OCCUPATIONAL MOBILITY AND THE QUALIFICATIONS OF POLISH CITIZENS

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ABSTRACT

Motives: Little is known about the occupational mobility of Poles. In the literature, only the impact of socio-demographic factors on occupational mobility has been investigated. Occupational mobility may be influenced by educational attainment and the type of acquired qualifications, but these considerations have not been studied to date.

Aim: The article examines occupational mobility, namely changes in occupation in a person's professional history, as well as declared willingness (readiness) to change occupation within 12 months. The presented results of empirical research are based on a unique set of data collected during a CAWI survey performed on a sample of 16,119 Poles aged 18-65. An event history analysis and a logit model were used to analyse occupational mobility and its determinants.

Results: The event history analysis revealed that Poles often change their learnt occupation. The results of the logit model indicate that the occupational mobility of Poles is influenced not only by demographic factors, but also by the acquired qualifications. Occupational mobility differed among respondents who acquired their qualifications at university, in a secondary school, or through vocational training. University graduates were characterized by the highest occupational mobility. Occupation mobility was influenced not only by educational attainment, but also by the type of acquired qualifications. Occupational mobility was highest among services and humanities graduates, and lowest among education and health graduates. Moreover, we found no evidence of significant spatial differences in occupational mobility in Poland.

Keywords: labour market, occupational mobility, qualifications

INTRODUCTION

Intensive labour mobility is often considered to affect the labour market positively because it allows the labour supply to adapt more readily to changing conditions from the demand side of the market. A change of occupation, however, comes with a high opportunity cost (vom Lehn et al., 2019). On one hand, job-takers forgo the benefits of the intellectual capital accumulated from the previously learnt occupation.

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On the other hand, they must quickly assimilate to learn the qualifications necessary for the new job. This trade-off is one of the main reasons why job takers' adjustment to new demand conditions takes such a long time.

In the economic literature, occupations are repeatedly used to explain a wide range of economic phenomena – for example, the development of modern technologies or changes in international trade. In the case of international trade, the liberalisation of world trade causes lower-wage pressure (Ebenstein et al., 2014). In the case of technology, occupations can be grouped according to routine and non-routine tasks, and this can be used to assess the chance of replacing work with technology (Acemoglu & Autor, 2010).

Job-takers choose occupations based on the acquired level of education and accumulated human capital (e.g. through training), and match their skills with tasks performed in the specific occupations (Lin, 2019). Economists sometimes point out that regarding the matching process, there are more questions than explainable answers. For instance, Maczulskij (2019) points out that we do not know the implication of the popularity of work[1], especially on the individual level and for occupations requiring less knowledge. The empirical findings indicate that for the occupational mobility of routine workers, upward mobility is more commonly observed than downward mobility [2].

The empirical studies of occupational mobility are not a popular topic of economic research, mainly due to the unavailability of data[3]. In this research, we present findings based on a relatively large survey dataset. We define occupational mobility as a real change of occupation in the active employment history of a respondent, and as a declared willingness (readiness) to change their occupation (Kucharski, 2014, p. 93). This readiness has multiple determinants, including those of a random nature (cultural or institutional).

Our work aims to explore the real mobility scale of Poles, and to deepen our knowledge about the determinants of a willingness (readiness) for occupational mobility. To achieve this goal, the research is divided into two parts. The first one is based on the event history analysis (the sequence of mobility). The main question this part addresses is related to performing a learnt occupation: Is it occurring commonly in the Polish economy? We also tried to determine in what stages of the professional career Poles are more likely to change occupation, and whether this includes change within major occupational groups.

Next, we inspect the factors that determine the propensity for occupational mobility. For this, we utilize a method based on the logit model, which allows us to examine demographic factors and regional differentiation (analysis on the voivodeship level). Our main contribution is connected with the analysis of occupational and qualification mobility. We deepen knowledge of how qualifications determine occupational mobility. This is done in two dimensions – levels and fields of qualifications according to the International Standard Classification of Education ISCED-F 2013. The main argument for using this nomenclature is that we expect different results (different determinants) in other countries because of different educational systems, national innovation systems, etc. This article is therefore a contribution to a larger stream of research but adds insight about the Polish case.

We have collected the data using CAWI (Computer-Assisted Web Interview) survey conducted in 2017. The survey was based on a nationwide random-quota sample of 16,119 people ranging in age from 18 to 65, of which 9,788 were working.

The article consists of the following parts. In the next section, we present a literature review. This review

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[1] The term "popularity of work" refers to a situation in which employees' decisions regarding the choice of the education path or acquiring skills and qualifications are influenced by the popularity of certain occupations. The examples that have been analysed most deeply empirically are information and communication technologies occupations (see Autor et al., 2003).

[2] Upward mobility is a promotion to a higher position (see Ng et al., 2007).

[3] Previous research frequently used data from longitudinal surveys, household panel studies, and labour force surveys.

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is assisted by text mining[4] of titles, keywords, and abstracts of a large number of scientific articles from Web of Science. The next section presents the data and methods used. Then, we analyse the sequence of occupational mobility, followed by the results obtained with econometric modelling of determinants of occupational mobility. The final section is reserved for concluding remarks.

LITERATURE REVIEW

To identify streams of research associated with labour mobility, we apply a text mining method based on the PICO search approach (Population/ Problem, Intervention/Exposure, Comparison, and Outcomes) adopted from Grames et al. (2019) (see Table 1). This allows us to conduct a preliminary screening of the literature, and helps in more intensive, in-depth research of determinants during the empirical analysis. In other words, this method allows us comparing more efficiently our results with other research findings, and to draw from a larger pool of findings.

Table 1. Keywords used in the PICO search

Category	Keywords
Population	population ages 15–64
Exposure	desire to change job
Comparison	performed occupation; learnt occupation
Outcomes	occupational mobility

Source: own preparation.

The main aim of the PICO keyword search method is to break down the research question into categories. The main argument for this method is that it allows for a more systematic review and thus a quicker assessment of the findings. We used the *Web of Knowledge* database because it is currently one of the largest repositories of scientific periodicals in the world, and because it allows Boolean searches (i.e., using the logical operators "or" and "and").

