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Should I Stay or Should I Go? Transitions to Inactivity in Poland

Zostać czy odejść? Ścieżki prowadzące do nieaktywności zawodowej w Polsce

Abstract

Given Poland's aging population, maintaining the labor supply is a major long-term policy challenge. This study investigates the determinants of individual decisions to leave the labor force. The flow probabilities were estimated using the rotating panel data from the 2010–2019 Polish Labor Force Survey (PLFS). We find that these decisions depend not only on life-cycle moment, educational level, and work experience, but also on family arrangements and work-life preferences. We also discuss that agricultural employment can be considered a labor force buffer in rural areas.

Keywords: Agriculture, Worker Flows, Multinomial Logit, Labor Market Transitions.

JEL: J21, J62

Streszczenie

Starzenie się ludności w Polsce powoduje że jednym z najważniejszych długookresowych wyzwań polityki rynku pracy jest utrzymanie zasobów siły roboczej. W niniejszym badaniu analizowane są determinanty indywidualnych decyzji o odpływie z zatrudnienia do bierności zawodowej. W oparciu o panel rotacyjny Badania Aktywności Ekonomicznej Ludności obejmującego lata 2010–2019, oszacowane zostały prawdopodobieństwa odpływów z zatrudnienia. Wykazano, że zależą one nie tylko od momentu cyklu życia, wykształcenia i doświadczenia jednostki, ale także od ograniczeń rodzinnych i preferencji dotyczących równowagi między życiem zawodowym a prywatnym. W szczególności omówiono rolę rolnictwa jako bufora zatrzymującego wśród aktywnych zawodowo osoby na obszarach wiejskich.

Słowa kluczowe: rolnictwo, przepływy na rynku pracy, przepływy pracowników, wielomianowy logit.

JEL: J21, J62

1. Introduction

Many empirical analyses of the labor market focus on the determinants of its basic metrics, e.g., its employment or unemployment rates. However, with the growing popularity of labor market matching theories, academic discussions have recently shifted towards understanding the determinants of the flows rather than the stocks. In line with this trend, the present study analyzes the factors that influence individual decisions to transition to inactivity. The focus is on the determinants of employment outflows, particularly flows to inactivity.

From an economic perspective, it is crucial to understand the factors that drive decisions to leave the labor market, whether temporarily or permanently. The present study divides these factors into three distinct groups: (i) external factors regulated by law (e.g., retirement age reforms); (ii) economic conditions (e.g., job destruction); and (iii) individual decisions or constraints (e.g., work-life preferences, fertility decisions, and health issues). To the authors' knowledge, most of the macroeconomic literature on flows does not rank these factors in any way.

Understanding how various factors influence labor market outflows is particularly important for policymakers. A comprehensive knowledge of labor market dynamics helps identify key factors for increasing employment rates among specific groups, thereby improving policy design. The present study therefore addresses the following questions:

1. Do the factors that keep individuals in employment vary across their life cycle stages?
2. Do outflows depend on family arrangements and work-life preferences, as well as education and labor market experience?
3. What role does agriculture play? Should it be considered a distinct labor market state or more as a buffer between employment and inactivity?

The present study focuses on the Polish labor market. Quarterly data from the 2011–2019 Polish Labor Force Survey (PLFS) are used. Poland was chosen because it is the largest country among the New Member States and because it has experienced significant labor market transformations over the past three decades. As the Polish economy transitioned from decades of state control to a market-based system with privatized industries, it embarked on a steady growth path.

Since the end of 2010, this economic development has been accompanied by structural changes in the age composition of the labor force. However, the decreasing working-age population now poses challenges to sustaining economic growth. Poland is undergoing a demographic transition that is significantly impacting the labor market (Tatarczak and Janik, 2023).

Additionally, the Polish economy has a relatively low labor force participation rate, which exerts pressure on public finances and hampers economic growth (Tatarczak and Janik, 2023). Policymakers face the challenge of implementing measures to raise the labor force participation rate so as to counteract the negative effect of demographic trends. Efforts to increase labor activity and reduce, or at least delay, outflows from the labor market are critical to mitigating these issues.

The present study adds to the literature on labor market flows in several ways. Firstly, it focuses on outflows to inactivity. This addresses a gap in the literature in

that it primarily examines flows between different states. Inducements to exit the labor market are of special interest.

Secondly, agriculture is considered a separate state in order to determine whether it functions as a buffer between employment and inactivity. The flows from non-agricultural employment to agricultural employment are viewed as an alternative to unemployment or inactivity.

Thirdly, the factors that influence the decision to leave the labor market are categorized into separate groups. This approach enhances the empirical literature on labor market transitions by emphasizing supply-side factors and evaluating the relevance of specific personal and household characteristics on individual labor market prospects. In particular, it is shown how these factors vary depending on an individual›s life cycle stage, family arrangements, and work-life preferences.

The paper is structured as follows: Section 2 presents the motivation for this research and describes the macroeconomic background of the analysis. Section 3 reviews the relevant literature and presents the hypotheses. Section 4 describes the data and methodology, including the conceptual framework, empirical strategy, and related issues. Section 5 presents the results of the analyses. Finally, Section 6 presents robustness checks, discusses the limitations of the study, and concludes the paper.

