

DEMOGRAPHIC CHANGE AND AUTOMATION AND THEIR IMPACT ON THE LABUOR MARKET. NATIONAL RESEARCH RESULTS

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Purpose: the main aim of the article is to determine whether demographic changes and automation threaten the development of the labor market.

Design/methodology/approach: theses and research questions presented in the article were verified by means of qualitative research conducted among representatives of national trade union organizations.

Findings: the conducted research and analyses show that breaking the mental barriers to demographic changes and automation in order to strengthen their acceptance may play a decisive role in creating the development of the labour market.

Originality/value: As evidenced by numerous sources cited in the text, the pursuit of development – in the phase of demographic change and the dynamic growth of automation – directly leads to economic growth in the dimension of both the state and local communities – favoring the social dimension of the individual and strengthening the human feeling of fullness of life.

Keywords: demographic change, automation, labour market.

Category of the paper: research paper.

1. Introduction

When analyzing the impact of demographic changes and automation on the labour market and education, it is worth noting that according to demographic projections, by 2030 the number of people of working age in the European Union will drop by almost 21 million. The population of young Europeans will decrease by 20% over the next 20 years. This change is one of the key challenges facing modern Europe and Poland in the area of the labour market and education. The demographic change indicated above determines important processes on the demand and supply sides of the labour market. As forecasts indicate, the result of the indicated change may

be a systematic decline in labour supply and, above all, an increase in the demographic burden ratio. According to forecasts, by 2060 the demographic load will increase significantly (compared to the base year, i.e. 2014 it may be even more than twofold). In turn, over three times – as forecasts indicate – may increase the burden of older people in the country (Kiełkowska, 2013, p. 6). The indicated process will have a huge impact on the quantitative and qualitative dimension of the labour market and education at every level of education.

In turn, in the context of automation, taking into account the future, it is worth emphasizing that scientists involved in research on artificial intelligence from the Universities of Oxford and Yale forecast that in 45 years machines will outrun people in all aspects of intelligence, and in 120 years all work will be automated, which will be done by man. In this light, it is worth asking the question whether automation will solve all existential problems in the future, and man will devote himself exclusively to consumption and pleasure. Will it lead to a global catastrophe in which machines take over the world, becoming ubiquitous, having the ability to learn, which will ultimately lead them to turn against man. Today, in view of the indicated megatrend – in globalized and automated economies determined in their development, among others demographic change – knowledge, which is exemplified by the knowledge society, creating competitive and innovative solutions, has become a key capital. It seems that the automation process, which is inevitably associated with the deepening phenomenon of demographic depression in the context of increasing competitiveness of economies, will determine the need to permanently raise the level of education, competences and create and master new knowledge.

Based on the above theses, an analysis of the survey results in the area of demographic change and automation was undertaken.

2. Discussion of the results

In the context of assessing the impact of demographic change and automation on the labour market, respondents were asked a total of ten questions. These were questions aimed at diagnosing the impact of demographic change and automation on the current and future situation of the domestic labour market; along with an attempt to determine the direction of their development. Surveys carried out using the CAWI technique – i.e. an online expert interview questionnaire (Batorski, 2006, pp. 99-131). As it has already been noted, the questionnaire contained 10 source questions and 4 metric questions, including questions with the indicated cafeteria of answers, whose construction was based on the Likert scale (Babie, 2005, pp. 281-182).

Research focused on the following cognitive areas:

- family changes from the "bourgeois" model to the "task-oriented" one,
- assessment of activities in the area of contemporary active social policy and the labour market and their importance for minimizing the effects of demographic changes,
- assessing the level of significance of factors determining demographic change,
- assessing the chances of reversing trends in demographic change – in particular, declining young people and aging populations,
- assessment of cultural and social processes that can most dynamically shape the future structure of the population living in Poland,
- the impact of automation in various areas of the economy on the domestic labour market in terms of opportunity or development barrier,
- assessment of the effects of the automation of industrial processes in the context of rising unemployment and the creation of new and better-paid jobs,
- job loss as a result of automation processes,
- the impact of automation on the disappearance of employment in some industries and professions, and on the allocation of employees to new jobs and tasks,
- the impact of automation on the creation of integration, openness and visionary solutions or reality in which man becomes a lonely, passive, immersed and lost being in the virtual world.

A targeted sample was used in the research, which was created by representatives of social dialogue institutions, employees and trade union activists derived from the "KADRA" Trade Union Agreement and the Trade Union Forum, including:

- Social Dialogue Councils,
- Provincial Councils of Social Dialogue,
- Labour Market Council,
- Voivodship Labour Market Councils,
- Poviats Labour Market Councils,
- Monitoring Committees,
- tripartite commissions,
- employees and trade union representatives who can stay in the future, active participants in social dialogue.

The key criterion for selecting a targeted sample was the following characteristics of the respondent: higher education, extensive life and professional experience, recognition in their socio-professional environment through their profession and social roles and, directly or indirectly, creation of labour market policy through the institutions of social dialogue.

The research tool was piloted on a sample of five randomly selected respondents. As part of the pilot, the following elements of the questionnaire were verified:

1. technical correctness: analysis in terms of transition rules, logic and order of questions asked, instructions for interviewers, etc. (technical notes),
2. linguistic correctness: analysis in terms of complexity and logic of sentences, intelligibility of the vocabulary used and abbreviations (linguistic and editorial comments),
3. substantive correctness: analysis of selection (relevance, legitimacy, completeness) of questions (e.g. control ones) and indicators (cafeteria) for closed questions (substantive remarks).

Based on the remarks and opinions obtained in the pilot, the structure of the questionnaire, questions and cafeteria was clarified and the questions in terms of language were standardized and standardized response categories were used. As a result, a research tool was obtained that was technically, linguistically and substantively correct. This tool was used for actual research as a source of research material for analysis.