The PICO search (see Table 1) allows us to collect abstracts, keywords, and titles of 424 scientific articles. We use these data to estimate n-grams using the algorithm proposed by Grames et al. (2019). N-grams are sequences of words that are used most frequently in a large corpus of text; in our case, the text contained in the collection of abstracts, so that:

$$p(x_1 \ldots x_n) = \prod_{i=1}^{n} q(x_i \vee x_{i-2}, x_{i-1}), \qquad (1)$$

where:

$x \in V$ – all words used in the analysis, $i = 1 \ldots (n-1)$.

The use of the algorithm created by Grames et al. (2019) in the R programming language allows us to collect trigrams (three-word phrases) which we next use to create a Document-Feature Matrix (DFM). We then use the obtained DFM to produce a keyword co-occurrence network (see Fig. 1).

In the selected economic literature, "labour mobility" is frequently associated with "human capital theory" (Adair & Bellache, 2018; Evertsson et al., 2015). Scientific literature differentiates between horizontal labour mobility (change across job positions at a similar level of company hierarchy) and vertical labour mobility (change across levels of job position, most often indicating a promotion). Vertical mobility may be understood as "upward occupational mobility" or "downward occupational mobility," of which the former is explored more frequently (in the tested sample, the ratio was 10 to 4). Other research streams include "intergenerational occupational mobility" and "intergenerational income mobility". Both phrases indicate intensive research about social mobility (change in social status).

What are the determinants of labour mobility? It turns out that regarding empirical research, occupational mobility is researched jointly with other types of mobility. Kettunen (2002), for instance, concentrate mainly on spatial mobility, but also include other types of mobility in their research. One of the conclusions from their research is that age significantly influences spatial mobility: The older

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[4] Text mining or text analytics is a process that leads to "the discovery by computer of new, previously unknown information, by automatically extracting information from different written resources" (Hearst, 2003).

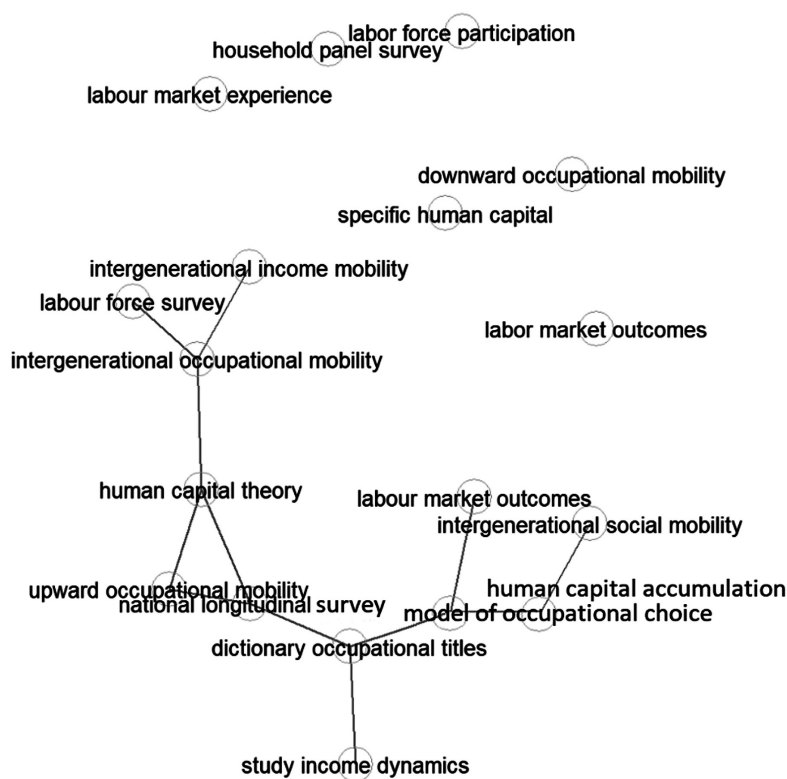✉lcywinski@wsiz.edu.pl, ✉eburdz@sgh.waw.pl, ✉rpater@wsiz.edu.pl

Fig. 1. Keyword co-occurrence network
Source: own preparation.

the people studied, the less spatially mobile they were. Kettunen (2002) demonstrate that occupational mobility is greatly influenced by the amount of demand for occupations.

Bergin (2008) shows that in Ireland, the propensity to change work position is determined by the time of activity in the labour market and experience. Bergin (2008) also shows that people employed in the public sector are less willing to change jobs than people employed in the private sector are. Moreover, the results of her research indicate that people with qualifications higher than their job position requires are also more likely to change their jobs than people who do not have qualifications higher than required. In the study by Bergin (2008), gender is not a statistically significant factor influencing occupational mobility.

Ferreira (2006) focuses on finding factors that determine occupational and "inter-company" mobility (positions within the same company). She presents a literature review in which she categorises the determinants of mobility into statistically significant and not significant groupings. However, this research is not conclusive as to gender differences in mobility. Shin (2007), in turn, examines how structural changes, primarily in the form of mergers and acquisitions, influence professional and inter-company mobility. His research shows that the factors determining inter-company mobility are gender, age, previous mobility experience, seniority, education, wages, as well as the unemployment rate and growth dynamics in the sector in which the respondents are employed. According to Shin (2007), occupational mobility depends on union status, age, length of service, level of education, and the occurrence of acquisitions or mergers in the sector.

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According to Groes et al. (2014), occupational mobility is a U-shaped curve for most occupations. This means it is greater in the case of lowest-paid and highest-paid occupations (the extremes of the curve). This finding arises from research based on a panel of Danish companies. In the case of Poland Rokicka & Starosta (2000) show that among factors that determine general labour mobility are: the socio-professional affiliation of respondents, sector of the economy (private or public), and education level.

During the corona virus pandemic researchers mostly focused on the very popular mobility from traditional work to remote work and its efficiency. For example, Bloom et al. (2022) report that in the USA hybrid work increased job satisfaction, significantly reduced attrition rates, altered the structure of hours worked rather than changing their number, intensified video communication (both while working at home and at the office), and did not affect performance and promotions significantly. Barrero et al. (2022) show that the shift to remote work decreases wage-growth pressure.

