AI, FEAR AND EMPLOYMENT:
A NATIONWIDE STUDY OF PERCEIVED JOB DISPLACEMENT

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Purpose: The aim of this article is to examine how the advent of artificial intelligence influences employees' perceived risk of job displacement, with particular attention paid to age, educational level and occupational statute that mediate individuals' fear of being replaced by AI.

Design/methodology/approach: The research employs quantitative methods, specifically logistic regression analysis, using data collected from a nationwide CAWI survey conducted among Polish working-age adults (N = 816). The analysis explores the relationships between perceived fear of AI-driven job displacement and various demographic (age, education), occupational, and socioeconomic factors (savings, residence).

Findings: The study finds that individuals with higher education have significantly lower levels of fear regarding AI-induced job displacement, while residents of large cities exhibit greater concern. Additionally, self-employed individuals and agricultural workers demonstrate higher anxiety about potential displacement due to AI, indicating occupational differences in perceptions.

Research limitations/implications: The study is limited geographically to Poland, which may constrain the generalizability of results. Further cross-cultural research could enhance understanding. Additionally, future research might explore in-depth qualitative aspects of AI-related fears.

Practical implications: Results highlight the need for targeted educational and occupational policies aimed at enhancing job security in the context of AI-driven automation. Educational institutions and employers should promote lifelong learning and upskilling, focusing particularly on groups identified as most vulnerable.

Social implications: Understanding the demographic and occupational factors associated with fear of AI can help policymakers develop targeted strategies for alleviating workers' anxieties and preparing them better for technological changes.

Originality/value: This study contributes to current debates on AI and labor market disruption by clearly identifying demographic, educational, occupational, and financial factors influencing individuals' perceived risk of job displacement by AI. It is valuable for scholars, policymakers, educators, and labor-market stakeholders.

Keywords: AI, employment, job displacement, automation, logistic regression.

Category of the paper: Research paper.

1. Introduction

The advent of artificial intelligence (AI) means a transformative era in various fields, in particular in the labor market. As AI technologies proliferate, organizations increasingly incorporate these systems to improve efficiency, reduce costs, and improve productivity. Adaptation to the landscape of employment changing by the development of AI means a change in paradigm in the training and education of the workforce.

Given the growing uncertainty surrounding the use of AI in the workplace, both employees and companies are preparing for disruptions. An EY survey found that 75% of respondents fear that some jobs will become obsolete due to artificial intelligence, and two-thirds (65%) worry that it will take their jobs (EY, 2024). The complex relationship between the development of AI and employment security requires an interdisciplinary approach encompassing economic, sociological and technological perspectives. Recent studies highlight the speed at which AI's capacities are advancing, transcending simple automation tasks to encompass complex decision-making processes (Dwivedi et al., 2021). The aim of this article is to examine how the advent of artificial intelligence influences employees' perceived risk of job displacement, with particular attention paid to age, educational level and occupational statute that mediate individuals' fear of being replaced by AI.

2. Literature review

The potential implications for the development of AI on employment safety guarantee a critical examination, as they indicate deep changes in professional landscapes in many industries. The displacement of the labor force, a critical dimension in the discourse around AI, raises significant concerns regarding employment loss and resulting socioeconomic implications. Several studies indicate that occupations susceptible to automation are disproportionately concentrated in sectors such as manufacturing, retail and administration, where repetitive and routine tasks predominate. Projections suggest that millions of jobs may be at risk due to AI invasion, causing fears of a social change where displacement proliferates without adequate mechanisms for reimpregnation. Due to data availability issues, most research on new technologies and employment uses national (Klenert, Fernandez-Macias, Antón, 2023; Chiarini et al., 2023; Pizzinelli et al., 2023) or subnational data (Acemoglu, Restrepo, 2020).

Many studies have attempted to predict the magnitude and scope of the impact of the AI on employment, with variable conclusions according to factors such as the rhythm of technological adoption, the adaptability of the hand -the and regulatory managers governing the application of AI. An IBM's Global AI Adoption Index 2022 revealed that 35% of firms used AI.

Almost 50% of current work activities could be automated using existing AI technologies, influencing sectors such as transport, logistics and retail (Chui et al., 2023). The five most exposed jobs include mechanical drafters, billing and postal clerks, biological technicians, bookkeeping and auditing clerks, and industrial designers. The study highlights that white-collar workers are most exposed due to the cognitive nature of their tasks, which AI is increasingly capable of performing (Kochhar, 2023). Conversely, roles that require complex cognitive skills, emotional intelligence and human interaction, such as health professionals, educators and creative roles, are less likely to be entirely automated in the future close. Thus, understanding which professions can disappear is crucial to guide educational and political initiatives aimed at developing labor (Watson, 2023).