The respondents expressed their opinions, choosing "Yes" or "No" or "Other" and based on an extensive rating scale, by level of importance: very large, large, moderate, small, does not matter. In order to achieve proper categorization, the research used an approach in which the answers with the indication of very large and large significance and the answers with the indication of medium, low and not significant were added together.

A total of 272 respondents were invited to participate in the study, of which 211 accepted them. This was the final group of respondents. Due to gender, women in the studies accounted for 26.1%, men 73.9%.

At the outset, in the light of the regularities and forecasts indicated in the introduction to the article, the first question in surveys in the area of demographic change focused on the assessment of the following thesis. In the country there is a radical reevaluation of the family. Instead of investing in the future of their children, parents focused on self-realization. This changes the family model from "bourgeois" to "individualized". A total of 211 study participants answered this question. The distribution of answers according to the following percentages: the answer "Yes" 46%, "No" 52% and "Other" 2% does not determine the acceptance or negation of the thesis presented in the question.

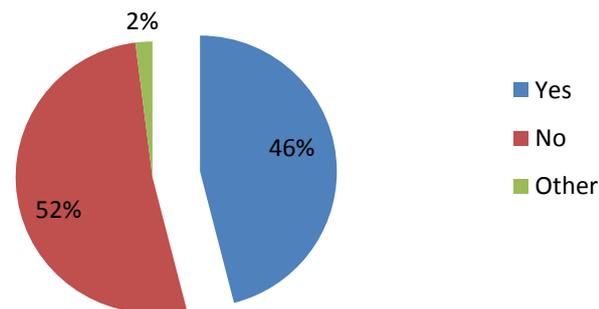


Figure 1. Is there a radical reevaluation of the family in the country? Instead of investing in the future of their children, parents focused on self-realization. This changes the family model from "bourgeois" to "individualized".

Analyzing the results of the research according to the criterion of sex, the obtained scores were divided according to the following percentage of respondents. In the case of women, the answer "Yes" was at the level of 58%, the remaining 42% focused on the answer "No". Among men, the distribution was 57.9% "No" and 42.1% "Yes".

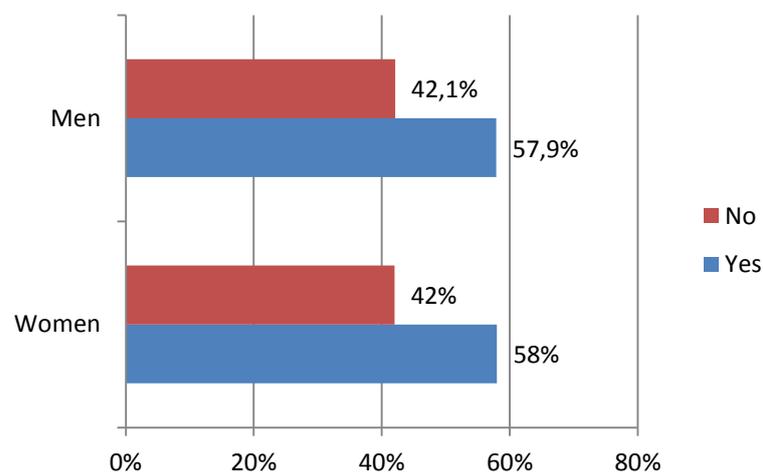


Figure 2. Is there a radical reevaluation of the family in the country? Instead of investing in the future of their children, parents focused on self-realization. This changes the family model from "bourgeois" to "individualized". Answers by gender.

In the next question, the respondents were asked to evaluate the nine activities in the area of contemporary social policy and the labour market and their importance for minimizing the effects of demographic changes. The obtained results of the assessments are presented in Table 1. In order to organize the obtained results, the following activities have been carried out. The first is to order the factors by summing up the answers by meaning: high and very high. In the second phase, the assessed factors were categorized due to the level of their importance for minimizing the effects of demographic change. To this end, the factors have been ordered from the highest to the lowest level of significance. The final analytical activity consisted in dividing the results obtained into four subsets, i.e. forms of activities with a level of significance above 90% – these are very important forms, from 85% to 90% of high importance, from 80% to 85% of moderate importance and below 80% – of low importance.

Table 1.

Activities in the area of contemporary national social policy and labour market by level of importance for minimizing the effects of demographic change [N = 210]

Lp.	Very important	Importnat	Moderate important	Small important	Does not matter	Level of importance
1	45,5%	41,1%	10%	2,9%	0,5%	86,6%
3	44,9%	41%	12,5	15%	0,5%	85,9%
2	43,4%	39%	14,6%	2,9%	0%	82,4%
4	49,8%	32,5%	13,3%	3,9%	0,5%	82,3%
7	43,3%	38,9%	14,3%	3,4%	0%	82,2%
5	45,3%	35,5%	15,8%	3,4%	0%	80,8%
6	35,5%	37,4%	25,1%	1,5%	0,5%	72,9%
8	32,7%	36,7%	24,6%	5%	1%	69,4%

Legend: 1. Incorporating aging into all policy (government) programs to adapt society and the economy to demographic change and to build a society accessible to all ages. 2. Supporting sustainable economic growth, the positive effects of which would be felt by all social groups. 3. Adaptation of the labour market, services and social infrastructure to changes and demographic forecasts. 4. Adaptation of the social security system to the ongoing and expected demographic changes (building a system of services and care in the place of residence, insurance for old age, etc.). 5. Striving to ensure a good quality of life and independence for people of all ages. 6. Striving for further development of lifelong education so that the education system reflects changing economic, social and demographic conditions. 7. Ensure full integration and participation of older people in society, with particular emphasis on the role and needs of older women. 8. Supporting older people in the family, promoting intergenerational solidarity.

Source. own study.