Occupational mobility is rarely a sole research topic. Other types of mobility have been primarily analysed to this point, with occupational mobility researched rather incidentally. As a result, existing research often considers only whether occupational mobility occurs vertically or horizontally. Very few studies give insights into the relationship between qualifications and job (occupational) mobility. To our knowledge, there are no studies at the level of detail proposed by us.

DATA AND METHODS

This article uses data from the study of the occupational and educational situation of Poles. The study was performed in 2017 using a computer-assisted web interview (CAWI) method on a nationwide random-quota sample of N=16,119 people aged 18-65. The shares of surveyed persons according to sex, age and size of the place of residence were consistent with the shares in the Polish population. The survey questionnaire was divided into four parts:

1. Demographics;
2. Occupational situation;
3. Qualifications;
4. Competences.

The core of the classification of individual respondents was their professional situation. First, they were divided into "working / not working", then "not working" was further subdivided into "working in the past / without work experience". Almost two-thirds (60.7%) of respondents indicated that they were working; 4.5% indicated unemployment (which is a similar result to the Labour Force Survey statistics for Poland at that time). Among the economically inactive persons, the categories with the highest shares were old-age and disability pensioners (37.9% of the inactive), homemakers (23.9% of the inactive), and school and university students (17.4% of the inactive). The significant share of retirees was primarily explained by the retirement age of men and women, as the sample covered people up to 65 years of age. In Poland, the minimum retirement age is 65 for men and 60 for women. In the context of questions about qualifications and professional competences, it is worth noting that 87.5% of not working respondents were economically active in the past.

Among 16,119 participants of this study, 8,144 were women (50.5%) and 7,975 men (49.5%). Within each age group, the number of respondents ranged from 177 to 713. Over one-third (36.3%) of the respondents lived in villages, 13.1% in small towns (up to 20,000 inhabitants), 20.2% in medium-sized cities (up to 99,999 inhabitants), 18.3% in large cities (100,000–500,000 inhabitants), and 12.2% in cities with more than 500,000 inhabitants. The respondents from Warsaw, the capital city of Poland, constituted 4.2% of all surveyed persons. The respondents represented the inhabitants of all 16 voivodeships.

Only 1.1% of respondents had at most primary or incomplete primary education, 1.9% had only lower secondary education, and 23% of the respondents declared vocational education (either basic or secondary); 10.7% declared general secondary education, 8.6% post-secondary, 17.6% undergraduate,

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and 36.2% indicated higher education. 0.9% of people in the sample had doctorate degree.

The demographics section of the survey contains eight questions about sex, age, place of residence, size of residence, education (also as a control question for answers provided in the "qualifications" section), marital status, number of children (if any), and average net income.

The "professional situation" section includes two sets of questions; one for people declaring employment, and one for those who were not employed. Employed people were asked 19 questions concerning the current form of employment, industry, sector, conditions, previous experience (if any), reasons for changing employment or occupation, as well as potential future plans concerning the place of employment and occupation. Non-working people (unemployed and economically inactive) were asked 13 questions about reasons for their unemployment or inactivity, previous professional experience (if any), whether they searched for jobs, and how they looked for a job.

The "qualifications" section included questions about types of attended courses and trainings, areas of vocational education, secondary and post-secondary education, and fields of completed higher education. The respondents were asked to classify all obtained qualifications. This approach guarantees detailed knowledge of the range and diversification of formal professional qualifications. The section contained 44 questions.

To explore the determinants of occupational mobility, we utilize two variables. The first one indicates the propensity to change one's occupation, as illustrated by the following question in the survey:

Do you intend to change your occupation within the next 12 months?
a) Definitely not
b) Rather not
c) It's difficult to say
d) Rather yes
e) Definitely yes.

The second variable represents the actual or historical mobility of respondents. We used the following question, for which the surveyed person answered with a number:

How many times have you changed your occupation? (Please note that the question concerns the occupation, and not the place or form of employment).

In both cases – readiness and actual change of an occupation in the past – occupational mobility is represented by an ordinal variable y_i, taking values $j = 1, ..., J$ for $i = 1, ..., N$ respondents. Therefore, we use a logit model of the form (Greene, 2002: 736):

$$y^* = m'\alpha + \varepsilon, \qquad (2)$$

where:
y^* – an unobservable dependent variable;
y_i – the observed variable;
m – a vector of explanatory variables, which include socio-demographic variables, occupation and qualifications of respondents.
α is a vector of parameters to be estimated;
$y_i = j$ if $\mu_{j-1} < y^* \leq \mu_j$, where μ includes parameters to estimate with α;
the probability of choosing a different value of j is
$$p_j = p(y = j \vee m) = p(\mu_{j-1} < y^* \leq \mu_j) = \Lambda(\mu_j - m'\alpha) - \Lambda(\mu_{j-1} - m'\alpha);$$
$\Lambda(m'\alpha) = \dfrac{exp\,(m'\alpha)}{1 + exp\,(m'\alpha)}$ is the logistic function.

RESULTS

Occupational sequence analysis

The questionnaire allows us to analyse the occupational mobility over the life cycle according to ISCO classification. We understand occupational mobility, as single or multiple changes in occupation. To this end, we follow each change in occupation since workers entered the labour market among those who were employed at the time of the questionnaire being conducted. We compare learnt (educated) occupations among major occupational groups, the occupation the person was employed in at the time of survey, potential intended changes in occupation within the following 12 months.

The sample consists of 9,788 workers, 46% of whom were females. The age distribution was quite even, with each age cohort 25–34, 35–44 and

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45–54 consisting of 25–30% of the sample, while 18–24 and 56–65 cohorts each consisted of 10% of the sample. One in three workers resided in rural areas, and one in five workers resided in big cities (from 100,000 to 500,000 inhabitants). The net monthly median salary was 2,500–3,000 PLN. Almost 40% of the sample did not change their occupation during their professional career, whereas 50% changed their occupation from 1 to 3 times (Fig. 2).