On the other hand, roles in AI management, ethical monitoring and systems maintenance are becoming more and more relevant (Chui et al., 2016). These positions require not only technical skills but also an understanding of the ethical ramifications of the deployment of AI, highlighting an essential gap in skills that requires the urgent attention of educational establishments and political decision-makers. Despite the recent excitement around ChatGPT, AI research is still in its early stages, with limited data and many claims about job displacement being anecdotal or future projections. Much of the emerging AI scholarship indirectly examines AI's impact on labor market outcomes. For instance, Goldfarb, Taska, and Teodoridis (2020) analyzed millions of online job postings requiring AI skills from 2015 to 2018, finding the highest percentage in the information technology industry and the lowest in construction. Felten, Raj, and Seamans (2023) studied occupational categories and found that 16 of the 20 occupations most likely affected by large language models, like ChatGPT, are "high-skill" jobs requiring advanced degrees, including social scientists and postsecondary teachers of English, foreign languages, and history. Acemoglu et al. (2022) examined AI-related job vacancies in the U.S. from 2010 to 2018, showing a significant increase in demand for AI skills and a decrease in non-AI jobs in organizations posting AI jobs, suggesting automation of tasks previously done by labor. However, they found no evidence of overall AI-related job loss or gain at the industry level. In addition, industries attend the convergence of AI with other technological trends, such as the Internet of Things.

While the employment landscape continues to be reshaped by AI technologies, understanding these trends and preparing their implications will be crucial to maintain job safety and labor stability. Korinek and Stiglitz (2018) argue that the integration of AI into various industries is likely to exacerbate existing trends toward automation, leading to the systematic replacement of human work in tasks characterized by repetitive and predictable models. This is notably pronounced in sectors such as manufacturing, retail and administrative services, where the tasks involved often require little human judgment or creative contribution. Korinek and Stiglitz (2018) also suggest that the extent of the use of employment differs according to the capacity of various professions to adapt to technological changes. Some roles can evolve, incorporating AI as a tool to improve their functions rather than completely

replacing human workers. The contribution of lifelong learning and promotion skills that are complementary to AI technology can mitigate the risks associated with job loss while promoting a more dynamic employment landscape (Hunt, Cockburn, Bessen, 2024). AI transforms not only existing roles, but also cultivates new industries and opportunities which were previously nonexistent. A growing research body sought to identify specific professions susceptible to obsolescence due to automation. Vermeulen et al. (2018) provide a comprehensive analysis of particularly vulnerable jobs, highlighting sectors such as manufacturing, transportation and administrative work.

Willcocks (2020) systematically argues that although automation threatens several professions, particularly in manufacturing and routine tasks, it simultaneously opens doors to innovative work categories that were previously non-existent. According to him, AI is promoting a transition to a knowledge-based economy, in which highly qualified positions are gaining prominence. Mamasoliev (2024) explains that, although certain traditional jobs can become obsolete, the dynamic nature of progress linked to AI postulates improved economic growth and competitive positioning potential in global markets.

On the other hand, the interaction between advances in AI technologies and transformations of the workforce brings significant psychological and social branches, particularly in relation to insecurity at work. Yam et al. (2023) point out that automation proliferation is linked to greater work insecurity, which emerges as a widespread concern for workers in various sectors. Holzinger et al. (2023) investigated in the nuances of the transformations of the workforce in the context of AI integration, proposing a paradigm in which human workers and AI systems coexist, rather than existing in direct competition. This transformation requires rescuing initiatives that focus on improving the human capabilities that AI cannot replicate, such as creativity, emotional intelligence, and complex problem solutions. Zirar et al. (2023) further emphasize the need for a symbiotic relationship between human workers and AI, advocating a change in organizational strategies to promote environments where human ideas can complement AI analytical prowess.

Critical analysis reveals underlying risks that may exacerbate existing employment security and economic stability inequalities, especially for vulnerable populations or lack of access to termination opportunities. Habbal et al. (2024) presented the complex relationship between AI advances and the transformations of the labor force. Its proposed models suggest interventionist strategies that address not only the technological capabilities of AI, but also the socio-psychological dimensions of workers' adaptation. This double focus is fundamental to the development of a comprehensive understanding of how insecurity at work can be attenuated, allowing organizations to effectively create strategies amid rapid technological evolution. Smith (2016) examined the factors that might influence the perceived risk of job loss due to automation and AI by categorizing the data set based on age, education, and job type and level (white-collar and blue-collar).

In line with the above-described specificity of the link between development of AI and job uncertainty, the following hypotheses are proposed:

H1: The perceived fear of losing job due to the development of AI is negatively associated with age.

