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SOCIAL NETWORKING SITES AS A CHANNEL FOR DELIVERING INFORMATION ABOUT DURABLE PRODUCTS AND ITS IMPACT ON PURCHASING DECISIONS

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ABSTRACT

The main objective of the paper is to identify the interdependencies between a type of a product (durable products) and the nature of information on social networking sites (SNSs) that affects the making of purchase decisions. An attempt has been made to answer the research question: to what extent types of products are of influence when using relevant information on SNSs and when making purchase decisions (pre-purchasing stage). The literary studies are complemented with empirical research done in three countries: China, Poland and the United States. The results confirm the importance of SNSs and the information obtained from them in making purchase decisions. In relation to the categories of products the strongest correlations were observed in fashion, household goods and cosmetics. In the case of the type of information gained through SNSs that influence making purchase decisions advertisements placed on SNSs and information about new products are the most significant.

Key words: social media, durable products, consumer decisions

INTRODUCTION

The majority of consumers search for information about products before making a buying decision [Jarvis 1998, Woo et al. 2015]. Some consumers want to see, others to touch them, read information on the Internet or ask other consumers for information. The type of information and the way it is searched for depend on the type of a product. Searching for information about durable products that can be bought with a substantial sum of money is more frequent and takes more time [Punj 1987, Huotari et al. 2015].

The evolution in information and communication technology (ICT) makes access to information easier and faster [Woo et al. 2015]. Along with the development of social networking sites (SNSs) the nature of communication [Weisfeld-Spolter et al. 2014] and conveying the information has changed. Face to face conversation has turned into communication through Facebook, Twitter, Instagram, Qzone or Sina Weibo. Computer mediated communication (CMC), the new approach in communication theory, has developed due to communication using Internet tools [Walther 1996, Haythornthwaite et al. 1998].

Social networking sites have also contributed to changing the way of gathering and conveying information about products amongst consumers at various stages of making purchase decisions [Chu and Kim 2011, Coussement and Teague 2013, Erkan and Evans 2016]. Through SNSs consumers gather information about particular products before making a purchase decision (pre-purchasing) and share their experiences

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with other consumers after the purchase (post-purchasing) [Jarvis 1998, Woo et al. 2015]. In marketing theory it is called electronic word of mouth [Cheung and Thadani 2012, Barreto 2014, Lin et al. 2014, Gvili and Levy 2016]. Social networking sites are also an important instrument used by enterprises in marketing communication [Kaplan and Haenlein 2010, Weisfeld-Spolter et al. 2014]. It is also influenced by changing the moment of making the final decision about buying a product which often happens whilst checking information on the Internet, between the point when the buying need appears and actually going shopping [Lecinski 2014].

The main objective of the article is to identify the interdependencies between types of products (durable products) and the nature of information on SNSs which influence purchase decisions. The research problem is presented in the light of the CMC theory and the zero moment of truth (ZMOT) concept. An attempt has been made to answer the research question: to what extent types of products are influenced when using the varied information on SNSs when making purchase decisions (pre-purchasing stage). The literary studies have been complemented with empirical research done in three countries: China, Poland and the United States. The importance of the study and analyses stems from the fact that there are not many papers on the subject in international literature.

The paper proceeds as follows: the literature review presents the theoretical background for the main objective and research questions concerning using SNSs in the context of the CMC theory and the process of making decisions (ZMOT concept). The next part describes the data used in the analysis and the results. Finally the author discusses the implications of the analysis and offers concluding remarks and limitations.

LITERATURE OVERVIEW

Theoretical background of communication in the context of computer mediated communication theory

Communication is the process of exchanging information between the sender and receiver through a specific channel [Davies et al. 2016]. In individual communication both sender and receiver are individual units exchanging a message via a communication channel (verbal, non-verbal, written, etc.) and medium. But in marketing communication the sender is usually an enterprise and the receiver is the potential customer [Clow and Baack 2015]. Based on the CMC theory the internet and its devices take a role of a medium in the communication process [Walther 1996]. Social networking sites are internet tools used for communication amongst participants (both individuals and enterprises). They are able not only to text the messages (e.g. Facebook, Qzone) but also to listen to or record (e.g. YouTube, WhatsApp, Youku Tudou). The communication level and type differs according to the chosen medium. Computer mediated communication participants transfer the message quickly without cost possibly to many receivers (recipients) at the same time [Smith and Zook 2011]. In the computer mediated communication concept the use of SNSs reduces the personal influences and their effects in the communication process [Walther 1996].

Social networking sites – tools in marketing communication

The use of SNSs by enterprises enhances the processes of affecting marketing activities, helps them to conduct more efficient research for an identification of customer needs and gain their opinions on already existing products. It also speeds up the identification of changes which take place in the market, helps in creating new product and bargain offers [Chandler and Chen 2015]. Applying these instruments in international activity significantly reduces operating costs, speeds up the enterprise's reaction to changes in markets as well as helping to adjust the offer to different tastes and preferences of consumers [Illia and Balmer 2012]. Current research on the significance of SNSs in enterprises' activities focuses on several aspects: analysis of the influence of posts and commentaries in the media on a company's image [Muntinga et al. 2011, Smith et al. 2012], the SNSs' significance in e-WOM [Chen Fay and Wang 2011], the role of SNSs in advertising [Okazaki and Taylor 2013]. In this paper the author focuses on different types of information given by enterprises through SNSs which can help the potential consumer to make purchasing decision in the context of the ZMOT concept.

Zero moment of true concept in the context of making a purchase decision

The growth of the Internet, which is a source of information about products, its frequent use as well as the development of SNSs influence the changes taking place during the process of making a decision [Coussement and Teague 2013, Barska and Wojciech 2014]. In traditional concepts a decision was often made at a shop under the influence of an advertisement, seller, etc. (first moment of truth) and the post-purchase experience was called the second moment of truth. Because of the frequency of using the Internet and SNSs the preliminary purchase decision is often made when checking information on the Internet (zero moment of truth), between the moment the purchase need appears and actually going shopping [Lecinski 2014]. The results of the research done by Google in 2011 in the United States highlighted the significance of the Internet and SNSs in terms of searching for information about products before buying them, comparing various offers on the Internet, looking for discounts, taking into account the reviews of products placed on the Internet [Lecinski 2011]. In these studies 37% of the respondents emphasized that the reviews about a particular product that can be found on the Internet significantly influence their consumer decisions. What is also important, are the recommendations of friends, the marketing message on the Fanpage of a given producer or brand and the reading of consumer blogs with reviews which have the greatest influence. The nature of the information obtained via SNSs which influences purchase decisions depends on the types of products. However, there are not many studies that are conducted in this area. In some of the projects the Internet turned out to be the most helpful source of information in making decisions about buying clothes, shoes and accessories [Hansen and Jensen 2009, Geissinger and Laurell 2016, Shephard et al. 2016]. When comparing the categories of products from the B2C market the studies highlight the fact that consumers most often search for information and spend more time making purchase decisions about durable products rather than fast moving consumer goods – FMCGs [Punj 1987, Huotari et al. 2015].

MATERIAL AND METHODS

Measurement development and data collection

In the exploratory empirical study the author used two research methods: PAPI (paper and pen personal interview) and CAWI (computer assisted web interview). The measurement instrument was a standardized questionnaire prepared for the purpose of this research. The element differentiating the research questionnaire in particular markets was the language. In Poland the Polish language was used, in China Chinese and in the American market English. In the preparation of the different version of the questionnaire a back translation procedure was used in order to eliminate mistakes stemming from linguistic, lexical or contextual differences.

The empirical data was gathered in 2016 and the total number of respondents surveyed in the three countries was 851, including 295 respondents from China, 296 from Poland and 260 from the United States. The data was collected by one of the non-probability methods (snow ball sampling). The sampling method that was applied influenced the consequences related to the interpretation of the results obtained which, in this case, should not be fully generalized for the whole population. The aim in choosing the countries was to compare countries from different regions and cultures.

Respondent profile

The respondents surveyed in each country were people who agreed to participate and were willing to express themselves as to what kind of information obtained through SNSs is useful in making purchasing decisions and what kind of products. The study was made amongst people of all ages and three age groups were distinguished, i.e. 15–20, 21–30, 31 or over. In China and Poland the respondents within the 21–30 age group predominated. In the United States most participants belonged to the age group 15–20. Taking into account the diversity in terms of gender it should be underlined that in the American group gender parity was nearly achieved (almost equal proportions of both genders). The larger number of women was observed in the Chinese and Polish groups, where the structure in terms of gender is very similar.

Variables' operationalization

To identify the relationships between product categories and types of information gathered through SNSs the statistical Spearman indicators were used (this measure is used for describing the strength of correlation between quantitative traits in the case of a small number of observations, which took place in this research). Firstly, the respondents were asked how often they look for information on SNSs about particular products (very often, often, from time to time, rarely, very rarely, never). In the reliability analysis the level of Cronbach alpha equals 0.73 – confirms that the proposed scale is a reliable tool for measuring. The following categories of products were assessed: mobile phones (P_1), computers – laptops, tablets, iPads (P_2); radio and TV (P_3), household goods (P_4), cars (P_5) cosmetics (P_6) and fashion – clothes and shoes (P_7). The product categories were identified on the basis of literature and preliminary research. Secondly, in order to identify the character of information gathered through SNSs which influence purchasing decisions the respondents were asked about the frequency of them taking into account particular information in so doing (very often, often, from time to time, rarely, very rarely, never). In the reliability analysis the level of Cronbach alpha equals 0.79 – confirms that the proposed scale is a reliable tool for measuring. The following types of information were identified in the preliminary research as dominant: information about new products (I_1); information about sales (I_2); information in advertisement form (I_3), link to the website of a producer (I_4); information about the fact that a product is worth recommending (I_5); and information about the fact that a product is not worth recommending (I_6).

RESULTS

The measurement of interdependencies between types of products P_1, …, P_7 and the nature of information obtained on SNSs (I_1, …, I_6) using the Spearman correlation coefficients showed the existence of statistically significant ($P < 0.001$) relationships (existence of positive correlations) between all the variables researched (the table). In other words the type of prod-

Table. Spearman correlation coefficients (r_s)* between the nature of information via SNSs influencing purchase decisions and types of products

Information category	Country	P_1	P_2	P_3	P_4	P_5	P_6	P_7
I_1	USA	0.23	0.24	0.27	0.39	0.28	0.31	0.37
	PL	0.48	0.43	0.37	0.34	0.33	0.34	0.4
	China	0.21	0.23	0.19	0.19	0.23	0.19	0.26
I_2	USA	0.17	0.19	0.17	0.33	0.22	0.31	0.43
	PL	0.43	0.37	0.29	0.3	0.3	0.47	0.48
	China	0.26	0.25	0.14	0.13	0.23	0.17	0.19
I_3	USA	0.26	0.32	0.33	0.43	0.37	0.31	0.41
	PL	0.38	0.35	0.37	0.31	0.28	0.42	0.38
	China	0.21	0.16	0.27	0.23	0.29	0.34	0.24
I_4	USA	0.28	0.28	0.28	0.4	0.37	0.25	0.39
	PL	0.34	0.32	0.32	0.3	0.2	0.41	0.41
	China	0.19	0.21	0.26	0.16	0.25	0.26	0.16
I_5	USA	0.3	0.31	0.31	0.37	0.33	0.23	0.44
	PL	0.33	0.32	0.33	0.26	0.18	0.47	0.45
	China	0.23	0.28	0.22	0.21	0.18	0.28	0.19
I_6	USA	0.24	0.27	0.27	0.36	0.31	0.32	0.37
	PL	0.27	0.28	0.23	0.24	0.21	0.39	0.41
	China	0.28	0.28	0.23	0.27	0.27	0.29	0.23

* Correlation is significant at the $P < 0.001$ level.
Source: Own research.

uct influences the nature of the information on SNSs which is helpful in terms of making purchase decisions. The level of these indexes denotes the strength of the relationship, the higher the Spearman coefficient the stronger the relationship $r_s = [-1; 1]$.

Taking into account the groups studied it needs to be noted that the strongest relationships (≥ 0.4) were observed in the Polish group in relation to $[P_1, I_1]$, $[P_6, I_2]$, $[P_7, I_2]$, $[P_6, I_5]$, $[P_7, I_5]$. Slightly less strong relationships were observed in the American group, e.g. $[P_4, I_3]$, $[P_7, I_3]$, $[P_7, I_5]$. In the Chinese group no strong relationship was noted, all the obtained relationships equaled $r_s < 0.3$. In other words, in the Chinese group types of products do not differentiate the nature of information influencing purchase decisions to such a degree as in the Polish and American groups.

In relation to the categories of products the strongest relationships were obtained in the case of fashion – clothes and shoes (P_7), household goods (P_4) and cosmetics (P_6) in the Polish and American groups. The more often the respondents make purchase decisions regarding these products the more often they use the information obtained from SNSs ($I_1, \ldots, I_6$).

Taking into account the nature of information obtained through SNSs and the influence on purchase decisions it is worth highlighting that the biggest number of the strongest relationships, regardless of a type of product ($r_s > 0.3$), was obtained in the case of advertisements placed on SNSs (I_3) and information about new products (I_1). This information is placed by enterprises as a part of marketing communication. In the case of communication with individual SNSs users positive recommendations (I_5) influence the making of purchase decisions more often.

DISCUSSION AND CONCLUSIONS

The analysis of the literature and the results of the exploratory research confirmed the importance of SNSs and the information obtained there in making purchase decisions. It is also a confirmation of changes in communication and consumer behaviour in relation to the development of information and communications technology (ICT) [Woo et al. 2015]. Information obtained from SNSs influences the moment of making a decision [Lecinski 2014], which, especially amongst young consumers, has changed from the first moment of truth to the zero moment of truth. The exploratory research also confirms the importance of information in influencing purchase decision in relationship to durable products, which was also observed in the results of studies done by other authors [Punj 1987, Huotari et al. 2015]. However the differences in the strength of the relationships between the types of durable products and the nature of information influencing purchase decisions have been demonstrated. Social networking sites are the most significant in relation to clothes and shoes as well as cosmetics. The results obtained provide an input to literature on the ways of making purchase decisions, the significance of types of information at the stage of the pre-purchasing of durable products. They have also theoretical and application value. They confirm theories on communication [Walther 1996, Haythornthwaite et al. 1998] and consumer behaviour [Jarvis 1998, Barreto 2014, Woo et al. 2015, Gvili and Levy 2016]. Moreover they have great significance for enterprises willing to use SNSs in marketing communication, thus provide information about their products through SNSs [Chen et al. 2011, Muntinga et al. 2011, Smith et al. 2012, Okazaki and Taylor 2013]. For example producers of clothes in particular should place information about sales and monitor forums and comments about their products on SNSs. Moreover enterprises operating in diversified foreign markets should pay attention to differences in the behaviour of SNSs users who are at the same time consumers [Fong and Burton 2008]. Social networking sites are the least significant when making purchase decisions in the Chinese group and the most significant in the Polish and American groups. It might be related to cultural differences regarding the significance of a relationship, group and trust in direct communication.

Limitations of the study

The empirical method of the study belongs to methods based on the declarations of the respondents. However, it may happen that the real behaviour deviates slightly from that declared. Other issues are the method of gathering respondents (non-random) and the sample size. The consequence of which is the lack of possibilities to apply the results to the whole of the popu-

lation researched. Future research should respond to these limitations. They can expand the utility of SNSs in random and bigger samples. Besides types of information can be related to different types of products (non-durables) or services.

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SERWISY SPOŁECZNOŚCIOWE JAKO KANAŁ PRZEKAZYWANIA INFORMACJI O PRODUKTACH TRWAŁYCH I ICH WPŁYW NA DECYZJE ZAKUPOWE

STRESZCZENIE

Głównym celem artykułu jest identyfikacja zależności między rodzajem produktów (produkty trwałe) a charakterem informacji w serwisach społecznościowych, wpływających na podejmowanie decyzji zakupowych. Dokonano próby odpowiedzi na pytanie badawcze: w jakim stopniu rodzaje produktów wpływają na wykorzystanie różnych informacji w serwisach społecznościowych w podejmowaniu decyzji zakupowych. Studia literaturowe zostały uzupełnione badaniami empirycznymi w trzech krajach – Chinach, Polsce oraz Stanach Zjednoczonych. Wyniki potwierdzają ważność serwisów społecznościowych oraz pozyskiwanych w nich informacji w podejmowaniu decyzji zakupowych. W odniesieniu do kategorii produktów najsilniejsze związki uzyskano w przypadku produktów modowych, produktów AGD i kosmetyków. W przypadku typu informacji uzyskanych za pośrednictwem serwisów społecznościowych, wpływających na podejmowanie decyzji zakupowych największe znaczenie mają reklamy umieszczane w serwisach społecznościowych oraz informacje o nowych produktach.

Słowa kluczowe: media społecznościowe, produkty trwałe, decyzje konsumentów

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SUPPLY NETWORKS AND INNOVATION ACTIVITY IN MEDIUM-HIGH TECHNOLOGY MANUFACTURING INDUSTRIES IN POLAND

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ABSTRACT

Increasing market dynamics requires the involvement of an increasing number of partners, including suppliers, customers and competitors located near the company and in its further surroundings. The interaction between participants in such networks leads to the exchange of knowledge and information, and this process takes on unique forms specific to the participants and the environment in which they occur. The study aims to determine the influence of distance and type of relationships with a competitor, supplier, and customer on the type of innovative activity in medium-high technology companies in Poland. The work assumes that close contacts with a competitor, supplier, and customer operating within a short distance support innovative activities. Domestic and foreign suppliers, customers and competitors are favored to undertake innovative activities, and the most positive influence on the stimulation of innovative activity is the cooperation with suppliers and foreign customers.

Key words: innovation, innovation activity, industry, medium-high technology

INTRODUCTION

Industrial activity is becoming an increasingly integrated network process involving national or international supply networks. The enormous variety of knowledge and information exchanged between entities that are part of such systems makes this process takes on various forms specific to the participants and the environment in which it takes place [Edquist et al. 2001]. Innovation in such a context is perceived as a result of the interaction between the company and other market participants as well as the process of acquiring knowledge [Malerba 2002]. The essence of the network's operation are the relationships between its entities belonging to three groups: enterprises, science, and state administration. As a result of mutual interaction in the process of knowledge and information exchange, participants create various relationships that shape the pace and direction of knowledge flow [Storper 1995]. This phenomenon is particularly important in the medium- and high-technology sectors [Dzikowski 2015]. Connections can take the form of vertical or horizontal interactions. Taking into account the fact that the communications are unpredictable and require direct contact, the process of creating the network focuses on the close relationships between the involved partners [Świadek et al. 2016]. Moreover, the very process of setting them up is the most important, as it contributes to the creation of close relations of understanding and deepening of joint work [Wang et al. 2014]. However, the learning process is not always facilitated by spatial proximity, which affects the intensification of collaboration between companies and other institutions. The critical role plays the existing knowledge base unique for a type of industry [Malerba 2005]. From this perspective innovation is defined

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as the implementation of a new or significantly improved product (product or service) or process, a new marketing method or a new organizational method in business practice, workplace organization or relations with the environment. Technical innovations concern changes in technology and technology and includes product, process, and organizational innovations [OECD 2005]. The study aims to determine the influence of distance and type of relationships with a competitor, supplier, and customer on the type of innovative activity in medium-high technology companies in Poland. The work assumes that close contacts with a competitor, supplier, and customer operating within a short distance (locally or in the region) support various innovation activities. The starting point of the work is the theoretical introduction including the relational and spatial conditions of industrial enterprises in supply networks. Then, the methodology of the study is discussed. The practical part includes logit models and incentives and impediments both investment and implementation of innovation. Finally, the summary contains conclusions, limitations and further possibilities.

LITERATURE REVIEW

Networks are structures defined by specific conditions that mean cooperation, coordination, communication, and sometimes a community of goals [Czakon 2012]. Linkages created by network actors affect both the relationships and the space in which individual network nodes operate [Dzikowski 2015]. Boschma [2005] argues that the importance of geographical proximity cannot be assessed in isolation, but should always be examined concerning other dimensions of proximity including cognitive, organizational, social, institutional and geographical proximity. Short distances allow employees to meet more frequently, which increases the likelihood of establishing closer relationships and the chance for faster informal cooperation, which will turn into formal cooperation of the organizations they represent [Bell 2005, Gilbert et al. 2008]. These factors are necessary to develop the appropriate level of confidence that is required for the exchange of knowledge [McCann and Folta 2011, Dyba 2016]. The described process of developing mutual trust, due to the rapidly progressing internationalization, went beyond the national framework [Binz and Truffer 2017]. Hence, the importance of having personal contacts for establishing innovative cooperation decreases [Freel 2003]. Direct interactions can be helpful in crucial moments of the innovation process, but in the remaining time communication based on electronic means of communication such as e-mail, communicator or telephone is sufficient [Gallaud and Torre 2005]. As a supply network, we will understand a relatively permanent grouping of independent, specialized companies that participate in a market-based cooperation system, with at least three organizations oriented towards the implementation of convergent goals [Czakon 2012]. A network defined in this way may take on various forms, sizes and organizational character, determined by the degree of complexity and quality of connections. Cassiman and Veugelers [2006] show that a firm's internal innovation activities including internal R&D and external knowledge acquisition are complementary and impact on their innovative collaborations with external partners. Many potential innovation partners can be distinguished and different types of innovations can result from these partnerships. The network with actors caring out innovation activities is called the innovation network. The events of the innovation network include creation, exchange, transformation, absorption and exploitation of resources in connection with broadly understand formal and informal relations [Ahuja 2000]. A characteristic feature of the innovation network are relationships [Etzkowitz and Leydesdorff 2000]. In the era of global economy, spatial proximity does not always contribute to the intensification of cooperation between partners [Leischnig et al. 2014], but may under certain conditions support the transfer of hidden knowledge [Wal and Boschma 2011]. The keys are a place occupied by the enterprise in the network [Bell 2005], the type of industry to which the enterprise belongs, the network structure it co-creates and the type of shared information is of great importance [Zaheer and Bell 2005]. Innovative activities involve expenditure on: research and development; intangible technologies; purchase of advanced machinery, equipment, hardware or software, as well as land and buildings (including improvements and repairs); staff training and marketing of new and improved products; other activities including design

work, planning and testing of new products and services, production processes and delivery methods [Janasz and Kozioł-Nadolna 2011]. This paper focuses on supply networks, and the role proximity and relationships of competitors, suppliers, and customers have on shaping innovation activities.

MATERIAL AND METHODS

The scope of the research relates to innovation activity in medium-high technology (MHT) industry. It concerns both product and process innovations new only to the firm. The survey was based on a questionnaire sent by email and then a telephone interview was conducted with the owner or manager of the given company. All data were gathered between 2008 and 2013. Explained variables include R&D expenditure, investments in new fixed assets including buildings and land, machinery and technical equipment and computer software, implementations of new or improved products or technological processes, including production methods, nonproduction systems, and support systems. In turn, explanatory variables consist of distance from a competitor, supplier and customer-defined from the local, regional, domestic and foreign perspective and a relationship with a competitor, supplier and customer including no contacts, cooperation, good neighborly relations and hostility. In this study, the model of logistic regression was estimated to assess whether and at which level each of the independent variables contributes to each kind of innovation activity [Lemeshow and Sturdivant 2013, Stanisz 2016]. The multinomial logit model estimates the effects of explanatory variables on a dependent variable with unordered response categories [Aldrich and Nelson 1984, Liao 1994, Stanisz 2016]. The significance of the independent variable coefficients was tested by using the Wald test, and it was considered a valid coefficient for the model when the level of statistical significance was $P < 0.1$. The calculations were performed in Statistica software.

RESULTS

The collection contains 981 enterprises operating in Poland, including 252 micro (25.69%), 350 small (35.68%), 275 medium (28.03%) and 104 large (10.6%) entities. Due to the nature of ownership, domestic enterprises dominate 313 (80.63%), foreign enterprises represent 110 companies (11.21%), and mixed capital is represented by 80 enterprises (8.15%). Table 1 shows the structure of firms due to the manufacturing sector.

The most firms invest in new fixed assets (78.6%) and implement new technology processes (76.5%). In contrast, both investments in buildings and land (29.6%) and implementations of new support systems (29.3%) are held the least. Table 2 includes research and development expenditure (R&D) model. A domestic competitor and cooperation with suppliers increase odds of taking R&D expenditure respectively 1.28 times and 1.35 times. In contrast, both local and

Table 1. The structure of firms due to the manufacturing sector

Sector	Number of firms / Share (in %)
Manufacture of machinery and equipment	480 (35.42)
Manufacture of electrical equipment	227 (16.75)
Manufacture of chemicals and chemical products	156 (11.51)
Manufacture of motor vehicles, trailers and semi-trailers	82 (6.05)
Manufacture of other transport equipment	21 (1.55)
Manufacture of railway locomotives and rolling stock	15 (1.11)
Total	981 (72.40)

Source: Own study.

Table 2. Research and development expenditure model

$\chi^2 = 46.448$, $P = 0.0000$					
Variable	Coefficient	*SE*	χ^2	*P*	Odds ratio
Domestic competitor	0.2483	0.1406	3.1182	0.0774	1.28
Cooperation with suppliers	0.3016	0.1539	3.8403	0.0500	1.35
Local customer	–0.8006	0.1837	18.9850	0.0000	0.45
Regional customer	–0.2795	0.1575	3.1469	0.0760	0.76
No contacts with customers	–0.6112	0.2306	7.0223	0.0080	0.54

Source: Own study.

regional customers decrease a probability of taking R&D expenditure. Firms cooperating mainly with local customers have nearly 0.45 times fewer odds to take R&D expenditure and firms cooperating mainly with regional customers have 0.76 times fewer odds. Firms maintaining no contacts with customers have almost a half fewer odds to take R&D expenditure. Research and development expenditure is both too risky and costly for firms focusing on local and regional customers in Poland. On the other hand, research and development activity requires an appropriate scale of economic activity and consecutive contacts with domestic customers what for local firms can be too challenging.

Table 3 includes investment in new fixed assets (INFA) model. Hostility to competitors supports the probability of investment in new fixed assets the most. Furthermore, firms with good neighborly relationships with competitors and customers and cooperating with foreign customers have about 1.5 times higher odds to invest in new fixed assets. In contrast firms with local and regional suppliers and maintaining basic relationships with suppliers have about a half fewer odds to take this kind of investment. The negative impact of local and regional suppliers and competitors shows the importance of trust and ability to establish good relations on the level of investment in new fixed assets. However, the most important factor is demand, which is insufficient for local and regional customers, and becomes a stimulus when clients are overseas.

Table 4 includes investment in buildings and land (IBL) model. Firms having domestic competitors and cooperating with customers including foreign customers have nearly 1.5 times higher odds to invest in

Table 3. Investment in new fixed assets model

$\chi^2 = 45.285$, $P = 0.0000$					
Variable	Coefficient	*SE*	χ^2	*P*	Odds ratio
Hostile to competitors	0.9116	0.3922	5.4006	0.0201	2.49
Good neighborly relationships with competitors	0.4541	0.2031	5.0011	0.0253	1.57
Local supplier	–0.6908	0.2347	8.6614	0.0033	0.50
Regional supplier	–0.5121	0.1772	8,3510	0.0039	0.60
Basic relationships with suppliers	–0.6539	0.1890	11.9640	0.0005	0.52
Foreign customer	0.4510	0.2742	2.7043	0.1000	1.57
Good neighborly relationships with customers	0.4207	0.2320	3.2877	0.0698	1.52

Source: Own study.

Table 4. Investment in buildings and land model

$\chi^2 = 37.144$, $P = 0.0000$					
Variable	Coefficient	*SE*	χ^2	*P*	Odds ratio
Domestic competitor	0.3173	0.1454	4.7598	0.0291	1.37
No contacts with competitors	–0.5704	0.1753	10.5862	0.0011	0.56
Good neighborly relationships with competitors	–0.3671	0.2016	3.3147	0.0687	0.69
Basic relationships with suppliers	–0.4663	0.2152	4.6963	0.0302	0.63
Foreign customer	0.4526	0.1957	5.3484	0.0207	1.57
Cooperation with customers	0.3121	0.1783	3.0613	0.0801	1.37

Source: Own study.

buildings and land. On the contrary, firms with no contacts with competitors and retaining basic relationships with suppliers and competitors have about 0.60 times fewer odds to take this kind of investment. Direct and good contact with customers helps to adjust the level of investments in buildings and land to the current requirements and future needs of customers. From the investors' perspective, the existence of strong national competition is conducive to making investments and may stimulate searching for customers abroad.

Table 5 includes investment in machinery and technical equipment (IMTE) model. Firms cooperating with foreign customers have 1.73 times higher odds to invest in machinery and technical equipment. On the other hand, firms cooperating mainly with regional suppliers and supporting mainly local customers have about 0.7 fewer odds to invest. Furthermore, firms retaining basic relationships with suppliers have 0.59 fewer odds to invest as well. The reason for this may concern both higher requirements of foreign customers and higher profitability of cooperation with foreign customers. In contrast, the insufficient level of technological advancement of both local and regional technology suppliers is the reason why technology transfer from those partners is not supported.

Table 6 includes investment in computer software (ICS) model. Firms cooperating with both domestic and foreign customers have about 1.6–1.82 times higher odds to invest in computer software. In contrast, firms having no contacts with both competitors and customers and cooperating mainly with local suppliers have about 0.55–0.73 fewer odds to invest in computer software. Investments in computer software are made to reduce the costs of cooperation, carry out complex tasks or improve business communication, and most often these tasks are carried out when the customers are domestic or foreign entities.

Table 7 includes launching new products (LNP) model. Firms cooperating with suppliers have 1.7 times higher odds to implement new products. In con-

Table 5. Investment in machinery and technical equipment model

$\chi^2 = 27.182$, $P = 0.0000$					
Variable	Coefficient	*SE*	χ^2	*P*	Odds ratio
Regional supplier	–0.2579	0.1486	3.0117	0.0826	0.77
Basic relationships with suppliers	–0.5225	0.1730	9.1267	0.0025	0.59
Local customer	–0.3198	0.1730	3.4185	0.0645	0.73
Foreign customer	0.5509	0.2406	5.2439	0.0220	1.73

Source: Own study.

Table 6. Investment in computer software model

$\chi^2 = 40.907$, $P = 0.0000$					
Variable	Coefficient	*SE*	χ^2	*P*	Odds ratio
No contacts with competitors	–0.3150	0.1427	4.8711	0.0273	0.73
Local supplier	–0.4705	0.2038	5.3270	0.0210	0.63
Domestic customer	0.5038	0.1495	11.3502	0.0008	1.65
Foreign customer	0.6000	0.2266	7.0115	0.0081	1.82
No contacts with customers	–0.6036	0.2175	7.7031	0.0055	0.55

Source: Own study.

Table 7. Launching new products model

$\chi^2 = 21.792$, $P = 0.0000$					
Variable	Coefficient	*SE*	χ^2	*P*	Odds ratio
Cooperation with suppliers	0.5331	0.1485	12.8825	0.0003	1.70
No contacts with customers	–0.4588	0.2172	4.4636	0.0346	0.63

Source: Own study.

trast to firms having no contacts with customers that have about 0.63 fewer odds to launch new products. Most implementations of new products are based on new materials and technologies, the acquisition of which requires high expenditures. Furthermore, both new materials and technologies are not always possible to purchase or develop basing on firms resources. The easiest way to obtain technology is direct contact and cooperation with suppliers.

Table 8 includes new technology processes (NTP) model. Firms cooperating with suppliers and cooperating mainly with foreign customers have about 1.57–1.74 times higher odds to introduce new technology processes than firms having no contacts with competitors and cooperating mainly with local suppliers that have about 0.51–0.65 fewer odds to implement new technology processes. International competition imposes the use of more and more modern technological processes to meet the customer's requirements, and the cheapest way to achieve this goal is to acquire technology as part of cooperation

Table 8. Implementation of new technology processes model

$\chi^2 = 36.019$, $P = 0.0000$					
Variable	Coefficient	*SE*	χ^2	*P*	Odds ratio
No contacts with competitors	–0.4355	0.1577	7.6207	0.0058	0.65
Local supplier	–0.6648	0.2092	10.0960	0.0015	0.51
Cooperation with suppliers	0.5541	0.1617	11.7409	0.0006	1.74
Foreign customer	0.4524	0.2494	3.2894	0.0697	1.57

Source: Own study.

with suppliers possessing the latest technological solutions.

Table 9 includes new production methods (INPM) model. Firms cooperating with suppliers and selling mainly abroad have about 1.58–1.8 times higher odds to implement new production methods.

Table 10 includes non production systems (INPS) model. Firms cooperating with suppliers and selling mainly abroad have about 1.35–1.65 times higher odds to implement non production systems, but firms with no contacts with customers have 0.54 times fewer odds.

Table 11 includes new support systems (INSS) model. Firms cooperating with customers, selling mainly abroad and retaining good neighborly relationships with suppliers have about 1.34–1.71 times higher odds to implement new support systems. In contrast, firms having no contacts with both competitors, cooperating mainly with local suppliers and regional customers and maintaining good neighborly relationships with competitors have about 0.48–0.69 fewer odds to implement new support systems. Cooperation with foreign customers forces support systems to meet new

Table 9. Implementation of new production methods model

$\chi^2 = 20.149$, $P = 0.0000$					
Variable	Coefficient	*SE*	χ^2	*P*	Odds ratio
Cooperation with suppliers	0.4548	0.1440	9.9624	0.0016	1.58
Foreign customer	0.5852	0.1913	9.3537	0.0022	1.80

Source: Own study.

Table 10. Implementation of non production systems model

$\chi^2 = 36.019$, $P = 0.0000$					
Variable	Coefficient	*SE*	χ^2	*P*	Odds ratio
Cooperation with suppliers	0.3011	0.1575	3.6524	0.0597	1.35
Foreign customer	0.5031	0.1886	7.1135	0.0077	1.65
No contacts with customers	–0.6159	0.2569	5.7464	0.0165	0.54

Source: Own study.

Table 11. Implementation of new support systems model

$\chi^2 = 37.937$, $P = 0.0000$					
Variable	Coefficient	*SE*	χ^2	*P*	Odds ratio
No contacts with competitors	–0.4811	0.1763	7.4449	0.0064	0.62
Good neighborly relationships with competitors	–0.3732	0.2064	3.2695	0.0706	0.69
Local supplier	–0.7247	0.2509	8.3443	0.0039	0.48
Good neighborly relationships with suppliers	0.5359	0.2367	5.1260	0.0236	1.71
Regional customer	–0.3717	0.1790	4.3150	0.0378	0.69
Foreign customer	0.4286	0.2006	4.5635	0.0327	1.54
Cooperation with customers	0.2950	0.1768	2.7853	0.0953	1.34

Source: Own study.

requirements and needs, which increases the quality and standard of service. Nevertheless, the lower requirements and needs of local customers mean that local suppliers are not as competitive as they could.

Tables 12 and 13 include all identified incentives and impediments grouped by innovation activity. Table 12 includes incentives for R&D expenditure, investment and implementation of innovation. The financial attractiveness of customers from developed countries makes it profitable for companies from developing countries to take risks of innovative activities more than for local and regional customers. Hence, the demand generated by foreign customers is the most important incentive. However, conducting innovative activities for demanding customers requires higher technological advancement, which in turn is not only an expensive, but also a long-term and risky task. The surveyed firms increase their techno-

Table 12. Incentives for research and development expenditure, investment and implementation of innovation

Variable	R&D	INFA	IBL	IMTE	ICS	LNP	INTP	INPM	INPS	INSS
Cooperation with customers	–	–	1.37	–	–	–	–	–	–	1.34
Cooperation with suppliers	1.35	–	–	–	–	1.70	1.74	1.58	1.35	–
Domestic competitor	1.28	–	1.37	–	–	–	–	–	–	–
Domestic customer	–	–	–	–	1.65	–	–	–	–	–
Foreign customer	–	1.57	1.57	1.73	1.82	–	1.57	1.80	1.65	1.54
Good neighborly relationships with competitors	–	1.57	0.69	–	–	–	–	–	–	0.69
Good neighborly relationships with customers	–	1.52	–	–	–	–	–	–	–	–
Good neighborly relationships with suppliers	–	–	–	–	–	–	–	–	–	1.71
Hostile to competitors	–	2.49	–	–	–	–	–	–	–	–

INFA – investment in new fixed assets; IBL – investment in buildings and land; IMTE – investment in machinery and technical equipment; ICS – investment in computer software; LNP – launching new products; INTP – implementation of new technology processes; INPM – implementation of new production methods; INPS – implementation of non production systems; INSS – implementation of new support systems.

Source: Own study.

Table 13. Impediments to research and development expenditure, investment, and implementation of innovation

Variable	R&D	INFA	IBL	IMTE	ICS	LNP	INTP	INPM	INPS	INSS
Local customer	0.45	–	–	0.73	–	–	–	–	–	–
Local supplier	–	0.50	–	–	0.63		0.51	–	–	0.48
No contacts with competitors	–	–	0.56	–	0.73	–	0.65	–	–	0.62
No contacts with customers	0.54	–	–	–	0.55	0.63	–	–	0.54	–
No contacts with suppliers	–	0.52	0.63	0.59	–	–	–	–	–	–
Regional customer	0.76	–	–	–	–	–	–	–	–	0.69
Regional supplier	–	0.60	–	0.77	–	–	–	–	–	–

Explanations as in Table 12.

Source: Own study.

logical level in cooperation with technologically advanced suppliers.

Nevertheless, Table 13 consists of impediments to R&D expenditure, investment, and implementation of innovation. The lack of contacts with competitors, customers, and suppliers preclude firms the most. Moreover, local suppliers and customers prevent firms from innovating. Firms, that are unable to keep pace with changes taking place in the world, have become distrustful and reluctant to introduce new products and technological processes. For many years, most of these companies have been cooperating with the same suppliers and customers that do not set too high requirements. However, in the long run, these entities are doomed to failure.

CONCLUSIONS

The study shows the influence of distance and type of relationships with a competitor, supplier, and customer on the type of innovative activity in medium-high technology companies in Poland. The most firms cooperate with customers and suppliers, invest in new fixed assets including machinery and technical equipment and computer software and implement new technology processes including launching new products. The work shows that cooperation with both foreign customers and suppliers support various innovation activities the best. Moreover, models do not show the impact of firm size and foreign capital on innovation activity. However, it may be a subject of further research [Dzikowski 2018]. Nevertheless, local suppliers and customers prevent firms from innovating. The impact is diversified regarding strength and kind of innovation activity. In general, suppliers seem to be more influential than customers. Furthermore, the influence increases as the distance increases. The assumption that the presence of local competition lowers innovative activity has not been confirmed, but both for local customers and suppliers this phenomenon is true. The study has numerous limitations as it does not allow to distinguish between geographical, social, organizational, institutional and cognitive proximity [Boschma 2005]. Therefore, geographical proximity cannot be an independent and direct explanation of the studied phenomena as it can be explained by other factors not included in the study, such as the existence of a technological and demand gap. The study shows that the most important factor of stimulating innovative activity is the demand generated by foreign or domestic customers. The further research can include networks characteristics or factors concerning organizational, institutional and cognitive proximity.

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SIECI DOSTAW A AKTYWNOŚĆ INNOWACYJNA PRZEMYSŁU ŚREDNIOZAAWANSOWANEJ TECHNOLOGII W POLSCE

STRESZCZENIE

Rosnąca dynamika rynku wymaga zaangażowania coraz większej liczby partnerów, w tym dostawców, klientów i konkurentów działających w pobliżu firmy oraz w jej dalszym otoczeniu. Interakcja między uczestnikami takich sieci prowadzi do wymiany wiedzy i informacji, a proces ten przybiera niepowtarzalne formy charakterystyczne dla uczestników i środowiska, w którym występuje. Celem badania było określenie wpływu odległości i rodzaju relacji z konkurentem, dostawcą i klientem na rodzaj działalności innowacyjnej w przedsiębiorstwach średniozaawansowanej technologii w Polsce. W pracy założono, że bliskie kontakty z konkurentem, dostawcą i klientem działającymi w niewielkiej odległości (lokalnie lub w regionie) wspierają działania innowacyjne. Przeprowadzona analiza wykazała, że krajowi i zagraniczni dostawcy oraz klienci i konkurenci wspierają działalność innowacyjną, a największy pozytywny wpływ na stymulowanie działalności innowacyjnej ma współpraca z dostawcami i odbiorcami zagranicznymi.

Słowa kluczowe: innowacja, działalność innowacyjna, przemysł, średniozaawansowana technologia

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IMPACT OF SOCIO-ECONOMIC CHANGES FOR COMPETITIVENESS IN THE FOODSERVICE INDUSTRY

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ABSTRACT

The development of the foodservice industry is related to the social and economic changes taking place in last three decades. The sector is sensitive to economic and social trends. The author's main aim is to define the most important socio-economic changes which took place in Poland as a result of the political and economic transformation after 1989 and the impact which took place in competitiveness in the foodservice industry. The paper used secondary sources of information such as: data of the Główny Urząd Statystyczny (CSO), business reports, and industry newsletters and publications. The research period was the years 1988–2016. A comparative method was applied for the analysis of collected data and materials. Analysis shows that gastronomic business is one of the most vigorous sectors in Poland. Foodservice enterprises show a significant improvement in the quality and variety of services. Social and demographic trends as well as changing values in society and consumer perceptions promote the development of new opportunities and products in the foodservice industry. The foodservice industry is highly competitive.

Key words: enterprises, foodservice, development, socio-economic changes

INTRODUCTION

The transformation of the economic and social system in Poland began when it was almost commonly accepted that the economic system based on central management and state ownership lost in the competition with the system based on private property and individual entrepreneurship, market competition, coordinating role of prices and regulatory role of law. After 1989 when communism finished, Poland changed enormously. It started the process of the stabilisation of the economy. Blanchard [1997] and Gomułka [1998] point to a positive role of reforms before 1989, as a result of which the private sector in 1989 represented a much bigger share in the economy than others, the former USSR, and to more profound liberalising reforms in the initial period of transformation, which resulted in an extremely dynamic growth of the new private sector.

Year 1989 marked the beginning of the transition to a market economy. The change from central planning to a market economy has had a major impact on the foodservice industry. When the right to own private businesses was restored, many new foodservice

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businesses were opened. The Polish market had been closed to western countries and it changed. American fast food companies, such as McDonald's, KFC have opened numerous outlets in Poland during the 1990s.

Food consumption patterns have also undergone some substantial changes. Research into consumption and its elements is an up-to-date and important area of interest for numerous scholars who represent different domains of science. In the conditions of transformations observed in the economy of Poland, the levels and structures of Poles' consumption were determined by many socioeconomic factors and processes.

MATERIAL AND METHODS

The paper used secondary sources of information, such as data from the Główny Urząd Statystyczny (CSO), business reports, and industry newsletters and publications. The research period was the years 1988–2016. A comparative method was applied for the analysis of collected data and materials. This article presents and assesses transformations in the level and structure of consumption in the foodservice market by Poles in the period of economy marketisation, the period from 1988 to 2016. In some cases, more recent years than 1988 were adopted for analysis due to a lack of relevant data.

RESULTS AND DISCUSSION

Impact of socio-economics on the foodservice industry

Socio-economic factors are lifestyle components and measurements of both financial viability and social standing. They directly influence social privilege and levels of financial independence. Factors such as income, environment and education are studied by sociologists in terms of how they each affect human behaviours and circumstances. As lifestyle measurements, they are believed to be directly correlated to patterns of food choices, migration, disease prevalence and rates of mortality in human populations.

Socio-economic factors influences in the last 30 years have seen many changes in overall consumption, which primarily involves the increasing importance of services in general, including the foodservice.

The development of the foodservice industry undoubtedly is related to the social and economic changes taking place in recent years in Poland. Changes in the conditions and lifestyles should be emphasised in different socio-economic groups [Kowrygo 2000, Sala 2000, Payne 2002, Dąbrowska 2008].

Factors favouring the development of foodservice enterprises are also associated with the development of urbanisation, the expansion of cities, and the growing number of people in cities [Masłowski 2001, Gheribi 2015a].

The scale and structure of the foodservice business are impacted primarily by consumers. Demand conditions foodservice business development related to the level of economic development in terms of the macro (national product, unemployment rate) and the micro level (the income situation, the structure of expenditure, the socio-demographic-cultural households) [Sala 2011].

The move towards eating out is promoted by changes in consumer lifestyle as well as changes in the socio-demographic structure of the Polish population.

Some socio-economic and demographic factors that come into play are: economic growth; increasing the level of education and skills of the population; a change in the demographic structure of the population, a growing share of one- and two-person households; general increase in job involvement; increasing women's professional activity; large growth in consumer income individuals; increasing in spending on food services; increasing importance of convenience in eating out; more families living on two incomes; changes in the structure of free time; the impact of advertising and promotion by large food service chains; more people in the age group of 25 to 44 who are inclined to eat out often.

At the present time in Poland the possibility of increasing the efficiency of the market participants continues to develop, as evidenced by the macroeconomic indicators showing economic growth, unemployment and the demographic situation. Between 1990 (when Poland finally met the centrally-planned economy) and 2016, Poland's GDP per capita increased 7.3 times

– from USD 1,731 (in then current prices) to USD 12,500. In terms of the rate of growth, Poland beat all the states of the OECD and the whole of Europe. The country is ranked 13th in the global list based on the data of the World Bank [Cipiur 2017]. The increase of the GDP in Poland between 1990–2016 is shown in Figure 1. Over the last 25 years, the Polish economy doubled in size, as measured in terms of real GDP. Today Poland is the 8th largest economy in the EU in real GDP terms and can look back with pride on an impressive history of growth over more than two decades. Poland's growth has been based primarily on dynamic exports, strong internal demand, productivity improvements, foreign direct investment (FDI), and the inflow of the EU funds.

