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# VALUES VERSUS ETHNOCENTRIC ATTITUDES OF CONSUMERS ON THE FOOD MARKET

Grażyna Adamczyk, Elżbieta Goryńska-Goldmann, Michał Gazdecki
Poznań University of Life Sciences

**Abstract.** The purpose of the research, the results of which are presented in this paper, was to show the significance, systems and hierarchy of values, as well as the relation of values with the ethnocentric attitudes of consumers. Among the most important values for consumers are: family, health and physical fitness. The ethnocentric attitudes of the surveyed consumers were correlated with the values they believe in. Original materials from a questionnaire survey made by direct personal interviewing are used in this paper. The respondents were chosen by non-random quota sampling. The respondent group was made up of individuals responsible for household food provisions. The cultural and symbolic values occurred with similar frequency and significance among the consumer groups formed by the criterion of ethnocentrism intensity. The approach to ethnocentrism was differentiated by traditional, national and custom values. The consumers with a higher ethnocentrism level declared a relatively higher significance and attachment to Catholicism, traditionalism and patriotism.

**Key words:** consumer ethnocentrism, attitudes, values, food market

## INTRODUCTION

Ethnocentrism is currently becoming one of the more apparent trends in economic and sociocultural areas of countries. Ethnocentrism may also have a variety of forms, intensity levels and scale of occurrence. In the area of consumer behaviour, ethnocentrism is construed as a belief that purchasing of imported goods is bad, since it is an unpatriotic attitude which harms the domestic economy and labour market. Consumer ethnocentrism is often equated with the tendency to purchase domestic products and passing over foreign goods due to a conviction that such attitude is more correct and moral [Falkowski and Różnowski 1996, p. 2].

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The foundations of ethnocentrism are first and foremost ethnicity, patriotism, a strong sense of national identity, as well as traditionalism and xenophobia, i.e. a conviction of superiority of one's group or nation. Considering the preferred values and the attitude to domestic and foreign products, three basic consumer types can be identified: (i) ethnocentric consumers, who prefer domestic products, (ii) internationalist consumers, who intentionally prefer foreign products, and (iii) cosmopolitan consumers, who prefer the characteristics of product they purchase to the country of origin [Karcz and Kędzior 1999, p. 26].

The attitudes are very complex structures which include, among others, cognitive and behavioural elements, as well as convictions concerning values. Hence in terms of ethnocentrism, three basic members can be identified: (i) the awareness of product characteristics guaranteed by the country of origin, (ii) emotional attitude to the country of origin, and (iii) the tendency to display behaviour towards products of different origin [Sajdakowska and Gutkowska 2000, p. 432].

Ethnocentric attitudes are conditioned by numerous factors, among which those of special importance are the socio-psychological ones, e.g. openness to foreign cultures, patriotism, conservatism, collectivism and individualism. More than once these factors can be highly correlated with demographic factors, e.g. age, sex, education, or material status.

The purpose of the research, the results of which are presented in this paper, was to present the significance, systems and hierarchy of values as well as the relation of values with the ethnocentric attitudes of consumers.

## INPUTS AND METHODOLOGY

To illustrate the theoretical deliberations over the values accepted by consumers and their impact on the assumption of ethnocentric attitudes, selected results are presented from the survey campaigns carried out in 2013 among the citizens of the Wielkopolskie Province, Poland, and focused on surveying consumer ethnocentrism on the food market. Original materials from a questionnaire survey made by direct personal interviewing are used in this paper. The respondents were chosen by non-random quota sampling. The respondent age structure reflected the general population age structure. A total of 350 interviews were qualified for analysis. The respondent group was made up of individuals responsible for household food provisions. The interviews were carried out in selected cities of North-Western Poland.

One of the research objectives was to establish the importance of values accepted by the respondents. Several value groups were specifically referred to, i.e. (i) traditional national values: family, statehood, patriotism and Catholicism, (ii) custom values: spontaneity and openness to other cultures, (iii) national character values: traditionalism (tradition), emotionalism and optimism, (iv) US based popular culture: achievement and success (sense of fulfilment), material comfort, health, and fitness and (v) symbolic values which excess consumer desires: freedom, self-fulfilment, and friendship.

The hierarchy of values was determined by handing out a set of 15 cards to each respondent. Each card represented one value. Each respondent was asked to choose six cards with the values most important to them and rank the cards from the most significant to the least significant.

## VALUES VERSUS ETHNOCENTRIC ATTITUDES: THE SURVEY RESULTS

The research results seem to demonstrate that the respondents value their families most (among all values to be identified). Note that this value is related to specific family-wise goals, which include the direct family, friends, helpfulness or acting for the good of others. The next most important values held in high esteem by the responded included health and fitness; one out of three of the interviewed listed ranked them on the first place in their hierarchy of values. The next rank in the hierarchy of values was assigned to happiness; however, the differences between the percentages of the respondents who ranked the values on the 3rd place were worth 22 percentage points. Over 60% of the respondents deemed that friendship was important and ranked on the 4th place in the hierarchy. Only 16% of the respondents gave the top rank to material comfort. The values of emotionalism, freedom and optimisms were identified as "important" by nearly 40% of the respondents. Nearly one out of five respondents identified achievement, success and tolerance as "important" values. The least "important" values were Catholicism, openness to other cultures, traditionalism, statehood, patriotism and spontaneity (Fig. 1).

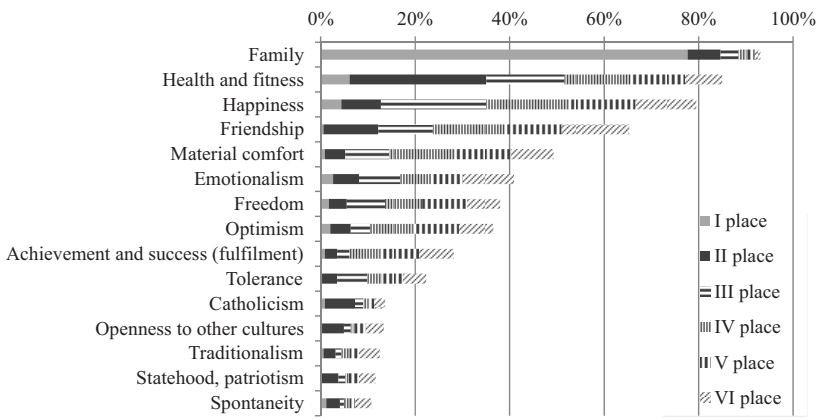


Fig. 1. Hierarchy of respondents' values
Source: Proprietary survey.

In order to investigate the relationship between the ethnocentric attitude intensity and the hierarchy of values, the average ranking of each value shown to the respondents was determined in three groups of the respondents set up by the ethnocentrism index on the CET scale[1].

The results of the consumer grouping by the ethnocentric attitude intensity demonstrate that the largest group declared a low ethnocentric level (47.7%), whereas the least populated group declared the highest ethnocentric level (16%). Nearly every third respondent represents a moderate ethnocentric attitude.

[1]The CET scale is based on the Likert scale and has 17 statements scored from 1 to 7. This tool defines the tendency to prefer domestic products by reference to four groups of psycho-social factors: openness to foreign cultures, patriotism, conservatism and collectivism.

Each of the values under analysis had a null hypothesis ($H_0$) put forward, which assumed statistical insignificance of the differences in the average hierarchy of values rank in the three respondent groups identified by ethnocentrism index (i.e. low, moderate and high ethnocentrism). The hypothesis test results are shown in Table 1. Figure 2 presents a comparison of the value significance (the share of respondents to choose the value) for which statistical testing revealed significance in differences.

Table 1. Hypothesis test results (grey cells denote a statistically significant difference between the surveyed groups)

| Specification | Low ethnocentrism vs. moderate ethnocentrism | Moderate ethnocentrism vs. high ethnocentrism | Low ethnocentrism vs. high ethnocentrism |
|---|---|---|---|
| Critical value (paired t test) | 1.97 | 1.97 | 1.97 |
| | | Absolute value of t Stat | |
| Family | 1.14 | 0.63 | 0.20 |
| Health and fitness | 0.68 | 1.54 | 2.27 |
| Happiness | 0.12 | 1.58 | 1.78 |
| Friendship | 0.17 | 2.27 | 2.45 |
| Material comfort | 1.58 | 0.68 | 1.89 |
| Emotionalism | 0.16 | 0.10 | 0.02 |
| Freedom | 1.54 | 0.39 | 1.70 |
| Optimism | 0.56 | 1.03 | 1.52 |
| Achievement and success (fulfilment) | 0.41 | 0.77 | 0.60 |
| Tolerance | 0.41 | 0.11 | 0.20 |
| Catholicism | 0.53 | 2.51 | 3.12 |
| Openness to other cultures | 1.44 | 0.09 | 0.97 |
| Traditionalism | 2.39 | 0.46 | 2.59 |
| Statehood, patriotism | 0.62 | 4.55 | 4.18 |
| Spontaneity | 1.22 | 0.17 | 0.79 |

If the absolute t statistic value is higher than the critical value (in the paired t test), the null hypothesis can be rejected; hence the differences between the investigated variables are statistically significant.
Source: Proprietary survey.

The family values had the highest rank in all types of attitude. Family and its happiness, health, and safety were the values most dear to all of the respondents.

Differentiated occurrence frequency can also be identified for certain values. While e.g. cultural or symbolic values of those investigated occur at a similar frequency and with a similar significance among all three consumer groups, certain traditional national values or custom values differentiate the ethnocentrism intensity. Consumers with a higher ethnocentrism level declared a relatively higher significance and attachment to Catholicism, traditionalism and patriotism. The values of health and fitness or friendship had a slightly lower significance to the high ethnocentrism group.

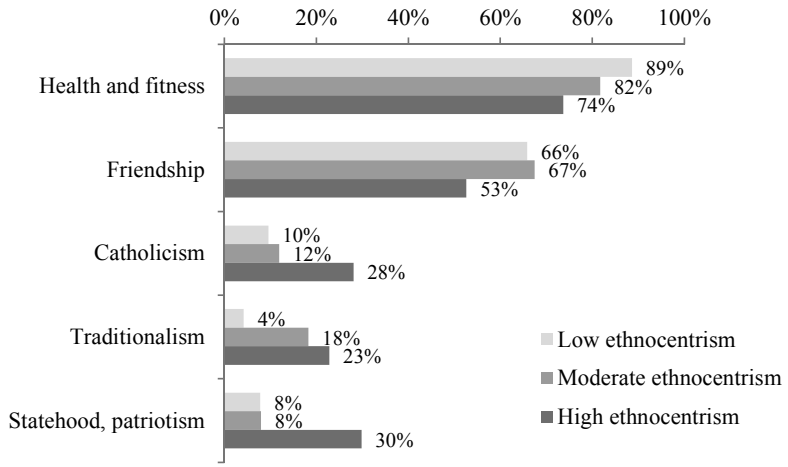


Fig. 2. Significance comparison of selected values by the varying ethnocentrism level groups
Source: Proprietary survey.

## VALUES AS A LODESTAR IN HUMAN LIFE

When attempting to define values as such no single universal approach can be elected. These issues are the subject of philosophy of values and axiology, where the latter defines the values as "everything that passes as important and dear to individuals and societies, desirable, related to positive experiences, and simultaneously an objective of human aspirations" [Łobocki 1993, p. 125]. Aside from the multi-faceted and interdisciplinary perspective of values, they have been customarily defined as the "things" valuable to man and of positive significance. Values can be defined for objects, but more often they relate to characteristics defined by people. Values may concern things, e.g. the taste of a meal; they may concern humans, as altruism does; they may also concern acts, such as patriotism or states, e.g. happiness. A value can usually be positive or negative or be a negation, i.e. the lack of values, the contradiction of value or an anti-value.

The values play a major role in the life of each human; they are the objectives humans strive to achieve; they are objects of desire, choice, a kind of aspiration, and give a feeling of meaning to life. The values assume functions which regulate various dimensions of human life: physical, social, cultural, mental or spiritual. A world devoid of values – both moral and extra moral – would be chaotic, dangerous, lawless and risky.

The definition and scope of a value is very often depreciated by connotation with moral standards and indicators. Values can also be health, happiness, education, beauty, activity or emotionalism. The values a man recognises are tell-tale of his personality, characterise his behaviour, decision-making, attitudes, interests, aspirations and drive towards objectives. Koźmińska and Olszewska [2007, p. 41] highlight that values are: "things and affairs which are important, precious and desired; they stand as life's lodestars, road maps or compasses; they are the standards of our thinking, attitudes, behaviours, and form the criteria for our assessments, decisions and choices".

## CLASSIFICATION AND SYSTEMS OF VALUES

Numerous classification types exist for values. One of the first ones was proposed by E. Spranger [Lesicki 2013], who grouped values into six basic categories: theoretical, economic, social, aesthetic, political and religious. An interesting classification of values was offered by J. Puzynina, who discriminated between absolute values, essential values and instrumental values, where the latter category is applied to reach the first two [Kurczab 2012]. According to another typology of the same author, values can be divided into declared values, experienced values, acknowledged values and executed values.

Apart from the classification of values, reference literature describes the concept of the system of values. It is equal to the concepts of the hierarchy of values or the scale of values. Each human being makes judgement on various planes of their development and activity. This occurs first and foremost in the biological, emotional and socio-cultural domains. The process of judgement is based on processing of information, organisation of values, orientation of choice, and self-control of behaviour. A known approach to the system of values is presented by Bielicki, who defines it as: "a state of affairs which results from organisation of individual experience in the process of evaluating the reality, i.e. defining what is good or evil, and thus the process attributes values and price to objects, and becomes one of the essential premises for regulation of behaviour of subjects" [Bielicki 2013].

The approach proposed by Milton Rokeach [2013] is of special importance when considering the system of values. That author established a model of values which has been frequently used as a basis for consumer segmentation. According to Rokeach, values form the so-called RVS, or Rokeach Value Survey / System. Rokeach defined two groups of values: terminal values, which are the objectives of humans and being values themselves, such as happiness, and instrumental values, which are certain convictions related to desirable behaviours that aim at securing the terminal values and include honesty, among others. The Rokeach values can be classified in seven topically different areas, which are: pleasure, safety, achievement, independence, maturity, conformism and social values.

Another known system of consumer grouping by accepted values is the List of values – LOV, created by L.R. Kahle and G.F. Timmer. The LOV was designed with A. Maslov's theory or hierarchy of needs and includes nine value types: pleasure, excitement, security, accomplishment, respect, self-respect, self-fulfilment, sense of belonging, and warm relationship with others [Kahle and Timmer 1938, pp. 48–49].

The SVS (Schwarz Value Survey) has a great importance in modern investigations into the value systems of consumers. Greated by S.H. Schwarza, the SVS features nine groups of values which relate to three areas: the nature of relationship between an individual and their group, the national security and the relationship of man with the natural environment [Bartosik-Purgat 2011, p. 131].

A very interesting approach to values exists in Polish reference literature as defined by A. Kusińska who differentiates between global values, specific domain values, and values on the level of product characteristics evaluation [Kusińska 2005, p. 27]. The global values are convictions concerning e.g. desired behaviours or states, as well as national or social values, such as freedom, honesty or security. The specific domain values concern the behaviours desired in various domains, e.g. economic, social or cultural. Kusińska's third type of values relates to the expected benefits from owning and using specific goods,

and includes e.g. brand loyalty. Kusińska also offers an analytical approach to the factors which condition consumer behaviour and terms it "the consumer system of values". The consumer system of values assumes that every consumer has "thousands of values on the level of product characteristics assessments, hundreds of values related to specific domains, and only dozens of global values" [Kusińska 2005, p. 28]. The author argues that all those values form a hierarchy in various areas while being highly affected by e.g. culture, social or economic factors.

## VALUES ACCEPTED BY POLES

The research by A. Jachnis and J. Terlak features an analysis of values of the Polish society in the face of the social and economic transformation at the turn of the 1980s and the 1990s. The authors identified three significant sources of values of the Poles which shaped the Polish systems of value at the end of the 20th century: traditional national values, e.g. family, the state, Catholicism, readiness for sacrifice, openness to other cultures, tolerance; values of the Communist ideology, e.g. egalitarianism, equality, work for all, collectivism; and the values of the popular culture mimicked from the US one, e.g. consumerism, success, activity, progress, individualism, and material comfort [Jachnis and Terelak 1998, p. 344]. The modern statistical Pole in their middle age represents a system of values which derives from the mixture of the aforelisted cultures with a shift in the gravity centre towards the elements of popular or mass culture values. The values recognised by the younger Polish generation are different; that generation was brought up in the free market economy, when a new and different schema of valuation was developed. The research of Kusińska indicate that the young people, who start their families, have their hierarchy of values dominated by good health, love, family happiness, independence, self-reliance, living in a free country, high income, and living in line with ones convictions and beliefs. Hence the family values have a high priority, followed in descending order of significance by ideal values, material values, and finally, the values related to self-fulfilment and aspirations [Kusińska 2005, p. 29].

The directions of changes in the values of Poles were also illustrated by an interesting research completed under the EVS (European Values System) in the years 1990, 1999 and 2008. The basis of values system differentiation between the EU countries identifies four sources: the processes of globalisation, the historical and cultural processes, the political transformations and the EU integration processes. As much as the Poles in the beginning of the 1990s differed from other European nations by a much stronger attachment to family values, work, and religion at the expense of free time value, politics or friendship, the trend was completely reversed by the end of the 2000s. Currently the Polish consumers seem to be more traditional and attached to material values while preferring survival to self-fulfilment than other Europeans. Despite this the changes in progress are indicative of an increase in the significance of post-materialistic values, e.g. freedom of speech or political liberty. Note that the current trends in accepted values are correlated with the increase in economic development and differentiation between socio-demographic and economic groups of consumers. As the EVS program has proven, the traditional and materialistic values are chosen by Poles in elderly years, of lower education, lower income and lower social standing [Jasińska-Kania 2012, p. 337].

## VALUES VERSUS ETHNOCENTRIC ATTITUDES OF CONSUMERS

The values of man strongly affect his attitude to various things, states, phenomena, persons or concepts. The attitudes usually define a certain type of individual predisposition for positive or negative valuation of specific objects. It has been widely agreed that attitudes are closely related to such categories as values or emotions. Assumption of a specific attitude, especially a positive one to an object, and making a purchase as a consequence, may be related to fulfilment of values, e.g. preference for healthy products, which a consumer purchases to fulfil their care for health.

The objective and area of investigation shown in this paper was to focus on ethnocentric attitudes and demonstrate the relationships of those attitudes to values recognised or accepted by consumers. The reference sources state that the types and occurrence range of ethnocentric attitudes depends on many significant factors, e.g. patriotism, sense of thread, psycho-social and demographic factors, openness to cultures, the ratio of individual values to collective values etc. [Witek 2010]. Glińska with associates expand those socio-psychological determinants with nationalism, conservatism and lifestyle [Glińska et al. 2008, p. 124]. Many researches in the field of ethnocentrism point out that under certain circumstances those variables provide a better and more precise explanation of ethnocentrism than demographic factors. Based on a review of results of empirical studies several major relationships can be demonstrated between ethnocentric attitudes and certain values. A decisive preference for procurement of domestic products is often related to the values of work and economic security, as demonstrated by a research among French consumers [Grzesiuk 2002, p. 14]. Such attitudes are also favoured by values related to conservatism, traditionalism, patriotism or a strong sense of nationality. They are usually characteristic of elderly persons.

A relatively significant relationship in the opposite direction of effect is the ethnocentric level vs. the openness to other cultures. The higher the openness, the higher the ethnocentrism is, and thus the stronger is the attitude. This pattern is definitely favoured by travels by consumers and their experiences with foreign cultures and other systems of value [Figiel 2004, p. 15].

Ethnocentric attitudes are more frequently represented by citizens of those countries which have strong national traditions, are highly developed and boast a deeply entrenched sense of national identity. The examples here include the Germans or the British [Mazurek-Łopacińska 2000, p. 4].

Each nation is characterised by a different hierarchy of values, i.e. with the priority or essential values with the highest ranks, down to the values of secondary importance. There has been a very strong impact of cultural values observed in the Polish society which have been becoming the guidelines for behaviour. A part of Poles usually negates the cultures which give priority to material values instead of the more prized values that are objectives of effort, e.g. family, honesty, honour, or lawfulness [Witek 2010].

Some research which is currently being done among Polish consumers and concerning the importance of the country of origin to the choices made in food indicate that over 80% of Poles definitely prefer domestic articles. The attachment to the Polish bidders on

insurance or banking markets is slightly weaker[2]. Other investigations also provide an equally high importance of the country of origin among the factors which determine the purchase choices, with over 85% of Polish consumers minding what the country of origin when buying food is[3].

## SUMMARY AND CONCLUSIONS

The purpose of this paper was to present the significance, systems and hierarchy of values as well as the relation of values with the ethnocentric attitudes of consumers. The basic input for this discussion was reference research and, last, but not least, the results of direct personal interviews with citizens of the Wielkopolskie Province in 2013. The investigation area focused on consumer ethnocentrism on the food market.

The results of the research into the values accepted by the consumers prove that the respondents' highest value is family, which is linked to specific family-related objectives. Another value of very high importance is health and fitness, according to the respondents.

The investigation also demonstrated certain differences in the hierarchy of values between the respondents on various (low, moderate and high) ethnocentrism levels.

The cultural and symbolic values were presented with similar frequency and significance in all three consumer groups identified by ethnocentrism intensity, whereas certain traditional values, national values and custom values differentiated the approach to ethnocentrism. The consumers with a higher ethnocentrism level declared a relatively higher significance and attachment to Catholicism, traditionalism and patriotism.

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## WARTOŚCI A POSTAWY ETNOCENTRYCZNE KONSUMENTÓW NA RYNKU ŻYWNOŚCIOWYM

**Streszczenie.** Celem badań, których wyniki zawarto w artykule, było przedstawienie istoty i znaczenia wartości, ich systemów i hierarchii, a także ich powiązania z postawami etnocentrycznymi konsumentów. Wśród najważniejszych wartości dla konsumentów należy wymienić rodzinę, zdrowie i kondycję fizyczną. Postawy etnocentryczne badanych konsu-

mentów były powiązane z wyznawanymi przez nich wartościami. W artykule wykorzystano materiały pierwotne z badania ankietowego wykonanego techniką bezpośrednich wywiadów osobistych. Ankietowani zostali dobrani w sposób nielosowy, z wykorzystaniem metody doboru kwotowego. Respondentami były osoby odpowiedzialne za zaopatrzenie gospodarstwa domowego w produkty żywnościowe. Wartości kulturowe i symboliczne występowały z podobną częstotliwością i znaczeniem wśród grup konsumentów utworzonych na podstawie natężenia etnocentryzmu. Wartości tradycyjne, wartości narodowe i obyczajowe różnicowały stosunek do etnocentryzmu. Relatywnie większe znaczenie i przywiązanie do takich wartości, jak katolicyzm, tradycjonalizm, patriotyzm deklarowali konsumenci o wysokim wskaźniku etnocentryzmu.

**Słowa kluczowe:** etnocentryzm konsumencki, postawy, wartości, rynek żywnościowy

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# APLICATION OF MINKOWSKI'S METRIC IN MEASURING CHANGES OF CONCENTRATION OF VALUE ADDED IN AGRICULTURE, FORESTRY, FISHING AND HUNTING SECTORS

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**Abstract.** This work is a direct continuation of a previous work by the authors that dealt with construction of new coefficients of concentration by using Minkowski's metric $\rho^p(1 \leq p \leq \infty)$. The following work gives examples of applications of those metrics in agriculture, forestry, fishing and hunting sectors. It also studies the pattern of changes of concentration of added value created in those sectors by comparisons with other sectors.

**Key words:** differentiation of Polish agriculture, value added, coefficient of concentration, Gini coefficient, Herfindahl-Hirschman Index, Minkowski's metric

## INTRODUCTION

During the beginning of the 21st century a series of significant changes in each and every economic sector in Poland. Poland's access to the European Union has enabled obtaining funds for development, especially for nullifying inequalities between regions. After Commission Regulation (EU) 715/2010, dated 10 August 2010 (O.J. EU L 210 dated 11 August 2010), Central Statistical Office published complete series of data from regional accounts in terms of gross national product (GNP) and gross value added (GVA), by types of business activity, according to Polish Classification of Activities – PKD 2007, for the period 2000–2010 [GUS 2012]. That publication allows to study the changes occurring during the period in question, sectioned into 66 subregions. Especially, it allows to partially verify the common hypothesis: EU subsidies diminish regional differentiation. As stated, published data deals with a relatively short period of 2000–2010.

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Naturally, measuring differentiation generally has a multidimensional character and requires relatively large and detailed data sets. The situation is further complicated by migration of people, which is both the cause and effect of changes of value of regional differentiation. Thus, it seems reasonable to begin with a synthetic measure to gauge changes in differentiation in a geographical frame. We can use GVA for a given region as such a synthetic measure that we will use to assess differentiation. A special example of a relatively rarely studied problem is the analysis of changes in agriculture, forestry, fishing and hunting sectors, as those sectors are believed to be "traditional". In the following work we will attempt to answer the question: how is value added changing for those sectors. Also, we will verify whether the changes have the same trends as changes of value added in all sectors combined.

Measurement of concentration is one of key problems in economics. That measurement is done in studies of inequality of income as well as concentration in particular markets. Literature dealing with that problem is abundant. It is worth noting that the most popular tool to study concentration of a market is the Herfindahl-Hirschman Index, denoted sometimes as Herfindahl Index or simply HHI [Herfindahl 1955, Hirschman 1964]. For completeness of our considerations: Calkins [1983], Kwoka [1985], Lijesen [2004], Matsumoto et al. [2012], Djolov [2013]. On the other hand the most commonly utilised coefficient in studies of inequality of income [Barnett 2005] is the Gini Index [Hoffman, Bradley 2007]. However, it must be stated that using only one coefficient, even one that is universally acclaimed, can lead to not noticing occurring changes. Moreover, different coefficients can point to different directions of changes in concentration. That phenomenon will be presented in the next chapter.

## MEASUREMENT OF CONCENTRATION

The idea of constructing an indicator that evaluates the phenomenon of concentration is in general based on measuring dissimilarity (differentiation, distance) between a structure of objects and a structure of goods that are owned by the objects. Literature gives many properties that such an indicator should have when it is used to measure concentration. In order to clarify used terms let us assume the following definitions and notations. A set in an n-dimensional Euclidean space $\Re^n$: $\Omega := \{ \mathbf{x} = (x_1,...,x_n) \in [0;\ 1]^n,\ x_1 + x_2 + .... + x_n = 1, x_i \geq 0,\ \mathrm{i} = 1,2, ...,$ will be denoted as a set of structural vectors or set of structures for short.