2. Macroeconomic background: Polish agriculture and the labor market

The macroeconomic background sketched in this study essentially comprises the main characteristics of the Polish labor market. Although they are converging, the labor market characteristics of Poland, as in most CEE economies, still differ from those of more advanced economies. This results mainly from the fact that, for many years, the gross value added and the employment structure of CEE have been characterized by a high share of agriculture and industry and a relatively low share of services.

The regions with the highest employment rates in agriculture have usually been characterized by relatively low unemployment rates. Rogut and Tokarski (2002) explain this with reference to the high hidden unemployment rates in agricultural regions. They also note that these regions are characterized by a low rate of outflows from unemployment to employment.

The Polish labor market can be characterized by the following trends. Firstly, demographics no longer support economic growth, as they did in previous decades. The number of people of working age 15–59/64 has been declining since the 2010s. While this trend is evident in most developed economies (Jones, 2022), the second demographic transition in Poland has been more pronounced compared to other economies (Kotowska, 1999).

Secondly, not only does Poland have a low proportion of working age people, but its labor force participation rate is low compared to that of most developed economies. This is accounted for by such factors as late labor market entry (mostly due to the large proportion of young people pursuing higher education), career breaks

(especially after childbirth), and early exit (largely due to the relatively generous early retirement programs introduced in recent decades).

Early labor market exit is also caused by insufficient aged care for those aged 80 and over. Family members often have to care for elderly relatives and a significant proportion of these informal caregivers are labor force participants under the age of sixty-five. In particular, women often take on family duties. A study of women in twelve European countries found that only 6 percent of preretirement-age (45 to 59) caregivers were in the labor force, while for women in this age cohort, the figure was 50 percent (Spiess and Schneider, 2003).

Life expectancy in Poland has been increasing since 1992. Nevertheless, healthy life expectancy remains below the EU average. This has resulted in an increasing number of adults requiring care, which in turn has raised the demand for caregivers. These are often family members who have to leave the labor market to look after their relatives. Zajkowska and Rokicka (2021) explored the profiles of people caring for older adults in Poland and found that they are often women (76.8% compared to 63.3% among non-caregivers). Caregivers are also, on average, older than non-caregivers (the average age is 55, with the average age in the sample being 48), and most are not employed (66.9%).

Poland's high inactivity rate has also been noted by the OECD (2021), which stated that despite the positive long-term trend, it remains above the OECD average. Of relevance here, the OECD raised the issue of the inactivity of older people in the working age cohort. In 2019, economically inactive people aged between 55 and 64 accounted for 35% of the economically inactive working-age population in Poland, compared with the OECD average of 20% (OECD 2021). Moreover, during the analyzed period (2011–2019), Poland's unemployment rate fell significantly and is now one of the lowest in the EU. This is mostly due to the continuing improvement in the economic situation. It has recently recorded the second-lowest unemployment rate in the EU after the Czech Republic. However, while low unemployment rates have long been the norm in the Czech Republic, they are perceived as the outcome of a structural shift in Poland. Poland had the highest unemployment rate in CEE in 2004 but one of the lowest in 2019. This achievement is perceived to be a consequence of the sweeping economic transformations over the last few years.

An understanding of labor market characteristics is also important in construing what is herein described as the fourth state of the labor market, namely agriculture. This sector plays an important role in the Polish economy.

Owners of a farm exceeding 2 ha are legally unable to register as unemployed, even if they are seeking employment outside agriculture. For this reason, farm owners often seek agricultural employment when they lose or leave non-agricultural employment, even if the scale of farm production is only large enough to provide for their own needs.

Farm production is taxed differently from non-farm production or services. In addition, mandatory social security contributions to the Agricultural Social Insurance Fund (KRUS) are lower than those for the Universal Social Insurance Institution (ZUS).[1]

[1] In 2012 the basic quarterly KRUS contribution was 122 PLN, while the minimum-wage monthly ZUS contribution was equal to 133 PLN. In 2019 they were 136 PLN and 483 PLN, respectively.

Not only do farmers pay lower social insurance contributions (to KRUS), but instead of paying income tax, they pay an agricultural tax calculated on the area sed, unless they run a "special production." To qualify for KRUS social security contributions, it is necessary to own a farm. Farms can be inherited or purchased conditional on an individual's agricultural education. Individuals not employed in agriculture or who are self-employed cannot contribute to KRUS, even if they own a farm and are engaged in agricultural production. Due to these restrictions, and to a favorable labor market, the number of farmers has decreased over time. KRUS insured 1,492,300 individuals in 2912, but only 1,199,300 in 2019.

According to the Agricultural Census, there were 1,317,000 operating farms in Poland in 2020, but only 39,000 of them were larger than 50 ha. This agrarian fragmentation has resulted in high labor intensity and low productivity (38.4% of the EU average).

Agricultural employment is not only subjected to lower social security contributions; it is also less demanding in terms of productivity. Therefore, it can serve as an intermediate option between employment and inactivity in areas where local labor markets offer fewer opportunities.

3. Literature review

There has been a great deal of research on labor market transitions – commonly referred to as flows – and their measurement. Since the 1970s, labor market analyses have increasingly adopted a dynamic approach, highlighting the significance of flows between labor market states. Early studies concentrated primarily on the flows between unemployment and employment. Over time, a substantial body of literature on multi-state transitions and inactivity has emerged. By adding non-employment as a distinct labor market state, Elsby et al. (2015) found that the labor force participation margin is crucial for understanding fluctuations in the unemployment rate.

