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AN ANALYSIS OF THE CHANGES OF EMPLOYMENT IN INDUSTRY

Industry is one of the most important segments of the national economy. The changes, which take place affect the business aspect of the labor market, and more specifically the employment of people in specific industry sectors. It can significantly influence on the way and the number of employment of people in the industry, so, therefore, it was purposeful to analyse whether there were significant changes in the number of employees in selected industry sectors. The aim of the paper was to analyse the basic statistical data from the Central Statistical Office in Poland if there were any changes of employment in the main industry sectors in Poland. The sectors that were analyzed were mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; water supply, sewerage, waste management and remediation activities. The research methodology was the analysis of trends from data from the period 2012–2017 (no data after 2017) from a reliable source, i.e. the Central Statistical Office in Poland. It was concluded that the important changes in the number of employment of people in the main industry sectors could be observed as evidenced by, among others, by the trends. The results of the analysis can be the basis for assessing the economic situation in the analyzed industry sector, and also to make next analyses targeted on the analysis of causes the trends in employed area in selected industry sectors in Poland.

Keywords: personnel management, industry, labor market, sociology of work, employment.

1. INTRODUCTION

Industry is one of the most important segments of the national economy and the changes which happen in it influence on the business activities aspect which is the labor market, and more specifically on the employment of people in selected industry sectors. An analysis and an evaluation of employment structures due to selected aspects of the market allow making actions which can affect the economic situation, competitiveness, and economic growth. In the European Union the three-sectors structure applies, where I sector – agricultural, II sector – industrial, and III sector – service (Kwiatkowska et. al., 1993). The changes occurring in the structure of the industry, and what is connected with this the changes in employment structure influence the functioning of the market, and also on the pace of economic growth. Correctness taking place in the global economy shows that, together with

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the development of socio-economic ,the decline in the share of industry in production is noted, and also in all employment. This occurrence results, for example, from the market saturation of industrial goods (Kwiatkowski, 1980). After the transformation of the market system, in the conditions of the central planning economy, the level of employment was high in state enterprises, but in spite of this, the high volumes from production were not achieved (Gajdzik, 2018). Due to the development of production technology, and the same the work productivity, it was concluded that it was important to analyze the industry in terms of an essential aspect which is the number of employed. The statistical data of employment of people in the main industry sectors in Poland were analyzed (i.e. mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; water supply, sewerage, waste management and remediation activities). The analysis was based on reliable data from the period 2012–2017 (no data after 2017) from the Central Statistical Office in Poland. The results of the analysis can be the basis for assessing the economic situation in the analyzed industry sector, and also to make next analyses targeted on the analysis of causes the trends in employed area in selected industry sectors in Poland.

2. THE CONCEPT OF ECONOMIC STRUCTURE

The macroeconomic effects connected with the economic slowdown in Poland from the turn of the XX th and XXI th centuries were the effect of the accession Poland to the European Union and the financial global crisis. The macroeconomic processes are a determinant of the areas of analysis regarding the dynamics, structures and changes taking place in employment in the Polish economy(Wacławik-Puzio, 2006). Each economy can be characterized as a set of elements, whose term is a description of the structure. Therefore, the economic structure is a set of elements that economy consist of the relations between these elements (Kalmut, 1996; Łukaszewicz, Karpiński, 2001; Dworak, Malarska, 2010; Markowska, Sokołowski, Strahl, 2014; Wąsowicz, 2014). There are changes in the collection of these elements and relations between them that influence economic structures. In turn defining of the concept of structural changes mainly applies to permanent and long-term changes, which are in the sectoral structure of economic systems. The themselves changes, which are on over the years, are the research field and new possibilities to define the rules of their shaping.

In economic analyses the structure of the economy undergoing changes in economic process also changes. Some of the reasons for changes taking place in the structure of the economy include:

- changes in the demand structure,
- differences in the rate of labor productivity growth in the branches of the economy,
- price changes,
- trade development (i.e. globalization process),
- policy of the economic liberalization (Łukaszewicz, Karpiński, 2001).

