turnover) towards sustainability.

Despite its undoubtedly multiple successes, FAO is claimed to be too weak in its fight against the behavior of transnational corporations (e.g. the matter of aspartame or cotton cultivation system in India controlled by Monsanto), which put pressure and lobby towards reaping their own benefits at the expense of the quality of life of societies. In the future, FAO should focus more on sustainable development.

WORLD HEALTH ORGANIZATION

In 1946, the United Nations convened a World Health Assembly in New York, where 61 countries ratified the constitution of the World Health Organization (WHO). At present, WHO has 194 member countries, and addresses health matters, coordinating them within the UN. Each member has one vote. WHO's key overriding goal is for all people to have the best possible health. Consequently, it has indirect influence on IER. According to WHO's website data, this organization has the following tasks:

- tighten cooperation between countries in the area of healthcare and eradication of epidemics of contagious diseases;
- ensure medical care to the people all around the world and reduce infant mortality;
- set standards and norms related to ingredients in medicines and food quality;
- draft healthcare policies based on scientific knowledge;
- provide technical support to countries;
- monitor and evaluate global and regional helath trends.

In 2007 WHO developed a 6-point action plan: 1. Promote development. 2. Improve health safety. 3. Strengthen healthcare systems. 4. Use research, information, and scientific proof. 5. Expand partnership cooperation. 6. Improve performance. It should be noted, that in 2007 in Geneva, Switzerland, during the 60th World Health Assembly, WHO outlined an action plan to improve workers' health. In addition, a Macroeconomy and Health Committee was appointed to evaluate how health influences economic development.

The Organization is financed primarily from member countries' membership fees, subsidies from non-governmental organizations, the pharmaceutical industry, but also from foundations, voluntary contributions from governments, other UN organizations and the private sector.

Out of dozens of programs and projects ran by WHO we should point to these which have special impact on the economy and IER processes. These include: impact of the environment on health, nutrition, social determinants of health, strategy planning, innovations, trade vs. health. The problems and challenges that appeared in the early 21st century led the organization to define new priorities and health programs, and to start a structural and strategic management reform. Pursuing its goals, WHO works together with other international organizations, like FAO and ISO on product the normalization of products, services, management, and best hygienic and production practices. What serves as a good example of the above is trilateral coordination of activities focusing on public health (WHO), intellectual property and innovation (WIPO), and trade (WTO). Since 2010 WHO has been introducing comprehensive reforms to address existing problems and undertake new health challenges in the 21st century.

Despite WHO's undeniable successes, the global society has not reached health safety yet. In many countries access to health care is insufficient, outbreaks of epidemics happen and are difficult to eradicate. Since the Organization is financially more dependent on funding from external sources, which is higher than membership countries' fees, WHO is often accused of yielding to the pressure of chemical, pharmaceutical, food, and other multinational corporations.

As WHO is focused on the health of society, in the paradigm of sustainable development the Organization's importance will be increasing with respect to International Economic Relations. Furthermore, it should be remembered that with an increasing number of new products posing unknown risks, there is a need of developing and implementing new health and safety regulations.

EXPECTED ROLE OF GLOBAL ORGANIZATIONS IN THE SHAPING OF INTERNATIONAL ECONOMIC RELATIONS TOWARDS SUSTAINABILITY

Studies show that formal, i.e. administrative and legal institutions influence the improvement of products' trade quality (objective perspective). Nearly commonplace global organizations responsible for product quality have potential to generate such products, improve them, apply and control in international economic relations. However, sustainable development of the well-being in IER requires an engagement network and social capital. It is founded on values, mutual norms, trust, cooperation, loyalty, and solidarity.

Between global organizations there exists a network of multilateral connections which shapes economic relations. Their purpose is to govern the flow of international capital, goods and services, as well as technologies, thereby reducing tensions connected with international turnover, especially during economic downturn. Some organizations work out ways and instruments mitigating the imbalance of the flow, with guidelines of their application (WTO, OECD). Other play an important role in adjusting countries' balance of payments (IMF, WB), or normalize and unify, thereby assisting in the trade of goods and services (ISO). Still other are to protect against economically aggressive behavior of corporations which is a threat to the health and life of the members of the society (WHO, FAO). However, there is plenty of room for improvement in the effectiveness of their operations. This point was also addressed by John Paul II in his encyclical *Sollicitudo rei socialis*, stating that the mechanisms governing the operating methods of international organizations should be reviewed and corrected, while the framework of economic and social interdependence should be based on social solidarity [Mazurek 2004].

The characteristics of the three global organizations discussed in this paper show that they have a lot of causative force to influence international economic relations, although their impact is much stronger, but remains "hidden". What is required are changes in the management of these entities to drive sustainable development. Following are some proposals put forward by experts in this area, as regards global organizations in general. The proposals apply also to the three organizations discussed in this paper [Stiglitz 2004, 2007, Bożyk 2008, Kołodko 2014].

1. Better use of the potential of instruments at the disposal of global organizations in the development of products' quality aspects.
2. Improvement of quality and transparency of formal institutions created within these organizations.
3. Enhancement of international rule of law. Specifically, following the rules of developing sustainable competitiveness, corporate social responsibility, counteracting corruption, sticking to commitments, etc.
4. Change in the mindset of people managing these organizations and accepting weaker members as equal partners in negotiations, in the development of programs, strategies, etc.
5. Ensure observance of sustainable development rules by all entities in the IER chain by programs, strategies, and legal institutions.
6. Social focus of international organizations as the foundation of the new IER paradigm.

It should also be noted that the activities of the three presented organizations apply to the same links of the product quality chain in IER. Moreover, the organizations' competencies – expressed in sustainable development indicators – overlap [GUS 2015]. On the other hand, some important indicators are not included in the objectives of these organizations, specifically these pertaining to the quality of world trade, e.g. consumption models and waste management. Consequently, there is a need to establish an international organization that monitors and coordinates the activities of the existing global organizations with respect to product quality.

In the future, these entities' impact on sustainable development should be based on a social initiatives towards quality, sustainable consumption and on global monitoring of natural and social environment. What enables their development is the digital economy and knowledge-based society.

CONCLUSIONS

The paper attempts to find an answer to the question, whether the operations of global organizations towards the improvement of the quality of goods and services in international trade are sufficient to exert expected impact on sustainable development. In the presented characteristics of the three global organizations connected with product quality in international economic relations, we show their goals in the context of sustainable development. In addition, we also point to some limitations existing therein. So far, the organizations approached product quality by evaluating its attributes from an objective perspective. On the other hand, the sustainable development concept requires also a subjective approach to quality. Literature fails to highlight such studies or their results.

Global organizations' drive towards sustainable development in international economic relations so far has been reflected in eliminating differences in administrative and legal solutions of national economies, and in the development of different forms of their cooperation. In line with this, the organizations still accept some instruments of endogenous and exogenous policy used in world trade by less developed countries.

Desk research shows that, first, the studied global organizations have positive and growing impact on international economic relations; second, in the future, product quality will determine more and more international trade turnover (volume, structure, directions), thereby increasing the role of these organizations ex ante. This poses a challenge to create a global quality organization, which, by coordinating functions, goals, and principles, as well as methods of their implementation in already existing organizations will drive the effectiveness of the latter's operations. Global organizations' activities in international economic relations in their drive towards sustainable development requires them to take a subjective approach to quality in the future. This will require more pressure on ethics, norms of reciprocity, trust, etc. in cooperation and collaboration.

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ROLA GLOBALNYCH ORGANIZACJI W MIĘDZYNARODOWYCH STOSUNKACH GOSPODARCZYCH W KONTEKŚCIE ZRÓWNOWAŻONEGO ROZWOJU

STRESZCZENIE

Problem badawczy pracy sprowadza się do pytania, czy dotychczasowa działalność organizacji globalnych na rzecz jakości istotnie kształtuje międzynarodowe stosunki gospodarcze (ang. IER), zgodnie z paradygmatem zrównoważonego rozwoju? Celem pracy jest ocena dotychczasowej działalności najważniejszych trzech organizacji globalnych w kształtowaniu jakościowych aspektów obrotu produktów w handlu międzynarodowym i określenie ich roli *ex ante*. Strukturę pracy stanowią oprócz wstępu i zakończenia cztery części składowe. Pierwsze trzy spośród nich zawierają charakterystykę organizacji globalnych, których działalność dotyczy w sposób bezpośredni i pośredni jakości produktów oraz ich bezpieczeństwa w handlu międzynarodowym. Są to ISO, FAO, WHO. Treść czwartej części zawiera określenie oczekiwanej roli tych organizacji w kształtowaniu międzynarodowych stosunków gospodarczych. W zakończeniu przedstawiono podsumowanie i wnioski.

Słowa kluczowe: globalne organizacje, IER, jakość produktów, zrównoważony rozwój

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 151–159
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.54

ORIGINAL PAPER

Received: 01.02.2017
Accepted: 02.10.2017

CHANGES OF EU COUNTRIES POSITIONS IN INTERNATIONAL TRADE OF MINERAL FUELS IN 2006–2015

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ABSTRACT

This paper analyzes changes of exports, imports and trade balance in mineral fuels, lubricants, and related materials (named fuels in this article) of EU member states in 2006–2015. Fuels are specific commodities because the most of the EU countries are dependent on fuel imports. Moreover, trade balance in fuels is important for EU countries because of its significant importance for trade balance in all goods. Author illustrated a dominating position of net importer of fuels in this period. There were the following most important net importers of fuels in 2015: Germany, France, Italy, Spain, United Kingdom, Belgium, Austria and Poland. In 2006, Germany was also the first net importer but Italy was the second one and France the third one. Poland obtained the ninth position in 2006. Denmark was the EU net exporter of fuels in the researched period. Moreover, trade deficit in fuels of most EU net importers improved, i.e. decreased in 2015 in comparison to the situation in 2006 because of the lower oil prices and undertaking of ecological innovations in production, including the agriculture. In the researched analyzed period, the biggest imports and trade deficits in fuels of the majority of EU countries were in 2008. Such a situation was connected with the third oil shock.