Vector $\mathbf{x'} := (x_1^{'}, x_2^{'}, ..., x_n^{'}) \in \Omega$ will be called an ordered structure constructed from structure $\mathbf{x} = (x_1, ...., x_n) \in \Omega$, if its coordinates are a permutation of coordinates of vector $\mathbf{x}$ which satisfies $x_1^{'} \leq x_2^{'} \leq .... \leq x_n^{'}$, which we will denote as $\mathbf{x'} := \mathbf{Px}$ for short, where operator $\mathbf{P}$ ($\mathbf{P}: [0;1]^n \rightarrow [0;1]^n$) will be called an order operator. Whereas, vector $\mathbf{x}^{\wedge} := (x_1^{\wedge}, x_2^{\wedge}, ..., x_n^{\wedge})$, where $x_i^{\wedge} := \sum_{j=1}^{i} x_j^{'}$, $i = 1, ..., n$ will be called a cumulated structure constructed from structure $\mathbf{x}$, and operator $\mathbf{C}: \Omega \rightarrow [0;1]^n$, defined as $\mathbf{x}^{\wedge} := \mathbf{Cx}$ will be called a cumulating operator. In addition we will distinguish two special structures in set $\Omega$:

$$\mathbf{e} := \left(\frac{1}{n}, \frac{1}{n}, ..., \frac{1}{n}\right), \quad \mathbf{s} := (0, 0, ..., 0, 1) \tag{1}$$

In our deliberations, the above vectors will play the roles of model structures, against which we will calculate measures of concentration of other structures. In order to simplify further pondering let us make an additional assumption that our data is on the individual object level (no aggregation). This assumption does not decrease the generality of the study, but makes it much easier.

If we denote the measure of dissimilarity (differentiation or distance, which does not need to be a metric) of two structures by d, the structure of owned goods (shares) by **x**, then indicator Ψ which valuates the concentration of goods, which distribution between shareholders is defined by structure **x**, can be defined by the following formulae:

$$\Psi(\mathbf{x}) := \frac{\mathsf{d}[\mathbf{C}(\mathbf{e}); \mathbf{C}(\mathbf{P}(\mathbf{x}))]}{\mathsf{d}(\mathbf{C}(\mathbf{e}); \mathbf{s})} \tag{2}$$

$$\Psi(\mathbf{x}) := \frac{\mathsf{d}(\mathbf{e}; \mathbf{P}(\mathbf{x}))}{\mathsf{d}(\mathbf{e}; \mathbf{s})} \tag{3}$$

where: **e, s** – defined by formula (1).

Naturally, not all measures of distance (dissimilarity) are equally "good" for constructing a coefficient of concentration. Most well known and widely used measure of distance (dissimilarity) is Minkowski's metric, which can be written as follows:

$$\mathsf{d}_p(\mathbf{x}, \mathbf{y}) := \left[\sum_{i=1}^{n} |x_i - y_i|^p\right]^{\frac{1}{p}}, \quad 1 \le p \le \infty \tag{4}$$

where: $\mathbf{x} = (x_1, ..., x_n)$, $\mathbf{y} = (y_1, ..., y_n) \in \Re^n$.

Practitioners that study levels of differentiation of income as well as goods owned by elements of a set of objects, often present a list of postulates for indicator Ψ, used to measure concentration. Generally, meaning in the case when data is aggregated, it refers to dissimilarity between the structure of elements and structure of goods that those elements own. In the case of detailed data, the most important and widely accepted postulates are:

- indicator Ψ reaches its minimal value when goods are evenly distributed amongst all objects,
- value of the indicator is in line with the principle of transfers, which states that a transfer of any amount of good from a "poorer" object to a "richer" object always results in an increase of inequality,
- transfer sensitivity axiom states that the impact of a transfer of goods from a "poorer" object to a "richer" object on the value of the indicator, when the value of the transfer is constant, is proportional to the amount of goods owned by the "poorer" object,
- indicator Ψ reaches its maximal value when all goods are owned by a single object.

It seems worthwhile to add to the above four postulates another one which states that the values of indicator Ψ are normalized, meaning the codomain of indicator Ψ is equal to a closed interval [0, 1]. This addition allows for comparisons of values of coefficients of concentration of sets of objects with different cardinalities. Please note that neither of the two most popular indicators, that is Gini Index nor HHI, satisfy that postulate:

- Gini Index has a codomain of $\left[0,\ \frac{n-1}{n}\right]$
- HHI has a codomain of $\left[\frac{1}{n},\ 1\right]$.

Because of that, both indicators are normalized for practical use:

$$\mathrm{HHI}^{*} := \frac{\mathrm{HHI} - \frac{1}{n}}{1 - \frac{1}{n}}, \qquad \mathrm{Gini}^{*} = \frac{n}{n-1}\mathrm{Gini} \tag{5}$$

where: structure $\mathbf{x} = (x_1, x_2, ..., x_n) \in \Omega$

HHI, Gini – indicators calculated according to original formulae [Gini 1914, Glasser 1962, Hirschman 1964, Herfindahl 1955]:

$$\mathrm{HHI}(\mathbf{x}) = \sum_{i=1}^{n} (x_i)^2, \quad \mathrm{Gini}(\mathbf{x}) := \frac{1}{n}\sum_{i=1}^{n} \left(2i - n - 1\right)x_i^{'}, \quad \mathbf{x}^{'} = \mathrm{P}\mathbf{x} = (x_1^{'}, x_2^{'}, ..., x_n^{'})$$

It can be easily shown that normalized indicators HHI* and Gini* satisfy all above conditions. Moreover, it is worth noting that if an indicator Ψ satisfies the above, and a function $f : [0; 1] \rightarrow [0; 1]$ is non-decreasing and $f(0) = 0$, $f(1) = 1$, then an indicator calculated as a composition of function f and indicator Ψ: $f(\Psi)$, will also satisfy the above postulates. It has been shown in the work [Binderman et al. 2013c] that when using Minkowski's metric, an indicator constructed by using formula (2) or (3) also satisfies the above postulates. Furthermore, it has been showed that the following equations hold true:

$$\mathrm{HHI}^{*} = \left[\frac{\mathrm{d}_2(\mathbf{e}; \mathbf{P}(\mathbf{x}))}{\mathrm{d}_2(\mathbf{e}; \mathbf{s})}\right]^2, \quad \mathrm{Gini}^{*} = \frac{\mathrm{d}_1[\mathbf{C}(\mathbf{e}); \mathbf{C}(\mathbf{P}(\mathbf{x}))]}{\mathrm{d}_1(\mathbf{C}(\mathbf{e}); \mathbf{s})} \tag{6}$$

where: $d_1$, $d_2$ – metrics as defined by formula (4).

This means that by using Minkowski's metrics we can construct many different coefficients of concentration which is significant from a practical standpoint. It should be mentioned that using only one coefficient, even one that is universally acclaimed, can lead to temporarily not noticing even relatively large scale changes. In addition, different coefficients can point to different directions of changes in concentration. In order to showcase this situation, let us consider the following example which deals with changes on a market consisting of different subjects. Table 1 shows the changes in shares in a market of 10 fictitious subjects in a span of few years. For each of the time series points

we have calculated the values of the two most popular, normalized coefficients of concentration HHI* and Gini* as well as a coefficient named Radar, which was proposed by the authors of this work in [Binderman et al. 2012]. In that work it was shown that the measure Radar satisfies all above postulates. The basis for constructing that coefficient is a radar chard of structural vectors [Binderman et al. 2008, 2009, 2013c, Binderman 2011, Binderman et al. 2013a, b].

Please mind that structural vectors denoted (in the first row) by symbols **s**1, **s**2, …, **s**6 (defined by coordinates in the below 10 rows) differ significantly between each other (Table 1). For example: **s**1 = (0.0105; 0.0111; 0.0112; 0.0114; 0.0115; 0.0116, 0.01395; 0.2933; 0.3099; 0.315) while **s**6 = (0.055; 0.055; 0.055; 0.055; 0.055; 0.055; 0.055; 0.055; 0.055; 0.505). In the bottom three rows we have given the values of coefficients of concentration for those structures, calculated via measures HHI*, Gini* and Radar, respectively. In both, the bottom three rows and Figure 1, the different reactions, in terms of changes of the level of values and the direction thereof, of individual coefficients are clearly visible.

Table 1. Illustration of values of coefficients of concentration for six exemplary structures (scenarios) – synthetic data

| | S1 | S2 | S3 | S4 | S5 | S6 |
|---|---|---|---|---|---|---|
| o01 | 1.105% | 3.0135% | 1.000% | 1.982526% | 5.4995% | 5.50% |
| o02 | 1.110% | 3.0185% | 1.996% | 1.982526% | 5.4995% | 5.50% |
| o03 | 1.120% | 3.0200% | 3.000% | 1.982526% | 5.4995% | 5.50% |
| o04 | 1.140% | 3.0250% | 4.000% | 1.982526% | 5.4995% | 5.50% |
| o05 | 1.150% | 3.0500% | 6.000% | 1.982526% | 5.4995% | 5.50% |
| o06 | 1.160% | 3.0900% | 7.000% | 5.750000% | 5.4995% | 5.50% |
| o07 | 1.395% | 3.1600% | 7.900% | 7.250000% | 5.4995% | 5.50% |
| o08 | 29.330% | 5.0950% | 8.600% | 10.000000% | 5.4995% | 5.50% |
| o09 | 30.990% | 33.0000% | 11.001% | 20.000000% | 5.4995% | 5.50% |
| o10 | 31.500% | 40.5280% | 49.503% | 47.087373% | 50.5045% | 50.50% |
| HHI* | 0.2025000 | 0.2025308 | 0.2025470 | 0.2025010 | 0.2025450 | 0.2025000 |
| GINI* | 0.6939333 | 0.6203567 | 0.6002911 | 0.6574722 | 0.4500500 | 0.4500000 |
| Radar | 0.7064599 | 0.7229833 | 0.7151906 | 0.7453993 | 0.6247594 | 0.6247059 |

Source: Own research.

In the case of transition from structure **s**1 to **s**6 we observe no change in the value of coefficient HHI* with a relatively large changes of both indicators Gini* and Radar. Moreover, it is worth noting that the value of coefficient HHI* for structures **s**1–**s**6 differs greatly from the values of both indicators Gini* and Radar. Additionally, the levels of change of values in Gini* and Radar differ greatly between each other when transitioning from **s**1 to **s**6. The difference is even more apparent in the transition between structures **s**1 and **s**2, where the direction of change in Gini* value is opposite to that of Radar. The changes can be viewed in detail in Figure 1. Please note that the range of values of HHI*

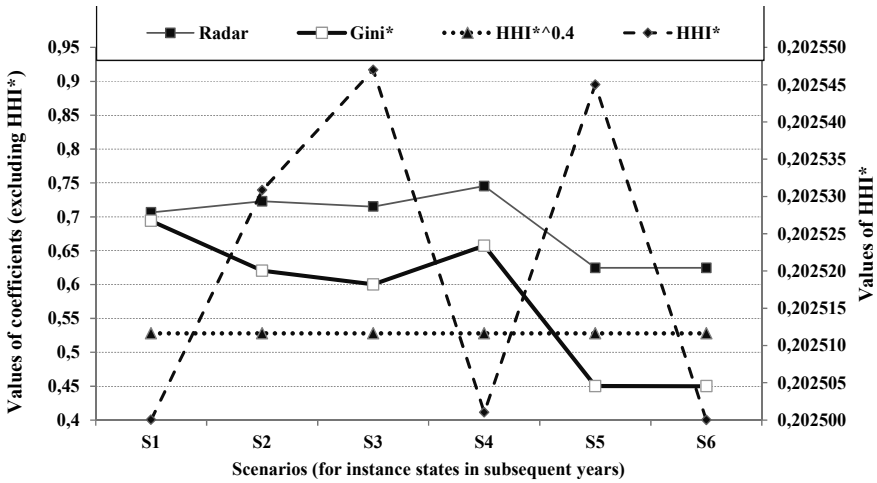


Fig. 1. Values of coefficients for structures defined in Table 1
Source: Own research.

coefficient of concentration in the above chart is different from that of Gini* and Radar, and is present on the right hand axis. It is necessary, because the range of values of HHI* is on a different level to that of Gini* and Radar, and the purpose of Figure 1 was to present the direction of changes in values of coefficients induced by changes in the underlying structure. In order to depict minute changes of value of coefficient HHI* in comparison to values of measures Gini* and Radar, according to the range of values present on the left hand axis, we have plotted values of an additional coefficient $(HHI^*)^{0.4}$.

In order to showcase the differences in measuring concentration via different coefficients even more, we will present charts of values of those coefficients in comparison to certain reference models. The simplest solution seems to be specifying structure models by using ordered family of Lorenz curves [Gastwirth 1971, Arnold 1987] and, based on them, constructing k-element structures of goods. Going back to the example from Table 1, we can construct structures of ten coordinates and identify them with, for example, structures of income which correspond to decile groups of workers in different countries or market shares of ten companies. Let us consider two families of curves:

$$L(t) = t^{\alpha}, \quad t \in [0;1], \ \alpha \geq 1 \tag{7}$$

$$L_{\mu}(t) = F_{\mu}\left(F_0^{-1}(t)\right), \ t \in [0;1], \ \mu \geq 0 \tag{8}$$

where: $F_{\mu}$ – cumulative distribution function for a normal distribution with mean μ and standard deviation equal to 1.

In Figure 2, we have presented two families of Lorenz curves and in Figure 3 charts of values of chosen coefficients of concentration which construction was based on Minkowski's metric. In order to create the structures we have used aggregation based on quantiles, choosing structures with 66 coordinates – which correspond to 66 subregions

of Poland. To increase the clarity of presented charts we have utilized the following notation:

- m(*p; q*) – for the *q*-th power of coefficient as defined in formula (2), while using distance as defined in (4),
- M(*p; q*) – for the *q*-th power of coefficient as defined in formula (3), while using the distance as defined in formula (4).

Naturally, with those definitions we have HHI* = M(2; 2) and Gini* = m(1; 1). Analysis of Figures 2 and 3 can aid a researcher (analyst) in choosing a right coefficient as one can choose a coefficient of appropriate sensitivity based on the shape of the curve of concentration.

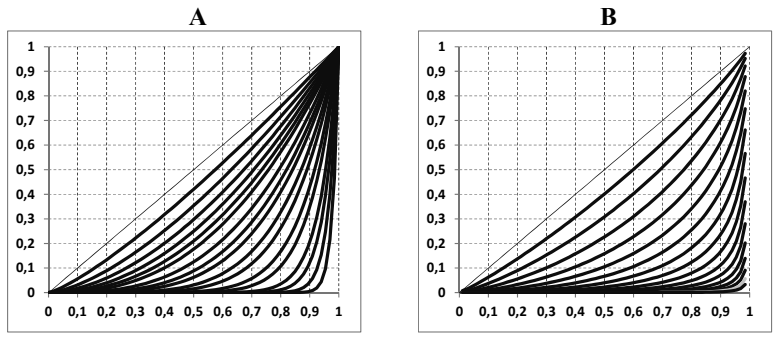


Fig. 2. Charts for curves of concentration defined by formulae (7) and (8)
Source: Own research.

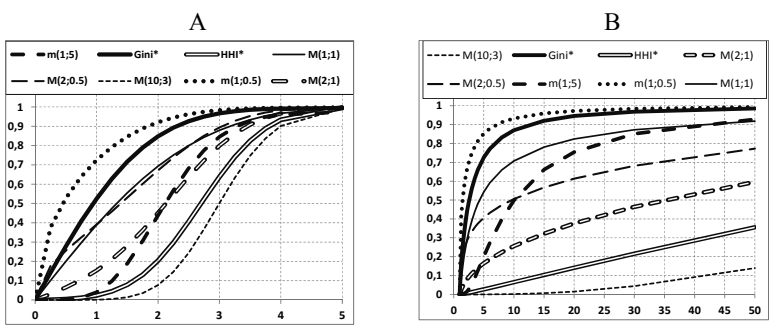


Fig. 3. Charts for chosen coefficients of concentration induced by curves of concentration presented in Figure 2
Source: Own research.

In Figure 2A we have presented charts for $\alpha = 1; 1.25; 1.5; 1.75; 2; 2.25; 2.5; 3; 3.5; 4; 5; 6; 8; 10; 15; 20; 30; 50$. In Figure 2B we have presented charts for values $\mu = \mu_i = 0 + 0{,}25i$, where $i = 0{,}1{,}\ldots{,}16$ and $\mu = 5$. Similarly, in Figure 3 we have presented charts for chosen coefficients of concentration for structures with 66 coordinates (corresponding a structure of a good for 66 objects) aquired from the curves of concentration from Figure 2.

## CHANGES IN CONCENTRATION OF GROSS VALUE ADDED

Poland is divided into six regions which are further divided into 66 subregions [Central Statistical Office, The Nomenclature of Territorial Units for Statistical Purposes (NTS), www.stat.gov.pl]. Possessing data for a period of only 11 years, we do not expect to see major changes in the sectors of agriculture, forestry, fishing and hunting. However, even now certain trends can be seen. In this work, due to space constraints, we have decided to limit our inquiry to measure concentration with only the most popular indicators in their normalized forms: HHI* and Gini*. Based on them, we will try to assess the direction of changes in each of the six individual regions. Let us note that, if follows from Figures 1 and 2 that those coefficients have different sensitivities to changes of structures of shares in gross value added. In Figure 4 we have presented changes in concentration of value added during the period 2000–2010 in six geographical regions.

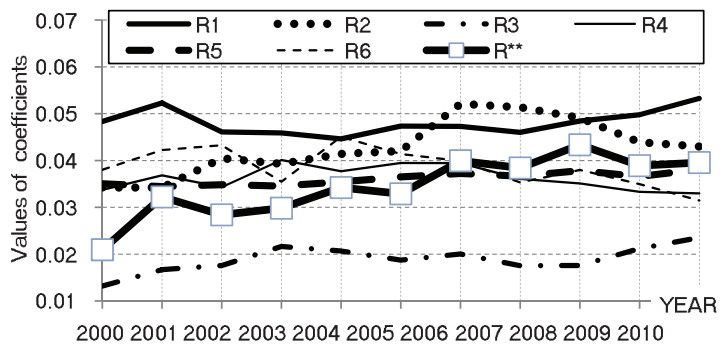


Fig. 4. Values of coefficients of concentration HHI* depicting concentration of GVA in sectors of agricutlure, forestry, fishing and hunting during 2000–2010

Source: Own research.

It can be easily seen that no clear drop in the level of concentration takes place, neither in the collectivity as a whole not in individual regions. The situation in those sectors is so unequivocal that the image of changes in a dynamic approach when using different coefficients of concentration is very similar, changing only in terms of the range of ordinate values. The chart on Figure 5, by depicting the values of measure HHI*, illustrates the concentration of gross value added in a collectivity of six regions as well as the individual regions themselves. The notation is as follows: R1 – central, R2 – south, R3 – east, R4 – north-west, R5 – south-west, R6 – north, R** – the collectivity of six regions. In Figure 5 we have presented values of coefficients of concentration M(2; 0.5), M(1; 1), Gini*, HHI* of gross value added in sectors of agriculture, forestry, fishing and hunting in the collectivity of 66 subregions. The values of HHI* use the right hand axis.

Based on Figure 5, we can conclude that changes in the considered sectors are occuring slowly and steadily. Because of that it is irrelevant which coefficient we use, we will always get the same trend of changes in its value. However, if we look at the value added for all sectors combined we can see some differences. In Figure 6 we have presented changes in concentration of GVA for all sectors combined for the collectivity of

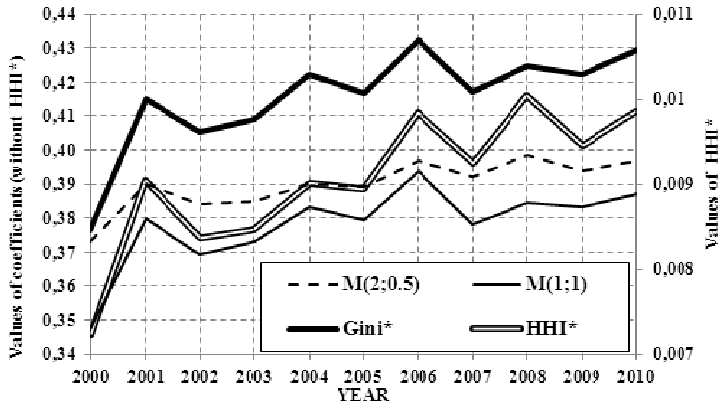


Fig. 5. Values of chosen coefficients of concentration of GVA in a collectivity of 66 subregions during 2000–2010

Source: Own research.

six regions measured by values of HHI* and chosen appropriately to the set of values coefficient m(p; q) of two variants: without capital citz Warsaw and with including it in the central region (denoted "z W-wa"). Because of different levels of values of individual coefficients the chart has been created with two vertical axes. Values of coefficients HHI*, m(1; 2.39), M(2; 1.669) and m(1; 3.33) are depicted on the right hand axis while values denoted "z W-wa" are on the left hand one. It is easily seen that coefficients of concentration HHI* and m(1; 2.39) without the capital show a reversed direction of changes between 2001 and 2002 as well as between 2008 and 2009. Those two coefficients when the capital city is included have the same direction of changes, but differ in the intensity of changes during 2006–2010. Figure 6 does not refute the thesis that after the access to the EU, if Warsaw is to be excluded, the concentration of value added in the collectivity

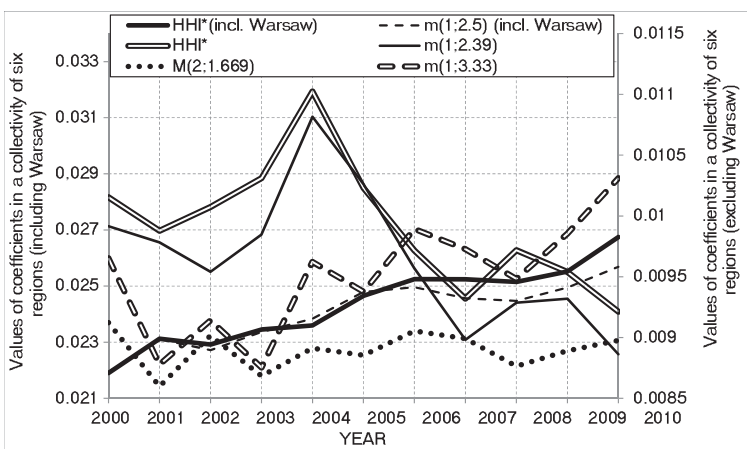


Fig. 6. Values of chosen coefficients of concentration of gross value added for all sectors combined in a collectivity of six regions, during 2000–2010

Source: Own research.

of six regions has a downward trend. When Warsaw is included the values of coefficients HHI* and m(1; 2.39) increase with a slight drop in years 2007 and 2008. In Figure 6 we have also included charts for values of coefficients M(2; 1.669) and m(1; 3.33) for a 65-element collectivity of subregions (Warsaw excluded). The former can be written as coefficient $(HHI^*)^{0.8245}$, while the latter as $(Gini^*)^{3.33}$. We have done this in order to increase the clarity of the chart. The chart of the former indicates that after a division into regions and excluding Warsaw concentration remains constant throughout the time period, while the chart of the latter an upward trend can be discerned.

## SUMMARY

Based on the results presented in this work for the changes of concentration of GVA created in the sectors of agriculture, forestry, fishing and hunting during 2000–2010 we can see that in general there is no problem when choosing an indicator, because the changes of values of all shown measures of concentration in the discussed sectors are occurring slowly and steadily. Because of that it does not matter which coefficient we use as we will get a similar trend of changes of its value. We have confirmed that the concentration of GVA for this sector in a collectivity of 66 subregions does not decrease after Poland's access to the EU, but we can even see a gentle upward trend (Fig. 5). If we limit ourselves to only a measure of HHI* on a collectivity of six regions (Fig. 4) we can see a definitive upward trend. Naturally, within each region (collectivity of subregions that makes up a region) the situation is a bit different (Fig. 4). However, if we carefully analyze individual charts, that present changes in concentration of GVA created by all sectors combined within a collectivity of six regions, in Figure 6 we can clearly see that the changes in values of considered coefficients give different results of changes in concentration between individual years. This can lead to different conclusions. For example, when we exclude Warsaw and consider the collectivity of 65 subregions, then based on values of M(2; 1.669) (meaning $(HHI^*)^{0.8345}$) one can conclude that during 2000–2010, the level of concentration of GVA was constant apart from slight fluctuations. However, when analyzing values of m(1; 3.33) one can deduce that that an upward trend was present. On the other hand, if we utilize measures HHI* or m(1; 2.39) then we can find that during 2004–2007 concentration in the collectivity of six regions decreases in year 2008 and in 2009 a slight increase is visible, only to have the value drop in 2010 to a level below that of 2007. Thus, if we base our deliberations on the values of those indicators we will be certain that the hypothesis stating that EU subsidies decrease regional differentiation is true. This cannot be said in the case of sectors of agriculture, forestry, fishing and hunting. Let us note here that the synthetic example given in the beginning of this work as well as real data about GVA, clearly point that using only one indicator, even one universally acclaimed, can lead to not noticing occurring structural changes, even when those changes are relatively large. Moreover, before choosing means to measure concentration, it is worthwhile to ponder for a moment what is the character of the analyzed changes, as different indicators have different sensitivities and can, in boundary conditions, point to different directions of changes in concentration. It is important to chose a measure that is most sensitive to the aspect that the researcher is trying to analyze. Because of that it is

advisable to create an analytical model that includes the analyzed aspect of the changes in order to choose the right indicator. One can use synthetic data to choose an indicator from those available in literature. Technology for creating measure, presented in this work, shows that a researcher has some leeway in constructing a new measure or transforming one already available.

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## ZASTOSOWANIE METRYKI MINKOWSKIEGO DO POMIARU ZMIAN KONCENTRACJI WARTOŚCI DODANEJ W SEKTORACH ROLNICTWA, LEŚNICTWA, ŁOWIECTWA I RYBACTWA

**Streszczenie.** Praca jest bezpośrednią kontynuacją pracy autorów dotyczącej konstrukcji nowych wskaźników koncentracji, przy użyciu metryki Minkowskiego $\rho^p$ ($1 \leq p \leq \infty$). W niniejszym artykule podano zastosowanie tych wskaźników w sektorze rolnictwa, leśnictwa, łowiectwa i rybactwa. Zbadano jak przebiegają zmiany koncentracji wartości dodanej wypracowanej w tym sektorze, dokonując porównań z innymi sektorami.

**Słowa kluczowe:** koncentracja rolnictwa, wartość dodana, współczynnik koncentracji, współczynnik Giniego, współczynnik Herfindahla-Hirschmana, metryka Minkowskiego

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# CONSTRAINTS IN THE PROCESS OF PARADIGM CHANGE IN THE EU AGRICULTURAL DEVELOPMENT

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**Abstract.** The purpose of this article is to assess the changes in proclaimed paradigms regarding development of the agricultural sector in the EU with particular focus on barriers to these changes. The theoretical part highlights the types of changes in the public policies, the main models of paradigm developments and the impact of institutional factors, including structures of policy networks on their changes. In the next part the CAP proclaimed paradigms are shown against the effects of the current policy. At the same time, these elements of policy network structure which contribute to the replication of the existing patterns of development are indicated. The summary contains reflections on the possibility of institutional change in the development of the CAP. It was found that only further reduction of the agricultural budget after 2020 can become a source of conflict between the actors (stakeholders) around available resources and may change the balance of power in the decision-making process in the CAP.

**Key words:** paradigms, public policy, agricultural development

## INTRODUCTION

Perception of the role of agricultural policy in the development of agricultural sector in a given historical moment depends upon the dominant way of thinking about the desired functions of agriculture and forms and aims of support. There is a clear dependence on the path of the previously taken decisions (path dependency). This particularly applies to redistributive policies, such as the Common Agricultural Policy (CAP), which favour certain socio-professional groups. The proclaimed ideas and normative assumptions arising from the accepted paradigm of agricultural development determine not only the choice of policy objectives, but also instruments for their implementation.