The obtained results entitle to formulate the following conclusions. To the activities in the area of contemporary social policy and the labour market, which are very important for minimizing the effects of demographic changes, research participants included two forms, which in the opinion of research participants are the inclusion of aging in all policy (government) programs in order to adapt society and the economy to changes demographics and to build a society accessible to all age groups and to adapt the labour market, services and social infrastructure to changes and forecasts demographic. In the area of high significance, however, five forms were found in the respondents' assessment, respectively with numbers in the table legend 1, 2, 4, 7, 5. Due to the percentage of responses, the above-mentioned forms of activities should be considered as dominant in the total set of assessed.

In the light of the third question regarding the assessment of the significance level of the next 10 factors determining demographic changes, it is clearly noted that the dominant source is the reduction in the average number of children in the family (80.2%, very important). At a significantly lower level of assessment, according to the percentage of answers given, two more sources were located, which are the disappearance of many children and the commonness of single-parent families (64% and 60.8% – very important). Other sources, whose level of assessment ranged from 28% to 58.7%, should be considered moderate and insignificant due to their level (Table 2).

Table 2.*Sources determining demographic change in the country by significance level [N = 209]*

Lp.	Very important	Importnat	Moderate important	Small important	Does not matter	Level of importance
1	42,6%	37,6%	12,9%	4,5%	2,5%	80,2%
2	29%	35%	21%	8%	7%	64%
3	23,6%	37,2%	25,1%	8%	6%	60,8%
4	19,2%	39,5%	23%	13%	5,5%	58,7%
5	19%	39,5%	23%	13%	5,5%	58,5%
6	22,8%	34,7%	21,8%	13,9%	6,9%	57,5%
7	18%	23,5%	25%	18,5%	15%	41,5%
8	14,9%	22,8%	32,2%	18,3%	11,9%	37,7%
9	15,1%	20%	31,7%	19,5%	13,7&	35,1%
10	9%	19%	37,5%	15%	19,5%	28%

Legend: 1. Promoting premarital sex. 2. Delaying the marriage age. 3. Dissemination of alternative forms of partnerships. 4. Increased divorce severity. 5. Universality of single-parent families. 6. Reducing the average number of children in the family. 7. Disappearance of many children. 8. Increase of voluntary childlessness. 9. Popularization of contraceptives. 10. Delay of procreation age.

Source. own study.

The next question referred to the assessment of cultural and social processes that can most dynamically shape the future structure of the population living in Poland. The selection of four processes was made on the basis of the latest literature in the area of demographic change (Marszowski, 2019, pp. 32-45). Table 3 presents the assessment of their significance level.

Table 3.*Cultural and social processes that can most dynamically shape the future structure of the population living in Poland according to the level of importance [N = 209]*

Lp.	Very important	Importnat	Moderate important	Small important	Does not matter	Level of importance
1	24,8%	32%	25,7%	13,1%	4,4%	56,8%
2	20,7%	29,6%	30,5%	13,8%	5,4%	50,3%
3	14,3%	34%	32%	12,3%	7,4%	48,3%
4	16,5%	25.5%	36%	16,5%	5,5%	42%

Legend: 1. Decreasing the importance of marriage as a form of human cohabitation for cohabitation. 2. Transition from family model: child with parents to model child with partners. 3. Transition from preventive contraception to conscious procreation. 4. Transition from homogeneous types of families and households to various forms.

Source. own study.

The obtained results clearly indicate that cultural and social processes which, in the opinion of the study participants, can most dynamically shape the future structure of the population living in Poland include the decrease in the importance of marriage as a form of cohabitation for cohabitation and the transition from preventive contraception to conscious procreation. According to the respondents' opinions, the smallest significance is related to the process related to the transition from homogeneous types of families and households to various forms.

The issue of changing (reversing) demographic trends in the country is another problem aspect on which the assessments of research participants focused. When asked about whether in 2030 Poland will have the chance to reverse the trends regarding demographic changes –

in particular, the declining population of young people and the aging population, 44% of respondents answered "Yes" and 56% "No".

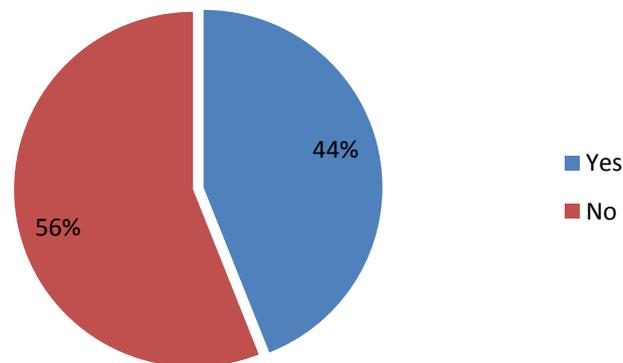


Figure 3. In the perspective of 2030, is Poland likely to reverse the trends regarding demographic change – in particular, the decline in the population of young people and the aging of the population?

Analyzing the results of the research according to the criterion of sex, the obtained scores were divided according to the following percentage of respondents. For women, the answer "Yes" is the percentage of answers 45.3%, the remaining 54.7% focused on the answer "No". Among men, the distribution was 51.3% "No" and 48.7% "Yes".