In the most obvious way, educational levels influence economic status, as higher paying jobs tend to require advanced or specialised education. Analysis of data from Figure 2 indicates that in the analysed period the number of people with a tertiary educational level significantly increased and dropped with primary and basic vocational. About 25% of Poland's population aged 24 or above has a university education.

The analysis of economic activity of the population aged 15 or more on the labour force surveys (LFS) basis in 1995–2016 that is shown in Figure 3 indicates that the number of unemployed women and men is decreasing, while the involvement in work is growing. This indicates an increase in general involvement in work.

While Poland's workers are well educated, they earn far less than Western European workers. Average monthly gross salaries are increasing in recent decades (Fig. 4) but still are less than in other Western European countries. Wages have been growing in Poland in the analysed period, but at a rate of only one percentage point faster than the consumer price index. The willingness to visit a restaurant increases with the size of income (both expected and current) [Brandhorst et al. 2017].

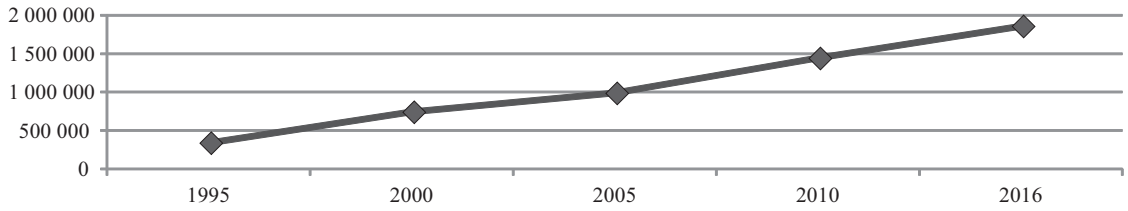

Fig. 1. Gross domestic product growth per capita between 1995 and 2016 (values in current prices in million PLN)

Source: Own calculation on the basis of the World Bank database.

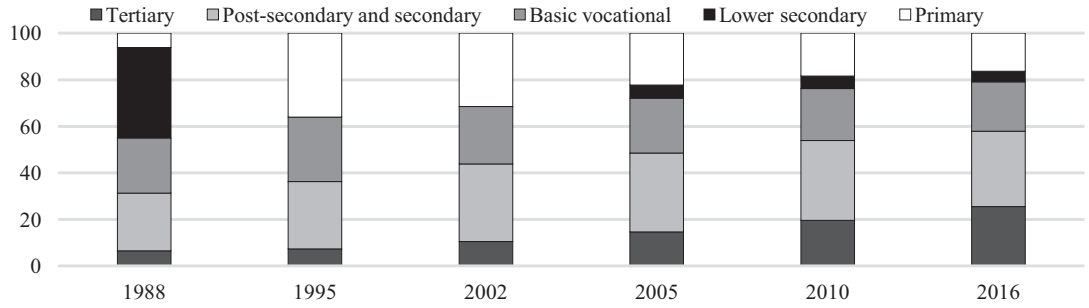

Fig. 2. Population aged 13 and more by educational level in the period 1988–2016 (%)

Source: Own calculation on the basis of the CSO database.

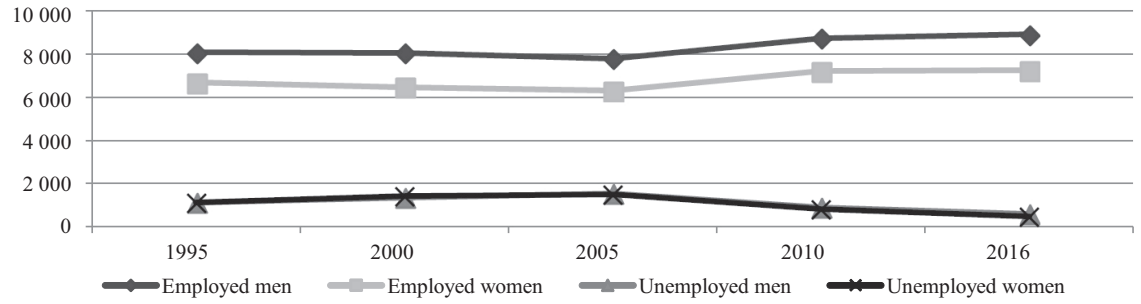

Fig. 3. Economic activity of population aged 15 and more on the labour force surveys basis in the period 1995–2016

Source: Own calculation on the basis of the CSO database.

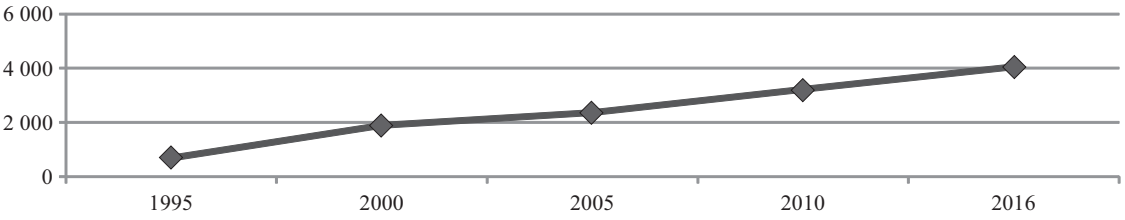

Fig. 4. Average monthly gross salaries in the period 1995–2016 (PLN)

Source: Own calculation on the basis of the CSO database.

The increase of income of the population took impact that Poles are more and more willing they eat outside the home.

The actual individual consumption of foodservice and accommodation in Poland in 2016 was PLN 41,449 million and was higher by 136.5% than in 2005 and per capita in 2016 was PLN 1,079.

One of most noticeable changes in eating habits of consumers in recent years is the increased incidence of meals eaten outside the home. The percentage of Poles aged 15+ who declared that they have visited a catering point in the last 12 months increased by as much as 8% compared to 2015 [Zimna 2017]. Restaurants, pizzerias and fast food are the most popular types of establishments visited by consumers [GfKPolonia 2017].

This upward trend is observed within the majority of consumers' socio-demographic groups as is shown in Figure 5. The highest expenditures on restaurants and hotels was incurred by the employees in non-manual labour positions (PLN 75.71 in 2016) and the self-employed (PLN 72.57 in 2016). The highest dynamics of changes in expenses for foodservices in 2016 compared to 2000 was observed among farmers (1,065%), retirees (572%) and pensioners (551%).

Despite the fact that in the analysed period, the increase in expenditure on restaurants and hotels was recorded in all the quintile groups, in addition it was noted that the highest expenditure was in quintile group V (PLN 112.28 in 2016), these were households in the best income situation. Expenses in this quintile group were 82.8–53.8% higher than in other groups. Analysis of the data from Figure 6 indicates a very strong relationship between the income situation of the household and the amount of expenses on foodservices.

Average monthly per capita expenditure on restaurants and hotels was increasing in all types of households. This expenditure decreased with the number of people in the household (Fig. 7). In addition, it was

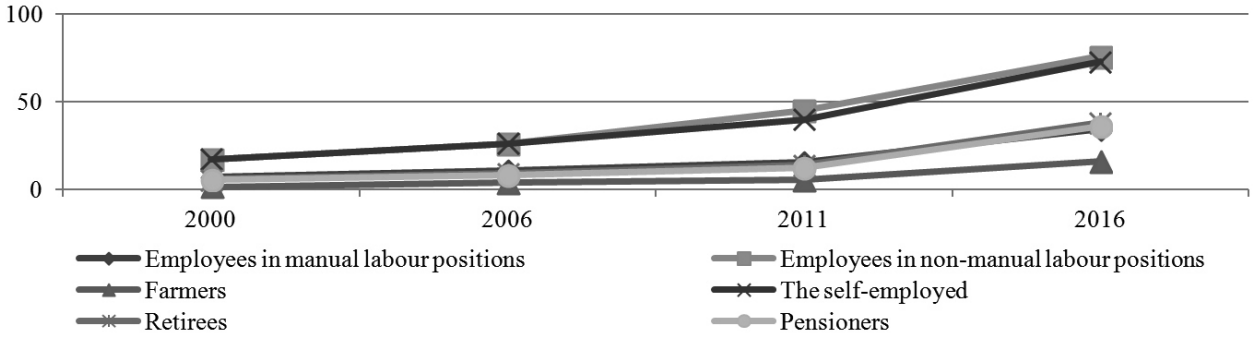

Fig. 5. Average monthly per capita expenditures on restaurants and hotels in households by socio-economic group of households in the period 2000–2016 (PLN)

Source: Own calculation on the basis of the CSO database.

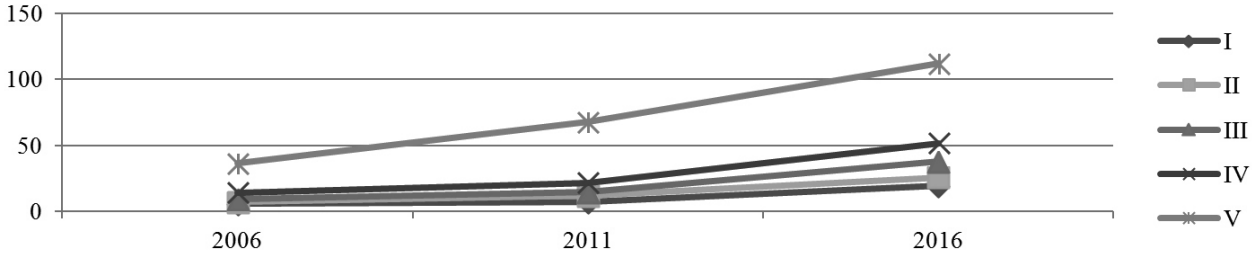

Fig. 6. Average monthly outgoings per capita in households by quintile groups on restaurants and hotels in the period 2006–2016 (PLN)

Source: Own calculation on the basis of the CSO database.

Fig. 7. Average monthly per capita expenditures on restaurants and hotels in households by number of persons in households in the period 2000–2016 (PLN)

Source: Own calculation on the basis of the CSO database.

noted that the highest expenditure was in one-person households (PLN 113.26 in 2016) and was higher by 49.6% than in two-person households.

Another factor significantly affecting the amount of expenditure on restaurants and hotels is the place of residence. In the analysing period, the average monthly per capita expenditure on restaurants and hotels was increasing in all households by class of locality (Fig. 8) but the highest expenditure was recorded in households living in cities of 500,000 and more residents (PLN 106.3 in 2016). It is worth emphasising that the foodservices offered in large cities are the most varied both in terms of the range of services and in prices [Gheribi 2017b]. This creates significant competition among operating companies, in connection with which, companies are fighting for customer satisfaction in order to provide the highest value.

The results obtained indicate the strong impact of socio-economic variables on the willingness to visit restaurants.

The GfK Polonia [2017] reports that price still remains the main determinant and barrier that does not allow some consumers to take advantage of the foodservice offers, but its significance significantly decreased compared to previous years. In my opinion however, it should be emphasised that price is not the barrier that does not allow some consumers to take advantage of the foodservice offers, but rather the low incomes of Poles. Own observations show that the prices of foodservice offers in Poland are very varied, but much lower than in other countries of Western Europe. It should be emphasised that the average monthly income 20% of people with the highest incomes (V quintile group) in 2016 amounted to PLN 2,879 per capita and was 5.2 times higher than the analogous income of 20% of those earning the lowest income (I quintile group). If consumers were to have higher incomes, they would be willing to use foodservices more often.

Education significantly differentiates the level of income as well as the expenditure of households. In households in which the reference person had higher education, the average monthly income per person was 41.3% higher than the national average, while expenses were higher by 38.7% [GUS 2017a].

In conclusion, it can be stated that the main target group of clients in the foodservice industry remain cities with population of over 100,000 residents, with high-income, a high level of education and single or two-person households. However, it should be noted that foodservice companies should consider targetting pensioners and retirees, because there is a lot of potential in them. Pensioners and retirees are a group of people who are very numerous and growing. "Population aging" is the increase of the number of older individuals in a society due to fertility declines and rising life expectancy. It is an irreversible global trend with far-reaching economic and socio-political consequences. Admittedly, the disposable income of these people is not very high in comparison with other countries of Western Europe, but they are willing to use the foodservice offers, and also have the added motiva-

Fig. 8. Average monthly per capita expenditures on restaurants and hotels in households by class of locality in the period 2006–2016 (PLN)

Source: Own calculation on the basis of the CSO database.

tion of meeting with friends. Pensioners and retirees in 2016 occupied the third and fourth place in terms of the amount of expenses for foodservices. That is why I believe that this is a promising group of clients which foodservice operators should not forget. Oliwińska [2014] reports that the lifestyles and life patterns of retirees are changing, and there is a departure from passivity to activity. Factors that limit the activity of older people are, among others, socio-economic factors, of which the most important is low income, which limits participation in social life and various forms of recreation [Bojanowska 2014].

Changes in foodservice industry – sectoral analysis

Social and economic changes in Poland which started from 1980–1990 have influenced consumers, but also the market, and entrepreneurs who run companies in the foodservice industry.

During the period of creating the centrally managed economy in Poland, the foodservice industry belonged to the least developed links in the food economy. By 1980 the primarily socialised foodservice industry developed (84% of total number of foodservice establishments): state-owned and cooperative food services and, to a very small extent, private companies (16%).

In the 1990s, several factors changed the economic structure: the adoption of a new economic model, Poland's opening to the world, the internal balance on the market, and establishing a connection between production and the market's needs, depriving trade of all ideological underpinnings, technological changes, innovativeness, a change in the population's lifestyles, and many others.

The sellers' market turned into the buyers' market. Liquidated industrial jobs were replaced by new ones created in a broadly understood service sector.

Foodservice has gone through major changes and since the end of the last century has undergone a remarkable transformation. This refers to the number of outlets, types, forms of activities, as well as to the revenue size and structure. The Law of 1988 on conducting business and its legislation contributed the most to this process.

In 1989, private outlets accounted for about 46% of their total number, and currently the foodservice industry is almost entirely privately held (98.7% in 2016), which leads mainly to a broad choice and more efficient management (Fig. 9).

In the 1980s and 1990s, simple forms of foodservice dominated, mainly canteens, bars and food stands. In 1993 bars still dominated (41.5%) and food stands (45%) but as a result of economic changes many new types of previously unknown foodservices emerged. Until 2005 all types of foodservices were rapidly expanding, while in 2005–2013 only restaurants recorded the largest growth [Gheribi 2015]. Currently, the foodservice market is still dominated by food stands (35.2%) and bars (30.1%), but their share is steadily decreasing in favor of restaurants (28.3%) – Figure 10. The Polish foodservice market became similar to the world foodservice industry. The data of the CSO shows that the highest concentration of foodservice enterprises was in Mazowieckie Voivodship. In 2016 there were 5,277 foodservice enterprises and 1,205 restau-

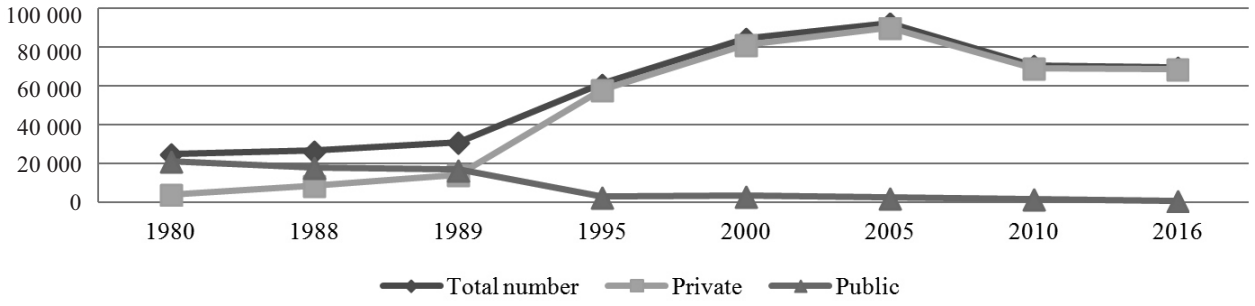

Fig. 9. Changes in numbers of foodservice establishments in Poland in the period 1980–2016

Source: Own calculation on the basis of the CSO database.

rants, which accounted for 26.9% of all foodservice enterprises in Poland and 20,36% of all restaurants in Poland [GUS 2017b]. In Warsaw, in 2016, there were 2,444 catering establishments, including 635 restaurants which indicate that approximately 50% of all facilities in the Mazowieckie Voivodship were located in Warsaw [GUS 2017a]. The increased number of foodservice companies positively influences the quality of the service provided, as companies compete for customer satisfaction. Restaurants represent higher quality services than a few years ago in both the property (interior, accessories), offered meals (breakfast, lunch, dinner, brunch) and services (home delivery, take away sales, organisation of events) [Gheribi 2013]. The increased number of foodservice companies in large agglomerations is due to demand from customers.

Nevertheless, the rising demand for foodservices contributes to an increase in revenue from gastronomic activities, which encourages this type of activity. In the 1980s and 1990s, revenues from foodservice were very small, because the foodservice enterprises were few and they were not as popular as today.

The revenue of foodservice enterprises is generated mainly by own-food production, followed by alcohol and tobacco sales. It is important to stress that the revenue generated by own-food production has been rapidly increasing. In 2016, own-production generated 80.6% of the total gastronomic activity revenue. In 1992–2016, the foodservice business in Poland

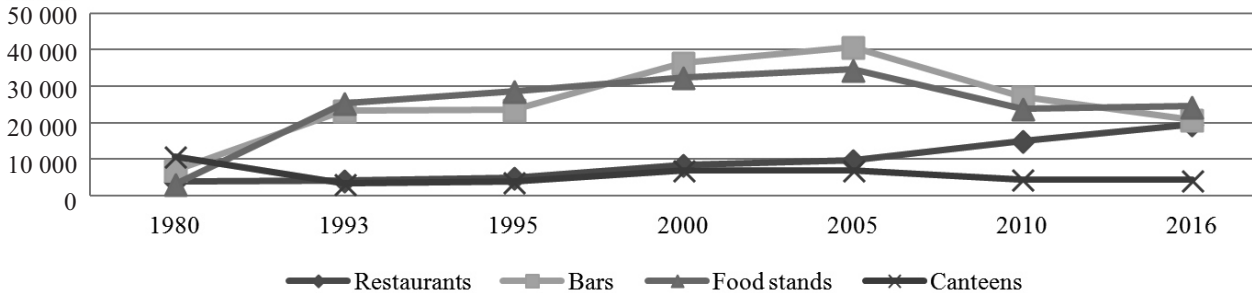

Fig. 10. Changes in structure of foodservice establishments in Poland in the period 1980–2016

Source: Own calculation on the basis of the CSO database.

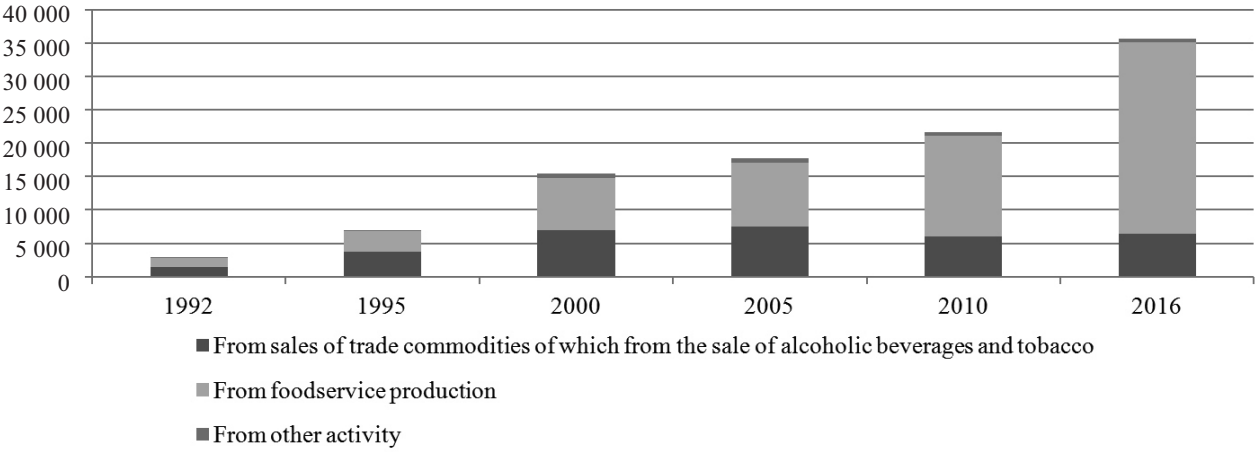

Fig. 11. Changes in revenues from foodservice activity in the period 1992–2016

Source: Own calculation on the basis of the CSO database.

maintained its value growth, which was attributed to increasing consumer confidence and a rising inclination to dine out, as is shown in Figure 13. In 2016, revenues amounted to PLN 356 million (current prices) and were higher by 64.49% compared with the year 2010, and 101.72% compared with the year 2005.

During the 1990s, American fast food companies, such as McDonald's and KFC, opened numerous outlets in Poland. One of the first chains in the foodservice industry in Poland was McDonald's, which opened the first restaurant in 1992 in Warsaw [Gheribi 2017a]. Currently in Poland McDonald's has 385 outlets in more than 150 cities, of which 249 are franchise outlets. Currently in Poland in the foodservice industry there are 204 concepts of network and 3,700 points [Profit System 2017]. McDonald's remains the most popular of foodservice chains. Almost half of Poles aged 15+ declared that they have visited the point of this network in the last 12 months. The KFC, Pizza Hut and Burger King chains also recorded a significant increase in popularity compared to 2015 [GfKPolonia 2017]. Leading global foodservice brands such as McDonald's, Pizza Hut, and Starbucks are opening their outlets in large agglomerations, and other international brands are planning to open there [Collers International 2015]. Increasing competition in the foodservice industry in Poland forces business operators to introduce more innovative offers and become more consumer oriented. Modern ways of communication with consumers are used, the Internet being a popular tool with access to such channels as outlets' websites, internet forums and social networks. According to the number of fans on the Facebook page, the most popular restaurant in Poland in 2017 was McDonald's with 1,530,614 fans, followed by KFC with 781,008 Facebook fans [Horecanet.pl 2017]. It is worth mentioning that the top 10 lists include not only global brands, but local, Polish ones, such as Da Grasso which was placed at number 7 with 121,600 fans. Da Grasso is among one of the largest players in Poland and it is the largest franchise pizza chain. The first restaurant founded by Da Grasso was in Łódź in 1996. Da Grasso has about 175 restaurants in 150 cities, and unlike the competition, Da Grasso has many locations in smaller towns as well.

CONCLUSION

The presented information in the analysed period confirms the continuous development of the foodservice industry in Poland. The development of the foodservice business undoubtedly is related to the social and economic changes taking place in last three decades. Supply data shows that the most dynamic growth comes from restaurants, and the primary and still-growing income share in foodservice comes from catering production. Data on the demand conditions proves that expenses on foodservices still dependent on the level of income, and rising Polish incomes brings hope for the consumer foodservice industry. The increased number of foodservice companies positively influences the quality of the service provided, as companies compete for customer satisfaction.

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WPŁYW ZMIAN SPOŁECZNO-EKONOMICZNYCH NA KONKURENCYJNOŚĆ W BRANŻY GASTRONOMICZNEJ

STRESZCZENIE

Rozwój branży gastronomicznej jest związany ze zmianami społeczno-gospodarczymi zachodzącymi w ostatnich trzech dekadach. Sektor ten jest wrażliwy na trendy gospodarcze i społeczne. Głównym celem pracy jest zdefiniowanie najważniejszych zmian społeczno-gospodarczych, jakie zaszły w Polsce w wyniku transformacji politycznej i gospodarczej po 1989 roku, oraz wpływu na konkurencyjność w branży gastronomicznej. W dokumencie wykorzystano źródła informacji, takie jak: dane GUS, raporty biznesowe i biuletyny branżowe. Badaniami objęto lata 1988–2016. Zastosowano metodę porównawczą do analizy zebranych danych i materiałów. Analiza pokazuje, że biznes gastronomiczny jest jednym z najbardziej dynamicznych sektorów w Polsce. Przedsiębiorstwa sektora spożywczego wykazują znaczną poprawę jakości i różnorodności usług. Trendy społeczne i demograficzne, a także zmieniające się wartości społeczne i mentalność konsumentów sprzyjają rozwojowi nowych możliwości i tworzeniu nowych produktów w branży gastronomicznej. Branża gastronomiczna jest silnie konkurencyjna.

Słowa kluczowe: przedsiębiorstwa, gastronomia, rozwój, zmiany społeczno-gospodarcze

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SENSITIVITY OF HOUSEHOLDS CONSUMPTION DEFLATOR TO CHANGES IN PRICES OF IMPORTED AGRICULTURAL PRODUCTS

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ABSTRACT

The aim of the article is to assess the sensitivity of the deflator of households consumption to changes in prices of imported agricultural products. In addition to assessing the scale of this sensitivity, its changes in time and spatial diversification were tracked. The research used the input – output price model. It is a macroeconomic model based on the cost formula, and therefore price sensitivity is described through the prism of flows of intermediate products, ignoring adjustment mechanisms. The statistical material for the period 2000–2014 was taken from world input – output database (WIOD) covering information about 43 countries of the world. The analysis carried out shows that changes in world prices of agricultural products have a rather small impact on the purchasing power of households. The observed changes in time are varied, however, the upward trend prevails. The results confirm the thesis that the sensitivity to price impulses flowing from abroad decreases along with the size of the country. Very clearly, especially in European countries, a breakdown in 2009 can be noticed, resulting from the financial crisis, which also moved to the real sphere.

Key words: input – output price model, consumer price index, agricultural products, pass-through

INTRODUCTION

Fluctuations in prices of consumer goods and services result in changes in the purchasing power of households. This phenomenon is discussed primarily when sudden increase in food prices occurs. A spectacular jump in prices of specific food products raises consumer concerns and becomes a topic often appearing in the media, the last example of which is the rise in the price of butter. In the developed countries, however, the scale of this problem seems to be small, as expenditure on basic goods, especially food, constitutes a not significant part of household expenditures. An important source of fluctuations in prices of food are changes in world prices of agricultural products. Determining how alarming consumers should be about fluctuations in world prices of agricultural products requires an empirical analysis. Prices of agricultural products have their share in shaping the prices of other products in the consumers' baskets, mainly processed food and textiles. For that reason, the analysis should take into account the intermediate flows, or to put it differently – the role played by agricultural products in value chains.

The aim of the study is to assess the sensitivity of the deflator of household consumption to changes in the prices of imported agricultural products. This sensitivity depends on three basic factors:

- import intensity of the economy;
- production technology, i.e. the role played by agricultural products in the value chains;
- the role of agricultural products and derived products in the basket of consumer goods.

Price changes trigger many adjustment mechanisms resulting from the supply and demand game, mainly dependent on price elasticity. To a different

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extent, these mechanisms create the opportunity for domestic producers to raise prices, unjustified by the increase in costs. These other factors were omitted in the study.

The study applied a macroeconomic approach. Agricultural products are defined below in accordance with NACE as A01: Crop and animal production, hunting and related service activities.

Research on price sensitivity to external impulses is of great importance for inflation forecasting. Such analyzes, often commissioned or supported by central banks, focus on the examination of pass-through mechanisms of exchange rate fluctuations on domestic prices [Auer and Schoenle 2016, Pennings 2017]. The interest of economists is also aroused by the mechanisms of transmitting other price relations, especially the impulses coming from the raw materials market, mainly crude oil [Nazlioglu 2011]. Most of them use time series analysis tools. In general, these models are based on the cost formula in less [Zhang and Qu 2015, Bekkers et al. 2017] or more [Pennings 2017] direct way.

Slightly less popular are the applications of the input – output price model, idea of which dates back to the 1930s [Leontief 1937, 1946]. It is a model based strictly on the cost formula, where the initial impulse is a change in import prices [Wu et al. 2013, Aydoğuş et al. 2017] or unit value added [Lee et al. 2000, Sharify and Sancho 2011]. Price sensitivity is often investigated using more developed models, where the input – output price equation is only one of the elements [Boratyński et al. 2007].

THE METHOD AND DATA SOURCE

In the study, a classic input – output price model was used. It is described by the formula:

$$\boldsymbol{p}^{K} = \mathbf{A}^{K\prime}\boldsymbol{p}^{K} + \mathbf{A}^{M\prime}\,\boldsymbol{p}^{M-1}\boldsymbol{v} \tag{1}$$

where: $\boldsymbol{p}^{K}$ – vector of domestic prices, which elements are output deflators;
$\mathbf{A}^{K\prime}$ – input – output matrix (coefficients of direct material flows, domestic products only);
$\mathbf{A}^{M\prime}$ – matrix of direct import coefficients (coefficients of direct material flows, imported products only);
$\boldsymbol{p}^{M}$ – vector of import prices;
$\boldsymbol{v}$ – vector of unit value added (including taxes on products).

The transformation of the above formula leads to a reduced form of the price model:

$$\boldsymbol{p}^{K} = (\mathbf{I} - \mathbf{A}^{K\prime})^{-1}\,\mathbf{A}^{M\prime}\boldsymbol{p}^{M} + (\mathbf{I} - \mathbf{A}^{K\prime})^{-1}\boldsymbol{v} \tag{2}$$

According to the equation (2), domestic prices change in response to changes in import prices and changes in unit value added. The transposed import-intensity matrix $\mathbf{\Pi}' = (\mathbf{I} - \mathbf{A}^{K\prime})^{-1}\,\mathbf{A}^{M\prime}$ determines the strength with which import prices will influence the prices of domestic products. Thus, the impact of import prices on the prices of domestic products depends on the import intensity of individual branches, but also on the flow of intermediate products in the domestic economy.

Assuming that all product prices are equal 1, the price transfer mechanism can be interpreted as follows: An increase in the prices of imported products of *i*-branch by 1 (or 100%) will cause the prices of all domestic products to increase according to the values of the elements in the *i*-th row of the matrix Π.

The changes in domestic prices recorded in this way affect the deflator of consumption in proportion to the structure of the basket of goods and services. At the same time, the increase in import prices of products of the *i*-th branch causes a direct (i.e. by 100%) increase in the prices of products of this branch in the "imported" part of the basket, without affecting prices of other imported goods in this basket. The unit value added does not change. Thus model response of the household consumption deflator to the change in external prices of agricultural products is calculated as a weighted average of two components:

- domestic – being the average of the elements of the *i*-th row of the matrix $\mathbf{\Pi}$ weighted by the structure of consumption of domestic products,
- imported – representing the average import prices weighted by the consumption structure of imported products.

This might be written as formula (3). It is also presented in Figure 1.

$$\Delta P_i = \frac{1}{C_D + C_M}\sum\nolimits_{j=1}^{n}\pi_{ij}C_{Dj} + \frac{C_{Mi}}{C_D + C_M} \tag{3}$$

where: ΔP_i – change in households' consumption deflator in response to 100% change in import prices of products of *i*-th branch;

C – household consumption, subscripts D and M denote domestic products and imported products respectively.

There are two sources of movements of import prices. The first is an exogenous change in the price expressed in a foreign currency (world price), the second is the exchange rate fluctuations. In the first case, the change is isolated, but it has, as a result of the existence of intermediate flows (value chains), the consequences for prices of other products on the world market. In the second case, the price movement applies to all imported products. The presented research aims to analyze the first of these two cases. Consist-

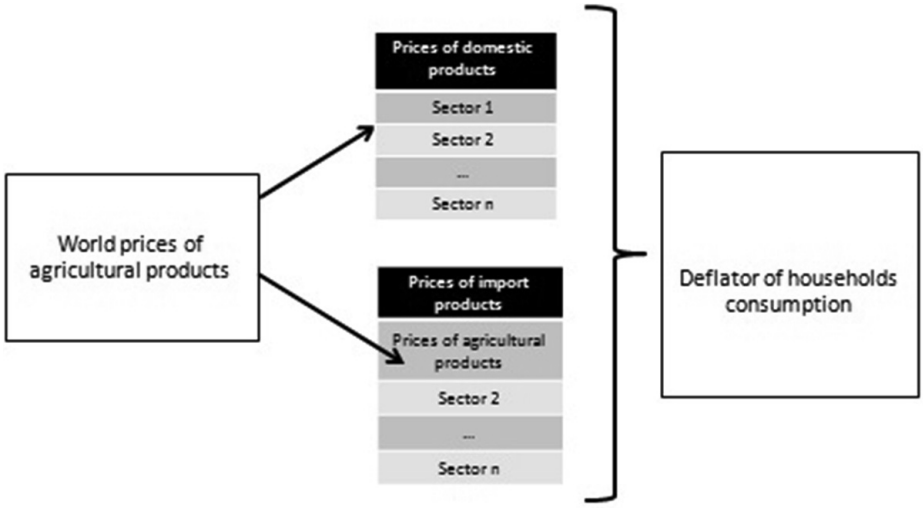

Fig. 1. Transmission of world price movements to the consumption deflator – a classic input – output price model

Source: Own elaboration.

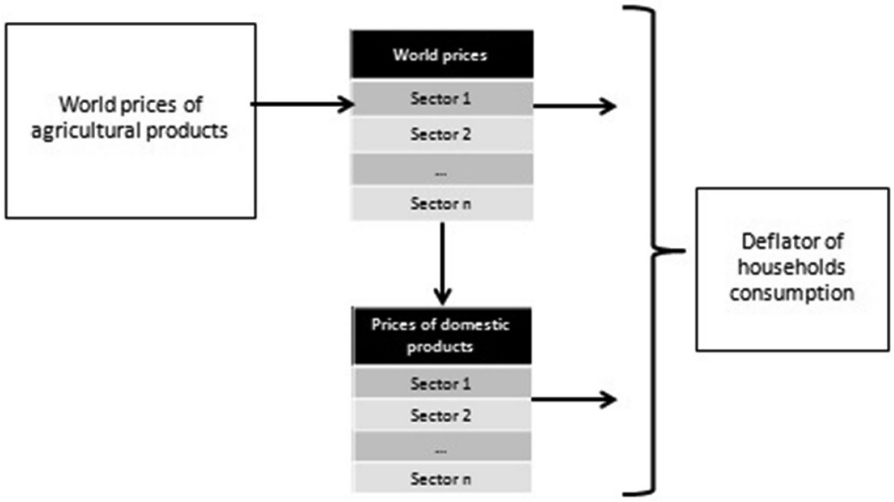

Fig. 2. Transmitting world price changes to the consumption deflator, taking into account adequate changes in world prices of other products

Source: Own elaboration.

ently using the cost formula it has been assumed that the price change of other products on the world market will be proportional to the share of agricultural products in the production costs for these products. Figure 2 shows this mechanism. The change in world prices of agricultural products moves the world prices of other products. In the next step, these changes are transmitted to the domestic prices and, proportionally to the basket structure, cause changes in the household consumption deflator.

To assess the scale of transmission shown on Figure 2, data from the WIOD, release 2016 were used. This database includes input-output tables for 43 countries (including the EU-28 countries) and covers the period 2000–2014. Each table presents the economy divided into 55 industries (branches) in an industry-industry system [Timmer et al. 2015, 2016]. This database includes high and medium developed countries only. For this reason, it is a great tool for analyzing value-added chains in industrial production, propagation of modern technologies, etc. Lack of countries with the lowest national income means that the statistical material used cannot be treated as a representative sample, so the conclusions from the study are limited. Unfortunately, in poorer countries, the quality of statistical surveys is lower and input – output tables are not constructed there.

RESULTS

The estimates of price sensitivity for all analyzed countries and years according to the method described in Figure 2 are presented in the table. Here the presentation is limited to the example of five selected economies. This set includes large (US and China), medium (Germany and Poland) and small economies (Lithuania, where price sensitivity turned out to be the highest).

Presentation of the results should be preceded by an assessment of the role that the analyzed branch plays in the economy. In Figure 3, the layout of the lines suggests that the role of the agricultural sector in the economy decreases with the increase of GDP per capita. The exception here is Lithuania, a country with a level of development similar to Poland, where the importance of agriculture is significantly higher.

Figure 4 presents one of the factors shaping the price sensitivity. It clearly confirms the validity of Engel's law. For the US and Germany, the share of agricultural products in household consumption stabilized at a very low level, not above 1%. For Poland and Lithuania it drops at a pace that promises the achievement of such a level in two to three decades. The decrease in this share in the case of China is surprisingly strong. This surprise is explained in Figure 5.

It turns out that this decline is largely due to the shift of Chinese households from consumption of agricultural products to the consumption of processed food. Figure 5 also shows that the products of the food industry are more important in the household basket than agricultural products. This means that the prices of agricultural products affect the deflator of consumption not only directly, but also as a cost factor for the production of the food industry (and, to a lesser extent, other branches).

Observing the downward trends in Figure 4 and stable shares (except the case of China) in Figure 5, one can expect results indicating a decline in the sensitivity of the deflator of household consumption to changes in the prices of agricultural products. Figure 6 shows something quite opposite. This means that the other two factors have definitely worked: import intensity and production technology. The importance of import intensity is confirmed by the observation that the sensitivity is inversely proportional to the size of the country. As shown in the table, this observation applies not only to selected five economies. Lithuania, Latvia, Estonia, Slovenia, Slovakia and Luxembourg show the greatest sensitivity (over 4% in 2014); the smallest (less than 1%) can be noticed for India, USA Brazil and Australia.

When estimating the linear trend model for each of 43 countries, a significant upward trend was recorded in 32 cases, in only 2 (Russia and Indonesia) the trend was decreasing, while in the remaining 9 the long-term changes were not confirmed. Figure 6 is therefore not completely representative for the entire group covered by the study, as it shows only countries where the price sensitivity increases. However, this is the predominant picture.

Table. Changes in deflator of households consumption (in %) as the reaction of a unit change in world prices of agricultural products in 2000–2014

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AUS	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9
AUT	1.7	1.8	1.8	1.8	1.8	1.9	2.0	2.1	2.2	2.1	2.3	2.4	2.4	2.5	2.5
BEL	3.5	3.4	3.4	3.6	3.7	3.7	3.7	3.9	4.1	3.7	3.1	3.4	3.4	3.4	3.5
BGR	1.8	1.8	1.8	2.0	2.3	2.5	2.7	3.0	3.3	2.6	2.8	3.0	3.2	3.4	3.3
BRA	0.6	0.6	0.6	0.7	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
CAN	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.4	1.5	1.5	1.5	1.7	1.7	1.8	1.9
CHE	1.5	1.5	1.4	1.5	1.5	1.6	1.6	1.7	1.8	1.6	1.6	1.6	1.5	1.6	1.6
CHN	0.7	0.7	0.7	1.0	1.3	1.3	1.4	1.3	1.5	1.3	1.6	1.6	1.7	1.5	1.4
CYP	3.2	3.2	3.2	3.1	3.2	3.2	3.3	3.4	3.7	3.2	3.2	3.2	3.0	3.2	3.3
CZE	2.2	2.2	1.8	2.2	2.6	3.0	2.9	3.1	2.9	2.9	3.0	3.2	3.4	3.6	3.6
DEU	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.1	2.2	2.1	2.2	2.3	2.3	2.5	2.4
DNK	2.2	2.3	2.2	2.3	2.4	2.4	2.5	2.6	2.7	2.4	2.4	2.6	2.6	1.8	2.3
ESP	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.7	1.6	1.7	1.9	2.0	2.0	2.0
EST	3.3	3.3	3.3	3.5	3.9	4.0	4.1	4.3	4.3	3.5	4.0	4.4	4.7	4.6	4.7
FIN	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.8	1.9	1.8	1.8	1.9	2.0	2.1	2.2
FRA	1.5	1.6	1.6	1.6	1.5	1.5	1.5	1.6	1.7	1.5	1.5	1.6	1.6	1.7	1.7
GBR	1.4	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.8	1.8	1.9	1.9	2.0	1.7
GRC	1.9	1.9	1.7	1.7	1.8	1.7	1.9	2.1	2.2	1.8	1.9	2.0	2.0	2.0	2.1
HRV	2.6	2.8	2.9	3.0	2.9	2.8	2.9	2.9	2.9	2.5	2.6	2.7	2.8	2.9	3.0
HUN	1.5	1.5	1.4	1.5	1.9	2.0	2.3	2.3	2.6	2.7	2.7	3.0	2.9	3.1	3.2
IDN	2.0	2.5	2.0	2.0	2.0	1.7	1.7	1.9	1.7	1.5	1.5	1.9	1.7	1.7	1.9
IND	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.5
IRL	2.2	2.6	2.6	2.4	2.4	2.5	2.7	2.7	2.8	2.0	1.4	2.1	2.4	2.3	2.1
ITA	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.5	1.4	1.6	1.8	1.7	1.8	1.9
JPN	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.1	1.2	1.0	1.0	1.2	1.2	1.4	1.5
KOR	1.3	1.4	1.3	1.4	1.5	1.2	1.2	1.3	1.8	1.7	1.8	2.1	2.1	2.0	1.9
LTU	3.4	3.7	4.0	4.3	4.5	4.8	5.3	5.6	5.9	4.6	5.2	6.2	6.8	7.2	6.8
LUX	3.9	3.9	4.1	3.9	4.1	4.2	3.9	3.8	3.7	3.9	4.2	4.4	4.1	4.2	4.3
LVA	3.7	4.0	4.0	4.3	4.7	5.0	5.1	5.3	4.9	4.1	4.6	5.3	5.6	5.5	5.3
MEX	1.2	1.2	1.2	1.3	1.3	1.2	1.2	1.4	1.6	1.6	1.6	1.9	1.8	1.8	1.8
MLT	3.3	3.0	3.0	3.0	3.1	3.2	3.5	3.8	4.2	3.7	3.9	4.0	4.0	4.0	3.7
NLD	3.3	3.1	3.0	2.6	2.5	2.5	2.5	2.8	3.0	2.8	2.8	2.9	2.9	4.0	3.8
NOR	1.5	1.6	1.7	1.6	1.6	1.6	1.7	1.8	1.9	1.8	1.7	1.9	1.9	2.1	2.1
POL	1.5	1.4	1.4	1.4	1.5	1.5	1.6	1.8	1.9	2.0	2.1	2.4	2.4	2.5	2.6
PRT	2.9	2.9	2.8	2.7	2.9	2.8	3.0	3.1	3.2	2.8	2.9	3.2	3.1	3.2	3.3
ROU	2.3	2.3	2.4	2.5	2.7	2.7	2.8	2.9	2.7	2.4	2.6	2.7	2.7	2.7	2.8
RUS	3.1	2.6	2.6	2.6	2.2	2.0	1.9	1.7	1.8	2.2	2.2	2.1	2.0	2.1	2.2
SVK	2.5	2.8	2.8	2.9	3.4	3.7	3.8	4.0	4.0	3.3	3.6	4.0	4.3	4.5	4.6
SVN	2.9	2.9	2.9	3.0	3.4	3.6	3.9	4.1	4.2	3.6	3.8	4.1	4.2	4.3	4.4
SWE	1.9	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.4	2.3	2.3	2.3	2.4	2.4	2.5
TUR	0.6	0.8	1.0	1.1	1.0	0.8	0.9	1.0	1.2	1.1	1.3	1.8	1.6	1.6	1.8
TWN	1.5	1.6	1.6	1.7	1.8	1.8	1.8	2.0	2.2	2.0	2.2	2.3	2.3	1.7	2.2
USA	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.6	0.6

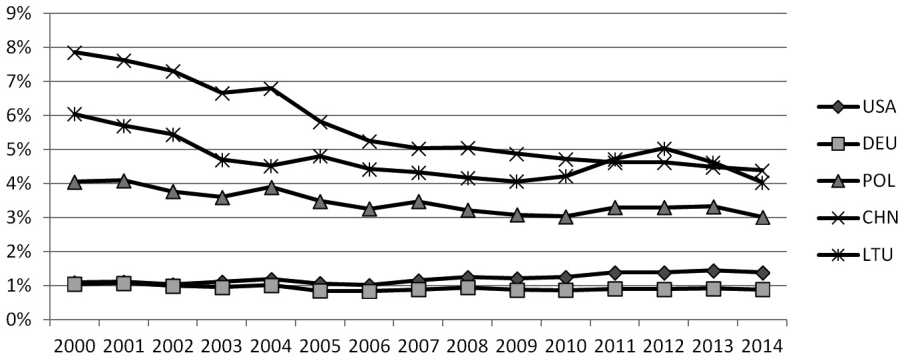

Fig. 3. Share of agricultural sector in domestic output in 2000–2014

Source: Own study based on WIOD.

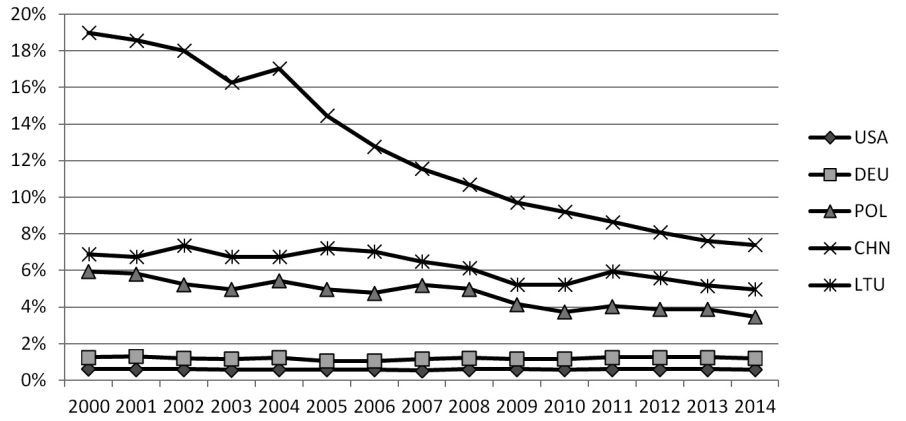

Fig. 4. Share of products of agricultural sector in households consumption in 2000–2014

Source: Own study based on WIOD.