Labor market transitions encompass various states, including employment, unemployment, and inactivity, as well as transitions between formal and informal employment, and shifts across different occupations or industries. The present study concentrates on the outflows from the labor market, with a particular focus on understanding the factors that influence these transitions. These exits may be encouraged by external economic conditions or by individual constraints and decisions.

Several studies analyze transition probabilities in labor markets in both developing economies (Haltiwanger and Vodopivec, 2002; Tasci and Tansel, 2005; Blunch and Sulla, 2011) and developed countries (Faik, 2012; Gomes, 2012). This research also covers transition economies, e.g., the Czech Republic (Huitfeldt, 1998; Stefanova et al., 2007), and Russia (Grogan, 2000). The most popular methodology in these studies involves estimating multinomial logit (or – albeit less often – probit) models to explain the probability of individual changes in the labor market states. The individual characteristics taken into account most commonly include age, tenure, gender, education, and marital status.

The role of age is consistently highlighted across studies. Empirical research, including works by Chéron et al. (2013) and Menzio et al. (2016), documents significant variations in labor market flows and stocks by age. Young workers are the most likely to change employment status due to their higher probability of both job loss and job acquisition (Terrell and Sorm, 1999; Bell, 2001; Vodopivec, 2002; Lehmann et al., 2005). Conversely, older workers are most likely to exit the labor market. This trend supported by several studies (Bell, 2001; Bukowski and Lewandowski, 2005; Earle, 2012; Vodopivec, 2002).

Labor market institutions often set age limits that affect motivation, with early access to retirement age benefits potentially discouraging continued employment, even before reaching an age where it is difficult to earn an income (Galecka-Burdziak and Góra, 2016). Some studies suggest that reducing work hours before retirement due to health constraints or caregiving obligations can influence the decision to leave the labor market (Machado and Portela, 2014). Part-time work can offer a way to remain active in the labor market despite these factors. Opportunities for phased or gradual retirement could thus help mitigate the outflow of older workers from the workforce. This leads to the first hypothesis of the study (H1): *The option of working part-time lowers the probability of the 55-70 age group becoming inactive*.

Labor force participation varies across different demographic factors, e.g. sex, age, education, marital status, and the presence of young children at home. These factors are closely linked with the individual's life cycle. Changes in overall labor force participation or inactivity rates can be explained by trends within demographic groups and shifts in the population's demographic characteristics. This brings us to the second hypothesis (H2): *Factors affecting the probability of becoming inactive in the labor market change over an individual's life cycle*.

The following two more specific hypotheses are proposed:

- Hypothesis H3: *Having young children increases the probability of the 25–34 age group becoming inactive*.
- Hypothesis H4: *The option of working part-time helps the 35–54 age group maintain labor market activity, but is not seen as a long-term commitment*.

Individuals in the 35–54 age group are typically at the peak of their careers, and seldom have young children or elderly relatives to care for. Their motivations to change their labor market status therefore differ from those of other age groups.

Another significant factor explored in the literature is education. The findings are consistent: better education correlates with a lower probability of becoming unemployed and a higher probability of finding a job if unemployed. Some studies also indicate that better-educated individuals are more likely to find employment in the service sector and less likely to be employed in agriculture (Bell, 2001; Terrell and Sorm, 1999; Bukowski and Lewandowski, 2005; Earle, 2012; Vodopivec, 2000). Additionally, the probability of transitioning to inactivity decreases with higher levels of education. Lamo et al. (2011) noted that in Poland, workers with vocational education are more likely to leave the labor market, and that those with basic vocational education are more likely to do so than those with secondary vocational education. This trend is especially evident among older workers, where those with vocational education have a higher probability of transitioning to inactivity. Gerbery

and Miklošovič (2020) further confirmed the role of education as a determinant of labor market flows, finding that individuals with high levels of education are less likely to become inactive than those with lower levels of education.

Regarding other factors, studies have found that women generally have a lower probability of changing their labor market state (Sorm and Terrell, 2000; Jackson and Mach, 2009). They also have a higher probability of becoming inactive (Vodopivec, 2000; Bukowski and Lewandowski, 2005; Earle, 2012). Child benefits may reduce labor supply, and women, especially mothers, tend to be more responsive to such transfers (Blundell, 1995). Having children is known to negatively impact women's labor force participation. In many developed economies, the labor force participation rates of prime-age men and women show that this difference becomes more pronounced when children are present in the household. Hence Hypothesis H5: *Women, particularly mothers, are more likely than men to become inactive*.

Unay and Kataria (2014) analyzed labor force flows, particularly outflows from the labor force, based on the degree of urbanization during the 2008–2009 crisis period. Their findings suggest that education level and marital status have different impacts on transitions to inactivity in rural and urban regions during economic downturns. Additionally, Bukowski and Lewandowski (2005) observed that residing in a big city decreases the likelihood of becoming unemployed.

As for the role of institutional settings on labor force transitions, some studies highlight the influence of public employment services. Most analyses show that fewer people leave the public sector than the private sector transferring to unemployment or inactivity. Fontaine et al. (2020) found that in four countries (the UK, France, the USA, and Spain), the probability of a worker moving from employment to inactivity is approximately 30 percent higher in the private than the public sector.