In our work we attach special importance to institutional factors. We hypothesize that till now there is no real paradigm shift in EU agriculture. Successive reforms of the CAP

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are exemplifications of different versions of dependence paradigm. Only slackening of the existing networks of institutional relationship and introduction of new actors into the decision-making process may result in significant changes in EU agricultural policy.

The purpose of this study is to evaluate changes in the proclaimed paradigms regarding development of the agricultural sector in the EU, with particular emphasis on barriers to these changes.

## DYNAMICS OF PARADIGM CHANGE IN PUBLIC POLICIES

The key point of reference in the process of public policies creation are ideas and normative assumptions arising from the accepted paradigm. Paradigm defines a way of understanding the world, influences the definition of problems and determines how to solve them [Skogstad, Schmidt 2011]. Initiators of paradigm shifts are usually anomalies – policy difficulties in dealing with specific problems. Dynamics and pace of paradigms change in public policy are determined, however, not so much by objectively assessed policy ineffectiveness in dealing with tasks it has to face or clear unadjustment of adopted ideological framework to changing social needs, but by institutional factors, including the type and nature of the links between the actors operating in the given policy subsystem.

Depending on the nature of the institutional constraints and the links between the actors the emerging anomalies can lead to small changes in the policy (first-order change), to significant changes, e.g. by replacing one instrument with another (second-order change) or to complete departure from accepted paradigm and its replacement with a new one (third-order change) [Hall 1993]. The first theories explaining the reasons for changes in public policies referred mainly to the idea of social conflict. Explanations currently dominating in the literature indicate that changes in the public policies are rather the result of the learning process. In this context, the Heclo's idea of political learning, the concept of policy-oriented learning of Sabatier or process of social learning described by Hall are quoted [Bennett, Howlett 1992].

The learning process proceeds differently within different policies and only in some cases there is a real paradigm shift. We can distinguish two models of paradigm shift – a sudden and abrupt break with the old order and adopting a completely new ideological assumptions for the policy (revolutionary model) and a gradual, incremental changes involving the inclusion of new ideas and solutions to the old paradigm, which later lead to the formation of a new paradigm (evolutionary model) [Skogstad, Schmidt 2011]. For some policies evolutionary model is a natural model of changes. Especially redistributive policies that create economic privileges and grant them to certain socio-professional groups, develop in clear dependence on decisions taken before (path dependency). At the same time, however, these policies, more than any other, are exposed to the phenomenon of rent-seeking and blockade from the existing beneficiaries. Even if the policy makers are of the opinion that the old paradigm does not work properly and it is necessary to adopt a new one, change may not be possible due to the resistance of institutionally embedded players, who can veto the decision (veto players) [Tsebelis 2002].

The nature of possible changes in public policies are affected not only by the type of relationship and interaction between the actors in the policy networks, but also by the

degree of concentration of power in the network (Table 1). As indicated by the policy-network literature, rapid and continuous changes happen only in a conflictual environment. Changes of incremental nature are characteristic for environments where behaviors based on mutual haggling dominate. The closed network structures based on hermetic cooperation between governmental actors and beneficiaries of the policy lead to the maintenance of the status quo [Silke, Kriesi 2007].

Table 1. Potential and type of policy change

| Distribution of power | Type of interaction | | |
|---|---|---|---|
| | conflict | bargaining | cooperation |
| Concentration | moderate potential for rapid (serial) shift | low to moderate potential for incremental change | low potential for change – maintenance of status quo |
| Fragmentation | high potential for rapid (serial) shift | moderate to high potential for incremental change | low to moderate potential for change – maintenance of status quo |

Source: Silke and Kriesi [2007, p. 145].

In general, the possibility of introduction of far-reaching changes to the policy, including a change in paradigm are significantly higher when it comes to the power dissipation in the policy network. In such network structures it is easier to shift the balance in favour of a coalition of actors who question the maintenance of existing solutions. Thus, a paradigm shift very often depends on changes in the institutional framework of policy making, including the opening-up of policy networks for new actors.

## PARADIGMS IN THE COMMON AGRICULTURAL POLICY

The recent years marked by the economic crisis and the difficulties of recovering from the recession questioned the theory of perfect markets. Reality has shown that there are no such markets because market participants have an unequal access to the information exchange, which causes an asymmetry in its flow, creating structural imbalances in the economy. Even the most advantageous market revenue-sharing mechanism, assuming preference for accumulation in the form of production investments and the growth of the herd is not applicable due to income barriers for farmers. This explains the need for more active role of the state, involving the support for institutions, which guarantee the access to information, stabilize agricultural markets and agricultural income, protect the ownership of land and promote technological progress [Czyżewski 2007].

The solutions adopted in the agriculture sector are usually associated with the four paradigms, formulated on the basis of the criterion relating to the role of the state in the economy [Josling 2002]:

- dependence paradigm (the state-assisted paradigm) based on the belief that agriculture meets the basic food needs, and is of strategic importance for the country,
- competitiveness paradigm, according to which agriculture is able to compete with other sectors of the economy,

- multifunctionality paradigm, according to which agriculture is an integral part of rural areas, providing public goods and other valuable services,
- global agriculture paradigm, in which agriculture can become part of the global food chain.

Consequences of the choice of a specific paradigm are clearly visible in the size and structure of the agriculture support. Although from the 1980s the decline in agriculture aid from public funds, expressed as the ratio of the estimated amount of support for agricultural producers (producer support estimate – PSE) can be observed worldwide, the support is still high. This is particularly visible in the OECD countries, where in 1986––1988 it amounted to about 37%, in 1995–1997 to about 30%, while in 2011–2013 to about 18%. Looking at individual countries, however, we observe significant differences in the level of support to the agricultural sector. The highest level of support is recorded in Norway, the lowest in New Zealand [OECD 2013]. High volatility of the PSE between regions and countries in the years is mainly due to the changes in the type of instruments used to support the agricultural sector. The share of the instruments that distort production and trade the most, i.e. market price support, payments coupled with production and input subsidies, has fallen in the agricultural income from 16% in 1995–1997 to 11% in 2010–2012. For the OECD countries the decline is even more pronounced, since these figures equaled to 32% in 1986–1988, 22% in 1995–1997 and 9% in 2010–2012. This process was mainly due to favourable prices on world markets. The small changes are observed in the use of other instruments, less distorting for production and trade.

When compared to other countries the European Union seems to be very reformist since it uses instruments distorting production and trade in the range lower than the average for OECD countries as a whole. Especially payments decoupled from production are used, apart from Switzerland, mainly in the EU, within the framework of the Single Payment Scheme and the Single Area Payment Scheme. This approach results from the paradigms proclaimed in the EU. It may seem that they are evolving, especially when we take into account the statements contained in the EU strategic documents.

The ideological basis for the Common Agricultural Policy must be sought in the 1950s and 1960s when the European Economic Community identified objectives and principles of operation of this policy. The reference point was then the dependence paradigm based on the assumption that agriculture requires special treatment because of its role in providing food and ensuring food security. State intervention in agriculture is justified by the specific nature of the sector, resulting from natural and geographical conditions. Important role is also played by a constant imbalance between supply and demand, which leads to significant fluctuations in prices and agricultural incomes. These factors affect the volatility of agricultural markets, which have to be corrected through variety of instruments within the scope of intervention policies [Daugbjerg, Swinbank 2007]. The introduction of the CAP was to facilitate the removal of barriers to trade in agricultural products between Member States and solve the structural problems of European agriculture, mainly related to the low productivity of land and labour. The CAP was also expected to provide an adequate supply of food for Europe and to reduce the differences between the level of agriculture income and other sectors of the economy.

The 1990s saw the evolution of the dependence paradigm to the paradigm of multifunctionality, which was being propagated by the European Commission and supported

by the majority of the Member States under the name of the European Model of Agriculture. According to it, the EU agriculture was to become diverse, sustainable, competitive and present throughout the EU, including less favoured areas. The presented range of values associated with agriculture confirmed the unique role of agricultural sector, however, a change in the way of justifying state intervention in agriculture can be observed. An important determinant of this concept is the role of agriculture in the provision of public goods, such as preservation of the countryside, rural cultural heritage, biodiversity. Due to the fact that public goods are not adequately regulated by market mechanisms, state intervention is needed both to correct negative externalities and to encourage farmers to deliver public goods [O'Connor et al. 2006]. Although the paradigm of multifunctionality gave the foundation for socially sustainable production processes, it did not solve income problems in agriculture because of pressures to increase the sector's competitiveness. This is evident in the successive reforms of the CAP (Agenda 2000, the 2003 reform, health-check of 2008, the reform of 2013), as they have not ended traditional market interventions, only reduced its role in order to create more market oriented agricultural sector.

The consequence of the adoption of dependence and multifunctionality paradigms was the emergence of protectionist trade policies and complex intervention instruments on domestic markets. Protectionist policy, which boils down to intensive protection of farmers against international competition, resulted in increased agricultural production. At the same time, thanks to export subsidies and other support instruments, it allowed for an increase in the average agricultural income, which, however, never levelled with the rest of the economy.

The solutions adopted, used in the context of dependence and multifunctionality paradigms, clearly show that there are many shortcomings and imperfections in terms of resource allocation within the scope of policy choices. There is maximization of the benefits of selected interest groups which contributes to the loss in social welfare. Consequently, the allocation of goods and services through the state is permanently ineffective when compared to the market mechanism. Inefficiency is expressed in lobbying, party politics, political interests of particular groups separated from economic rules and the phenomenon of rent-seeking.

According Czyżewski and Kułyk [2013], economic policy actions are the result of the activities of a political nature combined with the pressures of individual interest groups. The change in the flow of economic surplus following the action by state institutions generates efforts to capture surplus value. These concepts make a distinction between economic and political rents. This phenomenon is present both in the optimization through market processes where economic surplus is captured by the market structures, e.g. with a higher degree of monopolization and in the political processes requiring specific political choices.

An integral part of interest groups' political influence is their privileged access to the authorities in power. The political community is limited to a small number of institutions and interest groups. Its members regularly consult the scope and funding of areas of their interest. Each of the participants consider their power in terms of a positive-sum game [Zawojska 2005].

The EU decision-making mechanisms contribute to the lack of effectiveness of the EU's agricultural policy. The Common Agricultural Policy is heavily defended by the institutionalization of a separate EU Agriculture Council, supported by the Special Committee on Agriculture. The weakening of the role of the European Commission to the benefit of the European Parliament, as a result of the introduction of the co-decision procedure in the field of agriculture, promotes the conservation of the existing formal and informal relationships. The specificity of the EU agricultural negotiations, in particular, the fact that the Commission's proposals are frequently modified by the Council, also the consensual style of negotiations in the Council combined with exchange processes between the Member States limit the possibilities of introducing radical changes in the CAP. They favour incremental changes and decisions dependent on the path of previous decisions.

This process is also subject to strong lobbying by various interest groups. The original CAP-policy network did not include any non-agricultural interest groups. This meant that groups such as consumers and rural residents not engaged in agricultural activities had little influence on the process of agricultural policy making. Despite the fact that the representatives of non-agricultural groups are currently involved in the CAP-policy networks, their impact on the CAP is limited to the initial stages of the policy-making cycle.

This is particularly evident in the decisions regarding financing of the CAP. This situation is mainly due to the maintenance of the existing structure of the EU budget, which depends on contributions from the Member States and thinking in terms of maximizing the benefits from payments to the budget. The inclusion in the decision making process of new actors from the outside of the traditional interest groups related to agriculture creates a chance for a change in the functioning of the CAP after 2020.

By analyzing the evolution of the Common Agricultural Policy a clear dependence on the path of previously taken decisions (path dependency) can be observed. That is why, strict rules of the game introduced in the past are difficult to change over time. Therefore, subsequent reform of the CAP had been merely attempts to correct eventual errors caused by earlier policy decisions, which in turn contributed to the formation of further errors and the need for re-adjustment. This should be explained by the inability to move away from dependence paradigm, which has its justification in the period of implementation of CAP in the 1960s, but which raises doubts in the current period, with the completely changed EU and global environment. Formally, the EU has started to support the paradigm of multifunctionality. But in fact only forms of support to agriculture have been changed to justify the need for specific treatment of agriculture in the EU and for spending significant amounts of money from the EU budget on the CAP. The CAP reforms have not gone beyond the first and second-order changes. Generally, only the modifications of policy were introduced by the means of changing its instruments. Thus, within the scope of CAP dependence paradigm continues to be implemented, but under different names. A good example is the new CAP instrument of "greening", introduced with the last reform of the policy for 2014–2020. The original proposal by the European Commission which intended to reduce the negative impacts of agriculture on the environment given the dwindling natural resources and climate change, has been radically changed in the course of the negotiations between the EU institutions and the Member States, reducing pro-environmental behaviors of farmers to the minimum.

## CONCLUSIONS

To conclude the discussion, it can be argued that the CAP reforms gave not gone beyond first-and second-order changes. The new instruments introduced to the CAP contributed only to policy modifications. Despite attempts to support the paradigm of multifunctionality – by exposing the aims related to the provision of environmental public goods by agriculture (formal changes in the system of direct payments – environmental elements covering 30% of the payments) – CAP continues to be primarily a tool of realization of traditional agricultural interests. The dependence paradigm is being still implemented within the EU's agricultural policy, but under different names. It seems that only the inclusion of new actors from outside the traditional interest groups involved in agriculture in the decision making process will create an opportunity for a change in the functioning of the CAP after 2020.

One can wonder whether institutional changes are possible in the process of development of the EU agricultural policy. According to the North [2006, p. 555], "institutions usually are not created out of necessity, or even in order to make them socially efficient; they, or at least the formal rules, are created to serve the interests of those with the bargaining power to create new rules". It must be assumed that only further reduction in the agricultural budget after 2020 can become a source of conflict between actors (stakeholders) over the available resources and may change the balance of power in the decision-making within the CAP.

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## OGRANICZENIA W PROCESIE ZMIAN PARADYGMATÓW ROZWOJU ROLNICTWA W UE

**Streszczenie.** Celem artykułu jest ocena zmian zachodzących w głoszonych paradygmatach dotyczących rozwoju sektora rolnego w UE, ze szczególnym uwzględnieniem barier hamujących te zmiany. Część teoretyczna naświetla rodzaje zmian w politykach publicznych, główne modele rozwoju paradygmatów oraz wpływ czynników instytucjonalnych, w tym struktur współpracy sieciowej (policy networks) na ich zmiany. W kolejnej części głoszone paradygmaty WPR są ukazane na tle dotychczasowych efektów funkcjonowania polityki. Równocześnie wskazane są te elementy w strukturach współpracy sieciowej, które przyczyniają się do powielania dotychczasowych wzorców rozwojowych. W zakończeniu podjęto refleksję na temat możliwości zmiany instytucjonalnej w procesie kształtowania WPR. Stwierdzono, że dopiero kolejna redukcja budżetu rolnego po 2020 r. może stać się zarzewiem konfliktu między aktorami (grupami interesów) wokół dostępnych zasobów i zmienić układ sił w procesie podejmowania decyzji w zakresie WPR.

**Słowa kluczowe:** paradygmaty, polityka publiczna, rozwój rolnictwa

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# THE QUALITY OF WORK LIFE AND SOCIALLY RESPONSIBLE ACTIONS DIRECTED AT EMPLOYEES ON THE EXAMPLE OF A SERVICE COMPANY*

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**Abstract.** The aim of the study was to describe the implementation of socially responsible business actions addressed to employees in five areas. The two hypothesis has been assumed: 1. The analyzed company acts in social responsibly way towards the employees shaping their quality of work life; 2. Social responsible actions aimed to employees are influencing their quality of life and are important factor of financial success of the company. The original internal data from enterprise and data from other research were analyzed. The main method of research was case study. Data have been obtained through in-depth interviews. Elements of human resource management (HRM) in the enterprise have been characterized. The research found the level of implementation of the concept of corporate social responsibility (CSR) towards internal stakeholders and its importance in shaping the quality of work life.

**Key words:** quality of life, quality of work life, corporate social responsibility, human resource management

## INTRODUCTION

The quality of work life as a research problem is now considered fairly often. This issue is related to the concept of human resource management, which is growing in recent years. In particular the problem is related to the issues of sourcing, development and maintenance of human capital in organizations, which constitute the essence of HRM. This modern concept of management is based on the assumption that employees are the most valuable asset of an organization and its competitive potential. According to that the quality of life is exaggerating about the quality of this resource and its efficient use. Studies of quality of life of Polish people show how important this problem is. Much of the

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respondents, about 61%, believe that work affects their health and wellbeing, at least in a small degree, and 14% of them admit that the impact of work on their health or well-being is significant. A high level of stress at work is indicated as the main source of deterioration in the quality of life [Philips… 2010, pp. 9, 23]. Stress has various causes and different consequences for workers' health, both physical and mental health and can affect their productivity [Brun 2005a, p. 3]. Approximately 20–30% of the population of working people suffer from occupational stress. This stress causes symptoms that start from simple anxiety, going through depression, causing physical illness, and in extreme cases leads to death from overwork, or as a result of an attempt on own life [Praca… 2011, p. 1]. International Labour Organization estimates that more than 2,2 million workers died of occupational accidents and occupational diseases in 2005 [World… 2007, p. 1]. The inadequate quality and standards of work, including work organization and communication, are set out among the causes of stress at work [Philips... 2010, p. 30]. The style of management plays an important role in shaping organization of work and communication. Other causes include mobbing, professional burnout and discrimination. How should organizations counteract these negative phenomena to human capital, which is the source of effectiveness of the organization, so as to it be able to develop? Changes in management are necessary. These changes must be systemic and typed in a culture of the organization and have to held at a strategic level. A good solution to a given problem seems to be doing business in accordance with the concept of social responsibility (CSR) [Borkowska 2006, pp. 1, 10–11, Szczęsna et al. 2010, p. 22]. However, the concept of CSR, as a expanding one, it is implemented differently in business practice. Entrepreneurs learn of social responsibility for their business. It is evidenced by the small scale corrected deployments to the practice [IPSOS… 2002, p. 2, Dżoga et al. 2010, p. 3]. Therefore it is important to present examples of implementation of CSR in relation to workers and its usefulness in shaping the quality of work life.

The main aim of this work was to study the implementation of socially responsible actions aimed at employees in selected service company. The two hipothesis has been assumed:

1. The analyzed company acts in social responsibly way towards the employees shaping their quality of work life;
2. Social responsible actions aimed to employees are influencing their quality of life and are important factor of financial success of the company.

There were three research tasks in the work:

1. The presentation of the activities of HRM in the service company;
2. The characteristics of socially responsible actions directed to the staff on the background of the results of research on corporate social responsibility;
3. The assessment of the level of implementation of social responsibility in the area.

## RESEARCH METOD

The research method was case study. This method allowed to obtain detailed information and conduct in-depth analysis of the research problem. The research object was selected in a targeted way. Selection criterions were the number of employed persons and

implementation of an integrated quality management system. A private company with foreign capital from a group of SMEs from the developing industry of service was selected, which operates on the area of a large city and neighboring municipalities. The company employs approximately 200 employees, including 30 white-collar workers.

A directly in-depth interviews were used as a method of obtaining the data, with using a questionnaire consisting of five parts containing open-ended questions. Interviews were conducted in June and July 2011, with 5 workers occupying top management positions in the company and the employees personnel department. Another method was the analysis provided by employees of the company documentation, including "Book of the Integrated Management System", "Collective Labour Agreement" and "Rules of Work".

An objective measure have been used for survey the quality of work life [Woźniak-Krakowian 2004, pp. 1–2]. The way of wages and other activities to motivate employees and working conditions and work organization were analyzed.

The results of previous studies conducted in the company in September 2010 have been used in this work. These studies concerned the problem of leadership styles and the phenomenon of mobbing. Description of the methodology in these studies is in the publications: Jakubczak [2009, pp. 43–53], Gotowska and Jakubczak [2011a, pp. 76–78], Gotowska and Jakubczak [2011b, pp. 237–241].

## IMPLEMENTATION OF ACTIVITIES FOR THE EMPLOYEES – AN OBJECTIVE MEASUREMENT OF QUALITY OF WORK LIFE

The results of research on consumer attitudes towards corporate social responsibility suggest that the appropriate treating and fair rewarding the employee take a significant position in the hierarchy of actions expected by the society of entrepreneurs. Shaping a fair industrial relations is mentioned in the second place on the list of expectations and it is on the list just after the quality of products or services. Implementation of tasks connected with the employees took in total 43% of the indicated answers on the question: what actions are characterized by a socially responsible company [IPSOS… 2002, pp. 3, 5]. Activities aimed at employees in the company can be divided into several areas [Borkowska 2005, pp. 12–13]. For the purpose of the article they were divided into five groups: the organization of working conditions, the way of rewarding, forming partnerships at work, investment in human capital and balance work-life with the help for staff in difficult situations.

### The organization of working conditions

Organization of working conditions in the company proceeds on a highly formalized way. The most important are legal requirements included in the external basic legislation and statute books governing the organization of work. The company also operates an integrated management system (IMS), its essential element is the management of occupational health and safety. The system applies in business since 2005 and is based on standards: ISO 9001:2008, ISO 14001:2004 and PN-N 18001:2004. The system is subject to evaluation and improvement. All employees know the policies of IMS and have to use them. It is declared in politics of IMS that one of the pillars, on which it is built

development of the company, is a worker and his job safety. The tasks in the enterprise are carried out with regard to current law, including labour law. The working environment is regularly monitored and it is assessed the level of occupational risk to reduce harm and annoyance at workplaces and prevent occupational accidents and occupational diseases. A list of hazards in various processes affecting the work environment was developed for this purpose. The management fully supplies the necessary protective equipment to employees on an each workplace. Investments are directed to the work environment, including infrastructure and means of work, based on modern techniques and technologies that ensure an adequate level of safety and health. The company aims to ongoing training, awareness and involvement of staff in the implementation of the policy of quality, including safety and health. Employees are trained in this field according to plan training and according to needs arising from changing the rules, conditions and technology.

Declarations contained in the description of IMS policy are reflected in the "Book of the Integrated Management System", which describes the individual processes. One of the processes in the IMS is the "P-10 – Health and Safety Management". The purpose of the system is continuous improvement of occupational safety and health. As part of the process are carried out risk assessment for each workplaces, the assessment of harmful factors, research of staff, a register of accidents and occupational diseases, and training. Four activities have been identified in this process:

- identify hazards and job risks, planning and supervising the implementation of the objectives;
- identify potential failures, prevention and planning for dealing with accidents at work and failure;
- monitoring;
- internal and external communication.

The changes in the Book of IMS may be requested by all employees.

**The remuneration policy and motivational system**

The remuneration policy in an enterprise is set in a formalized way in the form of "Collective Labour Agreement" (CLA) between the company and the trade unions. Monthly rate of basic salaries is varied according to the work place. Complementary components of remuneration is:

- statutory bonus,
- incentive bonus,
- allowance for overtime work,
- supplement for Sunday work and holidays,
- foreman supplement.

In addition to that, the remuneration rules in specific cases have been set out:

- employees working at night are entitled to a night supplement, which equal 30% of the basic hourly rate;
- for employees in the operation of equipment which do not require constant supervision and workers constantly do additional work or perform services outside normal working hours may be established salary as a lump sum;

- employees performing a task outside of the place in which the head office is, is allocated amount to cover the costs associated with business travel;
- seniority of work amounting to over 20 years empowers the employee to retain 100% of salary in case of absence from work due to illness lasting a total of 33 days;
- jubilee awards, retirement and disability and survivors bonuses are awarded.

Generally, a way of shaping salary is different according to sort of positions of employee. Both workmen and white-collar workers receive base salary, but its height depends on the grade category of a worker. All employees are covered by the principles of rewarding, but they are different for these two groups. Rules of Creation and Sharing of Bonuses, which is annex to the CLA, lays down detailed rules for the loss of individual premiums. Workers in blue-collar are remunerated in a mixed system. The employees without the norms of a task are entitled to receive the statutory bonus, but the employees with set out the standards of a task are entitled to receive the incentive bonus. For employees in managerial positions and separate positions bonuses are determined by the President of the company taking into account the additional non-standard criteria, such as: proper supervision, ensuring the coordination of work within the organizational units and appropriate interaction with other organizational units

Incentive system is equipped mainly in financial instruments. The positive motivation dominates. Although the Labour Regulations allows the use of sanctions in the form of warning, reprimand or in cash for behavior not complying with the established order, work regulations, safety regulations and fire protection. The Rules set out in detail the violation. Not fulfilling the obligations or intentional damage done to the employer causes the withdrawal of privileges according to the damage suffered. The statutory bonus is 20% of basic rate, the incentive bonuses reach 50% of basic rate, and thus play a significant role in motivating employees to better performance and accuracy. Discussed way of rewarding is only possible through monitoring labour productivity, which in turn is conditioned by the implementation of new technologies and techniques in business. Clear criteria for evaluating productivity and armament in the innovation performance of IT ensure the effectiveness of the system.

**Shaping partnerships at work**

The culture an organization fosters forming partnerships in work. The organizational culture consists of many elements, among which is the management style. The studies have shown that only democratic styles, that are oriented to high intensity of the relationships, exist in the enterprise. Therefore, there is no doubt that the needs and goals of company employees are an important area of interest of managers in the analyzed company. In the company is also used mobbing prevention. Employees are familiar with basic information about how to deal with bullying situations on the occasion of the mandatory safety training. In September 2010, the study was conducted among all employees about the level of awareness about the problems of violence at work, and about the size and characteristics of this phenomenon. The results show that among 100 respondents, only 22 persons know the definition of mobbing not fully, the other persons understand the concept of violence at work in a correct and complete way. Although the specifics of the work and staff diversity in terms of socio-demographic characteristics such as age, type

of education or environmental of origin, could contribute to conflict, which are initiator of mobbing, the scale of the phenomenon is small and does not differ from the levels found in other studies [Gotowska, Jakubczak 2011a, pp. 80–83].

An important issue in building the appropriate relationships at work is communication. In the organization is realized the concept of Management through the Communication. Departmental managers have the knowledge of the company's competitive position, about management plans, problems and troubles of the company and its aims and they integrate the actions of their departments. The flat organizational structure within the company promotes good communication. A reduced power distance was observed. The Management emphasizes the importance of respect for each employee and his initiative. Employees are invited to express an opinion about their problems at work and ideas of the way improve implementation of the organization's objectives. The communication between organizational units is carried out in direct and not very formal way. There is a large decentralization of authority in the field of operational management. Managers at all levels due to their competence have free to decide how to achieve the objectives. Managers, especially higher order, have, in addition to the formal and functional authority, the authority of personal. Thus, the process of directing proceeds smoothly and managers avoid passive and active resistance to authority and discontent. There are partnership relations in working among executives, which encourage the creation team. Strategic decision making occurs in a collegial way. The integration of workers team takes place beyond the professional life well. There are organized regular recreational meetings and events with the participation of family of employees.

An important element in the practice of human resource management is an appropriate hierarchy and a level of awareness of the objectives among the participants of the organization. All managers expressed clear objectives for their departments. They are also integrated into the mission and strategic objectives of the company. The proper hierarchy of objectives provides the high level of involvement of individual members of organizations in their implementation. Managers emphasize in their statements about managing people, that getting high levels of employee engagement at all levels is necessary for success throughout the organization.