Key words: European Union, international trade, fuels, net exporters, net importers, third oil shock

AIM, RESEARCH METHOD, CHARACTERISTIC OF SUBJECT, HYPOTHESIS AND THEORETICAL BASIS

The aim is an indication of changes of EU countries positions in international trade of mineral fuels, lubricants, and related materials (named fuels in this article) in 2006–2015. The research method is a describing analysis based on statistical data from Eurostat. Subject of the analysis, i.e. fuels have been chosen because of their big importance for the EU economy and dependency of member states from fuel imports. Moreover, deficits in fuel trade balance influenced trade balance in all goods of EU countries. Fuels also are important factors in the agricultural production. Author verifies the hypothesis that the third oil shock in 2008 caused the biggest trade deficits in fuels of a majority of EU countries in the examined period .

The theoretical interpretations of advantages achieved from the international trade in fuels will be based on neo factors (or supply) theories, elaborated by G. Haufbauer, R. Baldwin, P. Keesing, J. Vanek. These theories claim that each country should specialize in exports of relatively abundant, i.e. cheaper commodities and in imports of relatively rare, i.e. expensive goods. Prices of exported and imported goods depend on rarity or abundance of productive factors, (i.e. natural sources, ordinary work, qualified work [so called human capital] abd material capital) that can be used for their production. Therefore, high developed countries should export high technology goods and import raw materials and fuels [Bożyk 2008].

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Moreover, I include a theoretical interpretation of political and economic reasons of changing oil price which influenced trade deficits in fuels of EU countries in particular years, especially during the third oil shock. This shock will be interpreted according to the paradigm of the global political-economic spiral. According to this paradigm, the influences of political and economic factors cause changes of the world system. These factors influence this system on the same scale but on various directions. The global system is disturbed during domination of political factors. Whereas, it is balanced relatively during domination of economic factors [Staszczak 2002, 2011].

A relatively rarity of fuels and activity of Organization of Petroleum Exporting Countries (OPEC) and Russia promote extraordinary high prices of these raw materials. OPEC caused three oil shocks in 1973–1974, 1979–1980 and in 2008, i.e. a drastic reductions of oil production and supply which caused a big growths of the oil prices. The third oil shock in 2008 was caused by OPEC and Saudi Arabia especially which limited the oil deliveries during the unstable political situation in Iraq. In the result, the nominal annual average oil price in 2008 was the highest in the history [InflationData.com 2015]. An initial growth of oil prices was connected with the end of the global economic prosperity and it was the additional reason of the world economic recession in 2008–2009, except the major reason, i.e. the financial crisis caused by transnational banks. According to the global political-economic spiral, the third oil shock was an example of the OPEC politics in the international scale that disturbed the world system. The next important reason of the global destabilization was ineffective state control over the activities of transnational banks and other corporations.

The global economic recession limited the world demand for fuels and, in this way, it forced a drastic reduction of their prices in 2009 [Staszczak 2009, 2011, 2012; InflationData.com 2015]. Oil prices increased again in 2009–2013 and decreased in 2013–2015 [InflationData.com 2015, Statista 2016]. Moreover, a growth of the U.S. production and exports of natural (especially shale) gas and petroleum products decreased the fuel prices in the last years [Barbe 2015]. Other factors influencing the final fuel prices were changes of the U.S. dollar exchange rates versus other currencies. It is connected with the fact that the oil prices are presented in American currency in the global market [Staszczak 2015].

CHARACTERISTIC OF INTERNATIONAL FUEL TRADE, EU GLOBAL POSITION AND IMPORTANCE FOR THE AGRICULTURE

European Union was the first importer of natural resources over the world in 2008 with 22.9% share in the global imports. Other leading importers of natural resources were as follows: USA (17.4%). Japan (10.5%) and China (9.9) [Ruta and Venables 2012]. Energy imports of European Union achieves 53%, crude oil (i.e. the major component of diesel and petrol) 90% and natural gas 66% of total EU consumption [European Commission 2017]. Fuels achieved 29.0% share in extra EU imports of all products in 2008 in comparison to 15.5% share in 2016. A drop of fuel share in total EU imports can be connected with modern technologies and lower fuel prices. Major suppliers of fuels to European Uninon in 2016 were as follows: Russia (with 29.6% share in EU fuel imports), OPEC (28.1%) and Norway (11.6%). Positions of fuel suppliers in EU imports were relatively stable in comparison to 28.6% share of OPEC, Russia (27.4%) and Norway (12.3%) in 2008, (Eurostat data base).

Nowadays, bioenergy and biofuels continue a small share in the in the world energy supply. However, biofuels can achieve 10% share of the global transportation fuels, except air transport in 2020–2030 [Bescu 2012]. EU will continue imports of fossil fuels in the coming decades but there are plans of a long-term energy transition toward the economy of renewable sources. The phenomenon of EU fuel dependency is still important and partially solved problem by attempts to limit using a fossil fuels (oil, gas and coal), [European Parliament 2015] and warrants to implement biofuels. Such regulations, on the one hand, influence on using fuels by agriculture but, on the other, promote agricultural production of biofuel components [Vergano and Laurenz 2012]. Moreover, a modern equipment of good technical condition in production, including agriculture, limits intake

of fuels [Wielewska and Kacprzak 2016] and promote a production of better quality [Olejniczuk-Merta 2016, Forgacs 2017].

However, the agricultural system is still dependent on non-renewable fossil fuel energy, i.e. chemicals, petroleum powered production and distribution equipment [Tomczak 2006]. Food and Agriculture Organizations of the United Nations promotes the global food system that both requires and produces energy [FAO 2011]. Therefore, economic policy of the EU, the USA and Brazil promotes a production of bioethanol and biodiesel [Hamulczuk 2014].

Ethanol is a prospective fuel that can be produced and used by agriculture because of a low costs of production and total biodegrability. It is made by a fermentation of sugar beets and cereals. Vegetable oil from rapeseed, soya and cocoa can be used to produce natural solvents as methyl esters of fatty acids [Chemat et al. 2012]. Fermentable sugars obtained from bagasse can be used to produce ethanol as fuel [Bhatia et al. 2012]. In the connection with the above mentioned facts, agricultural producers shall be prepared for changes of food system in the near future. Beet and rape seem to be the most important vegetables to be used for fuel production by Polish agricultural producers.

CHANGES OF POSITIONS OF EU NET EXPORTERS AND NET IMPORTERS OF MINERAL FUELS, LUBRICANTS, AND RELATED MATERIALS IN 2006–2015

Among EU member states, Denmark was exporter of fuels in 2015 (Table 1).

There were twenty seven net importers of fuels in 2015 as follows: (1) Germany, (2) France, (3) Italy, (4) Spain, (5) United Kingdom, (6) Belgium, (7) Austria, (8) Poland, (9) Netherlands, (10) Hungary, (11) Czech Republic, (12) Ireland, (13) Portugal, (14) Greece, (15) Sweden, (16) Finland, (17) Slovakia, (18) Bulgaria, (19) Luxembourg, (20) Croatia, (21) Romania, (22) Lithuania, (23) Slovenia, (24) Malta, (25) Cyprus, (26) Latvia and (27) Estonia – Table 1.

Whereas, there were two net exporters of fuels in 2006 as follows: Denmark that trade balance amounted to 4.5 billion euro and Bulgaria that trade balance amounted to 0.6 billion euro. However, Bulgaria was net importer since 2007, whereas Denmark was net exporter of fuels in all particular years of the examined period, except 2014 (Table 1).

There were twenty six net importers of fuels in 2006 as follows: (1) Germany, (2) Italy, (3) France, (4) Spain, (5) Belgium, (6) Austria, (7) United Kingdom, (8), Greece, (9) Poland, (10) Netherlands, (11) Portugal, (12) Sweden, (13) Hungary, (14) Finland, (15) Czech Republic, (16) Ireland, (17) Romania, (18) Slovakia, (19) Lithuania, (20) Luxembourg, (21) Slovenia, (22) Croatia, (23) Latvia, (24) Cyprus, (25) Estonia and (26) Malta – Table 1.

Germany was the first net importer of fuels in the searched period. France and Italy changes their positions in 2015 in comparison to the situation in 2006. Poland was the eight fuel net importer in 2015 and it was the ninth in 2006. Moreover, European Union was a net importer of

fuels in all particular years of the examined period and therefore, there is European dependency on fuel imports. However, the trade deficits in fuels of the European Union and the majority of the EU country-members were lower in 2015 than in 2006. It could be connected with the above mentioned cheaper oil in this year and with the innovative technology which let to save fuels. United Kingdom was an example of the country with deeper fuel trade deficit in 2015 than in 2006. This country was seventh fuel net importer in 2006 and the fifth one in 2015. There were deficits of the EU international trade in fuels in 2006 and 2015 and in all particular years of the examined period and the absolute majority of EU fuel net importers in a comparison to fuel net exporters.

However, the biggest trade deficits in fuels of the majority of the EU countries were in 2008. Such a situation was connected with the above mentioned third oil shock, i.e. a big increase of the oil prices in this year. The

Table 1. Trade balance in international trade of mineral fuels, lubricants and related materials (in milliards euro – current prices)