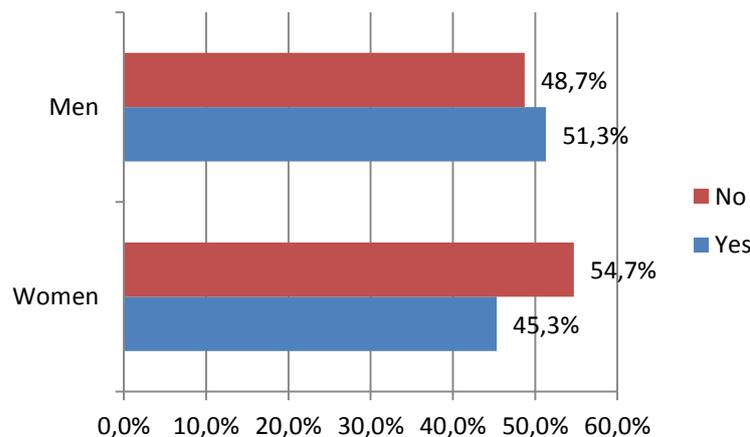


Figure 4. Does Poland have a chance to reverse the trends regarding demographic changes in 2030 – in particular the decrease in the population of young people and the aging of the society? Answers by gender.

In turn, the first question in the area of automation focused on assessing its impact on the domestic labour market in terms of opportunities or development barriers. A total of 211 study participants answered this question. The distribution of responses was shaped according to the following percentages: "64% chance", 30% "barrier" and 6% "I don't know". Analyzing the results of the research according to the criterion of sex, the obtained scores were divided according to the following percentage of respondents.

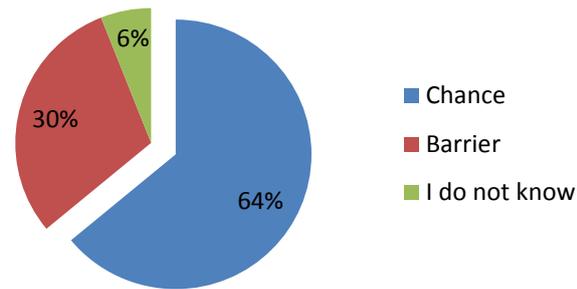


Figure 5. Impact assessment of the automation of production and other industry areas in various areas of the economy on the domestic labour market in terms of opportunity or development barrier.

For women, the "Chance" response was 86.3%, the other 9.8% focused on "Barrier" and 3.9% "I don't know." Among men it was the following distribution of 77.6% "Chance", 16% "Barrier" and 6.4% "I don't know".

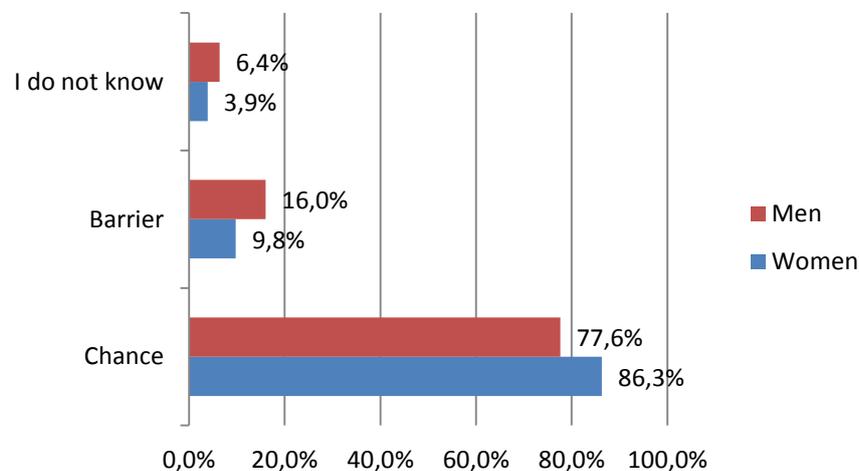
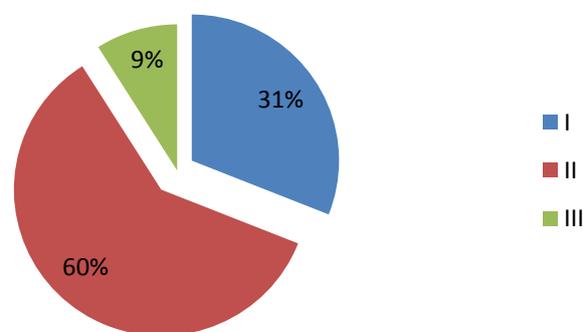


Figure 6. Impact assessment of production and other industry areas automation in various fields of the economy on the domestic labour market, in terms of opportunity or development barrier by sex.

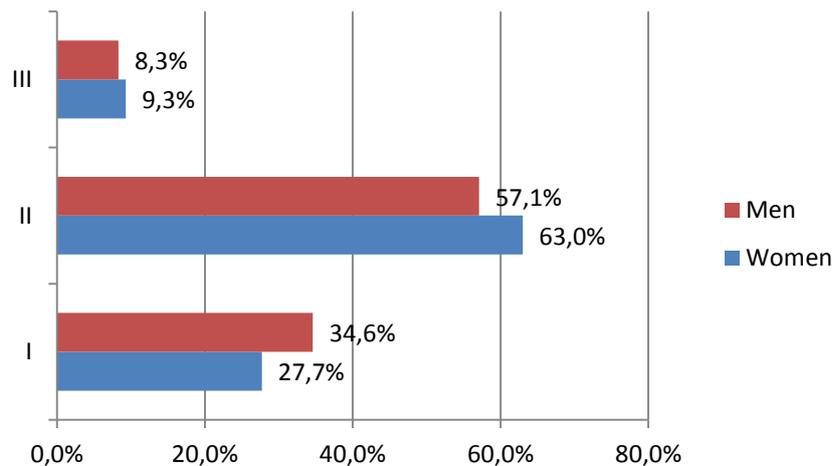
In the next question, respondents (209) were asked to assess the effects of the automation of industrial processes in the context of rising unemployment and the creation of new and better-paid jobs. For this question, the answers were based on the following percentages: "Increase in unemployment" 31%, "New and better-paid jobs" 60% and "I don't know" 9%.



Legend: I – Increase in unemployment, II – Creation of new and better-paid jobs, III – Other.

Figure 7. Evaluation of the effects of industrial process automation in the context of rising unemployment and the creation of new and better-paid jobs.