During structural tests, analyzes of changes in the structure in production and the use of factors for production were made, among other sectors share of selected branches in GDP (Clark, 1957) and changes in the employment structure (Łukaszewicz, Karpiński, 2001; Wacławik-Puzio, 2006; Kliczmyk, 2008; Śliwińska-Rubin, 2015). One of the main determinants of changes in the economic structure and structure of employment are changes in the employment sector in Poland as well as consumption demand resulting from economic development. The implementation of economic structure surveys seems to be the

most limited due to the analysis of production or employment structure, which is called in literature as the structure of largo sense (Kwiatkowski, 1980; Dworak, Malarska, 2010).

3. METHOD OF RESEARCH

An analysis of the statistical data of employment in the main industry sectors in Poland was carried out. The analysis was based on reliable data from the period 2012–2017 (no data after 2017) from the Central Statistical Office in Poland. It was decided that based on the available data from six years it will e possible to show the changes and trends taking place in Poland in particular industry sectors, i.e.:

- mining and quarrying;
- manufacturing;
- electricity, gas, steam and air conditioning supply;
- water supply, sewerage, waste management and remediation activities.

The results from the Central Statistical Office (from the period 2012–2017) were analyzed. The results were on the number of employed people in selected instrustry sectors, number of employed people by sex, viovodeships, and level of education. In addition, an analysis was made of employees' admissions to work and their dismissals. The aim of the paper was to analyse the basic statistical data from the Central Statistical Office in Poland if there any changes of employment in the main industry sectors in Poland.

4. ANANALYSIS OF CHANGES IN THE POLISH INDUSTRY

The analysis of data referring to the number of employed people in industry (Fig. 1, Fig. 2) included the number of employees hired on the basis of an employment contract, employers and employees (owners and co-owners), outworkers and agents.

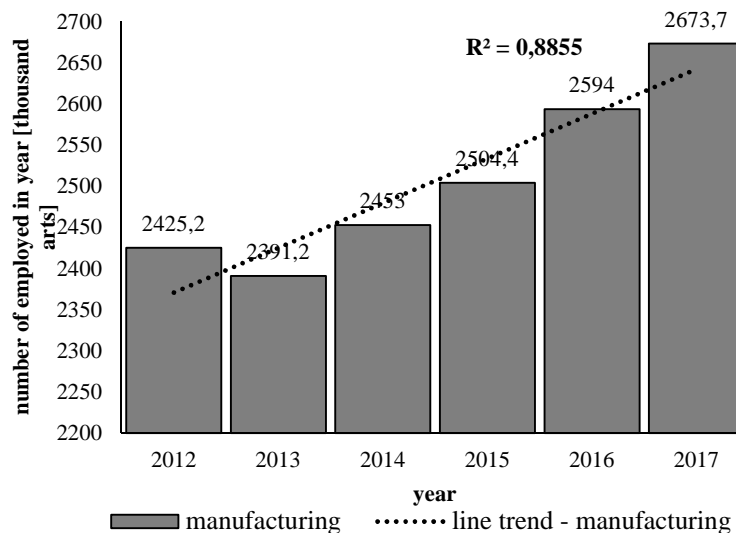


Fig. 1. The number of employed hired in the period 2012–2017 in industry sector – manufacturing

Source: Own study (the Central Statistical Office in Poland, 2019).