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006–15
EU-28	–285.9	–275.2	–375.4	–241.2	–306.0	–394.6	–421.4	–377.5	–334.8	–243.2	–3 255.3
Belgium	–14.8	–12.6	–18.7	–11.3	–13.5	–17.6	–19.4	–17.8	–15.4	–11.3	–152.4
Bulgaria	0.6	–2.4	–3.0	–1.9	–2.2	–2.6	–2.9	–2.6	–2.4	–1.7	–21.1
Czech Republic	–4.9	–4.5	–6.6	–4.0	–5.4	–7.2	–7.5	–7.5	–6.2	–4.2	–58.1
Denmark	4.5	4.2	4.0	2.3	2.2	1.6	1.3	0.3	–0.1	0.2	2..5
Germany	–67.2	–60.1	–87.7	–60.4	–73.6	–95.7	–98.1	–96.4	–83.2	–59.2	–781.7
Estonia	–0.5	–0.6	–0.7	–0.3	–0.2	–0.1	–0.2	–0.4	–0.4	–0.3	–3.7
Ireland	–3.7	–4.6	–5.7	–3.8	–4.7	–5.6	–5.3	–5.7	–5.3	–4.1	–48.6
Greece	–7.5	–6.6	–9.3	–5.3	–6.9	–7.4	–7.6	–6.3	–5.7	–3.9	–66.5
Spain	–32.3	–32.3	–40.7	–24.7	–31.6	–40.1	–39.1	–34.5	–30.1	–22.1	–327.6
France	–44.5	–43.4	–56.5	–38.3	–47.3	–62.1	–68.2	–64.6	–54.1	–39.4	–518.4
Croatia	–1.5	–1.7	–2.4	–1.6	–1.7	–2.4	–2.4	–2.2	–1.7	–1.5	–19.3
Italy	–49.3	–46.3	–58.4	–41.2	–51.4	–59.8	–61.5	–53.2	–42.4	–32.9	–496.5
Cyprus	–0.8	–0.9	–1.2	–0.8	–1.2	–1.3	–1.5	–1.2	–1.0	–0.7	–10.6
Latvia	–0.9	–1.0	–1.3	–0.8	–0.9	–1.1	–1.3	–1.3	–1.0	–0.7	–10.3
Lithuania	–0.8	–1.2	–1.9	–1.1	–2.0	–2.4	–2.5	–2.1	–1.7	–1.3	–17.0
Luxembourg	–2.0	–2.0	–2.5	–1.5	–1.9	–2.5	–2.8	–2.5	–2.2	–1.6	–21.5
Hungary	–5.7	–4.7	–6.7	–4.6	–5.1	–6.1	–6.3	–6.4	–6.5	–4.6	–56.6
Malta	–0.2	–0.1	–0.1	0.0	0.1	–0.2	–0.9	–0.7	–1.3	–0.8	–4.2
Netherlands	–6.4	–7.3	–4.4	–4.5	–9.3	–12.5	–16.8	–9.0	–10.5	–6.9	–87.4
Austria	–9.3	–7.9	–10.2	–6.8	–8.6	–11.4	–12.5	–11.3	–9.8	–7.7	–95.5
Poland	–6.6	–8.1	–11.1	–7.1	–9.4	–12.4	–13.3	–10.7	–10.8	–7.0	–96.4
Portugal	–6.3	–6.4	–8.2	–5.0	–6.0	–7.4	–7.9	–6.2	–6.1	–4.1	–63.6
Romania	–2.9	–3.3	–4.0	–1.9	–2.8	–3.6	–4.1	–2.7	–2.1	–1.5	–28.9
Slovenia	–1.6	–1.6	–2.3	–1.4	–1.8	–2.3	–2.4	–2.0	–1.5	–1.1	–18.2
Slovakia	–2.9	–2.7	–3.9	–2.8	–3.8	–4.5	–4.3	–4.4	–3.2	–2.8	–35.3
Finland	–5.2	–4.7	–6.4	–4.3	–5.3	–7.4	–5.2	–5.2	–5.0	–3.2	–51.8
Sweden	–5.7	–5.6	–6.7	–3.8	–6.1	–7.3	–7.2	–6.7	–5.7	–3.9	–58.7
United Kingdom	–7.6	–8.8	–12.9	–6.5	–8.0	–19.5	–25.4	–22.6	–18.8	–16.0	–146.1

Comments: the last column means a total balance for 2006–2015 – Author's calculations; the sequence of states in the table according to the sequence in Eurostat, i.e. alphabetically but relatedly to the names of countries in their own languages, e.g. Germany in German language means Deutschland and Finland in Finnish language means Suomi.

Source: Eurostat database.

only net exporter Denmark obtained the surplus on trade balance in 2008. The biggest net importers of fuels, i.e. Germany, Italy, France and Spain obtained deeper trade deficits in 2008 than in any other particular year of the examined period from 2006 to 2015 (Table 1) and such a situation confirmed the hypothesis.

EU NET EXPORTERS AND NET IMPORTERS OF MINERAL FUELS, LUBRICANTS, AND RELATED MATERIALS ACCORDING TO THE BALANCE IN THE PERIOD FROM 2006 TO 2015

Aiming at presentation of situation in international trade of EU fuel net exporters and net importers in the examined period, their trade balance is analyzed below. The European Union was the net importer of fuels in the period from 2006 to (Table 1).

There was only net exporter of fuels in the period from 2006 to 2015, i.e. Denmark (Table 1).

There were twenty seven net importers of fuels in the period from 2006 to 2015 as follows: (1) Germany, (2) France, (3) Italy, (4) Spain, (5) Belgium, (6) United Kingdom, (7) Poland, (8) Austria, (9) Netherlands, (10) Portugal, (11) Greece, (12) Sweden, (13) Czech Republic, (14) Hungary, (15) Finland, (16) Ireland, (17) Slovakia, (18) Romania, (19) Luxembourg, (20) Bulgaria, (21) Croatia, (22) Slovenia, (23) Lithuania, (24) Cyprus, (25) Latvia, (26) Malta and 927) Estonia – Table 1.

The first four net importers of fuels in the period from 2006 to 2015 were the same as net importers in 2015. Poland achieved the seventh position in this period, i.e. a better one than in 2006 and in 2015.

IMPORTANCE OF EXPORTS AND IMPORTS FOR THE MAJOR EU NET EXPORTERS AND NET IMPORTERS OF MINERAL FUELS, LUBRICANTS, AND RELATED MATERIALS

According to the value of exports of mineral fuels, lubricants, and related materials in 2015, the EU countries obtained the following positions (Eurostat database):

1) Netherlands that achieved the value of exports amounting to 67.0 billion euro (this country also was the first one in 2006 with the value of exports amounting to 51.4 billion euro and in the period from 2006 to 2015 with the value of exports amounting to 738.5 billion euro), 2) Belgium 30.1 billion euro (this country obtained the third position in 2006 with the value of exports amounting to 23.3 billion euro), 3) United Kingdom 29.8 billion euro (this country obtained the second position in 2006 with the value of exports amounting to 24.7 billion euro), 4) Germany 29.7 billion euro (this country also obtained the fourth position in 2006 with the value of exports amounting to 23.1 billion euro), 5) Spain 16.7 billion euro (this country obtained the seventh position in 2006 with the value of exports amounting to 8.8 billion euro), 6) France 14.8 billion euro (this country obtained the fifth position in 2006 with the value of exports amounting to 16.3 billion euro), 7) Italy 14.1 billion euro, 8) Sweden 8.3 billion euro, 9) Greece 7.6 billion euro, 10) Poland 5.9 billion euro, 11) Denmark (the only EU net exporter) 5.1 billion euro, 12) Czech Republic 4.3 billion euro, 13) Finland 3.9 billion euro, 14 Portugal 3.9 billion euro, 15) Lithuania 3.8 billion euro, 16) Austria 2.7 billion euro, 17) Romania 2.6 billion euro, 18) Slovakia 2.5 billion euro, 19) Bulgaria 2.4 billion euro, 20) Hungary 2.1 billion euro, 21) Slovenia 1.4 billion euro, 22) Croatia 1.3 billion euro, 23) Ireland 1.1 billion euro, 24) Estonia 1.1 billion euro, 25) Latvia 0.7 billion euro, 26) Cyprus 0.4 billion euro 27) Malta 0,3 billion euro and 28) Luxembourg 0.1 billion euro.

According to the value of imports of mineral fuels, lubricants, and related materials in 2015, the EU countries obtained the following positions (Eurostat database):

1) Germany that achieved the value of imports amounting to 88.9 billion euro (this country also was the first one in 2006 with the value of imports amounting to 90.3 billion euro and in the period from 2006 to 2015 with the value of imports amounting to 1,041.4 billion euro), 2) Netherlands 73.9 billion euro (this country obtained the fourth position in 2006 with the value of imports amounting to 57.8 billion euro), 3) France 54.2 billion euro (this country also obtained the third position in 2006 with the value of imports amounting to 60.8 billion euro),

4) Italy 47.1 billion euro (this country obtained the second position in 2006 with the value of imports amounting to 61.5 billion euro), 5) United Kingdom 45.8 billion euro (this country also obtained the fifth position in 2006 with the value of imports amounting to 43.2 billion euro), 6) Belgium 41.4 billion euro (this country obtained the seventh position in 2006 with the value of imports amounting to 38.1 billion euro), 7) Spain 38.8 billion euro, 8) Poland 12.8 billion euro (this country obtained the ninth position in 2006 with the value of imports amounting to 10.5 billion euro), 9) Sweden 12.2 billion euro, 10) Greece 11.5 billion euro, 11) Austria 10.4 billion euro, 12) Czech Republic 8.5 billion euro, 13) Portugal 8.0 billion euro, 14 Finland 7.1 billion euro, 15) Hungary 6.7 billion euro, 16) Ireland 5.1 billion euro, 17) Lithuania 5.1 billion euro, 18) Denmark (the only EU net exporter) 5.0 billion euro, 19) Bulgaria 4.1 billion euro, 20) Romania 4.0 billion euro, 21) Croatia 2.8 billion euro, 22) Slovenia 2.5 billion euro, 23) Luxembourg 1.6 billion euro, 24) Latvia 1.4 billion euro, 25) Estonia 1.4 billion euro, 26) billion euro 27) Malta 1.2 billion euro and 28) Cyprus 1.1 billion euro.

The biggest values of fuel imports in the examined period from 2006 to was 2015 were achieved by the majority of EU countries in 2008 and they were connected with the above mentioned third oil shock, i.e. a big growth of the oil prices, e.g.: (1) Germany achieved the value of fuel imports amounting to 114.2 billion euro, (2) France 79.5 billion euro, (3) Netherlands 77.0 billion euro and (4) Italy 76.8 billion euro (Eurostat database).

The importance of the fuel exports and imports for the major EU net exporters and net importers of fuels in 2015 was as follows: The only net exporter, i.e. Denmark obtained the eleventh position in exports and the eighteenth position in imports The first net importer, i.e. Germany obtained the fourth position in exports (this country also obtained the fourth position in 2006) and the first position in imports (this country also was the first one in 2006). The second net importer, i.e. France obtained the sixth position in exports (this country obtained the fifth position in 2006) and the third position in imports (this country also obtained the third position in 2006). Italy, i.e. the third net importer obtained the seventh position in exports and the fourth position in imports. The fourth net importer, i.e. Spain obtained the fifth position in exports and the seventh position in imports. Poland, i.e. the eighth net importer obtained the tenth position in exports and the eighth position in imports.