**The investment in human capital**

A work station training is mandatory and apply to new recruits. Employees also should undergo specialized training and perfecting courses, for example: administrative staff and workmen are being trained in their fields to adapt their knowledge and skills to changing the law or other circumstances. A number of training courses is mandatory and they must be take place on fixed dates. Employer's actions in this area are supervised by the Trade Unions, the Employee Council and the Social Work Supervisor and the Safety Inspector.

The investment in human capital, particularly in skills and health, are not fully completed field yet. There is a necessary to develop appropriate practices responding to the needs of workers, both in terms of topics and way of training of implementation or of choosing other forms of activity. The investment in human capital are associated with incurring monetary costs, but their effects are difficult to measure. Therefore, in the for--profit organizations, under strong competition, rational behavior is limit this sphere to the necessary minimum for financial reasons.

### The balance between work and life and assistance to staff in difficult situations

A very important element in shaping a positive relationship between worker and employer is to determine the time of work. It seems that the normatively determined daily eight-hour working time leaves little margin of maneuver for its flexibility. In the analyzed company, however, some rules were worked out that allowed account for both management and employees goals.

The research have been carried out among administrative staff in the company, using a questionnaire, on the regulation of hours begin and end the working day. Results of this research contributed to change rigid rules in the movable working time and matched to the individual needs of employees. The working time of workmen is regulated in a different way because of specific conditions resulting from the tasks. In general, these workers work within set deadlines, but it is also allowed more flexible working time in this framework, that is, its reduction after doing designated tasks. A flexibility working time is possible by monitoring of it and executable of tasks. This way of a control the efficiency affects on motivating of employees.

The company employ people with disabilities. Towards these workers are used the relevant provisions of the law. Workers' needs are taken into account for example by adjusting the positions and working hours.

About the satisfaction of employees with different aspects of working in a company may indirectly indicate the number and the reasons for the redundancies. Workplaces of workmen are diverse in terms of attractiveness of tasks. There is the largest rotation among employees in positions with the lowest attractiveness. The rotation on the other workplaces is small. There were three cases of redundancies in 2011. Two of them were held under an agreement between the parties. One of the employees did not receive a extension of contract of employment because of poor quality of his work.

The Collective Bargaining Agreement includes individual, random needs of workers. Among others for this purpose have been established the Company Social Fund. It were used in case of an application of an employee for assistance grants for the purchase of medicines for the treatment of cancer.

The Social Work Inspector operates in the company, who is elected by the whole crew from among the candidates presented by the Trade Unions.

## IDENTIFICATION OF SOCIALLY RESPONSIBLE ACTIONS DIRECTED AT EMPLOYEES

Characteristic of socially responsible activities is primarily voluntary nature, that means there are not only actions which follow the legal norms that are binding and determine the minimum requirements, but they are the additional actions [Borkowska 2005, p. 12].

The results suggest that the action identified in the company, that may be included in socially responsible activities, occur in almost each of the five areas mentioned above. Usually they are not defined and identified and called as socially responsible actions, and actions consistent with the concept of CSR. But these are actions established in the organizational culture and written strictly in business strategy, with other observed activities at the field of CSR, such as ecological responsibility, and social responsibility towards the contractors and the society (Fig. 1).

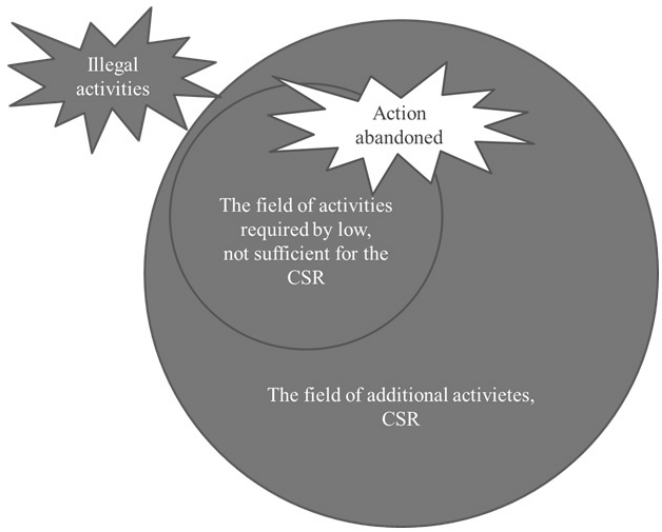


Fig. 1. Identification of socially responsible actions
Source: Own preparation.

There are three strategies, that are preventive against stress at work, realized in the company [Brun 2005b, pp. 518]. They were not identified by management yet. The first strategy of "identification with the place of work" is realized mainly through participating management style, which is reflected in the availability of the Management for employees regardless of position, and opportunities to influence the decisions of top management by all employees in the company. The second strategy consists in "to support staff", manifested in the organization of the system of evaluation and monitoring of employees using the principle of Management by Objectives and management actions aimed at prevention of stress in professional life. Latest from the strategy, the strategy "reducing the amount of duties" is manifested in efforts to flexible working hours. This strategy is varied and adjusted to the requirements of positions and is shaped differently for employees in positions of administrative and managerial, and executive positions. In both cases it gives the employees some control their own working hours and can be a motivator, and prevent the emergence of tensions caused by imbalance between the time shared between personal life and work.

Making an objective assessment of the attractiveness of jobs in the enterprise allow to noted that obtained gratuities in comparison with nuisance work on various types of positions can be evaluated positively. Especially that determinants of local and global labour market, do not give too many better alternatives to many of the employees in the company. Most jobs do not require highly skilled workers, while the company offers a very valuable today: stability of employment, clear and fair rules of work and wages, good working conditions and working organization and a certain amount of flexible working time. Therefore, it can be concluded that the company operates responsibly towards their employees.

## CONCLUSIONS

The analysis of research results allows to formulate the following conclusions:

1. There are carried out prevention of mobbing actions through a policy of openness and the provision of appropriate work in the company, which facilitates the flow of information within the company. There is also appropriate and transparent way of rewarding and assessing workers which reduces the occurrence of tensions and misunderstandings. Highly efficient and democratic management styles presented by the managers create the right climate which conducive to cooperation and limits rivalries in a bad sense.
2. Activities within the inner social responsibility are implemented in the enterprise at the level required by law, but there are also many examples of implementing these actions over the requirements set out by the normalization of legally. Often these actions are not identified and called as socially responsible actions. Their initiation takes place in an intuitive way. Improving awareness about the importance of these activities and the formulation and implementation of the objectives in this area can contribute to improving the quality of life of workers and thus increase productivity in the tested company. The activities should be preceded by subjective measurement of quality of work life in the enterprise.
3. Activities directed at employees are varied individually and in groups by type of occupied positions.
4. The least action that goes beyond the minimum was noted in the area of investment in human capital. This sphere requires a diagnosis by examining the needs of workers and developing appropriate practices.
5. Employee commitment to the goals of the organization is greater when they perceive the socially responsible actions carried out in business.
6. There are used all the strategies against stress at work which affecting the quality of life in the company. Such behavior is the key to business success. By cultivating the involvement of employees a company can achieve a high level of satisfaction of employees, which translate into their higher productivity.
7. The success of strategies chosen by the company is confirmed by objective and subjective conditions. The objective measure the success of the organization's activities for the employees, so as to keep and raise of their quality of life, is the company's financial condition. The business is growing by investing in the production potential and expands business profile. The company has gained leadership and continues increasing its share in the market in systematic way. The activities of the enterprise are often noticed by the environment to promote business in accordance with the principles of CSR and they are rewarded with prizes such as for example: "Gazele biznesu" and "Przedsiębiorstwo Fair Play". Members of the Management Board have also received state rank honors for his services associated with the performance of social functions to employees.
8. Action in a socially responsible way does not mean the implementation of the same variety of activities in each company (organization). The implementation of CSR conception, including actions aimed at the internal beneficiaries, should be differentiated by type of activity (manufacturing, services), the type of industry and specific characteristics of business organization, which consists of variables such as for example the size (number of employees), quality of employees and their specific needs and expectations.

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## JAKOŚĆ ŻYCIA ZAWODOWEGO I DZIAŁANIA ODPOWIEDZIALNE SPOŁECZNIE SKIEROWANE DO PRACOWNIKÓW NA PRZYKŁADZIE FIRMY USŁUGOWEJ

**Streszczenie.** W pracy poruszono kontynuowany od niedawna problem badawczy, którym jest jakość życia zawodowego. Celem opracowania był opis realizacji działań odpowiedzialnego społecznie biznesu skierowanych do pracowników w podziale na pięć obszarów. Sformułowano dwie hipotezy: 1. Przedsiębiorstwo stosuje społecznie odpowiedzialne działania skierowane do pracowników i wpływające na jakość ich życia; 2. Społecznie odpowiedzialne działania firmy są istotnym elementem wpływającym na sukces finansowy przedsiębiorstwa. W badaniach analizowano pierwotne dane wewnętrzne pochodzące z przedsiębiorstwa oraz wyniki badań innych autorów. Główną metodą badawczą było studium przypadku. Dane uzyskano za pomocą wywiadu pogłębionego. Scharakteryzowano elementy zarządzania zasobami ludzkimi w przedsiębiorstwie. W wyniku badań ustalono poziom realizacji koncepcji odpowiedzialności społecznej biznesu wobec interesariuszy wewnętrznych i jej istotność w kształtowaniu jakości życia zawodowego.

**Słowa kluczowe:** jakość życia, jakość życia zawodowego, społeczna odpowiedzialność biznesu, zarządzanie zasobami ludzkimi

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# COMMON AGRICULTURAL POLICY OF THE EUROPEAN UNION AND THE CHANGES IN POLISH AGRICULTURE

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**Abstract.** In Poland, as early as in the pre-accession period to the European Union, the activities aiming at the creation of conditions for implementation of the principles of Common Agricultural Policy (CAP), which assumed supporting of agricultural production with direct payments and match-funding, had already been undertaken. In order to realize that task, the Agency for Restructuring and Modernization of Agriculture (ARMA) was formed. In the years 2004–2013 it gave agriculture 94,9 billion PLN, within the frames of subsidies and its beneficiaries were farmers. A considerable increase in the development of agricultural production support, from less than 9% in pre-accession period to about 60%, in the years 2009–2010, did become a fact. Those financial means were mainly destined for creating production potential and structural alterations in agriculture. To determine the influence of CAP on Polish agriculture, the following parameters were subjected to analysis: factors of production and their structure, as well as productivity of agricultural production factors and food self-sufficiency. Significant changes, resulting in the increased agricultural productivity and factors of production, were recorded for all the analyzed fields. Also the production of majority of agricultural products per 1 inhabitant has increased, which contributes to food self-sufficiency of Poland.

**Key words:** agriculture, Common Agricultural Policy, support, subsidies, productivity, self-sufficiency

## INTRODUCTION

The Polish agriculture after World War II was functioning in completely different political, economic and legal conditions from that of market economy countries, which formed, and later associated subsequent European Union ( EU) countries [Kapusta 2012].

During the European Council summit in Copenhagen, 21–22 June 1993, a political decision about accession of Central Europe countries to the EU and the conditions

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of their membership were established. The challenge for Poland proved to be actual harmonization of the Polish law with the EU law, understood not only as appropriate legislative activities, but also as the change in activities of public authorities, first of all in the field of public administration [Nurzyńska 2012]. Common Agricultural Policy (CAP) of the EU involves mainly:

a) common market – abolition of trading restrictions referring to soil, forest and sea produce inside the EU; common process, fixed exchange-rate in agricultural trade turnover; harmonization of administrative, phytosanitary, veterinary and health protection regulations; structural policy is a component of CAP,
b) main assumptions of agricultural policy: a primary productive unit in agriculture is a farm; agriculture constitutes a special sector of the EU economy, which is to ensure the EU self-sufficiency regarding agricultural produce; agricultural policy requires separate legislative regulations, there are established primary rules of CAP (single market, the EU preferences, financial solidarity).

CAP objectives are to be achieved by:

- regulation of agricultural markets,
- financial support for farmers' income,
- co-financing of investment and modernization projects in agriculture and in rural areas,
- system of storage and sale of agricultural commodities,
- common techniques for import or export stabilization.

Common Agricultural Policy (CAP) possessed the instruments of financial support of agricultural producers and, therefore, the need to establish appropriate government agencies did arise. As early as in pre-accession period, institutional infrastructure, capable of receiving and redistributing support measures among the beneficiaries, was formed, among others, Agricutural Market Agency (AMA) [Ustawa...] and Agency for Restructuring and Modernization of Agriculture (ARMA) [Ustawa...], as well as a number of administrative decisions were taken [Nurzyńska 2012].

## RESEARCH OBJECTIVES, RANGE AND METHODOLOGY

The purpose of the work was determination of the effects of CAP on production and structural alterations in Polish agriculture. To capture properly those changes, the research on the state of agriculture in the years 2001–2003 and 2010–2012 was conducted. The first period shows the state of agriculture in Poland's pre-accession period to the EU, the second – after advanced changes in agriculture (nine years of CAP). The pattern of three-year periods in research can be justified by the fact that in agriculture we deal with nature forces, independent from a man, which affect on production and mean values. The latter ones, obtained for three years, at least partially reduce that changeability.

This elaboration was based on such sources as serial and non-serial publications, statistical data by Central Statistical Office (CSO).

The collected material was elaborated and interpreted with the use of the following methods: vertical comparative method [Kapusta 1976; Stachak 2003] and statistical method [Stachak 1997]. The assessment of food self-sufficiency was based on the methodology by Kapusta [2012] using:

a) index $S_s$, which is a quotient of national production (*Pk*) and national consumption (*Zk*), (in this case: food consumption, sowing, industrial consumption, grazing, as well as loss and shrinkage) according to the formula:

$$S_s = \frac{Pk}{Zk} \times 100$$

where: $S_s$ – degree of self-sufficiency;
*Pk* – national production;
*Zk* – national consumption;

b) share of consumption in production (%);
c) share of import in consumption (%);
d) share of export in national production (%);
e) balance of trade (thousands tons).

To analyze the occurring phenomena, indicators of change structure and dynamics. The research results were tabled and provided with the appropriate description.

## RESEARCH RESULTS AND DISCUSSION

Analyzing the transfer of financial means from the EU budget it is possible to state that as early as in 2004, the first financial means were received from the EU, among others, to support the development of rural areas, which probably provided for farmers' and village dwellers' increased acceptance of Poland's membership in the EU.

As a result of joining the EU, in Poland the expenditure of national budget on agriculture were supported by the EU funds within the frames of single area payments and complementary national direct payments (Table 1).

Single area payment is a financial instrument from the first pillar of CAP, where 100% expenses are covered by the EU budget. After negotiations with the European Commission (EC), Poland gained the right to co-financing determined amount of direct payments from national budget in particular years, reaching 100% of financing direct payments

Table 1. Single area payments realized within the frame of 2007–2013 campaign

| Period | Type of payment (million PLN) | | |
|---|---|---|---|
| | single area payment | complementary national direct payment | total |
| 2004 | 2 853.6 | 3 486.8 | 6 340.4 |
| 2005 | 3 160.2 | 3 529.1 | 6 689.3 |
| 2006 | 3 881.2 | 3 915.8 | 7 797.0 |
| 2007 | 4 242.8 | 2 763.0 | 7 005.8 |
| 2008 | 4 759.5 | 2 560.5 | 7 320.0 |
| 2009 | 7 071.2 | 3 384.2 | 10 455.4 |
| 2010 | 7 815.7 | 3 093.5 | 10 909.2 |
| 2011 | 9 875.2 | 2 579.5 | 12 454.7 |
| 2012 | 10 210.5 | 2 684.4 | 12 894.9 |
| 2013 | 11 092.2 | 1 909.2 | 13 001.4 |
| 2004–2010 | 64 962.1 | 29 906.0 | 94 868.1 |

Source: Agriculture in 2012, CSO, Warsaw 2013, p. 39; AMA.

from the EU budget only 2013. Therefore, expenses from national budget had to increase and they amounted (%) in particular years: 2004 – 2.89, 2005 – 3.29, 2006 – 3.74, 2007 – 6.67, 2008 – 8.58, 2009 – 6.18, 2010 – 9.83, 2011 – 9.1, 2012 – 8.34, 2013 – 8.39. It should be stressed, that before accession, in the years 1997–2003, the share of expenses on agriculture ranged, average, 2.23% [Nurzyńska 2012], which meant that the share of expenses on agriculture from national budget in 2013 increased by 2.8 times. Single area payments the highest payment which, in 2011, ranged 61% of all financial means directed to rural areas in Poland by the EU. Moreover, it was the payment whose purpose was to reach particular beneficiaries.

The number of beneficiaries granted single area payments and complementary national direct payments was changed: in 2004 it involved 1,387,842 farmers, in 2005 – 1,468,976 (the highest number) and later it systematically decreased, to reach 1,348,966 in 2013. Each year proportion of granted payments in relation to the number of applications amounted more than 99%.

More and more significant role of direct payments as an income-forming factor in agriculture can be observed year by year. Before the accession, subsidies provided for less than 9% of farmers' income, while in the years 2009–2010 it was more than 60% [Poczta 2012]. Complementary national direct payments, however, underwent the change both regarding the amount and the type of support. The payments (area and complementary) in most cases were destined by farmers to production activities and modernization of farms, which was expressed by the changes in resources of factors of production, as well as in production itself (Table 2).

Table 2. Changes in resources factors of production in the years 2001–2012

| Specification | Mean value for the years 2001–2004 | Mean value for the years 2010–2012 | Changes |
|---|---|---|---|
| Agricultural area (thousand ha) | 16 952.2 | 15 202.0 | –1750.2 |
| Agricultural area per 1 inhabitant (are) | 44.36 | 39.45 | –4.91 |
| Number of farms (thousand units) | 1 899.2 | 1 519.7 | –379.5 |
| Average farm area (ha) | 8.93 | 10.0 | +1.07 |
| Employed in agriculture (thousand AWU[b]) | 2103.5 | 2 325,7[a] | +222.2 |
| Employed per 100 ha agricultural area (AWU) | 12.4 | 15.3 | +2.9 |
| Assets value (million PLN), including: | 110 330.8 | 127 748.8 | +17 418.0 |
| buildings and civil engineering works (%) | 61.7 | 56.7 | –5.0 |
| machines, technical devices and tools (%) | 12.9 | 16.4 | +3.5 |
| means of transport (%) | 11.7 | 11.9 | +0.2 |
| Tractors in agriculture (thousand units) | 1 348.1 | 1 466.3[a] | +118.2 |
| Agricultural area 1 tractor (ha) | 12.57 | 10.37 | –2.2 |

[a]Data for 2010, [b]Annual Work Unit = 265 days × 8 hours = 2120 man-hour.

Source: Statistical Yearbook of Agriculture and Rural Areas 2005, CSO, Warsaw 2005, pp. 191, 199, 223–224, 232, 236, 238–239, 246–248, 252, 259–260, 278, 287–288, 296, 300, 304, 481–482, 484; Statistical Yearbook of Agriculture 2012, CSO, Warsaw 2012, pp. 81, 105, 158, 163,184–185, 191, 204; 2013, pp. 79, 103, 125, 130, 132, 145–147, 151, 153; Statistical Yearbook of the Republic of Poland 2003, CSO, Warsaw 2003, pp. 378, 382; 2004, pp. 192, 464, 467–469; 2012, pp. 195, 473–474, 477–480, 482, 484–486.

[1]The increase in the number of the employed probably resulted from: the change in methodology of counting employees, family members coming back to farms from business (results of economic downturn), as well as wilder range of labourious crops.

The factors of production underwent the following changes (Table 3):

- decrease in agricultural area by 10.3%, which brought about diminished agricultural area per 1 inhabitant of the country by 8.9%. To maintain previously obtained level of meeting food demand in the society, it is necessary to increase the development of agriculture,
- the number of farms decreased by 20% and average farm area increased by 12%,
- increase in the number of the employed in agriculture (AWU) by 10.6% and per 100 ha of agricultural area by 23.4%, which results in the development of increased, labourious production,
- increase in production assets value by 15.8% and, within their structure, could be observed the decrease in the share of buildings and civil engineering works by 5 percentage points 5 (p.p.), while the share of machines, technical devices and tools increased by 3.5 p.p., as well as means of transport by 0.2 p.p., also increased the number of tractors owned by farmers by 8.8%, while agricultural area per 1 tractor decreased by 17.5%.

Table 3. Changes in agriculture productivity

| Specification | Mean value for the years 2001–2004 | Mean value for the years 2010–2012 | Changes |
|---|---|---|---|
| Productivity of factors of production (PLN) | | | |
| land: gross output – Pg per 1 ha a.a (agricultural area) | 3 387.7 | 6 320.9 | +2 933.2 |
| final output – Pk per 1 ha a.a. | 2 466.6 | 4 983.7 | +2 517.1 |
| net final output – Pkn per 1 ha a.a. | 2 117.9 | 4 178.5 | +2 060.6 |
| assets: Pg per 1000 PLN assets | 520.5 | 755.1 | +234.6 |
| Pkn per 1000 PLN assets | 325.4 | 499.2 | +173.8 |
| labour: gross output – Pg per AWU | 27 302.0 | 41 317.0 | +14 015.0 |
| net final output – Pkn per AWU | 17 068.5 | 27 312.6 | +10 244.1 |
| Commercialization | | | |
| market output – Pt per 1 ha a.a. | 2 108.2 | 4 507.9 | +2 399.7 |
| net market output – Ptn per 1 ha a.a. | 2 918.3 | 3 702.6 | +784.3 |
| Pt per Pg × 100 (%) | 62.2 | 71.3 | +9.1 |
| Profitability | | | |
| gross value added – Wdb per 1 ha a.a. | 1 073.0 | 2 490.9 | +1 417.9 |
| gross value added – Wdb per AWU | 8 647.1 | 16 282.0 | +7 634.9 |

Source: Like in Table 2.

The changes in agriculture productivity, commercialization and profitability (Table 4):

- increase in gross output by 67.3%, final production by 81.2%, net final production by 76.9%, commercial farming (commodity production) by 105.7% and gross added value by 108.2%,
- increase in productivity of factor of production measured by net final production: land by 97.3%, assets by 53.4%, labour by 60%. In spite of the increase in labour productivity, it still was significantly lower than its mean value in the EU and in 2010 the mentioned productivity amounted 10008 Standard Output ($SO^2$) per AWU as compared to 28,429 per AWU in the EU-27 [Kapusta 2014],

[2]SO – Standard Output is mean value for five-year-production from 1 ha in EUR.

– increase in commercial farming: commercial farming by 113.8% per 1 ha a.a., net commercial farming by 26.9% and commercialization index increased by 9.1 p.p.,
– increase in profitability per 1 ha a.a. by 132.1% and per 1 AWU by 88.3%.

Table 4. Changes in Poland's food self-sufficiency

| Specification | Mean value for the years 2001–2004 | Mean value for the years 2010–2012 | Changes |
|---|---|---|---|
| Cereals | | | |
| Consumption (thousand tons) | 5 834.7 | 5 280.3 | –554.4 |
| Share of consumption in production (%) | 23.0 | 18.9 | –4.1 |
| Share of import in consumption (%) | 23.9 | 43.1 | +19.2 |
| Share of export in production (%) | 1.9 | 7.8 | +5.9 |
| Balance E-I (thousand tons) | –921.7 | –157.3 | –764.4 |
| Self-sufficienct index | 95.7 | 101.1 | +5.4 |
| Potatoes | | | |
| Consumption (thousand tons) | 5 046.0 | 4 333.7 | –712.3 |
| Share of consumption in production (%) | 25.6 | 47.3 | +21.7 |
| Share of import in consumption (%) | 6.0 | 8.6 | +2.6 |
| Share of export in production (%) | 1.9 | 6.0 | +4.1 |
| Balance E-I (thousand tons) | 70.6 | 177.6 | +107.0 |
| Self-sufficiency index | 100.4 | 102.0 | +1.6 |
| Cow milk | | | |
| Consumption (million l) | 9 992.3 | 9 598.3 | –394.0 |
| Share of consumption in production (%) | 86.6 | 79.4 | –7.2 |
| Share of import in consumption (%) | 2.9 | 11.0 | +8.1 |
| Share of export in production (%) | 17.5 | 24.4 | +6.9 |
| Balance E-I (million l) | 1 729.3 | 1 891.3 | +162.0 |
| Self-sufficiency index | 108.0 | 127.0 | +19.0 |
| Chicken eggs | | | |
| Consumption (thousand tons) | 438.3 | 359.3 | –79.0 |
| Share of consumption in production (%) | 89.6 | 61.2 | –28.4 |
| Share of import in consumption (%) | 0.5 | 10.0 | +9.5 |
| Share of export in production (%) | 3.3 | 55.4 | +52.1 |
| Balance E-I (thousand tons) | 14 | 289.3 | +275.3 |
| Self-sufficiency index | 102.9 | 138.7 | +35.8 |
| Meat and offal | | | |
| Consumption (thousand tons) | 2 911.3 | 3 034.3 | +123.0 |
| Share of consumption in production (%) | 89.6 | 76.4 | –13.2 |
| Share of import in consumption (%) | 2.9 | 23.1 | +20.2 |
| Share of export in production (%) | 8.7 | 37.8 | +29.1 |
| Balance E-I (thousand tons) | 198.4 | 799.3 | +600.9 |
| Self-sufficiency index | 107.1 | 124.6 | +17.5 |

Source: Like in Table 2.

The data confirming the increase in self-sufficiency (Table 4): cereals by 5.4 p.p., potatoes by 1.6 p.p., cow milk by 19 p.p., chicken eggs by 35.8 p.p., as well as meat and offal by 17.5 p.p.

The changes in the size of production of particular agricultural products, did influence on the increase in their size counted per 1 inhabitant. None of the analyzed products showed any change threatening foods self-sufficiency.

## CONCLUSIONS

Poland, aiming at the transition to market economy in 1990s, was preparing the whole economy for accession to the EU, which especially involved agriculture and rural areas. At the moment of accession, a number of institutions and legal solutions had already existed, which allowed to accept and appropriately manage financial support directed to rural areas and agriculture. That support provided for the necessity to increase expenditure on agriculture, also from country's public funds (co-financing). Eventually, financial support for agriculture increased from less than 9% in pre-accession period to 60% in the years 2009–2010. The subsidies – direct payments and complementary national direct payments directed to farmers constitute about 61% of all financial means destined for rural areas by the EU. The subsidies contribute to the increase in production potential of agriculture, the changes in its structure, increased productivity of factors of production, as well as to foods self-sufficiency.

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## WSPÓLNA POLITYKA ROLNA UNII EUROPEJSKIEJ A PRZEMIANY ROLNICTWA POLSKIEGO

**Streszczenie.** W Polsce już w okresie przedakcesyjnym do Unii Europejskiej podejmowano działania mające na celu stworzenia warunków wdrażania zasad wspólnej polityki rolnej (WPR), która zakłada wsparcie produkcji rolniczej dopłatami bezpośrednimi i uzupełniającymi. Dla realizacji tego zadania została powołana Agencja Restrukturyzacji i Modernizacji Rolnictwa (ARiMR), która w latach 2004–2013 do rolnictwa przekazała 94,9 mld PLN w ramach dopłat, a beneficjentami byli rolnicy. Wyraźnie wzrosło wsparcie rozwoju produkcji rolniczej z niespełna 9% w okresie przedakcesyjnym do około 60% w latach 2009–2010. Środki te zostały przeznaczone w większości na tworzenie potencjału produkcyjnego rolnictwa i zmiany strukturalne w nim. Aby uchwycić wpływ WPR na polskie rolnictwo, w opracowaniu poddano analizie: zasoby czynników produkcji i ich strukturę, produktywność czynników produkcji rolniczej oraz samowystarczalność żywnościową. Stwierdzono we wszystkich analizowanych dziedzinach znaczące zmiany, których efektem jest wzrost produktywności rolnictwa i czynników produkcji. Wzrasta również produkcja większości produktów rolniczych na 1 mieszkańca, co przyczynia się do poprawy samowystarczalności żywnościowej Polski.