For our analysis, we construct a model of potential trajectories of occupational mobility (Fig. 2). The initial state is the information of occupation learnt, according to ISCO classification, at the beginning of labour force participation. Since the beginning of the professional activity until the moment of the survey, occupation status may have altered in four ways:

1. Respondent's occupation did not change since the beginning of labour force participation, but the occupation performed differed from the occupation learnt;
2. Respondent's occupation performed did not change since the beginning of labour force participation, and the occupation performed was compatible with the occupation learnt;
3. Respondent's occupation performed changed since the beginning of labour force participation, but the occupation performed differed from the occupation learnt;
4. Respondent's occupation performed changed since the beginning of labour force participation, but occupation performed was compatible with the occupation learnt.

In the next step, we accounted for intended changes of occupation in the following 12 months. We assume that respondents would change the occupation if they indicated choices "yes" or "rather yes". The answers "no" and "rather no" were ascribed to intentions of not changing occupation. Next, workers who indicated intentions of changing occupation were assigned to one of three categories:

1. Change of occupation and new occupation would be compatible with currently performed occupation according to ISCO classification;
2. Change of occupation and new occupation would differ from the currently performed occupation according to ISCO classification, but new occupation would still be compatible with the occupation learnt;
3. Change of occupation and new occupation would differ from the currently performed occupation according to ISCO classification, and new occupation would also differ from the occupation learnt.

Figure 3 presents potential trajectories with the percentage share of workers in particular states.

We also analyse occupational mobility by applying sequence analysis methods. The results indicate that more than 60% of the workers changed occupation since the beginning of their professional activity, and almost 70% of these (42% of the overall sample) changed to an occupation different from the one learnt. One in five workers did not change occupation since the beginning of their professional activity, but were simultaneously working in an occupation different form the one learnt. Summary statistics further indicate that only 40% of the entire sample was working in occupations compatible with occupations learnt, according to major occupational groups.
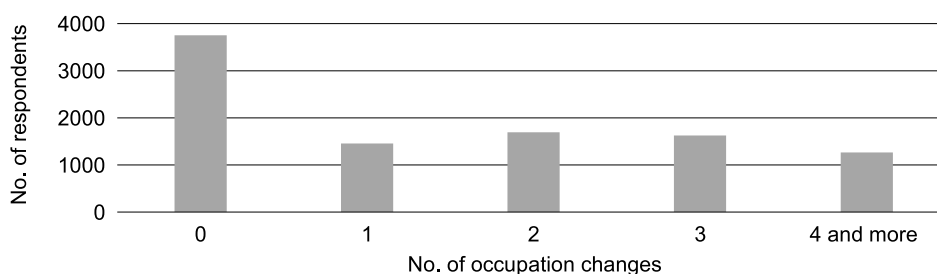

Fig. 2. Number of occupation changes over the professional life cycle
Source: own preparation.

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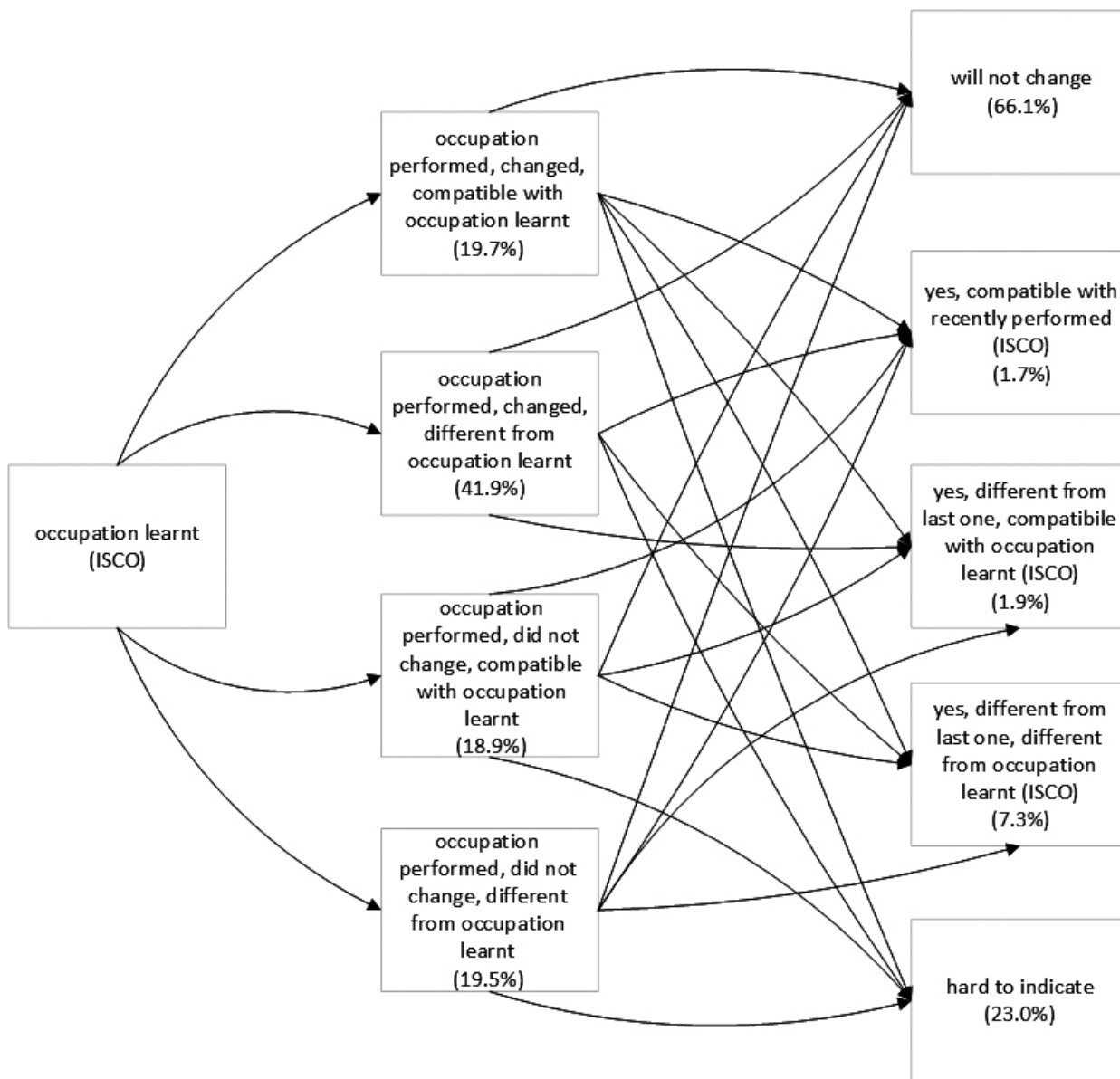
Fig. 3. Model showing intended occupational mobility since the beginning of labour force participation
Source: own preparation.