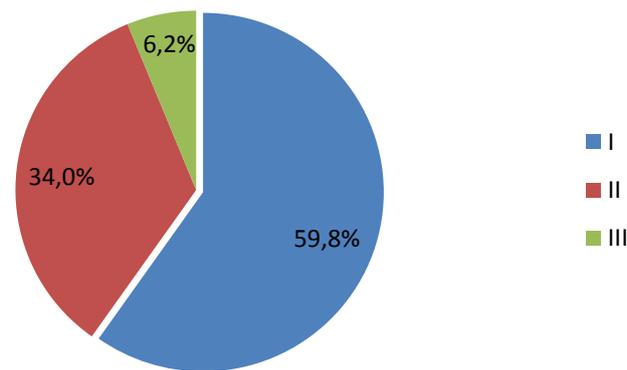
The above percentage distribution of responses entitles to the statement that in the opinion of the dominant percentage of study participants, automation will determine the process of positive changes in the labor market focusing on the creation of new and better-paid jobs. Out of ten such assessment was formulated by six respondents. Analyzing the results of the research according to the criterion of sex, the obtained scores were divided according to the following percentage of respondents. In the case of women, the answer "Creating new and better-paid jobs" was at the level of 63%, the remaining 27.7% focused on the answers "Increase in unemployment" and 9.3% "I don't know". Among men, the distribution was 57.1%, 34.6% and 8.3%.



Legend: I – Increase in unemployment, II – Creation of new and better-paid jobs, III – Other.

Figure 8. Assessment of the effects of the automation of industrial processes in the context of rising unemployment and the creation of new and better-paid jobs by sex.

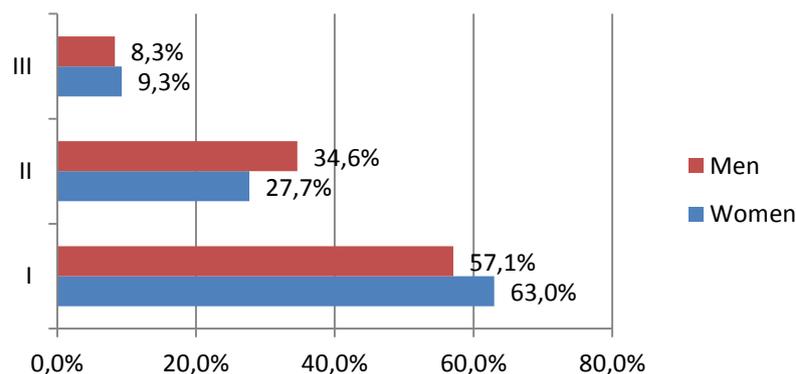
The issue of job loss as a result of automation-related processes is another cognitive area that focused the assessments of study participants (210 responses). When asked if production automation threatens the loss of work only by low-skilled employees whose professional duties are uncomplicated, repetitive and can easily be replaced by intelligent machines, or also by highly-qualified employees, the respondents will provide the following answers. If you answer that the problem will focus on employees low qualified, the percentage of respondents agreeing with this statement was 59.8%. The opinion that automation threatens the loss of job also by highly-qualified employees expressed 34% and the answer "I don't know" 6.2%.



Legend: I. Automation threatens the loss of work only by low-skilled employees, whose professional duties are uncomplicated, repetitive and can easily be replaced by intelligent machines, II. Automation also threatens the loss of jobs by highly-qualified employees. III. do not know.

Figure 9. Does production automation threaten the loss of work only by low-skilled employees whose professional duties are uncomplicated, repetitive and can easily be replaced by intelligent machines, or also by highly-qualified employees?

Also in the case of this question it is not difficult to decide its result. The distribution of the percentage of answers gives the right to state that the profession and qualification group that may be most severely affected by the problem of losing a job through the automation process can be people with the lowest qualifications, whose professional duties are uncomplicated and repetitive. Almost twice the percentage of research participants associates this phenomenon with employees with high and highest qualifications. Analyzing the results of the research according to the criterion of sex, the obtained scores were divided according to the following percentage of respondents. In the case of women, the answers were at the following levels: 63%, 27.7% and 9.3%. Among men, the distribution was 57.1%, 34.6% and 8.3%.



Legend: I. Automation threatens the loss of work only by low-skilled employees, whose professional duties are uncomplicated, repetitive and can easily be replaced by intelligent machines, II. Automation also threatens the loss of jobs by highly-qualified employees. III. do not know.

Figure 10. Does production automation threaten the loss of work only by low-skilled employees whose professional duties are uncomplicated, repetitive and can easily be replaced by intelligent machines, or also by highly-qualified employees. Answers by gender?

In the next question, respondents were asked to answer the question about whether automation will affect the disappearance of employment in some industries and professions, or rather the occurrence of employee allocation to new jobs and tasks (210 answers). In the case of this question, the answers were based on the following percentages: "Closure of employment" 31%, "Occurrence of the allocation process" 62% and "I don't know" 14%.

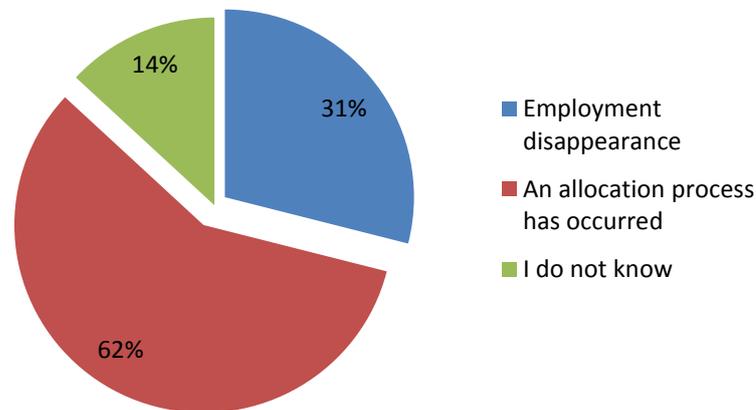


Figure 11. Will automation affect the disappearance of employment in some industries and professions, or rather the occurrence of employee allocation to new jobs and tasks?