**Słowa kluczowe:** rolnictwo, wspólna polityka rolna, wsparcie, dopłaty, produktywność, samowystarczalność

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# ASSESSMENT OF DYNAMIC GROWTH OF FOOD PRODUCTION IN BULGARIA

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**Abstract.** Perspectives for competitive growth are put in the core of the re-industrialization policy of the European Union for the next program period, and respectively are key issue for the Bulgarian industrial policy. Re-industrialization of the Bulgarian economy is possible in terms of support for competitive industries at present, but also to support industries that are at the bottom of competitiveness. The methodology for selection of appropriate "priority" sub-sectors and production specializations, is based on the following two principles:
1. A combination of economic criteria (at national and company level) and social criteria;
2. Measures targeted both: certain sub-sectors and production specializations that either have a competitive advantage, or are at the bottom of the rankings for competitive advantage.
On the basis of analysis six production specializations in food industry were identified for which specific policy measures have to be developed along the chain raw materials/inputs – production-marketing/export.

**Key words:** re-industrialisation, food production, dynamic growth, Bulgaria

## INTRODUCTION

The European economy is still recovering slowly from the 2008's crisis and especially the poorest regions in the European Union. The European economic policy has been updated and adjusted according to the new requirements in the beginning of the new planning period (2014–2020) and respectively the role of the EU-industry has been strengthened. Thus, the EU development passes through making a strong and profoundly reshaped European industry[1].

According to this rebirth of the industrial policy the EC adopted an action plan, titled For a European Industrial Renaissance, on 22 January 2014. Following the leading EU member states, the Bulgarian government has started a process of preparing a national action plan for the industrial Renaissance, that has not been completed yet.

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[1]See: EC, http://ec.europa.eu/enterprise/initiatives/mission-growth/index_en.htm#h2-2.

Food industry is one of the key industrial sub-sectors in Bulgarian economy. Determining the production specializations with potential for growth and revealed competitive advantages, as well as such with potential to become competitive is important.

The paper is going to assess the growth perspectives of Bulgarian food production. Thus, the paper is organized as follows: Introduction: provides an overview of the impact of re-industrialization perspectives on food production; 1. State of art: explains the basic issues of growth at production specialization level; 2. Methodology: shows the stages of assessment as well as the indicators of dynamic growth; 3. Data analysis: includes a brief presentation of the assessment of dynamic growth of Bulgarian food production; Conclusion: summarizes the research results.

In the background of the new industrial policy there are several prerequisites that formed the necessity to adjust the implemented policies and measures in the industry. First, the share of industry in GDP has fallen down sustainably since the mid-1980s and now it has reached a trough. According to the industrial chain, a further decrease of the industry level based on capital re-shapes could threaten some of the core elements of the chain (for example the ROI in trade or construction is some times bigger than that in the mining industry, which sharply indicates that capital shifts from industry to services). Second, when the industry produces goods targeted to satisfy basic (physical) needs (i.e. thirst-beverages/water; hunger-food, security etc.) the industry is able to overcome the negative effects and influences of the financial and economic crises with minor losses. Nevertheless, the industry has just survived, it could not fight back with non-productive sectors (i.e. services). Third, the industrial sustainability could not be kept steady without a relevant EU policy. Industrial production should obey the requirements of society for: environmental protection (the industry still pollutes the environment many times more than the nature could perceive), energy costs (many of the industrial processes are still not energy efficient using a lot of the energy inputs, principally the fossil ones), modernization of the industry lags behind the new technological development (the investment in research and innovation of industry is too low).

According to these prerequisites the basis of EU industrial Renaissance is focused on the following three priorities[2]: information networks, energy networks and green transport. The final result of implementing such policy priorities could be pointed out as follows: advanced manufacturing that is a knowledge-based one; bio-based products produced from clean raw materials; clean vehicles and vessels for greener transport; systems based on sustainable construction and raw materials; newer production standards based on smart grids and digital infrastructures.

The food production has an influence on the economic as well as on the social sphere. Basic reasons for this are summarized as follows:

- information networks and advanced manufacturing need a new type of workers that possess newer skills and knowledge;
- environmental protection and bio-based products: the arable land decreased but food needs to be increased. So, producers have to produce products out of the natural raw food materials;

[2]See EC, For a European Renaissance, COM (2014) 14/2, http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52014DC0014&from=EN.

- clean vehicles and vessels for greener transport: as a result of society's development in Bulgaria the villagers' infrastructure has been decreasing for years. So, there is inability to use such green transport.

Nevertheless, the food production is directly connected with human existence, so the point of the common industrial policy is to help the food production to change and grow much faster.

Industrial Renaissance as an expression of contemporary industrial policy represents the government's impact on economic processes. As there was a debate between post--Keynesians and neo-liberals for the role of the Government in the economic processes, the contemporary economic theory supposes different approaches to industrial policy [Rodrik 2008]. Basically, there are two different approaches [Marleba et al. 2001] to analyze inter-connections between industrial policy (resp. its effects) and dynamic growth.

First, the economists define that industrial policy expresses somehow interventions on the markets that could change the markets from the inside. Traditionally, industrial policy is referred to usage of taxes and subsidies from the Governments to persuade producers to act in ways in which they would be disinclined to do so. As an example, subsidies could persuade producers to keep open facilities and jobs which in other circumstances would not be viable [Sharp 2003].

Second, the neo-liberals define that industrial policy creates economic conditions and its measures effect on antitrust regulations. So, the industrial policy takes a central role in managing economic externalities as the degree to which the policy's actions effect on other market players' initial decisions. So, contemporary industry protection helps entities (and the economy as a whole) grow. In particular, encouraging investment, especially investment in R&D, education and training expresses the new growth theories [Sharp 2003]. Thus, the modern industrial policy "attempts to alter the sectorial structure of production towards sectors that are expected to offer better prospects for economic growth" [Pack and Saggi 2003]. Finally, the existence of "entrepreneurial governance" as an economic phenomenon changed the industry from the inside and governing the endogenous factors effects on structural dynamic are the same which are the major challenge for industrial growth [Krafft 2006].

As we perceive the second approach, we believe that the new industrial policy (resp. policy of industrial Renaissance) has to develop the markets as it regulates industrial structures in a way to protect start-ups and new entrants on the markets. In addition, Rodrik [2008], Lin and Chang [2009], and others define that the need of industrial policy in developing countries is because they are "ridden with market failures, which cannot be ignored simply".

But, how could we measure the effects of the industrial policy? To answer the question above, we need to define the dynamic growth expression as a specific result of the overall business activities in the economy. For the first time Forrester [1961] defines that industrial dynamic is result of the increasing ability to enforce the industry evolution for long-term periods [Forrester 1988]. Therefore, the industrial dynamics analyses the forces and directions of changes in industry architecture and may lead to evolution of markets [Mattig 2009].

Moreover, the industrial dynamics describes market driven factors that can change economic structures over time [Dietrich 2006; Krafft 2006]. According to this approach Dosi et al. [2004] give the requirements for defining industrial growth:

- relatively stable Pareto-type size distribution of firms (measured by numbers of employee or turnover);
- broad statistical aggregates that allows finding a relatively homogeneous groups of firms.

The contemporary measure of industrial growth is given by Carlsson and Eliasson [2001] and Madani [2001] who define the economic growth as result from the interaction of all market actors and it's based on double differentiation of the general production function (Y):

$$Y = A.f(K, L, M) \tag{1}$$

where: $A$ – index of HICK's natural technological progress.

Further endorsement of this approach we can find in the EU Industrial performance scorecard[3]. The EC measured the industrial policy's impact through basic growth factors as follows:

- changes of manufacturing productivity;
- quality of the workforce;
- share of exports in GDP;
- innovation index;
- energy intensity in industry;
- improvements in the business environment and efforts directed towards better regulation;
- electricity prices (excluding VAT) for small and medium-sized enterprises;
- business satisfaction with infrastructure (rail, road, port and airport);
- bank lending and access to finance for SMEs;
- business investment in equipment.

## METHODOLOGY

The methodology for selecting the appropriate "priority" industries and product specializations within the policy reindustrialisation is based on the following two principles:

- A combination of economic criteria (at national and company level) and social criteria;
- The measures are aimed both at certain sub-sectors and industries that either have a competitive advantage, or the bottom of the rankings for competitive advantage.

In this connection, following consequent steps in the selection of appropriate sub-sectors and product specializations are undertaken (Fig. 1).

[3]EC, Member States' Competitiveness: Performance and Implementation of EU Industrial Policy, SWD (2013) 346.

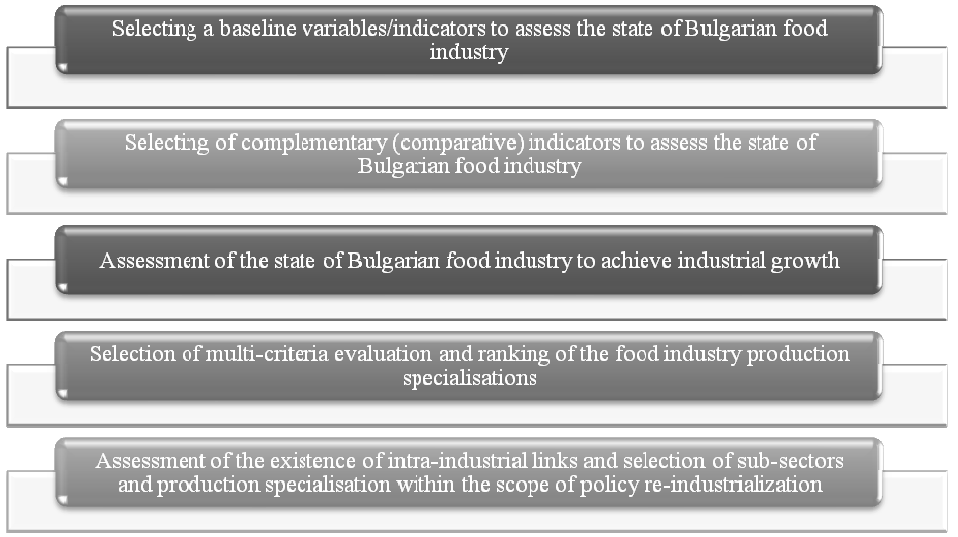


Fig. 1. Steps in the selection of appropriate subsectors and product specializations
Source: Own elaboration.

The sequence of steps of the methodological scheme required to submit additional arguments on each of them (Fig. 1).

**1. Selecting baseline variables (indicators) for assessment of the status of Bulgarian industry:** a basic requirement of this stage is the following principles to be fulfilled:

- reality: the assessment should be done using the existing features, which can actually be measured;
- importance and relevance: the assessment must be based on significant characteristics of the economy;
- comparative ability and versatility: the assessment should be based on evidences that can be set for each sub-sector and production, as well as on indicators that do not depend on the type of production, size of the sub-sector or stage of their development.

Appropriate indicators to assess the state of the Bulgarian industry can be reduced to two groups of indicators: economic and social.

Economic indicators: they relate the contribution of individual sectors or production for the country's economy. They express the economic value of the food specialization. The economic indicators explain the economic impacts of the industrial policy, respectively better position means and stronger effect of the industrial policy. Basically, these indicators are connected to the growth perspectives and they are: gross value added (GVA) by production factors (business investment in equipment; changes of labour productivity); innovation index; business performance.

Social indicators: relate to the sharing of social responsibilities between business and the state. International practice suggests businesses to share social commitments to the state, not only the economic effects of production. They express the social responsibility of the food producers and the share of social engagements between governments and business entities. In many cases the industrial policy covers only the social effects

nevertheless they are acceptable for the business. Three social indicators are used: share of social security costs in labour costs; share part-time employees to full-day employees; wage adjusted labour productivity (apparent labour productivity by average personnel costs).

**2. Selecting of complementary (comparative) indicators to assess the state of Bulgarian food industry:** express the relative importance of the sub-sector / industry for the country. They express the role of the food specialization in food production. These indicators just complete the economic and social indicators. They could be calculated as share to food production, manufacturing or industry as a whole. Complementary indicators are relative and can be both in terms of processing and in terms of the whole industry: share of GVA; share of production value; share of employment; investment rate (investment/ /value added at factors cost).

**3. Assessment of the state of the Bulgarian food industry to achieve industrial growth:** above indicators express the current situation. For this purpose we use generally accepted in world literature-based indicators of the production function and its first derivative: impact of material consumption growth; influence the labour intensity of growth; impact of capital intensity growth; impact of innovation;

This assessment should take account of the fact that there is a close functional relationship between different factors (e.g. higher cost of labour is mostly due to a low use of new technologies or low degree of scientific support of the business). In this respect, it is better to examine the degree of substitutability between factors of production, which is related to the study of the effect of increasing or reducing the use of one or another factor.

**4. Selection of multi-criteria evaluation and ranking of the food industry production specialisations**: The multi-criteria evaluation targets to determine the importance (weight) of the above three sets of criteria. Undoubtedly, it cannot give preference to one of them. This requires that seek suitable compromise that expresses the current economic policy pursued by the government, i.e. long-lasting policy (resp. present or long term); the scope of the policy (resp. individual economic agents or sub-sector as a whole); type of competitive advantage (resp. the contribution to the growth of the industry). In multi-criteria evaluation and analyse their potential for export (including in the EU), by assessing the indicator share of net exports of sub-sector or industry, and their export specialization. The purpose of the analysis is to promote and develop these specialisations that are related not only to the local market, but also have the potential of foreign markets, including thesis and in the EU.

**5. Assessment of the existence of intra-industrial links and selection of sub-sectors and production specialisations within the scope of policy re-industrialization:** at this stage to identify these sub-sectors and production specialisations that can lead to additional multiplier effect due to participation in one or other industrial chain.

The assessment of growth of Bulgarian food production and its connection with the Bulgarian industrial policy requires identifying these indicators with enough contribution to the industrial growth. Thus, we use a modification of the Solow-Swan production function (formula 2) and its first derivative (formula 3):

$$Y = f(x) = A_1.R.L.K.e^M \tag{2}$$

where: $Y$ – production value;
$R$ – costs for material resources;
$L$ – labour costs, including social payments;
$K$ – investment costs for machinery and equipment;
$M$ – innovation costs.

$$\log Y = a_1.\log(R) + a_2.\log(L) + a_3.\log(K) + a_4 M \quad (3)$$

where: $a_1$ – impact of material intensity on industrial growth;
$a_2$ – impact of labour intensity on industrial growth;
$a_3$ – impact of capital intensity on industrial growth;
$a_4$ – impact of R&D intensity on industrial growth.

## DATA ANALYSIS

### Database

To be more useful, the analysis is based on Eurostat data and covers the following indicators[4]:

- value added at factor cost (V12150) – *VA_fc*;
- apparent labour productivity / gross value added per person employed (V91110) – *ALabProd*;
- total intra-mural R&D expenditure (V22110) – *R&D*;
- gross operating surplus/turnover (gross operating rate) (V92110) – *GOS*;
- gross investment in machinery and equipment (V15110) / gross investment in tangible goods (V15150) – *Inv_m*;
- wage adjusted labour productivity / apparent labour productivity by average personnel costs (V91120) – *WLabProd*;
- wages and salaries (V13320) / personnel costs (V13310) – *WageSoc*;
- number of employees in full time equivalent units (V16140) / number of employees (V16130) – *Empl_Soc*.

### Data analysis

Dataset covers values of the indices, given above, for Bulgarian food production at four-digit level (C10xx) for 1995–2012. The analysis is based on their value (in EUR and %).

To understand their growth change, we use their natural logarithm value. Figure 2 shows that economic indicators have changed more significantly during the observed period. According to the figures we could divide the observed eight indicators in four groups:

[4]EC, Eurostat, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:***.

- significant growth: even though their base in 1995 is too low, three of the indices have changed rapidly for a 17-year period: apparent labour productivity; intra-mural R&D expenditure; and gross operating surplus;
- slow growth: added value at factor costs; wage adjusted labour productivity; and share of social security costs in labour costs;
- flat rate: share of part-time employees from full-day employees;
- slow decrease: share of investments in machines and equipment.

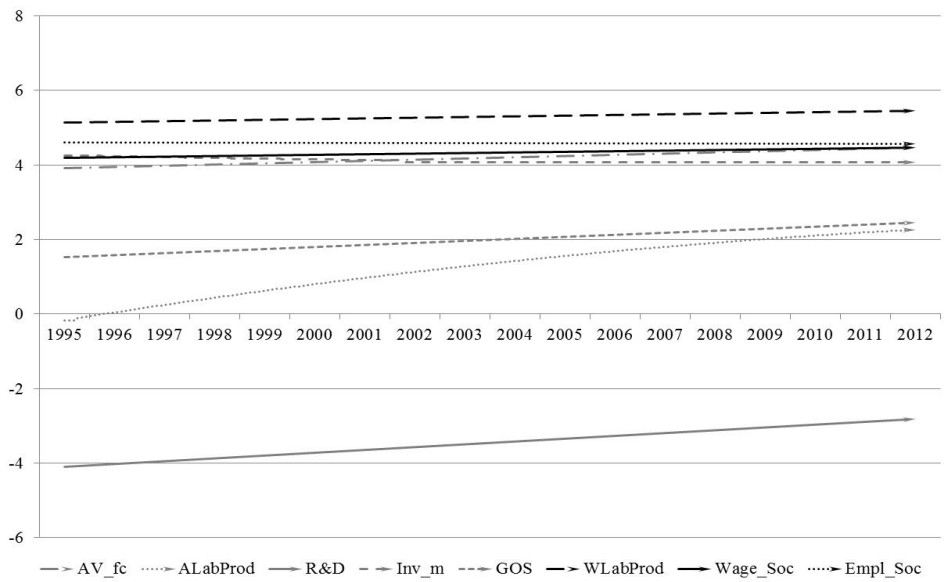


Fig. 2. Natural logarithmic values of the observed indices
Source: Eurostat and own calculations.

In conclusion: the food production in 2012 works at its optimal level as the social and employment indices do not change significantly.

The growth of the food production basically is result of innovation growth and is connected to higher labour productivity and profit.

The most negative is that the food production disinvesting as the change of investments in new machines and equipment slopes down.

This state is not equal for the whole range of food specializations (Fig. 3). The comparison between important and not-important specializations measured by value of indices we found that the higher change is done by the highest value specializations. Thus, the highest added value is generated by the largest specializations. This situation is valid for apparent labour productivity as well as for intra-mural R&D costs and gross surplus. But the biggest specializations are less social-friendly ones as the highest decrease of the full-time employment is accounted by them.

The effects of investments in machinery as well as of social securities are equally dispersed among different food specializations.

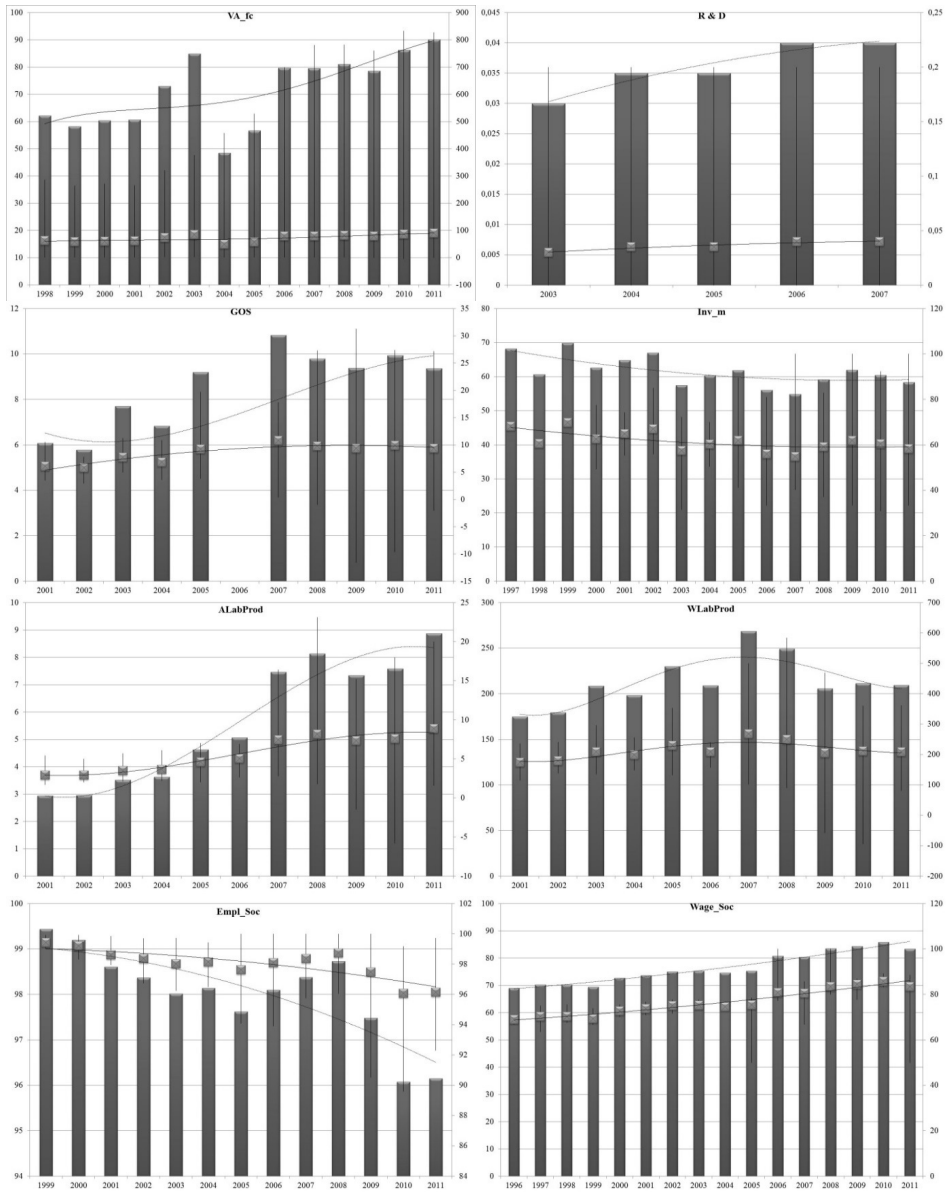


Fig. 3. Higher and lower values of the observed indices
Source: Eurostat and own calculations.

Based on the growth factors the classification of the food specializations is given in Table 1.

Table 1. Classification of food specializations by their economic and social attractiveness

| FOOD Specialization | NACE Rev.1 | NACE Rev.2 |
|---|---|---|
| Manufacture of grain mill products, starches and starch products | DA156 | C106 |
| Manufacture of vegetable and animal oils and fats | DA154 | C104 |
| Production, processing, preserving of meat and meat products | DA151 | C101 |
| Production of meat and poultry meat products | DA1513 | C1013 |
| Processing and preserving of fruit and vegetables | DA153 | C103 |
| Manufacture of ice cream | DA1552 | C1052 |
| Manufacture of cocoa; chocolate and sugar confectionery | DA1584 | C1082 |
| Manufacture of oils and fats | | C1041 |
| Processing and preserving of fruit and vegetables n.e.c. | DA1533 | C1039 |
| Production and preserving of poultry meat | DA1512 | C1012 |
| Manufacture of sugar | DA1583 | C1081 |
| Manufacture of dairy products | DA155 | C105 |
| Manufacture of other food products | | C108 |
| Manufacture of other food products n.e.c. | DA1589 | C1089 |
| Operation of dairies and cheese making | DA1551 | C1051 |
| Manufacture of prepared feeds for farm animals | DA1571 | C1091 |
| Manufacture of prepared animal feeds | DA157 | C109 |
| Manufacture of homogenized food preparations and dietetic food | DA1588 | C1086 |
| Production and preserving of meat | DA1511 | C1011 |

Source: Eurostat and own calculations.

According to the figures, the biggest economic and social attractiveness for growth and development is possessed by food productions, such as: grain products, processing oil, production of meat products and processing fruit and vegetables. They have compromised the economic strength and social responsibility that give them enough impulse to grow.

The assessment of real growth potential defines three groups of food specialization that have different potential to development measured by formulas 2 and 3:

- Lagging food specialization: they are falling behind the others as in material effectiveness as well as in apparent labour productivity and investment rate in machines and equipment. Examples of these groups are traditional specializations for Bulgarian agriculture and food production as follows: Production and preserving of meat and poultry meat; Processing and preserving of fruit and vegetables; Manufacture of vegetable and animal oils and fats; Manufacture of dairy products; and others;
- Reinforcing food specializations: they present better on the market, but their labour effectiveness is not good enough even though their material goods' effectiveness is the best one. The examples of this group are part of traditional specializations for the Bulgarian agriculture and food production but they show a technological and product development as follows: Manufacture of bakery and farinaceous products, incl. Manufacture of bread; Manufacture of fresh pastry goods and cakes; Manufacture of other food products n.e.c. and others;

- Developing food specializations: they are one of the smallest mostly newer food specializations that possess enough potential to growth. Their apparent labour productivity, goods effectiveness and investment rates overflow the average rates for the food production in Bulgaria. The examples of this group are not traditional specializations for the Bulgarian agriculture and food production as follows: manufacture of fruit and vegetable juice; processing and preserving of fish and fish products; manufacture of macaroni, noodles, couscous and similar farinaceous products; manufacture of margarine and similar edible fats; manufacture of prepared feeds for farm animals; manufacture of prepared meals and dishes; and others.

In comparison the differentiation between these three types of food specializations are given in Table 2.

Table 2. Differentiations in growth potential between different food specializations

| Independent Variable | Average | | Lagging food specialization | | Reinforcing food specializations | | Developing food specializations | |
|---|---|---|---|---|---|---|---|---|
| Log R | 0.125 | 0.977 | 0.563 | 0.881 | –0.020 | 1.010 | 0.257 | 0.933 |
| Log L | 2.514 | 0.974 | 3.396 | 0.686 | 4.004 | 0.535 | 2.347 | 1.093 |
| Log K | 3.279 | 0.822 | 4.304 | 0.388 | 5.037 | 0.318 | 3.168 | 0.691 |

Dependent Variable: Log P.
Source: Eurostat and own calculations.

According to their contribution to industrial growth to food production by usage of formulas (2) and (3) and their growth attractiveness (see Table 1) is given the next classification of the best six developing food specializations (Table 3).

Table 3. Classification of attractive food specializations with growth potential

| Specialization | NACE Rev.1 | NACE Rev2 |
|---|---|---|
| Manufacture of other food products n.e.c. | DA1589 | C1089 |
| Manufacture of sugar | DA1583 | C1081 |
| Manufacture of prepared animal feeds | DA157 | C109 |
| Manufacture of prepared feeds for farm animals | DA1571 | C1091 |
| Manufacture of ice cream | DA1552 | C1052 |
| Manufacture of homogenized food preparations and dietetic food | DA1588 | C1086 |

These six attractive food specializations with growth potential should be placed in the core of the contemporary industrial policy for Bulgarian industry Renaissance.
Source: Eurostat and own calculations.