To complement the transitions between occupations learnt and performed, we present in Table 2 the combination of occupation transitions. We also computed simple indicators to determine mobility to higher or lower major occupation groups. Workers educated in occupations classified as higher predominantly remained in the same group or moved to lower classified occupations, though percentage shares differed considerably depending on the major group. Workers originally classified as lower migrated more often to occupations classified as higher, although changes mostly occurred between adjacent or similar groups. Tables 4 and 5 in the Appendix provide analogous results for workers, who changed occupation and the occupation performed differed from the occupation learnt; and for workers who did

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Table 2. Occupational mobility between occupations learnt and performed, according to major occupational groups

Occupation learnt	Occupation performed										Mobility to group (%)		
	1	2	3	4	5	6	7	8	9	10	Higher	No changes	Lower
1	15	9	24	6	7	1	0	2	0	1	–	23.08	76.92
2	353	1983	997	443	394	37	149	130	93	21	7.67	43.11	49.22
3	149	353	781	374	477	23	157	154	161	8	19.04	29.62	51.35
4	7	21	25	45	20	0	0	6	10	0	39.55	33.58	26.87
5	27	46	66	60	340	7	30	25	84	1	29.01	49.56	21.43
6	8	16	20	8	26	31	12	9	18	1	52.35	20.81	26.85
7	53	82	107	84	173	16	532	198	122	8	37.45	38.69	23.85
8	9	5	15	12	12	3	11	39	8	0	58.77	34.21	7.02
9	1	2	3	5	2	0	2	1	4	0	80.00	20.00	0.00
10	1	0	1	0	2	0	1	0	0	3	62.50	37.50	–

Note: 1 – Managers, 2 – Professionals, 3 – Technicians and Associate Professionals, 4 – Clerical Support Workers, 5 – Services and Sales Workers, 6 – Skilled Agricultural, Forestry and Fishery Workers, 7 – Craft and Related Trades Workers, 8 – Plant and Machine Operators and Assemblers, 9 – Elementary Occupations, 10 – Armed Forces Occupation
Source: own elaboration.

Table 3. Occupational mobility between occupation performed and planned change in occupation, when the new expected occupation differs from current and learnt occupations

Occupation learnt	Occupation performed										Mobility to group (%)		
	1	2	3	4	5	6	7	8	9	10	Higher	No changes	Lower
1	0	0	2	10	2	8	0	2	0	0	–	0.00	100.00
2	0	54	0	46	26	24	0	4	4	0	0.00	34.18	65.82
3	0	42	10	0	48	12	2	4	4	4	33.33	7.94	58.73
4	2	16	20	34	0	30	2	6	10	0	31.67	28.33	40.00
5	8	20	26	36	50	0	2	2	16	8	53.57	29.76	16.67
6	0	0	0	2	0	0	0	0	2	2	33.33	0.00	66.67
7	0	2	8	10	12	14	0	0	14	2	74.19	0.00	25.81
8	2	8	2	4	12	8	0	10	0	0	78.26	21.74	0.00
9	0	4	14	2	28	10	0	4	10	0	86.11	13.89	0.00
10	0	0	0	0	0	0	0	0	0	0	–	0.00	0.00

Note: 1 – Managers, 2 – Professionals, 3 – Technicians and Associate Professionals, 4 – Clerical Support Workers, 5 – Services and Sales Workers, 6 – Skilled Agricultural, Forestry and Fishery Workers, 7 – Craft and Related Trades Workers, 8 – Plant and Machine Operators and Assemblers, 9 – Elementary Occupations, 10 – Armed Forces Occupations
Source: own preparation.

not change occupation since the beginning of labour force participation, and the occupation performed differed from the occupation learnt.

Following that, we analyse the expectations of changing occupation within the following 12 months. Depending on the initial state, between 60% and 80% of the workers did not plan any changes in occupation soon. Among those who did not change occupation since the beginning of their professional activity, and were working in occupations compatible with the occupation learnt, 79% did not plan changes in occupation. Another 15% of workers answered

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occupational groups. Relatively few workers planned to remain in the same occupational group. Whether they planned to move up or down in the classification depended on their initial state.

For robustness check of the results, we performed the analogous two-step analysis for four major occupational groups (occupation learnt). We wanted to determine if trajectories of transitions differed among these groups. The example chosen was based on the frequencies, and we examined the following groups: 2 – Professionals (4,600 workers), 3 – Technicians and Associate Professionals (2,637 workers), 5 – Services and Sales Workers (686 workers), 7 – Craft and Related Trades Workers (1,375 workers). No other major group consisted of more than 150 workers. The structure of answers was similar to overall indications, so were the trajectories of transitions.

Determinants of occupational mobility

Table 6 in the Appendix presents the results of modelling the propensity of employed persons to change occupation. The table indicates that readiness to change occupation increases with age only up to the age of 24. From the age of 25, the likelihood of change decreases. This may be related to the "job-shopping" phenomenon, i.e., the fact that young people often change jobs and experiment in the labour market, gaining experience (see Fitzenberger et al., 2015), and looking for the job that satisfies them in various perspectives. After a few years of frequent job changes, they become less likely to change jobs, settling in the enterprise they consider most appropriate. Declared occupational mobility increases with the size of the place of residence. People with an unmarried civil status (unmarried/single, widow/widower) showed a higher propensity to change their profession. The exception to this are divorced people, who showed a lower propensity of changing occupation. The occupational mobility was not significantly diversified regionally. The lowest negative coefficients, although statistically insignificant, were related to less economically developed regions.

The level of education by itself does not significantly affect the readiness to change occupation.