Caseworkers in public employment services implement active labor market policies by providing vocational training, temporary employment opportunities, and job search programs to registered unemployed individuals. However, institutional factors are less frequently discussed in the literature.

The role of the agricultural sector in CEE countries has also received relatively little attention. However, there are studies that show that workers previously employed in agriculture or declining industries are more likely to exit the labor force after becoming unemployed (Bukowski and Lewandowski, 2005; Orazem et al., 2005). Sorm (2000) notes that those working in agriculture are more likely to leave the labor force from a state of either unemployment or employment. Without agricultural employment, these individuals would likely become inactive, especially since rural labor markets offer few employment opportunities and commuting is not always feasible. Hence Hypothesis H6: *Working in agriculture acts as a buffer between employment and inactivity for rural dwellers*.

The bulk of the literature on the Polish labor market focuses on the period prior to joining the EU in 2004. Among the studies using more recent data, Cichocki et al. (2017) analyzed quarterly Polish data up until 2015 to investigate gross worker flows and their business cycle properties. This study primarily examines the cyclical nature of gross worker flows during the first two decades of Poland's economic transition.

Tyrowicz and van der Velde (2014) utilized data from 1990 to 2006 to examine worker flows in transition countries and analyze their impact on selected macroeconomic variables. They found that as transition progressed, the dominant types of worker flows evolved. Initially, transitions from public to private employment were most significant, but later, flows from industry to services became more prominent. However, they emphasized that the most crucial flows occurred within, rather than between, industries and sectors. Additionally, they highlighted the influence of demographic trends on these flows. Some authors stress the role of the business cycle in their analyses of flow intensity (Strawiński, 2009; Flek et al., 2018; Galuščák et al., 2021; Flek et al., 2022).

More recently, Cichocki and Siwińska (2021) analyzed the individual determinants of flows from employment to unemployment and inactivity, as well as flows from the public to the private sector and from manufacturing to services in Poland. Similar to other research on Poland, they used 1995–2015 PLFS data from 1995 to 2015, and employed multinomial logit and logit models in their analyses.

4. Data and Methodology

4.1. Descriptive statistics

The present analysis uses individual quarterly PLFS data from 2011 to 2019. This dataset was selected for its comparability and relevance. The year 2011 marks the first use of the National Census of Population and Housing 2011 for creating individual weights, while 2019 marks the last year before the COVID-19 pandemic introduced exogenous shocks into data collection and weighting. These have the potential to distort long-term trends.

The PLFS is a representative, individual-level survey that covers persons aged 15 and over who are members of sampled households. Since 2001, the PLFS methodology has been aligned with Eurostat recommendations, thereby enabling international comparisons. The survey employes a rotating panel design, with the scheme of surveying households within 2 consecutive quarters, followed by 2 quarters of break, and 2 quarters of surveying. The sample comprises 450,141 observations.

The sample was restricted to individuals aged 25–70. To test the hypothesis that the factors influencing labor market behavior and affecting flows out of activity vary according to life cycle stage (H2), the sample was divided into three age cohorts:

1. 25–34: This group includes individuals who have mostly completed their education, started their professional career, and are making significant family decisions (e.g., marriage, children).
2. 35–54: This group encompasses individuals at peak productivity, where decisions affecting labor market flows are influenced more by external factors than by family-related factors.
3. 55–70: This group consists of individuals considering (early) retirement or deciding to remain in the labor market.

Table 1.
Descriptive statistics

	25–34		35–54		55–70	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
age	29.74	2.84	43.76	5.79	59.02	3.38
years of education	14.34	2.39	13.76	2.45	13.36	2.48
female	0.44	0.50	0.47	0.50	0.42	0.49
children	0.81	0.90	0.96	0.99	0.16	0.49
children under 8	0.66	0.79	0.38	0.66	0.08	0.33
rural	0.35	0.48	0.34	0.47	0.26	0.44
farm	0.11	0.31	0.09	0.29	0.07	0.26
part-time	0.05	0.21	0.04	0.20	0.12	0.32
public	0.21	0.41	0.31	0.46	0.35	0.48
partner	0.63	0.48	0.82	0.39	0.80	0.40
working partner	0.63	0.48	0.82	0.39	0.80	0.40
partner's working hours	53.66	38.93	56.83	34.76	48.80	35.31
second job	0.06	0.23	0.08	0.27	0.06	0.24
total job experience	7.75	3.91	21.20	7.64	35.96	6.72
N	118984		245678		85467	
weighted N	140681		249213		75699	

Source: PLFS, own calculations.

Table 1 presents the descriptive statistics of the sample for each age group. The oldest age group (55–70) has more women than men, which accurately reflects the actual demographic structure of this cohort in Poland. This group also has the lowest average years of education, although the difference in educational attainment between the oldest and the youngest groups is not substantial. Additionally, this age group has the smallest proportion of individuals living in rural areas, residing on farms, or employed in the public sector.

The middle age group (35–54) has the highest proportion of individuals who live in rural areas and on farms, or who hold a second job, and by far the highest percentage of individuals employed in the public sector. Interestingly, this group also has the highest number of individuals who express a desire to work less and the highest number of working partners. These factors might seem counterintuitive, but the lower labor market activity rate in this age group suggests strong self-selection.