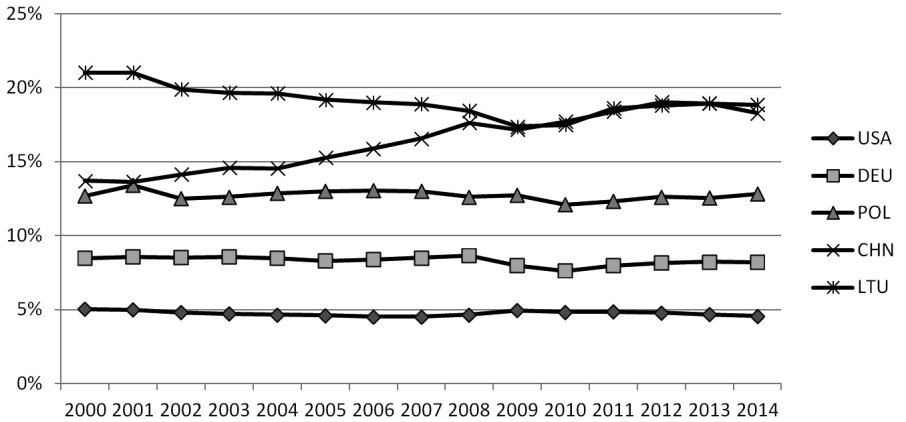

Fig. 5. Share of food industry products in household consumption in 2000–2014

Source: Own study based on WIOD.

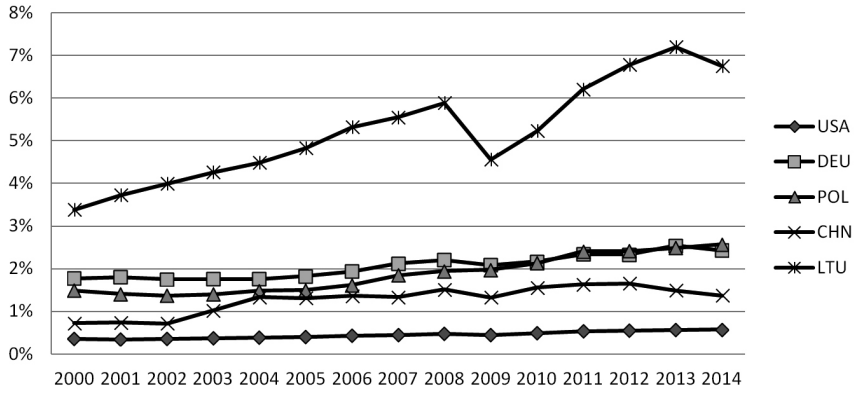

Fig. 6. The reaction of the deflator of households consumption to a unit change in prices of imported agricultural products, taking into account adequate changes in world prices of other products in 2000–2014

Source: Own study based on WIOD.

CONCLUSIONS

The analysis carried out shows that changes in world prices of agricultural products have a small impact on the purchasing power of households. The highest sensitivity was found in the case of Lithuania, where the doubling of world prices of agricultural products causes an increase in the deflator of households consumption by 7.2% (in 2013). It should be remembered that the analysis covered only high and medium developed countries. It is also worth adding that the macroeconomic results lead to averaging conclusions. Certainly, in the poorest households, where food is an important part of the basket of goods and services consumed, the fluctuations of the discussed prices can be clearly felt.

In general, the obtained results confirm known economic laws:

- sensitivity to price impulses from abroad decreases with the size of the country;
- together with the increase in incomes, the share of food products (mainly agricultural) decreases in the basket of products purchased by households;
- in general, the share of imports in household consumption is growing (including indirect imports for households needs);
- in 2009 a breakdown can be noticed, especially in European countries, resulting from the financial crisis, which also moved to the real sphere.

The observed changes in time are varied, however, the upward trend clearly prevails, which means that the increase in import intensity of economies is generally stronger than the effect resulting from the Engle law. A precise decomposition of the impacts of individual factors on price sensitivity can be carried out. It is an interesting direction for continuing the research.

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WRAŻLIWOŚĆ DEFLATORA SPOŻYCIA GOSPODARSTW DOMOWYCH NA ZMIANY CEN IMPORTOWANYCH PRODUKTÓW ROLNYCH

STRESZCZENIE

Celem artykułu jest ocena wrażliwości deflatora spożycia gospodarstw domowych na zmiany cen importowanych produktów rolnych. Oceniono skalę tej wrażliwości i prześledzono jej zmiany w czasie i zróżnicowanie przestrzenne. W badaniach wykorzystano model cen *input – output*. Jest to makroekonomiczny model stworzony na podstawie formuły kosztowej i w związku z tym wrażliwość cenowa jest opisywana przez pryzmat powiązań surowcowo-materiałowych, z pominięciem mechanizmów dostosowawczych. Materiał statystyczny z lat 2000–2014 zaczerpnięto z bazy światowych cen *input – output* – WIOD (ang. *world input – output database*), zawierającej informacje o 43 krajach na świecie. Przeprowadzona analiza wskazuje, że zmiany światowych cen produktów rolnych mają niewielkie przełożenie na siłę nabywczą gospodarstw domowych. Obserwowane zmiany w czasie są zróżnicowane, przeważa jednak tendencja wzrostowa. Wyniki potwierdzają tezę, że wrażliwość na impulsy cenowe płynące z zagranicy maleje wraz z wielkością kraju. Bardzo wyraźnie, zwłaszcza w krajach europejskich, zaznacza się załamanie w 2009 roku wynikające z kryzysu finansowego, który przeniósł się także na sferę realną.

Słowa kluczowe: model cen *input – output*, deflator spożycia gospodarstw domowych, produkty rolne, przenoszenie wahań cen

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OVERREPRESENTATION MAPS AS A TOOL TO ANALYSIS OF EXPENDITURE STRUCTURE

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ABSTRACT

In this article we made an approach to use tools of the grade data analysis to scrutinize structure of the consumer expenditures. Research material was taken from the Central Statistical Office of Poland database concerning expenditure of Polish households in the period of 1999–2015. Grade data analysis is treated as one of the multivariate data analysis methods and can be perceived as a method that is focused on fine visualization of the data in order to better understanding the interdependence that is contains. To do so, we used so-called overrepresentation maps. The analysis was conducted with taking into account time, class of the locality and socio-economic group. Conducted research showed the direction of changes in the average structure of the consumer expenditure.

Key words: grade correspondence analysis, GCA, structure, consumer goods and services expenditures

INTRODUCTION

Economic situation of Poland is constantly undergoing transformation. It is strictly related to overlapping processes, i.e. economic transformation and ongoing globalization. These processes had a significant impact on economic situation of all economic sectors, including household sector [Olejniczuk-Merta 2016].

Since the beginning of 1990s adaptive processes in the economic and social area have been observed, which led to adopting consumption patterns from American and European Union countries by Polish society. Situation of the Polish consumer changed significantly. Initially the Polish consumer functioned in the economy of shortage, whereas now he needs to make a choice from variety of goods and services, which in some situations may lead to inability to make one. This issue had been previously widely discussed by Schwartz [2013].

Additionally over the last years consumption of the Polish households has been undergoing perpetual changes and fluctuations, therefore constant analysis and observation is needed. Market subjects, including households, are functioning in the environment of various trends and macroeconomic factors, among which we can indicate: economic development, financial politics, inflation and level of redundancy. Moreover, the ongoing social changes, i.e. an influence of other cultures, constant raise the knowledge level, rational nutrition or simplified consumption, play also quite an important role. All of the above factors undoubtedly have enormous impact on building final household expenditure structure.

The purpose of this article is to show the most important changes and trends in the consumer expenditures structure in Polish households in the period of 1999–2015. The analysis was conducted for all Polish

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households and in distinction by both individual socio-economic groups and class of locality.

EMPIRICAL DATA

The empirical material used in this article is data taken from the Central Statistical Office of Poland concerning budget of the Polish households in the period of 1999–2015. It represents basic information source regarding revenue, consumption and expenditures within Polish households.

Households' expenditures were divided into groups according to the classification of expenditures based on COICOP/HBS [GUS 2011]. Finally there were 12 groups of expenditures received: food and non-alcoholic beverages (FOOD), alcoholic beverages, tobacco and narcotics (ALCO), clothing and footwear (CLOTH), housing, water, electricity, gas and other fuels (HOME), furnishings, household equipment and routine maintenance of the house (EQUIP), health (HEALTH), transport (TRAN), communication (COMMU), culture and recreation (CULT), education (EDUC), restaurants and hotels (HOTE), miscellaneous goods and services (OTHER).

METHODS

In order to better illustrate changes in the average structure of the consumer expenditures the grade correspondence analysis (GCA) was used [Kowalczyk et al. 2004, Gostkowski et al. 2015]. Grade correspondence analysis is a part of multidimensional data exploration [Borkowski and Szczesny 2005]. It represents a very important stage in order to reach statistics integration, data explorations, taxonomy, measurement theory and equal treatment of both continuous and discrete data. It can be seen as a method that is focused on very good visualisation of the data in order to better understanding the comprehensive data structure and its interdependencies [Borkowski et al. 2008]. All calculations were performed in GradeStat software developed and supported at the Institute of Computer Science Polish Academy of Sciences. Detailed description can be found at website http://gradestat.ipipan.waw.pl.

In this article the structure of given unit is understood as a vector of non-negative values in n dimensional Euclidean space, which sum of coordinates equals unity, where number of n dimensions is a number of groups concerning consumer goods and services. To evaluate any structural similarities between two units different similarity measures can be used [Kukuła 2000, Zeliaś 2000, Borkowski and Szczesny 2002, Malina 2004]. Among them we can distinguish concentration curve and associated concentration index [Koszela 2016, Koszela and Szczesny 2017]. Concentration curve of the distribution $\boldsymbol{q} = (q_1, \ldots, q_k)$ in relation to distribution $\boldsymbol{p} = (p_1, \ldots, p_2)$ is polygonal chain in the unit square joining points $(0; 0), (p_1, q_1), (p_1+p_2, q_1+q_2), \ldots, (p_1+ \ldots + p_k, q_1+ \ldots + q_k), (1; 1)$. Slope of the further sections of the polygonal chain to OX axis shows quotient q_i / p_i. Quotient q_i / p_i can run quite freely. Concentration curve received after shifting co-ordinates of vectors $\boldsymbol{q}$ and $\boldsymbol{p}$ in such a way, that next quotients are non-decreasing is called the maximum concentration curve, while corresponding concentration index is called the maximum concentration index $ar_{\max}$. Formally, it could be put in a form of pattern:

$$ar = 1 - 2 \cdot \int_0^1 C(t)dt \tag{1}$$

where: C – concentration curve of the distribution $\boldsymbol{q}$ in relations to $\boldsymbol{p}$.

The maximum concentration index and the distribution differentiation curves are basic tools of grade data analysis – GDA [Ząbkowski and Szczesny 2012]. Grade correspondence analysis algorithm strives to set rows and columns in the standardized P table ($\mathbf{P} = \{p_{ij} : i = 1, \boldsymbol{k}, \ldots, m, j = 1, \boldsymbol{k}, \ldots, k\}, \sum p_{ij} : i = 1, p_{ij} = 1, p_{ij} \geq 0$) in such a way, that all the ar index equal $ar_{\max}$. It also should be noticed, that maximizing ar for one pair of variables causes decrease the ar value for other pairs of variables. Hence GCA algorithm attempts to make reached ar indexes are as close as possible to $ar_{\max}$. To achieve that, GCA changes arrangement of rows and columns in the table of m rows and k columns at every step, trying to maximize the Spearman's rank correlation coefficient ρ^*:

$$\rho^* = 3\sum_{i=1}^{m}\sum_{s=1}^{k}\left\{\left(p_{is}\left[2S_{row}(i)-1\right]\left[2S_{col}(s)-1\right]\right)\right\} \tag{2}$$

where:

$$S_{row}(i) = \left(\sum_{j=1}^{i-1} p_{j+} \right) + \frac{1}{2} p_{i+}$$

$$S_{col}(s) = \left(\sum_{y=1}^{s-1} p_{+t} \right) + \frac{1}{2} p_{+s}$$

$$p_{j+} = \sum_{s=1}^{k} p_{js}$$

$$p_{+t} = \sum_{n=1}^{m} p_{nt}$$

The number of possible arrangements of rows and columns is finite and equals $m!*k!$. After the GCA algorithm is over, elements located in both rows and columns are ordered in relation to suitable hidden variables. Strong correlation occurs, when there is a strong monotonic association between those two hidden variables. A very important quality of GCA is setting similar rows (columns) next to each other.

An important advantage of this method compared to commonly known methods of cluster analysis [Ostasiewicz 1999, Zeliaś 2000] is a simultaneous presentation of features and facilities in overrepresentation maps (Fig. 1). The idea is to show various structures in the background of the average structure. To create an overrepresentation map in the first place, based on the standardized table P, h_{ij} overrepresentation indexes are determined for each table cell:

$$h_{ij} = \frac{p_{ij}}{p_{i+} p_{+j}} \tag{3}$$

Overrepresentation index indicates the extent to which observed value differs from what would be expected from ideal proportionality distribution (i.e. when there exists no relationship between the rows and columns). For such a set of overrepresentation indexes a map showing the degree of data representation can be created (Fig. 1).

RESULTS AND DISCUSSION

The level and households expenditures structure strongly determines living situation of the households [Zalega 2011]. Tendency to consumption reflects in the level and structure of the consumer goods expenditures [Stanislawska and Majchrzak 2009], therefore evaluation of consumer expenditures development is valuable source of information for both the theorists, as well as practitioners. Based on information showed in the table it can be stated, that the consumer expenditures in Polish households systematically increased, reaching the amount of PLN 1,091.19 per person in 2015. After eliminating influence of the inflation, change of the expenditures is not as substantial anymore. It can be even noticed, that after the 2009, level of consumer expenditures stabilized on the level of approximately PLN 650 Polish per person, which could

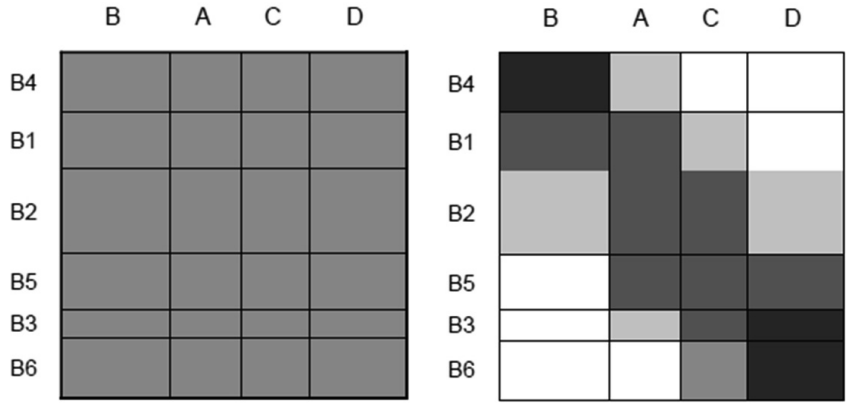

Fig. 1. Examples of overrepresentation maps in the absence of the relationship between the rows and columns (left) and otherwise (right)

Source: Own research.

be an effect of the economic slowdown. On the other hand, in 2012 re-growth of the average monthly consumer expenditures can be noticed.

Table. Average monthly expenditures for consumer goods and services per person in households and values of the consumer goods and services price indicator in relations to the year of 1999

Year	Nominal expenditure (PLN)	Real expenditure (PLN)	CPI
1999	530.15	530.15	1.000
2000	577.62	524.63	1.101
2001	585.72	504.26	1.162
2002	599.20	506.24	1.184
2003	648.74	543.75	1.193
2004	665.63	539.04	1.235
2005	660.67	524.02	1.261
2006	712.56	559.58	1.273
2007	755.58	578.89	1.305
2008	865.32	636.24	1.360
2009	913.86	649.21	1.408
2010	945.80	654.87	1.444
2011	971.83	645.16	1.506
2012	1 005.19	643.49	1.562
2013	1 061.70	673.61	1.576
2014	1 078.74	684.42	1.576
2015	1 091.19	698.60	1.562

Source: GUS [1999–2015].

In order to better illustrate changes in the average expenditures structure, an overrepresentation map showing expenditures structures in each period was used (Fig. 2). The determinant factors were average monthly expenditures (represented as structure) for consumer goods and services per person in Polish households.

When analyzing the overrepresentation map (Fig. 2), it can be stated, that the structure of average expenditures in Polish households underwent substantial changes. The biggest share in the budget in the analysed period had food and non-alcoholic beverages expenditures (FOOD), housing, water, electricity, gas and other fuels (HOME) and transport expenditures (TRAN) (column width). The darker hue shows overrepresentation and points out, that share of the consumer expenditures in the analyzed period has set over the average level of the expenditures calculated for the whole researched period. Taking that into account it can be stated, that in the period of 1999–2005 food and non-alcoholic expenditures (FOOD) were overrepresented – which means, that share of the expenditures in this period formed above the average level of the expenditures' share. To summarize – food and non-alcoholic beverages (FOOD) in the period of 1999–2005 had the biggest share in the expenditures of households.

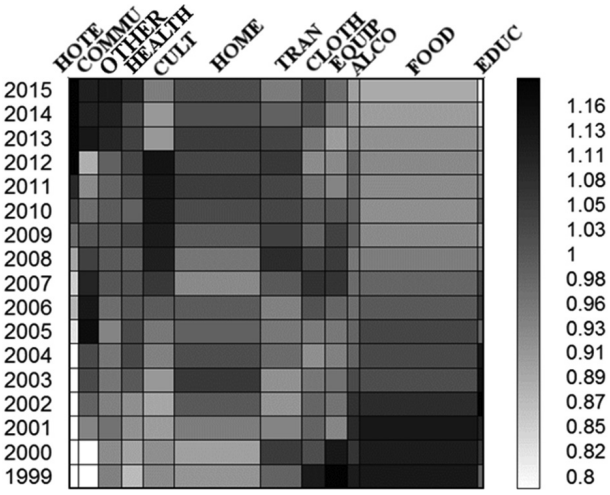

Fig. 2. Overrepresentation map for average monthly expenditure on consumer goods and services per person in Poland

Source: GUS [1999–2015].

Nevertheless, at the end of the analysed period an increase in the housing, water, electricity, gas and other fuels (HOME) and transport expenditures (TRAN) can be noticed. At the same time a decrease in share of the food and non-alcoholic beverages (FOOD) can be noticed, which can mean, that food and non-alcoholic beverages at the end of the analyzed period had no longer such a big share in the household expenditures structure as at the beginning of the analyzed period. An increase in housing, water, electricity, gas and other fuels expenditure (HOME) can

be explained with systematic increase of the various housing, water, electricity, gas and other fuels prices [Stolarska 2009, Świetlik 2014]. An increase of the expenditures connected with transport can be an effect of an increase of the people's mobility thanks to freedom of mobility ensured after Poland joined the EU [Hoszman 2013].

Additionally it can be noticed, that at the end of the analyzed period, there has been a systematic increase of the meaning of the expenditures for restaurants and hotels (HOTE), communication (COMMU), miscellaneous goods and services (OTHER) and health expenditures (HEALTH). What is more, during the period of 2013–2015 an underrepresentation of the expenditures for culture and recreation (CULT) can be noticed. This change can be caused by transferring expenditures for Internet services from the recreation and culture (CULT) group to the communication (COMMU) group, which in the period of 2013–2015 were overrepresented. A part of the observed changes was confirmed in the works of Kuśmierczyk and Piskiewicz [2012], and Piekut [2015], where an analysis of the change of the expenditures structure in chosen European Countries was described.

In the next stage of the research the overrepresentation map for the average expenditures for consumer goods and services in chosen socio-economic groups in 2015 was made (Fig. 3).

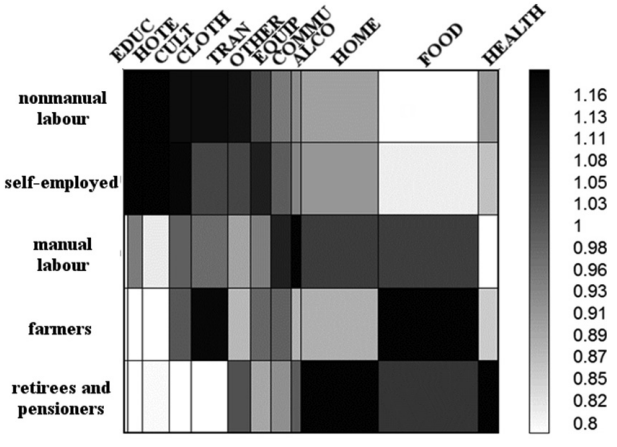

Fig. 3. Overrepresentation map for average monthly expenditure per capita in households by socio-economic groups in 2015 in Poland

Source: Own research based on GUS [2015].

Analysis of the overrepresentation map (Fig. 3) showed, that substantial differences in the average structure of the expenditures for consumer goods and services were noticed between each socio-economic group. The most similar consumer expenditures structures have households of employees in non-manual labour and households of the self-employed. For those two types of households strong overrepresentation of such expenditures groups as education (EDUC), hotels and restaurant (HOTE) or recreation and culture (CULT) may be noticed. It can be stated, that these are expenditures occurring when the revenue level is higher. Nevertheless, food and non-alcoholic beverages expenditures were strongly underrepresented. Different expenditures structure can be noticed in the households of employees in manual labour, farmers and households of retirees and pensioners. Within this group of households expenditures on education (EDUC), hotels and restaurant (HOTE) or recreation and culture (CULT) were strongly underrepresented. What is more, in this type of group of household strong overrepresentation of the food and non-alcoholic beverages (FOOD) expenditures can be observed – especially substantial for the farmers' households. Moreover, farmers' households show strong overrepresentation of the transport expenditures (TRAN). Conducted researched also proved, that alcohol, tobacco products and narcotics expenditures were severely higher in the group of households of employees in manual labour than in the other socio-economic groups.

Further analysis of the average consumer expenditures was performed with taking into account grouping households by class of locality (Fig. 4).

Conducted research showed, that there are no substantial differences in the average structure of the expenditures for consumer goods and services between each of the locality classes. The greatest differences in the average structure of the expenditures for consumer goods and services can be observed between households in cities with more than 500,000 citizens and households located in the rural areas – what arises from natural conditions. Additionally, households located in the rural areas showed overrepresentation of the expenditures for transport (TRAN) – what was acknowledged in the previous example – and expenditures for food and non-alcoholic beverages

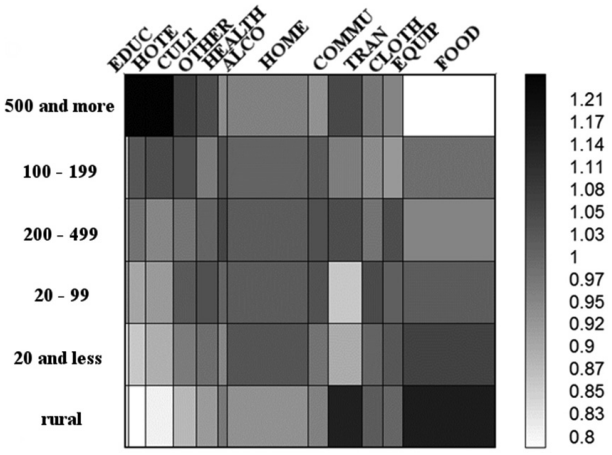

Fig. 4. Overrepresentation map for average monthly expenditure per capita in households by class of locality in 2015 in Poland

Source: Own research based on GUS [2015].

(FOOD). By contrast, very similar average structure of the consumer expenditures can be shown for other household classes. Without a doubt, their common feature is higher expenditure on housing, electricity, gas and other fuels (HOME).

CONCLUDING REMARKS

Conducted research showed, that in the analyzed period average expenditures on consumer goods and services were systematically growing to PLN 1,092 per person. Additionally, the largest share in the average expenditure on consumer goods and services is expenditures for food and non-alcoholic beverages. What is more, by the end of the analysed period it can be noticed that expenditures for restaurants and hotels (HOTE), communication (COMMU) and health (HEALTH) were overrepresented. The most similar structures of the average expenditures for consumer goods and services had households of employees in nonmanual labour and households of the self-employed. Moreover, the most different structures were the structures of households in cities with more than 500,000 residents and households located in rural areas.

Conducted research showed, that the GCA is a useful tool when analyzing changes in the average structure of expenditures for consumer goods and services. Use of this method allows analysis of the structures with usage of so-called overrepresentation maps, which deliver additional information about nature of the analyzed phenomenon.

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MAPY NADREPREZENTACJI JAKO NARZĘDZIE DO ANALIZY STRUKTURY WYDATKÓW KONSUMPCYJNYCH

STRESZCZENIE

W pracy podjęto próbę wykorzystania narzędzi gradacyjnej analizy danych do analizy struktury wydatków konsumpcyjnych. Materiałem badawczym były dane Głównego Urzędu Statystycznego dotyczące wydatków gospodarstw domowych w Polsce w latach 1999–2015. Gradacyjna analiza danych jest zaliczana do metod wielowymiarowej analizy danych i można ją wykorzystywać jako technikę wizualizacji danych umożliwiającą klarowne pokazanie ich współzależności. W tym celu wykorzystano tzw. mapy nadreprezentacji. Analizę przeprowadzono z uwzględnieniem czasu, klasy miejscowości zamieszkania oraz grupy społeczno-ekonomicznej. Przeprowadzone badania wskazały kierunek zmian w przeciętnej strukturze wydatków konsumpcyjnych.

Słowa kluczowe: gradacyjna analiza danych, GCA, struktura, wydatki na dobra i usługi konsumpcyjne

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REMUNERATIONS AND LABOUR PRODUCTIVITY IN AGRICULTURE AGAINST A BACKGROUND OF OTHER ECONOMY SECTORS

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ABSTRACT

The optimal allocation of resources in various sectors results in the sustainable development of the whole economy (the theory of optimum allocation of resources by Kantonowicz and Koopmans). According to Tinbergen's studies, the excessive labour force in one of them gives rise to all types of social and economic problems. The objective of theoretical considerations and empirical studies of this publication is to analyse the ratio of the remuneration for labour to its productivity in various economy sectors with particular attention paid to the agricultural sector. The authors also refer to the theory by Lewis and Schultz, who had analysed the problems of agriculture in developing countries, as well as to the Solow economic growth model with the Cobb–Douglas production function. In the light of the empirical data presented in the paper, we can conclude that in section A of Statistical Classification of Economic Activities this ratio is seriously disturbed and distorted. The remuneration is overvalued in relation to the labour productivity. Such a ratio is not a positive testimony to the reasonableness of management in the sense of agricultural producers' equilibria.

Key words: the ratio of the remuneration for labour to its productivity, sectoral aspect, agriculture

INTRODUCTION

For more than 200 years, economists have been analysing the reasons for which some economies develop faster than others (see: economics of development). Smith stressed that the annual product of each nation cannot rise in its value in a different way than just by increasing the number of productive employees or by an increase in their production force. The increase in the economic labour productivity results in a higher level of wealth and is contributed to by an improvement in capital to labour ratio, improved work organisation, increased competence of the staff, improved work discipline and motivation.

Jevons and Marshall believed that there is a close correlation among the factors of production, as their values are harmoniously matched with each other in the economic process. This match provides an equilibrium while making the full use of the productive potential. Otherwise, we would deal with the Nurkse's vicious circle of poverty.

In his paper entitled *Economic Development with Unlimited Supplies of Labour* of 1954, Lewis presented a model of the bi-sectoral development, in which he assumed that some underdeveloped countries have a dual economy – both traditional agriculture characterised by the low productivity, low income and the modern industry. Agriculture developing in rural areas and the urban industry resulted in large development differences among the parts of the country. This fact intensified migration to cities, which resulted in self-sustaining development (thanks to industrialisation). Due to the very low marginal labour productivity (according to Lewis – close to zero), the loss of labour

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force in the countryside did not result in the proportionate loss in the food production [Lewis 1954]. This image shows approximately the realities of the Polish economy.

The amount of remunerations is a variable dependent on many exogenous factors, among which of key importance is the level of economic development. Differentiation in the level of GDP per employee results from the diversification of the resources of the factors of production, as well as from the total changes in the efficiency of using these resources (production technology, investment). The economic structures of underdeveloped regions have been dominated by the low-value added activities. Along with the economic development, the relative share of low-value added sectors (e.g. agriculture) should decrease. The flow of labour force from the low produ-ctivity sectors to others (proper allocation of labour force) is one of the important factors affecting the rate of the average labour productivity and of the economic growth [Kosmalski 2010].

The objective of this article is to analyse the ratio of the remuneration for labour to its productivity in various economy sectors. Here, we assume that this ratio of the remuneration to its source of financing informs about the reasonableness of the allocation of this factor. Here, the adequate proportions should be maintained. On a basis of figures, we showed the mutual correlations of these two variables in the analysed sections. The study used mostly the information from the Local Data Bank Central Statistics Office (CSO) and Eurostat. The paper repeatedly referred to, in the sense of the concept of reasoning, to Cobb–Douglas production function. A good analytical tool to consider the reasons for the labour productivity level they are the Neo-classical production functions and resulting labour productivity functions. A certain reference to the considerations carried out here was the previous paper by Rembisz [2016].

PRODUCTIVITY VERSUS REMUNERATIONS – THEORETICAL ASPECT

A key issue in assessing the reasonableness of management is the ratio of the remuneration for the factor of production to its productivity [Gadomski 2015]. This ratio evolved differently in various economy sectors, which resulted from a series of endo- and exogenous reasons. From the Kuznets, Lewis, Schultz or Jorgenson models it follows that agriculture can be characterised by less favourable ratios than other sectors. The main point is that the labour productivity in agriculture is too low to finance the remuneration comparable to that in other sectors [Rembisz and Floriańczyk 2014, Rembisz 2016]. Hence, the maintenance of this state (including those proportions) without any structural changes would strengthen inequalities and would be an expression of irrational allocation. In microeconomic terms, this ratio is associated with the balance of the producer and is a basis for maximising its objective function. However, in macroeconomic and sectoral terms, this ratio is associated with the allocation and distribution. The productivity of factors finances their remuneration which is essential for the development and competitiveness of the whole economy.

As a relevant theoretical background we can refer to the Cobb–Douglas. The Cobb–Douglas production function in macroeconomic terms describes the mechanism of creating the national product. When transforming its form:

$$Y = F(K, L) = A\, K^{\alpha}\, L^{1-\alpha} \tag{1}$$

by making left and right division by the number of employees L, we obtain the labour productivity as the function of the capital to labour ratiofor the given production flexibility:

$$y = A\, k^{\alpha} \tag{2}$$

where: $y = \frac{Y}{L}$ – labour productivity;

$k = \frac{K}{L}$ – capital to labour ratio.

From the equation (2) it results that the labour productivity depends on the capital to labour ratio and total productivities of the factors of production or general technical progress A. The labour productivity flexibility in relation to the total productivity of the factors of production is 1, while in relation to the capital to labour ratio is α.

The differences in the capital to labour ratio among the states result from investment processes or accumu-

lation of real capital [Tokarski 2003, 2010]. The international diversification of total productivities of the factors of production may be a result of various materialised and non-materialised technologies in real capital, various institutional and legal solutions, various labour markets (differentiation of skills and knowledge of employees). Here, it is worth referring to the extended Cobb–Douglas production function, proposed by Mankiw et al. [1992] in a form of: $Y = K^{\alpha} H^{\beta}(R\ L)^{1-\alpha-\beta}$, where H means the resource of human capital in the economy, R – resource of knowledge directly intensifying the labour productivity, $\beta \in (0; 1)$ and means the production flexibility Y in relation to H – human capital inputs. In this case, the total productivity of the factors of production depends not only on the number of employees, but also on their knowledge, and more broadly on the potential of the research and development sphere and innovation of the economy.

According to Woś [1967, 1979], for assessing the level of development and im-portance of the food economy we can use five indicators: employment, gross value of fixed assets, investment inputs, global production and gross value added. Therefore, the labour productivity can be expressed by the global production or gross value added per employee. We can put it as follows:

$$X_A = x_r + x_p + \sum_{i=1}^{n} x_i b_{ir} + \sum_{i=1}^{n} x_i b_{ip} \tag{3}$$

where: X_A – global production of the food economy;
x_r – global production of agriculture;
x_p – global production of the food industry;
x_i – global production of i-th sections (branches) associated with agriculture and food industry, participating indirectly in food production ($i + 1, \ldots, n, n \neq r, p$);
b_{ir} – coefficient determining the flow of products and services of the i-th section (branch) to agriculture, expressed in percentage of the direct demand of the i-th section,
b_{ip} – coefficient determining the flow of products and services of the i-th section to the food industry.

The value added is one of the most objectified categories of assessing the efficiency of enterprises, applied in assessing the labour productivity. Its essence is that it measures the productivity from the point of view of the values brought by human capital in relation to the material costs coming from the outside. It is an important criterion of the ability to generate value for the owners [Gołaś and Kozera 2008, Gołaś 2010].

Undoubtedly, the labour productivity in agriculture depends, as in other sectors, from its capital to labour ratioand from the area per employee [Puzio-Waclawik 2006, Kołodziejczak and Wysocki 2013, Pawlak 2013, Włodarczyk 2013, Czyżewski and Kryszak 2016, Kusz 2017, Olipra 2017]. The need to maintain the appropriate ratios of the remuneration to the productivity is recognised in the literature. Therefore, it can be assumed that the land productivity and its area per full--time employee also determine the labour productivity. Starting from the correlations regarding the agricultural production level:

$$Y = L \cdot \frac{Z}{L} \cdot \frac{Y}{Z} \tag{4}$$

we obtain the labour productivity formula:

$$\frac{Y}{L} = \frac{Z}{L} \cdot \frac{Y}{Z} \tag{5}$$

Nevertheless, referring to the production intensification concept, we can propose the following correlations:

$$\frac{Y}{Z} = \frac{K+L}{Z} \cdot \frac{Y}{K+L} \tag{6}$$

where: $\frac{K+L}{Z}$ – the intensity of labour and capital inputs per 1 ha of UAA;
$\frac{Y}{K+L}$ – efficiency of involvement of capital and labour.

The problem of the remuneration/productivity ratio refers to the producer's equilibrium theory, which should balance the remuneration level with the marginal productivity of each factor of production. The equilibrium is achieved when the remunerations of the factors of production are equal to their productivities. This determines the sphere of rational management in the sense of technical efficiency [Rembisz 2016]. In-

come of the agricultural producer is the remuneration of labour inputs. According to Rembisz [2013], there are two main sources of this remuneration: rise in the prices of agricultural products and increase in the labour factor productivity. The agricultural producer, by maximising its objective function, tries to balance the remuneration level with the marginal productivity of each factor of production. We can therefore formulate the correlation of the producer's conditional optimisation for two factors of production:

$$R = Y c_Y \rightarrow \max \tag{7}$$

with: $K C_K + L C_L = m^k$, $\Pi = R - m^k$
where: R – revenue;
Y – production volumen;
c_Y – price obtained;
K – capital inputs with agricultural land;
C_K – remuneration of the capital factor (rate of interest and rent);
L – labour inputs;
C_L – remuneration for labour (income);
Π – profit;
m^k – financial constraint (resources for remunerations of involved factors of production).

In turn, if we ignore the prices obtained as the data (constants), which is of our interest in this article, we have:

$$\frac{Y}{L} = \frac{\partial Y}{\partial L} = C_L \tag{8}$$

Nevertheless, taking into account the prices obtained, which is a source of financing of the remuneration, we have the following relationship:

$$\frac{R}{L} = C_L \tag{9}$$

Reduction in the current level of employment (which gradually occurs), increase in the area of farms (which also slowly occurs) and increase in capital inputs are the assumptions necessary for the future development of the agricultural sector. Only such changes will bring the improved productivity, and hence also the higher remunerations of farmers.

PRODUCTIVITY *VERSUS* REMUNERATIONS – EMPIRICAL ASPECT

This article assumes the *ceteris paribus* principle in order to extract only the impact of the analysed labour factor and to make the analysis general. The objective of this part of the paper is to synthesise the results of empirical studies in relation to the above-mentioned analytical and theoretical assumptions.

Figure 1 illustrates the diversification of the labour productivity in the individual sectors of the Polish economy in the years 2010–2015.

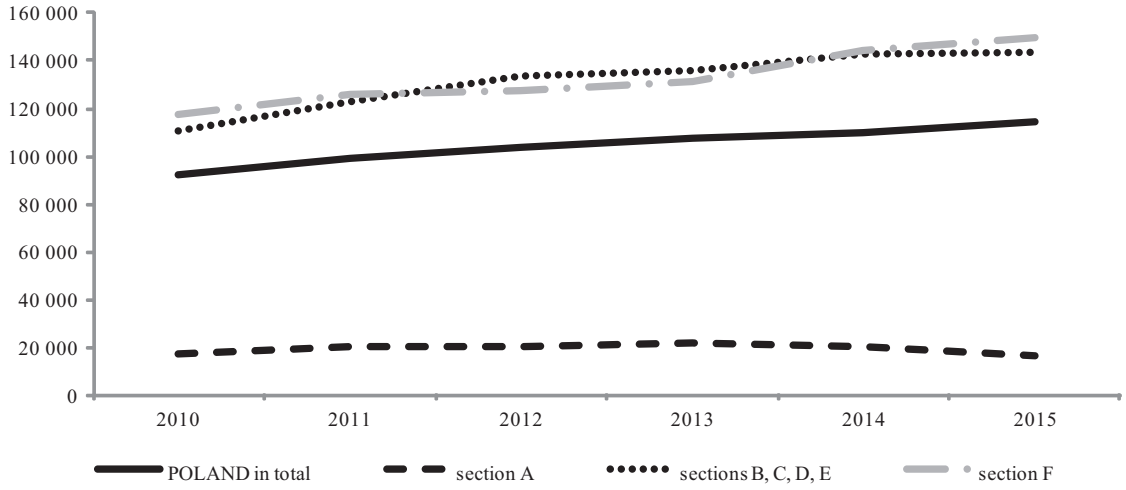
Statistical Classification of Economic Activities sections: section A – agriculture, forestry, fishing, fisheries; sections B, C, D, E – industry; section F – construction.

The data illustrated in Figure 1 and in the further Figures are an empirical verification of the analytical aspect. Agriculture, in terms of the labour productivity, significantly differs *in minus* from other sectors. What is more, this negative gap grows as the time goes by. At this point, we do not determine the reasons for this negative phenomenon. Of course, this finding is not surprising at all.

Figure 2 shows the average remuneration in sectoral terms. The illustration shows the highest and also the growing in time remunerations in agriculture. These results contradict the adopted assumptions not in the sense of their validity, but practice. The data indicates the independence of remunerations from the labour productivity. This rather indicates the irrational status. This is not a phenomenon motivating for the optimal allocation of labour resources, and thus for improving the competitiveness of the sector and strengthening the development of the whole economy. We do not keep on delving into the reasons of this state.

Data on the total average monthly remuneration applies to all entities of the national economy, i.e. also units employing up to 9 persons. Data on remunerations is provided in gross terms, i.e. including advances for PIT and, since 1999, mandatory social security contributions (pension, annuity and sickness) paid by the insured employee.

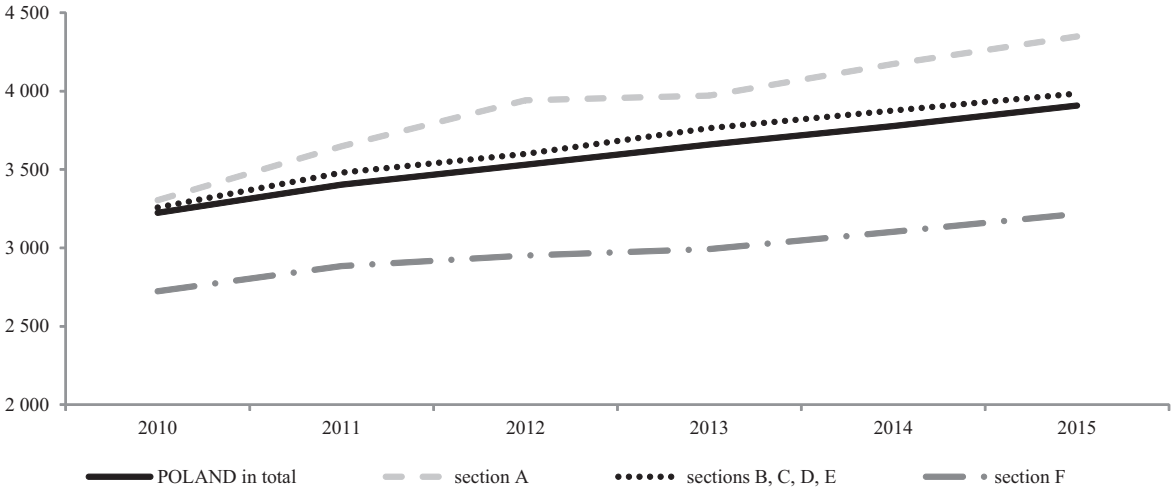
This phenomenon, negative for the economy, has been illustrated in Figure 3, where we can clearly see



Statistical Classification of Economic Activities sections: section A – agriculture, forestry, fishing, fisheries; sections B, C, D, E – industry; section F – construction.

Fig. 1. Gross value added per employee (labour productivity) by groups of NACE 2007 sections

Source: Local Data Bank, CSO.



Data on the total average monthly remuneration applies to all entities of the national economy, i.e. also units employing up to 9 persons. Data on remunerations is provided in gross terms, i.e. including advances for PIT and, since 1999, mandatory social security contributions (pension, annuity and sickness) paid by the insured employee.

Fig. 2. Average monthly gross remunerations in PLN in the national economy by NACE 2007 sections

Source: Local Data Bank, CSO.

how much the remuneration and productivity ratio in agriculture differs from other sectors (Fig. 3). This difference is nearly fourfold times and still grows. Naturally, this is a derogation from the reasonable grounds as shown above. Analysing the data over time allowed to capture the rate of those changes, as presented in Figures 4–6.

2016 saw the further deterioration (decrease) in the rate for section A [Strzelecki 2010, Kusideł and Modranka 2014].

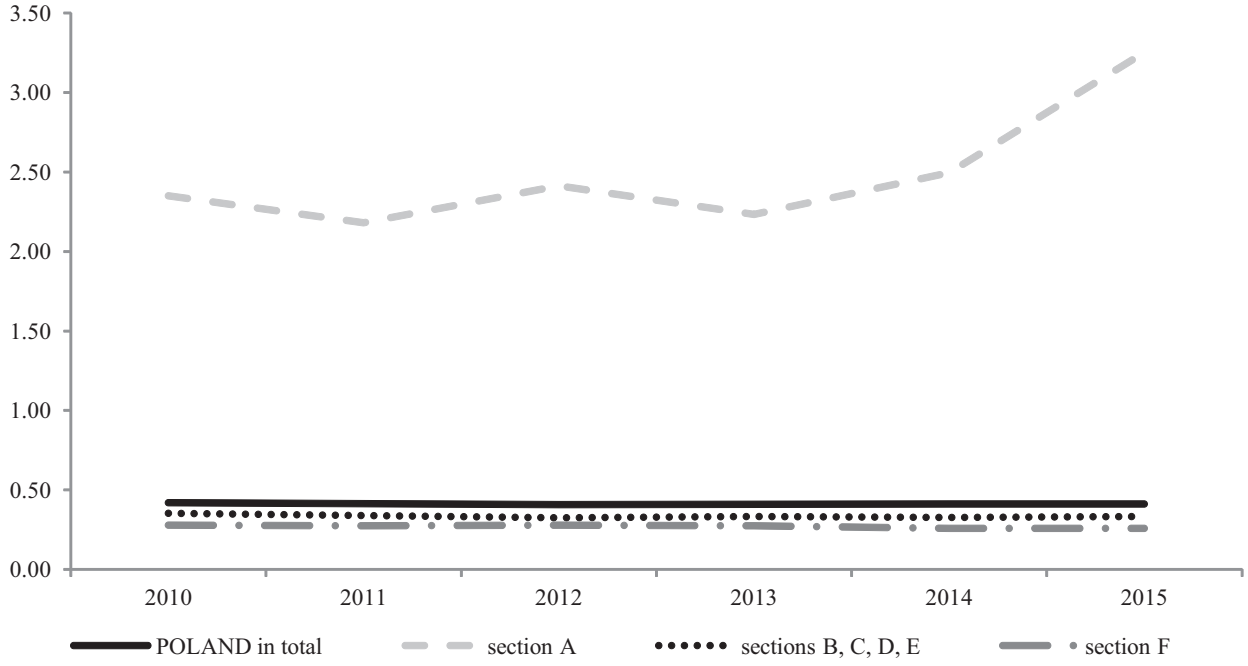
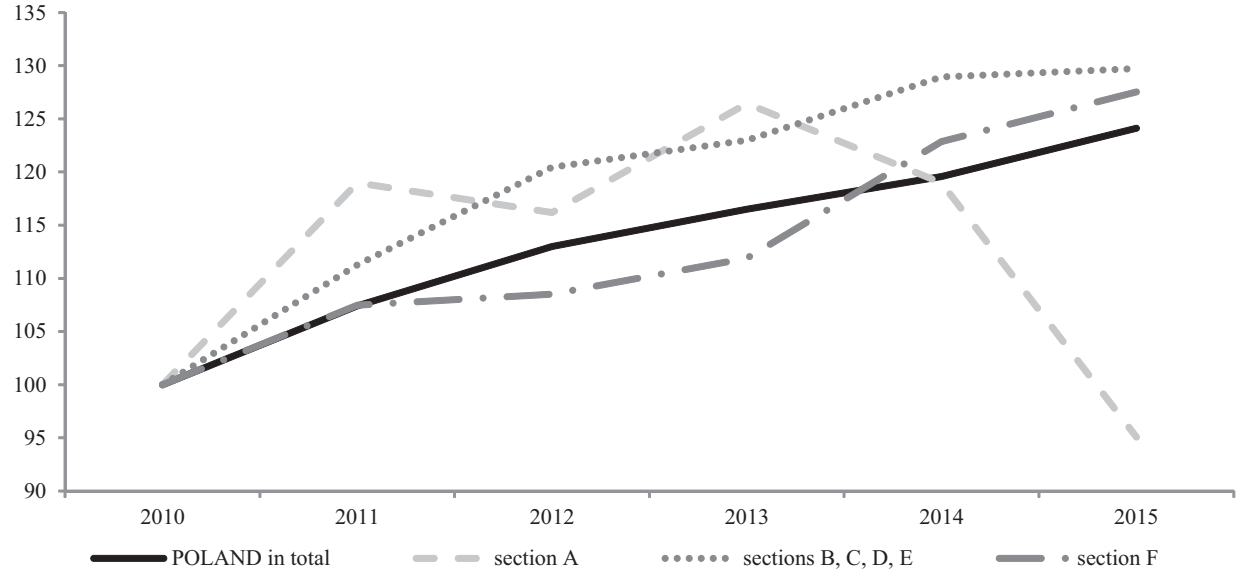


Fig. 3. Comparing the remuneration/labour productivity ratio in various economy sectors

Source: Local Data Bank, CSO.