This readiness is rather a function of the type of education (qualifications). The questions about qualifications were divided into three groups. The first group contained people who received training programmes and took classes over the course of their careers. Among this group, the willingness to change occupation was most often indicated by people who had received training in the arts and humanities, and the second most in information and communication technologies and services. People from the second group – those with secondary and vocational education, who finished business, administration, and law courses, as well as social sciences, journalism, and information – indicated the greatest willingness to change their profession. Those from the third group were representatives of the service occupations. From the point of view of higher education, graduates of technical sciences (including industry and construction) were most willing to change their profession, followed by service professions. At all qualification levels, people with qualifications in health, social welfare and education had a low propensity to change their profession.

The modelling results of the historical change of occupation are presented in Table 7 in the Appendix. Men changed jobs more often than women did. The respondents were more eager to change their profession until the age of 50. After age 50, this level decreased; respondents more often decided to stay with their last occupation. The size of the place of residence was conducive to professional mobility. Interestingly, education had a negative impact on historical occupational mobility. This negative impact might be due to Poland's unique history. During the centrally planned economy before 1989, higher education often secured more stable positions, thereby reducing the need to change occupations. This legacy continues to shape today's labor market dynamics in Poland. Historical conditions, in which higher education resulted in a much better labour market status, as well as a reduced the need to change profession, may have contributed to this finding. Divorce favoured a change of profession, and having a spouse was not favourable to occupational change. Having children was also

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not conducive to professional mobility. In the Polish context, traditional values and social expectations often encourage stability when family is involved and, consequently, lower readiness to make occupational changes. People could have also been more reluctant to changes being afraid of potential hindrances for a successful transition. The low spatial mobility of Poles may also contribute to this, especially in previous decades, when having a family could hinder migration to a new job. Generally, representatives of less economically developed regions had lower, though mostly insignificant, rates of historical professional mobility. This is possibly related to the economic transformation that Poland underwent after the fall of communism, which led to uneven regional development. In less developed regions, fewer job opportunities and lower internal mobility could make changing occupations more challenging. This may be related to more difficult job change conditions, low internal regional mobility, and low rates of change to and out of employment in such labour markets.

CONCLUSIONS

Occupational mobility is connected to eagerness and readiness to change an individual's current occupation. This eagerness reflects the readiness to bear all the opportunity costs associated to the matching process between labour supply and demand. In this article, we empirically explore people's past occupational mobility, the eagerness for such mobility in the near future and its determinants. These patterns may be strongly influenced by economic transformation Poland underwent after 1990, shifting from a centrally planned to market-based economy. This transition led to the redefinition of job roles and affected how individuals perceive occupational mobility. During the centrally planned economy employment had been ensured, and there had been no direct need to change qualifications. In 1990s the situation changed drastically. Productivity changes in the companies led to mass layoffs and low labour demand. Labour market situation was very unpredictable with high competition between job

seekers. This gradually changed during next decades, but surely affected the psychology of older job seekers.

Occupational sequence analysis indicates the direction of occupational mobility among major groups. While accounting for the high degree of data aggregation, the main following conclusions emerge. First, relatively few workers worked in occupations compatible with their learnt (educated) occupations and have not changed occupation since the beginning of their professional activity. These workers are least eager to change their occupation within the following 12 months. In contrast, there are also workers who changed their occupation since the beginning of the professional activity, and plan to change occupation again within the following 12 months. Among these workers, characterized by high occupational mobility, most plan the change to an occupation different from both the current occupation and the one learnt. Other workers are characterized by moderate occupational mobility. The sequence of changes between occupational groups did not differ significantly with respect to educational level attained nor occupation learnt. The sequence of trajectories has only correlational instead of causal character, however.

The sequence analysis results indicate that in the past, more than half of the workers in the sample changed their occupation at least once during their professional life cycle. Moreover, when workers changed occupation, it most often differed from the one learnt. This could be partially explained by the dynamic changes in the Polish labour market facing economic transformation. It created new occupations and modified existing ones, making some skills obsolete while putting premium on others. Among workers who did not change occupation, 20% were working in an occupation that differed from the occupation learnt. Our results also indicate that working in the learnt occupation during one's entire professional career was quite rare.

We found that sociodemographic features and family status significantly determine occupational mobility. Unmarried people are more eager to change occupation than married workers with children are. However, occupational mobility is mainly affected by

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the level and type of qualifications acquired during secondary and tertiary education and training. People with secondary or vocational qualifications are less likely to change jobs than those with higher education levels. The results also show that, after an initial increase in job mobility up to age 24, job mobility then declines with age. This finding is important for shaping educational and economic policy.

Which workers were most eager to change their occupation, regarding fields of education? Irrespective of the level of education, graduates from the service sector were most eager to change occupation. This may be related to the fact that acquired qualifications are not as specialized and may be used across different occupations. In the case of tertiary education and training courses, humanities and science graduates were most eager to change occupation. In the case of secondary and vocational education, business, administration, law and social science graduates were most eager to change occupation.

Finally, some research questions emerge that may indicate potential routes for future research: To what extent labour market matching process in Poland affects eagerness and readiness to change occupation (e.g. time-consuming job matching process and long mean job search duration)? To what extent initial unsuccessful educational choices (as relatively few workers work in their learnt occupation) affect occupational mobility? Causal research on these aspects would contribute to better understanding of determinants of job occupation mobility.

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REFERENCES

Acemoglu, D., & Autor, D. (2010). *Skills, Tasks and Technologies: implications for employment and earnings.* National Bureau of Economic Research Working Paper 16082. https://www.nber.org/system/files/working_papers/w16082/w16082.pdf (23.02.2021).

Adair, P., & Bellache, Y. (2018). Labor market segmentation and occupational mobility in Algeria: Repeated cross-sectional and longitudinal analyses (2007 to 2012). *Review of Development Economics*, *22*(4), 1765–1783.

Autor, D. H., Levy, F., & Murnane, R. J. (2003). The Skill Content of Recent Technological Change: An Empirical Exploration. *The Quarterly Journal of Economics*, *118*(4), 1279–1333. https://doi.org/10.1162/003355303322552801

Barrero, J. M., Bloom, N., Davis, S. J., Meyer, B. H., & Mihaylov, E. (2022). The shift to remote work lessens wage-growth pressures. *IZA Discussion Paper*, 15385. https://docs.iza.org/dp15385.pdf (08.08.2023).