The youngest age group (25–34) typically has the youngest children, necessitating full-time care, which is supported by demographic trends. Although the middle-aged group has the most children overall, the need for childcare is more pressing in the younger age group due to their children's ages. This observation explains why the age of children was included as a possible factor affecting employment outflows.

Apart from the typical three labor market states (employment – in the tables denoted E, unemployment – U, and inactivity – I), agriculture (denoted R) is enumerated as a distinct fourth state. In Poland, agricultural employment primarily serves to

meet personal or family food needs, resulting in lower productivity and remuneration than other sectors of the labor market. Based on these assumptions, the present study argues that flows from non-agricultural to agricultural employment can be considered alternatives to unemployment or inactivity, particularly for middle-aged individuals.

Labor market transitions are movements between these labor market states. In the full sample, 1.8% of employed individuals transition out of employment. The highest outflow rate is among the oldest group (3.0%), while the lowest is among the middle-aged group (1.3%) (see Table 2).

Flows from non-agricultural employment to individual agriculture range from 6.9% of all employment outflows in the middle-aged group to 3.7% in the oldest age group. Transitions from employment to unemployment decrease with age, from 46.83% of all employment outflows in the youngest group to 37.26% in the oldest. Outflows to inactivity are most frequent among the oldest (81.28% compared with 48–49% for the others).

Table 2.
Transitions from employment by age

Age	E	E ⟶ U	E ⟶ I	E ⟶ R	Total
25–34	133319	1258	1323	109	136009
	98.0%	0.9%	1.0%	0.1%	
35–54	237779	1420	1518	219	240935
	98.7%	0.6%	0.6%	0.1%	
55–70	70954.8	335.3	1812.5	82.4	73185
	97.0%	0.5%	2.5%	0.1%	
weighted N	442053	3013	4653	410	450129
%	98.2%	0.7%	1.0%	0.1%	

Source: PLFS, own calculations.

Most transitions from agriculture to inactivity are driven by health issues or retirement. Individuals moving from unemployment to inactivity often citereport the termination of a contract or layoff (retrenchment) as reasons, indicating that unemployment is not a steady state, and claim that they became discouraged after a period of fruitless job hunting. Flows from employment are almost equally distributed among retirement, contract termination, and family reasons (including family leave). Job termination or family issues are likely to cause only temporal inactivity, as the majority of the inactive population is motivated by retirement and health reasons (see Table 3).

Table 3.
Reasons why individuals entered inactivity by flow status [%]

t	I	E ⟶ I	U ⟶ I	R ⟶ I	Total
retirement	40.39	23.38	2.72	25.67	39.21
health	26.91	10.71	7.94	25.1	26.17
job destruction	11.76	11.08	31.47	3.76	12.15
fired	1.38	3.11	6.45	1.51	1.52
left	1.51	5.08	8.61	2.26	1.73
end of contract	3.8	20.97	25.67	23.03	4.66
family, personal	12.62	21.62	15.24	14.56	12.86
education	0.11	0.33	0.37	0.16	0.12
army	0.02	0.01	0	0	0.02
other	1.51	3.7	1.53	3.95	1.56

Source: PLFS, own calculations.

Although the sample consists solely of working-age individuals, retirement remains the most frequent reason for inactivity. Those who have stopped working or who are seeking employment are primarily motivated by family and personal reasons (see Table 4).

Employment in agriculture seems more of a necessity than a less demanding occupation if the above sample is any guide. The average weekly working time in agriculture is 48.2 hours, while in non-agricultural employment is 39.2 hours per week.

Table 4.
Reasons why individuals do not look for employment by transition status [%]

Reason	I	E ⟶ I	U ⟶ I	R ⟶ I	Total
discouraged	4.6	7.68	33.01	6.1	5.22
education	0.86	1.63	2.48	0.29	0.91
family, personal	19.23	38.7	43.99	25.49	20.07
retirement	51.64	30.1	4.06	33.46	50.29
health	21.61	15.2	13.3	24.14	21.34
other	2.05	6.7	3.16	10.51	2.17

Source: PLFS, own calculations.

The flow from non-agricultural to agricultural employment might also be induced by the loss of, or resignation from, principal employment, as 43.35% of respondents with more than one job claimed that the second one was in agriculture.

Finally, part-time employment is seldom an unrestricted choice. Only 44.73% of part-time contracts are indefinite term. Only 20.36% of part-timers with fixed term contracts are satisfied with this arrangement solution, and 25.15% cannot find other jobs.

4.2. Methodology

Four labor market states, namely. Employment, unemployment, inactivity, and agriculture, are distinguished. We intend to answer the question, of whether there are different factors that affect transitions to inactivity depending on the age of the individual.

To calculate flows we need to match individuals across the survey waves. At issue are attrition, temporary absence, and nonresponses, which might be correlated with the outcomes of interest (since the sampling unit is the household i.e., young individuals moving for a job cannot be matched across the survey waves). Following Donovan et al. 2023 the *survwgt* package for Stata was applied to post-stratify the cross-sectional weights so that the population distribution over selected dimensions would fit the official marginal distributions for these variables. Reweighting was performed using age, gender and labor market status variables over time.