2016 saw the further deterioration (decrease) in the rate for section A [Strzelecki 2010, Kusideł and Modranka 2014].

Fig. 4. Comparing the rate of the labour productivity in the sectors of economy

Source: Local Data Bank, CSO.

An irregular decrease in the labour productivity in section A has occurred since 2013 (Fig. 4). At the same time, the construction industry recorded its superior growth. The rate of remunerations is illustrated in Figure 5.

Since 2004, we may observe the rise in the remunerations for labour in agriculture, which is mainly the result of financial instruments of the Common Agricultural Policy. Therefore, the rate of changes in remunerations in section A differs so much from other sections (B-F). However, this rate is not due to the improved labour productivity, which significantly distorts the processes of structural transformation in the countryside and slows down the outflow of some employees to other sectors. The lack of the optimal allocation of labour resources consequently impedes the economic growth and reduces the competitiveness of the Polish economy. This affects the fact that the remuneration and labour productivity ratio in this sector is, as we showed above, the most favourable.

Figure 6 shows clearly how disproportionately the remuneration for labour increases in relation to its productivity. In the period from 2013, when this productivity decreases – the remuneration still grows significantly. This is shown in red in Figure 6.

In the light of the graphically presented ratios it results that agriculture (and more precisely, section A) draws benefits from the cross-sectoral division. Here, it is difficult to talk about the transfer of value worked out in agriculture to other sectors. The situation is reverse. In section A, the remuneration is higher than the labour productivity. In addition, this sector also makes use of political rent (CAP grant), as already mentioned. However, it is worth stressing that the phenomenon applies mainly to the south-eastern regions (the table), which are the most problematic for the economy not only in the case of section A.

In order to illustrate in a more synthetic manner, the grounds for the discussed relationships for section A, Figure 7 has been made where the variables analysed so far have been compared. With the labour inputs, which are relatively constant over time (within the range of 1,915–1,937) and their productivity decreases (gross value added per employee; in 2010 equal to PLN 16,871, in 2013 – PLN 21,334 and in

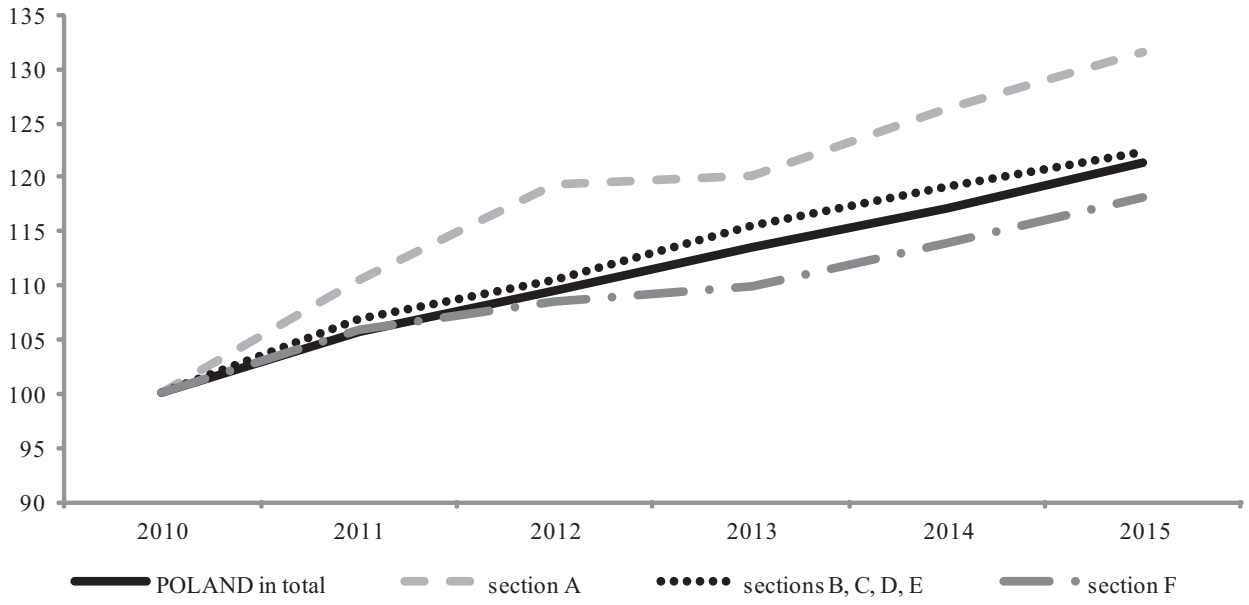


Fig. 5. Comparing the rate of changes in remunerations in the economy sectors

Source: Local Data Bank, CSO.

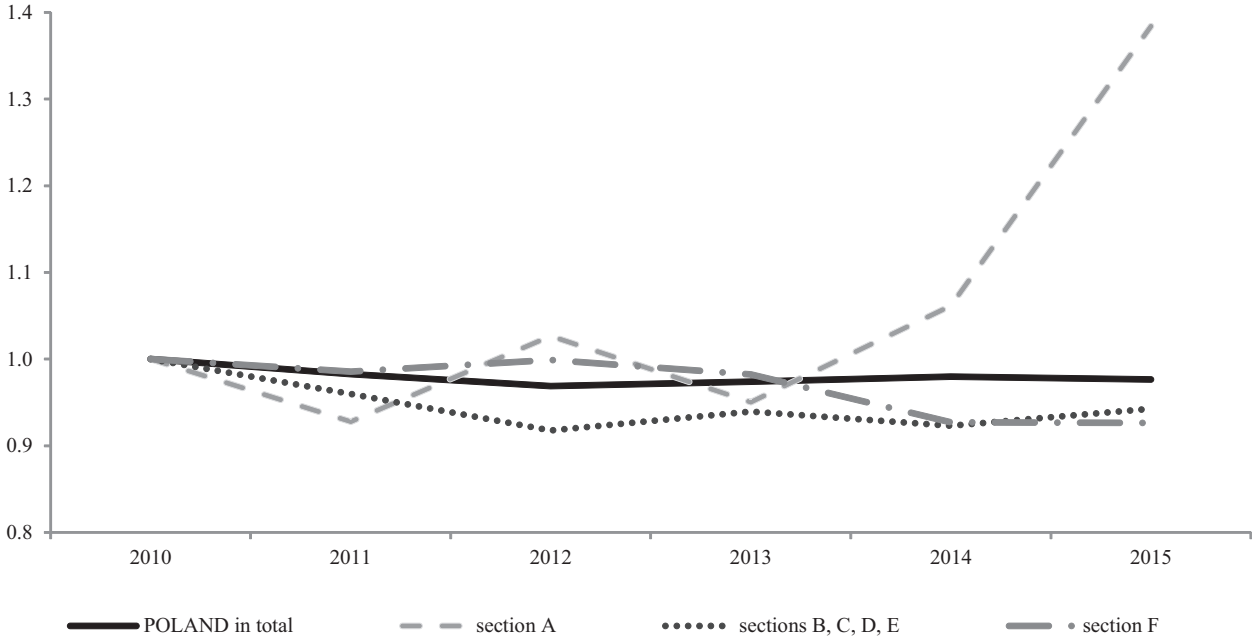


Fig. 6. Comparing changes in remunerations to changes in the labour productivity in the economy sectors

Source: Local Data Bank, CSO.

Table. Labour productivity and renumerations in secion A in Poland by voivodeships in 2010–2015

Specification	Gross value added per employee (labour productivity) (PLN)					Average monthly gross remunerations (PLN)	
	2010	2011	2012	2013	2014	2010	2015
Poland	16 871	20 074	19 600	21 334	20 071	3 304	4 348
Dolnośląskie	18 763	23 385	22 001	21998	21054	3 475	4 383
Kujawsko-Pomorskie	22 471	25 793	26285	30604	28113	3 069	4 194
Lubelskie	10 294	13 572	12 577	13 776	12 117	3 412	4 439
Lubuskie	29 325	35 978	35 476	37 890	38 144	3 389	4 494
Łódzkie	16 309	19 337	18 021	19 692	20 558	3 338	4 501
Małopolskie	6 570	8 027	7393	7 227	7 294	3 236	4 329
Mazowieckie	24 353	29 500	28 424	32 933	29 532	3 594	4 331
Opolskie	23 05	28 272	27 075	25 587	23 603	3 158	4 208
Podkarpackie	4 235	5 381	4 881	5 444	4 934	3 441	4 703
Podlaskie	18 888	21 725	20 840	24 747	21 579	3 770	5 283
Pomorskie	25 154	29 032	30 512	31 962	32 503	3 300	4 370
Śląskie	13 914	16 809	17 108	16 850	15 881	3 375	4 655
Świętokrzyskie	9 337	11 637	10 469	11 418	11 017	3 774	4 865
Warmińsko-Mazurskie	31 727	38 116	36 735	37 493	36 383	3 386	4 397
Wielkopolskie	24 993	27 670	29 285	30 885	29 540	2 990	3 996
Zachodniopomorskie	33 826	36 084	37 762	41 707	39 433	3 353	4 258

Source: Local Data Bank, CSO.

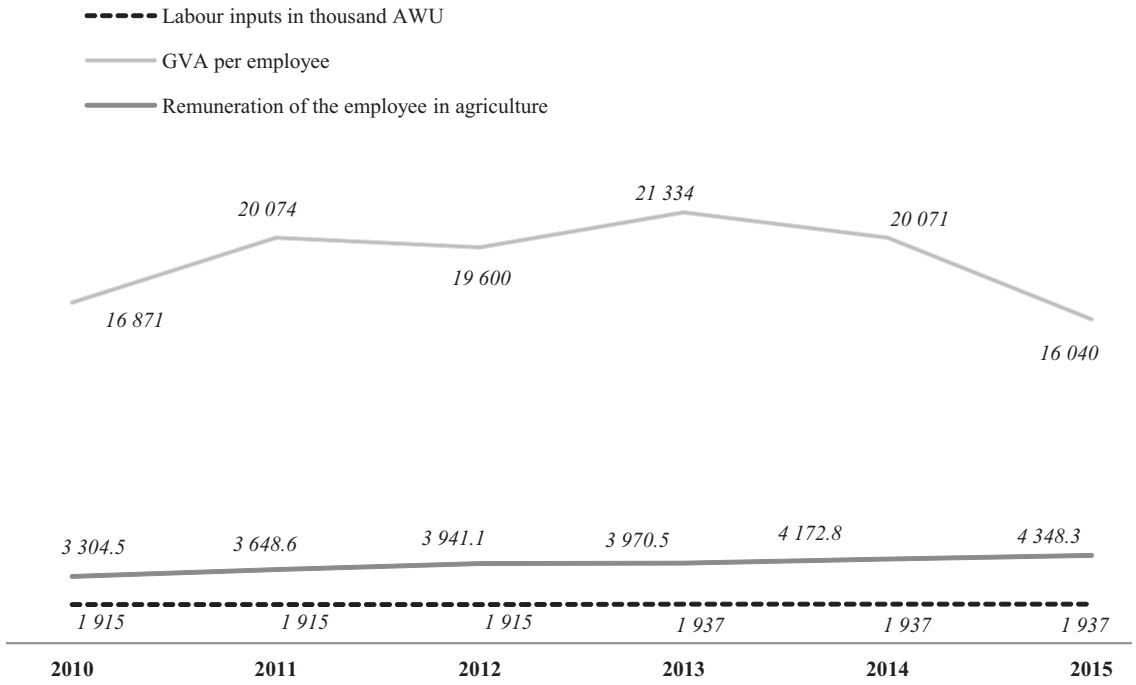


Fig. 7. Comparing labour inputs, gross value added (GVA) per employee and remunerations of the employed in agriculture in Poland, in the years 2010–2015

Source: Local Data Bank, CSO.

2015 – only PLN 16,040), the average monthly gross remuneration increased from PLN 3,304.5 in 2010 to PLN 4,348.3 in 2015.

SUMMARY

The article raises the issue of the remuneration/labour productivity ratio. A compa-rative analysis has been carried out as regards the ratio of agriculture to other economy sectors classified according to the PKD 2007 sections. From the Kuznets, Lewis, Schultz or Jorgenson models it results that agriculture can be characterised in this respect by the less favourable remuneration/productivity ratios. The economic development requires the movement of persons from the lower productivity sector and thus resulting lower remunerations to the higher productivity sectors.

In the light of the empirical data presented in the paper, we may conclude that in section A this ratio is seriously disturbed and distorted. The remuneration does not depend in this case on the labour productivity. In other words, the remuneration is overvalued in relation to the labour productivity. This ratio is not a positive testimony to the reasonableness of management in the sense of agricultural producers' equilibria. In order to improve this state, a reasonable activity would be to strive for a rapid improvement in the labour productivity in agriculture, which undoubtedly must involve the allocation of the labour factor to other sectors. This is confirmed by the continuous topicality of the quoted Lewis, Kuznets models.

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WYNAGRODZENIA I WYDAJNOŚĆ PRACY W ROLNICTWIE NA TLE POZOSTAŁYCH SEKTORÓW GOSPODARKI

STRESZCZENIE

Optymalna alokacja zasobów, w tym osób pracujących, w różnych sektorach skutkuje zrównoważonym rozwojem całej gospodarki (teoria optymalnej alokacji zasobów Kantonowicza i Koopmansa). Według badań Tinbergena nadmiar rąk do pracy w jednym z nich rodzi problemy społeczne i gospodarcze. O takiej sytuacji mówimy w przypadku polskiego rolnictwa. Celem rozważań teoretycznych oraz badań empirycznych niniejszej publikacji jest analiza relacji między wynagrodzeniem pracy a jego wydajnością w różnych sektorach gospodarki ze szczególnym zwróceniem uwagi na sektor rolny. Autorzy nawiązują również do teorii Lewsa i Schultza, którzy badali problemy rolnictwa krajów rozwijających się, a także do modelu wzrostu gospodarczego Solowa z funkcją produkcji Cobba-Douglasa i postępem technicznym w sensie Harroda. W świetle przedstawionych w pracy danych empirycznych można stwierdzić, że w sekcji A Polskiej Klasyfikacji Działalności ta relacja jest poważnie zaburzona i zniekształcona. Wynagrodzenie jest przewartościowane w stosunku do wydajności pracy. Taka relacja nie świadczy pozytywnie o racjonalności gospodarowania w sensie równowag producentów rolnych.

Słowa kluczowe: relacja wynagrodzenia do wydajności pracy, ujęcie sektorowe, rolnictwo

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ORIGINAL PAPER

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INNOVATIVENESS OF EUROPEAN REGIONAL SPACE: CONVERGENCE OR DIVERGENCE?

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ABSTRACT

The aim of the article is to assess the convergence of innovativeness in European regions at the NUTS-2 level. In the first part of the work, the concept of region's innovativeness is defined and methods of its measurement are presented. Next, the conditions and determinants of convergence/divergence of innovativeness in the regional area are discussed. The theoretical part of the paper suggests that the issue of convergence in the field of innovativeness is a significant, but relatively poorly explored, research area in economic literature. The empirical part of the article presents the results of the study of sigma and gamma convergence of innovativeness in a group of European regions. The research sample consists of 220 regions from 22 European Union countries, as well as Norway, Serbia and Switzerland. The obtained results indicate the occurrence of sigma divergence processes and the lack of gamma convergence processes.

Key words: region, regional development, innovation, innovativeness, convergence

INTRODUCTION

In the modern economy, innovation is a key factor of development. Research on agglomeration processes and new production areas, which started in the 1980s, shows that the innovation processes have a regional context. Understanding innovation processes requires research into an innovative environment, understood as a set of territorially-oriented factors. The ability of the territorial system to create broadly understood innovations is defined as the region's innovativeness.

Considering the existence of specific factors affecting the management of innovation processes specific to given local systems, it is an important cognitive issue to assess changes in the innovation capacity of regions, which allows to determine whether regions are similar to each other in the level of innovativeness or there are reverse trends. In the practical dimension, the analysis of convergence/divergence of innovation can be helpful in assessing the effectiveness of regional policy implementation. It is worth noting that in the case of the European Union, one of the basic objectives of regional policy is to increase the economic cohesion of regions, including their innovativeness.

The aim of the article is to assess the convergence of innovativeness of European regions at the NUTS-2 level in 2009–2017. In empirical part of the paper, data from the Regional Innovation Scoreboard were used. The analyzes were two-track and included the study of sigma convergence and the evaluation of gamma convergence.

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INNOVATIVENESS OF A REGION: SIGNIFICANCE AND MEASUREMENT

In the economic literature, there are different approaches to defining regional innovativeness. Most researchers identify the region's innovativeness with the category of innovative capacity of the regional space. In this approach, innovation is a derivative of pro-innovative tangible and intangible resources of the region and the ability to constant searching and using the results of innovation processes in economic practice [Niedzielski 2011]. Tacit and explicit knowledge plays a key role among the resources used for the development of innovation. Due to the complexity of knowledge and limited mobility of its tacit component, the trajectory of innovation processes should be considered with respect to the functioning of the regional innovation system, which is a complex research object, cultural and institutional infrastructure that dynamically accelerates the development of new products and processes in a given space [Markowski 2008]. In such a perspective, the region means a geographically defined and administratively supported structure including innovation networks and institutions that significantly affect the innovative results of business entities. Thus, the innovative potential of the region depends on the following factors [Li 2009]:

1. Expenditure on innovations made by companies, universities and research institutes located in the region.
2. Relationships between local participants of innovation processes.
3. Support for innovation processes by government/ /local government agencies and financial institutions.
4. Relationships between creators and users of knowledge used for the development and implementation of innovation.
5. Interactions between regional participants in innovation processes and innovators from outside the region.
6. Economic structure and innovative environment which are characteristic for the region.

Considering the above determinants of region's innovativeness, while measuring the innovative capacities at the regional level, one should take into account both input indicators in innovation processes and output indicators defining the results of the innovation activity. Depending on the purpose and scope of the study, the analysis of innovativeness may concern both the development of partial indicators and synthetic indicators. In both cases, the values of regions' innovation characteristics may be assessed in relation to reference values (e.g. average), or their changes over time. Among many approaches to assessing regional innovativeness, the methodology proposed by the European Commission as part of the Regional Innovation Scoreboard (RIS) project deserves attention. Together with the Community Innovation Survey (CIS) and the European Innovation Scoreboard (EIS), the Regional Innovation Scoreboard is the basic tool for measuring the innovation potential and its diversities in a regional perspective. In addition, it is a source of information that is necessary for the effective shaping of regional innovation policy.

CONVERGENCE OF INNOVATIVENESS AT REGIONAL LEVEL

In the 1980s, a research program on the processes of economic convergence of countries and regions was initiated. Intensive research on the phenomenon of convergence, anchored both in the neoclassical theory of growth – NTW, and in the theory of endogenous growth – TEC, led to the definition of many types of convergence and different ways of its verification [Islam 2003]. Despite the lack of consensus on the issue of defining convergence, it can be considered that it means the process of "approximating" and "similarizing" various initially dissimilar phenomena, which leads to the disappearance of differences between entities. In the literature, two classic approaches to convergence identification are most common, i.e. the sigma convergence test and the convergence beta test (unconditional and conditional) [Sala-i-Martin 1996]. The first one consists in analyzing the trends of changes in the level of dispersion of the analyzed economic indicator among regions or countries, which is reduced in the case of convergence (the so-called sigma convergence). Nevertheless, the second approach is based on a linear relationship between the average increase in the indicator in the analyzed period and its initial

level. In the case of negative dependence, regions or countries with a low initial level of the index achieve higher increases, enabling catching up of higher developed regions or countries. Verification of the beta convergence occurrence can be complemented by the study of changes in the ranking of the analyzed objects. This approach is called gamma convergence [Boyle and McCarthy 1997]. It is worth noting that the occurrence of beta convergence is a prerequisite for sigma convergence, however, it is not a sufficient condition [Sala-i-Martin 1996].

Most of theoretical as well as empirical works in the field of convergence in the regional area focus on income convergence. Taking into account the key role of innovation and technical progress in regional development [Strahl 2010, Crescenzi and Rodríguez-Pose 2011] and the importance of regional conditions in innovation processes [Feldman and Kogler 2010], the analysis of convergence of innovativeness at the regional level is an extremely important research problem. According to the assumptions of R&D activity models under the new theory of growth, the processes of knowledge production may be characterized by growing economies of scale, which in turn leads to the "outflow" of technology leaders and income divergence. Assuming Romer's argument [2005], learning processes and knowledge exchange between employees of the R&D sphere can be considered as prospective sources of increasing economies of scale in R&D activity, which allows to obtain the effects of synergy. It should be noted that in accordance with the proximity paradigm, interactive and collective learning is supported by proximity that is understood not only in the geographical dimension (distance in space, physical proximity), but also cognitive proximity (similarity and ability to "speak the same language") and organizational proximity (ability to undertake joint ventures) [Rallet and Torre 2005]. Moreover, the use of the current knowledge base for the production of new knowledge may lead to a situation where regions having a technological advantage will remain in a favorable position in the future. This assumption is consistent with the concept of path dependence, which indicates the existence of self-reinforcing mechanisms in the development of regions within the framework of determined structures and trajectories [Martin and Sunley 2006].

Nevertheless, the phenomenon of diffusion of knowledge makes it possible to eliminate the technological gap by imitating new solutions by technologically lagging regions. According to the technological gap theory, technologically lagging countries/regions have the potential to launch a catching-up process by implementing modern technological solutions, bypassing R&D, while incurring significantly lower implementation costs, compared to innovators [Gerschenkron 1962]. A prerequisite for making use of the so-called Veblen–Gerschenkron effect by regions with a low level of innovation is their ability to absorb innovations. As suggested by Döring and Schnellenbach [2006], new knowledge in a form of innovation is more easily absorbed by regions with a threshold level of knowledge resources and human capital. For example, Englmann and Walz [1995] developed a theoretical model, according to which lack of mobility of one of the production factors used in the production of capital goods with a high level of technological advancement prevents diffusion of knowledge and initiation of production of this good in a technologically lagging region. Considering the ability to create and imitate innovations, Niedzielski [2011] indicates the existence of three types of territorial systems, which include:

- regions capable of generating innovation;
- regions incapable of generating innovation but capable of absorbing and diffusing them;
- regions that have neither the ability to innovate nor imitate.

The effect of the occurrence of convergence processes of the level of innovativeness of objects in a specific regional space is the disappearance of the diversity between the specified territorial systems. In turn, confirmation of the so-called Gerschenkron's reverse hypothesis are divergence processes. As Kubielas [2009] notes, if it is true that at the sectoral level, national (regional) productivity and research capital are the conditions of effective absorption (knowledge, technology), the diffusion of technology on the international scale will lead to divergence rather than convergence.

Based on the considerations made, the following research question can be posed:

Are there any convergence processes in the field of innovativeness in the European regional space?

RESEARCH DATA AND METHODS

The source of data on the level of innovativeness of European regions is the RIS, which characterizes the innovation potential and innovation results of 220 regions from 22 European Union countries, as well as Norway, Serbia and Switzerland. The scope of the study covers the years 2009–2017.

To measure the region's innovation, a synthetic index representing the average of 18 standardized partial indicators was used. According to the eighth edition of the RIS, partial indices characterizing the level of innovation of European regions can be classified into four groups. The first one is referred to as framework conditions and includes indicators of population with higher education, participation in lifelong learning, international publications and the citations of scientific publications. The second group of indicators refers to investment in innovation and includes data on R&D expenditures in the private and public sector as well as other expenditures on innovation in small and medium-sized enterprises. Another set of indicators is characterized by innovation activity and concerns the tendency to introduce various types of innovations in small and medium-sized enterprises, undertaking cooperative activities, public-private partnerships, patent applications, design and trademarks applications. The last group are impact indicators that relate to employment and exports in the high/medium technologies sector and revenues from the sale of new products.

The σ convergence study was based on the standard deviation of the natural logarithms of the y_{it} innovation measure in the period t (t = 1, 2, ..., T) calculated according to the formula:

$$\sigma_t = \sqrt{\frac{\sum_{i=1}^{N}(\ln y_{it} - \ln \bar{y}_t)^2}{N}}$$

where: i – region's index (for i = 1, ..., N);
$\bar{y}_t$ – average level of the indicator in the considered group of regions in year t.

Decreasing trend of the standard deviation of the natural logarithms of the innovation measure confirms the occurrence of σ convergence.

In addition to the σ convergence measurement, the assessment of the occurrence of gamma convergence was made. For this reason, the Kendall rank concordance coefficient was used with the following form:

$$RC_t = \frac{\text{variance}\left[\sum_{t=0}^{T} AR(Y)_{it}\right]}{\text{variance}\left[(T+1)\cdot AR(Y)_{i0}\right]}$$

where: $AR(Y)_{it}$ – rank of the studied region and in terms of the examined feature in time t;
T – interval between the first and the last test period;
$T+1$ – number of years of study;
$AR(Y)_{i0}$ – rank of the studied region and in terms of the examined feature in the initial period t = 0.

The Kendall rank concordance coefficient assumes values in the interval <0; 1>. The hypotheses about the occurrence of (H_0) or the absence of (H_1) γ convergence can be expressed as follows:

$H_0: RC_t = 0$

$H_1: RC_t \neq 0$

In order to test the significance of the Kendall rank concordance coefficient, the following statistic test was used:

$$\chi^2 = T(N-1)RC_T$$

where: T – number of years of study;
N – number of regions.

RESULTS AND DISCUSSION

The results of the standard deviation calculations for the natural logarithms of the innovation measure are given in Table 1, and the graphical presentation together with the trend function is shown in Figure 1.

Based on the obtained results, it can be concluded that in 2009–2017 there was a slight upward trend in the standard deviation of the natural logarithms of the innovation indicator, which proves the occurrence of sigma divergence processes in the group of the analyzed regions. Confirmation of the observed regularity is a positive sign and significance of the coefficient on the time variable for the determined trend function.

When interpreting the results, it should be noted that they are in line with the results of the analyzes

Table 1. Values of standard deviations (*SD*) of natural logarithms of the innovation measure and their dynamics in the group of analyzed regions in 2009–2017

Year	*SD*	Chain index
2009	0.43	–
2011	0.42	0.99
2013	0.43	1.02
2015	0.47	1.08
2017	0.45	0.97

Source: Own elaboration.

carried out by Veugelers [2017], which investigated the processes of convergence of innovative capacities of EU countries in 2008–2015. As the author of the study points out, the level of heterogeneity of innovative capabilities of the examined objects in the analyzed period was high, yet, at the same time it did not show strong divergence. Importantly, high heterogeneity concerned all of the components of the innovative capacities of the EU countries, the diversification being the highest in the case of intensity of research and development works. It should be noted that different trends occurred in the years 1999–2006, as indicated by the study carried out by Strahl [2011]. In accordance with the results obtained in the European regional space, there have been favorable transformations in the area of innovation development, as in separate groups of countries, inter-regional disparities on the NUTS-2 level have been limited.

According to the adopted research procedure, the next stage of the analysis was to assess the occurrence of gamma convergence. As Boyle and McCarthy note [1996], based on sigma convergence research only, one cannot answer the question: do regions with low initial level of innovation catch up with more innovative regions? Analyzing data from 2009–2017, it can be concluded that most of the regions belonged to innovation followers or moderate innovators. The group of leaders was the most numerous in 2013, and in subsequent years its number began to decrease. As for modest innovators, they were the least numerous group among the studied regions (Table 2). In 2017, all regional leaders were in total in 11 countries. The most innovative region in the European Union was Stockholm, followed by Havedstaden and the south-east region in Great Britain. The majority of innovation leaders and strong innovators were located in the so-called Old Union. Moderate and modest innovators belonged mainly to the so-called New Union and countries of Southern Europe.

Table 3 contains the values of the Kendall concordance rank coefficients. The obtained results indicate the lack of gamma convergence in terms of the level of innovativeness in the European regional space. The calculated values of empirical statistics χ^2 exceed the critical values on the significance level $\alpha = 0.01$ adopted in the study.

Looking for the reasons for the absence of significant changes in the position (rank) of the regions

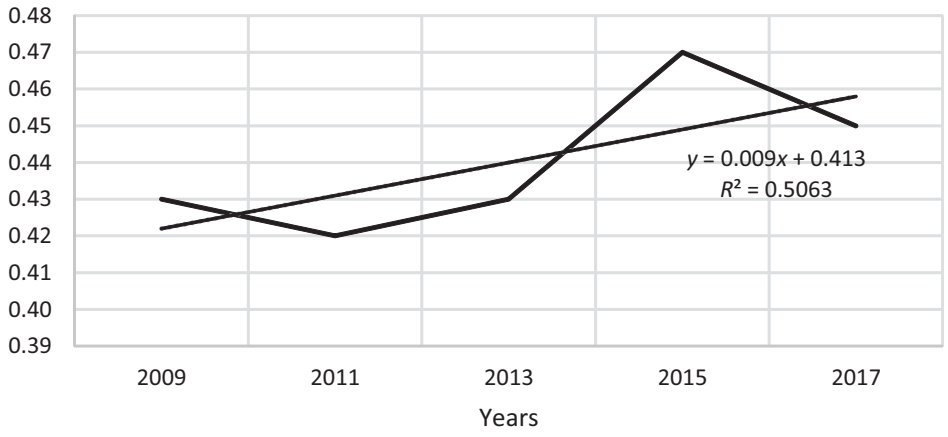

Fig. 1. Standard deviations (*SD*) of natural logarithms of the innovation index and trend function

Source: Own elaboration.

Table 2. Distribution of groups of regions with different levels of innovation

Year	Innovation leaders[a]	Innovation followers[b]	Moderate innovators[c]	Modest innovators[d]
2009	49	63	82	26
2011	48	65	80	27
2013	60	53	83	24
2015	54	58	76	32
2017	53	60	85	22

[a]Regions with a relative performance more than 20% above the EU average, [b]regions with a relative performance between 90 and 120% of the EU average, [c]regions with a relative performance between 50 and 90% of the EU average, [d]regions with a relative performance below 50% of the EU average.

Source: Own elaboration.

Table 3. Values of Kendall concordance rank coefficients

Year	Value
2009	1.000
2011	0.994
2013	0.991
2015	0.988
2017	0.984

Source: Own elaboration.

examined due to the level of their innovativeness, it is worth referring to the concept of the path dependance. According to this concept, the trajectory of innovation (new knowledge) development processes depends on the initial resource of knowledge and system-institution conditions. Thus, it can be expected that regions with a high initial level of innovativeness are developing more dynamically than regions lagging behind in terms of innovation capabilities. Confirmation of this thesis can be found in Markowska's research [2014], according to which, there is a tendency to strengthen European regions in the positions of both leaders and outsiders in the field of innovation. Her calculations show that there is a relationship between the average value of the innovation rate and the rate of change, which indicates the presence of self-reinforcing effects.

CONCLUSIONS

The theoretical considerations and their results of empirical research carried out in the work allow to draw the following conclusions:

1. Innovativeness of the region is most often identified with the concept of innovative capabilities, which should be based on the functioning of the regional innovation system. The measurement of the region's innovation capacity should include indicators of the input to innovative activity and indicators of the effects of innovative activity in a specific territorial space.
2. The results of research indicate that in 2009–2017 there was a slight upward trend in the standard deviation of the natural logarithms of the innovation indicator, which confirms the occurrence of sigma divergence processes in the group of analyzed European regions. In addition, there was no gamma convergence in the level of innovativeness in the European regional space. The observed regularities question the effectiveness of the current EU development strategy, i.e. *Europe 2020. A Strategy for Smart and Sustainable Development Fostering Social Inclusion*.
3. Further research work on the assessment of the diversification of the level of innovative capability of European regions should focus on club convergence and take into account the analysis of the dispersion of sub-indices characterizing the region's innovation.

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INNOWACYJNOŚĆ EUROPEJSKIEJ PRZESTRZENI REGIONALNEJ: KONWERGENCJA CZY DYWERGENCJA?

STRESZCZENIE

Celem artykułu jest ocena konwergencji innowacyjności regionów europejskich szczebla NUTS-2. W pierwszej części pracy zdefiniowano pojęcie innowacyjności regionu i przedstawiono sposoby jej pomiaru. Następnie omówiono uwarunkowania i przesłanki konwergencji/dywergencji innowacyjności w przestrzeni regionalnej. Rozważania teoretyczne sugerują, że problematyka konwergencji w zakresie innowacyjności jest istotnym, ale relatywnie słabo rozpoznanym obszarem badawczym w literaturze ekonomicznej. W części empirycznej opracowania przedstawiono wyniki badania konwergencji innowacyjności typu sigma i gamma w grupie regionów europejskich. Próba badawcza składa się z 220 regionów z 22 państw Unii Europejskiej, a także Norwegii, Serbii oraz Szwajcarii. Uzyskane wyniki wskazują na występowanie procesów dywergencji typu sigma oraz brak zachodzenia procesów gamma konwergencji.

Słowa kluczowe: region, rozwój regionalny, innowaje, innowacyjność, konwergencja

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ECONOMICS AND BIOLOGY – IN SEARCH OF COMMON GROUND

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ABSTRACT

The article touches on the issues of relations between economics and biology from economic point of view. Its aim is to try to integrate the chosen achievements of both sciences. The author, inspired by statement of Alfred Marshall, supports his position that economics is a branch of biology. Reflections on this topic enhance interdisciplinarity of such fields of study and improve our understanding of the reality. By way of analyzing literature and by using deductive and reductive reasoning relations between economics and biology are pointed out as well as implications. Also, the reasons and indications of the integration are shown as well as existing problems in such approaches.

Key words: methodology, economic theory, biological theory

INTRODUCTION

Alfred Marshall [1920] once said that "economics has no near kinship with any physical science. It is a branch of biology broadly interpreted". In spite of his words a trend in economics to integrate achievements of various sciences can be observed only recently. Interdisciplinarity makes everything more complex without a doubt but there is no turning back while it is a means of understanding reality better. Especially, a closer relation of economics and biology may advance efforts for the economic theory to accept a more realistic nature of economic agents.

Although biological theories are not to be compared with physical theories in terms of better predictability of various phenomena, the divergence between them is explained by specific conditions and nonlinear systems of observed adaptation processes. At the same time biology resembles economics in terms of creating efficient models explaining behaviour of biological systems [Krakauer et al. 2011]. Both disciplines aim at discovering laws which govern the behaviour of living creatures. Both of them feature also evolutionary logic in reasoning in the sense that agents are subject to evolutionary pressure to maximize their utility (in case of biology it is further genes replication). Micheal Ghiselin [1978] emphasizes the benefits possible to achieve when generalisations from a certain level could be used between these sciences. He notices that a field of knowledge which covers economic processes (e.g. competition) should be acknowledged irrespective of whether it is associated with humans or not. This is why he proposes to acknowledge the collection of knowledge called natural economy (biology) which is harmonised with political economy (economics), making together general economy. He is conscious though of the differences between these collections.

This article represents the point of view of an economist. The author's position is that it is essential to come back to the roots and place emphasis on science interdisciplinarity. What makes it even more urgent is that it refers to economic theory which analyses and predicts behaviour of various agents. Taking

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advantage of achievements of biology in economic theory contributes to better understanding of reality and more precise analysis of economic agents' behaviour. This paper is an attempt to broaden the existing paradigm of (neo)classical economics. The author tries to achieve it by way of deductive and reductive reasoning through the analysis of economic literature and biological theory literature.

ECONOMICS AND BIOLOGY – THE HISTORY OF EARLY RELATIONS

The very first common relations are mentioned already in ancient times when there was no division in science.

The father of economics, Adam Smith, was using the phrase oeconomy of nature especially in his *The Theory of Moral Sentiments* [1759]. What he meant was praising positive effects which were unintended but derived from an intelligent agent. This phrase was, however, taken from Carl Linnaeus in 1751. Smith was his student along with Charles Darwin. Apart from that, he based division of labour that is the foundation of economic activity on biological instinct of humans which stimulates them to exchange and trade. In the 18th century also Bernard de Mandeville [1714] was referring to biology in *The Fable of the Bees* in which he was comparing society to a hive as well as François Quesnay, fascinated by discovery of blood circulation and homeostasis of human body.

Thomas Malthus [1798] with his book *An Essay on the Principle of Population* was an important source of inspiration for Charles Darwin and Alfred Russel Wallace. Malthus' idea of struggle for existence was adapted in Darwin's theory of natural selection. The creator of the phrase the dismal science was convinced that population multiplies geometrically and food arithmetically so everybody will face natural selection in fight for survival. Gertrude Himmelfarb [1959] finds however that this idea could have been utilized by taking biological analogies attributed to Benjamin Franklin.

John Gowdy's view [1997] is that it is Herber Spencer who is the most prominent promoter of biological analogies in social science. He developed both the theory of evolution and evolutionary approach in them. It is him, not Darwin, who used the term evolution. He influenced thoughts of Thorstein Veblen and Alfred Marshall but not only theirs. He is also indirectly present in works of the founders of the Austrian School. According to Spencer, evolution is closely related to progress which is not accidental at all. It is just an inherent part of nature [Spencer 1851]. The creator of the collocation "the survival of the fittest" is indirectly responsible for the similar rule in economics which comes down to profit maximizing by entrepreneurs. It is however a notably theoretical approach in both fields of study. Herbert Simon showed in economics that the indication of rationality is making optimal choices which are not the best ones but which are good enough only. Spencer's thought about social progression through competition is still present in economic theory though.

Thorstein Veblen is thought to be one of the fathers of evolutionary economics, although he wrote an article in which he negated economics as an evolutionary science [Veblen 1898]. In his view, economic systems are subject to permanent and complete evolution but also institutions within them are subject to selection [Veblen 1919].

The aforementioned Marshall was often refererring to biology but he was not making use of it often at the same time [Thomas 1991]. He was conscious that biological concepts are very complex [Marshall 1920] and perhaps this is why he was somewhat humble by saying that a Mecca for economists is in economic biology rather than in dynamics [Marshall 1961]. He was very particular about economics taking care of human beings in a state of flux. Statistical hypotheses play only an ancillary role to what is the main point of interest of economics, that is living force and movement [Marshall 1920]. After his death interest in interdisciplinary topics including biology in social sciences dwindled [Degler 1991].

This issue witnessed a strong revival in the 1950s with the groundbreaking work of Armen Alchian [1950], although it was also Milton Friedman [1953] who paid attention to biology. A period of a certain fashion in using evolutionary analogies was very short thanks to criticism of Edith Penrose [1952]. Another wave of interest was accompanied by inception of sociobiology [Becker 1976, Hirschleifer 1977] and was

advanced since the publication of the book by Richard Nelson and Sidney Winter [1982].

A discussion in the literature about relations between economics and biology could be difficult to follow due to too many threads. A methodological indistinctness of axiological nature appeared on the horizon and it could be helped by searching for the common denominator. It seems justifiable to evaluate what biological concepts may be used in economics to help solve specific economic problems.

REASONS AND INDICATIONS FOR INTEGRATION

The author of this paper thinks there are issues which may link achievements of both sciences. They are: preferences; metaphors and analogies; evolution and evolutionism; cooperation; new science disciplines within economics.

Preferences

The problem of preferences is strictly associated with the utility theory and the assumption about rationality of *homo economicus* which was already challenged [Simon 1957]. Questions may arise here regarding the purpose of the utility function and its adaptation as well as the nature of preferences. The economists have not been carrying out research into origin and content of preferences. They have been treated as given (*De gustibus non est disputandum*).

The achievements of biology may considerably enrich the theory of economics. Biological factors are the basis of our preferences, also of these which are associated with time and risk taking. They may also supplement the economic concept of rationality. The biologists make use of this concept as well but they emphasize issues of tendency, instincts, the selfish gene, conditioning or habituation more. At the very basic level, the creation of needs may be associated with homeostasis, which relies on behaving in such a way so that the individuals try to maintain the key variables in certain limits allowing for survival and optimal functioning. It is a very simplified approach however.

The economists do not take altruism, especially towards relatives, into consideration. It is understood by them as an action beneficial for others but as a relative cost for the individual who encourages it. This topic was covered by Theodore Bergstrom [1995, 1996] who wrote about economic interactions within families with reference to biology. The newest experimental results regarding altruism and its variations were discovered by Martin Zwick and Jeffrey Fletcher [2014] although its genetical conditioning had been noticed earlier.

Jack Hirschleifer [1982] agrees that tastes are genetically controlled because they have to be permanent in the face of possible free riding activity. Our selfless or irrational aims allow us to compete better in groups in the course of evolution. Robert Frank's [1987] opinion is similar and he treats selfless preferences as genetically programmed. He makes use of Darwinian selection mechanism in his analysis and tries to explain difficult for the (neo)classical theory of economics phenomena by linking them with the utility function. Nikolaus Robalino and Arthur Robson [2013] add also that economic preferences have been conditioned by both genetic and cultural evolution.

It is worth to complement the existence of preferences to a topic of neurobiology which is associated with the brain structure. The limbic system responsible for the reward system is evolutionarily older than the frontal lobes responsible for decision taking. Equally interesting is the idea of the selfish gene [Dawkins 1976] which explains selfishness of all the living creatures. From a deterministic and teleological point of view life evolution is driven by genes (replicators) and its aim is reproductive success. In order to protect their replications genes are to create certain behaviour mechanisms which affect preferences of the living creatures.

Metaphors and analogies

Biological metaphors and analogies are used in economics but linking them purely and simply with evolution would mean oversimplification of this matter. Similarly, the approach of economists to analogous thinking may be oversimplified as well. Bruce Hannon [1997] emphasizes its meaning noting that analogies refer to creative researchers.

Elias Khalil [1998] gives five examples of metaphors and their roles in economic theory. The first metaphor of the selfish gene shows that non-human

agents allocate scarce resources and do not act selfishly according to rational optimization. It is consistent with the neoclassical theory of choice-making. The second metaphor of ecological influx explains the prowess of various (human and non-human) agents to produce surplus and it also differs from rational optimization. The third one of genotype shows how technology or institution schemes inform the development and behaviour of any organisation. The fourth metaphor of the organism explains the order of firms and states. Finally, the ecosystem metaphor explicates the order of markets which is different from the order of organisations.

Utilization of biologic metaphors by economists should be characterized by great caution. They can not be applied everywhere but they may give new insight and better understanding of phenomena. The existing metaphors and analogies can be divided into three categories [Gowdy 1997]: the ones to justify capitalism and especially markets; the ones enriching the neoclassical model with e.g. diffusion of technological innovations and decision making under uncertainty; the ones using the achievements of evolutionary biology in order to analyse nonoptimal economic results.

Evolution and evolutionism

According to Richard Nelson [1995], the state of both sciences, their tools and level of development, allow today to research and utilize the theory of evolution in the theory of economics making the analysis of societies better. It is especially useful in institutional economics in the context of Douglass North's book [1990] describing the existence of cumbersome institutions in economic history. The utilitarian nature of this topic can be observed for example in cases of such institutions as money and a firm. A novel approach to Darwin's concepts was developed by his predecessors Thorstein Veblen and Joseph Schumpeter who took a different approach at the same time.

From a methodological point of view the proponents of the evolutionary attitude reject theorising in neoclassical economics paradigm in favour of methodology of biology. George Modelski and Kazimierz Poznanski [1996] notice that such change from mechanics to biology means transition from statics (this is the nature of the neoclassical theory) to dynamics. Then the analysis moves from time free reality towards reality in which time matters. This, in turn, involves irreversibility and opens the way for history. Biology is not focused on determining but on probability and chance as well as on diversity and change. It may offer economics supplementing its theory with concepts of accidentality, irreversible change and uncertainty.

Change in economics takes place by innovations. At the micro level individuals use more and more effective technologies or they are in retreat. The cumulative effect of such changes makes new quality. In comparison to biology, the way of change is identical in other fields (market forces). Evolution is progressive and it favours agents who maximize their profits. This is the process of optimization in economics and it was mentioned also by Milton Friedman [1953] when he wrote about natural selection.