Bergin, A. (2008). Job Mobility in Ireland. *The Economic and Social Review*, *40*(1), 15–47. https://www.esr.ie/ESR_papers/vol40_1/ESRI%2040-1-2.pdf (19.10.2023).

Bloom, N., Han, R., & Liang, J. (2022). How hybrid working from home works out. *National Bureau of Economic Research Working Paper*, 30292. https://www.nber.org/papers/w30292 (08.08.2023).

Ebenstein, A., Harrison, A., McMillan, M., & Phillips, S. (2014). Estimating the Impact of Trade and Offshoring on American Workers Using The Current Population Surveys. *The Review of Economics and Statistics*, *96*(4), 581–595. https://www.mitpressjournals.org/doi/pdf/10.1162/REST_a_00400 (23.02.2021).

Evertsson, M., Grunow, D., & Aisenbrey, S. (2015). Work interruptions and young women's career prospects in Germany, Sweden and the US.

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Work, Employment and Society, *30*(2). https://doi.org/10.1177/0950017015598283

Ferreira, P. (2006). *Explaining job mobility: an integrated analysis of the determinants of promotions and firm separations*. http://conference.iza.org/conference_files/SUMS2006/ferreira_p1209.pdf (06.06.2018).

Fitzenberger, B., Licklederer, S., & Zwiener, H. (2015). Mobility across firms and occupations among graduates from apprenticeship. *Labour Economics*, *34*, 138–151.

Grames, E. M., Stillman, A. N., Tingley, M. W., & Elphick, C. S. (2019). An automated approach to identifying search terms for systematic reviews using keyword co-occurrence networks. *Methods in Ecology and Evolution*. https://doi.org/10.1111/2041-210X.13268

Greene, W. H. (2002). *Econometric analysis*. 5th ed. Prentice Hall Upper Saddle River.

Groes, F., Kircher, P., & Manovskii, I. (2014). *The U-Shapes of Occupational Mobility* [Unpublished manuscript]. University of Pennsylvania. https://www.sas.upenn.edu/~manovski/papers/U_Shapes.pdf (04.06.2018).

Hearst, M. (2003). *What Is Text Mining?* https://people.ischool.berkeley.edu/~hearst/text-mining.html (08.01.2022).

Hofstede, G. (2000). *Kultury i Organizacje – zaprogramowanie umysłu* [*Cultures and Organizations – mind programming*]. Wydawnictwo PWN.

Kettunen, J. (2002). Labour mobility of unemployed workers. *Regional Science and Urban Economics*, *32*(3), 359–380.

Kucharski, L. (2014). *Bezrobocie równowagi w Polsce. Ujęcie teoretyczne i empiryczne* [*Equilibrium unemployment in Poland. Theoretical and empirical approach*]. Wydawnictwo Uniwersytetu Łódzkiego.

Lehn, C. vom, Ellsworth, C., & Kroff, Z. (2019). Reconciling Occupation Mobility in the Current Population Survey. *IZA Discussion Paper*, 13509. https://www.iza.org/publications/dp/13509/reconciling-occupational-mobility-in-the-current-population-survey (24.02.2021).

Lin, D. (2019). *Multi-Dimensional Abilities, Task Content of Occupations and Career Choices: A Dynamic Analysis*. https://doi.org/10.18130/v3-0mmf-ev67

Maczulskij, T. (2019). Occupational Mobility of Routine Workers. *Tyopapereita Working Papers*, 327. https://labour.fi/wp-content/uploads/2020/02/Tyopaperi327.pdf (24.02.2021).

Mazur, Z., & Orłowska, A. (2018). Jak zaplanować i przeprowadzić systematyczny przegląd literatury [How to plan and conduct a systematic literature review]. *Polskie Forum Psychologiczne*, *23*(2), 235–251.

Ng, W. H., Sorensen, K. L., Eby, L. T., & Feldman, D. C. (2007). Determinants of job mobility: A theoretical integration and extension. *Journal of Occupational and Organizational Psychology*, *80*, 363–386.

Rokicka, E., & Starosta, P. (2000). Mobilność zawodowa i edukacyjna [Occupational and educational mobility]. In E. Kryńska (Ed.), *Mobilność zasobów pracy: analizy i metody stymulacji* [*Workforce mobility: analysis and stimulation methods*]. IPiSS.

Shin, T.-J. (2007). The impact of structural Dynamics on job mobility rates in the United States. *Social Science Research*, *36*, 1301–1327.

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APPENDIX

Table 4. Occupational mobility between occupation learnt and occupation performed across major occupational groups, for individuals that changed occupation since the beginning of their professional activity, and current occupation differed from learnt occupation

occupation learnt	occupation performed										mobility to group (%)		
	1	2	3	4	5	6	7	8	9	10	higher	no changes	lower
1	2	0	2	0	4	0	2	0	0	0	–	20.00	80.00
2	0	10	28	8	6	0	0	4	0	0	0.00	17.86	82.14
3	464	0	1224	602	544	42	206	176	140	28	13.54	35.73	50.73
4	210	462	0	486	682	18	232	220	220	12	26.44	19.12	54.45
5	6	32	32	0	24	0	0	8	18	0	58.33	20.00	21.67
6	32	76	98	96	0	10	44	38	120	2	58.53	1.94	39.53
7	4	16	28	10	30	0	10	16	24	2	62.86	7.14	30.00
8	82	110	162	138	292	10	0	290	182	4	62.52	22.83	14.65
9	8	6	24	18	14	6	18	0	12	0	88.68	11.32	0.00
10	2	4	6	8	2	0	2	0	0	0	100.00	0.00	–

Note: 1 – Managers, 2 – Professionals, 3 – Technicians and Associate Professionals, 4 – Clerical Support Workers, 5 – Services and Sales Workers, 6 – Skilled Agricultural, Forestry and Fishery Workers, 7 – Craft and Related Trades Workers, 8 – Plant and Machine Operators and Assemblers, 9 – Elementary Occupations, 10 – Armed Forces Occupations
Source: own preparation.