Multinomial logits with a White variance–covariance matrix were estimated to determine the impact of selected factors (x_i) on the probability of leaving non-agricultural employment (p_{Es}). The estimated equation is described as follows:

$$p_{Es} = \frac{\exp(\mathrm{x_i}\ \beta_\mathrm{m})}{1+\Sigma_\mathrm{s}\ \exp(\mathrm{x_i}\beta_\mathrm{m})} \tag{1}$$

where:
$s \in \{U, R, I\}$ is the flow to unemployment (U), employment in agriculture (R), or inactivity (I).

In the initial formulation of the model, based on the literature, the following explanatory variables were used:

- age – a continuous variable calculated based on the year of birth;
- years of education – a continuous variable for years of completed education, calculated on the basis of the self-reported level of education;
- female – a dummy variable for gender (1 for female, 0 for male);
- children – number of children in the household aged 0–17 years;
- rural – a dummy variable indicating whether an individual lives in a rural area (1 for rural, 0 for urban);
- part-time – a dummy variable indicating whether an individual works part-time or full-time (1 for part-time, 0 for full-time);
- public – a dummy variable indicating whether an individual works in the public or private sector (1 for public, 0 for private);
- children under 8 – children in the household aged 8 and younger, i.e., the family leave entitlement threshold as set out in the Polish Labor Code;
- partner – a dummy variable indicating whether there is a partner in the household (1 if an individual pointed out another household member as a partner, 0 otherwise);
- partner working hours – a continuous variable reporting the typical (average) number of hours worked in the main workplace as self-reported by the partner of the interviewed individual;

- total experience – defined as a total number of years spent working retrospectively as self-reported by the individual;
- second job – a binary variable indicating the holding of more than one job (1 for having more than one job, 0 for having one job).

Interactions between the selected variables were additionally allowed for.

Following the most popular approach in the literature, flow determinants were analyzed using a multinomial logit model. The multinomial logit model seems to be the most appropriate method to estimate the influence of individual factors on the probabilities of transitions in the labor market. The White sandwich estimator of variance was also used. This is robust for some kinds of misspecification. All estimation tables report odds ratios and standard errors.

Several robustness checks were employed to confirm the estimates and conclusions. The subsample was divided into 2011–2014 and 2015–2019 periods to account for business cycle effects, and yearly flows were estimated to account for seasonal changes. Finally, the analysis estimating inflows into inactivity was reversed.

5. Results

5.1. Individuals aged 25–34

This section presents detailed results of the estimations for the younger age group, which consists of individuals aged 25 to 34. Following the literature, we expect women, particularly mothers, to be more likely to become inactive. Mothers more often interrupt their careers and leave (at least temporarily) the labor market. This results not only from the free choices of women but perhaps, especially in rural areas, from a lack of affordable and accessible childcare facilities or services (both private and public). The study therefore controls for having children in the household, and for their ages (i.e., whether they are no older than 8).

The basic model, which controls for gender, education, and basic job characteristics [Table 5 and Table 6, column (1)] is first estimated and variables related to family composition then added [Table 5 and Table 6, column (2)]. The third model includes variables related to the spouse's work intensity [Table 5 and Table 6, column (3)]. Finally, a model with variables related to individual labor intensity is estimated [intensive margin, Table 5 and Table 6, column (4)].

The description of the results begins with the family-related variables. Firstly, women are more likely than men to transition from employment to inactivity. While having children, as expected, generally seems to act as a factor that keeps individuals in employment, it does not significantly influence flows to agriculture.

When considering the interaction between gender and having children, mothers are significantly more likely to become inactive. Age is only an important factor for flows to inactivity; it is not significant in any model analyzing flows to agriculture. This will be further discussed in the conclusions, but it is important to note that age impacts labor market exit decisions differently for men and women.

Among the family-related variables, the effect of having an employed partner, their working hours, and the interaction between gender and partner working hours are considered. When analyzing outflows to inactivity, an interesting pattern emerges: women with working partners are more likely to leave the labor market, whereas this is not the case for men. These findings support the intrahousehold specialization hypothesis, which is based on cultural factors, and the generally higher earnings of men.

Individuals living in rural areas have a higher probability of leaving the labor market, with outflows to agriculture being more likely than outflows to inactivity. This is consistent with the unique characteristics of Polish agriculture, as discussed above.

Both inflows to inactivity and agriculture are more likely among part-time workers, indicating a weaker attachment to the labor market compared to full-time workers. Family variables generally have a greater impact on flows to inactivity than to agriculture. Moreover, working in the public sector is associated with a lower probability of transitioning to inactivity. Conversely, part-time workers are more likely to become inactive. Transitions from employment to farming are more frequent among less educated individuals, those in the private sector, and part-time workers. As expected, outflows to agriculture are more likely for those living in rural areas or having a family farm, highlighting the importance of appropriate infrastructure. Additionally, having a second job is associated with an increased likelihood of transitioning to agriculture. Labor market institutions also play a role, as having a part-time job is positively related to all probabilities of out-of-employment flows, suggesting a loose attachment to the labor market.

Table 5.