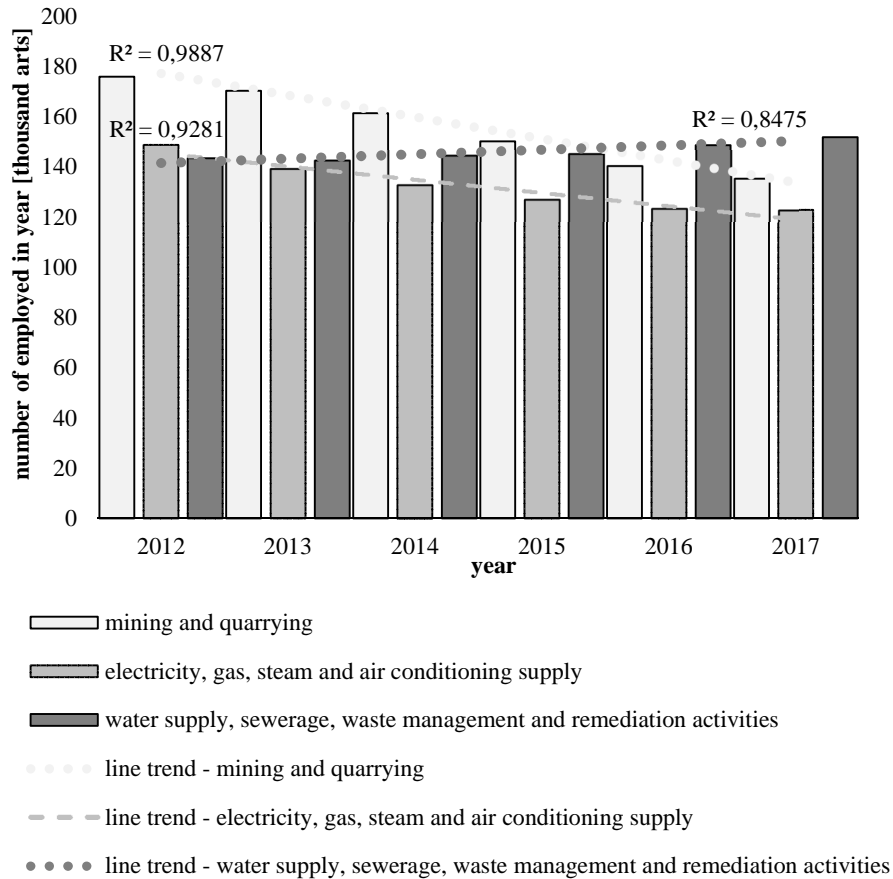


Fig. 2. The number of employed hired in the period 2012–2017 in selected industry sector
Source: Own study (the Central Statistical Office in Poland, 2019).

The majority of employed in the period 2012–2017 from the main industry sectors that were analyzed was in the sector of the industrial processing sector (Fig. 1). There the linear upward trend ($R^2 = 0,89$) was observed in case of the number employed people in the analyzed period of time.

An analysis of the number employed in the next economic sectors in the period 2012–2017 was made (Fig. 2). The linear upward trend ($R^2 = 0,85$) was observed in the sectors of water supply, sewerage, waste management, and remediation activities. In turn the linear decreasing trend was observed in the sectors of mining and quarrying ($R^2 = 0,99$) as well as production and supply of electricity, steam gas and hot water ($R^2 = 0,93$).

Then, the number of employed in the industry in a given voivodeships was analyzed (Fig. 3) and also the number of employed in the industry in terms of sex (Fig. 4) in period of 2012–2017.

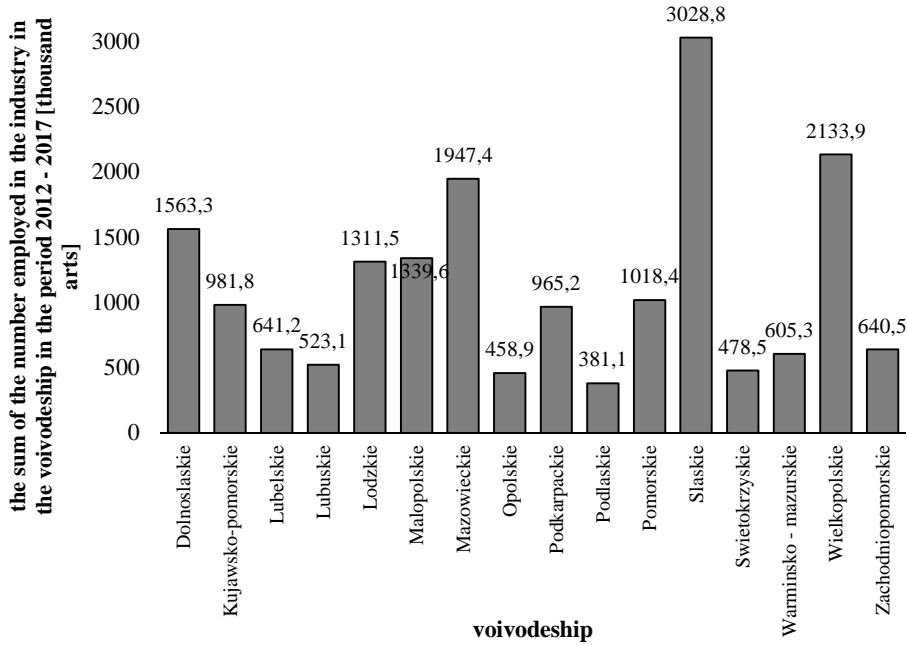


Fig. 3. The sum of the number employed in the industry in the voivodeship in the period 2012–2017

Source: Own study (the Central Statistical Office in Poland, 2019).