## CONCLUSIONS

Growth and development of enterprises in food production depends on the establishment of favourable conditions that will strengthen their comparative advantages, as well as existing and/or potential competitiveness, and will smooth the influence of the existing negative factors. One of the possible ways is the elaboration of the National Long-term Programme for Reindustrialization of Food Industry (NLPRFI).

Key elements of the NLPRFI should be targeted to:

- Global R&D directly serving Food industry and acting as a basic prerequisite for innovation leading to the efficiency of industrial production;
- Modern and relevant scientific qualification requirements (competencies), and all categories of staff in companies in the food industry;
- Create external environment (political stability and security to all components of the business environment) to stimulate the investment activity and focus the investment on new technology solutions in the food industry;
- Change the ratio between our traditional industries with high input of resources and low added value products on one hand, and new medium and high technology sectors where the country has comparative advantage on the other;
- Increasing the share of industry in GDP and GVA at the expense of the share of services in enriched interconnection and interaction between "industry-services";
- Industry operating and developing in line with the environmental requirements and environmental protection; businesses that have successfully implemented and social protection functions and responsibilities to society and the country, along with the achievement of business goals.

The main objective of the program is to provide reindustrialisation prerequisites and conditions for the consistent implementation of structural change aimed at technological and product modernization of the Bulgarian food industry, leading to industrial growth and increasing contribution of the industry to GDP and economic growth of the Bulgarian economy.

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## OCENA DYNAMIKI WZROSTU PRODUKCJI ŻYWNOŚCI W BUŁGARII

**Streszczenie.** Perspektywy konkurencyjnego wzrostu są w centrum uwagi polityki reindustrializacji w Unii Europejskiej w perspektywie finansowej 2014 roku i odpowiednio jest to kluczowe zagadnienie również w polityce przemysłowej Bułgarii. Reindustrializacja gospodarki Bułgarii jest możliwa w zakresie wsparcia już obecnie konkurencyjnych gałęzi, jak również tych, które będą kluczowe dla konkurencyjności gospodarki. Metodologia wyboru właściwych priorytetowych sektorów i produktów jest oparta na następujących zasadach: połączenia kryteriów ekonomicznych (na poziomie krajowym i na poziomie przedsiębiorstwa) i społecznych, ukierunkowania działań na wybrane podsektory i specjalizacje produkcyjne (produktowe), które cechują się przewagą konkurencyjną lub są podstawą przewag konkurencyjnych.

**Słowa kluczowe:** reindustiralizacja, produkcja żywności, dynamika wzrostu, Bułgaria

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# ECONOMICS TYPOLOGY OF FRUIT FARMS IN THE GRÓJEC AND WARKA AREA

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**Abstract.** Poland is the biggest apple producing country in the European Union. The highest apple production level in the world there are on the Grójec and Warka area. The aim of the publication is to present a typology of fruit farms in the region of Grójec and Warka. The study made use of: the survey method with using an interview, and Ward's hierarchical clustering method. The study was conducted among 229 fruit farms in Grójec and Warka area in July–August 2010. It allowed for the four types of fruit farms to be distinguished: farms with a potential for development, farms with an average potential for development, farms without a potential for development, and bankruptcy-bound farms.

**Key words:** typology, apples, horticulture, orchards

## INTRODUCTION

In many European countries, development of fruit farming occurred gradually as a result of a constantly increasing standard of living. The fashion for back gardens as well as royal, palace and court orchards, prevalent in various parts of Europe mainly from the end of the 17th century until the turn of the 19th and 20th centuries, also played a significant role in this process. Industrialisation of Europe and internal migration within individual states contributed to the establishment of employee gardens as well as to the transformation of back gardens into fruit farms. An important determinant for the formation of orchards, both in Poland and Europe, came in the form of such elements as: knowledge and skills of farmers (gardeners and fruit farmers) engaging in orchard cultivation [Majewski 2014], the choice of a location suitable in terms of environment and climate, and selection of apple cultivars optimal in terms of market needs. Over the recent decades, the fruit consumption model has undergone a significant transformation. The

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awareness of significance of fruit in human diet has increased accompanied by consumers and consumer organisations' increased pressure on production of safe food, i.e. food free of pollutants, contaminants, and chemical agents [Engler et al. 2013]. In response to the pressure of consumer organisations, institutions of the European Union are modifying regulations pertaining both to packaging and information content to be found on packaging [Mazurkiewicz-Pizło and Pachuca-Smulska 2012]. The literature points to increasing competition on the apple market [Groot 2000]. This process influences the increase in the quality of fruit available on the market as well as the increase in the significance of integrated fruit production, i.e. a combination of ecological and conventional fruit farming [Reganold et al. 2001]. As a result of increased competition on the European fruit market, apples will have to be cheaper to produce. The fruit farmers are seeking optimal management methods able to reduce costs and increase efficiency of fruit farms [Hester and Cacho 2003] on the other they are searching for environment-friendly production methods acceptable for the consumer. It is also important to note there are high diversification of fruit producing enterprises on the European market. Entities operating on this market can have a form of cooperatives, international and domestic enterprises, as well as numerous producer groups. Producer groups constitute an alternative for the developing fruit farms of various size by fulfilling a variety of functions, e.g. increased access to know-how, increased access to market, increased competitive power, conducting joint marketing operations, and obtaining funding from the EU funds [Biernat-Jarka 2006]. As a result of high competition on the fruit market, both the quality of the offered product and the main directions in domestic sales of the domestic product as well as in their distribution have undergone a change. The aim of the publication is to present a typology of fruit farms in the region Grójec and Warka. On this base it will be created typology of orchard farms.

## MATERIAL AND METHODS

The area of Grójec and Warka in Poland is characterised by the highest apple production concentration in the world. For the needs of an orchard farms analysis it were also used effects of own studies from the years 2010–2012, which were conducted in the group of orchard farmers from the Grójec and Warka area [Pizło 2001, 2011a and b]. The farms were selected based on the information pertaining to the total area and the area occupied by orchards in individual farms. The study made use of: survey method with using an interview Ward's hierarchical clustering method. The questionnaire of interview consisted of 89 questions pertaining to fruit farms proper and fruit farmers' households. Within the fruit farm area structure the following divisions were identified: up to 2 ha of orchard, from 2.01 to 4 ha, from 4.01 to 8 ha, from 8.01 to 12 ha, and more than 12 ha of orchard. The total area of orchard plantations in these farms was 1,915.65 ha (Table 1). The farms with the area ranging from 4.01 to 12 ha of orchard were dominated in the population participating in the study, and accounted for 80% of research attempt.

Table 1. Area and structure of orchards in the farms covered by the study

| Specification | Less than 2 ha (very small) | From 2.01 to 4 ha (small) | From 4.01 to 8 h (medium size) | From 8.01 to 12 ha (big) | More than 12.01 ha (large) | In total |
|---|---|---|---|---|---|---|
| The number of fruit farms taking part in the 2010 study (–) | 11 | 30 | 89 | 68 | 31 | 229 |
| The structure of fruit farms covered by the 2010 study (%) | 4.80 | 13.10 | 38.86 | 29.69 | 13.54 | 100 |
| Total orchard area (ha) | 15.8 | 104.55 | 576.65 | 693.99 | 524.66 | 1915.65 |
| Orchard plantation structure (%) | 0.82 | 5.46 | 30.10 | 36.23 | 27.39 | 100 |

Source: Own calculations on the basis of the research conducted in 2010.

## THEORETICAL FRAMEWORK

Economic decisions made by fruit farmers pertain to, similarly as in the case of other enterprises, the allocation of financial and material resources as well as one's own time and time of farm labourers (including family members) in such a manner as to maximise profits while making sensible investments in the farm. Fruit farmers' decisions pertain to production issues related, among others, to the choice of: apple rootstock type [Robinson et al. 2004, Gjamovski and Kiprijanovski 2011, Sosna and Gudarowska 2013] which determines the tree's growth, its resistance to frost, and its crop yield; and particular apple cultivar which is connecting both to its florescence [Sosna and Gudarowska 2013] and harvest period. Such decisions should also depend on the target group preferences – i.e. consumer preferences. Next to the above-indicated decisions, the fruit farmers have to decide on the intensity of cultivation, investment issues related to the size of area of new plantings, and construction of a new fruit storage facility. Another type of decisions for the fruit farmer are marketing activity: where, to whom, and for how much to sell apples. It is these decisions that the optimum utilisation of the farm resources and profitability of the venture depend on [Perry et al. 2001]. Next to the above-indicated criteria of an economic character, there are also decisions related to responsibility for the consumer's health and the natural environment [Fan et al. 2012]. Comparative studies of apple cultivars indicate that the factors reducing the environmental impact of fruit farming and which at the same time are significance for the farm's economic standing include [Mouron et al. 2006]: control of energy-consumption, toxicity for natural environment, and eutrophication. Reduction of energy consumption in apple production is to a greater degree correlated to fuel cost reduction (reduced operation of machinery) in particular through optimisation of organisation in the farm (e.g. during apple harvest time) [Mouron et al. 2006]. In turn, the plant protection level depends on the cultivar cultivated as well as homeostasis of the environment. Assessment of plant protection effectiveness is difficult to measure due to the influence of atmospheric factors [Mouron and Scholza 2006], in particular wind, rain and sunshine. For many years, especially following the accession to the EU, specialist fruit farms in Poland have been changing the fruit tree cultivation system departing from traditional cultivation (among others, big trees and wide spacing

between rows) towards dwarf and ridge-top orchards with several thousand trees per 1 ha [Szewczuk et al. 2011]. The income generated from apple cultivation, however, strongly depend on the market and consumer preferences on the one hand while on the other on the agritechnical factors as well as the fruit farmer's know-how and economic capacity. The change in the cultivation method has contributed to the intensification of production and increased efficiency of a substantial part of fruit farms.

## CHARACTERISTICS OF THE GRÓJEC AND WARKA AREA – AN AREA OF CONCENTRATED ORCHARD PRODUCTION

The present territory of the Grójec-Warka region almost overlaps with the Grójec poviat area. The Grójec area is dominated by intensive orchard cultivation covering for more than 40% of national apple production. Orchard intensity in individual communes of the Grójec poviat reaches almost 70%. The Commune of Grójec is located 45 km away from Warsaw. In turn, the communes of Warka and Grójec form a homogeneous fruit farming region. The Grójec and Warka area is characterised by concentrated orchard production and it is one of the biggest fruit farming areas in Europe.

## WARD'S HIERARCHICAL CLUSTERING METHOD

In the study of the fruit farms in the Grójec and Warka region, groups were isolated with the use of Ward's hierarchical clustering method. Upon a preliminary analysis of the survey data from the set of 229 fruit farms, 30 farms were removed when missing data was detected. Finally, 199 farms constituting the classification object set ($\Omega$) remained to be used in the further studies. Ward's method is frequently employed in economic research [Siedlecka 1998, Dudek and Orłowski 2006, Karpio et al. 2006]; it gives a possibility to group objects in clearly defined clusters with approximate size. The cluster analysis most frequently focuses on a finite set of objects $\Omega = \{o_1, o_2, ..., o_n\}$. Each of the objects in set ($\Omega$) is characterised by $m$-characteristics represented by variables $X_i$ ($i = 1, 2, ..., m$) and it may be considered to be a point in a certain $m$-dimensional space, the so-called classification space. Subsequently, a certain measure of distance ($d$) is introduced inside the set ($\Omega$) thus obtaining a metric space ($\Omega$, $d$). The methods for classification of objects used presently are divided into several groups and one of those groups is a group of so-called hierarchical clustering methods. These methods commence the classification process from the formation of $n$ one-element clusters ($n$ – number of objects), which in subsequent $n - 1$ steps are combined in increasingly larger groups (clusters) until one cluster containing all the objects is obtained. The algorithm for grouping of objects within the hierarchical clustering methods is as follows:

- having a given set of objects $\Omega = \{o_1, o_2, ..., o_n\}$ and metric $d$, $n$ of one-element clusters $\{o_1\}$, $\{o_2\}$, ..., $\{o_n\}$ is generated and the matrix of the distance between them is determined $D = [d_{ij}]$;

- based on the matrix of the distance between the clusters $D = [d_{ij}]$, two clusters X and Y located the closest in relation to each other, i.e. compliant with the requirement expressed as $d_{XY} = \min\{d_{ij}\}$, are identified;
- clusters $X$ and $Y$ are joined into one by reducing their number by 1 and conducting a new measurement of the distance between the clusters, a new distance matrix (D) is determined;
- the steps are repeated several times until one cluster containing all the objects is obtained.

The best-known clustering methods are: the nearest-neighbour method, the furthest neighbour method, the median method, the centre of gravity method, the group average method, and the Ward's method. Differences between the particular methods pertain to the differing ways for determination of distances between clusters. In the case of Ward's method, the manner of calculating the distances between clusters is complicated and it is recorded with the use of the following formula [International Symposium...]:

$$d_{hk} = \frac{n_i + n_h}{n_i + n_j + n_h} d_{hi} + \frac{n_j + n_h}{n_i + n_j + n_h} d_{hj} - \frac{n_h}{n_i + n_j + n_h} d_{ij}$$

where: $h$, $i$, $j$, $k$ – designate clusters;
$k$ – new cluster formed by joining clusters $i$ and $j$;
$d_{hi}$, $d_{hj}$, $d_{ij}$ – distances between clusters;
$n_i$, $n_j$, $n_h$ – size of clusters.

Results of clustering of objects by means of agglomerative methods are frequently presented as graphs or hierarchical trees (dendrograms).

From the pool of characteristics, 21 variables were initially selected, describing various aspects of fruit farming-related operations: the cultivation area, volume of production, costs, information on new plantings, and others as well as household characteristic variables. The set of characteristics, however, had to be narrowed down due to the strong correlation of certain variables or a low level of their variability – among others such variables, as: *volume of other crop production*, *other crop cultivation area*, *total costs*, and *total volume of production*, were omitted. The following variables *pear production*, *pear cultivation area*, and *ordinary cold storage* were also omitted due to the high zero value incidence. In the course of the analyses, a decision was made to omit certain household characteristics. Finally, the set of the characteristics contained 12 following variables: $X_1$ – orchard area; $X_2$ – new plantings area; $X_3$ – apple cultivation area; $X_4$ – apple production volume; $X_5$ – value of 1 ha of new plantings; $X_6$ – total economic costs; $X_7$ – direct costs; $X_8$ – ordinary storage area; $X_9$ – number of hours worked; $X_{10}$ – family survival time in absence of income; $X_{11}$ – a number of persons in a household; $X_{12}$ – monthly family income (six income classes). The values of variables $X_2$, $X_3$, $X_4$, $X_6$, $X_7$, $X_8$ and $X_9$ were calculated per 1 ha of the cultivation area. Variables $X_1$, $X_5$, $X_{10}$, $X_{11}$, $X_{12}$ were not calculated. Table 2 provides the values of correlation coefficients between the variables. In the majority of cases, absolute values of correlation coefficients are close to zero and point to a very low correlation of characteristics.

Table 2. Matrix of the linear correlation coefficient between the variables

| × | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ | $X_9$ | $X_{10}$ | $X_{11}$ | $X_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $X_1$ | 1.00 | – | – | – | – | – | – | – | – | – | – | – |
| $X_2$ | 0.08 | 1.00 | – | – | – | – | – | – | – | – | – | – |
| $X_3$ | 0.16 | 0.05 | 1.00 | – | – | – | – | – | – | – | – | – |
| $X_4$ | 0.03 | –0.04 | 0.10 | 1.00 | – | – | – | – | – | – | – | – |
| $X_5$ | 0.22 | 0.09 | 0.16 | 0.10 | 1.00 | – | – | – | – | – | – | – |
| $X_6$ | –0.24 | 0.00 | 0.18 | 0.13 | 0.07 | 1.00 | – | – | – | – | – | – |
| $X_7$ | 0.04 | 0.11 | 0.17 | 0.07 | 0.03 | 0.35 | 1.00 | – | – | – | – | – |
| $X_8$ | –0.11 | 0.04 | –0.05 | –0.03 | –0.02 | –0.05 | 0.03 | 1.00 | – | – | – | – |
| $X_9$ | –0.46 | –0.01 | –0.05 | 0.16 | 0.05 | 0.43 | 0.17 | 0.06 | 1.00 | – | – | – |
| $X_{10}$ | 0.20 | –0.03 | 0.06 | 0.04 | 0.07 | 0.10 | 0.07 | –0.11 | –0.12 | 1.00 | – | – |
| $X_{11}$ | 0.24 | 0.11 | –0.01 | 0.10 | 0.10 | 0.02 | 0.02 | –0.09 | 0.05 | 0.08 | 1.00 | – |
| $X_{12}$ | 0.20 | 0.01 | 0.10 | 0.11 | –0.25 | 0.01 | 0.03 | –0.12 | –0.17 | 0.24 | 0.12 | 1.00 |

Source: Own study on the basis of research.

Variability coefficient values $V_i$ of characteristics $X_i$ ($i$ = 1, 2, ..., 12) were calculated as a quotient of a standard deviation to the median value of a given characteristic. With the exception of variables $X_1$, $X_3$, $X_{11}$, and $X_{12}$, the values determined point to the high or extremely high level of variability of the variables at issue (Table 3).

Table 3. Variability coefficients Vi of the variables at issue

| × | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ | $X_9$ | $X_{10}$ | $X_{11}$ | $X_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $V_i$ | 56% | 85% | 23% | 188% | 111% | 68% | 80% | 256% | 80% | 117% | 37% | 42% |

Source: Own study on the basis of research.

In the multivariate analysis, it is important to make the level or range of characteristics variability uniform. The variables taking on high values have a significantly larger impact on the distance between objects than the smaller value variables. In certain cases, characteristics of relatively small values may have no impact on the classification of objects whatsoever. The transformation of variables has this effect that all the characteristics become *important* to the same degree. The present study makes use of standardisation of characteristics which has this result that the median value of each of the characteristics equals zero while the standard deviation equals one. The conversion formula is as follows

$$\tilde{x}_i = \frac{x_i - \overline{X}_i}{S_i}$$

where: $x_i$, $\tilde{x}_i$ – values of $i$-th variable before and after standardisation;

$\overline{X}_i$, $S_i$ – median value and the value of the standard deviation of variable $X_i$ respectively. The distances between the objects were calculated with the use of the Euclidean metric. In further three steps, the number of four clusters was adopted.

## TYPOLOGY OF ORCHARD FARMS CLUSTERS IN THE GRÓJEC AND WARKA AREA

The clusters were designated with symbols A, B, C, and D and were presented as a dendrogram (Fig. 1).

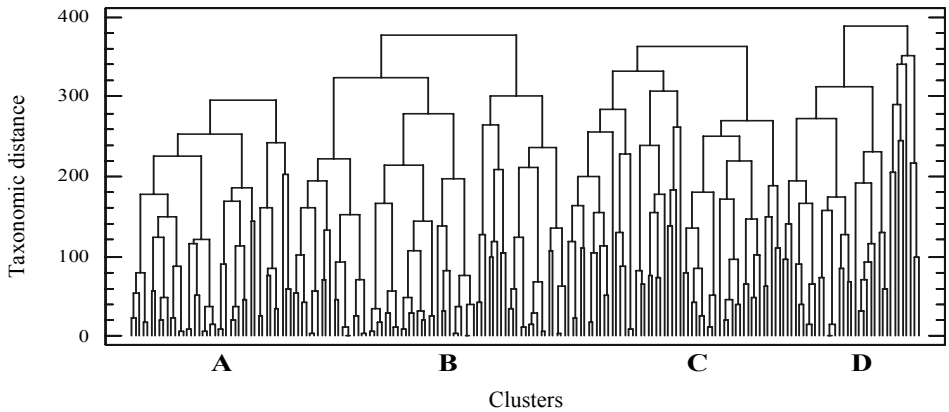


Fig. 1. Classification of fruit farms by Ward's method (the case of four clusters)
Source: Own study on the basis of research.

Tables 4 and 5 respectively provide information on the size of clusters and coordinates of specific cluster centroids. Most fruit farms qualified for cluster B. The smallest number of them appeared in cluster D.

Table 4. The case of four clusters: size and percentage of the total number of orchard farms

| Cluster | Number of orchard farms in a cluster (–) | Share in all clusters (%) |
|---|---|---|
| A | 41 | 20.6 |
| B | 69 | 34.7 |
| C | 54 | 27.1 |
| D | 35 | 17.6 |

Source: Own study on the basis of research.

Coordinates of the centroids (verses of Table 5) signifying centres of the clusters provide good accuracy information on the average level of all 12 characteristics (in relation to each cluster separately). They make determination of the location of the cluster's centre in space possible and point to differences between the clusters. They also show, obviously in a certain approximation, whether a given characteristic diversifies the clusters to a small or large degree.

It is fitting to indicate that, for example, variable $X_2$ (size of new plantings per 1 ha) does not show any differences between clusters A, B, and C since the values of the second coordinate of the centroids are identical. The situation is similar in the case of variable

Table 5. The case of four clusters: centroid coordinates

| Cluster | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ | $X_9$ | $X_{10}$ | $X_{11}$ | $X_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 11.9 | 0.18 | 0.89 | 21.2 | 301.9 | 5 876.8 | 4 234.7 | 11.5 | 790.3 | 0.51 | 4.2 | 2.6 |
| B | 7.2 | 0.18 | 0.71 | 15.0 | 44.6 | 3 579.2 | 3 473.4 | 20.0 | 797.3 | 0.29 | 4.0 | 3.0 |
| C | 10.1 | 0.18 | 0.89 | 33.7 | 81.3 | 7 195.2 | 6 282.0 | 11.7 | 800.2 | 1.14 | 4.1 | 4.3 |
| D | 4.6 | 0.11 | 0.88 | 47.8 | 127.2 | 8 998.9 | 5 398.6 | 53.4 | 1 934.8 | 0.46 | 3.5 | 2.1 |

Source: Own study on the basis of research.

$X_3$ (share of apple cultivation area in the total cultivation area): in this respect there are no differences between clusters A, C, and D. Whereas substantial differences occur, for example, in the case of variables: $X_4$ (apple production volume), $X_5$ (value of 1 ha of new plantings), $X_6$ (general economic costs), $X_7$ (direct costs).

Farms with the median orchard area of 11.9 ha were classified within cluster A. These farms had the largest area among all the identified clusters. This group consists of farms with the area from 5.8 to 21 ha, nevertheless, the farms within 7 to 15 ha interval are dominant. At the same time, fruit farms qualified within this group are characteristic for a very high value of 1 ha of new plantings ($X_5$, on average PLN 301.9 thousand) and the lowest number of hours worked ($X_9$, on average 790.3 h per ha). In this group we observe a low apple yield per 1 ha ($X_4$: 21.2 t per ha) and low general economic and direct costs ($X_6$: PLN 5,876.8 per ha) and ($X_7$: PLN 4,234.7 per ha). Households in this group are characterised by the highest average number of people in the family ($X_{11}$: 4.2 person) and a low average monthly income level ($X_{12}$). The average monthly income of the family is PLN 1,641 while an average monthly income per person is PLN 438.5. At the same time these are families with the level of savings sufficient to sustain a family for ca. 0.51 year ($X_{10}$) and is lower only than the analogous indicator for cluster C.

Among the farms qualified within group B, 69 farms were studied, which amounted to 34.7% of all surveyed farms. The farms within this group were characterised by the average size orchard area of 7.2 ha. This group includes farms with the area from 1 to 17 ha, but is dominated by those in range of 3–12 ha interval. The characteristic distinguishing this cluster against the entire population was distinctly the lowest level of many indicators, i.e.:

- the lowest share of apple cultivation area in the total cultivation area ($X_3$: 0.71);
- the lowest size of apple cultivation area ($X_4$: 15 t per ha);
- the lowest value of 1 ha of new plantings ($X_5$: PLN 44.6);
- the lowest general economic and direct costs ($X_6$: PLN 3,579.2 per ha; $X_7$: PLN 3,473.4 per ha);
- the shortest family survival time in absence of income ($X_{10}$: 0.29 year).

This group records also a small number of hours worked ($X_9$: 797.3 h per ha), slightly higher than in group A. The average number of people in the family ($X_{11}$) is 4.0, with the average monthly family income of PLN 2,142, and the average monthly income per person is PLN 567. The average income of this household group is distinctly higher than in the case of clusters A and C, they are only lower than the average income for cluster D households.

The number of fruit farms qualified to cluster C was 54 and it was the second biggest group constituting 27.1% of the total number of farms (Table 4). This group included

farms with the most diversified orchard area: from 1.6 to 28 ha whereby the average area is 10.1 ha. This group includes the highest number of fruit farms with large orchard area and standing out in terms of high income indicators. This group is characterised by the highest level of average income: $X_{12} = 4.3$ (monthly family income – six income classes) which gives the average family income at the level of PLN 3,825 and the average monthly income per capita of PLN 1,154.9. In this respect, cluster C households clearly dominate over the three remaining groups. The level of accumulated savings is also the highest while the average period of household sustenance on previously accumulated resources in absence of any family income was as much as 1.14 year ($X_{10}$). This group of farms is characterised by high general economic costs ($X_6$: PLN 7,195.2 per ha) and the highest direct costs ($X_7$: PLN 6,282.0 per ha). Apple production in cluster C is distinctly higher than in the case of clusters A and B farms: 33.7 t per ha ($X_4$), at a slightly higher number of hours worked ($X_9$: 800.2 h per ha).

The fourth group of orchard farms is cluster D, comprising 35 farms with the lowest orchard area of 4.6 ha. These are farms with the area from 0.5 to 9 ha with the prevalence of the farms in the interval from 2 to 7 ha. The volume of apple production per 1 ha is the highest in this group and it is 47.8 t per ha ($X_4$). At the same time, it is fitting to point to the new plantings level per 1 ha of cultivation area which is the lowest among all the groups ($X_2$: 0.11) while the very value of 1 ha of new plantings reaches an average level and is PLN 127.2 ($X_5$). At PLN 8,998.9 per ha ($X_6$), the level of general economic costs is the highest in this group while at PLN 5398.6 per ha ($X_7$) the high level of direct costs is lower only in comparison to cluster C farms. Cluster D farms are characterised by an extremely high value of the hours worked ($X_9$: 1,934.8 h per ha) which is almost 2.4 times higher than in the three remaining groups. Cluster D households generate the lowest income: the average monthly income per household is PLN 1254, while the average income per capita is PLN 436.7. The lowest persons per household indicator ($X_{11}$: 3.5) has this result that despite a low household income, the income per capita is approximate to the average income in cluster A (Table 6).

Table 6. Indicated average monthly gross farm income per capita for each indicated cluster

| Cluster | Average number of persons in an fruit farm | Average income class | Average income of an analysed fruit farm | Average income per capita |
|---|---|---|---|---|
| A | 4.2 | 2.6 | 1 641 | 438.5 |
| B | 4.0 | 3.0 | 2 142 | 567.0 |
| C | 4.1 | 4.3 | 3 825 | 1 154.9 |
| D | 3.5 | 2.1 | 1 254 | 436.7 |

Source: Own study on the basis of research.

The interval series specified in the survey was used to calculate the average income of farms. The analysed income is an average monthly farm income (farm income) obtained in 2010. The last income interval was defined as right-open, hence the maximum income value was adopted at PLN 8,000. To determine the average farm income, the income determined median interval was adopted. For each group, the total of incomes of farms divided by the number of the farms in a given cluster was determined.