Analyzing the results of the research according to the criterion of sex, the obtained scores were divided according to the following percentage of respondents. For women, the answer was 29.4%, 62.8% and 7.8%. Among men, the distribution was 31.9%, 61.5% and 6.6%.

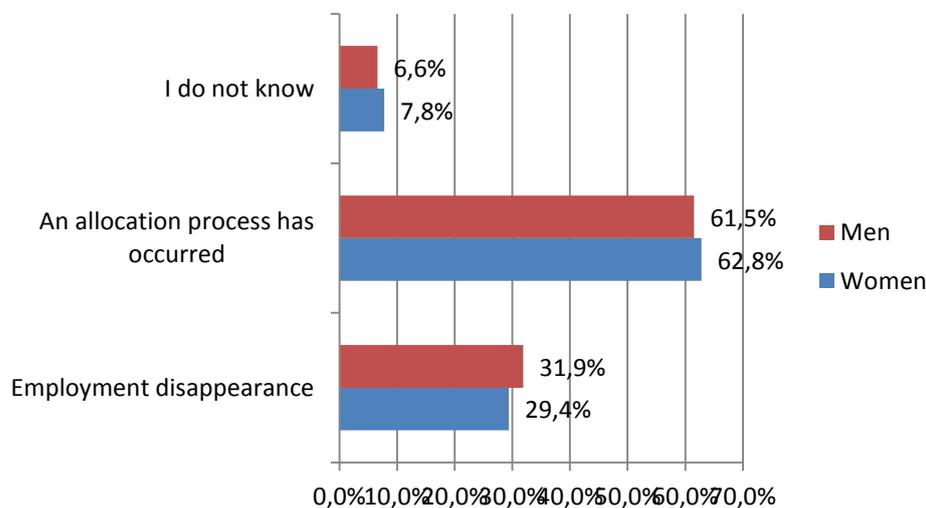
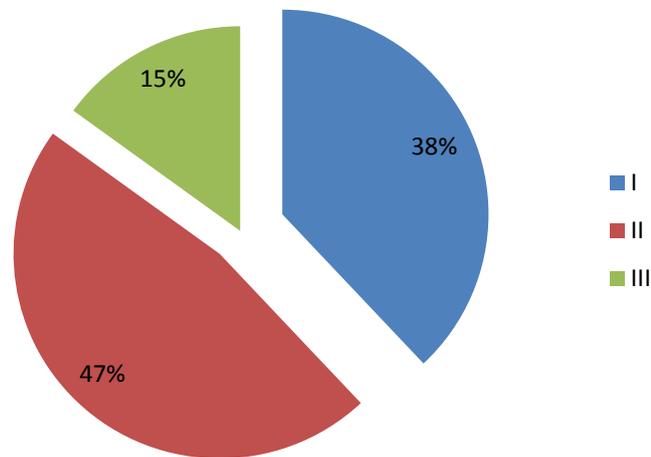


Figure 12. Will automation affect the disappearance of employment in some industries and professions, or rather the occurrence of employee allocation to new jobs and tasks? Answers by gender

The final question poses the problem of the impact of automation in the context of creating integration, openness and visionary solutions or reality in which man becomes a lonely, passive, deepened and lost being in the virtual world (210 answers). Analysis of the results obtained indicated the following distribution of the percentage of answers given. People who felt that automation could create integration, openness and visionary solutions accounted for 38% of the

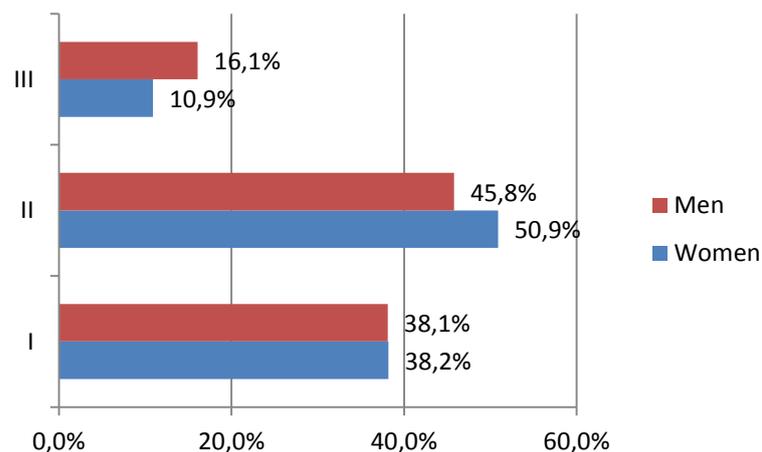
total. On the other hand, people who are inclined to accept thesis that automation will create a reality in which a person becomes a lonely, passive, immersed and lost being in the virtual world accounted for 47%. People who could not answer this question constituted the remaining 15% of respondents.



Legend: I. Automation creates integration, openness and visionary solutions. II. Automation creates a reality in which man becomes a lonely, passive, deepened and lost being in the virtual world. III. do not know.

Figure 13. Does automation create integration, openness and visionary solutions or a reality in which a person becomes a lonely, passive, deepened and lost being in the virtual world?

Analyzing the results of the research according to the criterion of sex, the obtained scores were divided according to the following percentage of respondents. In the case of women, the answer was 38.2%, 50.9% and 10.9%. Among men, the distribution was 38.1%, 45.8% and 16.1%.



Legend: I. Automation creates integration, openness and visionary solutions. II. Automation creates a reality in which man becomes a lonely, passive, immersed and lost being in the virtual world. III. do not know.