Cooperation

Competition is associated with cooperation. It is present in biology between various species but also within them. Individuals or groups of individuals (firms, industrial branches, states) who are in a certain habitat (market) compete with each other for the same resources. Economists analyse cooperation of individuals and competition between them using achievements of behavioural and experimental economics. The acclaimed game theory should be mentioned here. Peter Corning [1997] finds that this theory can support both realistic and holistic view of economic evolution. He indicates the disadvantages of game theory (the prisoner's dillema) which is to favour specific behaviour. Players can not do certain things and this implies lack of realism with people and with all the biological world because free riders and cheating can not be punished and communication is not allowed.

The explanation of rules and the mechanics of human cooperation is a big challenge to social and natural science. One of such mechanics is a strategy of strong reciprocity which is based on two pillars. The first one is based on psychological propensity to cooperate with reference to social preferences (especially altruism). The second one implies that integrity and moral feelings are biologically costly and it poses a paradox for natural selection which favours non-altruists. This

is why evolutionary mechanisms are so fundamental here because they can sustain behaviour which is not beneficial to an individual [Rosas 2011].

New science disciplines within economics

Economics now looks like a great tree with many branches but it is branches what make a tree and not *vice versa*. The process of new branches formation, that is science disciplines, has been taking place for some time now and it takes us even closer to a more realistic picture of human nature. They are supposed to be complementary to each other. Emery Castle [1999] noticed that biological concepts allow to understand institutional change better. It should occur in the theory of economics and in natural resources management.

Evolutionary economics is one of such branches. It underlines human capabilities to accumulate competitive knowledge resources and to influence institutional surroundings which affect social actions [Martens B. 2011]. It also brings out collective and environmental factors that influence individuals and tries to raise the problem of genetic conditioning which influences economic behaviour.

Behavioural economics came into existence due to discovery of a departure from homo economicus rationality. Its representatives study how cognitive limitations of humans, their attitude towards risk, social factors, influence the process of decision making. They utilize the achievements of biology including those regarding the structure of brain and its functioning. Human mental skills which have developed through natural selection are somewhat limited and this fact is taken into consideration in behavioural economics. Heuristics, cognitive limitations in information processing and decision making are among them. Ulrich Witt [2011] says that, with very few exceptions such as Daniel Kahneman and George Loewenstein, the omitted aspects of this branch are motivational dimensions of behaviour that is where comes motivation from and how it changes over time.

Ecological economics studies the issues at the intersection of economic systems and biophysical world. From a biological point of view which is neglected by economists present economic activity has an adverse effect on the environment and it is impossible to sustain it in the long run. Some say that economics and ecology are two separate systems that are not to be compared with each other [Vedeld 1994] but there are also opinions that ecological issues may broaden the theory of economics providing a new perspective on economy and nature [Binswanger 1993, Ring 1997]. Certain theoretical achievements regarding problems of the natural environment in the face of limited resources may improve interaction and influence of humans on the flora and fauna [McCoy 2003].

Bioeconomics which came into being in the 1970s is to integrate economics and biology in order to enrich both disciplines by way of expanding their theoretical and empirical basis. Economists may take advantage of economic policy implications for the benefit of the people [Landa and Ghiselin 1999]. Issues covered by this discipline include information processing by the brain, rationality and preferences of humans.

ISSUES CONCERNING THE INTEGRITY APPROACH

In author's opinion, few issues arose while integrating economics with biology: the problem of the agent; reductionism; building models; taxonomy.

The problem of the agent

With intergration of economics and biology a question arises about the subject of research being treated in a similar way. Micro- and macroeconomics study individuals or aggregates such as consumers, households, firms, organisations, states. Nevertheless, biologists are interested in other subjects such as bacteria, cells, organisms, herds, colonies.

Comparing firms and organisms with each other creates three kinds of problems. The first one is associated with purposefulness in contrast to optimisation. The second one concerns the status of attributes or behaviour. The third one regards organisations' coherence. This division is suggested by Elias Khalil [1997] and it can be also considered from the point of view of naturalists and their opponents.

Reductionism

A reductionist method as a paradigm of scientific methodology means treating phenomena and complex processes in a simplyfying way or it means explaining

complex phenomena through description or explanation of their fragments. Reductionism is very common in the theory of economics and in other science and it can be especially helpful in searching for common ground for economics and biology. Economists tried to develop macroeconomics in the 1970s on a solid microeconomic basis but they started to turn to the game theory and psychology in the face of difficulties they came across. It turned out that mathematical analysis of behaviour did not come up to expectations. It was Alan Kirman [1992] among others who thought that analysis of individuals should be abandoned.

Complete reductionism is wrong because higher complex systems are not just a sum of lower systems and they are also characterised by new qualities impossible to explain by looking at their fragments only. Science can not do without it to a certain degree however. Each measurement, experiment and theory are its manifestation. A challenge here is to find the golden mean. Tony Lawson [1985] finds that no particular level of analysis should be favoured because all fragments and systems are inextricably bound up with each other.

Building models

A notion that people are not the only species in the dynamic ecosystem of this planet is a new perspective for economists. This fact should be incorporated in their models and it is all the more reason that people's life is dependant on other species.

Modelling simplifies reality and certain models are applied in theories and may be used for convenience of analysis and not because they are close to reality. This problem relates to both economics and biology and it may even be highlighted in an attempt to integrate them. Till Grüne-Yanoff [2011] thinks that economists have been using biological concepts uncritically in their models (e.g. selection and replication) but there are reasonable possibilities to interpret them in order to explain social situations. Collin Rice and Joshua Smart [2011] draw conclusions on importing models from various disciplines. Moreover, they identify and analyse specific strategies as well as utilise premises and theories from other disciplines. Achievements of other sciences may be useful. They may allow for right conclusions if used reflectively and carefully [Martens J. 2011].

Taxonomy

It is the science derived from biological sciences employed originally to name, describe and classify organisms. It is now used also in other disciplines, e.g. in economics to make stock portfolio.

The aforementioned Alfred Marshall [1920] may be ac-kowledged as one of the very first economic taxonomists but his opinions were very general. Michael Ghiselin [1978] with his proposal to divide economics into political, natural and general made a step forward with his precision treating biology as an economic discipline.

CONCLUSIONS

There is a growing tendency in science to cross particular disciplines. It is not the easiest process in the case of economics and biology but a slow incorporation of their achievements allows for more realism in theory. Empirical economic analysis is usually in accordance with the paradigm of neoclassical theory but some studies of e.g. indifference curves and isoquants do not yield results in conformity with reality. In the face of the above the Marshall's words of economics as a branch of biology seem understandable. Kenneth Arrow [1995] was not the only one who figured that the idea of what comprises the economic theory would have to change and that the biological paradigm was more appropriate for economics than equilibrium models analogous to mechanics.

It is assumed in the analysis of the decision making process that humans are rational beings. It turns out that some tools and theories used for other species may also explain some behaviour in economics. Economics and biology can be complementary to each other because they have more in common than they have differences. We can not be too optimistic, however, in joining them together. Great care subject to discussion is advisable here.

The author of this paper had to solve the perennial dilemma and decided to choose a relatively broad range of issues. The opportunity cost in this case is the depth of analysis. It is also obvious that some issues are omitted because this paper can not exhaust the topic. There are still no exhaustive answers to many questions. These may be got after further research.

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EKONOMIA I BIOLOGIA – W POSZUKIWANIU WSPÓLNEGO MIANOWNIKA

STRESZCZENIE

Artykuł porusza problematykę związków ekonomii i biologii z punktu widzenia ekonomisty. Jego celem jest próba integracji wybranego dorobku obu nauk. Inspirując się słowami Alfreda Marshalla, autor wspiera jego twierdzenie, że ekonomia jest dziedziną biologii. Rozważania tej tematyki wpływają na rozwój interdyscyplinarności dziedzin naukowych i przyczyniają się do lepszego zrozumienia rzeczywistości. Przy wykorzystaniu analizy źródeł oraz rozumowania dedukcyjnego i redukcyjnego wykazano związki między ekonomią i biologią oraz przedstawiono implikacje z tego wynikające. Ponadto scharakteryzowano przyczyny i przejawy integracji oraz istniejące problemy w integracji podejść.

Słowa kluczowe: metodologia, teoria ekonomii, teoria biologii

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ORIGINAL PAPER

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ANALYSIS OF CONTRACT FARMING EFFECTS ON EFFICIENCY AND PRODUCTIVITY OF SMALL-SCALE SUNFLOWER FARMERS IN TANZANIA – A PROPENSITY SCORE METHOD APPROACH

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ABSTRACT

This paper attempts to measure and compare technical efficiency (TE) levels across small scale contract and non-contract sunflowers farmers in Kongwa district, in the central agricultural zone of Tanzania. Sunflower is not the ideal contract crop; it lacks conventional characteristics of a contract crop such as high perishability, product homogeneity, high hygiene, and safety requirement at the end market and product being hard to grow. We apply propensity score method of Rosenbaum and Rubin to mitigate bias arising from observed characteristics among farmers in both groups. Participating in contract farming lead to an average increase in technical efficiency of a farmer by 4.5–7.4%, and this impact is significant at 5% level. Similarly contract participation increases land productivity of a famer by an average, in the range of 20.8–25.1 kg·ac^{-1}. This impact is significant at 5% and the expected output(total factor productivity) per acre of an average contract farm produces 24% more sunflower per acre than non-contract farm. Participation in contract farming has a significantly positive effect on the use of high-quality seeds, which can explain a part of the higher (land) productivity of contract farmers compared to non-contract farmers. By improving service provision from contract firms to farmers (e.g. improved seed provision), there is still a room to improve efficiency, thereby increasing productivity and total output.

Key words: technical efficiency, propensity score method, contract farming, sunflower production, Tanzania

INTRODUCTION

This paper investigates the effects of contract farming on technical efficiency and productivity of small-scale sunflower farmers in Kongwa district. It is well known that agriculture production in developing countries generally has a very low productivity compared to non-agricultural production in the same country or to agricultural production in developed countries. The low agricultural productivity often has many diverse reasons, e.g. limited knowledge about productivity--enhancing production methods and highly productive technologies, limited availability of or access to highly productive varieties and productivity-enhancing inputs, limited availability of liquidity and limited access to credit, and/or reluctance to invest in productivity--enhancing measures due to production risk, output price variability, and unreliable market access combined with (rational) risk aversion of poor farmers.

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Contract farming is seen as a tool to increase agricultural productivity in developing countries, as it could solve some of the abovementioned problems, e.g. by improving access to knowledge, better technologies (e.g. highly productive seed varieties), productivity-enhancing inputs, and credit and by providing more predictable output prices and guaranteed market access. Vertical integration in production and marketing has often been a case for perishable products, products with technical requirements and economic importance [Bijman 2008]. Over time however, this practice is increasingly being extended to several other mundane crops [Guo and Fraser 2015].

There exist some studies in the literature [Bravo-Ureta and Pinheiro 1997, Begum et al. 2012] that compare the productivity and efficiency of contract farmers and non-contract farmers in developing countries but most of these studies on contracts involving crops considered to be ideal contract crop, i.e. crops with specific characteristics such as high perishability, product homogeneity, high hygiene and safety requirement at the end market and product being hard to grow. There are only very few studies that analyse the causal effects of contract farming in commercial production involving low value crops like sunflower as it is in this paper.

THE OBJECTIVE OF THE STUDY

The main objective of this study is to accurately measure the impact of contract farming on technical efficiency and productivity of sunflower farmers in Kongwa. The specific objectives of this study are as follows:

Technical efficiency (TE) as presented in literature [Farrell 1957, Coelli et al. 2005], is about the maximization of output for a given set of inputs. It compares the actual input combinations used to produce a unit of the output with an efficient, unobservable, but estimatable isoquant from sample observations. Technical efficiency is measured by comparing the observed output in production function against the feasible (frontier) output under the assumption of fixed input; alternatively, it is measured as the ratio between the observed input and the minimum input under the assumption of fixed output in cost functions. Technical efficiency indicates how far the firm can increase its output without employing additional resource but rather improving the level of its efficiency. It helps understanding of how farmers are operating and what factors are affecting their production. Thus, through non-price factors, contract farming may bring about a decrease in cost of production or increase in yield per unit, which in turn may enhance production efficiency, productivity and incomes of farmers involved.

MATERIAL AND METHODS

This paper uses data from a cross sectional farm survey conducted in Kongwa district of Dodoma in central agricultural zone of Tanzania. The data were collected between September and October 2012 under POLICOFA I project, the project sponsored by DANIDA Fellowship Centre through Tanzania-Denmark Pilot Research Programme. The sample included 400 small-scale sunflower farmers stratified on participation: 205 were contract farmers while 195 were non-contract farmers. Two stage sample design was used to collect the data. First, eight villages from four wards were selected purposefully on account of contract farming presence. Then, the contract farmers were randomly selected from list of contracted farmers, and non-contract farmers were also randomly selected from village households list. The data collection was carried out by face to face interview with the household head using structured questionnaire.

This study uses stochastic models as proposed by Kumbhakar et al. [1991] and extended by Battese and Coelli [1995]. The use of stochastic model is more appealing because the model allows accounting for the statistical noise and inefficiency. It provides estimators for the parameters of model linear in parameters with a disturbance term that is assumed to be a mixture of two components, which have a strictly non-negative and symmetric distribution respectively [Kumbhakar and Lovell 2000]. It generates good results for a production set-up in which there is a single output and multiple inputs.

The frontier model with Cobb–Douglas formulation fitted in this paper is of the following type:

$$\log yield = \beta_0 + \beta_1 \log (farmsize) + \beta_2 \log (labour) + + \beta_3 \log (implement\ expenditure) + \beta_4 \log (seed) \mid + + \alpha_1 + \varepsilon \quad (1)$$

Technical efficiency level is predicted after estimation of the frontier production model.

In order to effectively investigate the effects of contract farming on technical efficiency of sunflower production of small farmers involved in Kongwa district, this paper adopts Roy–Rubin model [Roy 1951, Rubin 1974] as cited in Caliendo and Kopeinig [2008]. According to this model, conclusion about the impact of a given treatment on outcome of interest for the individual beneficiary involves estimation of how the individual would have performed had he not received the treatment (the missing counterfactual). The frame of analysis consists of treatment which in this study refers to participation into contract farming; the treated are individual household participating in contract farming, while the effect or outcome of interest is the change; that is, increase or decrease of technical efficiency and productivity of farmers participating in contract farming.

Propensity score matching method and the treatment effects on the treated (ATT)

Let C, be a dummy variable, such that $C = 1$, if a household participates in contract farming and $C = 0$, if otherwise. And let Y_{1i} and Y_{0i} denote potential outcome (technical efficiency or productivity) of contract and non-contract farming households respectively.

The observed outcome of individual household is: $Y = C\ Y_{1i} + (C = 1)\ Y_{0i}$, rather than $Y_{1i} - Y_{0i}$ for the same individual household. Thus, the primary treatment effect of interest to be estimated is the average treatment effect on the treated that can be written as:

$$\tau = E\ (y_{1i} - y_{0i} |\ C = 1) = \mathrm{E}\ (y_{1i} |\ C = 1) - E\ (y_{1i} |\ C = 1) \quad (2)$$

The propensity score $p(X)$ is defined by Rosenbaum and Rubin [1983] as the probability of receiving a treatment or not conditional on given pre-treatment characteristics. The propensity score $p(X) \equiv \Pr(C = 1|X) = E(C|X)$. Propensity score matching is a way to correct the estimation of treatment effects controlling for the existence of the confounding factors, based on the idea that the bias is reduced when the comparison of outcome is performed using treated and control groups who are as similar as possible [Rosenbaum and Rubin 1983]. The propensity score replaces the collection of X characteristics in the observational study with just one number based on these characteristics. It reduces the dimensionality problem of matching treated and control units on the basis of the multidimensional vector of X. Then, X in equation (2) can be substituted for $p(X)$ so that:

$$\tau = E[\{y_{1i} - y_{0i} |\ C = 1\} = \mathrm{E}\ [\mathrm{E}\{\ y_{1i} - y_{0i} |\ C = 1, p(X)\}] = = E[E\{\ y_{1i} |\ C = 1, p(X)\} - E\ \{\ y_{0i} |\ C = 0, \mathrm{p}(X)\} |\ C = 1] \quad (3)$$

According to Rosenbaum and Rubin [1983], however, certain assumptions need to hold. First is the balancing assumption (balancing hypothesis). It is assumed that there should be balancing of pre-treatment variables given the propensity score. That is: $X \perp C|p(X)$, implying that observations (treated and control) with the same propensity score must have the same distribution of characteristics independently of treatment status. Secondly, the assignment to treatment is unconfounded given the propensity score. That is, conditional on X; C and (Y_{1i}, Y_{0i}) are independent; by notation $Y_{1i}, Y_{0i} \perp C|p(X)$.

Common support condition

For quality matching of propensity score, proposition is further made that $0 < p(X) < 1$ to ensure common support, that is, there are treated and non-treated for each characteristic in X for which comparison is made. If the common support is not satisfied in the treatment group, e.g. if $p(X) = 1$, such households are dropped and ATT is estimated only for those households where: $p(X) < 1$. This restriction means that the test of balancing property is performed only on the observations whose propensity score belongs to the intersection of the support of the propensity score of treated and controls [Backer and Ichino 2002].

Matching estimators of the ATT based on the propensity score using different matching algorithms

This paper uses the most widely used methods, the nearest neighbour matching (NNM) where each treatment unit is matched to the comparison control unit with closest propensity score [Backer and Ichino 2002].

However, in order to check the robustness of the result of NNM, the effect of contract on technical efficiency and income using NNM method is compared to estimates using Kernel based matching method (KBM) and the ordinary least squares method (OLS).

The nearest neighbour matching (NNM)

In this method each treatment unit is matched to the comparison control unit with closest propensity score. Once each treated unit is matched with a control unit, the difference between the outcome of the treated units and the outcome of the matched control units is calculated [Backer and Ichino 2002]. The ATT is then generated by averaging these differences and is given as:

$$ATT = \frac{1}{N_1}\sum_{i=1}^{N_1}(Y_{1i} - \sum_{j=1}^{N_0} w_{ij} Y_{0j}) \quad (4)$$

where: N_1 – number of participants;
N_0 – number of non-participants;
i – index of participants;
j – index of non-participants;
w_{ij} – weights: where $w_{ij} \in [0, 1]$ and $\sum_{j=1}^{N_0} wij = 1$;
Y_{1i}, Y_{0i} – outcome of interest on both participants and non-participants.

With NNM all treated units find a match [Backer and Ichino 2002].

RESULTS AND DISCUSSION

Table 1 compares selected variables between contract and non-contract farmers. Share of 79.3% of all households surveyed were headed by males while only 20.7% were female headed. The average age for non--contract farmers at 41.4 years is significantly lower than contract farmers at 43.7 years.

There are no significant differences in level of education between the two groups. In overall, the majority farmers (74%) have primary level education, while 23.3% have virtually no formal education. Only 2.3 and 0.5% have secondary and diploma education levels respectively. Generally the level of education among sunflower farmers is basically a primary education considered to be a low education but which can allow the needed flexibility in attitudes towards adopting new farming practices.

Comparatively as indicated in the Table 1. Contract farmers are on average not significantly different from non-contract farmers in terms of farm size and share of land allocated for sunflower production, which suggests that there is no pronounced concentration in sunflower production even among contract farmers. Yet contract farmers have significantly higher mean output and mean yield per acre. While contract farmers have mean output of 4,223 kg and mean yield per acre of 121.6 kg, mean output, and mean yield per acre among non-contract farmers are only 325.1 and 103.9 kg respectively, indicating that being in contract gives some advantages that enable farmers to produce more output per acre and more total output. Contract farmers have better access to high yielding seed variety and have higher rate of use of these improved seed at 46.3% compared to non-contract farmers' seed use at 8.7%. The mean technical efficiency for contract farmers is 68% while that of non-contract farmers is 64%, and the difference is statistically significant at 5% level of significance.

Using simple t-test results assessment was also made to see if there had been indication of self-selection bias observable among contract farmers, the idea was to speculate whether the observable gains among contract farmers are results of participating in contracts or are there just because these farmers had better conditions even before joining contracts (self-selection bias), and hence would emerge far better off than their fellow non-contract farmers even if they had not engaged themselves in contracts. This is just a preliminary investigation as the paper eventually carries out estimations of the actual effect of contracts on variable of interests namely; technical efficiency and productivity using a method of propensity score matching.

Thus, ownership of assets which are not likely to change due to contracts (pre-determined assets) is considered. Table 1 shows t-test results of the mean differences between contract and non-contract farmers. Results show that contract farming households are not significantly different from non-contract farming household in terms of household land endowment, non-agriculture assets possessed and amount of labour

Table 1. Summary statistics of socio-economic characteristics of farmers

Variables		T – sample means (N = 400)	Non-contract farmers (means) (N = 195)	Contract farmers (means) (N = 205)	t-Test of means difference
Household	age	42.55	41.36	43.67	–1.81**
	H/h size	5.38	5.44	5.33	0.50
	adults – ratio	0.49	0.48	0.506	–0.90
	dependence – ratio	0.49	0.51	0.47	1.71**
Farm	farm size	3.60	3.40	3.70	–0.29
	farm – ratio	0.48	0.47	0.49	–1.07
	land endowment	8.42	8.28	8.55	–0.36
	family labour	23.07	22.80	23.32	–0.30
	expenditure	50 337.6	48 143.75	52 424.53	–0.71
	seed (kg)	11.52	11.77	11.29	0.41
	output (kg)	374.9	325.13	422.25	–2.4**
	yield (kg·ac^{-1})	112.9	103.87	121.55	–2.17**
	tech. eff. level	0.65	0.64	0.68	–2.57**
Credit access	accesable credit (%)	4	4.1	3.9	
Extension	external service (%)	27	13.85	39.51	
Education	no education	23.25	25.13	21.46	
	primary education	74.0	73.33	74.63	
	secondary education	2.25	1.03	3.41	
	diploma	0.5	0.50	0.49	
Gender	male	79.25	75.9	82.40	
	female	20.75	24.10	17.56	

*, ** and *** represent significance at 10, 5 and 1% levels respectively.

power owned in households (given as proportion of adults in a household).

Basing on the t-test results in Table 1, it can be concluded that there is no strong evidence to suggest that there was self-selection bias among contract farmers. In other words, observable differences between contract and non-contract farmers in terms of productivity and level of total output could be attributed to contract participation.

The difference in technical efficiency score observed in the distributive statistics cannot be concluded to be a result of contract participation due to potential selection bias arising from some observable factors, which may be simultaneously influencing both participation and technical efficiency. To address selection bias, this paper adopts propensity score matching method. The paper follows the steps of Backer and Ichino [2002].

Using propensity score matching method, results in Table 2 show that, in overall, the logit model (participation model) is significant as expressed by Wald chi-square test (20) $\chi^2 = 69.18$, $P < 0.001$ and pseudo-$R^2 = 0.1010$. However, the pseudo-R^2 at 10.1% is low, indicating that although the model is significant, it only accounts for a small part of the variability of the dependent dummy variable, the contract participation. It is, however, argued in the evaluation literature that, in propensity score matching, trying to achieve balance on relevant predictors is more important than taking trouble trying to mode the selection process [Augurzky

Table 2. Logit (weighted) estimation of propensity score

Dependent variable: contract participation dummy	Coefficient	Robust *SE*	$P > \|z\|$
Explanatory variables			
Age (years)	0.023	0.011	0.04**
Household size (number of persons in the household)	0.059	0.089	0.51
Experience in growing sunflower	–0.003	0.039	0.944
P/education (1, if having primary education,0 otherwise)	0.419	0.296	0.157
S/education (1, if having secondary education,0 otherwise)	1.13	1.05	0.283
Household land endowment	–0.056	0.035	0.114
Land endowment per household member	0.350	0.208	0.092*
Value of non-agricultural assets (Tshs)	–1.85e-08	1.60e-08	0.248
Having a bank account (1 yes, 0 otherwise)	–2.26	0.636	0.000***
Savings 2 (1, if f/inst., 0 otherwise)	–0.801	0.700	0.253
Savings 3 (1, if assets, 0 otherwise)	0.702	0.243	0.004***
Dummy 1 (1, if village 1, 0 otherwise)	1.26	0.428	0.003***
Dummy 2 (1, if village 2, 0 otherwise)	1.26	0.400	0.002***
Dummy 3 (1, if village 3, 0 otherwise)	1.31	0.394	0.001***
Dummy 4 (1, if village 4, 0 otherwise)	0.731	0.391	0.062*
Dummy 5 (1, if village 5, 0 otherwise)	0.774	0.404	0.056*
Dummy 6 (1, if village 6, 0 otherwise)	–0.361	0.494	0.465
Dummy 7 (1, if village 7, 0 otherwise)	–0.651	0.525	0.214
Constant	0.048	1.49	0.974
Number of observations = 400			
Log pseudo likelihood = –159.95498			
Wald chi-square (20) = 69.18			
Prob. > χ^2 = 0.0000			
Pseudo-R^2 = 0.1010			

*,**,*** significant at the 10, 5 and 1% levels respectively.

and Schmidt 2001, Kiluve et al. 2002, Khandker et al. 2010] as cited in Venetoklis [2004]. This is also because for contracts, for example, there are explicit terms which are often reinforced by numerous unwritten rules, and implicit incentives which make it difficult to find observational data that captures every important aspect of the contract environment [Wu and Roe 2007].

Examination of the logit model indicates that, among all the predictors in the model as presented in Table 2 only age, land endowment per household member and having economic ability to make savings by means of purchasing assets including stocks of seasonal crop harvest for future resell or exchange significantly favour participation in the contract.

Having generated the propensity score, it is important to examine its distribution. The figure indicates that the propensity scores is reasonably similar in the contract and non-contract farmers. This is necessary to ensure that there are good matches as we apply propensity score matching method.

It is important to ensure that there are balancing scores within the common support region before proceeding to estimate the average effect of treatment on the treated (ATT). This is done by discarding treated individuals with a propensity score lying outside the common support restriction. The region of common support in this data is [0.01911637, 0.93316652] and its detailed summary is as described in Table 3.

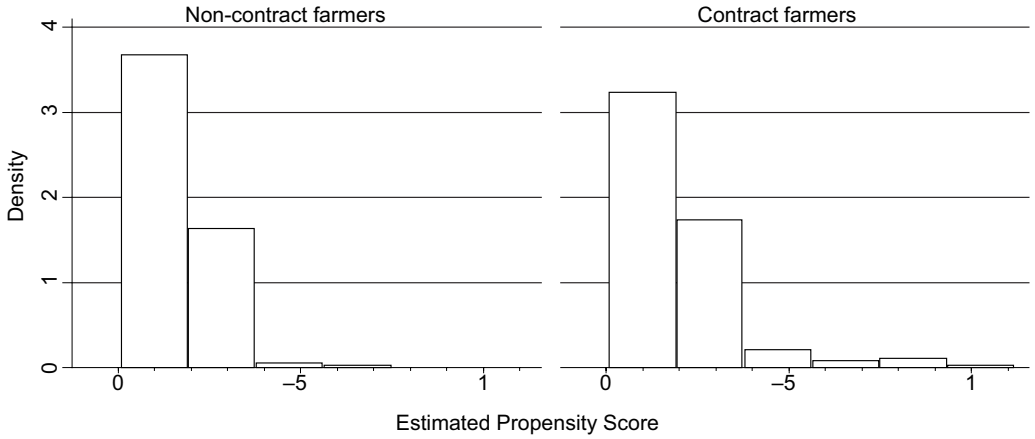

Fig. Distribution of propensity scores for non-contract and contract farmers

Table 3. Description of the estimated propensity score in region of common support

Estimated propensity score				
	Percentiles	Smallest		
1%	0.02186	0.0191164		
5%	0.0333034	0.0199475		
10%	0.0477531	0.0215964	observations	399
25%	0.0858596	0.02186	sum of weights	399
50%	0.155941		*AVG*	0.1772523
		Largest	*SD*	0.1320227
75%	0.2351803	0.7968217		
90%	0.3154769	0.8012924	variance	0.01743
95%	0.3766117	0.8108296	skewness	2.138178
99%	0.7968217	0.9331665	kurtosis	10.23555

Table 4. Distribution of contract and non-contract farmers based on blocks of propensity score

Inferior of block of propensity score (with common support)	Whether a household is in contract or not		Total
×	0	1	×
0.0191164	135	128	263
0.2	49	37	86
0.3	7	25	32
0.4	2	8	10
0.6	1	4	5
0.8	0	3	3
Total	194	205	399

The common support option has been selected.

With skewness at 2.1 and kurtosis at 10.2, Table 3 further indicates that, the issue of normality in the distribution of propensity is score is not generally problematic. Balancing hypothesis is therefore likely to hold well.

Identification of the optimal number of blocks

The final number of blocks is 6. This is the number of blocks that ensures that the mean propensity score is not different for treated and controls in each block. This also means that each predictor used in the logit model does not differ between the two groups. Table 4 shows the inferior bound, the number of treated and the number of controls for each block. The balancing property in this analysis is satisfied. Final blocks are defined and the common support option has been selected.

Effect of contracts on technical efficiency and land productivity

Table 5 presents results of comparison between contract and non-contract farmers matched by the NNM. The 205 contract farmers are matched with 109 non--contract farmers. The ATT is shown for technical efficiency score and land productivity. With regard to technical efficiency the results in Table 5 indicate that, contract farming has significant positive effect on technical efficiency level of farmers. The ATT estimated by NNM method suggest that contract farmers are on average 7.4% higher in technical efficiency score than non-contract farmers. This difference in technical efficiency score is statistically significant at 5% level and above. Similarly, the results in Table 5 indicate that contract arming significantly increase land productivity (yield per acre) via improved technical efficiency. Contract famers have on average 25.5 kg more of sunflower yield per acre than the non-contract farmers. The result is statistically significant at 5% level or better.

To assess the robustness of the results another quite widely used technique of matching based on propensity score, the Kernel based matching method (KBM) is applied. Table 6 shows results obtained by KBM. Standard errors are obtained by bootstrapping using 100 replications because analytical standard errors could not be computed. The 205 contract farmers are matched with 194 non-contract farmers. The results obtained by KBM method for technical efficiency and productivity are statistically significant at 5% level and above, and appear to be substantively close to the results obtained by NNM method.

The results in Tables 5 and 6, taken together, present consistent evidence that contract farming has positive significant impact on technical efficiency in the range of 5.8–7.4%, and land productivity in the range of 20–25 kg.

Furthermore, based on the mean yield per acre and technical efficiency level statistics of both contract

Table 5. Average treatment effects on the treated

Matching algorithm	Outcome	ATT	*SE*	*t*	Number of treated	Control number
NNM	technical efficiency	0.074***	0.031	2.55	205	109
	land productivity	25.456**	11.533	2.20	205	109

,* significant at 5 and 1% levels respectively.

Table 6. Average treatment effects on the treated

Matching algorithm	Outcome	ATT	*SE*	*t*	Number of treated	Control number
KBM	technical efficiency	0.058***	0.018	3.290	205	194
	land productivity	20.883**	7.865	2.655	205	194

,* significant at the 5 and 1% levels respectively.

Table 7. Average effects of contracts on the treated

Matching algorithm	Outcome	Effect	Robust *SE*	*t*	Number of treated	Control number
OLS	technical efficiency	0.045**	0.01	2.30	205	195
	land productivity	15.04*	8.27	1.82	205	195

*,** significant at the 10 and 5% levels respectively.

and non-contract farmers as summarised in Table 1, the expected output (total factor productivity) per acre of an average contract farm is computed as 121.5 × × 0.68 = 82.6 kg, while that of a non-contract farm is equal to 103.8 × 0.64 = 66.4 kg. Thus, other things being equal an average contract farm produces 82.6/66.4 – 1, which is equal to 24% more sunflower per acre than non-contract farm.

Since results in descriptive statistics suggested that there was no selectivity bias, based on evaluation of time invariant characteristics. It would be reasonably right to estimate the effect of contracts on technical efficiency and land productivity by using OLS on the survey data without having to correct for selectivity bias. Results would equally be unbiased and consistent. Table 7 shows results obtained by OLS method. Standard errors indicated are robust as the sample is weighted. Compared to results from matching methods NNM and KBM, results by OLS method are similar in terms of sign, significance, though with slight difference in magnitude revealing the significance of carrying out treatment effect analysis.

CONCLUSIONS

Findings in this paper present important insights about functioning of contract farming and its effect on smallholder farming. It has been shown that contract farming of sunflower production in Kongwa district generates higher technical efficiency and increased yield (productivity) to households.

Simple comparison of treatment effects by OLS method are slightly inferior compared to results obtained by NNM and KBM procedures; this validates the robustness of the results and usefulness of the propensity score method in impact analysis. The method has the strength that, it reduces bias by matching treatment and control households on the basis of observable covariates [Khandker et al. 2010]. It assumes that selection bias is based on observed characteristics. This paper therefore, contributes to technical efficiency and productivity literature by implementing propensity matching technique, a non-experimental method with strength to address the problem of selection bias inherent in many observational data, a method that is relatively new in agricultural production economics studies.

Examining the magnitude of the estimated effects of contract on variables of interest, one might argue that the effects are not substantial enough to reflect the real potential of contract farming in raising technical efficiency as revealed in other studies, e.g. Ruben and Saenz [2008]. However, the fact that the results are positive and significant is of particular importance. Small, but significant effects could be pointing to the fact that present sunflower production contracts practiced are still confronting some problems. For example, despite that farmers need several types of inputs such as seeds, pesticides, and fertilizers for improved productivity, and only seed input is involved in present contractual agreements. Firms cannot expand their facilitation role to match farmers' basic demands they would like to have in contracts. By improving service provision from contract firms to farmers (e.g. improved seed provision), there is still a room to improve efficiency, thereby increasing productivity and total output.

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ANALIZA WPŁYWU KONTRAKTACJI NA EFEKTYWNOŚĆ I WYDAJNOŚĆ MAŁOOBSZAROWYCH GOSPODARSTW PRODUCENTÓW SŁONECZNIKA W TANZANII

STRESZCZENIE

W artykule podjęto próbę pomiaru i porównania poziomów wydajności technicznej grup producentów słonecznika z małoobszarowych gospodarstw kontraktujących i tych bez kontraktacji w okręgu Kongwa, w centralnej strefie rolniczej Tanzanii. Zastosowano metodę oceny *propensity score* Rosenbauma i Rubina. Udział rolnika w kontraktacji prowadził do średniego wzrostu wydajności technicznej o 4,5–7,4%, przy znaczącym, pięcioprocentowym poziomie istotności. Podobnie większa była produktywność ziemi – średnio od 20,8 do 25,1 kg·ac^{-1}. Szacowana produkcja całkowita słonecznika w przeliczeniu na jeden akr w przeciętnym gospodarstwie kontraktującym przewyższyła o 24% poziom produkcji z grupy gospodarstw bez umowy kontraktacji. Kontraktacja miała znaczący, pozytywny wpływ na stosowanie wysokiej jakości materiału siewnego, co może częściowo wyjaśniać większą produktywność ziemi w gospodarstwach kontraktujących. Dalszy wzrost wyników produkcyjnych wciąż jest możliwy poprzez poprawę usług firm kontraktujących.

Słowa kluczowe: wydajność techniczna, metoda *propensity score*, kontraktacja w rolnictwie, produkcja słonecznika, Tanzania

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CHANGES IN LABOUR PRODUCTIVITY IN THE AGRIBUSINESS IN EUROPEAN UNION COUNTRIES

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ABSTRACT

The main aim of the paper is to identify the changes in labour productivity in the agribusiness and to define its relationship to labour productivity in the entire national economy of the EU countries. Labour productivity is expressed as gross value added per employee in agribusiness as a whole and its three zones (I – industries manufacturing means of production and services for agriculture and the food industry, II – agriculture, III – food industry). The analysis concerns selected years from 1995 to 2010, which are the most recent available data. The gross value added in agribusiness were calculated by means of the formula suggested by Woś in 1979. As it results from the analyses, despite favorable changes, the productivity of labour in the agribusiness in the new EU Member States remains at a lower level than in most of the EU-15 countries. The main reason behind the differences in the levels of agribusiness labour productivity is a surplus of the labor force in the agriculture in the most EU-12 countries. Moreover, the EU-15 countries especially from Western and Northern Europe demonstrate smaller differences between the labour productivity in agribusiness and other sectors of the national economy.

Key words: labour productivity, agribusiness, European Union

INTRODUCTION

Assessing the effects of economy management is among the primary problems tackled by economic sciences. The effectiveness evaluation allows for reasonable decision making (minimizing the expenditures needed to fulfill the objective while maximizing the effects of owned resources or expenditure inflows). As Nordhaus and Samuelson emphasize [2012], the effective use of production factors determines the competitiveness level on a local, regional and international scale. In this context, the productivity of labour is a matter of particular importance. The level of labour productivity is a major element for the assessment of economic processes and for the distribution of economic growth effects among various social groups. Therefore, labour productivity is among the key objectives of national policies [Wojtyna 2010]. While entailing lower costs and an increased supply of cheaper goods and services, high levels of labour productivity boost the market dynamics and result in increasing the purchasing power, prosperity and competitiveness of societies [Landmann 2004]. This pattern applies to the entire national economy but is particularly relevant for the agri-food sector which, according to Alaudin et al. [2005], usually demonstrates lower levels of labour productivity compared to other sectors of the economy. The competitiveness of the entire food sector (agribusiness) is also shaped by production costs, prices of marketed foodstuffs, quality and assortment of products offered, and currency exchange rates (e.g. in the case of countries outside the euro zone). Furthermore, in the food industry itself, labour productivity

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depends on the specific nature of production in different sectors.

Dynamic development of agribusiness in different regions of the world has been a subject of many research. For example Haggblade [2011] explored the links between projected rapid rates of agribusiness expansion and Africa's economic growth. Jabri [2016] analyzed the size of food and agribusiness firms in different regions of India with regard to business enterprise characteristics and performance. Reynolds et al. [2009] identified factors influencing the sustainability of selected agri-food chains in Germany. Determinants and effects of a corporate social responsibility (CSR) strategy for enterprises in German agribusiness were examinde by Heyder and Theuvsen [2012]. Buccirossi et al. [2002] from the analysis of competition policy in the European Union's agribusiness concluded that farmers are the weakest link of the entire supply chain in Europe. The authors suggest that the use of the concept of purchasing power could be developed to balance the agro-food chain. Reardon and Barrett [2000] and Tomczak [1997, 2000] among the most important factors in agribusiness development in many regions of the world listed improvement of technologies throughout the agri-food production, processing and distribution chains, skills transfer and access to foreign capital and foreign markets. Changes of the importance of Polish agribusiness in the national economy were analyzed by Mrówczyńska-Kamińska [2014], Wicki and Grontkowska [2015] while in comparision with other EU countries by Mrówczyńska-Kamińska [2015].

Continuous monitoring of labour productivity, in relative and absolute terms, is necessary both for producers in agri-food sector and for the sake of economic growth in the EU countries. Given the above, the main aim of the paper is to identify the changes in labour productivity in the agribusiness and to define its relationship to labour productivity in the entire national economy of the EU countries.

MATERIAL AND METHODS

According to the classic formula, agribusiness is part of the economic system which produces food and provides raw materials from the farm to consumers [Davis and Goldberg 1957]. Agribusiness consists of three main economic aggregates, which are used in this analysis: I zone includes the industries manufacturing means of production and services for agriculture and the food industry, II zone – agriculture and III zone – the food industry. Labour productivity in the agribusiness and in its zones is expressed as gross value added per employee. The gross value added in agribusiness were calculated by means of the formula suggested by Woś [1979]:

$$X_A = x_r + x_p + \sum_{i=1}^{n} x_i b_{ir} + \sum_{i=1}^{n} x_i b_{ip}$$

where: X_A – gross value added of agribusiness in the country;
x_r – gross value added of agriculture;
x_p – gross value added of the food industry;
x_i – gross value added of i-th sectors related to agriculture and the food industry ($i + 1$, 2, ..., n, $n \neq r$, p), which indirectly participate in food production;
b_{ir} – the coefficient specifying the flow of goods and services of the i-th sector to agriculture, expressed with the percentage of indirect demand of the i-th sector;
b_{ip} – the coefficient specifying the flow of goods and services of the i-th sector to the food industry, expressed with the percentage of indirect demand of the i-th sector.

According to the definition of agribusiness, the gross value added of this sector includes the total (complete) value of gross value added of agriculture (x_r) and the food industry (x_p). These are the components which contribute directly to the food production. The procedure applied to determine the input of the branches that indirectly participate in food production (I zone) is slightly more complex. Only certain parts of their products and services can be found in the value of food production. These values are proportional to the size of the flow of tangible goods and services of the i-th sectors of the national economy to agriculture and the food industry, which are calculated on the basis of intersectoral flow balances, i.e. input – output analysis.

The basic source of data used in the analysis were input – output balance tables for individual EU countries published by Eurostat. The input – output

method, i.e. the outlay and performance method, was developed by Leontief [1949]. The objective of the input – output analysis is to investigate the production relations between individual branches in the national economy. This method has been used by Davis and Goldberg [1957] to formulate the theory of agribusiness. The selected data from 1995 to 2010 were used in the analysis, i.e. the most recent available data on "Intersectoral flow balance" for individual countries of the EU.

RESULTS

Table 1 shows the labour productivity in three zones of agribusiness in EU countries from 1995 to 2010. In 2010, the highest level of the analyzed index was recorded in the agribusiness of Western and Northern European countries while Bulgaria, Romania, Poland, Latvia and Lithuania exhibited the lowest levels. The relatively high labour productivity in the food industry of Ireland, the Netherlands, Denmark, Belgium, Sweden and the UK, and the relatively low labour productivity in the agriculture of new EU members were the factors that contributed the most to that result. For instance in 2010, in the Netherlands and Ireland, one person employed in the food industry (III zone) generated a gross value added of over EUR 100 thous. Meanwhile, the amounts for Bulgaria, Poland and Lithuania were more than 13 times and 5 times lower, respectively. Similar results were observed in the agriculture (zone II). For instance, in the Netherlands, Denmark and Belgium, one employee generated a value added ranging from EUR 20 thous. to 36 thous. while the corresponding amounts recorded in Bulgaria and Romania were 10 times and 20 times lower, respectively. The above shows enormous differences in agribusiness labour productivity levels between the new members and EU-15 countries. However, a positive signal is that the differences between new and old Member States has become smaller. While in 1995 the difference in labour productivity between these two groups of countries was 10-folds, in 2010 it was about 5-folds. Studies conducted by Baer-Nawrocka and Markiewicz [2012] confirmed similar direction of changes in EU agriculture. Accordingly, 2000–2008 was a period of reduction of the spatial imbalances in the EU as regards labour productivity expressed as gross value added per employed in agriculture. The main factor of this trend towards further convergence was mainly the increase of value added generated in the agriculture sector along with a concurrent reduction of the number of agriculture employees in the EU-12 countries. The changes of gross value added was faster than changes to labour resources. The processes of labour productivity convergence between old and new EU Member States were driven by the instruments of the Common Agricultural Policy which became a sort of catalyst in elimination of spatial inequalities between the productivity of the labour factor in various countries. In spite of positive developments, differences in the labour productivity level between new and old member countries have remained high. This is a consequence of important disparities in level of the agricultural development between the UE-15 and EU-12 countries, in terms of production patterns, the structure of farms, the farmers access to means of production, and the ability to substitute labour with capital.

What matters in economic analyses is not only the absolute labour productivity (the value added vs. the number of employees ratio) but also the relative labour productivity (compared to the labour productivity in the entire national economy). According to Woś [2001], the economic rating compared to other sectors of national economy may be defined as the agribusiness' internal competitiveness which takes into account the inter-sectoral flows of value added and their balance. At the same time, this allows to measure the ability of the agriculture and agribusiness sectors to self-finance their development. The relative labour productivity depends on the level of the absolute labour productivity in specific sectors of the national economy, and also on the sectoral employment patterns, i.e. the share of specific sector in the overall employment. Usually, the key reason for low labour productivity levels in the agribusiness compared to other non-agricultural sectors is the high employment, mainly in its second zone (agriculture).

When analyzing the data on the relative labour productivity in agribusiness seen in the context of the national economy in EU countries (Table 2), it can be noted that countries where people employed in agriculture (and in the entire agribusiness) represent a rela-

Table 1. Labour productivity in agribusiness in the European Union countries in 1995, 2000, 2007 and 2010 (gross value added per worker, EUR thous.)