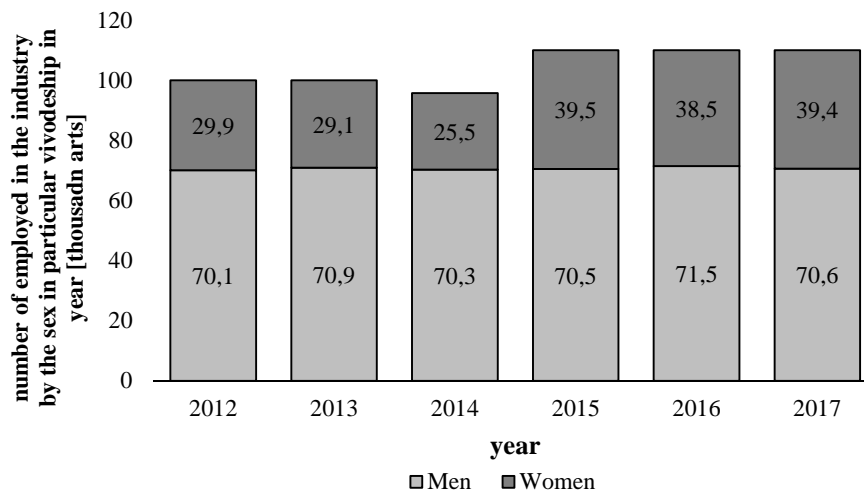


Fig. 4. The number of employed in the industry by the sex in particular viodeship in the period 2012–2017

Source: Own study (the Central Statistical Office in Poland, 2019).

Due to the fact that no trends were observed in individual years (in the period 2012–2017) in the cause of the number of employed in the industry sectors in a particular voivodeship, as summary analysis of the total number of the employed in the industry in particular voivodeship was made. The biggest number of employed was in the Slaskie Voivodeship, and next in Wielkopolskie and Mazowieckie. The smallest number of employed was in the Podlaskie Voivodeship, then Opole Voivodeship and Swietokrzyskie Voivodeship. In the case of the number of employed in the industry by sex in the period of 2012–2017, there were no trends observed, and the number of men to the number of women was much bigger.

Next, the analysis of employed in industry by the level of education in the period of 2012–2017 was made (Fig. 5).