IMPORTANCE OF THE TRADE IN MINERAL FUELS, LUBRICANTS, AND RELATED MATERIALS IN THE TRADE IN ALL GOODS OF THE MAJOR EU FUEL NET EXPORTERS AND NET IMPORTERS

Analysis covers the only net exporter, i.e. Denmark and major net importers of fuels in 2015. The trade balance in fuels is compared with the trade balance in all goods. Moreover, there are calculated the shares of the fuel exports in the merchandise exports and of the fuel imports in the merchandise imports according to the data from Eurostat.

The European Union was the net importer of fuels in 2015. The EU trade balance in fuels amounted to –243.2 billion euro and the trade balance in all goods amounted to 64.2 billion euro. The EU fuel exports amounted to 85.2 billion euro, i.e. 4.8% EU merchandise exports amounting to 1,790.7 billion euro. The EU fuel imports amounted to 328.4 billion euro, i.e. 19.0% EU total product imports amounting to 1726.5 billion euro [Eurostat 2016; percentage shares – Author's calculations]. Therefore, the EU deficit of trade in fuels decreased importantly the EU surplus of trade in all goods. The EU exports of fuels was a relatively small part of the EU merchandise exports but the EU fuel imports was a very important share of its imports of all products.

Denmark achieved the trade balance in fuels amounting to 0.2 billion euro and the trade balance in all goods amounting to 8.9 billion euro. Moreover, Danish fuel exports was eleventh in the EU and amounted to 5.2 billion euro, i.e. 6.0% merchandise exports of this country amounting to 85.9 billion euro. Whereas, the fuel imports of Denmark was the eighteenth in the EU and amounted to 5.0 billion euro, i.e. 6.5% Danish merchandise imports amounting to 77.0 billion euro. There is proved that Danish fuel trade surplus improved in a little scale the merchandise surplus of this country [Eurostat 2016; percentage shares – Author's calculations]. Moreover, there were relatively low shares of fuel exports and imports in trade of all goods of Denmark.

Germany, i.e. the first net importer of fuels with the fuel trade balance amounting to –59.3 billion euro but this country was also the first net exporter of all products with the merchandise trade balance amounting to 251.9 billion euro in 2015. German fuel exports was the fourth in the EU and amounted to 29.7 billion euro, i.e. 2.5% merchandise exports of this country amounting to 1198.3 billion euro. Fuel imports of Germany was the first in the EU and amounted to 88.9 billion euro, i.e. 9.4% merchandise imports of this country amounting to 946.4 billion euro (Eurostat database; percentage shares – Author's calculations). According to the above indicated data deficit of trade in fuels decreased importantly German surplus of trade in all goods. German exports of fuels was only small share of merchandise exports of this country but fuel imports of this country was an important part of its total product imports. Such a situation confirms a strong economic position of Germany in EU. This country exports mostly high technology goods but it is dependent of fuel imports.

The second net importer of fuels, i.e. France achieved the fuel trade balance amounting to –39.4 billion euro and this country also was the second net importer of all goods with the merchandise trade balance amounting to –59.9 billion euro in 2015. Fuel exports of France was the sixth in the EU and amounted to 14.8 billion euro, i.e. 3.2% French product exports amounting to 456.0 billion euro. Fuel imports of this country was the third in the EU and amounted to 54.2 billion euro, i.e. 10.5% French imports of all goods amounting to 515.9 billion euro (Eurostat database; percentage shares – Author's calculations). In this way, the deficit of trade in fuels deepened importantly French deficit of trade in all products. French exports of fuels was a small share of merchandise exports of this country but fuel imports of this country was a big part of its total product imports. Such a situation confirms French dependency on fuel imports.

Italy, i.e. the third net importer of fuels achieved the fuel trade balance amounting to –32.9 billion euro but this country was the third net exporter of all goods with the merchandise trade balance amounting to 45.2 billion euro in 2015. Italian fuel exports was the seventh in the EU and amounted to 14.1 billion euro billion euro, i.e. 3.4% total product exports of this country amounting to 413.9 billion euro. Fuel imports of Italy was the fourth in the EU and amounted to 47.1 billion euro, i.e. 12.8% merchandise imports of this country amounting to 368.7 billion euro (Eurostat database; percentage shares – Author's calculations). According to the above indicated data, the deficit of trade in fuels decreased importantly Italian surplus of trade in all goods. Fuel exports of Italy was a small share of its merchandise exports but fuel imports of this country was a big part of Italian total product imports. Such a situation confirms Italian dependency on fuel imports.

It is also important to analyze a situation in Poland, that was the eighth net importer of fuels which achieved the fuel trade balance amounting to –7.0 billion euro but this country was the net exporter of all goods with the merchandise trade balance amounting to 3.7 billion euro in 2015. Polish fuel exports was the tenth in the EU and amounted to 5.9 billion euro, i.e. 3.3% merchandise exports of this country amounting to 178.7 billion euro. Fuel imports of Poland was the eighth in the EU and amounted to 12.8 billion euro, i.e. 7.3% Polish merchandise imports amounting to 175.0 billion euro (Eurostat database; percentage shares – Author's calculations). According to the data indicated above, the deficit of trade in fuels decreased significantly Polish surplus of trade in all goods. Fuel exports of Poland was a small share of its merchandise exports but fuel imports of this country was a relatively big part of Polish merchandise imports. Such a situation confirms Polish dependency on fuel imports. The above analysis proves that net importers have bigger influence on EU trade balance in fuels than net exporters.

CONCLUSIONS AND PERSPECTIVES

European Union and the absolute most of EU countries were net importers of mineral fuels in the period from 2006 to 2015. Such a situation proves the fuel dependency of the European Union and confirms the hypothesis that net importers have bigger influence on EU trade balance in fuels than net exporters. The third oil shock in 2008 caused the biggest fuel trade deficits of the most of EU countries in the researched period and such a situation confirmed the hypothesis.

Deficits of trade in fuels influenced importantly merchandise trade balance of most important EU net importers. Exports of fuels achieved only small share of merchandise exports but fuel imports of was an important part of total product imports of most important country-members.

Germany was the first EU net exporter in 2006 and in 2015. Whereas, France was the second net importer and Italy was the third one in 2015. These countries changed their positions in accordance to their positions in 2006. Poland was the ninth EU fuel net importer in 2006 and the eighth one in 2016. The only EU fuel net exporter in 2015 was Denmark and this country also was the first net exporter in 2006. Author forecasts that the EU countries will continue the tendency to reduce their dependency on mineral fuel imports through using renewable sources and agricultural production of fuels.

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ZMIANY POZYCJI KRAJÓW UE W MIĘDZYNARODOWYM HANDLU PALIWAMI MINERALNYMI W LATACH 2006–2015

STRESZCZENIE

W artykule dokonano analizy zmian eksportu, importu i salda handlu paliwami, smarami i podobnymi materiałami (nazwanymi paliwami w tym artykule) krajów członkowskich UE w latach 2006–2015. Paliwa są specyficznymi towarami, ponieważ większość krajów UE jest uzależniona od ich importu. Ponadto saldo handlu paliwami jest ważne dla krajów UE z powodu jego dużego znaczenia dla salda handlu wszystkimi towarami. Autor wykazał dominującą pozycję importerów netto paliw w tym okresie. Najważniejszymi importerami netto paliw w 2015 roku były: Niemcy, Francja, Włochy, Hiszpania, Wielka Brytania, Belgia, Austria i Polska. W 2006 roku Niemcy również były pierwszym importerem netto, Włochy były drugim, a Francja trzecim. Polska zajęła dziewiąte miejsce w 2006 roku. Dania była eksporterem netto paliw w całym badanym okresie. Ponadto deficyt handlu paliwami najważniejszych unijnych importerów netto poprawił się, tzn. zmniejszył się w 2015 roku w porównaniu do sytuacji z 2006 roku, z powodu niższych cen ropy naftowej i podjęcia ekologicznych innowacji w produkcji, włączając rolnictwo. W badanym okresie największy import i deficyt handlu paliwami większości krajów UE wystąpiły w 2008 roku. Taka sytuacja była związana z trzecim „szokiem" naftowym.

Słowa kluczowe: Unia Europejska, handel międzynarodowy, paliwa, eksporterzy netto, importerzy netto, trzeci szok naftowy

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 161–168
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.55

ORIGINAL PAPER

Received: 10.05.2017
Accepted: 14.11.2017

DEVELOPMENT FACTORS FOR CROSS-BORDER B2C E-COMMERCE IN THE WORLD AND IN POLAND

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ABSTRACT

The study attempted to identify the factors determining the development of CBEC B2C e-commerce in the world and in Poland. The level of CBEC development in selected countries has been shown. CBEC is a dynamically developing trading sector in the world. Countries differ in terms of CBEC development, which is due to the varying levels of selection of the products in their internal markets and the economic development of a particular country. CBEC's worldwide development is also largely due to the international B2C electronic marketplaces. The barriers to the development of CBEC in the world include inadequate regulations to CBEC specificity, problems and costs of logistics and difficulties in conducting online marketing on foreign markets.

Key words: cross-border e-commerce, CBEC, Internet, B2C

INTRODUCTION

The Internet is a geographically unlimited medium, and the people of the globe have better access to the Web. This implies that more and more consumers around the world in search of products are increasingly visiting foreign websites. On the foreign market consumers buy products that they can't find in the home market, cheaper or with higher quality than domestic products. With the development of e-commerce and the prosperity of societies, shopping at foreign websites has become easier and more available for consumers around the world. Cross Border Electronic Commerce (CBEC) deals with online transactions between market participants from different countries. These are transactions in which individual Internet users make online purchases on foreign websites. This type of eCommerce is associated with the physical transport of products from the company's warehouse, directly to consumers from other countries in the form of individual shipments.

In Poland, cross-border e-commerce is not yet very well developed in terms of sales by Polish online stores to foreign consumers and in terms of purchases of Polish consumers in foreign online shops. However, both in Poland and in the world, CBEC is becoming increasingly popular.

The aim of the article is to identify the factors determining the development of CBEC in the world and in Poland. The author focused on B2C transactions, where the buyers of products sold by online shops are individual consumers. The study was based on a review of the literature and secondary CBEC data available mainly from Eurostat and the Google Barometer.