Item	1995				2000				2007				2010			
	I zone	II zone	III zone	total	I zone	II zone	III zone	total	I zone	II zone	III zone	total	I zone	II zone	III zone	total
Austria	32.8	7.6	28.2	13.5	39.1	5.4	23.4	12.8	58.8	13.1	62.2	34.3	69.0	15.7	62.9	37.7
Belgium	43.0	30.1	46.9	39.9	54.6	35.5	53.1	47.8	64.8	25.5	64.0	52.3	69.0	29.2	63.7	55.4
Bulgaria	×	×	×	×	3.7	2.1	3.7	2.4	9.8	2.4	4.6	3.3	15.7	2.0	7.5	3.8
Czech Republic	9.0	5.8	8.5	7.1	9.6	6.6	11.9	8.9	13.1	10.9	17.9	13.7	15.6	8.2	19.9	13.9
Denmark	29.6	37.4	42.2	36.9	36.6	38.4	48.6	41.2	49.2	23.6	62.7	44.0	45.6	20.3	63.8	41.6
Estonia	3.3	2.7	5.1	3.5	5.9	3.6	7.3	5.1	13.9	7.2	12.5	10.3	17.7	9.4	14.8	13.0
Finland	28.0	11.9	48.0	21.3	38.5	12.9	43.2	22.7	47.7	12.7	63.2	28.7	52.4	14.1	66.0	31.3
France	28.4	28.7	52.1	34.7	19.6	30.4	53.9	34.3	45.3	33.8	60.2	44.7	51.2	32.0	60.8	45.8
Greece	×	×	×	×	13.6	10.1	32.6	13.2	14.0	14.3	39.4	18.2	14.0	9.1	57.1	17.5
Spain	19.6	15.4	32.4	20.2	25.0	21.4	33.6	25.1	29.5	24.5	38.5	29.4	27.8	25.9	54.0	33.6
Nether-lands	35.5	36.4	61.4	42.9	58.2	36.0	68.9	50.6	47.3	40.3	95.8	55.5	46.1	36.4	101.6	56.3
Ireland	27.1	23.5	61.5	32.5	40.1	22.6	55.7	34.4	41.8	21.0	85.1	41.1	44.0	21.2	117.9	49.3
Lithuania	4.2	1.8	3.7	2.4	6.7	2.1	10.3	4.0	11.5	5.5	9.7	7.6	18.1	5.5	18.3	11.6
Latvia	2.5	1.6	7.5	2.7	2.6	1.1	7.9	2.6	3.5	6.1	11.5	6.7	×	×	×	×
Germany	24.3	23.6	40.4	29.6	30.1	27.6	38.6	32.5	34.7	25.7	40.1	34.1	38.0	22.2	41.9	34.9
Poland	5.0	1.3	6.9	2.1	7.5	2.0	10.7	3.3	9.9	4.1	11.8	6.2	8.1	4.1	18.0	7.1
Portugal	7.9	4.3	21.5	7.1	10.8	3.9	28.0	8.2	16.8	4.4	28.4	9.4	18.0	3.8	28.1	9.1
Romania	3.3	1.6	7.8	2.1	3.8	0.9	12.5	1.5	6.3	2.6	26.1	4.4	5.7	2.4	31.8	4.6
Slovakia	10.8	4.6	7.0	6.2	14.9	8.4	13.2	11.1	20.9	15.7	19.2	18.0	22.5	13.4	24.0	18.7
Slovenia	9.0	3.2	15.0	5.5	14.4	4.0	20.0	7.7	27.0	6.4	25.5	11.7	32.9	7.0	29.5	13.3
Sweden	36.7	12.8	43.1	25.4	51.7	14.3	58.3	33.8	59.2	14.0	64.0	38.9	62.8	13.0	64.5	39.2
Hungary	7.2	3.1	7.6	4.5	10.1	3.2	8.8	5.4	19.4	9.1	13.6	12.1	19.2	9.3	15.4	12.7
United Kingdom	22.1	32.7	42.3	33.2	20.9	40.2	62.1	43.6	31.7	31.8	68.2	45.7	30.5	32.1	54.1	40.0
Italy	25.9	20.8	43.8	27.0	36.1	26.9	46.8	33.6	42.6	27.6	47.6	36.1	51.4	26.1	50.3	37.9
EU-12	5.8	2.0	7.7	2.9	7.1	1.7	10.4	3.0	10.3	3.9	14.6	6.3	10.4	3.6	19.1	6.8
EU-15	26.1	21.5	43.4	28.5	28.9	22.2	46.0	30.4	37.7	23.9	52.2	35.6	40.3	22.4	54.5	36.5
EU-27	20.9	10.3	34.2	16.7	22.6	9.3	36.5	16.5	30.0	13.0	41.8	22.9	31.8	12.1	44.8	23.7

Source: Own calculations based on data from input – output tables for the EU countries and from data about national account, Eurostat, date of access 20.03.2017.

tively low share in the total employment of the national economy (Fig. 1), demonstrate a labour productivity in that sector at a level comparable to the national economy average. In the analyzed period, the lowest agribusiness labour productivity ratio compared to the entire national economy was recorded in Portugal, Poland, Latvia, Bulgaria, Slovenia, Romania and Greece, i.e. mainly in countries with the highest share of agricultural employees in the total employment. In these countries, the agribusiness labour productivity was by more than 50% lower than the national economy average level. Nevertheless, in the Netherlands, the UK and Belgium, the agribusiness labour productivity ranged from 80 to 90% of the average labour productivity in the national economy. In 2010, on an average basis throughout the EU, one agribusiness employee

Table 2. The relation of labour productivity in agribusiness to labour productivity in whole national economy in the European Union countries in 1995, 2000, 2007 and 2010 (%)

Item	1995				2000				2007				2010			
	I zone	II zone	III zone	total	I zone	II zone	III zone	total	I zone	II zone	III zone	total	I zone	II zone	III zone	total
Austria	71.2	16.5	61.3	29.4	78.0	10.7	46.6	25.6	95.3	21.2	100.9	55.6	108.3	24.6	98.8	59.2
Belgium	85.0	59.6	92.8	79.0	100.0	65.1	97.4	87.5	95.2	37.5	93.9	76.9	97.6	41.3	89.9	78.2
Bulgaria	×	×	×	×	98.3	54.6	98.5	63.8	178.3	43.5	83.4	59.8	177.4	22.0	84.4	43.4
Czech Republic	120.5	77.8	113.1	94.9	83.5	57.9	103.9	77.6	58.3	48.5	79.4	61.1	58.6	30.7	74.8	52.1
Denmark	64.6	81.7	92.0	80.6	67.7	71.1	90.1	76.4	74.1	35.6	94.5	66.3	63.3	28.1	88.7	57.8
Estonia	82.7	67.7	128.2	87.1	61.2	37.2	75.7	53.3	64.2	33.5	58.2	47.6	77.8	41.2	65.2	57.5
Finland	65.7	27.9	112.7	50.0	76.8	25.8	86.1	45.2	75.4	20.1	100.0	45.4	83.5	22.5	105.3	49.9
France	55.2	55.8	101.2	67.5	38.9	60.4	107.0	68.1	72.1	53.7	95.7	71.0	78.7	49.1	93.5	70.5
Greece	0.0	0.0	0.0	0.0	47.4	35.2	114.0	46.0	33.8	34.4	94.8	43.7	33.1	21.5	134.9	41.4
Spain	63.1	49.7	104.4	65.2	71.9	61.6	96.7	72.1	64.7	53.8	84.5	64.4	54.2	50.6	105.6	65.7
Netherlands	87.7	90.0	151.9	106.1	126.5	78.3	149.7	110.1	80.2	68.2	162.5	94.0	75.8	59.8	166.8	92.4
Ireland	60.3	52.1	136.7	72.2	72.7	41.0	100.9	62.3	53.4	26.8	108.7	52.5	57.6	27.8	154.4	64.5
Lithuania	134.9	56.8	120.2	77.6	84.7	26.3	131.6	50.6	68.7	32.9	57.9	45.5	103.4	31.7	104.7	66.6
Latvia	72.8	47.4	216.8	77.8	32.5	13.8	98.4	32.6	21.0	36.6	68.9	40.2	0.0	0.0	0.0	0.0
Germany	52.7	51.0	87.4	64.1	64.3	59.0	82.5	69.4	63.4	47.1	73.2	62.2	69.0	40.2	76.0	63.2
Poland	77.8	21.2	107.8	33.3	68.6	17.8	97.6	30.3	54.9	22.6	65.9	34.4	41.3	20.9	91.6	36.0
Portugal	45.6	24.5	123.6	40.8	48.8	17.8	126.8	37.2	59.0	15.3	99.7	33.0	59.7	12.5	93.3	30.1
Romania	131.9	62.5	313.6	82.4	111.0	25.3	367.4	43.3	53.3	21.7	221.2	37.7	46.5	19.4	260.5	37.8
Slovakia	169.6	72.3	110.2	97.5	153.6	86.6	135.7	114.6	91.8	69.0	84.4	79.0	81.5	48.5	87.0	67.8
Slovenia	60.3	21.2	101.2	37.3	70.1	19.7	97.3	37.4	87.0	20.6	82.1	37.6	102.5	21.7	91.7	41.2
Sweden	89.9	31.3	105.5	62.1	94.5	26.0	106.4	61.7	90.4	21.4	97.8	59.5	92.8	19.2	95.2	57.8
Hungary	98.0	41.6	103.4	61.1	97.2	30.5	85.1	52.1	94.1	44.1	66.2	58.8	94.1	45.5	75.8	62.3
United Kingdom	72.3	106.9	138.2	108.7	40.5	77.8	120.4	84.5	58.2	58.4	125.3	84.0	58.0	61.1	102.9	76.1
Italy	73.0	58.6	123.4	76.1	77.9	58.0	100.8	72.5	77.6	50.4	86.7	65.7	91.1	46.2	89.1	67.2
EU-12	73.5	24.8	98.4	37.2	90.6	22.0	76.9	39.0	68.0	25.7	78.9	41.4	61.5	21.5	77.1	40.3
EU-15	63.1	52.0	105.1	68.9	62.3	47.8	99.2	65.6	68.1	43.2	94.3	64.4	71.0	39.6	96.0	64.4
EU-27	58.5	28.8	95.6	46.7	58.8	24.2	94.8	42.9	62.7	27.1	87.5	48.0	64.6	24.6	91.0	48.2

Source: Own calculations based on data from Table 1 and from data about national account, Eurostat, date of access 20.03.2017.

generated approximately 52% less than one person employed in the national economy. These results show that in most of the EU countries, agribusiness is among the economy sectors that struggle to reach high levels of labour productivity. However, in countries with a higher level of social and economic development, agribusiness is by far more competitive on a domestic basis than in countries less developed economically. This is mainly because these countries have experienced profound structural changes a long time ago, as regards both the entire national economy and agribusiness itself. The food manufacturing pattern is dominated by industrial sectors of national economy (I zone), usually representing higher levels of labour productivity than the agriculture which typically is the main sector in countries at a lower level of economic development.

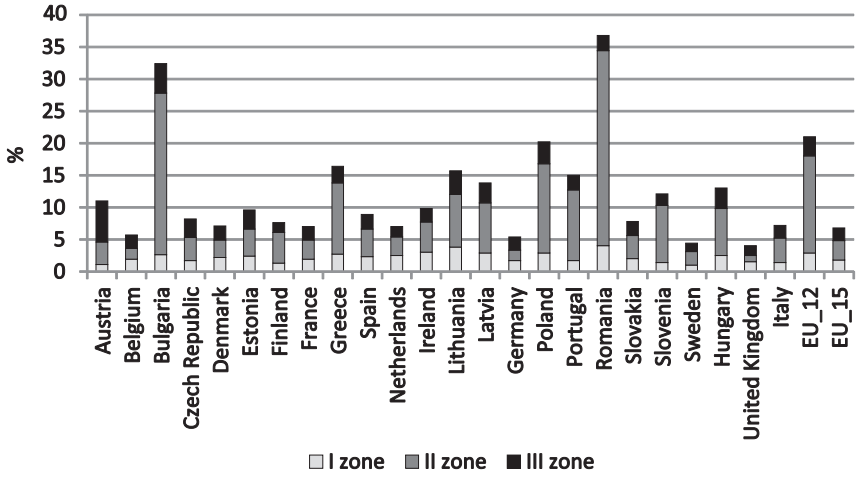

Fig. 1. The share of employed in agribusiness in the national economy in the European Union countries in 2010

Source: Own elaborations based on input – output table in the EU countries in 2010 and data from Eurostat www.epp.eurostat.ec.europa.eu, data of access 20.03.2017.

The detailed analysis of labour productivity ratios in zones of agribusiness areas has proved in the Netherlands, Ireland, the UK and Finland, labour productivity in the food industry was above the average labour productivity in the national economy. A particular situation as regards labour productivity in the food industry, compared to the entire national economy, took place in Romania. Throughout the period under review, productivity in the III zone of agribusiness was by far higher than national economy average (by approximately 200% in the last year under review). However, this indicator does not reveal any extraordinary results in the Romanian food industry. The main reason for this situation is that in Romania, there are only a few sectors of the national economy (other than the food industry) that could drive the economic development. Although Bulgaria is a similar case, in this country the potential labour productivity of the I zone of agribusiness is higher compared to the entire national economy.

When considering the issue of agribusiness labour productivity, it is worth mentioning the relationship between labour productivity in the entire agribusiness and the level of social and economic development (Fig. 2). Two groups of the EU countries were distinguished when analyzing this dependency. The first one comprised countries where both the agribusiness labour productivity and the GDP per capita are low. These include the majority of countries who joined the EU after 2004 as well as Greece and Portugal. This is because in many of the new member countries (except for the Czech Republic and Slovakia) a major role is played by family farming concentrated in relatively small holdings, which is not conducive to the creation of modern agribusiness. In these countries, one of the key conditions for the development of agriculture towards agribusiness is reduction of the number of agricultural employees and the number of farms, as well as the increase of the efficiency in the use of owned resources and, as a consequence, the improvement of the economic performance in terms of income. This process largely depends on the economic development rates of other sectors of national economy. Therefore in this countries agriculture and the entire agribusiness tend to develop at a slow rate. Meanwhile, commercial farms fully interrelated with the market, agribusiness enterprises, extremely high labour productivity levels, low levels of employment in the agriculture, integration with the industry, and the globalization of the agricultural economy are the dominating characteristics of Western and Northern European countries, mainly Ireland, Denmark, the Netherlands, Sweden, Austria, Finland, the UK, France and Germany [Mrówczyńska-Kamińska 2015].

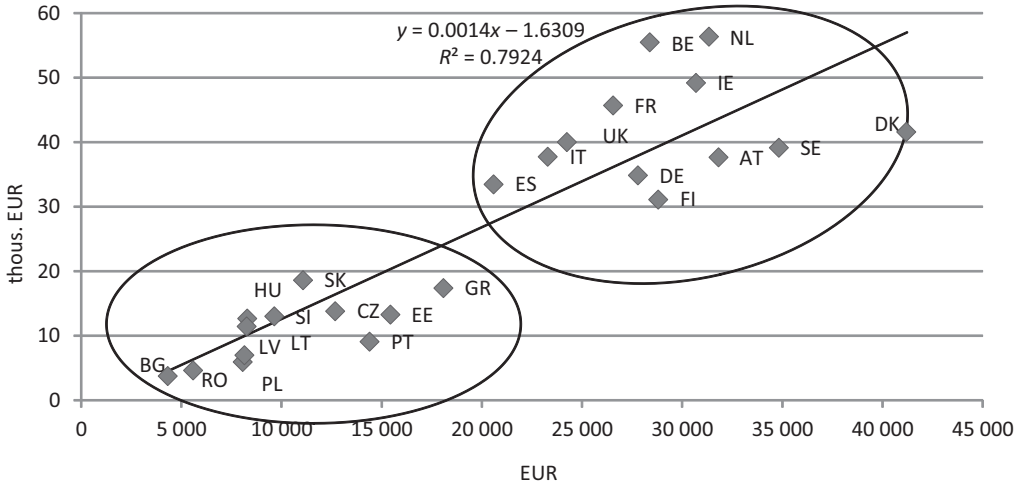

Fig. 2. Relation between the level of labour productivity in agribusiness and GDP per capita in EU countries in 2010

Source: Own elaborations based on input – output table in the European Union countries in 2010 and data from Eurostat www.epp.eurostat.ec.europa.eu, data of access 20.03.2017.

DISCUSSION

The analysis of the changes of agribusiness labour productivity in the EU countries allows to draw some conclusions as to the foreseen directions of its development in the EU-12 countries. The condition for moving to higher development stages in these countries is to increase the productivity and attain higher levels of economic development. The development level of the food sector plays an important role in the country's economic development by interrelating production and consumption. For the agriculture and entire food sector, manufacturing operations are a way to deliver raw materials to other non-agricultural sectors of the national economy, and to shape the demand from other modern economy sectors (inter-sectoral flows). On the consumption side, a higher productivity of specific agribusiness areas contributes to increasing the population's income and, thus, generates demand for industrial manufacturing. Generally, this drives the economic growth and, as a consequence, increases the employment in non-agricultural sectors, as shown by Dethier and Effenberger [2012] and Jabri [2016]. The agriculture and agribusiness development may result from the natural economic processes. However, these may be supported with an appropriate economic policy. As shown by modern economics, Central and Eastern European countries may choose between two directions for the development of agriculture and of the entire agribusiness: either the conventional agri-food system which is dominated by industrial agriculture and by large food and commercial corporations (just as in Western and Northern European countries), or a system based on a more environmentally-friendly agriculture, smaller processing companies and local markets (sustainable growth). It seems that from the perspective of problems currently experienced by new EU member countries (too many agricultural employees, low level of agribusiness productivity, land fragmentation), the latter is likely to be a better match for that group of countries [Mrówczyńska-Kamińska 2015]. However, as noted by Zegar [2012], a major problem is that the sustainable growth paradigm remains outside the mainstream development economics which may perpetuate the underdevelopment of these countries. The development path paved by highly-developed countries means progressing through sub-sequent stages of development, from traditional to modern societies. However, according to some theories, the one-way road based on western concepts of moving from traditional to modern societies may be replaced by the cultural and political pluralism [Musiał 2008]. These include the neo-modernization theories which claim that integration and globalization

processes will result in accelerating the modernization processes. As a consequence, countries may experience faster modernization progress and move closer to the defined development stage. In this approach, modernization mainly means the efforts made by poorly developed countries in order to catch up with the leading societies at the highest development stages. This acceleration may result in an extremely fast progress through specific development phases, or even in skipping some of them. According to Sen [2002], social factors play a relevant role in particular phases, and modernization means a social change process.

Whether the new member countries will follow the path paved by developed Western and Northern European countries, primarily based on a large increase of labour productivity, or will they choose a totally different development path in the food manufacturing area, remains an open question. And there is no obvious answer to that. It can only be concluded that labour productivity will be a milestone for both development paths, and the growth rate will be by far lower if the sustainable growth paradigm is adopted.

CONCLUSION

As shown by the analyses, despite favorable changes in the period from 1995 to 2010, the productivity of labour in the agribusiness in the EU-12 countries remains at a lower level than in most of the EU-15 countries. A surplus of the labor force in the agriculture is the main reason behind the differences in the levels of agribusiness labour productivity in specific countries. The high level of employment in the agriculture sector in these countries is of a structural nature, and results from economic, social and demographic processes shaped for many years. In the agriculture sector, this is reflected by the defective structure of agricultural land, by the domination of small farms which involve large quantities of labour used in an ineffective manner, and by the small scale of manufacturing operations.

Meanwhile, Western and Northern European countries demonstrate smaller imbalances in labour productivity between the agribusiness and other sectors of the economy as a whole. While the ratio of sectoral labour productivity to labour productivity in the national economy is decreasing in the agriculture sector, it is increasing in the food industry and in the I zone of agribusiness. This is also true for countries who joined the EU structures after 2004. These countries demonstrate a consistent decrease of the number of employees in the agricultural sector itself. As a consequence, their share in the general employment of the national economy is also decreasing. Therefore, if absolute labour productivity ratios remained unchanged, the relative labour productivity in the agriculture sector would demonstrate a firm downward trajectory. However, the level of relative labour productivity in the agriculture sector slowly starts to increase. This results from a higher growth dynamics of labour productivity in the agriculture sector compared to other sectors of the national economy in medium and highly developed countries. In highly developed countries, the growth rate of labour productivity in the agriculture exceeds the growth rate of labour productivity in the industry sector. This allows to overcome the adverse impact of the decreasing share of agriculture employees on the level of relative labour productivity. Accordingly, the decline in employment in the agriculture provides better opportunities for increasing the productivity of labour in the agriculture and, indirectly, in the entire agribusiness. The main reason for that increase should be the increasing ratio of fixed assets per employee, because usually the low levels of labour productivity in the agriculture and in the food industry are related to low capital expenditures. Other factors that could improve the competitiveness of the food industry include a higher concentration of the production, consolidation of enterprises, better quality and innovativeness, and joint purchases of (raw) materials for manufacturing purposes.

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ZMIANY W WYDAJNOŚCI PRACY W AGROBIZNESIE W KRAJACH UNII EUROPEJSKIEJ

STRESZCZENIE

Głównym celem artykułu jest identyfikacja zmian w wydajności pracy w agrobiznesie oraz scharakteryzowanie współzależności między wydajnością pracy w tym sektorze a wydajnością pracy w gospodarkach narodowych krajów członkowskich UE. Wydajność pracy wyrażona została wartością dodaną brutto przypadającą na jednego pracownika w całym agrobiznesie i jego trzech sferach (I – przemysł wytwarzający środki

produkcji i usługi dla rolnictwa i przemysłu spożywczego, II – rolnictwo, III – przemysł spożywczy). Analiza dotyczy wybranych lat w okresie 1995–2010. Jak wynika z przeprowadzonych analiz, mimo że zaszły pozytywne zmiany w wydajności pracy w agrobiznesie krajów UE-12, to nadal poziom tej wydajności jest niższy w większości państw UE-15. Główną przyczyną tych różnic jest nadwyżka siły roboczej w rolnictwie większości krajów UE-12. Ponadto w krajach UE-15, zwłaszcza tych z zachodniej i północnej Europy, wykazano mniejsze nierówności w wydajności pracy między agrobiznesem a innymi sektorami gospodarki ogółem.

Słowa kluczowe: wydajność pracy, agrobiznes, Unia Europejska

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ORIGINAL PAPER

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COUNTERACTING FINANCIAL EXCLUSION AS AN ETHICAL ASPECT OF THE ACTIVITIES OF COOPERATIVE BANKS BASED ON OWN RESEARCH

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ABSTRACT

The main purpose of this thesis is to present the opinions of clients on the ethical aspects of the activities of cooperative banks in the context of limiting financial exclusion. The author attempts to answer the questions: were clients refused with banking services, what were the reasons for this refusal, do cooperative banks offer electronic banking services to limit financial exclusion. The empirical basis of the issues discussed herein is the study of the subject literature and the results of a survey conducted among 132 clients of selected cooperative banks. The thesis assumes that financially excluded clients are those who have limited access to the products and services offered by cooperative banks. The following methods were used to develop the test results: structural and χ^2 test. Based on the results of the survey, general conclusions were drawn. A small percentage of clients of the selected cooperative banks encountered difficulties in accessing banking services. Financially excluded clients are usually single men, living in the countryside, farm workers or physical workers. Electronic banking services are not very popular among clients of cooperative banks. It is difficult to identify the effect of non-cash trading on the level of financial exclusion of these institutions.

Key words: financial exclusion, business ethics, cooperative banks, clients

INTRODUCTION

Socio-economic development is accompanied by the development of the financial sector. Therefore, access to basic financial products and services and their use is of great socio-economic importance. Banks, through their activities, should contribute to the socio-economic development of the country, increasing the wealth of the society through socially responsible business, introducing innovations and supporting education of the society.

Unfortunately, in many countries, also highly developed, the number of people affected by financial exclusion is increasing. It is a signal indicating that market mechanisms that are necessary are not sufficient indicators of banks' operations. It is necessary to take into account ethical values in the process of making economic decisions.

Cooperative banks, as institutions of public trust, build the trust of clients and shape the positive image of the entire sector through their activity. Providing services primarily to the local community, economic entities and local government units try to fulfill their mission in a reliable, honest, careful and responsible manner as well as ensuring high standards of professional ethics.

THE CONCEPT OF FINANCIAL EXCLUSION

The concept of financial exclusion was first used in 1993 by geographers who focused on limited physical access to banking services, following the closure of

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a bank branch [Leyshon and Thrift 1993]. In the 1990s, researchers addressing this type of exclusion emphasized that it concerns certain social circles, in gaining access to modern financial instruments, banking services, consumer credit and insurance [EC 2008].

In 1999, financial exclusion was defined in a broader sense for the first time and referred to people who have difficult access to basic financial services [Kempson and Whyley 1999].

Anderloni [2006] notes that at least two approaches to defining financial exclusion can be found in the subject literature: broad and more restrictive. The broad approach emphasises financial needs, referring to the difficulties experienced by people on low incomes and in a disadvantaged social situation. This applies to the following services: having an account, the possibility of making non-cash settlements, access to credit and insurance, and having small savings, taking into account the unstable professional situation.

In the more restrictive approach, the definition places more emphasis on specific services and lack of access to them. These services are often referred to as basic (universal). These are financial services that have no impact on the household budget, but, at the same time, constitute an important element in the life of the individual – for its survival, security and participation in social and economic life [Iwanicz-Drozdowska 2008].

The broad concept of financial exclusion, based on barriers to the use of financial services, identifies various aspects of this type of exclusion [Kempson and Whyley 1999]:

- exclusion due to geographic availability;
- exclusion due to accessibility – occurring when access restrictions arise from the risk assessment process by a financial institution;
- exclusion due to conditions – occurring in a situation where the product offer is not properly adapted to the needs of a given group of people;
- price exclusion – related to the existence of excessive prices, which are a barrier to access to financial services;
- marketing exclusion – existing in a situation when a given group of people is excluded in accordance with the marketing policy of a financial institution;
- self-exclusion – the reasons for this kind of exclusion lie in the conviction of a group of people about the lack of need to use banking services due to the expected disappointment after using these services. Sometimes it is the result of being refused access to financial services in the past or the conviction that financial institutions do not accept certain groups of people, e.g. national minorities.

The European Commission defines financial exclusion as a situation in which a person encounters difficulties in accessing and/or using services and financial products to the extent corresponding to his needs and enabling him to conduct a normal social life [EC 2008]. It is worth stressing that financial exclusion is a frequent consequence of social exclusion. People affected by material poverty, unfavorable social processes have a problem with achieving an adequate level of social and economic life, and in the process of obtaining education and entering the labor market.

According to the literature on the subject, the following types of financial exclusion can be distinguished: payment, investment, insurance, pension, credit and savings exclusion. It is worth mentioning here one more concept related to exclusion on the financial market, namely bank exclusion. It is a narrower concept in relation to the concept of financial exclusion presented above and includes a restriction in access to banking products and services. In particular, it includes transactional, credit and savings exclusion [Kuchciak 2012].

When classifying a financial exclusion, its causes should be taken into account. The main reasons for financial exclusion include:

- income level and diversification;
- changes in the labor market related to job insecurity and income;
- demographic changes related to aging of the population and change of the family model.

Borcuch [2012] indicates: demand, supply and social factors of financial exclusion (Table 1). Taking into account the factors presented in Table 1, it is possible to indicate several socio-economic features that largely determine financial exclusion. These include: level of education, professional status, income, age, place of residence. Financial persons are particularly exposed to financial exclusion: persons living in rural areas,

Table 1. Reasons for financial exclusion

Social factors	Demand factors	Supply factors
Liberalization of financial markets, leading to greater complexity (complexity) of financial instruments	Concern about high costs accompanying financial instruments	Risk assessment applied by financial institutions
Structural changes in the labor markets, manifested by more frequent job changes and less security	The conviction that financial services are not intended for poor people	Financial marketing run by financial institutions
Fiscal policy, which may tax the banking services too heavily	Fear of losing control over finances, distrust of their suppliers	The conditions and types of products and the manner of their delivery
Demographic changes manifested by a higher divorce rate or later age of children leaving the house	Willingness to use alternative sources of financing	The price of financial products
Inequalities in earned income	Negative experiences from the past	–

Source: Borcuch [2012].

where access to financial services is difficult, young or elderly people, people who do not have a permanent job and, therefore, obtain relatively low income.

When analyzing the phenomenon of financial exclusion, one more issue should be taken into consideration, namely a group of people characterized by inadequate use of banking services. Thus, the phenomenon of exclusion on the financial market should be considered on two levels: people with no access to banking/financial services and people with limited access to above-mentioned services and products [IBnGR 2014].

ETHICAL ASPECTS OF BUILDING COOPERATIVE BANKS' RELATIONS WITH CLIENTS

The immanent feature of the relationship between clients and banks, an important and inalienable, basic value, is the culture of public trust. It is an inseparable attribute of the bank's operation and determines its development and survival [Masiukiewicz 2007]. Three levels of building public trust can be distinguished: personal ties [Masiukiewicz 2007]; deontological codes (Code of Good Banking Practice) [ZBP 2013]; legal system of financial markets [Masiukiewicz 2007].

Co-operative banks, in their relationships with clients, strive to take into account the special trust they receive through high requirements as to the reliability and careful treatment of all clients. Undertaking activities in this area is postulated in the principles of good banking practice. It is a set of standards of conduct concerning the activities of banks and referring to persons employed in banks and also to persons acting as intermediaries in banking activities, i.e. acting for and on behalf of banks. These rules include [Strzelecki 2008]:

- rules of conduct for banks with clients;
- principles of mutual relations between banks;
- advertising rules, rules of conduct for bank employees;
- provisions regarding the Banking Ethics Committee together with the attached regulations of the Banking Ethics Committee.

For people who want to pursue their professional career in the banking and financial sector, qualification standards have been developed under the patronage of the Polish Bank Association (ZBP), which include: a set of requirements for the banker's profession, a set of knowledge and skills necessary for a bank employee, a set of professional requirements necessary to perform duties at individual positions in the bank. In addition, the standards set out how to run a career, at what rate and scope of specialization and [ZBP 2018]:

- a description of the requirements that can be used to describe job positions, employee assessments and create a competence map;

- tools for rationalization of promotion and remuneration policies;
- tools for planning the professional development of individual employee groups and reserve staff;
- a certification system that objectively confirms the level of knowledge and skills.

The effectiveness of a cooperative bank depends on the professional knowledge of employees and their entrepreneurship. When the level of qualifications of employees increases, their use of past experience and the so-called common sense approach to problem solving. Increasingly, when using strategic decisions, team management or negotiations, the basics of management, sociology and psychology are used. Public confidence in the bank is also built by: honesty, diligence and competence of the bank's management and staff; keeping banking secrecy by its employees.

A bank may be considered a public trust institution capable of performing its basic functions as a reliable partner only on the condition that its team of employees is completely trustworthy [Strzelecki 2008].

Cooperative banks maintain higher employment than dictates market share. This translates into better client care. Employees of cooperative banks enjoy high trust of clients, especially the speed of making credit decisions. Their extensive knowledge of products and clients is often the result of a long service period. This knowledge of employees facilitates quick and safe decision making and is one of the most valuable assets of cooperative banking [Olszewski and Morye 2013]. Employees of cooperative banks are usually people from the local environment, neighbors or friends of clients. Thanks to this, the contacts are not just business, and the offer can be more suited to the needs and expectations of the environment.

The management staff at cooperative banks draws attention to the fact that the potential employee is nice, substantive, helpful and ready for changes. She/he should treat the client as she/he would like to be treated. New employees should learn the individual approach to the client and the ability to recognize his or her needs.

Cooperative banks are mainly focused on local and regional markets, with a broadly defined mission or a bundle of priorities. Their healthy business model is often emphasized, based on relationship banking, decentralization and understanding of the needs of the local community.

OPINION OF THE CLIENTS OF COOPERATIVE BANKS ON THE SUBJECT OF FINANCIAL EXCLUSION IN THE LIGHT OF OWN RESEARCH

The aim of the study was to get to know clients' opinions on: ethical aspects of cooperative banks' functioning and their role in limiting financial exclusion by offering electronic banking services. The complementary aim was an attempt to characterize the phenomenon of financial exclusion defined as limited access of cooperative bank clients to banking services.

The survey was conducted in September and October 2015 among clients of selected cooperative banks, located in the Płock Poviat (Mazowieckie Voivodship) and Żywiecki Poviat (Śląskie Voivodship). Clients included in the survey were selected using the convenient method [Hill and Aleksander 2003]. Clients who left the bank were asked to complete the survey and expressed their willingness to answer the questionnaire. In total, 100 people from the Mazowieckie Voivodship and 32 from the Śląskie Voivodship were examined. The sample was unrepresentative. The calculations were performed in IBM SPSS 23.0. The statistical significance was $P < 0.05$.

In total 57 men and 75 women participated in the study, which constituted 43.5 and 56.5%, respectively; 22 people were in the 18–25 age group, 25 were from the age range 26–35, 34 people in the 36–45 age group, 28 people in the age group 46–55, and 18 respondents – 56–65 years, and 5 people over 66 years old. Most people lived in the village, that is 54 people, a communal village – 50 people. The largest number of people had higher vocational education (30 people) and secondary vocational education (29 people). Fifty-nine people had a permanent job. As a rule, these people were farmers (25 people) and physical workers (26 people). Most people, i.e. 37, declared that they receive a monthly net income per person in the range of PLN 1,001–1,500.

Due to the subjective scope of the study, empirical considerations assumed that the phenomenon of financial exclusion would apply to persons who have limited access to banking services and products. Respondents declared that they are clients of cooperative banks, which means that they use a narrower or wider range of the offer of these institutions. However, this offer is not always satisfactory and adapted to expec-

tations. In addition, clients face difficulties, especially those with low incomes in accessing non-cash services, loans and insurance.

Therefore, the clients of cooperative banks were asked if there was a situation where cooperative banks refused to provide banking services (Table 2). About 12% of respondents faced the situation that banks refused to provide banking services. Over 86% of the surveyed clients did not experience such a situation.

Table 2. Refusal to provide services by cooperative banks

Did the cooperative banks refuse to provide banking services?	*N*	%
Yes	15	11.4
No	114	86.4
No answer	3	2.2
Total	132	100.0

Source: Results based on own research.

The results of the analysis conducted on the basis of the survey indicate that there is a significant relationship between the gender of the surveyed clients and the refusal of cooperative banks to provide banking services (Table 3). Significantly more often, the surveyed men experienced such difficulties (19%) than women (5.4%). The distribution of responses may result from other socio-demographic features of the surveyed group, in which people living in rural areas predominated and most often are farmers or physical workers who do not achieve regular income.

Table 3. Relationship between the gender of respondents and the refusal to provide services by cooperative banks

Did the banks refuse to provide banking services?		Gender		Total
		female	male	
Yes	*N*	4	11	15
	%	5.4	19	11.4
No	*N*	68	46	114
	%	91.9	79.3	86.4
No answer	*N*	2	1	3
	%	2.7	1.7	2.2
Total	*N*	74	58	132
	%	56.5	43.5	100

$\chi^2 = 5.847$; $df = 1$; $P = 0.016$; test significant at $P < 0.05$.

Source: Study based on own research.

The marital status also significantly influenced the frequency of refusal of cooperative bank decisions (Table 4). The data presented in Table 4 confirm that, most often, the refusal to provide banking services was met by single persons (8.1%) and divorced persons, widows or widowers (26.7%). Single people are treated worse by banking institutions and, therefore, are more exposed to financial exclusion.

Table 4. Relationship between respondents' marital status and refusal to provide services by cooperative banks

Did the banks refuse to provide banking services?		Marital status			Total
		single	married	divorced / widow / / widower	
Yes	*N*	6	5	4	15
	%	8.1	6.3	26.7	12.1
No	*N*	23	75	11	109
	%	83.8	90.4	68.7	82.6
No answer	*N*	2	3	1	6
	%	8.1	7.3	6.6	5.3
Total	*N*	31	83	16	132
	%	23.5	62.9	12.1	100

$\chi^2 = 7.580$; $df = 2$; $P = 0.023$; test significant at $P < 0.05$.

Source: Study based on own research.

Clients most often indicated loans and bank loans as services whose services were refused by banks (Fig. 1). This is not always the case for people who are financially excluded. The reason for refusal may be too high loan or credit amount in relation to creditworthiness. Clients sometimes optimistically assess their financial situation, which may lead to accepting too large burdens, which in the situation of limiting household income may cause financial problems. The analysis of the results of the survey did not show any significant relationships between socio-economic factors (age, sex, marital status, place of residence, professional status, income level) and types of services refused by the bank.

Clients were asked to indicate the reasons for the bank's refusal. The results are presented in Figure 2. The most common reason for the refusal to provide banking services was lack of creditworthiness

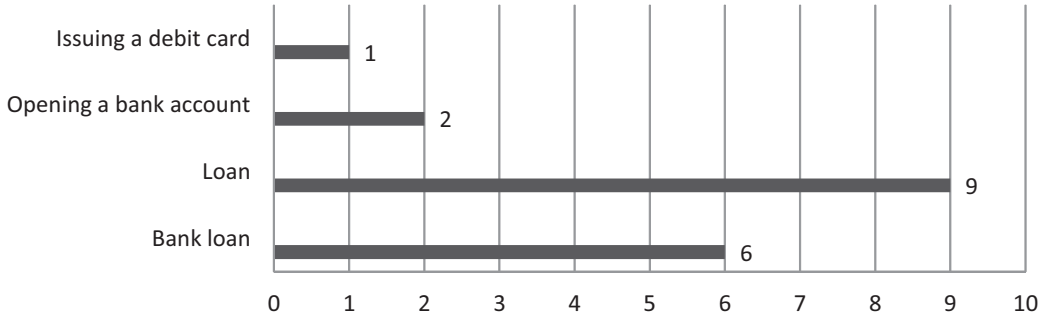

Fig. 1. Services refused by a cooperative bank (*N*)

Source: Study based on own research.

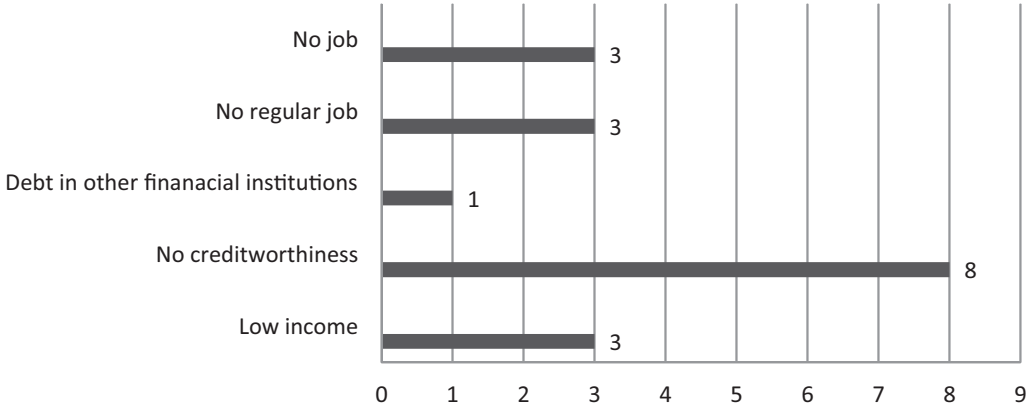

Fig. 2. Reasons for refusal from the bank (*N*)

Source: Study based on own research.

(8 indications). The percentage of refusals to grant a loan is undoubtedly related to the fact that banks and many financial institutions check the credibility of the client in the Credit Information Bureau. On this basis, they assess creditworthiness.

Cooperative banks try to compensate difficulties in reaching bank branches, costs related to the use of traditional banking services, with the offer of non-cash services. Banks encourage clients to use payment cards, ATMs and electronic banking, in order to limit the phenomenon of financial exclusion.

Fifty-nine surveyors declared using electronic banking services offered by cooperative banks. This represents approximately 45% of the responses given (Table 5). A high percentage (50%) of surveyed clients of the surveyed banks does not use such services. The results indicate that many clients still have concerns about electronic channels of access to banking services. The most skeptical about modern solutions are retirees and pensioners (90% of respondents do not use this

Table 5. Using electronic banking services at cooperative banks

Specification	*N*	%
Yes	59	44.7
No	66	50
Bank does not offer such services	4	3
Total	129	97.7
No data	3	2.3
Total	132	100

Source: Study based on own research.

form) and people living in rural areas (67% from this group gave a negative answer) [own research].

CONCLUSIONS

The results of the conducted research indicate that a small percentage of cooperative bank clients were refused to provide a banking service. These situations most often concerned men living in rural areas and running a farm or being physical workers. Among persons excluded financially, free persons prevailed. The clients were most often refused a loan or a bank loan. The reason could be low creditworthiness resulting from the lack of regular income or failure to meet previous obligations or overly optimistic assessment of the financial situation of own household.

Cooperative banks try to popularize non-cash products among clients, which are cheaper than traditional services. Unfortunately, many clients still do not use this channel to access banking services. The reason may be the conservative mentality of clients expressed through the reluctance to modern banking solutions and concerns related to the security of transactions in electronic access channels.

The following conclusions were made on the basis of the conducted research:

1. Cooperative banks have a very important role in the distribution of banking services in small towns and in rural areas. Without them, the level of financial exclusion in Poland would be much higher, because cooperative banks are often the only financial institution located in less urbanized areas, where the degree of banking is much smaller than in larger agglomerations.
2. In order to limit financial exclusion, it is also important to overcome psychological barriers related to lack of trust in electronic channels of banking services distribution and high level of cash cultivation in rural areas. Educational initiatives undertaken by cooperative banks may be very important in this matter.
3. Skillful building of relations through the personalization of service is an element of advantage of cooperative banks. It also affects the limitation of financial exclusion, and in the broader context of social exclusion.

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PRZECIWDZIAŁANIE WYKLUCZENIU FINANSOWEMU JAKO ASPEKT ETYCZNY DZIAŁALNOŚCI BANKÓW SPÓŁDZIELCZYCH W ŚWIETLE BADAŃ WŁASNYCH

STRESZCZENIE

Głównym celem opracowania jest zaprezentowanie opinii klientów na temat etycznych aspektów działalności banków spółdzielczych w kontekście ograniczania wykluczenia finansowego. Autorka próbuje odpowiedzieć na pytania: czy klientom odmawiano świadczenia usług bankowych, jakie były przyczyny tej odmowy, czy banki spółdzielcze oferują usługi bankowości elektronicznej w celu ograniczenia wykluczenia finansowego. Podstawą empiryczną problematyki poruszonej w artykule są studium literatury przedmiotu oraz wyniki badania ankietowego przeprowadzonego wśród 132 klientów wybranych banków spółdzielczych. W opracowaniu przyjęto założenie, że klienci wykluczeni finansowo to osoby, które mają ograniczony dostęp do produktów i usług oferowanych przez banki spółdzielcze. W celu opracowania wyników badania wykorzystano następujące metody: wskaźniki struktury i test zgodności χ^2. Na podstawie wyników przeprowadzonego badania sformułowano ogólne konkluzje. Niewielki odsetek klientów badanych banków spółdzielczych napotykał trudności w dostępie do usług bankowych. Wykluczani finansowo klienci to najczęściej mężczyźni stanu wolnego, zamieszkujący tereny wiejskie, prowadzący gospodarstwo rolne lub będący pracownikami fizycznymi. Usługi bankowości elektronicznej nie cieszą się zbyt dużą popularnością wśród klientów banków spółdzielczych, trudno więc wskazać wpływ obrotu bezgotówkowego na poziom wykluczenia finansowego klientów tych instytucji.

Słowa kluczowe: wykluczenie finansowe, etyka biznesu, banki spółdzielcze, klienci

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THE ARMED FORCES OF THE REPUBLIC OF POLAND AS AN EMPLOYER IN MODERN LABOUR MARKET IN OPINION OF SOLDIERS AND MILITARY STAFF

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ABSTRACT

As an employer, the Armed Forces of the Republic of Poland (AF RP) engage in modern market competition to win over the professional service recruits and military staff. Search and retention of properly trained personnel may help the Polish armed forces to carry out their tasks in efficiency way. The article shows the selected results of the pilot survey dealing with the image of the armed forces as perceived by the soldiers and the military employees. The survey has been carried out as an opinion poll to identify the attributes of the AF RP as an employer and to determine significance of these attributes for the soldiers and the military employees. Results of the survey indicate that the attributes that make the Polish army stand out as an employer at the labour market include: stable employment, professional development opportunities, teamwork orientation, challenges and high demands from the organisation members, relatively high remuneration, and sense of mission in striving to be useful to the society.

Key words: attributes of employer, labour market, military units

INTRODUCTION

Changes in close and further surrounding of the Armed Forces of the Republic of Poland (AF RP) condition goals and tasks ahead of them. Achieving them requires i.a. searching the job market to find proper candidates to take up military service and work, and to develop skills of the soldiers and the army employees. To attract them, the AF RP compete with other employers, which makes personal policy and promotional actions the potential key factors affecting the image of the armed forces in society and determining interest in working for the army. In the selection process and during professional career candidates for soldiers and the army employees and soldiers in service compare traits of the armed forces and their attractiveness against other employers. Some of the military traits attributed to the army reflects the specific nature of this organisation, i.a. discipline and close hierarchy, centrally set standards and rules, necessity to follow certain pattern of behaviour. The other ones shape as a result of the armed forces interacting with the surrounding, including evolution of concepts, methods and techniques of management affecting efficiency of their actions and are a consequence of technical and technological progress through which the previous methods of working for an organisation are transformed.

As pointed out by Jabłońska-Wołoszyn attracting and keeping employees is a huge challenge for an organisation, since employees are becoming more and more aware of their needs and raise high demands for employers [Jabłońska-Wołoszyn and Piotrowska-Trybull 2017]. At the same time public and private organizations wanting to achieve success need to realise

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that employees' potential is its essential determinant. Therefore, human resource management activities may significantly improve effectiveness of the armed forces and increase appeal of this organisation at the job market, which is especially significant in the context of resigning from obligatory conscription.

The human resources management in the armed forces source literature puts emphasis on the issues of: diagnosis of leadership cadre and general staff professional preparation [Tomaszewski 2016], ethical problems of actions by leaders and managers [Szulc and Mazurek 2012], improving the processes of human resource management in the Armed Forces [Jabłońska-Wołoszyn 2016], evolution of personal function in the armed forces [Sirko 2013], officers professional satisfaction [Majewski 2016], professional development of leadership cadre [Majewski 2013], cadre reconversion [Kościelecki 2010], the armed forces image politics [Kurek 2016], material conditions of professional soldiers [Orzyłowska 2010], role of the army at local job market [Sirko and Piotrowska-Trybull 2013]. There is no comprehensive approach to issues dealing with place and role of the armed forces at the modern job market, hence the author's intention to tackle this subject in this article.