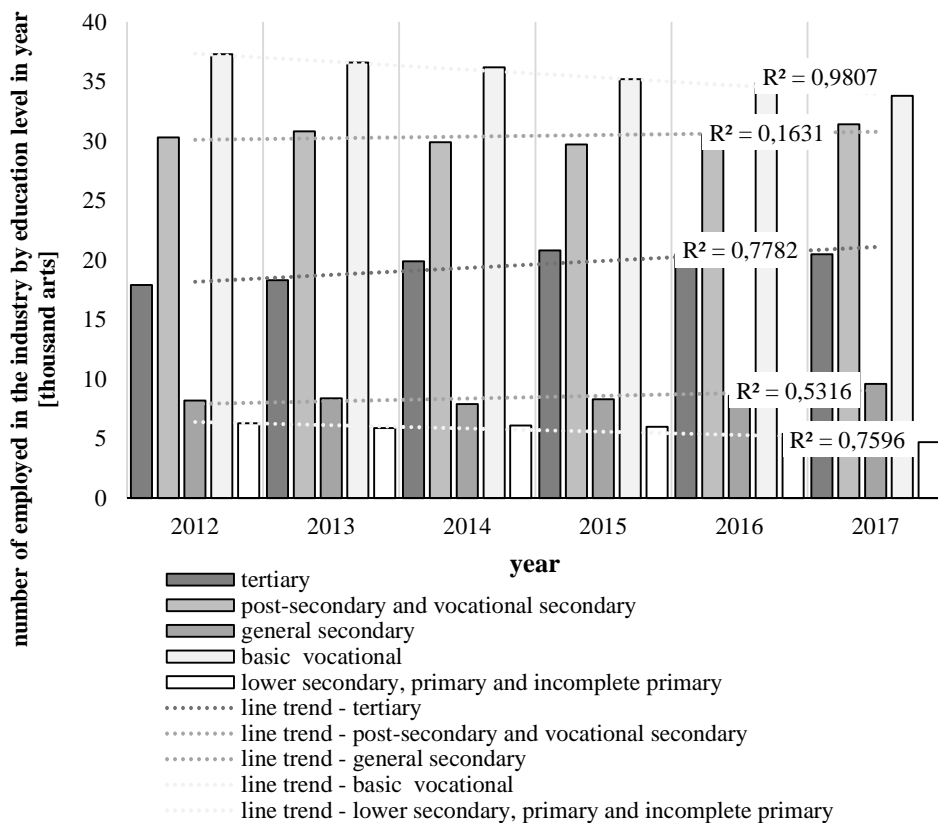


Fig. 5. The number of employed in the industry by education level in the period 2012–2017

Source: Own study (the Central Statistical Office in Poland, 2019).

In the cause of the number of employed in the industry by education level in the period 2012–2017, it was observed that the biggest number in particular years were the people with basic vocational education, next with post-secondary and secondary vocational and higher education. The smallest number of employed in the industry by the level of education in the

period of 2012–2017 were people with lower secondary, primary and incomplete primary and also general secondary education. A linear decreasing trend in the cause of people with basic vocational was observed ($R^2 = 0,98$) and with the lower secondary, primary and incomplete primary education ($R^2 = 0,76$). In turn, the linear upward trend ($R^2 = 0,78$) was in the case of people with higher education. The number of people with post-secondary and secondary vocational education as well as general secondary education remained at a similar level (no trends).

The number of admissions and redundancies at work (Fig. 6) and also the vacancies (Fig. 7) in the period of 2012–2017 in the main industry sectors were analysed. The number of people admitted to the job and the number of dismissed workers, who have been transferred, returned and departed for holidays. The number of admitted to work, included the number of hires for the first time and subsequent time. The number of dismissals from work included people with whom employment contracts was terminated by an employee or by the employer (also the group dismissals was included). The number of dismissals from the job referred to people, who were retired due to inability to work, as well as people who left work or deceased persons (the Central Statistical Office in Poland, 2019).

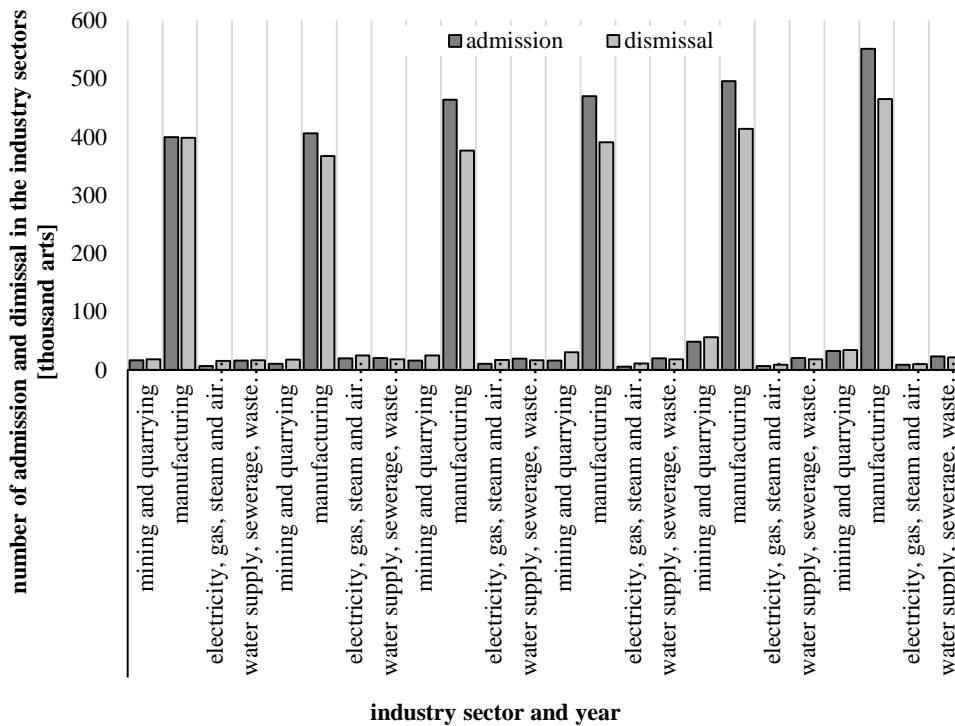


Fig. 6. The number of admissions and redundancies at work in the industry sectors in the period 2012–2017

Source: Own study (the Central Statistical Office in Poland, 2019).