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EXPANSION OF ONLINE STORES INTO FOREIGN MARKETS AND ITS MARKETING SUPPORT

CBEC is developing because of the specific features of the Internet, which is a global interactive medium. Thanks to the network, consumers have access to products offered by sellers around the world. At the same time, online retailers gain an open, geographically unlimited market. In the world, changes in socio-cultural conditions can be observed as a result of globalization and internationalization. Consumers are increasingly looking for satisfying products because of their quality, price and place of origin in the world [Zalega 2017]. Consumers shopping in foreign online stores have access not only to increasingly diverse products that meet sophisticated needs, but often also to cheaper products compared to products offered in the domestic stores. A wider range of online products is a source of consumer prosperity because consumers have better access to the products they actually want [Laudon and Traver 2016].

Electronic commerce increases the geographical reach of the market for both sellers and buyers. This results in increased online competition and lower prices for electronic commerce products [Kommerskollegium 2012]. On the other hand, for internet sales companies, there are many new niche markets with the size to provide prospective new markets. These niches are also open to small firms [APEC 2015].

The launch of CBEC is accompanied by the establishment of a shop on its own website. Another solution is to use for sale so-called electronic markets. These are websites that bring together many sellers and buyers. Electronic markets have an appropriate IT infrastructure and operate according to specific rules. They offer sellers an easy way to present their products and also provide many sales support services. Electronic markets can be a way to expand business to foreign markets. For example, sellers from different countries may, for example, sell through the Chinese B2C Taobao market, which is used by some 350 million Chinese buyers [LTP Team 2015].

Electronic markets attract consumers because they provide a wide selection of products, efficient price comparisons and the ability to make quick, safe and satisfactory purchases. Especially important in the early stages of CBEC development in the world was the electronic B2C marketplace Ebay. Thanks to this electronic market, in the late 1990s, foreign purchases of European Internet users began on a large scale. The world is seeing a significant increase in overseas purchases through the Chinese B2C electronic market, Ali Expres. It is a foreign B2C electronic market through which consumers have the opportunity to purchase products from foreign sellers. Its popularity is also high in Poland and in 2017 it was third with 4.14 million subscribers, behind such electronic online marketplaces as Allegro (15.3 million subscribers) and Ceneo (8.8 million) [Mazurkiewicz 2017].

A large part of CBEC takes place through separate, not operating within the electronic market, sales websites, i.e. online stores. Online stores that dominate CBEC's global sales come mainly from China, United Kingdom, Germany and USA [Cheliński and Szymkowiak 2017]. Large online stores are often created in a language version appropriate to a specific target market. This is an expensive solution because it requires translating the entire e-store with the individual product descriptions into the language of potential buyers. Managers of Polish companies planning to expand into foreign markets through e-commerce claim that the translation of the sales website is a big financial and organizational challenge [Bełcik 2014].

Online sales abroad entail high costs of online and offline promotions in a given country, with the need to design an appropriate positioning strategy, content marketing and display ads tailored to consumers in a particular country. Entry to new markets is also linked to relatively expensive informative advertising. Messages communicated on modern markets should be conected to the cultural space of target consumers and effectiveness of communication relies on correct identification of consumers' cultural codes of different nations of the world [Mazurek-Łopacińska 2016]. The successful online sale of products in CBEC requires firms to adapt their marketing efforts to the specificity of their international customers. From the perspective of a single online retailer starting CBEC, it is important to make a decision about the target market, website translation, payment method and tax information for consumers. It is also important to choose the right courier to deliver the shipment.

THE POPULARITY OF ONLINE SHOPPING ABROAD AMONG CONSUMERS

In order to determine the degree of CBEC development in different countries, data from Eurostat were used. Referring to them, the table 1 provides information on what percentage of the population in a given country makes foreign purchases online. This information relates to the period 2011–2016.

Table 1. Percentage share of consumers of selected European countries making online purchases abroad between 2011 and 2016

Country	2011	2012	2013	2014	2015	2016	Difference between 2016/2011
Austria	36	41	45	44	52	52	16
Czech Republic	8	8	10	11	13	13	5
Germany (former FRG)	13	15	17	18	21	23	10
Estonia	16	19	20	35	39	41	25
Spain	13	15	16	21	26	29	16
Finland	39	44	45	48	50	45	6
France	20	21	24	26	26	27	7
Italy	7	8	8	11	13	14	7
Poland	4	5	6	8	8	9	5
Portugal	12	14	16	19	22	23	11
Romania	3	2	3	2	3	5	2
Slovakia	16	23	25	25	30	32	16
United Kingdom	18	20	20	27	30	33	15
EU-28	14	16	18	21	23	26	12

Source: Author's analysis based on Eurostat database.

Table 1 shows the selected EU countries only for clarity of information in order to present significant changes in CBEC. The table shows that countries with a relatively high share of consumers buying products online abroad are Austria, Estonia, Finland, the United Kingdom and Slovakia. In turn, the biggest change after 5 years in the share of consumers buying online abroad was recorded in Estonia. Major changes have also occurred in Austria, Spain and Slovakia.

On the basis of the data presented in Table 1, it can be assumed that a relatively significant factor influencing the level of foreign online purchases by the buyers of a particular country is the relatively small internal market, which forces consumers to search abroad for a variety of products at an attractive price, as it can be found in e.g. Estonia or Slovakia, where the share of online buyers abroad was higher in 2016 than in the Czech Republic, Italy or Spain.

It can also be said that the level of economic development and consumer prosperity also determines the activity of consumers in foreign online markets, as evidenced by, for example, a significantly higher share of consumers buying online abroad in countries such as Germany and Spain compared to Poland and Romania. Poland has a relatively large and well-stocked internal market, but Germany in this respect is certainly superior to Poland.

In spite of this, the percentage of Germans who bought abroad in 2016 was more than double the percentage of Poles buying online abroad.

Comparing these two countries, data from the Google Barometer survey conducted in 2015 has been used. The research concerned internet users' opinions regarding the factors preventing them from buying online abroad. Internet users were asked why they did not buy products online abroad. The author compares the opinions of German and Polish Internet users in Table 2.

Table 2. German and Polish Internet users' opinions on the factors preventing them from online shopping abroad (%)

Opinions of internet users	German users (sample N = 1 152)	Polish users (sample N = 1 445)
Online stores from my country meet my needs	36	41
I did not consider this problem	23	27
I suppose they are more expensive	14	23
I suppose the delivery takes longer	18	19
I suppose the return of the product is difficult / expensive	28	24
I'm worried about customer service issues	21	17
I'm afraid to pay in foreign currency	12	14
I'm afraid of language problems	8	20
I do not trust foreign online stores	26	12
Sites of foreign stores are of low quality	4	1

Source: Author's analysis based on Consumer Barometer with Google data, https://www.consumerbarometer.com/en [accessed: 27.05.2017].

The information presented in Table 2 indicate that significant factors preventing Polish and German Internet users from shopping online abroad are: meeting the shopping needs in the national e-stores, fear of long delivery times and problems with product return and customer service. There is also a high percentage of Internet users who have never considered buying online abroad. Comparing the data presented in Table 2, it can also be said that the biggest differences between Polish and German Internet users are in perception of online shopping costs, language problems and trust with foreign online stores. Polish Internet users, compared to German, view online shopping as more expensive, more often fear language problems, but on the other hand they trust more foreign online stores.

Therefore, it can be assumed that the significant factors indicated by internet users as frequently stopping them from shopping on the Internet abroad result largely from problems connected with communication with foreign entities and logistical problems of product delivery. One can also assume that it is difficult for online stores to get with the promotional message to the awareness of foreign consumers.

SECURITY AND TRUST IN CBEC TRANSACTIONS

In e-commerce, consumer trust with online stores is very important [Turban 2006]. Trust means that the other side of the transaction will keep the promise and honestly deal with the transaction. Therefore, an important task

for an internet seller is to establish a high level of trust with the buyers. This is particularly important in CBEC because of the high rate of fraud compared to national e-commerce. Making fraud in CBEC is easier than in domestic trade. Transaction participants come from different countries, therefore, the enforcement of their rights is very difficult. The transaction is conducted with an entity operating in another country, time zone and other legal system and using a different currency [Huang et al. 2007].

There are 4 important security issues in e-commerce: transactional parties must know their identity, data can not be seen by eavesdroppers, communicating parties need to know when data has been compromised, it must be possible to prove that the transaction took place [Pittayachawan et al. 2004].

CBEC retailers are estimated to experience 50% more fraud cases compared to online domestic retailers and experts point to the following major security-related challenges facing retailers in international e-commerce [Renfrow and Donela 2017]: constantly evolving fraud tactics, lack of global buyer identity verification standards, differences between countries in terms of the number of frauds, rejections of many legitimate transactions due to fears of fraud, difficulty in promptly verifying the identity of the purchasers.

Verifying data on buyers is not only a security issue, but also can impact a higher shipping costs and lost sales. The problem of data verification is also indicated by Polish entrepreneurs selling products to consumers abroad. They say that the company needs a system of efficient verification of data and addresses of foreign customers buying online, because customers often enter addresses incorrectly, making it difficult or impossible to ship products [Fajferek 2017].

Various initiatives are in place to increase the security of e-commerce transactions. For example, in 2014, the European Banking Authority (EBA) announced guidelines for secure online payments in the European Union. An important point of these guidelines is the recommendation for "strong authentication" use in online transactions. This is a kind of multifactor authentication. It consists of using at least two of the following three features: 1 - something that only the user knows (e.g. password); 2 – something that only the user has (e.g. token), 3 – specific user characteristics (e.g. fingerprints) [Campi 2012]. However, these are guidelines that apply to only a few online stores due to the cost of implementing it.

Legal factors in CBEC

CBEC transactions are related to parties representing two or more different countries. Even within the European Union, in spite of the general regulations on e-commerce, each member state has its own specific regulations in force. Therefore, it is important to know these specific regulations by those who want to sell to a particular country. An internet seller considering foreign sales should check for any country that there are no regulations in place that give consumers specific rights. This is a particularly important question of checking the laws in force in a given country because in the case of online sales of goods to consumers, the appropriate court is the one of consumer place of residence [Czerniawski and Wiercińska-Krużwska 2017]. It should also be noted that in cases where the transaction is subject to the jurisdiction of another country, the cheated seller often resigns of asserting his rights due to the high costs of legal proceedings abroad, translations, etc.