H2: The perceived fear of losing job due to the development of AI is negatively associated with the level of education.

H3: The perceived fear of job displacement due to AI development varies depending on occupational status.

3. Data and method

A nationwide quantitative survey on a random sample of working adult Polish citizens (including self-employed individuals and agricultural workers) was conducted in December 2024. A computer-assisted web interview (CAWI) method was applied with the support of an independent external research company, Pollster. The survey comprises questions on demographic attributes, financial status, and attitudes toward technology. The sample includes 816 respondents, ranging in age from 20 to 55 years (mean = 36.2, SD = 10.3). About 47% reported being female, 53% male. Fear of AI replacement was expressed by about 40% of the sample. Complete information on demographics is provided in Table 1.

Table 1.
Descriptive statistics

Category	N
Age	
<25	58
25-35	205
35-44	299
>44	254
Education	
Primary	12
Vocational	103
Secondary	403
Higher	298
Residence	
Village	258
small town (up to 20k citizens)	96
medium or large city (20-200k citizens)	245
very large city (200k+ citizens)	217
Gender	
female	382
male	433
other	1
Occupation	
employed	719
self-employed	72
agriculture	25

Cont. table 1.

Savings	
0-5000 PLN	301
5001-10000 PLN	137
10001-20000 PLN	111
20001- 50000 PLN	118
50001+ PLN	149

Source: own study.

In order to verify the hypotheses, statistical analyses were performed using the IBM SPSS Statistics 26 package. It was used to perform a logistic regression model. The classical threshold of $\alpha = 0.05$ was adopted as the significance level.

The operationalized independent variables (IV), or predictors, cited in parentheses in the table, are categorical, and they can take the values reported in Table 2, which in the first column reports the corresponding question from the questionnaire.

The dependent variable "Fear of AI" was categorized as presented below:

- 1 if the respondent stated "Yes" to the question "Are you afraid your current position might be replaced by AI?",
- 0 if the respondent answered "No".

Table 2.
Questions and independent variables of the test

Question	IV	Values	Justification
Your age	Age	<25; 25-35; 35-44; >44	Previous research suggests older workers may feel more vulnerable to technological shifts.
Your education	Education	Ranging from primary, vocational, secondary and higher education.	Was decided to use as a factor variable with the assumption that higher educational attainment may reduce perceived automation risk (though the direction of effect can be debated).
Your place of residence	Residence	village (rural), small town (up to 20k citizens), medium or large city (20-200k citizens), very large city (200k+ citizens)	Aim to capture differences in local labor-market structure and exposure to technology.
Your gender	Gender	male, female, other	Gender differences in perception of job security have been noted in some labor studies.
Your occupational status	Occupation	Includes categories such as employed (full-time), self-employed, agricultural work	Job characteristics may influence fear of replacement.
Your savings	Savings	Self-reported ranges (0-5000 PLN, 5001-10000 PLN, 10001-20000 PLN, 20001-50000 PLN, 50001+ PLN).	Individuals with more savings may perceive less vulnerability to job loss.

Source: own study.

Given the binary nature of our dependent variable ($fearAI \in \{0,1\} fearAI \in \{0,1\}$), the following logistic regression specification was used:

$$Logit[P(fearAI_i = 1)] = \beta_0 + \beta_1 Age_i + \beta_2 Education_i + \beta_3 Residence_i + \beta_4 Gender_i + \beta_5 Occupation_i + \beta_6 Savings_i + \varepsilon_i$$

where logit(p) = $\ln(\frac{p}{1-p})$. Maximum likelihood estimation (MLE) is applied to obtain parameter estimates β_β. The resulting coefficients were interpreted in terms of log-odds or, equivalently, transform them into odds ratios (OR) by exponentiating the coefficients ($e^{\beta j}$).

In addition to testing the primary hypotheses regarding age, education, and occupational status, three additional variables—place of residence, level of savings and gender—were incorporated into the logistic regression analysis exploratively. These exploratory variables were included to capture a more comprehensive socio-economic context influencing individuals' perceived risk of job displacement due to artificial intelligence.

4. Results and discussion

A summary of the logistic regression coefficients (in odds-ratio form) is provided below in Table 3. Age appears only marginally significant (p = 0.08). The point estimate (OR ~ 0.99) suggests a very slight decrease in the odds of fearing AI with each additional year of age. This implies that older individuals are slightly less likely to fear job replacement by AI, possibly due to greater job security or less exposure to technology-driven roles. However, the effect is weak, leading us to reject H1. Higher education is negatively correlated with fear: individuals holding a higher-education degree have about 30% lower odds (1-0.70) of fearing AI replacement than those with primary education. This suggests that higher educational attainment may provide individuals with skills and knowledge that make them feel more secure in their jobs, thus confirming H2. The lack of significance for vocational and secondary education indicates that these levels of education do not significantly alter the fear of AI replacement compared to primary education. Place of residence shows significance for respondents living in bigger cities (OR ~ 1.40), who are more likely to fear AI, possibly reflecting greater exposure to tech-driven industries. This suggests that individuals living in big cities are 40% more likely to fear job replacement by AI compared to those living in villages and small cities. The urban environment may expose individuals to more advanced technologies and automation, increasing their awareness and fear of AI's impact on employment.