Multinominal 4-state logit model estimates, quarter to quarter employment to inactivity (E → I) transition part of the model (25–34 years, odds ratios, N = 118986)

E → I	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
age	0.891***	0.891***	0.903***	0.907***	0.935***	0.891***	0.889***
	(0.0114)	(0.0114)	(0.0120)	(0.0118)	(0.0139)	(0.0114)	(0.0113)
years of education	0.927***	0.925***	0.885***	0.893***	0.906***	0.919***	0.911***
	(0.0148)	(0.0149)	(0.0132)	(0.0133)	(0.0134)	(0.0140)	(0.0137)
female	2.371***	2.371***	1.272	2.174***	2.309***	2.323***	2.298***
	(0.251)	(0.251)	(0.170)	(0.297)	(0.243)	(0.246)	(0.243)
children	0.905	0.909			0.939	0.905	0.910
	(0.0739)	(0.0746)			(0.0758)	(0.0740)	(0.0742)
female * children	2.049***	2.047***			1.956***	2.042***	2.019***
	(0.177)	(0.177)			(0.168)	(0.177)	(0.174)
rural	1.081				1.065	1.089	1.076
	(0.0757)				(0.0747)	(0.0759)	(0.0750)

E ⟶ I	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
part-time	1.613***	1.608***	1.593***	1.483***	1.507***	1.636***	1.285
	(0.187)	(0.187)	(0.184)	(0.173)	(0.174)	(0.191)	(0.166)
public	0.758**	0.760**					
	(0.0718)	(0.0717)					
farm		1.074	1.093	1.321**			
		(0.111)	(0.113)	(0.137)			
children under 8			0.928	0.770**			
			(0.106)	(0.0733)			
female * children under 8			2.290***	3.106***			
			(0.275)	(0.316)			
partner			0.504***				
			(0.0873)				
female * partner			3.168***				
			(0.646)				
partner working hours				0.993***			
				(0.00201)			
female * partner working hours				1.000			
				(0.00225)			
total experience					0.936***		
					(0.0116)		
second job						0.529**	
						(0.118)	
preferred hours							0.980***
							(0.00569)
Observations	118984	118984	118984	118984	118984	118984	118984
Pseudo R-squared	0.205	0.209	0.217	0.216	0.214	0.208	0.205
AIC	25475.8	25351.2	25101.2	25119.4	25172.8	25392.2	25470.6

Note: Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: PLFS, own calculations.

Table 6.

Multinominal 4-state logit model estimates, quarter to quarter employment to agriculture (E → R) part of the model (25–34 years, odds ratios, N = 118986)

E → R	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
age	0.964	0.989	0.989	0.989	0.904	0.936	0.960
	(0.0359)	(0.0362)	(0.0379)	(0.0367)	(0.0485)	(0.0361)	(0.0358)
years of education	0.908*	0.854***	0.820***	0.823***	0.894*	0.845***	0.887**
	(0.0393)	(0.0402)	(0.0380)	(0.0383)	(0.0411)	(0.0370)	(0.0379)
female	0.446*	0.509	0.758	0.470	0.444*	0.548	0.451*
	(0.157)	(0.176)	(0.264)	(0.216)	(0.159)	(0.198)	(0.159)
children	1.133	1.200			1.113	1.122	1.118
	(0.133)	(0.126)			(0.136)	(0.130)	(0.134)
female * children	1.288	1.223			1.329	1.315	1.321
	(0.259)	(0.233)			(0.271)	(0.261)	(0.260)
rural	18.01***				17.65***	13.93***	17.72***
	(6.231)				(6.091)	(4.983)	(6.136)
part-time	3.816***	3.838***	3.860***	3.847***	4.043***	3.162***	4.660***
	(1.203)	(1.196)	(1.208)	(1.205)	(1.300)	(0.978)	(1.593)
public	0.366*	0.394*					
	(0.151)	(0.162)					
farm		31.21***	32.15***	31.91***			
		(9.836)	(9.717)	(10.04)			
children under 8			1.233	1.331*			
			(0.206)	(0.184)			
female * children under 8			1.326	1.074			
			(0.377)	(0.272)			
partner			1.217				
			(0.402)				
female * partner			0.498				
			(0.267)				
partner working hours				0.999			
				(0.00310)			
female * partner working hours				1.003			
				(0.00502)			
total experience					1.072		
					(0.0434)		
second job						8.855***	
						(2.042)	
preferred hours							1.029*
							(0.0137)
Observations	118984	118984	118984	118984	118984	118984	118984

E ⟶ R	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
Pseudo R-squared	0.205	0.209	0.217	0.216	0.214	0.208	0.205
AIC	25475.8	25351.2	25101.2	25119.4	25172.8	25392.2	25470.6

Note: Standard errors in parentheses, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: PLFS, own calculations.

5.2. Individuals aged 35–54 years

Table 7 and Table 8 present the analysis results for the middle-aged group, which consists of individuals aged 35 to 54. Family-related variables, especially having children (and their ages), are predicted to have a significant but somewhat smaller significance compared to the younger age group. Predictably, the flow to agriculture is more common in rural areas, a finding confirmed by the results (the coefficient denoted by the variable "rural" is only significant when analyzing flows from employment to agriculture).

The estimation strategy for this age group mirrors that of the younger group. First, a basic model controlling for gender, education, and basic job characteristics was estimated [Table 7 and Table 8, column (1)]. Next, variables related to family composition were incorporated [Table 7 and Table 8, columns (2) and (3)]. The fourth model includes variables related to the spouse's work intensity [Table 7 and Table 8, column (4)]. Finally, a model that includes variables related to individual labor intensity (intensive margin) is estimated [Table 7 and Table 8, column (5)].