## SUMMARY

A significant part of fruit farms in the analysed Grójec and Warka area are family farms (ventures) with the increasing group of intensive cultivation farms. On the basis conducted research, there are follow four orchard farm types:

- farms with a high potential for development characterised by a high production potential (orchard area, infrastructure, especially storage facilities) are operated by fruit farmers who have a successor or who took over the farm, or those with social capital in the form of a supportive family. Most often, these are group A farms with the orchard area ranging from 7 to 15 ha and, at the same time, the largest average number of people in family as well as a part of group C farms characterised by a high income indicator;
- farms with an average potential for development – minority of farms classified within farm clusters A and C. In particular, clusters C farms are characterised by the largest orchard area which predestines this group as a group with a potential for development. These farms maintain multidirectional structure of orchard production;
- fruit farms without a potential for development. They are predominantly farms in cluster B, characterised by the lowest degree of specialisation or the lowest value of new plantings (traditional orchards are dominant). Frequently, these farms must struggle to survive. In majority, they are run by older farmers without successors prepared to take over;
- bankruptcy-bound fruit farms constitute a small group of farms. They are usually farms which due to random causes such as, for example, spouse's demise are in a difficult situation or farms which due to the lack of a successor suffered from years of underinvestment. It is possible to include within this group cluster D fruit farms which despite a high value of hours worked in orchards generate the lowest income.

Summing up the development of horticulture in the area Grójec and Warka we can say that there is a big development potential. Nevertheless the main barrier of development is a lack of diversification of apple's market. The research point out that the biggest develop chance have a fruit farms with the high degree of development potential. These are the one, which have a good professional and families relations and the owner of farm have the vision of growth. In turn the barrier of fruits farm development is many lines of production. It concerns especially farms with average potential of growth. The last two groups of farms probably will have to resign from production or will have to diametrically change the farm organization.

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## EKONOMICZNA TYPOLOGIA GOSPODARSTW SADOWNICZYCH W REGIONIE GRÓJCA I WARKI

**Streszczenie.** Polska jest największym producentem jabłek w Unii Europejskiej. Obszar Grójca i Warki charakteryzuje się najwyższym poziomem produkcji tych owoców na świecie. Celem publikacji jest przedstawienie ekonomicznej typologii gospodarstw sadowniczych w regionie Grójca i Warki. W pracy wykorzystano następujące metody badawcze: metodę sondażową z wykorzystaniem kwestionariusza wywiadu oraz metodę grupowania hierarchicznego Warda. Badanie przeprowadzono wśród 229 gospodarstw sadowniczych na terenie gmin Grójca i Warki w okresie czerwiec-sierpień 2010 roku. Pozwoliło to na wyodrębnienie czterech typów gospodarstw sadowniczych: gospodarstwa o dużym potencjale rozwojowym, gospodarstwa o średnim potencjale rozwoju, gospodarstwa bez potencjału rozwoju oraz gospodarstwa upadające, pozbawione możliwości dalszego rozwoju.

**Słowa kluczowe:** typologia, jabłka, ogrodnictwo, sadownictwo

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# UTILISING THE PROFESSIONAL POTENTIAL OF THE ELDERLY IN THE PROCESS OF CONSTRUCTION OF SILVER ECONOMY IN POLAND

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**Abstract.** The issue of professional activity of the elderly is currently the subject of intense debate. The projected decline in the population of young people makes it necessary to raise the level of professional involvement of the more mature part of the labour force. The increase in the economic activity of people aged 50+ is seen as an opportunity to preserve the continuity of economic growth. This paper explores the issue of the possibility of utilising the professional potential of elderly people in the context of the construction of silver economy, paying attention to the possible benefits stemming from the implementation of its principles.

**Key words:** occupational activity, labour market, elderly, silver economy

## INTRODUCTION

The transformation of the demographic structure of the Polish society is occurring in a period of dynamic economic change. There is no doubt that one of the most positive manifestations and consequences of the socio-economic transformation is the increase in life expectancy of Poles. However, the increase in life expectancy and low birth rate result in increased dynamics of population aging. The awareness of this process has led to increased interest in the problems of the economic activity of the more mature part of the labour resources and the possibilities of implementation of the concept of silver economy in Poland. At its base there is a positive approach to the consequences of an aging population. Moreover, a lot of debates and subject literature highlight the necessity to prepare the economy for the new demographic proportions, because only then is it possible to maintain economic growth. Silver economy, as an economic system directed at the use of the potential of the elderly and taking into account their needs, is becoming a subject of public debate in Poland. One of the main problems associated with the prolongation

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of life is concerned with the issue of raising the level of participation of the elderly, especially the more mature part of the workforce.

An important challenge in this area is to develop solutions that would prevent premature withdrawal from the labour market of the elderly and the promotion of active aging. This article takes the issue of the use of professional potential of the elderly in the implementation of the concept of silver economy in Poland. The starting point for consideration is to present the dynamics of growth participation of the elderly in the Polish society. With the above in mind, the analysis of the changes in the economic activity of the more mature part of the labour force was performed. Based on the literature, the concept of silver economy was presented in more detail, paying attention to the benefits of its implementation. This study incorporates the desk research analysis.

## THE POPULATION OF THE ELDERLY IN POLAND – CURRENT STATUS AND FORECASTS

Undertaking the analysis of changes in the population of the elderly, the different ways of classification within this group should be noted[1]. Polish statistics gives two ways of classifying the population into age divisions. On the one hand, the so-called isolated economic age groups are distinguished, on the other hand, the biological groups are listed. The elderly can be seen as the ones that are listed in the group of people at the retirement age, or, by using the criterion of biological age, in the group of over 65-year-olds. Regardless of the classification, the term "elderly person" is used to refer to people aged over fifty included in the labour force. As far as the issue of participation of the elderly who have exceeded the established retirement age is of moderate interest, whereas the professional activation of people aged 50+ has become the main goal of the consecutive government programs in Poland[2].

A significant increase in interest in the problems of demographic changes is mainly associated with their direction and consequences that they entail. Firstly, for a dozen of years, the process of changing the demographic structure of the population has been observed, which is characterized by reducing the number of children and young people and the growing proportion of elderly people in the total population. As a result, there exists the gradual intensification of the negative consequences associated with the change of the ratio between the population of the working and non-working ages. Poland is no exception on the map of Europe when it comes to the direction of the demographic change, according to the demographic forecasts available, however, as prepared by the Central Statistical Office and Eurostat, the dynamics of the aging Polish population will be very high throughout the coming decades. It is anticipated that the gradual reduction in the

[1]The criteria of the classification of the elderly are presented, among others, in H. Mamzer, Cultural conditioning of old age and creating market, In: H. Mamzer, J. Isański, A. Bełkot, New social relations: seniors in postmodern societies, Oficyna Wydawnicza Epigram and Contributions, Bydgoszcz 2013.

[2]In 2004 the 50 Plus Program was started: the program for the employment of people over 50 years of age. In 2008 another government project was adopted named Solidarity Generations The Activities to Increase the Activity of People Aged 50+.

population from 38.5 million in 2013 to 36.5 million in 2035 and up to about 33.9 million in 2050. The projected gradual shrinking of the population will run in parallel with a significant change in the age structure. The closer analysis of the prognostic data highlights a number of trends (Table 1).

Table 1. The population as broken down into the economic age groups (in thousands) by 2050

| Economic age group before raising the retirement age | 2013 | 2020 | 2035 | 2050 |
|---|---|---|---|---|
| Total population | 38 496 | 38 138 | 36 477 | 33 951 |
| Broken down in terms of age | | | | |
| pre-working | 6 995 | 6 733 | 5 568 | 4 963 |
| working | 24 422 | 22 787 | 20 715 | 16583 |
| post working | 7 078 | 8 617 | 10 193 | 12 404 |
| Economic age group after raising the retirement age | 2013 | 2020 | 2035 | 2050 |
| Total population | 38 496 | 38 138 | 36 477 | 33 951 |
| Broken down in terms of age | | | | |
| pre-working | 6 995 | 6 733 | 5 568 | 4 963 |
| working | 24 548 | 23 820 | 22 569 | 19 048 |
| post working | 6 952 | 7 585 | 8 340 | 9 939 |

Source: Own study based on Prognoza ludności na lata 2014–2050, GUS, Warszawa 2014.

In both variants of the forecasts, the decrease in the number of people of the working age is projected, with the rate of decline slower in the case of the variant taking into account the increase in the retirement age. Changing the retirement age will not prevent the increase in the population of working age, but the growth rate is less than while maintaining the existing age limits. The natural consequence of the decision to prolong the working life of Poles is the gradual increase in the number of people of working age, while reducing the number of people of retirement age. With this option, it means an increase the number of people of working age from 126 thousand people in 2013 to 2,465 thousand in the year 2050.

A significant change of the population structure is also evidenced by changes in the share of each group in the total population. In 2013 both those in pre- and post-production age constituted slightly more than 18 per cent of the population each. The remaining 63 percent are people of working age. In turn, the forecast for 2050 show the potential labor resources will constitute 56 per cent, and there is a significant difference between the non-working age populations – the share of the population of working age will be twice higher than in pre-working age [Prognoza ludności… 2014].

Demographic trends outlined in relation to the elderly population will mean both an increase in the number of people who are just entering the old age, as well as those who live to the old age. In view of the decision to prolong the period of economic activity the need to step up action to foster the full participation in the labour market, not only people in their fifties, but also those in their sixties becomes rather obvious. Retaining those people in the labour market, which in the period of up to 2020 will supply the age groups 55–59 and 60–64 seems particularly important.

## SILVER ECONOMY AS A WAY OF ADULT AGE LABOUR FORCE DEVELOPMENT

Silver economy is a concept formed relatively recently, in 1970s. The concept has replaced the original wording used in the literature, such as, among others, "positive aging", "successful aging" Extracting silver economy has become a necessity resulting from the fact trying to find the best way to the rational use of socio-demographic, which, according to demographers, awaits the world in the near future. The fact that the lengthening of the life of the society, in addition to the undeniably positive consequences, however, carries a threat in the form of the aging of the Polish population (assuming the continuous low birth rate), which, in turn, makes it necessary to adapt the existing economic system to the changing reality. One of the ideas to solve this situation is to implement the principles of silver economy that permits the use of the potential of the elderly in the best way possible, both from the point of view of good seniors, as well as the economy. According to Klimczuk [2011], research on the concept of silver economy should be treated in terms of the search for a new scientific paradigm and implementation.

Creating silver economy is the European Commission's recommendation contained in the report, titled Europe's Demographic Future. It is assumed that there is no single, precise definition and statistics reflecting the development of this phenomenon. In this document, it is recommended to understand it as "a combination of good supply conditions (high level of education, research and development, sensitive and flexible markets) with the increased purchasing power of older consumers, which offers great new opportunities for economic growth" [Europe's demographic... 2007].

Silver economy should not be treated as one sector, but as a set of products and services in a lot of already existing sectors. In a narrower sense, the term "silver economy" is sometimes used interchangeably with the term "silver market". This market involves goods, values and services for high net worth individuals above 50 years of age, as well as special trade arrangements between economic operators to enable them to adapt to aging workforce. So far in the literature it has not been developed in detail how to implement the principles of the model of silver economy in the economic reality. It follows certainly from the fact that this is a relatively new trend and the fact that global aging does not mean that every country is in the same situation. In addition, not every country or region has the same opportunities and resources to implement the rules of silver economy. Moreover, in the opinion of experts developing the first Polish silver economy strategy for Małopolska, there are reasonable reasons to believe that the principles of silver economy are much better implemented in a region than in a country [Golinowska 2012]. This results from the fact that aging at different rates affects regions differently and the rules would be better implemented locally than on a large scale. This creates, on the one hand, the opportunity to prepare for the projected demographic changes, on the other hand, it makes that free resources among others in the labour market are needed to run the application and development.

In confirmation of this thesis the recommendations contained in the report, tilted Demographic Change and Aging: Implications for Local Labour Markets in Poland [2013], can be cited which state that the aging population, in fact, creates new opportunities for economic development in the region. The chances for development that arise should be

promoted and people encouraged to make use of them. In the process of the construction of regional development strategies should take into account the postulates of silver economy, not only as an expression of concern for the elderly, but also for economic reasons. Because it is believed that problems associated with the progressive aging of the society directly influence the extent of economic growth and generate high budget expenditures, mainly for social security and other needs specific to senior citizens. Forming the basis for the introduction of the principles of the silver economy may in turn contribute to the increased activation of senior citizens, in terms of both professional and social life. This, in turn, may result in the improved quality of life of the elderly, and ultimately of the whole society.

Silver economy is a system in which the elderly are treated as an active, productive and socially useful group. It draws attention to the obvious benefit from the use of professional experience of the elderly. Moreover, the idea of silver economy boils down to the fact that there is the possibility of combining the interests of producers, elderly care institutions, business, tourism, entertainment or educational and advisory activities Also the aging process affects the formation of new forms and types of services [Kijak and Szarota 2013]. On the other hand, silver economy can be considered as economic opportunity for the state and businesses because of the possibility to create new market opportunities. One of such possibilities may be the increase in the exports of goods manufactured for the needs of the elderly people. The demand in silver economy is less sensitive to changes in economic conditions, due to, among others, overall highly reliable to demographic forecasts, or from an increase in retirement benefits [Radvanský and Páleník 2011]. The decision to extend the professional activity of Poles from the perspective of the implementation of possibilities the concept of silver economy may be interpreted as a positive impulse for the economy, even if attention to the possibility of expansion of industry and services targeted to meet the needs of the elderly, especially those who are in a good financial situation The issue of the use of professional potential of is crucial in the context of the development of silver economy. As it is emphasized by the experts in the labour market: "is the need to implement, especially in enterprises, programs in the field of age management, intergenerational cooperation projects, instruments such as mentoring, coaching, and programs encouraging a healthy lifestyle, which will aim to promote older employees as a valuable human resource for employers, whose knowledge and professional skills possessed can be communicated to younger persons in the workplace" [Demographic... 2013].

To increase employment, especially of the elderly, the extension of the working life of women and men, restoring and strengthening relationship between generations in the workplace and flexicurity are particularly useful [Schimanek 2012]. However, all the goals that are included in the national strategic documents relating to the labour market do not include activities to increase the employment of people of retirement age, but only of people aged 50+. This means that in order to take full advantage of the changing demographic situation and to effectively implement the principles of silver economy, it is necessary to take into account the activities taken to promote and support the employment of the elderly.

## THE DEGREE OF USE OF THE PROFESSIONAL POTENTIAL OF THE ELDERLY

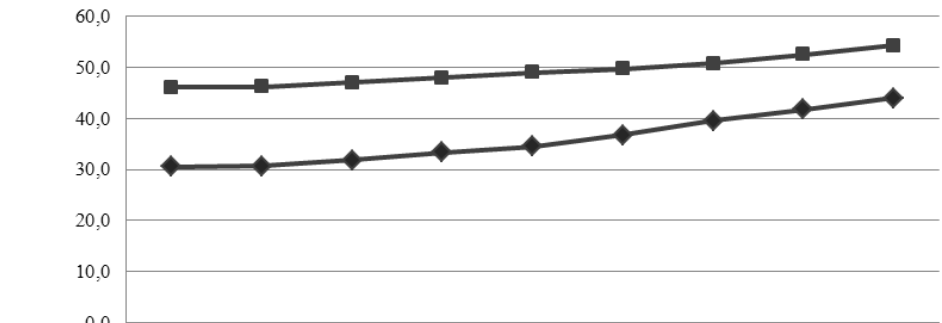
Aging and shrinking of labour impose a different perspective on the elderly on the labour market. The report of the European Foundation for the Improvement of Living and Working Conditions, tilted Age and employment in the new Member States, underlines that "the loss of skilled and experienced workforce, especially in sectors with a high proportion of older workers, can trigger a decline of economic growth. In the aspect of dwindling population of young people in Europe in order not to lose business opportunities due to lack of staff, companies will have to increasingly rely on older workers" [Wiek a zatrudnienie… 2006]. Poland has not yet experienced a significant loss of labour force, what is more, over the last two decades, the number of people of working age (15–59 and 64 years old) has increased. The abundance of labour supply allowed the country to establish various kinds of benefits to people approaching the retirement age. In 1990s, driven by the need to reduce unemployment among the elderly, the decision was made to introduce social benefits, including the so-called early retirement. They were directed at the unemployed who still needed no more than two years to reach the statutory retirement age. In 1997 the entitlement to those benefits was limited to employees performing certain professions only. Despite later attempts to reduce retirement pension privileges, the possibility to acquire the right to them extended till the end of 2008. Maintaining the possibility of early termination of economic activity resulted in the deactivation of the more mature part of professional labour resources [Dezaktywizacja osób w wieku okołoemerytalnym 2008].

Although the retirement age was 60 years for women and 65 for men, the average age of exit from the labour market was lower. For example, in 2005 the average age of men who were leaving the labour market in Poland was 57 years and was the lowest in the European Union. On average, men ended their professional activity about eight years before the statutory retirement age. Moreover, in the years 1988–2005 the average age of professional deactivation of men decreased by almost 3.5 years [Rzońca and Wojciechowski 2008]. The growing awareness of the direction and consequences of changes in the age structure of the Polish society, started up the process of gradual termination of retirement pension benefits. As a result, there was an increase in the average age at which the Poles left the labour market. In 2012 it amounted to 59.9 years, in men – 60.2, and 59.5 in women [Ważniejsze informacje... 2013]. At the same time in the group of priority objectives realized by the State, found to increase the utilization rate of the professional potential of the elderly. This is due to the Human Capital Development Strategy 2020 [2013] provisions where it is stated, inter alia, that the essential aim of actions for older labour force should be allowing the extension of the period of their professional activity.

The presence of the elderly in the labour market in Poland is both a natural consequence of changes in the age structure of the society, as well as it is associated with the gradual raising of the pension age. Past activities and programs are focused on activating the group of people in their fifties. There is no doubt, however, that they should be supplemented with solutions aimed at people over the age of 60 and contributing to the labour force. Regardless the effectiveness of the use of professional potential of the more mature

part of labour force, the issue of the economic activity of people who are of retirement age and work, or demonstrate willingness to work remains of interest.

Today, because of the importance of problems associated with changing the demographic proportions in Poland, as well as in many other European countries, the decision was made to gradually move away from the solutions to support the professional inactivity of elderly. It may be assumed that the need to increase the level of their professional activity on the one hand results from the need to reduce the scale of wastage of work and the financial burden of the state on the other hand is a manifestation to pursue the idea of active aging in Poland. By limiting consideration only to the professional dimension of this activity, it is impossible to fail to note that Poland is located in the group of countries with a relatively low level of professional activity, especially of the elderly. However, the data from the last few years indicate a positive trend expressed in the growth of professional activity in the group of 55–64-year-olds. It is true that the activity rate in Poland is still below the EU average, but within nine years it increased by more than 13 per cent (Fig. 1)[3].




| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| Poland | 30,5 | 30,7 | 31,8 | 33,3 | 34,5 | 36,7 | 39,6 | 41,8 | 44,0 |
| UE-28 | 46,1 | 46,2 | 47,1 | 48,0 | 49,0 | 49,7 | 50,8 | 52,6 | 54,3 |

Fig. 1. The activity rate of Poles aged 55–64 in 2005–2013
Source: Eurostat.

The possibility of earlier statutory retirement of women in Poland makes it difficult to accurately compare the levels of activity of people in age group 55–64. Despite these difficulties, the noteworthy fact is the upward trend in the employment of people in the given age range that has persisted since 2008 (Table 2).

Among adult citizens of Central European countries only the elderly people in Slovenia and Hungary are less economically active than Poles. Closer analysis of the data also shows that in the group of countries with a high employment rate of the elderly there is Germany, Denmark and Estonia. The undisputed leader in this area is Sweden, where more than 70 per cent of 55-64-year-olds work.

[3]It is worth mentioning that the generally accepted in the international statistical upper limit of the working age, i.e. 64 reflects the average age of the existing economic activity in Europe. However, given the general tendency of European countries to raise the retirement age, the statistics will perhaps be enriched with additional age ranges.

Table 2. The employment rate of people aged 55–64 in selected EU countries in 2008–2013

| Specification | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|
| European Union | 45.5 | 45.9 | 46.3 | 47.3 | 48.8 | 50.2 |
| Czech Republic | 47.6 | 46.8 | 46.5 | 47.7b | 49.3 | 51.6 |
| Denmark | 58.4 | 58.2 | 58.4 | 59.5 | 60.8 | 61.7 |
| Germany | 53.7 | 56.1 | 57.7 | 59.9 | 61.5 | 63.6 |
| Estonia | 62.4 | 60.4 | 53.8 | 57.2 | 60.6 | 62.6 |
| Latvia | 59.4 | 53.2 | 48.2 | 50.5b | 52.8 | 54.8 |
| Lithuania | 53.1 | 51.6 | 48.3b | 50.2 | 51.7 | 53.4 |
| Hungary | 31.4 | 32.8 | 34.4 | 35.8 | 36.9 | 38.5 |
| Poland | 31.6 | 32.3 | 34.1b | 36.9 | 38.7 | 40.6 |
| Romunia | 43.1 | 42.6 | 41.1 | 40 | 41.4 | 41.5 |
| Slowenia | 32.8 | 35.6 | 35 | 31.2 | 32.9 | 33.5 |
| Slovakia | 39.2 | 39.5 | 40.5 | 41.3b | 43.1 | 44 |
| Finland | 56.5 | 55.5 | 56.2 | 57 | 58.2 | 58.5 |
| Sweden | 70.1 | 70 | 70.4 | 72 | 73 | 73.6 |

b – break in fine series.
Source: Eurostat.

According to the assumptions of Europe 2020 strategy, one of the priorities in the pursuit of inclusive growth is the achievement of the employment rate of people aged 20–64 at the level not lower than 75 per cent. In accordance with the indications it will be possible by improving the number of working women and of the elderly [Europa 2020... 2010]. In the case of Polish, achieving the target above to be a challenge. Analysis carried out indicates, that the employment potential of the elderly is utilised in less than 40 per cent held at the significant difference in employment rates between men and women, on average, it is nearly 20 percentage points (Fig. 2).

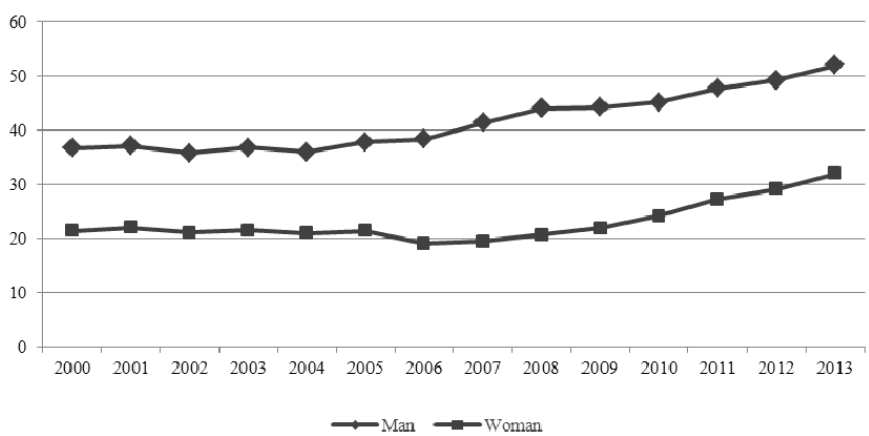



Fig. 2. The employment rate of women and men in age group 5–64 in Poland in the years 2000–2013 (in per cent)
Source: OECD Employment Outlook 2014.

In 2013, only 32 per cent of Polish women in age group 55–64 worked (compared to 50 per cent of men). The analysis confirms the insufficient level of utilization of professional potential of the elderly in Poland. This conclusion is not surprising in view of the opportunities that enabled Poles to leave the labour market early until recently. Considering the future demographic trends and growing participation in the labour force of the more mature people, it is necessary to increase the involvement of all market protagonists to cooperate in order to change the situation. The experience of other countries shows that increasing the involvement of the elderly in the labour market is not only a necessity, but it also brings a series of benefits for themselves, businesses and the economy. It creates new challenges at the same time [Chiva and Manthorpe 2009, Taylor 2013].

The analysis of employment among elderly people from different age groups shows an increasing trend over the last few years. Employed persons aged 55–59 in 2012 constituted 9.7 per cent of all employees (to compare, in 2009, the rate was 7.8 per cent). In the age group 60–64 some 3.8 per cent was working (2.2 per cent in 2009) while in the group of people aged 65 and over 1.6 per cent were employed (in 2009 the rate was 1.4 per cent). Although the data presented illustrate the progression when it comes to the percentages of people working in each analyzed age group in comparison with 2009, it should be noted that the percentage of employees really decreases with the transition to the next age bracket.

The issue of longer professional activity raises a lot of controversy among Poles, as evidenced by the results of public opinion polls. The survey conducted in May 2012 by CBOS [Opinie o zmianach… 2012] shows that the vast majority of respondents are opposed to the extension of the period of economic activity by means of raising the retirement age. This solution was opposed by 82 per cent of interviewed men, and 88 per cent of the total number of respondents declared their objection to raising the retirement age for women. The reasons of unambiguously negative assessment of the issue of prolonging the professional activity are complex. Certainly there are concerns about the ability to work in old age, not only in terms of health, but also the availability of jobs for of the elderly among them.

## CONCLUSIONS

For over a dozen years there has been a lively discussion in Poland on the demographic and socio-economic consequences. One of the threads recurring in the discourse is the issue of the construction of silver economy, which allows to measure the effects of an aging population. The attractiveness of silver economy is based on the assumption that it is a development strategy taking into account not only the needs of an aging population, but it is also conducive to the development of and meeting the needs of all social groups. One of the elements essential to the implementation of this concept is increasing the degree of utilization of the professional potential of the elderly. The issue of the participation of the elderly who are of working age is particularly important. Prejudice about it results in the low level of professional activity of older Poles. The reasons of this are complex. However, thinking about the implementation of the concept of silver economy in Poland is necessary to increase the effectiveness of actions aimed at raising the professional

activity of the elderly. This requires changes in thinking about employing the more mature labour force among both employers and those concerned. Past experience suggests that employers, for fear of poor quality of work of persons 50 years of age, caused by, among others, worse health, learning difficulties, take decisions, which largely contribute to the exclusion of older people from the labour market. In turn, employees themselves, for fear of lack of employment seeking other opportunities that will allow them to survive until the right to a pension, for example apply for the status of the pensioner or seek illegal employment, thereby contributing to professional self-exclusion. It is worth adding that in the concept of silver economy, it is equally important to create opportunities to use the professional potential of the elderly who are at the retirement age, who are also a source of potential benefits for employers.

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## WYKORZYSTANIE POTENCJAŁU ZAWODOWEGO OSÓB STARSZYCH W PROCESIE BUDOWY SREBRNEJ GOSPODARKI W POLSCE

**Streszczenie.** Kwestia aktywności zawodowej osób starszych jest aktualnie przedmiotem ożywionej dyskusji. Prognozowany spadek populacji osób młodych rodzi konieczność podniesienia poziomu zaangażowania zawodowego dojrzałej części zasobów pracy. W zwiększeniu aktywności zawodowej osób w wieku 50+ upatruje się szansy na zachowanie ciągłości wzrostu gospodarczego. W niniejszej pracy poddano analizie kwestię możliwości wykorzystania potencjału zawodowego osób starszych w kontekście budowy srebrnej gospodarki, zwracając uwagę na możliwe korzyści wynikające z wprowadzenia jej zasad.