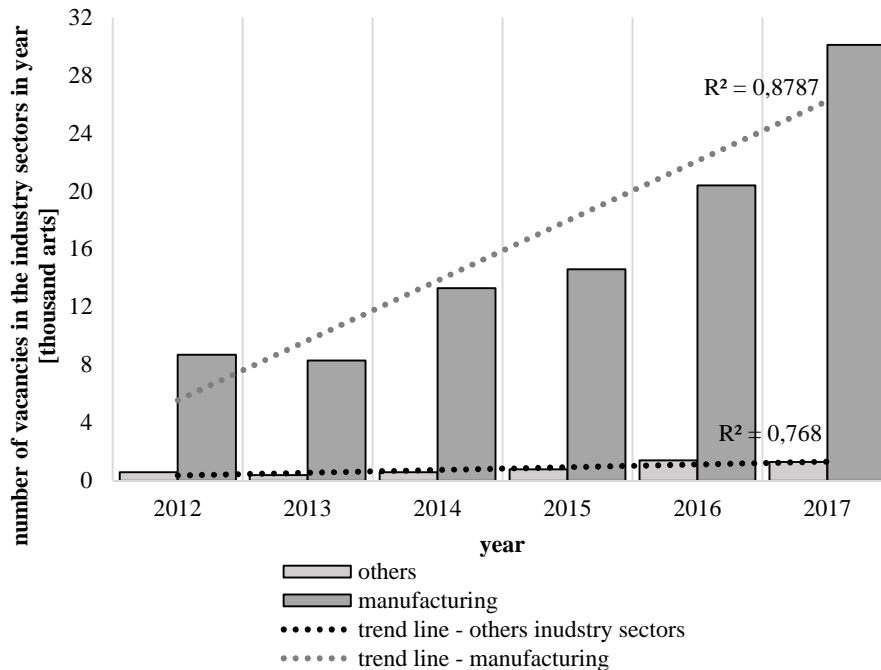


Fig. 7. The number of vacancies in the industry sectors in the period 2012–2017
Source: Own study (the Central Statistical Office in Poland, 2019).

No trends were observed in the number of admissions and redundancies in the industry sectors in the period of 2012–2017. The majority of those analysed were the industrial processing sector. The number of admissions and redundancies in other industry sectors in particular years was at a similar level.

The number of vacancies at work (in the period 2012–2017) in the industrial processing sector and other sectors was compared. These number was shown as the total number because were not significant differences in individual years in these industry sectors, i.e. mining and quarrying; electricity, gas, steam and air conditioning production and supply; water supply, sewage and waste management and remediation activities. A linear upward trend was observed ($R^2 = 0,88$) in the number of vacancies at work in the industrial processing sector in the period of 2012–2017, as well as a linear upward trend in the total number of vacancies at work in other industry sectors ($R^2 = 0,77$).

5. CONCLUSION

The statistical data of the changes employment in the selected industry sectors in Poland (in the period of 2012–2017) from the Central Statistical Office in Poland was analyzed. The sectors that were analyzed were mining and quarrying; production and supply of electricity, gas, steam and air conditioning; water supply, sewage, waste management and remediation activities. The aim of the paper was to analyse the basic statistical data from the Central Statistical Office in Poland if there were any changes of employment in

the main industry sectors in Poland. After the analysis, it was concluded that the important changes in the number of employed in the main industry sectors were identified, as evidenced by observed trends, i.e.:

- trends regarding the analysis of the number of employed in particular industry sectors in the period of 2012–2017:
 - linear upward trend ($R^2 = 0,89$) – industrial processing;
 - linear upward trend ($R^2 = 0,85$) – water supply, sewage, waste management and remediation activities;
 - linear decreasing trend ($R^2 = 0,99$) – mining and quarrying;
 - linear decreasing trend ($R^2 = 0,93$) – production and supply of electricity, gas, steam and air conditioning;
- trends regarding the analysis of the number of employed in the industry by education level in the period of 2012–2017:
 - linear decreasing trend ($R^2 = 0,98$) – people with basic vocational education;
 - linear decreasing trend ($R^2 = 0,76$) – people with lower secondary, primary and incomplete primary education;
 - linear upward trend ($R^2 = 0,78$) – people with higher education;
- trends regarding the number of vacancies at work in industrial sectors in the period of 2012–2017:
 - linear upward trend ($R^2 = 0,88$) – industrial processing sector;

No trends were observed in case of:

- the number of admissions and the number of redundancies in the industrial sectors in the period of 2012–2017;
- the number of employed in the industry sectors in industrial voivodeships in the period of 2012–2017;
- the number of employed in the industry by sex in the period of 2012–2017.

Additionally, after analyzing data from the Central Statistical Office from the period of 2012–2017, about the employment in the selected industry sectors, it was concluded that:

- the overwhelmingly large number of employed persons in the period of 2012–2017 from the main industry sectors that were analyzed were characterized by the industrial processing industry sector;
- the largest number of employed was in the Slaskie Voivodeship, and next in Wielkopolskie and Mazowieckie; the smallest number of employed was in the Podlaskie Voivodeship, then Opole Voivodeship and the Swietokrzyskie Voivodeship;
- the majority of people working in industry were men.

The analysis made it possible to conclude, that were important changes in the number of employed in the industry from 2012 to 2017, both in terms of the level of education and industry sectors. Additionally, it was concluded that the industrial processing sector in Poland is a significant advantage in the case of the number of employed than in other industry sectors and that the majority of people working in industry in the analysed years were men. The results of the analysis can be the basis for further analyzes for trends in the employment in selected sectors of industry in Poland.

REFERENCES

- Central Statistical Office in Poland [access: 18.04.2019]. Access on the internet: <https://stat.gov.pl/>.
- Clark, C. (1957). *The Conditions of Economic Progress*. London: Macmillan.
- Dworak, E., Malarska, A. (2010). *Changes in sectoral structure of employment in Poland in comparison to the European Union*. ACTA UNIVERSITATIS LODZIENSIS FOLIA OECOMICA, 242.
- Gajdzik, B. (2018). *Analysis of changes in the employment level in metallurgy in the long run* [access: 18.04.2019]. Access on the internet: <http://oamquarterly.polsl.pl/wp-content/uploads/2018/01/04-Gajdzik-2-KN30.pdf>
- Kalmut, M. (1996). *Evolution of the economic structure in highly developed countries*. Wrocław: Publisher of the University of Economics O. Lange.
- Kliczyk, P. (2008). *Analysis of the employment structure in the Polish economy compared to other European Union countries*. Science notebooks 793 of Cracow University of Economics.
- Kwiatkowska, W. et. al. (1993). *Employment and unemployment – dynamics, structure and policy of the state – White Paper*. Poland – European Union. Economy from No. 32, Warsaw: URM.
- Kwiatkowski, E. (1980). *Theory of three sectors*. Warszawa: PWN.
- Łukaszewicz, A., Karpiński, A. (2001). *Economic structure. Modification and new phenomena*, Economist.
- Markowska, M., Sokołowski, A., Strahl, D. (2014). *Taxonomy of employment structure changes in modern industry and services in the European Union regions*. Works of the Commission of Industrial Geography of the Polish Geographical Society.
- Śliwińska-Rubin, A. (2015). *Changes of the Polish industry since the accession of Poland to the European Union*. “Studies in Public Policy”, 2(6).
- Wacławik-Puzio, B. (2006). *A three-sector employment structure in Poland compared to the European Union countries*. “Science notebooks” No. 4, Polish Economic Society, Cracow.
- Wąsowicz, J. (2014). *The dynamics and structure of employment transformations in Poland post accession to the European Union*. “Social policy in the face of demographic changes” 167, University of Economics in Katowice.

DOI: 10.7862/rz.2019.hss.19

The text was submitted to the editorial office: March 2019.

The text was accepted for publication: June 2019.