In light of the above, the goal of the studies was to identify the armed forces' traits as an employer and to determine their meaning for soldiers and military employees.

When trying to identify traits of the Armed Forces of the Republic of Poland as an employer, references were made to the motives of taking up a job in the military, conditioned i.a. by images of the army, work and service conditions in this organisation, shaped under the influence of experiences and interests. Other sources of references were experiences of the soldiers and the army employees acquired through participation in actions of this organisation as the armed forces. The following research inquiry was assumed as the main issue: Which attributes make soldiers and the army employees see the AF RP as an employer at the modern job market and what is their significance for the surveyed?

To conduct the studies, the following research hypothesis was formulated: among the attributes that make soldiers and the army employees see the AF RP as an employer a large significance is assigned to work stability, team work, high demands, professional challenges and mission-based actions. These attributes affect the appeal of the armed forces and potentially increase the interest in professional service and working for the army. Different significance of specific attributes depends on many variables, which include: belonging to a group (of soldiers or the army employees), job and service seniority, type of corps (soldiers), education, place of residence and post held.

Qualitative and quantitative methods allowed to achieve the goal and solve the research issue. Opinions of the soldiers and the army employees were obtained using the diagnostic survey method through a questionnaire, allowing to get a more thorough understanding and draw up a better description how the Armed Forces of the Republic of Poland are perceived as an employer. The questionnaire was drawn using two measurement scales: nominal and ordinal. The closed questions ranking of the answers according to a given criterion (significance and degree of agreement with a statement) were predominant. Moreover, the questionnaire included half-opened questions with a possibility to fill in an answer by a respondent allowing to diversify the research material. The results were statistically significant at the level of $\alpha = 0.05$. Chi-squared test was used to verify the statistical hypotheses.

The pilot study was conducted by Piotrowska-Trybull et al. [2017] in two groups. The first one included 101 soldiers who participated in the courses of the War Studies University in March 2017. The second group included the soldiers on duty in the 11th Mazovian Artillery Regiment in Węgorzewo and military workers of this regiment, 145 respondents in total. The study in the second group was conducted at the verge of March and April 2017. Selection of the respondents was purposeful. In the case of the regiment, the size of sample: higher and lower ranking officers, non-coms and career privates was determined proportionately to their participation in the unit structure. Excel and Statistica were used to analyse the collected material.

The respondents included 36 women, 202 men, 8 study participants did not state their gender. As far as corps distribution is concerned, there were 70 higher ranking officers, 38 lower ranking officers, 33 non-coms, 80 career privates and 25 civilian employees (to

simplify the descriptions the army employees were also included among corps). Share of 47.1% of the participants held leadership and managerial posts. As far as job and service seniority in the military is concerned, the greatest number of respondents served and worked in the army for more than 16 years (40.6%), followed by 5–8 year tenures (22.4%) and the respondents with job seniority of up to 4 years – 16.6%. The respondents with 9–12 year seniority constituted 12.2%, whereas the number of persons within the range of 13–16 years of job seniority was the smallest. Most of the study participants had higher education 55.3%, followed by the secondary one – 27.2%, junior high – 6.5%, post-secondary – 5.3% and basic vocational – 2.4%.

MOTIVES FOR TAKING UP WORK IN THE ARMY

The study was initiated by specifying the motives viewed as an internal state of stimulus to take up action leading to satisfy a need [Koziński 2003], which were, to the highest extent, responsible for the respondents' decisions to select the armed forces as an employer. Their attributes, used as guidelines by the respondents when making decisions on starting up work or service in the army, indicate significant traits and values from the perspective of potential workers, worth to be strengthened and emphasised when competing over candidates on the job market.

The respondents paid highest attention to: employment certainty (81.3%), interest in the army (67.8%), possibility of promotion (63%), relatively high salary and other privileges (60.9%) – Table 1. It needs to be pointed out that the motive in the form of employment certainty when selecting an employer was also stressed in other studies [Piotrowska-Trybull 2016]. The less importance was applied to: the army financing courses and trainings improving professional development (57%) and possibility to check yourself in difficult situations and work in a team – 52% in both of the cases.

There was an average co-relation between the employment certainty variable and place of permanent residence [Góralski 1987]. The respondents in rural areas and in cities up to 50,000 citizens more often than others indicated that this motive was important or very important for them. A similar dependency was also found between employment certainty and education. Respondents with secondary and higher education stressed this motive as important and very important more often.

The variable of interest in the army as a motive of choosing the military service and work was co-related with acquiring knowledge and information on the army from books and web sites devoted to this subject, during the open days held by a military unit and from family members who serve or work in the army (average co-relation). Thus, independent knowledge

Table 1. Motives of taking up work in the army (respondents' replies in %)

Motives	Scale				
	1	2	3	4	5
Prestige of a military unit as an employer	53.25	15.45	15.04	8.54	4.07
Employment certainty	1.22	3.66	13.01	37.80	43.50
Possibility to check yourself in difficult/stressful situations	4.07	8.94	33.33	37.40	15.04
Possibility to work in a team/group	3.25	8.94	32.52	42.28	10.57
Financial support of professional development by a military institution	6.50	10.16	26.02	41.06	16.26
Chances for promotion	7.72	8.13	20.73	41.46	21.54
Relatively high salary and other privileges	8.54	6.91	22.76	39.84	21.14
Interest in the army	5.28	9.76	17.48	43.50	23.58
Family traditions	27.24	20.33	23.58	20.73	7.32
Chance	53.25	15.45	15.04	8.54	4.07

Scale from 1 to 5, where: 1 – unimportant; 2 – of little importance; 3 – of average importance; 4 – important; 5 – very important.

Source: Own study based on the conducted studies.

acquisition and contacts with persons involved in working for the army were significant channels to obtain information for such individuals. The least important motives when selecting the army as an employer were: prestige of a unit (67.8%), family traditions (47.5%) and chance (67.8%).

It is worth to underline that in the studied group the prestige of a military unit was seen as important and very important motive for selecting an employer by a small amount of respondents, however, the army is enjoying a good opinion in the public eyes. The results of 2015 studies by the Public Opinion Research Center (CBOS) show that 69% of Poles express positive opinions on the army and 4% – negative [CBOS 2015].

ATTRIBUTES OF THE ARMY AS AN EMPLOYER

To find out about the respondents' opinions on the Armed Forces of the Republic of Poland as an employer and their attributes, the respondents were asked to rank specific categories regarding i.a.: manners and instruments of motivating, possibility to strike balance between professional and personal life, professional development, preparation to carry out tasks and the skill set required to do so, cooperation with society and in international structures and being proud of belonging to the military formation.

The greatest number of the respondents, to a large and a very large extent, agreed with the statement that work in the army is stable and secures well-being of a family (73.5%). In turn, close to 11% of the surveyed disagreed with this statement or agreed with it only to a small extent. A relatively significant role of the army at a local job market, especially in smaller municipalities, is also confirmed by results of other studies [Sirko and Piotrowska-Trybull 2013].

In the context of job market and payment conditions (amount of remuneration and endowment) the respondents referred to the issues of their competitiveness in comparison to salaries in other professions. Around 49% of the surveyed agreed, to a large and a very large extent, with the statement that the army

Table 2. Army as an employer as viewed by the respondents (selected aspects in %)

Army attributes	Scale				
	1	2	3	4	5
Working for the army is stable – secures well-being of a family	2.44	8.54	15.04	45.93	27.64
The army raises high demands towards its employees/persons on duty	3.66	9.76	23.98	43.09	19.11
The army offers competitive remuneration in comparison to other professions	10.57	11.38	29.27	35.77	13.01
Work conditions in a military unit (material and non-material are attractive)	6.10	15.45	34.15	34.55	9.76
Working for a military unit allows to reconcile professional responsibilities with the domestic ones	8.54	23.17	28.05	28.46	11.38
Belonging to the army formation brings in the sense of pride	2.85	8.54	27.24	42.68	18.29
The army takes care of professional development its employees	12.60	15.04	34.96	29.27	7.72
Military institution employees/persons on duty are prepared to carry out tasks in international structures	6.50	25.20	38.21	24.39	5.28
Cooperation of the army with non-governmental organisations, authorities and citizens is crucial to build common welfare	3.25	6.50	28.86	41.46	19.92
Everyday work of a soldier/an employee is aimed at meeting the challenges faced by the army	2.85	11.79	36.59	35.77	13.01

Scale from 1 to 5, where: 1 – I do not agree; 2 – I agree to a small extent; 3 – I agree to an average extent; 4 – I agree to a large extent; 5 – I agree to a very large extent.

In some of the lines the values do not sum up to 100% due to the insufficiencies amounting from 0.41 to 1.21% in specific categories.

Source: As in Table 1.

offers competitive salary, in comparison to 11% declaring that they do not agree with the statement or agree with it only to a small extent.

There is an average co-relation between the remuneration competitiveness variable and the permanent place of residence variable (R = 0.39). The respondents coming from smaller towns more often agreed with the statement about the competitiveness of remuneration offered by the army. Moreover, there is an average co-relation (R = 0.38) between the variables remuneration competitiveness and job seniority and the strong co-relation between the variables remuneration competitiveness and the respondents belonging to specific corps (R = 0.52). The respondents with shorter tenures more often agreed, to a large extent, that salary in the army is competitive, whereas the respondents with longer tenures more often indicated that the level of remuneration competitiveness is average. When running an analysis of remuneration competitiveness in terms of corps represented by the respondents, it is worth to point out that the army employees disagreed with the statement that remuneration offered by the army is competitive compared to other professions or agreed with it to a small extent. At this point it is worth to note that although the level of remuneration in the army may be attractive at the beginning of work, it does not change essentially along the years of work, no matter its effectiveness. The higher and lower ranking officers the most often indicated that the agree with this statement to an average extent and the career privates more often underlined that they agree with it to a large and very large extent.

The respondents also assessed the conditions of work in a military unit, which are one of the essential elements affecting efficiency and involvement of the employees in work and exert an influence on evaluation of an employer. Referring to the motivating theory by Herzberg, work conditions are one of the hygiene factors, and their insufficient level is the source of dissatisfaction with job [Przybyła 2003]. Replies of the respondents regarding attractiveness of job conditions in a unit were analysed in terms of corps they represented and job seniority. The statement that job conditions in a unit are attractive was agreed with most often by the career privates, more than half of them declared that they agree with such a statement to a large or a very large extent. Higher and lower ranking officers most often indicated that they agree with it to an average and to a large extent, while the non-coms – to a large extent. Contrary opinions were expressed by the army employees, with 64% of them declaring that they disagree with the statement or agree with it only to a small extent (strong co-relation R = 0.50) and when referring to job seniority, it is worth to point out that the soldiers and employees whose job tenure amounted up to 8 years most often indicated that they agree with the statement to an average and to a large extent. At the same time the respondents with job seniority of more than 16 years agreed with the statement to a large extent in 32% and to an average extent in 41 % (average co-relation R = 0.32).

Among the respondents 62% agreed, to a large and a very large extent, with the statement that the army raises high demands towards its employees and persons on duty. The variable of high demands towards employees and persons on duty was co-related with the variable of attractive job conditions in a military unit (average co-relation R = 0.46).

One of the factors deciding on whether a profession is perceived as attractive or not is the possibility to reconcile professional and domestic duties. This aspect is shaped by organisational solutions, including work time management resulting from complexity of specific tasks and their number and tools available at a job post. It is also affected by professional skills determining possibilities to carry out the assigned tasks within specific time frames, place, ensuring specific quality and using allocated resource. Among the respondents, close to 40% agreed, to a large and a very large extent, with the statement that the army creates conditions allowing reconciliation of professional and domestic duties, ca. 29% stated that they agree to an average extent, 23% to a small extent, and 8.5% disagreed.

Possibility to reconcile professional and domestic responsibilities was co-related with gender (average co-relation R = 0.31). More than half of women (64%) and 36% of men claimed that working/service in the military allows to reconcile these responsibilities. Altogether close to 40% of the respondents agreed, to a large and a very large extent, with a statement that working for the army makes it possible to maintain

life balance. It is also worth to emphasise that 16.6% of women and 33% of men stated that reconciliation of duties is possible to a small extent or impossible. A relatively high percentage of the surveyed claiming that the army does not create conditions allowing reconciliation of duties may result from the service nature i.a. working outside a place of residence, high availability requirement, tasks complexity.

Accounting for the conclusions from the studies formulated by Kieżun regarding the own work organisation by a manager [1997], the opinions on how soldiers and military employees at leadership/managerial posts reconcile their duties in comparison to persons occupying specialist and administrative positions were investigated into. In this case, there was a weak co-relation between the variables (R = 0.29). Among the persons at managerial posts, close to 30% stressed that reconciliation of responsibilities is impossible or possible to a small extent, another 33% claimed that it is possible to an average extent, and 27% declared that it is possible to a large and a very large extent. In the group of respondents with non-managerial posts 24% stressed that reconciliation of responsibilities is impossible or possible only to a small extent, 23% stated that it is possible to an average extent and more than half claimed that work and service in the army allows to reconcile their duties to a large and very large extent. Results of the studies allow to suppose that the persons at leadership and managerial posts find it slightly more difficult than other respondents to strike balance between career and private life. It is also worth to point out a co-relation between the variable of being employed in the army allows to reconcile responsibilities and job and service seniority (R = 0.44). Close to 60% of the respondents whose job seniority was up to 8 years stated that reconciling responsibilities is possible to a large and a very large extent. Whereas 17% the persons with more than 16 years of seniority gave such an answer and 47% stressed that it is impossible or possible only to a small extent – therefore, the longer the tenure in the army, the harder is to reconcile different responsibilities, which may be associated with the fact that the persons with more than 16 years of seniority occupy important posts and time-consuming positions, which may make it difficult to fulfil their responsibilities.

A co-relation was also found between the level of education and possibility to reconcile responsibilities (R = 0.42). Among the respondents with higher education 38% stressed that reconciling responsibilities is possible to a small extent, in comparison to 27% of those who claimed that it is possible to a large and very large extent. Whereas the respondents with junior-high and basic vocational education saw the possibility to reconcile these responsibilities to a small or very small extent, 18.7 and 0.0%, respectively. It may be assumed that the higher the education of soldiers and the army employees is, the more complex and numerous their tasks become, requiring them to devote more time for work and, at times, less time for families. Moreover, a co-relation was noted between the respondents' town size and opinions on possibility to reconcile professional and domestic responsibilities (average co-relation R = 0.43). The respondents from villages and towns of up to 20,000 citizens more often than others stressed that work in the army allows them to reconcile responsibilities to a large and very large extent, 64 and 46% respectively. The more populated the town of the respondents was, the more often they chose the answer – to a small or very small extent.

Another key issue in the context of employer's attractiveness is supporting development of employees. One of the forms of supporting development are the trainings, which bring qualified employees to an organisation, thus increasing its efficiency, and raising their self-esteem. As stressed by Majewski, in the case of soldiers professional development is not aimed at generating economic values, it rather "allows to achieve the assumed goals more effectively, making actions more beneficial in terms of praxeology" [2013]. Share of 37% of the respondent stated that the army takes care of professional development of its employees to a large and a very large extent, while close to 28% of the surveyed claimed the opposite and the remaining ones assessed this support as average.

When analysing responses of men and women, it is worth to notice that a similar percentage of them (27% in both groups) claimed that they disagree with this statement or agree with it only to a small extent. None of the women stated that the army takes care of

professional development to a very large extent and ca. 8.5% of men provided such an answer. In turn, taking into consideration the corps affiliation, it was discovered that the army employees (40%) more often than others declared that the army does not take care of their professional development or that it takes care of it only to a small extent. Non-coms split their opinions – 30% stated that the army takes care of their professional development to a small extent and 40% of them found this extent as large.

Higher and lower ranking officers and career privates most often chose the answer that the army takes care of soldiers' professional development to an average extent – 45.7, 39.4, 34.2% respectively. Opinions on the army taking care of professional development of its employees were co-related with job seniority (average co-relation $R = 0.34$). Among the respondents with 9–12 year tenure in the army, 60% claimed that the army takes care of professional development of employees to a large and a very large extent. A close, yet slightly lower, level of indications was noted among the respondents with job and service seniority spanning from 5 to 8 years (48%). Whereas the respondents with service seniority from 13 to 16 and over 16 years disagreed with this statement or agreed with it to a small extent – in 31 and 30% respectively. At the same time the share of statements that the army takes care of professional development to a large and a very large extent was 30 and 27%. Considering the above results, it is advisable to find out what is the manner and what are the tools of taking care of professional development of the cadre or what is the manner of emphasising the actions taken up in the army to counteract dissatisfaction. A balanced share of those who assess the army positively and negatively in this respect may lead to decisions of leaving the army, resulting in loss of knowledge and skills [Dziwniel and Wykrotka 2016]. Moreover, the results of studies indicate that ca. 27% of the respondents with higher education agree with this statement to a small or very small extent, and 40% claim that the army takes care of cadre development to an average extent.

It is worth to consider what makes the respondents feel proud from belonging to the Armed Forces of the Republic of Poland. One of the possible answers is the awareness of working for the common well-being. More than 60% of the surveyed agreed, to a large or very large extent, with the statement that cooperation of the army with non-governmental organisations, local authorities and citizens is crucial for generating common well-being – security – which is an overriding goal of human activity, determining conditions of life and development [Kuriata 2016]. Almost 10% of the respondents disagreed with this statement.

CONCLUSIONS

The results of the analyses allowed to draw up the attributes used by the study respondents in their perception of the Armed Forces of the Republic of Poland as an employer. Preliminary significance of these attributes for the respondents was also determined, both at the stage of taking up jobs and service in the army and in association with experiences stemming from at least a-couple-of-year tenures in the AF RP. The hypothesis formulated in the introduction was verified positively with reference to the studied group. At the stage of selecting an employer and collecting work and service experience the following attributes were indicated as the ones important for the respondents and making the army stand out at the modern job market:

- job stability, which in the eyes of the surveyed plays an important role in ensuring the sense of security;
- professional challenges and high demands that enable professional development, competing rivalry and checking yourself in difficult situations;
- team work based on trust and shared responsibility of its members and belonging to the formation that gives the sense of pride;
- sense of a mission surfacing as striving to be useful in a society.

Other noteworthy attributes stressed by the respondents included: possibility to maintain balance between professional and private life, remuneration competitiveness, attractive job conditions, professional development support. Importance assigned to these attributes depended on work and service seniority, level of education, affiliation with a group of soldiers and the army employees. For instance, with reference to the trait of striking balance between professional

and private life opinions of the respondents depended on the types of posts held, participation in missions, education and gender of the respondents. Whereas the opinions on remuneration competitiveness were co-related with a place of respondent's residence, job seniority, affiliation with a group of the army employees or soldiers.

The above deliberations concern only the studied group. Their generalisation at the current stage of works is not possible, since this group is not representative. However, preliminary identification of dependencies is a stimulus for further studies dealing with role and place of the armed forces at the job market in the context of attributes making this organisation stand out and its attractiveness in comparison to other employers. It might also turn out useful at the stage of forming proposals of changes in the sphere of human resource management aimed at attracting valuable candidates to the organisation and to keep them in its ranks to ensure efficient performance of tasks by the armed forces.

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SIŁY ZBROJNE RZECZYPOSPOLITEJ POLSKIEJ JAKO PRACODAWCA NA WSPÓŁCZESNYM RYNKU PRACY W OPINII ŻOŁNIERZY I PRACOWNIKÓW

STRESZCZENIE

Siły Zbrojne Rzeczypospolitej Polskiej jako pracodawca konkurują na współczesnym rynku pracy o pracowników do służby zawodowej oraz wojska. Poszukiwanie oraz utrzymanie odpowiednio przygotowanego personelu ma umożliwić sprawną realizację przypisanych im zadań. W artykule zaprezentowano wybrane wyniki badania pilotażowego w zakresie postrzegania sił zbrojnych jako pracodawcy, przeprowadzonego z wykorzystaniem metody sondażu diagnostycznego. Celem badania było zidentyfikowanie atrybutów sił zbrojnych jako pracodawcy oraz określenie znaczenia tych atrybutów dla żołnierzy i pracowników cywilnych wojska. Wyniki badań wskazują, że do atrybutów, które wyróżniają wojsko jako pracodawcę, można zaliczyć: stabilność zatrudnienia, możliwości rozwoju zawodowego, zespołowość, wyzwania oraz wysokie wymagania wobec członków organizacji, stosunkowo wysokie wynagrodzenie, a także poczucie misji przejawiające się w dążeniu do bycia użytecznym w społeczeństwie.

Słowa kluczowe: atrybuty pracodawcy, rynek pracy, jednostki wojskowe

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DETERMINANTS OF LOCAL DEVELOPMENT STRATEGIES

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ABSTRACT

The article seeks to specify the extent to which municipal development strategies form the basis for municipality development and what determines these strategies and development processes at the local level. It discusses the following issues: the nature and objectives of local development strategies, characteristics of the development strategy in the Stara Błotnica Municipality in the Mazowieckie Voivodship, and the determinants of the municipality's local development strategy. The considerations herein suggest that the foundation for actions and the use of its resources is provided, on the one hand, by its multifunctional development and, on the other, by sustainable development, relying chiefly on its resources and support from various aid funds, in particular the European Union funds. The municipal development path is set in line with the socio-economic policy implemented by higher levels, namely the EU, Poland, the Mazowieckie Voivodship and the Białobrzeski District. Task performance requires financial outlays that exceed the municipality's budget, which proved to be a barrier to full implementation of the strategy. The article was prepared on the basis of related literature as well as documents and materials concerning the Stara Błotnica Municipality in the Mazowieckie Voivodship.

Key words: municipality, strategy, development, determinants

INTRODUCTION

Socio-economic transformations taking place in Poland since the 1990s have aroused interest in local development strategies. This is reflected as strategies for the development of municipalities, groups of municipalities, districts, etc., that specify their development path. Strategy implementation contributes to the change of the functional structure of an area, yet no widespread success of municipalities and districts can be spotted in structural changes or improvement of living and working conditions of their inhabitants. Neither are subsequent updates of these strategies always instrumental to the progress in this respect. Therefore, questions arise regarding the determinants of local development strategies, at the stages of both preparation and implementation. These make up the content of this article.

The following issues are analysed in the article: the nature and objectives of local development strategies, characteristics of the development strategy in the Stara Błotnica Municipality in the Mazowieckie Voivodship, and the determinants of the municipality's local development strategy. The study seeks to specify the extent to which municipal development strategies form the basis for municipality development and what determines these strategies and development processes at the local level. The aim hereof is primarily cognitive, based on related literature and documents regarding the functioning of the municipality in question. The foundation for considerations was provided by data processing methods, i.e. analysis and synthesis. The

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considerations are mainly made at the local (municipal) level, combined, however, with higher levels.

THE NATURE AND OBJECTIVES OF LOCAL DEVELOPMENT STRATEGIES

The local scale comprises a specific area limited by spatial coverage and separated from the environment, including – as in Poland – a municipality, a group of municipalities or a district. For its constituent parts (e.g. cities or villages), it is a system designed for the implementation of specific social, economic and environmental objectives and tasks, as well as having production resources and intellectual capital, including investment expenditures, for these purposes. In turn, development is a process of positive changes encompassing quantitative growth and qualitative progress that upset the existing balance. Therefore, this development should be integral, integrated and sustainable. A local strategy is a set of objectives and tasks of a given community and major organisational projects to be implemented within a specific timeframe and defining actors and instruments for their implementation [Adamowicz 2003, Wiatrak 2011, Lusawa 2012, Blakely and Leigh 2013]. It should be stressed that economic development lays the foundations for development in other fields, hence creating and stimulating the former should underlie the activities of territorial governments that create material conditions for developing other domains [Rakowska 2017]. This approach is reflected as local development strategies combining various spheres of activity and their determinants [Wiatrak 2011].

A strategy contains at least the following elements [EU 2013]:

- a description of its objectives and their hierarchy, including target outcomes;
- an action plan showing how objectives translate into actions;
- a description of solutions for strategy management, monitoring and evaluation;
- a description of community involvement in strategy development;
- a financial plan.

A strategy is a comprehensive programme defining all levels of the local system and organising activities within these levels. It covers the entire functioning of a territorial unit, setting the future directions for action, including the scope of changes, and delineating the conditions and tools for action implementation. This is mirrored in strategy objectives that most often encompass the following areas of action [Szewczuk et al. 2011]:

- restructuring and diversification of business activities;
- economic growth and development of the services sector, with new jobs, lower unemployment, increased demand for offered products, etc.;
- technological development and implementation of innovations;
- development of institutional infrastructure and social resources supporting the development of the area;
- qualitative changes in the natural environment through building green infrastructure and eliminating threats to the environment;
- improving the welfare and quality of life of the population through income, working conditions, housing, etc.;
- increasing social and professional mobility through retraining, entering new professions, etc.;
- developing a positive image of the area through actions listed above as well as cooperation of the local community.

Each area has its own hierarchy of objectives and tasks corresponding to existing capacities and expectations as to a specific range of changes and development. Capacities are determined by the resources possessed by a territorial unit but also by external resources (such as loans, leasing, aid funds, etc.) that it can obtain for its development programmes. Nevertheless, expectations arise from the adopted strategy objectives and prepared development programmes. In order for the expectations to be satisfiable, a balance needs, however, to be ensured between them so that the actions resulting from the strategy are realistic. It should be highlighted that although it is the resources possessed that form the basis for local strategies, their activation depends on the activity of the territorial unit managers, their attitude expressed as the quest for changes and determination of transformation paths. What should also be taken into account is the activity of the local population in this respect, in particular that

of leaders and local action groups (LAGs) supported in the EU Member States. Local action groups are involved in developing the capacity of local actors to devise and implement community-led strategies and manage projects under these strategies [EU 2013]. Nonetheless, successful implementation of LAG strategies hinges on their consistency with the strategies of municipalities and districts.

Local development factors are both internally and externally diverse, namely they are closely related to a specific area but also to a region and the country. The following factor groups should be first and foremost taken into consideration [Warczak 2015]:

- economic factors: labour resources, natural resources, fixed assets, size of the internal market, etc.;
- social factors: demographic and occupational structure of the local population, population growth, migrations, education and training, healthcare, cultural values, promotion of culture, traditions, customs, development of tourism, sports, etc.;
- technical and infrastructural factors such as: infrastructural facilities, innovation level of the economy and its products;
- environmental factors: appropriate management of the natural environment and its resources, actions to reinforce environmental sustainability, etc.;
- political and systemic factors, i.e. the nature of government and the scope and manner of governance, the level of its acceptance by the public, applicable legal rules and regulations, international relations, etc.;
- spatial factors such as: location factors, concentration factors, cooperation with other areas and local communities, etc.;
- local factors: understood as the social capital, including the development of self-governance, development of initiatives, development of social activity, cooperation for development, etc.

Each area (municipality, district, and so forth) must itself ensure drivers for its own opportunities and conditions and for those that are created by the environment. How these opportunities will be seized depends primarily on the institutional environment of the area and its attitude towards development. On the one hand, formal institutions involved in the operation of territorial units and their development activities in the existing legal system should be taken into account. On the other hand, what should be considered is also informal institutions such as tradition, established behavioural patterns, value system, and the like [Wilkin 2016]. Both groups of institutions are important, so they should be mutually reinforcing stimulants of development (e.g. a value system fostering entrepreneurial activities undertaken by municipal authorities).

THE STARA BŁOTNICA MUNICIPALITY DEVELOPMENT STRATEGY

The preparation of the strategy of the examined municipality commenced with the SWOT analysis defining the conditions for the functioning and development of municipalities and forming the basis for individual strategic provisions. Along these lines, a mission was devised for 2004–2019, reading: "The Municipality of Stara Błotnica is environmentally clean and oriented towards food production using environmentally friendly methods. The Municipality also develops small and medium-size enterprises providing jobs outside agriculture. Social and technical infrastructure fully meets the needs of its inhabitants. Stara Błotnica is a safe municipality that eagerly welcomes pilgrims visiting the Shrine" [Urząd Gminy Stara Błotnica 2004]. The mission was worded similarly in the Development Programme for 2015–2020, indicating that "The Municipality of Stara Błotnica aims to create opportunities for its inhabitants to develop on a multi-faceted basis by making full use of its potential. This development will concern both the social sphere (through enhancing the quality of public services, the aesthetics of the environment and conditions for various forms of activity) and the economic sphere (through ensuring an attractive investment offer enriching the local labour market)" [Urząd Gminy Stara Błotnica 2015].

The mission as the main objective of the strategy was elemental for defining strategic goals as presented in the table. In both cases, the mission was formulated broadly, descriptively specifying the character of the municipality and the lines for action. Actually, it is the information about the municipality indicating the basic branch of activity: agriculture and additional non-agricultural activities. It is simultaneously a declaration that the municipality cares about the living

and working conditions of its inhabitants through the development of infrastructure and intellectual capital. Strategic goals were worded in a similar manner and were largely declarative, especially in the first document. They target the essential spheres of the municipality's functioning, namely the economic, social and environmental spheres where conditions are planned to be created for their better performance through development, education and promotion.

The spheres addressed by strategic goals do not raise any objections as they result from the SWOT analysis pointing out the need for restructuring and development as well as solving problems that have accumulated for years, relating, in particular, to the improvement of the population's income and living and working conditions. Accordingly, a reference is made to multifunctional development combined with the development of infrastructure and human capital. The defined strategic goals of Stara Błotnica have a different status and meaning for the municipality, as reflected in individual more specific programmes, including [Urząd Gminy Stara Błonica 2004]:

1. *Agricultural development programme* that assumes increased attractiveness of agricultural crop range through the establishment of specialised farms, farms producing "healthy food", ecotourism farms, etc. To this end, the following goals were set: to prepare a report on the condition of farms and the system of agricultural restructuring, to make an analysis of the potential for establishing producer groups and to promote them, to organise training and specialist consultancy on increasing the competitiveness and profitability of farms in the municipality.
2. *Processing sector development programme* involving the establishment of processing plants using crops from the municipality and the development of the economic sector supporting agriculture. A system supporting processing activities and services for agriculture was meant to be developed for that purpose. In addition, these initiatives were to be supported by the municipal government through subsidies and allowances as well as training and consultancy in this field.
3. *Forest protection and afforestation programme* that will improve soil water regime and increase the municipality's attractiveness to tourists. Therefore, a provision was made for the development of afforestation schedules, including the withdrawal of the lowest-class soils and wasteland from agricultural use.
4. *Support programme for local pro-environmental initiatives* that raise the quality of the natural environment. Accordingly, the goal was to conceive a support plan for social pro-environmental initiatives in the municipality and to ensure that local authorities provide financial assistance for initiatives and related cooperation, as well as to offer advice on substantive matters and promote and inform about these projects.
5. *Programme for the use of nature for tourism development*, assuming the design of a project for the development of pilgrimage tourism and active recreation together with related accommodation and catering facilities, including agrotourist farms. Moreover, the need to promote the municipal tourist and agrotourist offer was indicated.

Table. Strategic goals in Stara Błotnica in 2004–2020

2004–2019	2015–2020
Stara Błotnica – agricultural and environmentally friendly municipality	To increase the quality of life of inhabitants: – to develop human and social capital – to expand and strengthen the social sphere – to develop the recreation base and culture
To improve the standard of living in Stara Błotnica	To expand and modernise technical, including energy, infrastructure
To use municipal assets for the development of entrepreneurship and tourism	Economic development: – to create conditions for economic development – to promote the municipality

Source: Own elaboration on the basis of Urząd Gminy Stara Błotnica [2004, 2015].

6. *Programme for preparing land for investment*, beginning with the analysis of the investment land currently owned by the municipality and obtainable in the future through preparing a schedule for the development of new plots for investment, and ending with the establishment of a system for informing potential buyers about the municipality's offer and its promotion.
7. *Programme for obtaining funds for the municipality development*, as the strategic goals cannot be achieved in the assumed timeframe solely with the funds from the municipality's budget. Therefore, it was planned to set up a team for obtaining external funds for the municipality development that would prepare applications for funds, in particular aid funds.

The above and other programmes cover the overall functioning of the municipality and indicate the lines for its actions. The elemental instruments for the implementation of adopted strategic goals primarily include drawn up reports and support plans, followed by advice, information and promotion. Other instruments involve subsidies and allowances in the implementation of supported projects (e.g. processing or afforestation). A range of funding sources was foreseen for the development strategy, from budgetary funds, through money from various the EU programmes and funds, to private financial resources. It should be emphasised that the studied municipality does not have sufficient own resources, hence the programme to raise funds for the municipality development was a good solution. However, raising money for development investment from external sources cannot rely only on applications for funds from the EU programmes given the constraint which is the municipality's inability to provide its own contribution. Thus, private capital and optimised asset management should be considered, as noted in recent years [Urząd Gminy Stara Błotnica 2015].

The adopted strategic programmes of Stara Błotnica result, as already mentioned, from the SWOT analysis and indicate the problems to be solved that are contained in the operational goals defined as follows [Urząd Gminy Stara Błotnica 2004]:

- development of eco-friendly agriculture and processing sector;
- economic development of the municipality;
- a municipality attractive to investors;
- tourism development;
- improved value of natural environment;
- expansion of technical infrastructure systems;
- a municipality with a strong social infrastructure base;
- a safe municipality;
- wide-scale promotion of the municipality.

The operational goals are worded succinctly, indicating in which areas the municipality will develop. These goals are essentially a repetition of the mission, but they adequately reflect the scope of municipal activities that complement one another, forming a relatively coherent agenda for its functioning.

DETERMINANTS ANALYSIS OF THE STARA BŁOTNICA LOCAL DEVELOPMENT STRATEGY

Local development strategies depend on a number of various internal and external factors with different impacts. When analysing strategic documents of Stara Błotnica, it can be concluded that the following factors had a decisive influence on the strategy.

The municipality's production resources

The mission and strategic goals of Stara Błotnica were defined following the SWOT strategic analysis, taking into account, in particular, the magnitude, uniqueness and the degree of exploitation of its production potential. Stara Błotnica is an agricultural municipality; therefore, further agricultural activities are proposed, yet with a greater focus on eco-friendly production methods. Such a choice was motivated by the possessed natural resources of a relatively high quality and with not severely degraded environment. In addition, given the location of the Marian Shrine in the municipality, the development of pilgrimage tourism was planned. Also in this case, a reference is made to usable resources – firstly, those associated with pilgrimages, secondly, with natural resources and thirdly, with an agrotourist base built in farms but primarily being an effect of rendering houses and farm buildings habitable.

Socio-economic policy

The next factor that had an impact on the development path of the studied municipality are the objectives and

development directions set forth in regional, national and international socio-economic and environmental policies that can be used at the local level. Strategic documents of Stara Błotnica refer chiefly to strategic documents of the Mazowieckie Voivodship, notably [Urząd Gminy Stara Błotnica 2015]:

- *Białobrzeski District Development Strategy for 2008–2018* (updated);
- *Development Strategy of the Mazowieckie Voivodship until 2020* (updated);
- *Development Strategy of the Mazowieckie Voivodship until 2030. Mazovia as an Innovative Region*.

It should be emphasised that the cited documents, in turn, result mainly from the socio-economic policy established at the EU and national levels, from *Europe 2020 – A strategy for smart, sustainable and inclusive growth*, through the *Strategy on Innovation and Efficiency of the Economy "Dynamic Poland 2020"*, to the *Rural Development Programme for 2014–2020* drawn up at the Ministry of Agriculture and Rural Development. At the same time, the issues included in strategic documents of Stara Błotnica are present in the *Local Community-Led Development Strategy 2014–2020* prepared by the Zapilicze Local Action Group, to which the municipality in question belongs. The integration of the objectives and directions of socio-economic, environmental, agricultural, rural policies in the local development strategy should be assessed positively. It means that it is well addressed and receives attention from the public. Different factors matter here, in particular clearly defined goals and directions but also implementation instruments such as aid and financial support programmes. In many municipalities, including the examined one, the financial factor might have been decisive for the choice of the lines for action, yet it confirms the accuracy and effectiveness of that choice.

Involvement of the local community

Strategic documents of Stara Błotnica indicate the local community involvement in their preparation. What should be pointed out here is, above all, the involvement of the municipal council, and then of people working in the municipal office and in various municipal institutions (also voluntarily, for example in the volunteer fire brigade). This activity was expressed, among others, as participation of various community groups in strategic planning workshops discussing and assessing municipal development plans. Socialisation of the preparation of the municipal development strategy, notably the openness of municipal leaders and councillors to changes in its development orientations, should be assessed positively and the dissemination of such a model of local community involvement should be encouraged. It is true that this is not a common process, but there are good chances for it to be proliferated in accordance with the diffusion-of-innovations theory.

Fashion for certain activities and projects

When examining strategic plans of Stara Błotnica, it should be noted that its development goals are similar to those in other municipalities. First and foremost, this similarity can be spotted in the creation of new jobs through entrepreneurial activities, especially in non-agricultural sectors such as tourism. These activities are to be carried out through the use of innovation and in accordance with the principles of sustainable development. The adopted actions to be implemented in the studied municipality are, on the one hand, similar to those in other municipalities and, on the other, largely result from the objectives and directions of socio-economic policy. Such a combination should be welcome if resources are provided for their implementation. Unfortunately, this is not always the case, also in the examined municipality. For example, the tasks aimed at developing the tourist function of Stara Błotnica, notably pilgrimage tourism, have been fulfilled to a small extent. It should be added that all municipalities in Poland assume the development of the tourist function without considering who will take advantage of this base. This seems to be already noticed in the studied municipality, because more attention has been paid in recent years to the recreation of its inhabitants than to inbound tourism.

Financing strategic actions of the municipality

The implementation of strategic tasks largely depends on the abilities to finance them. In the municipality in question, such abilities are mostly potential (e.g. taxes), hence it is important to analyse the real possibilities of raising funds in individual periods, and

then to compare them with planned expenditure. Stara Błotnica's own financial resources were not (and are not) sufficient to fulfil adopted objectives and tasks, which is why the use of aid programmes and projects (especially the EU funds) and private investor funds is planned. The *Programme for obtaining funds for the municipality development* was simultaneously launched, with no spectacular effect, though. Most actions were carried out under programmes and projects financed from aid funds, whereas the attraction of private investors leaves much to be desired. The task of the municipal government policy is to create a climate for investment activities that will mobilise the local population and external investors to undertake further actions. To this end, the area should be promoted and information provided on possible activities of and help from local governments, on the one hand, with financial incentives (e.g. tax credits), land preparation and development for investment, easier acquisition of land, etc., on the other [Warczak 2015].

The five groups of factors presented above influenced the development strategy of the studied municipality and its directions. It should be highlighted that these determinants were closely interrelated, underpinning the actions adopted for the municipality development. Likewise, a number of other determinants of its development, such as the improvement of the quality of life of its inhabitants, actions for its social capital and the role of such capital in the municipality development, etc., were closely related to those discussed herein.

CONCLUSIONS

The analysis of strategic documents of Stara Błotnica indicates that:

- they were prepared in line with methodological assumptions, taking into account the resources, the current state of municipality development and the opinion of inhabitants;
- the basic determinants of the municipality's development path ensue from the actions that are consistent with the national and the EU socio-economic policies, as chosen by municipal leaders (and supporting administration);
- further determinants result from the adaptation of the municipality's policy orientations to the requirements of the voivodship, district and local strategies for the exploitation of its production potential;
- the foundation for actions and the use of the municipality's resources is provided by its multifunctional development, on the one hand, and by sustainable development, on the other;
- only some sections of local communities (e.g. councillors) are strongly engaged, with no broader involvement of inhabitants that would foster the creation of social capital, thereby initiating entrepreneurial activities and contributing to their implementation;
- task performance requires financial outlays that exceed the municipality's budget, which might have proved to be a barrier to full implementation of the strategy;
- the strategy assumes too much optimism as a result of the fashion for the development of specific directions and their support and is not fully grounded in its implementation instruments;
- the strategic plan of 2015, compared to 2004, was better prepared, is more realistic, but many goals and tasks remain slogans that will be difficult to put into reality.

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UWARUNKOWANIA STRATEGII ROZWOJU LOKALNEGO

STRESZCZENIE

Celem artykułu jest określenie, na ile strategia rozwoju gminy jest podstawą jej procesów rozwojowych oraz co warunkuje tę strategię i procesy rozwojowe na szczeblu lokalnym. Na treść artykułu składają się następujące zagadnienia: istota i cele strategii rozwoju lokalnego, charakterystyka strategii rozwoju w gminie Stara Błotnica (województwo mazowieckie) oraz analiza uwarunkowań rozwoju lokalnego badanej gminy. Z przeprowadzonych rozważań wynika m.in. to, że podstawą działań i wykorzystania zasobów badanej gminy są z jednej strony jej wielofunkcyjny rozwój, a z drugiej – zrównoważony rozwój. Oba te czynniki są uwarunkowane zasobami gminy i wsparciem finansowym z różnego rodzaju funduszy pomocowych, zwłaszcza unijnych. Kierunki rozwoju gminy są zgodne z realizowaną polityką społeczno-ekonomiczną przez wyższe szczeble, tj. Unię Europejską, Polskę, województwo mazowieckie i powiat białobrzeski. Realizacja zadań wymaga nakładów finansowych przekraczających możliwości budżetu gminy, co okazało się barierą pełnego wdrożenia strategii. Artykuł przygotowano na podstawie literatury przedmiotu oraz dokumentów i materiałów dotyczących gminy Stara Błotnica (województwo mazowieckie).

Słowa kluczowe: gmina, strategia, rozwój, uwarunkowania

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THE LABOUR MARKET AS SEEN BY YOUNG WORKERS – SELECTED ASPECTS

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ABSTRACT

The Polish labour market is a dynamically changing environment. This affects the situation of the young people entering the market. In the last dozen years young people, especially those still educating, have been changing their attitudes to work. Since the mid-1990s, there has been a growing interest in higher education. This has been reflected in the fast growth of privately run higher education institutions and in the increasing number of people with degrees. The article aims to depict the situation of young people on the Polish labour market in 2010–2017. Statistics and key indicators for the labour market are used to provide a quantitative presentation of the problems discussed. In addition to this analysis, a problem-based approach is used. This article is based on an overview of the literature on the subject, as well as on technical reports and statistics taken from Polish and foreign publications.

Key words: work, graduate, education, unemployment, overeducation, transition

INTRODUCTION

Every year, a substantial number of young people enter the job market, offering their skills, knowledge, qualifications and commitment, thus supplying the labour market with new human capital. This group is highly diversified internally in terms of education, age, experience and career expectations. In the last dozen years, the labour market situation has evolved with the development of the labour market itself and, more broadly, of the entire economy. The education attainment statistics for young Poles have changed over that period. There has been a steady increase in the number of people with university degrees, from 6,408 thousand in 2010 to 8,456 thousand in 2016. However, the number of people finishing their education at any of the other four levels declined steadily compared to the previous years [GUS 2017e]. Since the mid-1990s, there has been a growing interest in higher education, which is reflected in the education attainment statistics. It has been believed for years that a university degree is more prestigious than lower levels of education and that it helps to find a good job. This is the main reason why young people have tended to stay in education and to postpone the decision to find work. As a result of this tendency, which has been continuing for a long time, university degrees have lost in value, young people are overeducated, graduates are not equipped with what they actually need to meet the need and expectations of employers, and young people's transition from education to the labour market is postponed. These processes have become established and are a major barrier to the participation of young people or graduates in the labour market. The article aims to present and analyse the situation of young people on the Polish labour market in 2010–2017. Given Poland's present economic situation, which is good, driven by factors such as GDP growth, lower

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unemployment and the fast growing number of immigrants, especially Ukrainians, working in Poland [MRPiPS 2016], the research hypothesis is that the present labour market situation of young people in Poland has improved in recent years.

MATERIAL AND METHODS

For the intended purpose of the article, two analytical approaches are employed. One approach is the use of statistics and key indicators for the labour market to provide a quantitative presentation of the problems discussed. The other approach deals with specific problems, or processes, in the labour market nowadays affecting young people in particular. These include overeducation, prolonged transition (from education to the labour market) and an unintended impact of the 500+ government scheme on the labour market [Raising Children Aid Act 2016], particularly on young women. This article is based on an overview of the literature on the subject, as well as the statistics of Eurostat and GUS.

Young people on the labour market in Poland: a quantitative approach

The people included in this study are a group aged between 15 and 34. The analysis covers years 2010–2017 (Q2). In 2017, the number of people in employment was 17,359 thousand, which included 5,933 thousand (or 34%) young people. The number of young people at work was 4,582 thousand, which accounted for 27.7% of the entire working population. They worked mostly in full-time employment, except for the youngest group (15–17 years) of 15 thousand, who worked on a part-time basis. 449 thousand people included in the study were out of work. The activity rate, the employment rate and the unemployment rate are shown in Figure 1.