Figure 14. Does automation create integration, openness and visionary solutions or a reality in which man becomes a lonely, passive, deepened and lost being in the virtual world? Answers by gender.

Qualitative results indicate that the very small – the magnitude of statistical error – respondents did not refer to the content of the questions posed in the study. On this basis, it can be assumed that the problem areas undertaken in the research are widely noticeable and known to participants. In the light of the question about the family model, the issue of its transformation has not been resolved by the research participants. The obtained result indicates that respondents perceive the family still in the "bourgeois" formula, i.e. one in which children and their future are in the foreground – and parents are the creators of their development. Analysis of the results by sex confirms that on an identical level, the family model is perceived by women as men. However, observing the ongoing processes of transformation of the family model – in particular – in the most developed countries of the world and Europe, it can be assumed that as a result of the dynamic economic development of Poland and the associated increase in the quality of life, the process of transformation of the family model from "bourgeois" to "individualized" can develop significantly over time (Strzelecki, 2013, pp. 1-21). In this context, looking for actions in the area of contemporary social policy and the labour market that can minimize the effects of demographic changes based on the results obtained, one can point to the need to include the issue of aging in the all policy (government) programs to adapt society and the economy to demographic change and to build a society accessible to all age groups and to adapt the labour market, services and social infrastructure to demographic changes and forecasts. In the opinion of respondents, indicated actions should be considered as priority. It is worth noting the relevance of the indicated activities in the context of those already implemented in the European Union and the country. You can find them, among others in the following documents: "Active aging indicator and its extension to the regional level" (Karpiński, 2015) and "Strategies for action in an aging society" (Action strategies..., 2012). In turn, the respondents' answers to the question about the factors that most significantly determine demographic changes in the country made it possible to point to the following: reduction in the average number of children in the family, disappearance of many children and the universality of single-parent families (Janiszewska, 2016, pp. 34-51). It is worth noting that the indicated sources are similar in their source and focused on family issues. Maybe it is worth expanding this area to include the aspect of the progressing process of transformation of forms of married and family life, which is noted in numerous studies and which is the subject of numerous studies. The above proposal is justified by the results of the analysis indicated by the participants of the study of cultural and social processes that can most dynamically shape the future structure of the population living in Poland. They included as the most significant reduction in the importance of marriage as a form of human coexistence for cohabitation and the transition from preventive contraception to conscious procreation. The final cognitive issue undertaken in part of the research in the area of demographic change was the assessment of chances of reversing demographic trends in the country. In particular, the declining population of young people and the aging of the population. Research participants perceive such opportunities in a small percentage (in the overall answers the advantage of the supporters of

the answer 'Yes' over 'No' was only 2%). On the other hand, strong pessimists regarding the reversal of trends are women, among whom the answers to "No" prevailed over the answers to "Yes" in a percentage of over 19%; in the case of men it was 2.6%.

In conclusion, demographic change is a significant challenge for many areas of public policy, such as family, labour market, social security and education. The identified challenges and areas of their impact are part of a broader spectrum of reflection that should focus on a holistic approach to the public policy system, which is the key determinant shaping human capital, in which, according to forecasts, by 2050 people over the age of sixty–five can constitute 20% (Population structure..., 2019) of the total population of all Europe in Poland over 36% (Population forecast..., 2014).

As in the case of research in the area of demographic change, also in the analyzed case focusing on the phenomenon of automation a small percentage of respondents did not answer the questions asked. This result entitles the formulation of the first conclusion, which states that the problem areas undertaken in the research are widely noticeable and known to the participants. It is worth emphasizing, however, that the more the content of the question moves away from the problems of the labour market and education, the lower the percentage of answers enabling a clear resolution of the problem raised in the question. In the light of the question about the assessment of the impact of the automation of production and other industries in various areas of the economy on the domestic labour market, based on the results obtained, it should be stated that this is a development opportunity. Only every third of the study participants expressed a different opinion. Particularly positively – in the context of development opportunities for processes taking place in labour markets – the impact of automation is noticed by women. Nearly nine out of 10 research participants expressed this view. The indicated correctness is underlined in numerous publications and communications. Marianne Thyssen, Commissioner for Employment, Social Affairs, Skills and Mobility of Workers, said in 2018 that employment in the EU has reached the highest level in the history of 236 million jobs. Unemployment is steadily decreasing. We should take full advantage of this positive impetus in the economy and give citizens new and more effective rights that we have previously established under the European Pillar of Social Rights: fair working conditions, equal access to the labour market and fair social protection (Commission report..., 2018). This opportunity must be seized to ensure that all citizens and employees can benefit from these positive changes in the labour market. The regularity described above is confirmed in the analysis of the results of the impact of automation on the increase in unemployment and the creation of new and better–paid jobs. In this cognitive area, it can also be assumed that automation as a process will create the creation of new and better–paid jobs. Unemployment will not be determined by this process, but by a phenomenon that participates in changes social and economic. Also in this case, women (63%, males 57.1%) predominated in assessments focusing on the answers to the creation of new and better–paid jobs. In this light, it is worth pointing to the 2016 study of the American Pew Research Center, which showed that 65% of