Table 5. Occupational mobility between occupation learnt and occupation performed across major occupational groups, for individuals that did not change occupation since the beginning of their professional activity, but current occupation differed from learnt occupation

occupation learnt	occupation performed										mobility to group (%)		
	1	2	3	4	5	6	7	8	9	10	higher	no changes	lower
1	0	8	20	4	8	2	0	0	0	2	–	0.00	100.00
2	242	0	770	284	244	32	92	84	46	14	13.38	0.00	86.62
3	88	244	0	262	272	28	82	88	102	4	28.38	0.00	71.62
4	8	10	18	0	16	0	0	4	2	0	62.07	0.00	37.93
5	22	16	34	24	0	4	16	12	48	0	54.55	0.00	45.45
6	12	16	12	6	22	0	14	2	12	0	70.83	0.00	29.17
7	24	54	52	30	54	22	0	106	62	12	56.73	0.00	43.27
8	10	4	6	6	10	0	4	0	4	0	90.91	0.00	9.09
9	0	0	0	2	2	0	2	2	0	0	100.00	0.00	0.00
10	0	8	20	4	8	2	0	0	0	2	–	0.00	0.00

Note: 1 – Managers, 2 – Professionals, 3 – Technicians and Associate Professionals, 4 – Clerical Support Workers, 5 – Services and Sales Workers, 6 – Skilled Agricultural, Forestry and Fishery Workers, 7 – Craft and Related Trades Workers, 8 – Plant and Machine Operators and Assemblers, 9 – Elementary Occupations, 10 – Armed Forces Occupations
Source: own preparation.

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Table 6. Results of modelling the propensity for employed persons to change occupation

variable	estimate	Z-statistic	
1	2	3	4
Socio-demographic variables			
Sex (woman)	-0.05	-1.3	
Age	0.05	3.8	***
Age2	-0.001	-6.3	***
Size of place of residence	0.04	3.8	***
Education level	0.02	0.8	
No. of children	-0.23	-4.3	***
Unmarried / single			
Married	-0.23	-2.8	**
Divorced	-0.40	-2.7	**
Widow / widower	0.09	9.7	***
Region			
Zachodniopomorskie			
Dolnośląskie	-0.14	-1.2	
Kujawsko-pomorskie	0.02	0.2	
Lubelskie	0.08	0.6	
Lubuskie	0.01	0.1	
Łódzkie	-0.05	-0.4	
Małopolskie	0.00	0.0	
Mazowieckie	-0.09	-0.6	
Opolskie	-0.21	-1.6	
Podkarpackie	-0.18	-1.3	
Podlaskie	0.08	0.6	
Pomorskie	-0.17	-1.6	
Śląskie	-0.09	-0.6	
Świętokrzyskie	-0.20	-1.4	
Warmińsko-mazurskie	-0.13	-1.1	
Wielkopolskie	-0.03	-28.0	***
Qualifications			
Training Education	-0.09	-1.3	
Training Humanities	0.37	3.5	***
Training Social sciences	0.02	0.2	
Training Business	0.15	2.6	*
Training Life sciences	0.14	1.2	

1	2	3	4
Training ICT	0.29	3.4	***
Training Technical	0.19	2.9	**
Training Agriculture	-0.03	-0.2	
Training Health	0.01	0.2	
Training Services	0.24	3.9	***
Secondary Education	0.13	1.9	.
Secondary Humanities	0.07	0.8	
Secondary Social sciences	0.25	2.3	*
Secondary Business	0.28	4.5	***
Secondary Life sciences	0.09	1.1	
Secondary ICT	0.14	1.7	.
Secondary Technical	0.07	1.3	
Secondary Agriculture	0.07	0.7	
Secondary Health	0.04	0.5	
Secondary Services	0.18	3.1	**
Tertiary Education	0.01	0.1	
Tertiary Humanities	0.29	3.7	***
Tertiary Social sciences	0.13	1.5	
Tertiary Business	0.13	2.1	*
Tertiary Life sciences	0.24	3.0	**
Tertiary ICT	-0.06	-0.6	
Tertiary Technical	0.39	5.6	***
Tertiary Agriculture	0.30	2.3	*
Tertiary Health	0.02	0.2	
Tertiary Services	0.33	4.0	***

Significant at: *** 0.1%, ** 1%, * 5%, . 10%. Qualifications are presented according to their type or level, and by field or area. The description starts with type of qualification: Training means trainings and courses; Secondary means vocational or secondary education; Tertiary means higher education. It is supplemented with educational field: Education; Humanities means arts and humanities; Social sciences means social sciences, journalism and information; Business means business, administration and law; Life sciences means life sciences, mathematics and statistics; ICT means information and communication technologies; Technical means technology, industry, and construction; Agriculture; Health means health and social care; Services.
Source: own preparation.

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Table 7. Results of modelling the historical change of occupation

variable	estimate	Z-statistic	
Socio-demographic variables			
Sex (woman)	-0.30	-9.8	***
Age	0.13	14.8	***
Age2	0.00	-12.6	***
Size of place of residence	0.05	6.0	***
Education level	-0.04	-4.5	***
No. of children	0.02	1.0	
Unmarried / single			
Married	-0.08	-1.7	.
Divorced	0.36	5.5	***
Widow / widower	-0.004	-0.04	
Employment status (employed)	0.56	15.3	***
Region			
Zachodniopomorskie			
Dolnośląskie	0.05	0.6	
Kujawsko-pomorskie	-0.09	-1.0	
Lubelskie	-0.14	-1.5	
Lubuskie	0.19	1.6	
Łódzkie	0.10	1.1	
Małopolskie	-0.05	-0.5	
Mazowieckie	0.02	0.2	
Opolskie	-0.11	-0.9	
Podkarpackie	-0.25	-2.5	*
Podlaskie	0.07	0.6	
Pomorskie	0.15	1.6	
Śląskie	-0.06	-0.7	
Świętokrzyskie	-0.14	-1.2	
Warmińsko-mazurskie	0.08	0.7	
Wielkopolskie	-0.04	-0.5	

Significant at: *** 0.1%, ** 1%, * 5%, 10%.
Source: own preparation.

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