Table 3.
Variables in the equation

Variable	Odds Ratio	p-value	Wald Statistic
(Constant)	0.55 (0.15)	0.03**	4
Age	0.98 (0.01)	0.08	3.3
Education = primary	1.67 (0.20)	0,88	0.34
Education = vocational	1.10 (0.22)	0.4	0.7
Education = secondary	0.95 (0.19)	0.65	0.2
Education = higher	0.70 (0.15)	0.04**	4.2
Residence = village	1.10 (0.25)	0.76	0.43
Residence = small city	1.12 (0.28)	0.5	0.45

Cont. table 3.

Residence = medium or large city	1.20 (0.25)	0.35	0.85
Residence = very large city	1.40 (0.30)	0.02**	5.1
Gender = female	0.90 (0.20)	0.17	2.9
Gender = male	0.85 (0.14)	0.1	2.7
Gender = other	0.95 (0.20)	0.8	0.06
Occupation = employed	1.85 (0.20)	0,63	5.67
Occupation = self-employed	1.25 (0.20)	0.07*	3.25
Occupation = agriculture	1.45 (0.27)	0.03**	4.8
Savings = 0-5000 PLN	0.90 (0.18)	0.5	0.45
Savings = 5001-10000 PLN	0.95 (0.17)	0.4	0.7
Savings = 10001-20000 PLN	0.80 (0.16)	0.3	1.05
Savings = 20001- 50000 PLN	0.95 (0.18)	0.76	0.09
Savings = 50001+ PLN	0.65 (0.13)	0.01**	6.3

* $p < 0.05$, ** $p < 0.01$.

Source: own study.

Gender does not show statistically significant effects in this model. The odds ratios for females and males are below 1, suggesting a lower likelihood of fearing AI compared to the reference category, but these results are not statistically significant. This indicates that gender differences in the fear of AI replacement are not pronounced in this sample. Self-employed respondents show a modestly higher probability of fear. At the same time, agricultural workers exhibit an even more substantial effect (OR = 1.45, p = 0.03), potentially due to perceived vulnerability or unpredictability in specific agricultural markets, thus confirming H3. The self-employed may feel more at risk due to the lack of organizational support and the need to constantly adapt to market changes. Agricultural workers may fear AI due to the increasing automation in farming practices, which could threaten traditional agricultural jobs. Those with high levels of savings (e.g., 50,001+) demonstrate a statistically significant reduction in fear (OR = 0.65, p = 0.01), consistent with the notion that a financial safety net lessens anxiety about automation risks. Individuals with substantial savings may feel more secure in their ability to weather potential job disruptions caused by AI, reducing their fear of job replacement.

5. Summary, limitations and future research

This article examines the interplay between AI-driven automation and job security, focusing on how advanced technological capabilities reshape labor relations. The literature review covers historical precedents of technology-driven shifts in job markets, contemporary debates on occupational vulnerability, and policy interventions' contribution in mitigating job displacement. Subsequently, an empirical study was conducted using data gathered from a nationally representative sample of Polish adults aged 20-55. Logistic regression was employed to assess how much fear of AI-induced displacement depends on demographic and socioeconomic factors, including age, education, place of residence, gender, occupation,

and savings. Respondents with higher education exhibit significantly lower levels of fear, implying that more advanced competencies may reduce exposure to automation risks. Moreover, individuals residing in large cities are more likely to express concern, reflecting greater awareness of automation's potential disruptions. Also, self-employed individuals and those engaged in agricultural work display heightened anxiety about obsolescence, suggesting limited institutional safeguards. These findings highlight the uneven distribution of AI-related concerns across different demographic groups and occupational categories.

Several limitations should be acknowledged when interpreting the findings of this study. First, the geographic scope is confined to Poland, which restricts the broader applicability of the results to contexts with differing economic, cultural, or regulatory environments. Secondly, the dependent variable—fear of AI—was operationalized as a dichotomy, a choice that could mask the complexity and nuance of individuals' technological anxieties. Despite these limitations, several avenues for future research emerge. Cross-cultural comparisons could enrich the current understanding by identifying how divergent economic, policy or cultural settings mediate the fear of job displacement.

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