Very often, entrepreneurs are discouraged from selling to foreign consumers because of fear of double taxation. Difficulties in practical implementation of taxation for cross-border income stem largely from two concepts of taxation. The first is territorial jurisdiction, where the taxation of income earned on the territory of a given country is assumed. On the other hand, the second concept assumes taxation of the incomes of the inhabitants of a particular country irrespective of which country in the world these incomes have been achieved. As a result, the adoption of one of these two legal concepts can lead to double taxation of the online store. It is believed that there is a mismatch between the current way of taxation in the world and the specifics of electronic commerce [Gałuszka 2013]. This is due to the ambiguity in the approach of taxation in the territorial concept. It is particularly difficult to justify taxation when income in CBEC is linked to many countries and it is difficult to pinpoint the specific contribution of one country.

The European Commission is taking steps to simplify the tax system and encourage small retailers from the EU to sell in other countries. One example is the Mini One Stop Shop concept. This is a solution that enables entrepreneurs to conduct electronic transactions with consumers from EU countries without having to register in each of the countries of origin of the buyer. With this solution is only one registration in the database without having to register in each country separately. This is a solution that facilitates the payment of VAT in the countries where the buyers come from, through a single country of identification, that is, the country where the store is located [Vasquez et al. 2017].

LOGISTICS IN CBEC

In CBEC there is usually a large distance between the seller and the buyer. The consequence of this is a significantly higher cost of shipment compared to domestic shipments. The characteristic of e-commerce logistics is the importance of the so-called last mile delivery, which is the most complex and costly process of all processes in the supply chain. Small batches of goods must be delivered to many geographically dispersed consumers. This problem becomes more complex in CBEC, where we are dealing with extended delivery times and various legal regulations. In CBEC there is a problem of the relatively small flow of goods between countries carried out by a single courier company. In international trade, shipping must often be subject to additional measures and pass through more distribution hubs, which with low flow of goods causes higher unit costs. The solution to this problem can be, for example, the introduction of additional entities into the supply chain in CBEC, which are so-called fourth party logistics (4PL) companies whose tasks include supporting the flow of information between the supplier, the buyer and the logistics service provider (courier). 4PL creates an electronic platform on its website that allows to find offers, compare them, pay and track shipments. The platform keeps up to date with information about the services and prices of logistics companies, allowing to decide on the company that will deliver the shipment [Kawa 2017]. Due to such kind of intermediaries in the logistic chain, it is possible to lower the unit costs of the shipment, and thus lower the price paid by the buyer in a foreign online shop.

Streamlining CBEC's product delivery chains is particularly important for small and medium-sized businesses that should strive to reduce shipping costs, especially given the fact that large online retail stores are increasingly offering free shipping. They can afford this because they are able to negotiate better prices with large couriers [Ballebye et al. 2017].

High impact on logistics efficiency have barriers on the borders of states. Import of some products may be restricted. Some countries introduce regulations leading to the extension of import tariffs and requirements for goods imported through CBEC [Laubscher 2017]. On the other hand, countries are also seeking to maintain preferential treatment for foreign products imported that are purchased online and distributed through so-called bonded warehouses. For example in China international brands are transported to Chinese consumers without being subjected to import quarantine obligations and long-term quality controls. This is particularly important for products which marketing is strictly regulated such as food products, diet supplements, cosmetics [Brennan 2017].

Logistical problems may in the future be influenced by a macro-environmental factor, which is the depletion of natural resources such as crude oil and the possible price increase of this material in the world [Fechner 2007].

The research conducted among Polish online shops intending to start CBEC shows that the major problems of these companies are concerns about high costs of shipping products and returns, lack of knowledge about foreign trade and costs of settlement of disputes with buyers [Cheliński and Szymkowiak 2017]. This confirms the earlier thesis that logistic barriers and legal barriers are the main barriers to the launch of CBEC.

CONCLUSIONS

As a result of the presented analysis, the following conclusions regarding the development of CBEC and its determinants have been found:

- CBEC is a dynamically growing commercial phenomenon on a global scale.
- CBEC is at particularly high level in developed countries, and in countries with relatively less developed internal markets in terms of selection of products.
- There are significant differences in attitudes towards CBEC in terms of the country of origin of Internet users.
- An important factor in the development of CBEC in many countries are international B2C electronic markets. They are an attractive place to do business online and a safe and easy way to shop abroad for consumers.
- Important barriers to the development of CBEC in the world are the mismatch of legal solutions in many countries with the specificity of CBEC, logistics problems and shipping costs, as well as the difficulty of conducting marketing activities via the Internet on foreign markets comparing with domestic markets.

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UWARUNKOWANIA ROZWOJU TRANSGRANICZNEGO HANDLU ELEKTRONICZNEGO B2C NA ŚWIECIE I W POLSCE

STRESZCZENIE

W opracowaniu podjęto próbę identyfikacji czynników warunkujących rozwój transgranicznego handlu elektronicznego CBEC typu B2C na świecie i w Polsce. Pokazano stopień rozwoju CBEC w wybranych krajach. Można stwierdzić, że CBEC jest dynamicznie rozwijającym się sektorem handlu na świecie. Kraje różnią się pod względem rozwoju CBEC, co wynika z różnego poziomu zasobności w produkty ich rynków wewnętrznych oraz rozwoju gospodarczego danego kraju. Do rozwoju CBEC na świecie w znacznym stopniu przyczyniły się międzynarodowe rynki elektroniczne B2C. Do barier rozwoju CBEC na świecie można zaliczyć niedostosowania regulacji prawnych do specyfiki CBEC, problemy i koszty logistyczne oraz trudności w prowadzeniu działań marketingowych online na rynkach zagranicznych.

Słowa kluczowe: transgraniczny handel elektroniczny, CBEC, Internet, B2C

Acta Sci. Pol.
Oeconomia 16 (4) 2017, 169–178
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2017.16.4.56

ORIGINAL PAPER

Received: 12.09.2017
Accepted: 05.12.2017

CHANGES IN FOOD CONSUMPTION IN POLAND AND OTHER EU COUNTRIES

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ABSTRACT

The article presents the determinants and directions of changes in food consumption in Poland against the background of other EU countries. Presentation the state of scientific knowledge is a baseline for further considerations. The next chapter includes the determinants of changes in food consumption in the countries of the EU over the last decade. Nextly the economic background in EU countries was presented. The next chapter was dedicated to the food consumption patterns in EU countries**.** A comparative analysis of food consumption in EU countries indicates that discrepancies remain in the level of economic growth within the European Union. Changes in consumption patterns in EU states are of both a quantitative and qualitative character. The present analysis of transformations in food consumption of Polish households shows that the tendency displayed in the results of previous research continues today.

Key words: changes in food consumption, household expenses, consumer behaviours

INTRODUCTION

The globalisation of consumption has unified consumer behaviour patterns on a global scale. Significant changes in the consumption patterns of post-communist countries have occurred over the last decade. Consequently, nutritional needs are now met at a more satisfactory level, while consumption is rationalised to a greater extent.

According to Engel's law, in countries characterized by a relatively high standard of living, food expenditures as a share of overall expenditures are rather low. The pace of growth of real income in individual countries in the EU has varied greatly. The most dynamic growth was recorded in the post-communist countries. A decreasing share of food expenditures in overall expenditures is a significant indicator of growing affluence of the inhabitants of EU member states. While such a decrease has occurred in Poland, the share is still higher than in the developed EU member states That GDP in Poland has reached 70% of the EU average is a good sign indeed, particularly considering that in 2004 it was less than half of this average. The GDP growth can be attributed to high economic growth in Poland over the last eight years [Szwacka-Mokrzycka 2015]. The scale of GDP growth in Poland is consistent with its position in Europe as an emerging market.

THE STATE OF SCIENTIFIC KNOWLEDGE

An interdisciplinary approach to researching the economics of consumption will look at economics, social, biological and agricultural sciences. The contribution of other scientific fields and disciplines is used to create the theory and examine the processes occurring in different areas of consumption. In terms of theory and the ap-

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plication of consumption research, particular attention is given to "consumer behaviour" and its determinants, as well as the decision-making process arising therefrom. The multifaceted approaches used to describe the causative factors of consumer behaviour determine a typology of consumers on the basis of social and psychological conditions. As a result of activities conducted in this area, it is possible to determine consumer "lifestyles". Another important aspect, from the point of view of research into consumption, is assessing consumers' satisfaction of their purchasing needs.

The scope of consumption includes both the direct act of satisfying individual needs and human behaviour in the process of producing, exchanging and consuming goods and services. In the macroeconomic approach, consumption is treated as a stage of social reproduction, responsible for the finalisation of the whole reproduction process. This multifaceted approach to consumption indicates its special place in economic sciences. At the same time, it should be noted that under the school of classic economics, i.e. at the turn of the eighteenth and the nineteenth centuries, as well as in pre-classic approaches including mercantilism, Physiocracy and Marxist economics, consumption was pushed to the margins of economic theory [Bywalec and Rudnicki 2002].

Oscar Lange played a key role in shaping views on the role of consumption in a centrally planned economy. According to Lange [1978], consumption was a subject of interest in non-economic sciences. The position of consumption in economic sciences was developed in the 1960s and is attributed mainly to such outstanding scientists as Krzyżewski [1959], Lipiński [1960], Hodoly [1965] and Piasny [1967]. In the 1970s, consumption gained a permanent position in the economic sciences, with Pohorille [1971] and Hodoly [1975], among others, among the prominent contributors.

Over the past decade, the consumption sciences have developed significantly, alongside changes in the world economy brought about by the processes of integration and globalisation. A large number of researchers have weighed in on the topic of new trends in consumption and the creation of a new consumer culture [Komor 2000, Mazurek-Łopacińska 2003, Bywalec 2010, Tkaczyk 2012, Koszewska 2013, Dąbrowska et al. 2015, Małysa-Kaleta 2015]. The position of consumption in food economy was developed in the 1970s and is attributed to Zielińska [1978], Janoś-Kresło [1989], Szwacka-Salmonowicz, Zielińska [1996], Żelazna [2000], Szwacka-Salmonowicz [2003], Gutkowska and Ozimek [2005], Urban [2005], Szwacka-Mokrzycka [2015], and other scientists.