**Słowa kluczowe:** aktywność zawodowa, rynek pracy, osoby starsze, srebrna gospodarka

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# TERRITORIAL DIVERSIFICATION OF TECHNOLOGICAL EXCLUSION IN RURAL AREAS IN POLAND

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**Abstract.** During the transformation, after 1989 year Poland has developed more slowly than countries of the European Union in terms of economic and technological progress. With transformation from a centrally planned economy to a free market, the rate of development in our country increased significantly. In the literature disparities in access and ability to use of information technologies between inhabitants of urban and rural areas are often indicated. The paper presents research results on technological exclusion areas development in rural areas in terms of territorial in Poland in 1994–2012. The main data source were the results of household budget surveys developed every year and made available for consideration by the Central Statistical Office. Obtained results were complemented by an analysis of social diagnosis research results conducted every two years since 2000.

**Key words:** rural households, technological exclusion, territorial diversification, household budget surveys

## INTRODUCTION

Toffler divided economic development into three waves. The first period was dominated by agriculture, in the second, major role was played by the industry, and the third is characterized by significant increase of information and knowledge importance, which in turn has led to domination of the service sector in the economy [Toffler 1980]. Table 1 shows the changes which underwent various dimensions of society during the transformation from the local agrarian society, in which the land ownership and human labour accounted for the richness, to the global information society in which information has become a major economic good [Dziuba 2007]. Both the modern economy and society depends not only on shared information, but also of how it is collecting and transmitting, which in turn increases its value as the product. Information as the fourth production

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factor provides the economic superiority for companies which it holds, and can use effectively [Kendall and Scott 1990, Pomykalski 2001]. Apart from obvious advantages of increasing the role of information in the economy and society, should also be given to new challenges appearing as a result of such a process. One of them is faster and faster increasing number of information both necessary and unnecessary, which creates a kind of information noise with which part of the population is unable to cope. This problem applies to a smaller dimension of information society, which is characterized by much more efficient ways of using and managing information [Juszczyk 2000].

Table 1. Developmental characteristics of three types of societies

| Characteristics | Agrarian society | Industrial society | Information society |
|---|---|---|---|
| Wealth | land | capital | knowledge |
| Main product | food | industrial products | information, data |
| Work | by the house | far from home | at home, teleworking |
| Transport | river, road | railway, highway | infostrada |
| Energy | human, animal | coal, steam, petrol | electricity, nuclear energy |
| Scale of operation | local | regional | global |
| Entertainment | ritual, folk | mass | domestic, interactive |
| Mystery | religious | political | commercial |
| Education | master | school | computer, e-learning |

Source: Goban-Klas and Sienkiewicz [1999, pp. 54–55].

Changes were also in the structure of resources affecting the socio-economic development. Agricultural society was based mainly on land and labour, industrial society on capital and labour and the information society on knowledge and information.

## INFORMATION SOCIETY DEVELOPMENT

Already in the 1990s in recommendations about information society prepared for the Council of Europe, it was noted that the States which first create the information society will gain the greatest benefits to enable them to reach the level of highly developed countries. Such countries will become a model of practice for countries where so far for various reasons (political, historical, economic) development of information society progressed slowly or related activities were ad hoc or provisional [Bangemann 1994]. In Poland, political, economic and social changes after 1989, resulted in the economic and technological development proceeded more slowly than in other EU countries. They had undoubted influence on the slower development of information society in our country. This process was slower in Poland than in the Czech Republic, and Hungary, which at the same time did efforts related to EU accession. One of the main reasons for a slower pace of formation of information society in Poland in the 1990s in comparison with other European countries were low investments to carry out research and development (R&D), which are the main factor of long-term technological progress. This also applied to re-

search on information and communication technologies. According to OECD data the average value of GERD (gross domestic expenditure on R&D) in Poland in the years 1991–1999 was 0.69%. For comparison, during the same period in Hungary, the index reached the level of 0.81%, and the Czech Republic 1.02%. The highest levels of the coefficient of GERD there were characterized by: Sweden – 3.22%, Japan – 2.85%, United States – 2.57% [OECD, Main Science and Technology Indicators].

In the first decade of the XXI century, influence earlier political system and centrally planned economic system was getting weaker, due among others the progress of a free market economy, as well as the importance of economic development and technological individual characteristics of individuals (age, sex, education, the material situation, the type of biological family, the place of household functioning, and socio-economic group) growing [Czapiński and Panek 2000–2013]. These changes resulted in a more dynamic information society development in Poland, which is reflected in the growth of the indicators for level of development of the information society [Ziemba and Żelazny 2012, Schlichter and Danylchenko 2013]:

- ICT development index (IDI) – in Poland within the last 10 years almost doubled in 2012, reaching a level of 6.31, only 0.42 below the level of developed European countries. Poland (an increase of 89%) among the countries of the European Union after Romania (up 116%), Bulgaria (an increase of 113%), Croatia (an increase of 98%) and Lithuania (an increase of 93%) is characterized by one of the fastest pace of this index change [International Telecommunication Union 2013]. Amongst 28 member countries, Poland in 2012 occupied 21st position, which meant a rise of two places compared to 2002;
- networked readiness index (NRI) – in the latest ranking of The Global Information Technology Report 2014 Poland ranked at 54th position to give a level equal to 4.2 NRI. Among the EU countries, as in the case of IDI, Poland was ranked at 22nd place (23th place compared with all European countries);
- gross domestic expenditure on R&D (GERD) – in 2002 in Poland amounted to 4,522 million acting by 0.56% of GDP. Within 10 years, their value tripled, acting 0.9% GDP in 2012. Although the rate of change was one of the highest among EU countries (EU-28) Poland in 2012, in relative terms (GDP), has spent on ICT research over twice less than most of the EU member states – the average was 2.07% of GDP. Poland in 2012 has released on research and development 3,429,855 million (11th place among EU countries), and per capita development expenses totaled only EUR 89 (24th place).

In the years 1994–2012 the systematic increase in the number of households equipped with a variety of information and communication technologies and in their spending on them have been shown [GUS 1994–2012]. On the one hand this is a result a general increase in the level of wealth of the society and the systematic decrease in the level of costs that must be incurred to obtain access to these technologies. On the other hand, one can see a growing social awareness of the benefits to be achieved as a result of their possession, as well as more often of the nature of the work, which makes it not only at work, but also in his private life must have access to appropriate technological solutions [Śmiałowski and Jałowiecki 2012]. Possession and using modern information and com-

munication technologies is currently a source of competitive advantage in terms of both macroeconomic and microeconomic [European Commission 2010, GUS 2004, 2013b].

Apart from the obvious advantages brought by technological progress in developed and developing countries also it began to observe the phenomenon of inequality in access to ICT, which was described as different types of exclusions. In the literature, mostly can be found up with the term "digital exclusion" concerning the division of society due to the possession and use of the Internet, computer, and mobile phones [Chinn and Fairlie 2004]. On the one hand, the term "digital indicates" to take into account in studies latest ICT solutions, on the other it reduces the area of analysis excluding analog technologies so prevalent until recently. Therefore, in the studies it was used an technological exclusion term defined as the division of society into those who in their households do not have or do not use regularly both kinds of technologies, digital and analog. Technological exclusion phenomenon is also present in Polish society, and now its scale is one of the main indices used to assess the degree of technological, social and economic advancement of the state.

Władysław Grabski already in the 1920s, pointed out that the economic, social and political development in Poland depends on eliminating the problems at rural areas. He claimed that "for the general progress of society, for its strength in national and state, for social and civilizational improvement, it is necessary that the general rural population had a high degree of economic independence and its environment should be an significant amount of the population capable of knocking out ahead" [Grabski 2004].

While for almost 100 years conditions in which rural households functioning changed diametrically, the main concepts presented by Grabski did not lost much in the news. The problems of educational opportunities for rural youth or economic efficiency of rural households are still actual. In addition, agriculture has to face the new challenges of the implementation of new technologies, including diminishing the technological exclusion problem.

## THE AIM AND PURPOSE OF STUDIES

Research on the digital exclusion, performed in Poland so far focused mainly on the analysis of access, possession and using of information and communication technologies, such as mobile phones, computers and Internet connection for the main social, economic or demographic [Czapiński and Panek 2000–2013, Sobocka-Szczapa 2011]. In the literature technological exclusion of rural households was mostly analyzed only at a national level, or in some regions, for example in Mazowieckie voivodeship [Czapiński and Panek 2000–2013, GUS 2004, 2013a]. There is a lacks of cross-sectional studies focusing on digital and analog exclusions in different groups of rural households and analyzing the processes of its changes in time. One of the main factors determining technological exclusion phenomenon is the household functioning place [Czapiński and Panek 2000–2013, GUS 2004, 2013a].

The aim of the study was to identification of areas of technological exclusion and their diversification in rural areas in terms of territorial in Poland in the years 1994–2012. Presentation of complete image required a comparison of the results with the corresponding

information for the various categories of the size of cities and all of the villages and towns at the same time. The paper presents only the aspects of equipment of rural households in: computer, Internet connection, mobile phone and so traditional technologies (TV, satellite or cable TV, landline phone and a radio). Rural households were understood as households located in rural areas.

To assess the scale of technological exclusion of rural households used the so-called possession each technology factors, which was defined as the percentage of rural households with access to the technology in the total number of rural households in the voivodeship [Śmiałowski and Jałowiecki 2012]. All results are presented on the maps taking into account an administrative division existed in Poland since 1998. Thus, for data from the years 1994–1998, there was necessary to make the conversion of 49 "old" to 16 "new" provinces with using of towns and villages categories structure and Monte Carlo simulations in accordance with the method described by Śmiałowski and Jałowiecki [2013]. In the case of Internet and mobile phones possession, GUS collected information since 2000, and therefore on the charts of these two technologies only data for the years 2000––2012 are presented. Due to the readability charts presenting the coefficient of connection to the Internet and mobile phones possession, presents only the results of even-numbered years, while the other two shows the results of every three years. To analyze the dynamics of changes of studied coefficients the average rate of change (ARC) calculated according to formula (1) was used.

$$\sqrt[n-1]{\frac{x_n}{1}} \tag{1}$$

For all studied technologies, voivodeships has been divided into four groups according to the method by Nowak [Nowak 1990]. Affiliation to particular groups was determined on the basis of formulas (2), (3), (4) and (5). In the Figures 1–4, darker colors mean group of voivodeships characterized by higher values of studied coefficients.

$$\text{group I } \left[\min x, \bar{x} - s(x)\right] \tag{2}$$

$$\text{group II } \left[\bar{x} - s(x), \bar{x}\right] \tag{3}$$

$$\text{group III } \left[\bar{x}, \bar{x} + s(x)\right] \tag{4}$$

$$\text{group IV } \left[\bar{x} + s(x), \max x\right] \tag{5}$$

In studies, a primary data source was the results of Household Budgets Survey (BGD) conducted annually by the Polish Central Statistical Office (GUS). They contain detailed characteristics of more than 30 thousand households and approximately 100 thousand people in every year. These data concern economic, social, territorial, and demographic characteristics, as well as structure of incomes, expenditures and household equipment. The results are complemented by socio-economic information derived from social diagnosis panel research conducted since 2000, and since 2003 he has regularly every two years. The sample during 13 years has more than quadrupled from 3,005 households in 2000 to 12,355 in 2013 covering over 36 thousand people. Source data have been processed and aggregated into an unified database, forming the basis for further studies.

## RESULTS

In Poland in the years 1994–2012 the percentage of rural households equipped with a PC in all voivodeships continued increasing trend (see Fig. 1). An analogous growing trend was seen both in the case of other classes of the town as well as a total of all rural households in different voivodeships. In 1994, a group which have the highest values of the coefficient of having PC included rural households of Zachodniopomorskie (7.4%) and Opolskie (7.2%) voivodeships. The groups with the lowest percentage of rural households accounted for Lubelskie (0.8%) and Podkarpackie (0.9%) voivodeships. In the 18 years the structure of both groups changed significantly. In the first group, in 2012 there were rural households of Wielkopolskie (71.5%) and Pomorskie (70.4%) voivodeships, while in the second of Podlaskie (53.8%), Warmińsko-Mazurskie (54.4%) and Łódzkie (57.6%) voivodeships. The fastest development of rural households in terms of PC possesion were in those that existed in Podkarpackie ($ARC_{1994\text{-}2012} = 37\%$), Lubelskie ($ARC_{1994\text{-}2012} = 36\ \%$) and Mazowieckie ($ARC_{1994\text{-}2012} = 32\%$) voivodeships, and the slowest were in Zachodniopomorskie and Opolskie (both $ARC_{1994\text{-}2012} = 17\%$).

With the increase the level of computerization of rural households also increased the number of households with Internet connection (Fig. 2). In 2000, the highest value of the possession coefficient among rural households was observed in Opolskie (3.3%) voivodeship, whereas the lowest in Łódzkie (0.9%) and Pomorskie (0.9%) voivodeships.

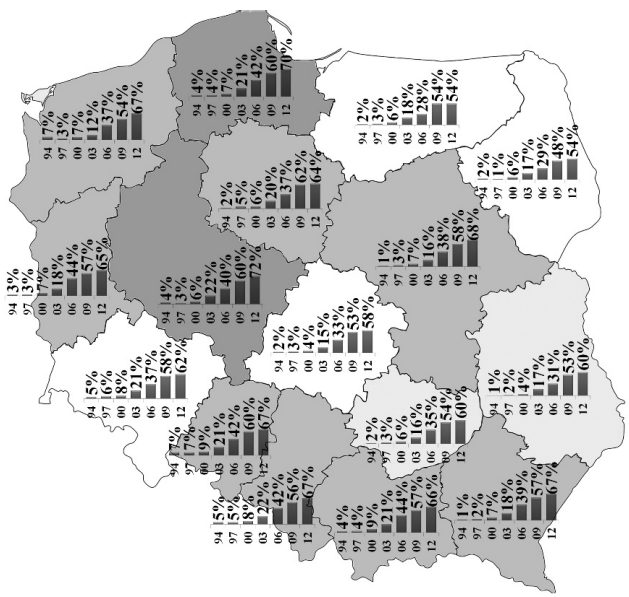

Fig. 1. The percentage of rural households equipped with a PC in the years 1994–2012 in different voivodeships and their classification due to the average size of this share during the period considered (darker colour indicates a higher average share)

Source: Own preparation on the basis of GUS data from Households Budgets Survey 2012 [GUS 1994–2012].

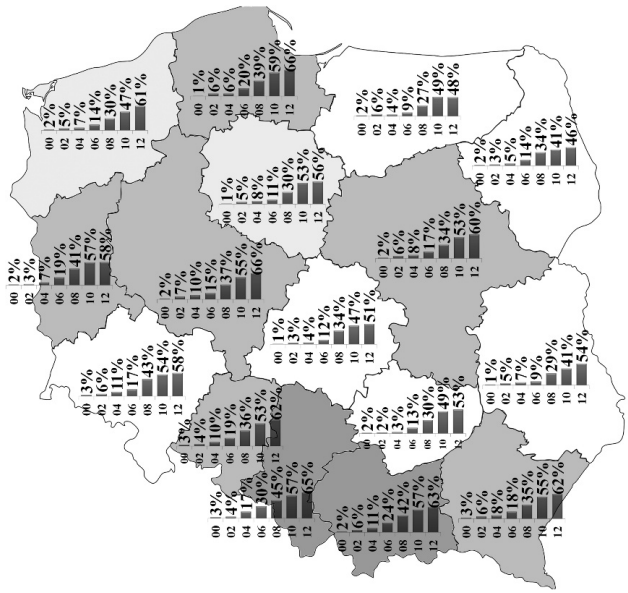

Fig. 2. The percentage of rural households equipped with an Internet connection in the years 2000–2012 in different voivodeships and their classification due to the average size of this share during the period considered (darker colour indicates a higher average share)

Source: Own preparation on the basis of GUS data from Households Budgets Survey [GUS 1994–2012].

In 2012, the highest coefficient values were found in Wielkopolskie (66.2%), Pomorskie (66%) and Śląskie (65%) voivodeships, and the lowest in Podlaskie (46.4%) and Warmińsko-Mazurskie (48.2%) voivodeships. Among surveyed technologies, the most dynamic increase of possesion factor was connected to the Internet. The fastest development of rural households were those in: Pomorskie ($ARC_{2000\text{-}2012}$ = 43%), Lubelskie ($ARC_{2000\text{-}2012}$ = 40%) and Łódzkie ($ARC_{2000\text{-}2012}$ = 40%) voivodeships, while the slowest in: Opolskie ($ARC_{2000\text{-}2012}$ = 28%), Dolnośląskie ($ARC_{2000\text{-}2012}$ = 29%), and Podkarpackie ($ARC_{2000\text{-}2012}$ = 29%) vovivodeships.

In the period from 2000 to 2012 the number of rural households equipped with a mobile phone has increased several times (Fig. 3). Since 2008, the gradual saturation of households by this technology has visible, which results in slowing down the growth of such rural households number. In the first year of the study by far the largest share of rural households equipped with this technology, fell on Lubuskie (17.4%) and Pomorskie (17.1%) vovivodeships, and the lowest on Lubelskie (5.9%) and Podkarpackie (6.5%) voivodeships. After 12 years, a group of rural households characterized by the highest levels of the coefficient of holding mobile phones accounted for Wielkopolskie (95.3%), Pomorskie (93.7%) and Mazowieckie (93.7%) voivodeships, while the smallest for Podlaskie voivodeship (81.7%). Analysis of dynamics of changes in coefficient value showed the fastest growth in the regions of Lubelskie ($ARC_{1994\text{-}2012}$ = 24%) and Podkarpackie ($ARC_{1994\text{-}2012}$ = 25%) voivodeships, and the slowest in Lubuskie ($ARC_{1994\text{-}2012}$ = 15%) and Pomorskie ($ARC_{1994\text{-}2012}$ = 15%) voivodeships.

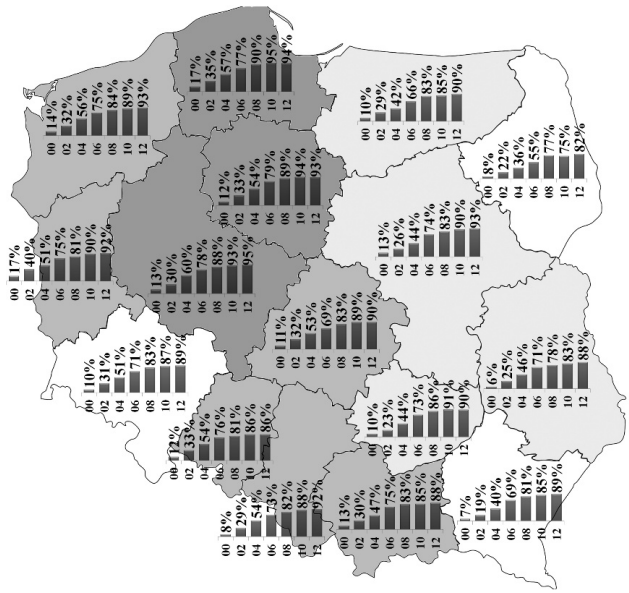

Fig. 3. The percentage of rural households equipped with a mobile phone in the years 1994–2012 in different voivodeships and their classification due to the average size of this share during the period considered (darker colour indicates a higher average share)

Source: Own preparation on the basis of GUS data from Households Budgets Survey [GUS 1994–2012].

In the years 1994–2001 the growth of traditional technologies (TV, satellite or cable TV, landline phone and a radio) possesion coefficient in rural households is clearly visible (Fig. 4). In the period of 2002–2012 in most of the voivodeships, this level remains constant. After 2010, in Dolnośląskie, Kujawsko-Pomorskie and Warmińsko-Mazurskie vovivodeships the slight downward trend is noticeable, and upward trend in Lubuskie, and Łódzkie voivodeships.

In 1994, traditional technologies in terms of numbers were characterized by the greatest diversification among the four analyzed groups of technologies. On the one hand, in the Śląskie voivodeship, only 37% of rural households were equipped with this kind of technology, on the other hand, the level was almost twice as high in Małopolska (66.5%) and western provinces (65.5%). It is worth noting that the group of voivodeships with the lowest values of coefficient of ownership of traditional technologies in 2012 was characterized by only 3% higher values than the group with its highest value in 1994. In 2012, the lowest group contains Łódzkie (69.3%), Świętokrzyskie (69.4%) and Mazowieckie (69.9%). By far the highest value of this coefficient was found in the Opolskie voivodeship (83.7%). Among all analyzed groups, traditional technologies were characterized by the lowest dynamics of changes throughout the period considered. The fastest increase in the level of ownership of traditional technologies was found in Śląskie voivodeship ($ARC_{1994\text{-}2012}$ = 4.2%), while the slowest in Wielkopolskie and Małopolskie voivodeships (both $ARC_{1994\text{-}2012}$ = 0.8%).

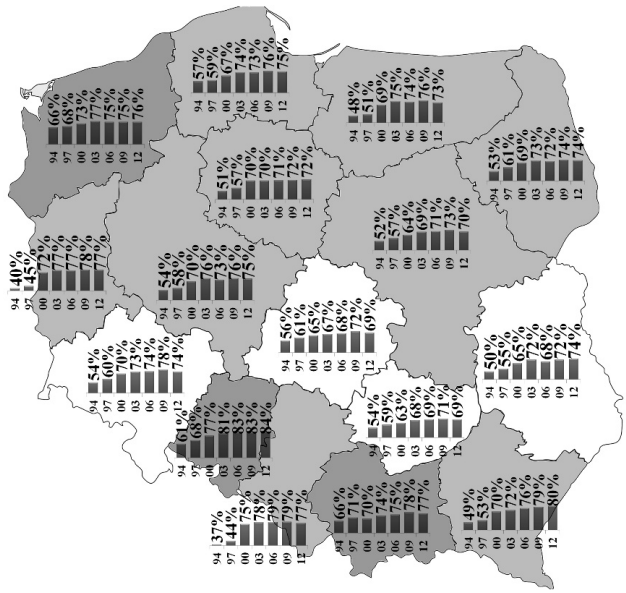

Fig. 4. The percentage of rural households equipped with traditional techologies in the years 1994–2012 in different voivodeships and their classification due to the average size of this share during the period considered (darker color indicates a higher average share)

Source: Own preparation on the basis of GUS data from Households Budgets Survey [GUS 1994–2012].

Classification of rural households in each voivodeships according to the average value of coefficient ownership of selected technologies in the years 1994–2012 coincides with the results of specific research equipment of rural households in these technologies and their dynamics of changes over time. In the matter of computers, mobile phones and Internet connection possession a slight difference between the eastern and western provinces in favor of the latter is noticeable. In particular, north-eastern area of Poland was characterized by the lowest values of these three technologies possession coefficients. In the case of traditional technologies, as a result of the classification, rural households in particular voivodships were to classify only into three groups, due to the fact that no voivodeship was included in the second group. It resulted from high stratification of owned technologies.

## CONCLUSIONS

Access and skills to use of modern ICT technologies are now *sine qua non* condition of full participation in the modern information society life. The results indicate a systematic increase in the analyzed period, the number of rural households equipped with different types of ICT. This was due to both the increase in the wealth of rural households with a decline in the cost of ownership of ICT, as well as with increasing benefits from their possession and use every day. Within 18 years, access to all of the analyzed

categories of ICTs, was characterized by a positive trend. In the case of modern ICT technologies (computer, internet, mobile phone) changes from 1994 to 2012 can be compared to the period between birth and obtaining a maturity. In most voivodeships throughout the analyzed period, year after year a systematic increase the value of each technology possession coefficient. After 2008 year, only in Kujawsko-Pomorskie, Świętokrzyskie and Warmińskie-Mazurskie voivodeships short-term and one-time decrease the share of rural households equipped with a mobile phone and a computer were observed. In addition in Podlaskie vovivodeship it was also connected with Internet possession. Analysis of equipment of rural households and the dynamics of its changes indicates the presence of strong relationship between having a computer and Internet connection. By far the most developed regions in terms of access to modern ICT technologies were rural areas in Pomorskie and Wielkopolskie voivodeships. In terms of rural households equipment with a computer and Internet access, the leading are Małopolskie and Śląskie voivodeships, in the case of the only computer itself Opolskie voivodeship, and in the case of mobile phones even Kujawsko-Pomorskie voivodeship. Dolnośląskie, Podlaskie and Lubelskie were areas in which the lowest percentage of rural households equipped with all studied modern ICT were identified. Łódzkie, Świętokrzyskie and Warmińsko-Mazurskie voivodeships supplement this group with regard to the connection to the Internet and PC possesion, and Podkarpackie voivodeship for mobile phone possession.

In the near future should be also expect that, while in subsequent years the number of rural households equipped with a computer and internet connection will continue to grow rapidly, in the case of mobile phones as a result of saturation index values will be having oscillated around the level of 90%. In the case of traditional technology since the middle of the first decade of XXI century there is a noticeable stabilization of the percentage of rural households equipped with these technologies. Only in Dolnośląskie, Kujawsko-Pomorskie, Lubuskie and Świętokrzyskie voivodeships were impermanent downward trends or growth. Voivodeships, which were dominated by traditional technologies, are Małopolskie, Opolskie and Zachodniopomorskie. The lowest advancement level were characterized rural households from Lubelskie, Łódzkie, Świętokrzyskie and Dolnośląskie voivodeships. In the next years, however should be expected a slow decline of the importance of technologies at the expense of traditional ICT technologies, like all households in particular voivodships

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## TERYTORIALNE ZRÓŻNICOWANIE WYKLUCZENIA TECHNOLOGICZNEGO NA OBSZARACH WIEJSKICH W POLSCE

**Streszczenie.** W okresie transformacji, po 1989 roku Polska w zakresie gospodarczego i technologicznego postępu, rozwijała się wolniej niż państwa Unii Europejskiej. W wyniku transformacji z gospodarki centralnie planowanej do wolnorynkowej, tempo rozwoju w naszym kraju znacznie wzrosło. W literaturze często wskazywane są dysproporcje między mieszkańcami obszarów miejskich i wiejskich w zakresie dostępu i umiejętności wykorzystywania technologii informacyjnych. W pracy przedstawiono wyniki badań na temat rozwoju obszarów wykluczenia technologicznego na obszarach wiejskich w przekroju terytorialnym w Polsce w latach 1994–2012. Głównym źródłem danych były wyniki badań budżetów gospodarstw domowych przeprowadzanych co roku i udostępnianych odpłatnie

przez Główny Urząd Statystyczny. Dane te zostały uzupełnione o analizę wyników badań diagnozy społecznej przeprowadzanych cyklicznie co dwa lata począwszy od 2000 roku.

**Słowa kluczowe:** gospodarstwa wiejskie, wykluczenie technologiczne, zróżnicowanie terytorialne, badania budżetów gospodarstw domowych

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Pisulewski, P., Strzetelski, J., Antoniewicz, A. (2009). Podstawowe założenia IZ PIB-INRA norm żywienia przeżuwaczy (Basic objectives of nutritional standards for ruminants of the IZ PIB-INRA). [In:] J. Strzetelski (Ed.), IZ PIB-INRA. Normy żywienia przeżuwaczy. Wartość pokarmowa francuskich i krajowych pasz dla przeżuwaczy. Wyd. IZ PIB, Kraków, 11–20.

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