Americans are convinced that in 50 years robots will do most of the work that people currently do, but 80% believe that their own profession in five decades will not change at all (Pew Research, 2016). On the other hand, as a result of the analysis of the respondents' answers to the question whether production automation threatens the loss of work only by low-skilled employees, or also by highly-qualified employees, it is not difficult to decide who will be affected by the indicated job loss. The distribution of the percentage of answers gives the right to state that the profession and qualification group that may be most severely affected by the problem of losing a job through the automation process can be people with the lowest qualifications, whose professional duties are uncomplicated and repetitive. Almost twice the percentage of research participants associates this phenomenon with employees with high and highest qualifications. Due to the sex of study participants, identical responses by percentage were similar (women 63%, men 57.5). The indicated correctness is confirmed, among others in the Gumtree.pl study developed by DELab University of Warsaw, in which 54% of surveyed Poles said that in the future they would have to work in several professions to support themselves. Unskilled workers (70%) fear the least, entrepreneurs least (43%) (Active +..., 2017). The assessment of the impact of automation on the disappearance of employment in some industries and professions or the occurrence of employee allocation to new jobs and tasks also clearly indicates the dominance of the allocation process. Over twice the percentage of respondents pointed to this process. When analyzing the answer to this question, there is no significant differentiation in the percentage of respondents (women 62.8%, men 61.5%) by gender. In the light of the above assessments, it is worth noting that in the next decades the so-called employment polarization, i.e. a relative increase in the demand for work of people with high qualifications and those with low qualifications and performing simple work, with a relative decline in the demand for work of people with an average level of qualifications. This process, the most advanced in the United States and visible in Western Europe, in Poland is not yet clear, but it will probably accelerate. Because it is based on technological progress that displaces work that is subject to computerization and automation, one should not be under the illusion that it can be effectively opposed, especially in an open, globalized economy. In these conditions, the challenge for the policy is to create conditions conducive to the creation of highly productive jobs while ensuring adequate support for those groups of employees who lose polarization processes (Lewandowski..., 2014, p. 196). In the final question in the area of automation, the issue of the impact of the process on creating integration, openness and visionary solutions or a reality in which a human being becomes a lonely, passive, immersed and lost being in the virtual world was raised. This question was the most difficult for research participants in resolving the problem. The analysis of the obtained results does not entitle to explicitly define the area that can be determined to a greater extent by automation. The percentage of responses obtained in the study makes it possible to state that the phenomenon of loneliness, passivity, depression and loss of a person in the virtual world as a result of the phenomenon of automation is closer to a higher percentage of respondents (11%).

The percentage of responses by gender was exactly the same (women 10.9%, men 7.7%). The indicated regularity corresponds to the results of research on artificial intelligence of scientists from Universities at Oxford and Yale, who assume that in 45 years machines will outrun people in all aspects of intelligence, and in 120 years all work will be automated, which will be done by man. In this light, it is worth asking the question whether automation will solve all existential problems in the future, and man will devote himself exclusively to consumption and pleasure (The robots will take over..., 2019). Will it lead to a global catastrophe in which machines take over the world, becoming ubiquitous, having the ability to learn, which will ultimately lead them to turn against man. It seems that both the first and the second scenario are connected with the present, in which modern institutions and their global reach create incomparably greater chances for people to experience a safe and satisfying life than any of the pre-modern systems. Modernity, however, also has a dark side, which has become clearly visible in the current century. This dark side of modernity is the loss of the individual between the global aspirations of modernity and the local dimension of human existence, the breakdown of space-time relationships, the reorganization of social relations within the network society, or the constant struggle with the processes of marginalization, differentiation and exclusion (Giddens, 2008, p. 5).

3. Conclusions

The research results described above – it seems – clearly determine the issues of the importance of scientifically shaped demographic assessments and analyzes. On their basis, it can be concluded that the effect of the regressive nature of demographic change is the growing process of demographic aging, which will affect the situation on the labour market. Vocational deactivation of numerous (high-growth) years of retirement age with a weak supply of labour from a small number of (low-volume) years entering the productive age can lead to quite different difficulties on the labour market – difficulties in obtaining labour, both in terms of quantity, as well as qualitative.

In the light of the observed and anticipated changes, it is important to emphasize the importance of influencing the population structure of Poland and the Silesia Voivodship, waving highs and demographic lows, extending the lowland phase at the end of the 1980s for subsequent years (transformation period), and the impact economic and political transformation and Poland's accession to the EU into the spatial, demographic, social, economic and infrastructural sphere, which highlighted numerous development problems. Among them, currently – as indicated by numerous studies – one of these challenges is the preparation of properly educated, modern, intelligent and sensitive to demographic changes personnel that will efficiently and effectively use their potential to achieve the assumed economic goals and

implement the mission of national enterprises (Marszowski, 2018, pp. 213-240). The dominant in these activities is – as has already been noted before – a modern, innovative and responding to contemporary and future challenges education system at every level of education. A system that is part of the short and medium term economic goals and megatrends – in phase II demographic transition and globalization – determines the successful development of the two most important human and social capital in the modern world and the resulting human attitudes, the universality of ideas, the ability to create them and gathering around them the most creative individuals, norms of behavior and, above all, creating a climate for fulfillment and achieving success through an individual in the modern and changing world with a hitherto unknown dynamics (Marszowski, 2018, pp. 5-26).

On the canvas of all the content contained in this article, the image of the future clearly emerges, in which man, industry and the surrounding reality will be shaped by the automation process developing with hitherto unknown dynamics. It will lead to the disappearance of the world dominated by the industrial age and the transition to a new era determined by technologies dominated by data flow and their analysis. The changes will focus on selected economic and social areas (Regional, 2012). In this light, it seems that the future of labour markets will be determined by two trends. In the first of these, labour markets will be on the margins of overlapping. On the basis of their development potential, they will successfully join the indicated processes of demographic change and automation – and will enjoy equal benefits with respect to other participants.

In this light, it seems that the decisive role in creating the development of the labour market can play overcoming mental barriers to demographic change and automation to strengthen their acceptance. As evidenced by numerous sources cited in the text, the pursuit of development – in the phase of demographic changes and the dynamic growth of automation – leads directly to economic boom in the dimension of both the state and local communities – favoring the social dimension of the individual and strengthening the human feeling of fullness of life (Wronka-Pośpiech, 2015, p. 133).

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