DATA AND METHODOLOGY

A wide range of information has been used for this article because of the many areas it touches upon. It relies on research from Eurostat Data and data from the Polish Central Statistical Office. With the research done for the years 2007–2014, the sources for the comparative analysis of food consumption in EU countries were real adjusted gross disposable income of households, final food and non-alcoholic beverage consumption expenditures, and the subjective evaluation of household income in 2005–2013 was based on questionnaire research in the form of a direct interview with households.

CHANGES IN FOOD CONSUMPTION IN THE COUNTRIES OF THE EU

Numerous factors determine the direction and nature of changes in consumption. Research conducted by a range of authors shows the changes that have taken place in the EU over the last decade have involved both the level and structure of consumption [Bywalec 2010, Małysa-Kaleta 2015].

These changes are the result of many processes, some extrinsic and others rooted in the internal conditions of development and civilization of societies integrated within the EU. As for the external conditions, economies being internationalised in the global dimension and, consequently, globalisation, are of the utmost importance here. In the global scale, technological change, the development of information technology and cultural change are all likewise important.

The processes of globalisation do not affect all European countries evenly. They may take the form of standardised actions, or adapt themselves to local environments. This heterogeneity of responses is attributable to the diversity of EU countries, resulting from the significant polarization of the level of economic and social development of member states and the experience of economic transformation. With regard to internal determinants, economic factors, including the level of income and purchasing power of consumers, are of key importance, as are non-economic factors including demographic, cultural, social and psychological ones [Mazurek-Łopacińska 2003, Małysa-Kaleta 2015].

In the scientific community, the prevailing view is that the spread of new consumer trends is the result of both external and internal factors [Koszewska 2013]. There is today a growing consensus about the importance of certain factors influenced by new trends in consumption. Demographic, cultural, technological and economic conditions should all be considered. Changes in these conditions contribute to the emergence of the "new consumption" and a new consumer culture [Bywalec 2010]. The most advanced European countries, which point to model solutions in this area, may be looked to for a benchmark for determining the pace and scale of transformations.

Research done on Europe looks at consumer typologies based on the concept of lifestyle, or gaining insight into the motives and values of the consumer. These methodologies are based on the notion of a Euroconsumer, the standard buyer of standard products [Komor 2000, Szwacka-Mokrzycka 2013]. In light of the various statements on existing consumer typologies, it can be concluded that a truly European buyer profile does not emerge from among other lifestyle-based profiles [Tkaczyk 2012]. On the other hand, segments of consumers behaving similarly and exhibiting similar values can be distinguished, irrespective of their country of residence.

Globalisation today is reflected in the unification of consumer behaviour patterns on a global scale. In the light of the transformations, consumption is recognised as a process that promotes the product range available on the world market. This is conducive to convergence in consumption patterns and consumer behaviour. Among the factors influencing the globalisation of consumption, there are those which promote and those which inhibit its development [Mazurek-Łopacińska 2003]. Those which promote it can be found on both the demand side and the supply side. Global consumers acquiring products and increasing their spatial mobility promotes globalisation from the demand side. Supply-side factors include stronger competition, enterprises pursuing economies of scale, production factors flowing freely and the development of new technologies. Growing competition and companies searching for new markets internationally have further promoted globalisation.

Changes in consumer needs and their hierarchisation occur under the influence of both external and internal factors. Many authors point to the fact that demographic and socio-occupational changes are central to the process of shaping consumer needs, and in particular affect the change in hierarchy and level of demand, determine the creation of new needs, change the ways and means of addressing them, and change the course of consumers' decision-making processes. At the same time, within the EU Member States, there is considerable variation in the determinants that influence the transformation process in the needs and ways of meeting consumer needs. This is due to the uneven level of economic development in the Community, the different levels of market economy experience and cultural differences. Economic factors are considered to play by far the most important role in modeling consumption (With regard to its level and structure across EU countries).

THE ECONOMIC BACKGROUND IN EU COUNTRIES

A macroeconomic measure that can be used to show a population's standard of living is gross disposable income per capita in the household sector. Disposable income is designated for financing consumption and for savings. The value of income is calculated on the basis of the purchasing power parity and expressed in the common conventional currency – Purchasing Power Standard (PPS). The Data presented in table 1 show

that in 2007, the highest disposable income in the household sector per capita was attained by Austria, the UK, the Netherlands, Belgium, Germany, France and Italy. The income of these countries greatly exceeded the EU-28 average (from 10 to 24%). In Poland, meanwhile, real disposable income in the household sector was 45% lower than the EU-28 average (Table 1), while Bulgaria and Romania's incomes were far below that of Poland.

Table 1. Real adjusted gross disposable income of households per capita in EU in 2007–2013

Specification	2007	2008	2009	2010	2011	2012	2013
EU-28	19.145	19.392	19.125	19.585	19.940	20.277	20.311
Austria	23.722	23.884	23.384	24.218	24.469	25.325	24.923
Belgium	21.077	21.657	21.472	22.278	22.716	23.141	23.069
Bulgaria	6.519	7.352	7.153	7.512	8.155	8.475	8.921
Croatia	nd	nd	nd	nd	nd	nd	nd
Cyprus	18.700	20.581	19.535	20.116	19.313	18.299	17.749
Czech Republic	14.070	13.497	13.850	14.191	14.672	14.892	14.954
Denmark	18.871	19.067	19.288	20.446	21.042	21.634	21.368
Estonia	10.777	11.710	10.924	11.066	11.753	12.243	12.844
Finland	19.641	20.521	20.462	21.323	22.081	22.837	23.015
France	22.015	22.083	21.800	22.651	23.083	23.328	23.265
Germany	22.836	23.122	22.438	23.981	25.052	25.859	25.897
Greece	18.277	19.161	18.845	17.761	16.480	15.790	14.797
Hungary	11.279	11.293	11.182	11.717	12.503	12.526	12.762
Ireland	20.349	20.269	19.552	19.794	19.163	19.230	19.233
Italy	20.972	21.385	20.402	21.131	21.200	20.627	20.578
Latvia	11.338	11.843	9.829	9.893	9.893	10.575	11.760
Lithuania	11.369	12.486	11.622	12.444	13.144	13.795	14.839
Luxemburg	nd	nd	nd	nd	nd	nd	nd
Malta	nd	nd	nd	nd	nd	nd	nd
Netherlands	23.135	23.267	22.725	22.405	22.725	22.813	22.436
Poland	10.456	10.828	11.351	12.319	12.777	13.540	14.030
Portugal	15.814	16.050	15.924	16.489	16.214	15.997	16.855
Romania	7.308	8.518	8.039	8.500	8.698	8.813	–
Slovakia	11.918	12.822	12.846	13.847	13.966	14.192	14.755
Slovenia	15.755	16.197	15.363	15.706	16.099	16.004	15.972
Spain	18.309	18.641	18.732	18.232	18.417	18.318	18.507
Sweden	20.611	21.194	20.944	21.240	22.210	23.088	23.226
United Kingdom	23.104	22.329	22.153	21.626	21.250	21.998	21.782

Source: Own elaboration on the base of *Europe in figures* – Eurostat yearbook from 2015.

The situation changed dramatically in 2013, when the difference between Poland and the EU-28 decreased to 31%. The condition of households in Bulgaria and Romania likewise improved, with the share of disposable income among inhabitants of those countries constituting 44% and 43% of disposable income, respectively. The distance between these countries and the EU-28 decreased by 5% and 10%, respectively, while in 2007 Bulgarians and Romanians had much less gross income per capita at their disposal. Real disposable income per capita was higher in most EU member states in 2013 than it was in 2007, though the pace of the rise had varied by country. The post-communist countries – Poland, Lithuania, Bulgaria, Romania and Estonia – underwent the most dynamic growth (34, 30.5, 36.8, 20.5 and 19.2%, respectively, Table 1). The rest of the countries in this region saw stable growth. A significant increase in real income per capita was also observed in the most developed countries of the EU. From 2013 to 2007, Germany's grew by 13.4%, followed by Denmark at 13.2%, Sweden at 12.6%, and Belgium by 9.5%. In the remaining EU member states characterised by the highest level of growth, the income level was stable (Table 2). At 20%, Ireland and Greece posted decisive decreases in their disposable income per capita over the period.

Of course, the global financial crisis substantially impacted household incomes. Before the crisis – in years 2007–2010 – real gross income had increased significantly in the EU-27 (by more than 2.5%). In this period, Poland posted a sizable increase (12.4%), though even that paled in comparison to Bulgaria's (20.5%). In Latvia, Lithuania and Greece, on the other hand, real incomes decreased by 20% and 11%, respectively (Table 1).

The share of expenditures for food in overall expenditures of households can be examined to estimate the purchasing power of inhabitants of EU countries.

Engel's law holds that in countries characterised by a relatively high standard of living, food expenditures as a share of overall expenditures is rather low. Therefore, an obvious indicator of rising affluence of the inhabitants of the EU – as elsewhere – is a decrease observed in the share of food expenditures in total expenditures. This applies to Poland as well, though it still spends more of its income on food than

Table 2. Expenditure on final food and non-alcoholic beverage consumption (current prices)

Country	Food and non-alcoholic beverages in % of total expenditure		
	2005	2010	2013
Austria	10.1	9.9	10.0
Belgium	13.4	12.9	12.9
Bulgaria	20.3	18.2	18.7
Croatia	nd	nd	nd
Cyprus	13.2	12.1	14.2
Czech Republic	14.8	14.1	15.7
Denmark	11.0	11.3	11.2
Estonia	nd	20.0	20.7
Finland	12.0	12.1	12.8
France	12.8	12.9	13.4
Germany	10.8	10.3	10.4
Greece	17.2	17.2	17.2
Hungary	16.5	16.9	18.3
Ireland	9.3	9.7	10.6
Italy	14.8	14.4	14.4
Latvia	21.4	20.0	19.1
Lithuania	25.3	24.0	23.8
Luxemburg	8.8	9.4	9.6
Malta	14.0	13.5	13.0
Netherlands	nd	11.1	11.6
Poland	21.1	19.3	18.1
Portugal	15.9	15.8	18.0
Romania	29.8	27.0	29.7
Slovakia	18.0	17.2	17.6
Slovenia	14.8	14.6	15.3
Spain	13.1	12.6	13.1
Sweden	11.9	12.2	12.4
United Kingdom	8.5	8.8	9.1

Source: The author, on the on the basis of Annual International Statistics 2015..

do more developed EU countries. In Poland, income and prices still determine the level and structure of food consumption. In 2010–2012, however, consumer food expenditures as a share of the overall value of household expenditures stabilised around 25%. The higher level of expenditures in the analyzed period was associated with inflation, and did not indicate an improved standard of living. The food consumption indicator showed that similar trends prevailed in Slovakia, while the figures were slightly lower for Portugal and Greece. In the developed EU member states, the share of food expenditures in total expenditures came to approximately 10–14%. The countries with the lowest (8.5–14%) share of food expenditures to total expenditures include the United Kingdom, Luxemburg, Ireland, Austria, Germany, Denmark, the Netherlands, Sweden, Finland, Belgium, Malta, Spain, France, Italy, and Cyprus (Table 2).