It can be concluded from the above figures that people between the ages of 20 and 34 were the most active labour market participants. The employment rate was over 80%, and the activity rate exceeded 84%. In this age group, the unemployment rate was 5–4.5%. These are people no longer in the education process. The other people aged 15–19 are present on the labour market, but the figure is small (78 thousand in total), as these people were still in educational at the secondary level. Unemployment was the highest among people aged 18–19, at 25.6%, and the employment rate was low, at 8.6%. According to the statistics included in economic activity of the population, Q2 2017 [GUS 2017c], the activity rates for school-leavers and graduates aged 15–30 in Q2 2017 were as follows. The number of school-leavers and graduates at all levels of education was 385 thousand (including 21.2% who were inactive in the labour market). Of these, 166 thousand were people with university degrees, with only 14 thousand of them being inactive in the labour market. The total number included 111 thousand of people with further education or secondary vocational education qualifications. Of these, 27 thousand were inactive in the labour market. There

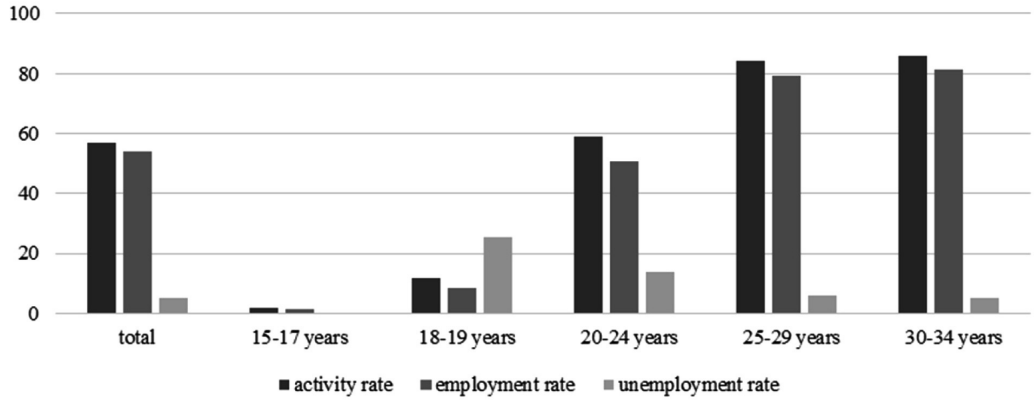

Fig. 1. Economic activity of the population aged 15–34 in Q2 2017

Source: Own elaboration based on GUS [2017b].

were 61 thousand people with general secondary education, with 25 thousand of them being inactive in the labour market. The number of people with basic vocational education totalled 35 thousand, which included 9 thousand being inactive in the labour market. The highest employment rate, at 78.9%, was among higher education graduates. This group had the lowest unemployment rate, at 13.8%. The activity rate was the highest in this group (91.6%). The lowest rates were given for people with basic vocational education. The unemployment rate in this group was 42.3% and the employment rate was 42.9%. Interestingly, the activity rate was at 74.2%. This proves that there are barriers of entry to employment for this group. For people with general secondary education, the activity rate was relatively low, at 57.4%; the employment rate was 41%; and the unemployment rate was 28.6%. People with further-education or secondary vocational education performed slightly better. The activity rate was 76.6%, the employment rate was 55%, and the unemployment rate was high (at 28.2%). The above statistics show that people with university degrees find it easier to cope on the labour market. In Poland, the drive for knowledge and easy access to educational services at the higher education level have led to a rapid increase in the number of people with university degrees (8,456 thousand in 2016). In the 30–34 age group, this number continued to grow steadily and was higher than the average figure for EU-28 throughout the analysis period. This is shown in Figure 2.

The level of educational attainment among young people is the key factor responsible for their labour market situation. In 2010, in the 30–34 age group, 33.8% had university degrees. In 2016, this percentage was as high as 44.6%. According to forecasts, this percentage is expected to grow steadily and nearly a half of all Poles will have university degrees [Czarnik and Turek 2015]. Statistics show that not all university graduates can find work today. The arrival of even greater number of university graduates will increase the already fierce competition for good jobs. The situation is not likely to improve. The competencies of this large group of potential labour market participants can only be verified if they are evaluated in terms of the quality of their qualifications. This approach would allow for identifying people offering top-quality human capital, and these people will be attractive to employers above all. The changes of the activity rate for this age group is shown below in Figure 3.

In Poland, the activity rate in the analysis period ranged from 55.8 to 56.7%, which was significantly lower than the average for the EU, at 70%. For people aged 25–34 years, the activity rate exceeded 85%; for those aged 15–24, it was between 32.8 and 34.7%. This is linked with young Poles' approach to education. More specifically, they stay in education, thus postponing their entry onto the labour market. This is reflected in employment rates, as shown in Figure 4.

In the analysis period, the employment rate for the Polish economy ranged from 58.9 to 65.4%. Throughout this period, the rate was lower than that for the EU-28 countries. The employment rate was the highest in the 24–35 age group and exceeded 80% in 2017. In contrast, the employment rate for young people

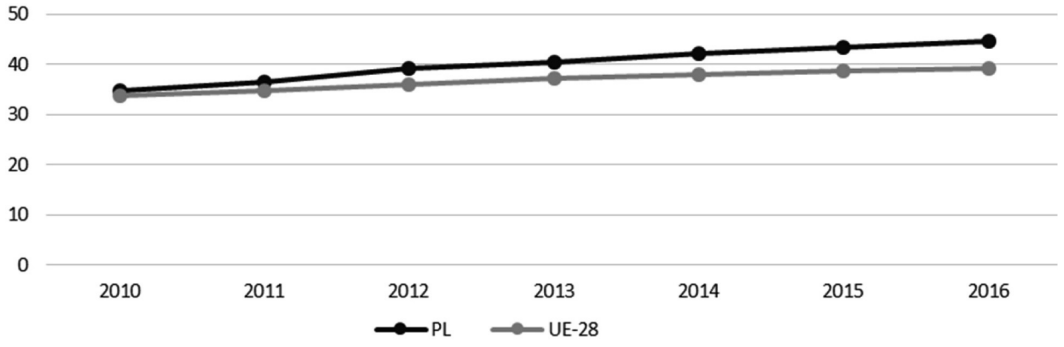

Fig. 2. Persons aged 30–34 with tertiary educational attainment in 2010–2016

Source: Own elaboration based on GUS [2017b].

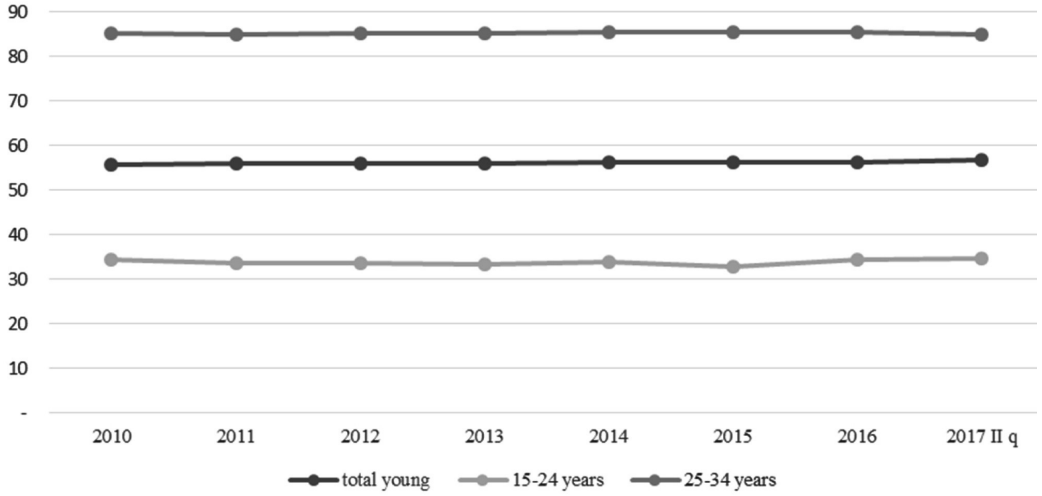

Fig. 3. Activity rate for people aged 15–34 in 2010–Q2 2017

Source: Own elaboration based on GUS [2017b].

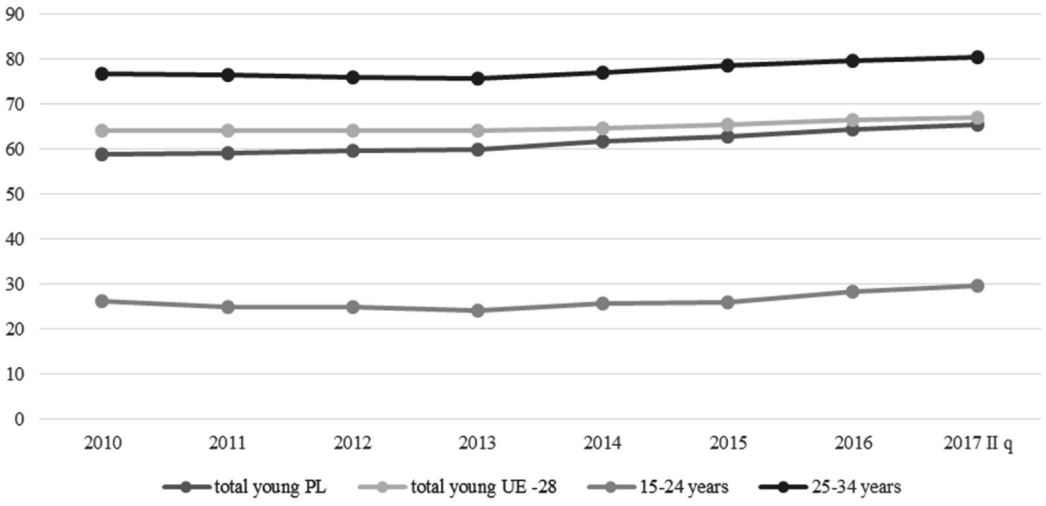

Fig. 4. Employment rate for people aged 15–34 in 2010–Q2 2017

Source: Own elaboration based on GUS [2017d].

aged 15–24 was, throughout the analysis period, below 40%, which can be explained by the fact that these people are both active in the labour market and active in education. The unemployment rate in the analysis period was the highest for this age group too. A comparison of the rates is shown in Figure 5.

In 2016, the average unemployment rate for the EU-28 countries was approx. 10%. In the 15–24 age group, in the analysis period, it ranged from 23.6 to 18.7%, which was definitely higher [Eurostat 2017a]. In Poland, this rate for this age group was higher. It was not until 2016 that it was lower for the first time, at 17.7%, than that for the EU-28 countries. An analysis of rate change indicates that the labour market situation of young people in this age group in the EU-28 countries is difficult. The unemployment rate

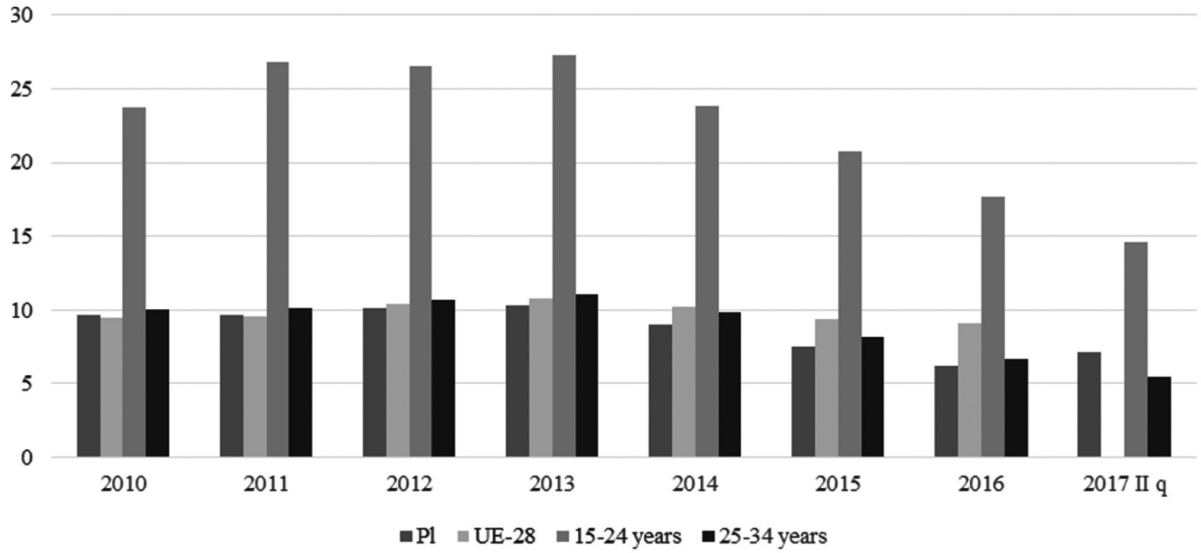

Fig. 5. Unemployment rate for people aged 15–34 in 2010–Q2 2017

Source: Own elaboration based on GUS [2017a].

varied greatly across the EU in 2016 [Eurostat 2017a]. The difficult situation of young people in Europe's labour markets is greatly affected by differences between education systems across the continent, country-specific institutional solutions, as well as cultural factors. In most countries, young people find it difficult to start a career [Eurostat 2017a]. Within this context, there are two aspects to be addressed, as they somehow determine the labour market situation of young people. One of the aspects is that there are young people who are neither in employment nor in education or training, known as NEETs. At present, the number of NEETs in the EU-28 countries was approx. 19% in the 20–34 age group [Eurostat 2017a]. These people are a resource that is not being used by national economies. Figure 6 shows the change of NEET numbers over time.

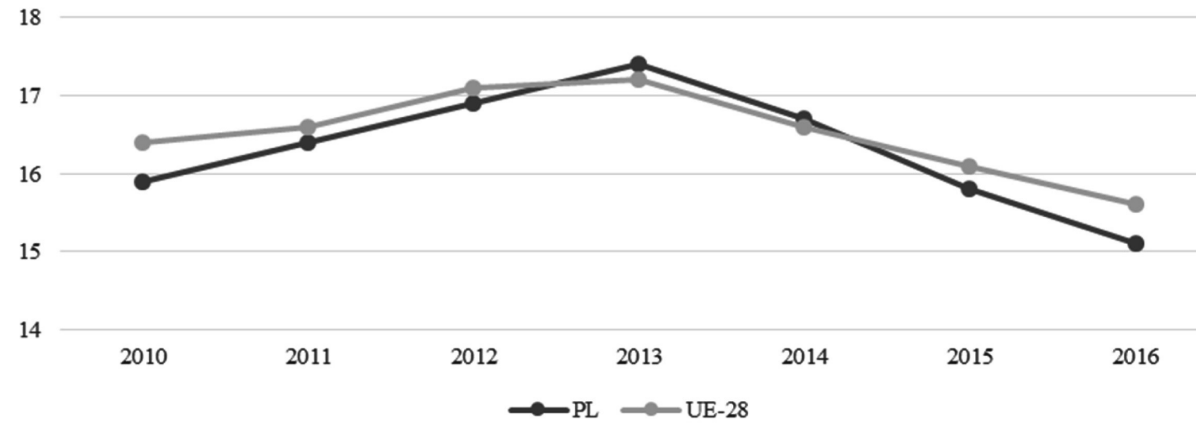

Fig. 6. Young people neither in employment nor in education or training – NEET (aged 15–34) in 2010–2016

Source: Own elaboration based on Eurostat [2017c].

NEET is the problem of young people being increasingly passive in the area of career and education. This is particularly important if we look at the present and predicted depletion of workforce in Poland. Eurostat figures show very clearly that the percentage of people living in extreme poverty is still high. In this regard, Poland is ranked in the region of the average for Europe, but it is far from the EU leaders with the lowest numbers of inactive young people, which are Luxembourg, the Netherlands and Sweden, with a figure of below 10%. The other aspect concerns the situation of young people who finish their education too early. This group is defined as a percentage of the population aged 18–24 who have completed at least the lower-secondary level of education and are neither in education nor in training [EC 2011]. Figure 7 below illustrates this situation in the analysis period.

Poland's performance with its 5% as compared to the average for the EU-28 countries of above 10% is good. During the analysis period, this percentage was steadily low, which can be associated with the country's compulsory education. However, it is worth mentioning the adverse effects of this phenomenon, which include the risk of unemployment, a high chance of having to do simple manual work, or working on a part-time basis, plus low pay, antisocial phenomena, as well as exclusion from participation in the labour market fully and with satisfaction. Early leavers from education hardly ever come back to education, and they are very often among the beneficiaries of social assistance and welfare programmes [DWUP 2011].

Young people on the labour market in Poland: a problems approach

Overeducation, or excessive education, is a consequence of the rapid growth of higher education institutions in Poland after 1990 and easy access to these institutions for anyone who wanted or wants a degree. The core of overeducation is that people with degrees work in professions or positions that do not require such high qualifications [Kiersztyn 2011]. This has an impact on other young people, i.e. those without degrees. They are pushed into less attractive jobs below their expectations and below their qualifications. In the labour market, the expectations of university graduates as regards employment, pay and development opportunities are modified. Faced with fierce competition, only some graduates succeed in achieving their goals. It seems that the overeducation problem could be helped by systemic solutions designed to respond the expectations in the labour market, including solutions intended to inhibit the "overproduction" of university graduates and to promote vocational education. Given the statistics for education attainment among young people in Poland and forecasts regarding higher education, which are related to compliance with the guidelines contained in the Europe 2020 strategy [EC 2010], it can be concluded that overeducation will continue to grow in Poland. As a result, improper employment patterns will be established and people with nothing beyond secondary education will be marginalised.

Transition is the process of going into employment after achieving a particular level of education and

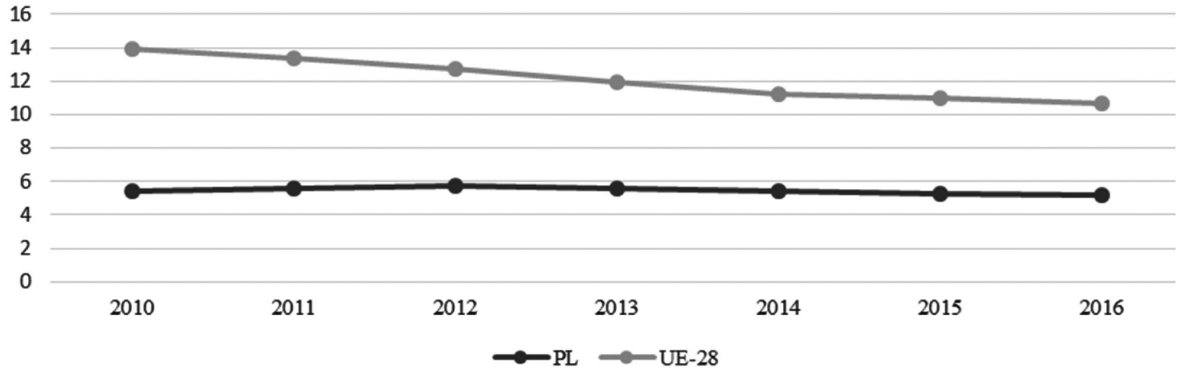

Fig. 7. Early leavers from education and training (aged 18–24) in 2010–2016

Source: Own elaboration based on GUS [2017c].

finding a satisfying job that can make the graduate financially independent [Rożnowski 2009, Piróg 2013]. Overeducation leads to prolonged transition, which is a situation where a person does not go into employment within the first six months after leaving education [Gangl and Muller 2003]. If a graduate takes too long to find a job, they may be discouraged from continuing the search, join the inactive population, experience a loss of belief in their abilities, accept jobs below their capabilities and qualifications, or in the grey economy, which leads to the depletion of human capital and losses on a personal level and for the entire economy. Overeducation and prolonged transition can be seen as major barriers for young people interested in becoming active participants in the labour market. A new social phenomenon in the Polish economy is the Family 500+ government scheme. With the falling supply of workforce and the unfavourable demographic situation, the Family 500+ scheme is a temporary form of financial support that is expected to help increase Poland's birth rate. The scheme is targeted at young people, and young women have to come to the predominant beneficiaries of the scheme. A year and a half after the scheme was launched, it can be said to have been fairly effective in terms of improving Poland's demographic situation [Myck 2016]. The study entitled [Praca.pl 2017] has revealed that some beneficiaries of the Family 500+ scheme, particularly young people, those with a low level of education attainment and those with low pay, have joined the ranks of passive labour market participants As a result of the scheme, the number of such people changed from 150 thousand in September 2016 to 240 thousand in March 2017, the latter figure accounting for 1.5% of the entire working population [Work Service, n.d.]. It is always difficult for young people to go back into employment after a long break. However, the period of inactivity in the labour market, spent on taking care of and bringing up children, can be used for preparations to go back into employment efficiently and with a sense of satisfaction. If, during such a period, the person concerned completes additional courses to improve their skills and qualifications or to prepare to start up their own business, re-entering the labour market can be a success. However, if the person has no motivation for personal development and to return to the labour market, the Family 500+ scheme can also be seen as a factor that makes it difficult, especially for young women, to go back to work.

CONCLUSIONS

This article aimed to present and analyse the Polish labour market situation of young people in 2010–2017. The findings of the analysis in this article are as follows:

1. There is a significant imbalance in terms of the level of education attainment among Poles: the largest number of people working in the Polish economy are people with university degrees, followed by people with further-education, basic vocational education, secondary education and those with no more than lower-secondary education. In terms of education attainment, the situation is similar in the case of school leavers and graduates who have entered the labour market in 2017.
2. In Q2 2017, the most passive labour market participants were people with secondary education (approx. 40%), followed by basic vocational school leavers (25%), further-education school leavers (24.3%) and, finally, people with university degrees (8.4%).
3. The analysis shows that the economic activity rate and the employment rate for all the people included in the study were very similar throughout the analysis period. Whereas the unemployment rate, particularly for the 15–24 age group, has been falling steadily since 2013, indicating that the labour market situation of this age group has improved.
4. Due to the significantly higher number of young people with university degrees that entered the labour market, the adverse effects of overeducation and prolonged transition have become established, which can be regarded as a barrier to full and active participation by young people in the labour market.
5. The phenomena of leaving education too early and adopting a passive approach to education and career are present on the Polish market. This situation is the most difficult for the young people involved in these phenomena, and finding a place for themselves in the labour market is the most difficult for these people.

6. The temporary passivity in the labour market resulting from participation in the Family 500+ social assistance government scheme may be a barrier of entry to the labour market on the one hand, but also an opportunity for young people to prepare better and more effectively to enter or return to the labour market on the other.
7. The research hypothesis is that the present labour market situation of young people in Poland has improved in recent years. The analysis, however, has confirmed this hypothesis. The improved labour market situation, including lower unemployment, has been a result of the general improvement in the condition of the Polish economy. However, the phenomena that have prevented young people from adopting an active approach to work are still present and continue to affect the Polish labour market. They are barriers to the full, active and satisfying participation of young people in the labour market.

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RYNEK PRACY W PERSPEKTYWIE MŁODYCH PRACOWNIKÓW – WYBRANE ZAGADNIENIA

STRESZCZENIE

Rynek pracy w Polsce zmienia się dynamicznie, co wpływa na sytuację ludzi młodych, którzy stają się jego uczestnikami. W ostatnich latach można zaobserwować, jak zmienia się podejście ludzi młodych do podejmowania pracy. Od początku lat 90. XX wieku obserwuje się w Polsce wzrost zainteresowania kształceniem na poziomie wyższym. Znalazło to odzwierciedlenie w rozwoju prywatnego szkolnictwa wyższego oraz rosnącej liczbie absolwentów. Celem artykułu jest zaprezentowanie sytuacji ludzi młodych na rynku pracy w Polsce w latach 2010–2017. Wykorzystano podstawowe wskaźniki rynku pracy do zaprezentowania omawianego zjawiska w ujęciu ilościowym. Uzupełnieniem analizy jest uwzględnienie podejścia o charakterze problemowym. Praca powstała na podstawie przeglądu literatury przedmiotu, raportów tematycznych oraz danych statystycznych zaczerpniętych z opracowań krajowych i zagranicznych.

Słowa kluczowe: praca, absolwent, edukacja, bezrobocie, overeducation, tranzycja

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SUSTAINABLE CONSUMPTION IN CONSUMER BEHAVIOUR OF POLISH SENIORS (REPORT FROM OWN RESEARCH)

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ABSTRACT

The discussion presented in this study focuses on consumer behaviour of people aged 65+ in Poland that may be classified as sustainable consumption. The article primarily seeks to offer some insight into sustainable consumption within the consumer decision-making process among Polish seniors. The basis for the conclusions is provided by direct research conducted in the form of a survey questionnaire on a sample of 2,537 people aged 65+ in 2014–2015 in 10 Polish cities of various populations and sizes.

Key words: seniors, sustainable consumption, consumer behaviour

INTRODUCTION

Mass consumption and consumerism characteristic of contemporary societies are causing not only destructive consequences for human spirituality, physical and mental health and social relations but also for the natural environment. As rightly pointed out by Bauman, consumerism consists in continuously buying, consuming, using, disposing of waste so that everything can begin all over again the following day [Bauman 2005]. The negative consequences of over-consumption, manifested as buying and throwing out products constantly, have given rise to various environmental trends and movements that firmly reject excessive consumerism and call for application of the principles of sustainable development based on respect for the environment combined with responsible use of the achievements of the modern world. Sustainable consumption is a consumer trend within the drive towards maintaining the balance between human natural needs and what makes civilisational progress necessary. According to Borys, it is a major objective of sustainable development, while being strongly connected with the realisation of quality of life as the overarching goal of the new paradigm of development [Borys 2014]. It should also be highlighted that sustainable consumption as a response to consumerism promotes reduction of wastage, resource consumption, environmental damage and even a decrease in the number of product components and functions. Mittelstaedt argues that the number of sustainable consumption supporters is growing year by year and, as a result, consumer behaviour characteristic of this consumer trend will have an increasing impact on the economy [Mittelstaedt et al. 2014]. It is therefore necessary to specifically assess the extent to which sustainable consumption is present in the daily purchasing behaviour of Polish consumers, in particular the elderly. More and more senior consumers are following new consumer trends, including sustainable consumption. This consumer trend implies a new structure, new forms and methods of consumption but also the emergence of new needs and motives for their satisfaction. Today, seniors are more frequently willing to follow these changes. This

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article seeks to provide some insight into sustainable consumption in consumer behaviour of people aged 65+ in Poland, based on the results of the author's own research.

The concept and essence of sustainable consumption

The source materials suggest that the first working definition of sustainable consumption was coined in Norway in 1994 during the so-called Oslo Roundtable on Sustainable Production and Consumption organised by the Norwegian Ministry of the Environment. According to the participants in that symposium, sustainable consumption can be defined as "the use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations" [Ministry of the Environment of Norway 1994, 1995]. It may thus be said that sustainable consumption is defined as a holistic approach that is aimed at minimising the environmental impact of social consumption and production systems and that involves individuals deliberately seeking to minimise adverse effects of consumption of consumer and investment goods and services through rationalisation and utilisation of production factors (resources) and reduction of generated post-production and post-consumption waste [Zalega 2015].

According to Moisander and Pesonen, sustainable consumption is such where its form and volume define a set of consumers' environmental values and attitudes that lead to green awareness (or broader social awareness) and an environmentally (and socially) responsible process of making market decisions [Moisander and Pesonen 2002].

According to Kiełczewski, sustainable consumption is a structure where the shape of individual systems and relationships and dependencies between them enable the achievement of sustainable development objectives. Consequently, consumption of today's generation does not limit the possibilities of consumption for future generations [Kiełczewski 2008]. In other words, sustainable consumption means optimum, conscious and responsible use of available natural resources, goods and services at the level of individuals, households, local communities, business communities, local, regional and national governments and international structures, in accordance with the principles of sustainable development, bearing in mind the good of future generations [Zalega 2014]. It should be emphasised that sustainable consumption is based on the wish to reduce wastage as well as waste and pollution generation (best practices in the field of waste management, water and waste water management, renewable energies and development of eco-friendly products) and to choose goods and services which comply, as far as possible, with certain ethical, social and environmental criteria [Heinzle 2012, McDonagh et al. 2012, Paetz et al. 2012].

In practice, a distinction is made between the so-called weak and strong sustainable consumption [Seyfang 2011]. Weak sustainable consumption, also known as mainstream sustainable consumption, chiefly involves a reorientation of consumption towards its rationality and efficiency (especially the use of scarce resources) at various levels, in particular environmental, yet with a general increase in consumption. Furthermore, it is assumed that sustainable consumption will be achieved through improved energy efficiency of equipment and other technological solutions. Nevertheless, strong sustainable consumption is based on the postulate of consumption reduction in general, requiring consumers to give up consumption at the current level for the benefit of future generations [Seyfang 2011]. Strong sustainable consumption assumes that in order for this to be achieved, significant changes must also occur in the levels and patterns of consumption. The concept of quality of life, good life, human non-economic activity is also of key importance [Lorek and Spangenberg 2014, Spangenberg 2014]. In the literature, the dominant view is that instruments and conditions for weak sustainable consumption can be developed in the longer term, yet strong sustainable consumption is merely a postulate [Tukker et al. 2010, Lorek and Fuchs 2013].

Similarly to sustainable development, sustainable consumption should be characterised by stability and (self-)sustainability. Stability means that consumption processes ensuring maximum consumer satisfaction become well-established within an unlimited period of time [Jackson 2005, Krantz 2010, Schrader and

Thøgersen 2011, Leßmann and Masson 2015]. This implies that consumption processes should include mechanisms minimising the risk of internal disturbances that limit or prevent further consumption. Self-sustainability means the presence of mechanisms that minimise the risk of endogenous disturbances limiting or preventing further consumption. However, consumption sustainability requires balancing the following aspects [Kiełczewski 2008]:

- economic: the proportion between current and future consumption is determined so that consumption processes do not materially disturb the economic equilibrium;
- environmental: maximisation of satisfaction with consumption while preserving the quality and utility of natural resources and the natural environment; the material level of consumption is adapted to the requirements of the circular economy, which is tantamount to the imperative to prefer such forms of consumption that are the least harmful to the environment;
- social: a fairly even distribution of consumption among all people, regardless of time and space, at least for socially desirable goods; such sustainability requires the preference for consumption forms that are the least socially problematic or that contribute to solving such problems;
- psychological: finding the optimum balance between material consumption and satisfaction of non-material needs, which requires an appropriate system of values, awareness and education to be developed;
- demographic: demographic determinants are not a permanent barrier to consumption growth, and membership of a demographic or socio-occupational group is not a significant barrier to consumption of socially desirable goods;
- spatial: possible ways of addressing needs should ensure that they do not interfere with spatial order;
- intertemporal: these dimensions of sustainable consumption are achievable in the long run.

These aspects show that sustainable consumption primarily seeks to ensure that desirable forms of consumption prevail over undesirable ones and that mechanisms exist that would limit the occurrence and consequences of unsustainable consumption. Many authors [Hertwich 2005, Dueby et al. 2016] simultaneously stress that the implementation of sustainable consumption requires sustainable action at all stages of the life cycle of goods and services (not only in the production phase), as often reflected as the terms cradle-to-cradle or cradle-to-grave in the literature.

CONCEPTUALISATION OF RESEARCH

The empirical material contained in this article comes from direct research conducted in the form of a survey questionnaire on a sample of 2,537 households in 2014–2015 in 10 Polish cities of various populations and sizes. In accordance with the research assumptions, the sample included persons over 65 years of age who took independent purchasing decisions in the market. In order to select the sample, the selective quota sampling procedure was used. The characteristics (quotas) covered by the research were: sex and age.

This research method was chosen in view of the older age of respondents whose openness to new media (Internet, smartphone, i-Pod) often used in direct research is limited.

The survey was conducted among participants of the university of the third age (UTA) at state universities in: Warsaw, Kraków, Łódź, Poznań, Gdańsk, Katowice, Lublin, Białystok, Toruń and Wrocław, as well as among members of parochial clubs in parishes located in the archdioceses of Warsaw, Kraków, Łódź, Białystok, Gdańsk, Katowice, Lublin, Poznań, Wrocław and the dioceses of Warsaw-Praga and Toruń.

Selection and characteristics of the research sample

Studying consumer behaviours is an extremely intricate process. This is due to the complexity of consumption and consumer purchasing behaviours in the field of consumer decision-making. Such research encompasses an important step to explain the phenomenon examined, namely adoption of specific indicators. This is essential because an indicator is used to define a certain characteristic of an object or phenomenon which is in such a relation with another characteristic that indicates the occurrence of the latter when it occurs itself. An indicator is a measurable, i.e. empirically available, variable. When consumer

behaviours are investigated, indicators explaining the complexity of this phenomenon include demographic (sex, age, place of residence, household size) and socio-economic indicators (education, income).

The survey covered 71% of women, with only every third respondent being male. There were definitely more women than men, and people aged 65–74 formed the largest age group in the sample[1]. Place of residence was also an important variable in the research. In line with the research assumptions, the sample comprised respondents who lived in the largest Polish cities.

Respondents were also asked about their level of education. The questionnaire included four categories of education: primary, basic vocational, secondary and higher education. Respondents with secondary education formed the largest group. Nearly 2/5 of those surveyed declared this level. Every fourth respondent was a university graduate, and those with basic vocational education represented a similar percentage. In the sample surveyed, people with primary education were the smallest group (11.4%).

Nearly half of those surveyed were members of households consisting of two persons, while fewer than 2/5 represented three-person households. Every sixth respondent was a member of a single-person household.

The largest group of respondents included people whose monthly income per capita did not exceed PLN 2,000.00. For every third respondent, monthly income per household member ranged from PLN 2,001.00 to 3,000.00. In turn, every fourth person interviewed had monthly disposable income per capita of between PLN 3,001.00 and 4,000.00. The smallest group of respondents included households where the income was above PLN 4,000.00 per capita a month.

Implementation of sustainable consumption in consumer behaviour of the seniors surveyed

Sustainable consumption is a trend that is becoming stronger in the context of consumer behaviour of people aged 65+. The research examined the attitudes of senior consumers towards sustainable consumption.

Table 1. Sustainable consumption as understood by the seniors surveyed

Item	Number of respondents (N = 2 537)	Share (%)
Sustainable consumption means rational and efficient use of scarce resources at various levels, in particular environmental, yet with a general increase in consumption	314	12.4
Sustainable consumption means consumption involving its reduction in general, requiring consumers to give up consumption at the current level for the benefit of future generations	1 265	49.8
Sustainable consumption means making, as far as possible, sociologically and environmentally responsible consumer choices based on information on products and services, including practices used by their providers, production process and recycling possibilities	958	37.8

Source: Own research.

[1]The Anglo-Saxon literature uses the following division of older people: (i) young old – people aged 60/65–74; (ii) old old – people aged 75–84; and (iii) the oldest old – people aged 85 and more. The age classification in this study is similar to that proposed by the World Health Organization [Moschis 1992]. The author divided seniors into: (i) young old – people aged 65–74; (ii) old old – people aged 75–84; and (iii) the oldest old – people aged 85 and more. According to the United Nations, the conventional old-age threshold is 65. It should be remembered, however, that old age is not just the number of years that a person has lived. We distinguish calendar (chronological) age and biological age. Many factors often cause very large discrepancies between chronological and biological ages.

It essentially checked whether older people understand the concept and idea of sustainable consumption and whether their possible competences translate into practical behaviour. To this end, respondents were asked about their understanding of the term sustainable consumption (Table 1).

In the light of the research results, it can be stated that half of people aged 65+ understand sustainable consumption as its strong form. This answer was more often indicated by women (53.4%), mostly aged 65–74 (53.1%), seniors with higher education (57.3%) and a monthly income of above PLN 3,000.00 per capita (55.8%), most frequently living in Warsaw (52.6%), Poznań (51.7%) and Gdańsk (50.9%) and actively attending UTA courses (54.9%). Almost 2/5 of senior respondents misunderstand sustainable consumption, identifying it with conscious consumption, also known as ethical consumption or responsible consumption in Anglo-Saxon countries. This answer was chiefly chosen by men (40.3%) and old old respondents (43.8%) with a monthly income of less than PLN 3,000.00 per person, who had completed basic vocational education (47.6%), mostly living in Kraków (42.6%), Lublin (41.8%) and Białystok (41.9%) and being parochial community members (39.8%). It should be made clear that the terms sustainable consumption and conscious (ethical) consumption carry different systems of meanings. While sustainable consumption involves environmental discourse, conscious consumption refers to individualistic and moral discourses. The survey conducted found that only one in eight respondents construed sustainable consumption as its weak form. This answer was more often chosen by women (14.2%) than men (10.6%), by seniors with basic vocational (13.1%) and secondary education (12.9%), with a monthly income not exceeding PLN 3,000.00 per capita (14.3%), living in Katowice (13.4%) and Wrocław (13.2%) and being parochial community members (13.1%).

Another issue was whether senior consumers follow the assumptions of sustainable consumption in their consumer behaviour (Table 2).

The survey shows that people aged 65+ implement the idea of fully sustainable consumption to a small extent. Only every eighth surveyed senior fully realises its postulates when making consumer decisions. By contrast, more than half of the elderly responded negatively. Every twelfth senior found it difficult to say whether their consumer behaviour was consistent with the assumptions of sustainable consumption. This share of indecisive senior consumers can be explained by their misunderstanding of sustainable consumption.

The alternative consumer trend of sustainable consumption may form a certain lifestyle, and a specifically oriented way of buying products may (though not necessarily) represent a particular ideology of life for some older people. The proportion of seniors who declared that they acted fully in line with the idea of sustainable consumption was much higher among women (13.8%) than men (10.6%) as well as among university graduates (14.1%) and those earning a monthly per capita income of more than PLN 4,000.00, mostly inhabitants of Warsaw (13.3%), Poznań (12.8%) and Gdańsk (12.1%), and those actively attending UTA courses (15.1%). In contrast, older people who considered their consumption to be unsustainable were seniors with primary education (67.3%), mostly men (57.3%), aged 75–84 (62.3%), with a monthly income not exceeding

Table 2. Subjective perceptions of the seniors surveyed on whether they put sustainable consumption into practice

Item	Number of respondents (N = 2 537)	Share (%)
My consumption is fully sustainable	310	12.2
My consumption is slightly sustainable	647	25.5
I cannot say whether my consumption is sustainable	202	8.0
My consumption is not sustainable	878	54.3

Source: Own research.

PLN 2,000.00 per capita (64.1%), living in Łódź (56.2%) and Katowice (55.8%) and being parochial community members (56.7%).

Senior consumers who follow the principles of sustainable consumption can be referred to as competent, conscious consumers. They usually shop at markets, in small corner shops, and avoid hyper- and supermarkets and shopping centres.

Goleman has recently developed the idea of ecological intelligence. He argues that man is not beyond nature, but is part of it. Man not only acts but also adapts to its system [Goleman 2009]. It can therefore be said that ecological intelligence, perfectly integrated into sustainable consumption, is construed as the ability to learn from experience and rationally deal with the environment, which understands and feels. This means that ecological intelligence makes it possible to use the environment and modify actions in such a way that will cause the least environmental damage and losses. In his theory, Goleman argues that ecological intelligence provides information about the consumer lifestyle that does not undermine the fragile balance between human activity and the ecosystem, thereby forming part of rational and environmental behaviour of consumers.

Seniors' environmental behaviour as part of sustainable consumption was measured by means of 20 statements (Table 3).

The survey results indicate that the behaviours forming part of sustainable consumption are exhibited (albeit with varying frequencies) by the majority of older people. The largest group of senior respondents said that they used reusable bags (92.7%), with 64.2% doing so whenever possible. A similar percentage of

Table 3. Environmental behaviour of the seniors surveyed as part of sustainable consumption (% of answers)

No	Statement	Whenever possible	From time to time	Never
1	I buy carefully, only as much as needed at the moment	46.6	32.7	20.7
2	Before I buy a product, I gather product information confirmed by other consumers	20.1	39.0	40.9
3	Before I buy a product, I always check its expiry date	61.2	30.2	8.6
4	Before I buy a product, I check if it is biodegradable (recyclable)	10.6	55.2	34.2
5	I use reusable bags	64.2	29.0	6.8
6	I choose products in green, minimised packaging	10.2	41.9	47.9
7	I avoid purchasing disposable items (plates, cups, cutlery, plastic bags)	37.2	19.5	43.3
8	I regularly sort waste	59.2	32.4	8.4
9	I use water sparingly	58.9	33.8	7.3
8	I throw out used batteries into special containers	32.3	44.8	22.9
11	I replace light bulbs with energy-saving ones	57.8	28.3	13.9
12	I limit gas consumption	57.6	33.2	9.2
13	I buy energy-efficient equipment	34.7	48.6	16.7
14	I use electricity sparingly	63.8	28.6	7.6
15	I throw out expired drugs into special containers	19.3	24.4	56.3
16	I collect waste separately	25.3	25.4	49.3
17	I return glass bottles to collection points	24.9	20.9	54.2
18	I buy drinks in recyclable packaging	23.6	20.1	56.3
19	I pay attention to eco-labels	15.3	34.5	50.2
20	I reduce car use for public transport or bicycle	20.6	32.9	46.5

Source: Own research.

those aged 65+ admitted that they used water (92.7%), electricity (92.4%) and gas (90.8%) sparingly. In the three cases, those who did so whenever possible were the dominant group (58.9, 63.8 and 57.3%, respectively). Nearly 92% of seniors sorted waste, of which 59.2% admitted doing so always. The responses show that those surveyed most often segregate plastic packages, metal and paper. In line with the requirements of sustainable consumption, these actions are often taken up by respondents mainly for financial reasons (they save water and electricity due to their low income and use their own bags to avoid additional spending on disposable bags at the point of sale). The survey results confirm that money saving is, indeed, the key motive for seniors' environmental behaviours, but the resultant environmental protection is an additional, secondary advantage.

The findings indicate changes in seniors' attitudes. Before making any decision, in particular before buying products, senior respondents who display consumer behaviours in line with sustainable development assess whether their purchase is actually necessary or whether it is solely intended to raise their own material status. Over 79% of them declare that they buy carefully – just as much as they need at a given moment, which reduces the risk of wastage. In the decision-making process, almost 2/3 of them gather product information confirmed by other consumers. Such behaviours should probably be assessed positively since they reduce the risk of buying a wrong product that is not in line with expectations. Less than half of people aged 65+ say that they are more likely to buy an eco-friendly product that has eco-labelling. Nonetheless, research into Fair Trade [Radziukiewicz 2015] clearly confirms that this outcome should be regarded as a wish to present oneself as a more modern and responsible consumer whose consumer decisions are consistent with sustainable consumption rather than actual behaviour.

The described consumer behaviours of people aged 65+ result in tangible economic benefits not only for respondents but also for their households. In addition, these environmental behaviours as part of sustainable consumption largely overlap with the research on environmental awareness and behaviour of Polish residents that is systematically carried out by TNS Polska [2014].

Research by foreign authors demonstrates that the concern for rational use of available natural resources and the reduction of post-consumption waste generation are some key determinants of consumers' purchasing behaviours that ideally fit in sustainable consumption [Diamantopoulos et al. 2003, Young et al. 2010]. English-language literature describes the profile of a "sustainable consumer" by means of different variables, namely geographic and cultural indicators, personality and socio-demographic characteristics. Among people aged 65+, certain cognitive reactions and beliefs about environmental behaviours can be noted. Based on their research, some authors [Krantz 2010, Schrader and Thøgersen 2011, Leßmann and Masson 2015] believe that such actions contribute to more rational management of scarce resources, reduced consumption of toxic materials and pollution emissions, thus allowing the current and future generations to live in a less polluted environment with all the related consequences.

For people aged 65+, the most important obstacle to making decisions consistent with the sustainable consumption idea is the financial constraint (51.7%). This answer was most often indicated by seniors in financial difficulty with a monthly income of less than PLN 2,000.00 per capita (68.6%), mostly women (53.2%), aged 75–84 (54.6%), with basic vocational education (54.7%) and living in Lublin (53.1%) and Toruń (52.4%). Another major barrier that was pointed out by every third surveyed senior was poor information on how to act in line with sustainable consumption. Following the economic barrier, it was the most important obstacle for the old old (33.1%) and the oldest old (32.6), chiefly men (33.9%) with secondary education (33.6%), earning a monthly income of PLN 2,000.00 per capita (34.1%), living in Białystok (32.9%) and Toruń (32.78%) and being active members of parochial communities (33.9%). The least significant obstacles were those connected with the effort and time needed to stick to sustainable consumption assumptions.

CONCLUSION

When deciding on the purchase of selected products or services and when performing specific activities in their daily lives, people aged 65+ in Poland each time

follow a more or less sustainable consumption pattern. Seniors whose purchasing behaviours largely conform to sustainable consumption buy only necessary things, paying attention to the quality of goods that have extended lifetime through recycling or re-use, thereby reducing wastage. Furthermore, these behaviours contribute to the conscious and deliberate reduction of consumption of products that require rare natural resources to be used and generate much waste.

The majority of seniors reported the discussed environmental behaviours that are consistent with the sustainable consumption idea, albeit to varying degrees and with varying frequencies. These are most often household-related activities including waste sorting, economical consumption of water, electricity and gas, and the use of reusable bags.

The increased scope of seniors' behaviours and actions for environmental protection should be assessed positively. At the same time, it is worth noting that these behaviours often result from economic rather than environmental motives.

The survey shows that the proportion of seniors who declared that they acted in line with the idea of sustainable consumption was much higher among women than men as well as among university graduates and those earning a monthly per capita income of more than PLN 3,000.00, mostly inhabitants of Warsaw, Poznań and Gdańsk, and those actively attending UTA courses.

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ZRÓWNOWAŻONA KONSUMPCJA W ZACHOWANIACH POLSKICH KONSUMENTÓW SENIORÓW (RAPORT Z BADAŃ WŁASNYCH)

STRESZCZENIE

Prezentowane w opracowaniu rozważania koncentrują się na zachowaniach konsumenckich osób w wieku 65+ żyjących w Polsce, które wpisują się w ideę zrównoważonej konsumpcji. Głównym celem artykułu jest próba uchwycenia zrównoważonej konsumpcji w procesie podejmowania decyzji konsumpcyjnych przez polskich seniorów. Podstawę wnioskowania stanowią informacje pochodzące z badań bezpośrednich przeprowadzonych w formie wywiadu kwestionariuszowego na próbie 2,537 osób w wieku 65+ w latach 2014––2015 w 10 miastach Polski o zróżnicowanej liczbie ludności oraz różnej wielkości.

Słowa kluczowe: osoby starsze, zrównoważona konsumpcja, zachowania konsumenckie

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