The countries with a medium share of expenditures on food to total expenditures (above 15–20%) include Slovenia, Czech Republic, Greece, Slovakia, Poland, Bulgaria, Portugal, Bulgaria, and Hungary. The highest level of food expenditures to total consumption expenditures occurred in Estonia, Lithuania and Romania, the countries with the relatively lowest standard of living (Table 2).

CHANGES IN FOOD CONSUMPTION PATTERNS IN EU COUNTRIES

The extent to which changes in consumption are consistent with the direction and magnitude of the changes in food consumption is essential to the issues discussed in this paper.

As research conducted in Poland and other post-communist bloc countries has shown, significant changes in food consumption have occurred as a result of the integration of Eastern European countries [Kwasek 2012, Szwacka-Mokrzycka 2013]. At the same time, research shows that while consumer behaviour patterns from Eastern Europe have gradually converged with those of more developed Western European countries, a great distance still separates these countries. Foremost among the reasons for the differences is the purchasing power of consumers and a lower level of experience in implementing and operating in a market economy on the part of the countries of Central-eastern Europe, where basic goods are in far higher demand, and significantly lower saturation has taken place.

Research conducted in Poland shows that, over the past decade, satisfaction of food needs has increased markedly, the structure of the food intake has shifted towards rationalization, and qualitative changes have also taken place. While these tendencies are observed primarily for households with relatively high income levels, the poorest households, where the level of food supply is still relatively low, have not fared as well. The analysis of changes in food needs also shows that qualitative changes are largely due to the intensification of substitution processes between food groups and within these groups.

Over the past decade, changes in consumer preferences have involved a significant polarisation of consumer choice vis-a-vis quality, price and purchasing loyalty. Consumers in post-communist countries have lower brand loyalty than those in EU countries with a higher level of economic development. Significant differences also apply to the distribution of consumer preferences on the basis of consumer age. In Poland, young consumers are highly open to novelties, while older consumers have ethnocentric attitudes. Undoubtedly, the pattern of consumer behaviour in the EU is one in which attitudes constantly change. This is manifested by the increased demand for highly processed products, also known as convenience foods.

A SUBJECTIVE EVALUATION OF HOUSEHOLD INCOME SITUATION

The subjective evaluation of the income condition of households, carried out in 2005–2013 (Table 3), constitutes an important supplement to the analysis regarding the share of food expenditures in households' total consumption expenditures. As a general trend, households located in countries with a high standard of living assess their income condition as much better than those in developing countries. However, significant

Table 3. The subjective evaluation of household income situation in 2013 (percentage terms). Households which declared that their present income allows them "to make ends meet"

Country	With great difficulty	With difficulty	With some difficulty	Fairly easily	Easily	Very easily
Austria	5.4	8.6	27.3	29.9	20.3	8.5
Belgium	8.8	12.2	18.8	26.8	27.4	6.1
Bulgaria	32.9	32.3	26.4	6.5	1.5	0.3
Croatia	26.3	36.2	28.6	6.8	1.8	0.3
Cyprus	32.1	27.3	24.7	11.2	4.0	0.7
Czech Republic	9.1	22.6	38.4	21.8	7.2	0.9
Denmark	4.9	7.2	15.9	29.0	25.3	17.6
Estonia	7.5	15.9	44.8	23.2	7.6	1.1
Finland	2.2	4.7	17.0	34.5	26.2	15.5
France	4.5	16.0	41.6	26.3	9.7	1.9
Germany	3.0	6.1	11.8	41.0	28.9	9.2
Greece	39.6	38.7	15.7	4.2	1.5	0.4
Hungary	26.7	27.2	34.6	10.0	1.2	0.3
Ireland	17.4	19.4	36.8	19.2	4.7	2.6
Italy	19.0	22.6	37.5	16.7	3.5	0.6
Latvia	25.4	29.0	30.7	11.6	3.1	0.3
Lithuania	9.6	23.3	51.6	13.2	2.4	0.0
Luxemburg	4.4	9.0	16.9	32.8	28.7	8.2
Malta	15.1	21.5	28.9	27.4	6.0	1.2
Netherlands	3.8	11.7	15.0	14.2	43.6	11.7
Poland	12.7	19.8	38.4	22.3	5.8	1.0
Portugal	24.8	22.1	33.8	19.7	4.1	0.4
Romania	23.4	27.5	36.2	9.3	3.2	0.4
Slovakia	13.3	23.3	42.2	18.6	2.2	0.4
Slovenia	11.2	21.9	39.3	18.8	7.9	0.9
Spain	18.6	20.2	28.2	22.6	9.5	0.8
Sweden	2.9	3.7	7.5	39.9	20.3	25.6
United Kingdom	9.6	11.5	27.3	31.7	12.7	7.2

Source: Own elaboration on the basis of Annual International Statistics 2015.

differentiation is visible in the distribution of the respondents' answers. Approximately 2–7% of declarations provided by households from Austria, Belgium, Denmark, France, the Netherlands, Luxembourg, Germany and Sweden fell in the "make ends meet with difficulty" range, while the share of the "make ends meet easily" was similar (Table 3). A completely different situation is typical of the post-communist states, such as Bulgaria, Lithuania, Latvia, Romania and Hungary, where the share of both of these replies fell in the 23–30% range. Moreover, there is considerable differentiation here too. Indeed, the relatively highest share of the "make ends meet with difficulty" responses occurred in countries with relatively low growth in disposable income over the analysed period, i.e. in Bulgaria, Romania, Lithuania, where the share of people indicating they were barely getting by was sometimes above 30%. Finally, it is worrying when the share of responses indicating a deteriorating evaluation of the households' income condition over time goes up. Such observations were made in Greece, Cyprus, Hungary and Croatia, where the share of households' negative evaluations in 2013 increased by nearly twofold over 2005 levels' (Table 3).

Separate reference is needed with respect to evaluating the income condition returned by Polish households. In 2005–2014, the poverty zone decreased in Poland, but still encompasses a significant part of society. Low income groups may have more difficulty affording food. As prices for primary foods rise, they become less accessible, especially to families with the lowest incomes (*European Survey on Income and Living Conditions*, EU-SILC). In Poland, only 1.2% of the households that participated in the survey declared that, given their current income, they "make ends meet" very easily, while 6.9% said they do so easily, 23.7% quite easily, 37.2% with some difficulty, 18.9% with difficulty, and 12.1% with great difficulty.

The financial condition of households located in the countryside is more difficult than that of their urban counterparts. Only 0.6% of the surveyed rural households are able to "make ends meet" very easily with their current level of income (compared with 1.6% in the city), 4.8% do so easily (7.9% in the city), 20.3% quite easily (25.4% city), 40.4% with certain difficulty (35.5% city), 21.5% with difficulty (17.6% city), and 12.4% with great difficulty (12.0% city).

CONCLUSIONS

The present analysis shows a clear connection between the level of a country's economic development and the food consumption model. As a result of that correlation, European countries characterised with a high standard of living demonstrate growing satisfaction of their food related needs. In the group of developing countries, which includes Poland and most other post-communist states, that relation still proves true, but the share is still much higher than in highly developed countries. The above translates into development of the food consumption model across EU states. Ongoing changes in consumption patterns in EU states are of both a quantitative and qualitative character. Qualitative changes are clearly reflected in the considerable demand for highly processed convenience foods and organic foods. In Poland, changes in consumption patterns have been occurring for several years now, and concern above all the greater satisfaction of food-related needs and greater consumption rationalisation. Changes in food consumption trends and patterns cannot be discussed separately from globalisation processes. Globalisation helps standardise consumption patterns both throughout Europe and on a global scale but at the same time supports their diversification. As evidenced by various surveys, consumer behaviour diversification supports the development of a food consumption model closely connected with consumer ethnocentrism.

While the prevailing consumption model in Poland is approaching that of other EU countries, there remain important differences. Here, as elsewhere in Post-communist countries, the most important factor behind the

changes in the structure of food consumption is incomes, which have improved the quality of consumption. As evidenced by the desire to rationalise food cons, consumer awareness has also been an essential factor in changing consumer preferences.

While the consumption model in Poland continues to close the gap with other EU countries, significant differences remain. The most important factor in the changes in the structure of food consumption in post-communist countries are incomes, which can help to improve the quality of consumption. As reflected in the desire to rationalize food consumption, consumer awareness also plays an important role in the process of changing consumer preferences.

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ZMIANY W KONSUMPCJI ŻYWNOŚCI W POLSCE NA TLE POZOSTAŁYCH KRAJÓW UE

STRESZCZENIE

W artykule zaprezentowano uwarunkowania i kierunki zmian w konsumpcji żywności w Polsce na tle pozostałych krajów UE. Punktem wyjścia rozważań jest prezentacja stanu wiedzy z tego zakresu. Kolejna część opracowania prezentuje uwarunkowania zmian w konsumpcji żywności w Polsce na przestrzeni ostatniej dekady. Następnie przedstawiono kierunki zmian we wzorcach konsumpcji w krajach UE. Analiza porównawcza wzorców konsumpcji żywności w krajach UE wykazała, że główną determinantą zmian w ich obrębie jest poziom rozwoju ekonomicznego kraju. Zaobserwowana tendencja stanowi kontynuację wyników badań prowadzonych w tym zakresie.

Słowa kluczowe: zmiany w konsumpcji żywności, wydatki gospodarstw domowych, zachowania konsumpcyjne

CONTENTS
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