In all specifications, the probability of leaving employment for inactivity decreases with years of education. The same is true of flows from employment to agriculture. This suggests that the greater the number of years of education, the lower the chances of leaving employment. This is partly because the better educated have more options and typically earn more. These findings are consistent with previous research (see Stefanova et al., 2007; Gerbery and Miklošovič, 2020). Greater work experience similarly decreases the likelihood of transferring to inactivity.

As for family-related variables, having children is generally associated with continued employment. However, a strong and statistically significant interaction exists between being female and having children. Having a child affects the labor market activity of women and men differently. Women are more likely to withdraw (at least temporarily) from the labor market to care for children, contributing to what is what is commonly referred to as the motherhood penalty—a phenomenon where mothers experience reduced earnings, lower career progression, and fewer employment opportunities compared to both fathers and childless women. This reflects the gendered responsibility for domestic labor and caregiving. Childbirth often leads to extended periods of labor market withdrawal for mothers, although women are reentering the workforce more quickly than they used to. This reentry is often contingent on the availability of caregiving services, such as nurseries, preschools, and after-school care, which typically operate for shorter hours than a standard working day, posing additional challenges for working mothers.

The interaction of gender and having children behaves differently in flows to different states. It correlates with increased probability of flows to unemployment and inactivity, but with decreased probability of flows to agriculture. However, having children no older than two was insignificant in all specifications, likely because most individuals in the analyzed age group have older children. In some specifications, having children no older than eight increases the probability of leaving employment. In general, women are more likely to deactivate or become unemployed than men, which confirms the findings by Vodopivec (2020), who found that women are more likely to become inactive than men.

There is a positive correlation between having a part-time job and leaving employment. There is a weak correlation between a partner's working hours and transferring from employment to unemployment and inactivity, but no significant correlation between this variable and transferring to agriculture.

Table 7.

Multinominal 4-state logit model estimates, quarter to quarter employment to inactivity (E → I) transition part of the model (35–54 years, odds ratios, N = 245682)

E → I	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
age	1.010	1.010	1.010	1.011*	1.013*	1.076***	1.011
	(0.00593)	(0.00594)	(0.00554)	(0.00549)	(0.00557)	(0.00775)	(0.00593)
years of education	0.826***	0.826***	0.818***	0.820***	0.825***	0.856***	0.832***
	(0.0102)	(0.0101)	(0.00985)	(0.00985)	(0.00972)	(0.0105)	(0.0105)
female	1.041	1.039	1.155*	1.144	1.042	0.922	1.028
	(0.0882)	(0.0879)	(0.0836)	(0.0827)	(0.105)	(0.0801)	(0.0879)
children	0.867**	0.869**				0.868**	0.872**
	(0.0438)	(0.0440)				(0.0432)	(0.0441)
female * children	1.580***	1.580***				1.551***	1.575***
	(0.0959)	(0.0960)				(0.0938)	(0.0958)
rural	0.920		0.924	0.932	0.977	0.916	0.970
	(0.0580)		(0.0581)	(0.0587)	(0.0615)	(0.0580)	(0.0618)
part-time	2.582***	2.579***	2.609***	2.599***	2.261***	2.075***	2.747***
	(0.245)	(0.245)	(0.248)	(0.247)	(0.214)	(0.202)	(0.286)
farm		0.696**					
		(0.0798)					
children under 8			0.800**	0.818*	0.862		
			(0.0636)	(0.0648)	(0.0667)		
female * children under 8			2.435***	2.409***	2.407***		
			(0.224)	(0.221)	(0.217)		
partner				0.846*			
				(0.0596)			

E ⟶ I	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
partner working hours					0.989***		
					(0.00140)		
female * partner working hours					1.002		
					(0.00174)		
public						0.669***	
						(0.0514)	
total experience						0.939***	
						(0.00470)	
second job							0.396***
							(0.0650)
preferred hours							1.004
							(0.00453)
Observations	245678	245678	245678	245678	245678	245678	245678
Pseudo R-squared	0.054	0.062	0.057	0.059	0.065	0.070	0.062
AIC	38491.5	38186.3	38386.5	38299.8	38047.1	37868.1	38199.0

Note: Standard errors in parentheses, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: PLFS, own calculations.

Table 8.

Multinominal 4-state logit model estimates, quarter to quarter employment to agriculture (E → R) part of the model (35–54 years, odds ratios, N = 245682)

E ⟶ R	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
age	1.029*	1.017	1.017	1.018	1.015	1.029	1.022
	(0.0148)	(0.0147)	(0.0144)	(0.0140)	(0.0141)	(0.0193)	(0.0152)
years of education	0.778***	0.758***	0.776***	0.777***	0.770***	0.790***	0.768***
	(0.0244)	(0.0249)	(0.0245)	(0.0256)	(0.0256)	(0.0275)	(0.0250)
female	0.535**	0.565**	0.667*	0.666*	0.638	0.586*	0.684
	(0.114)	(0.123)	(0.118)	(0.118)	(0.243)	(0.135)	(0.150)
children	1.010	0.976				1.011	0.964
	(0.0840)	(0.0819)				(0.0841)	(0.0806)
female * children	1.384*	1.378*				1.392*	1.414*
	(0.194)	(0.197)				(0.196)	(0.199)
rural	10.75***		11.06***	11.11***	10.78***	10.73***	7.487***
	(2.310)		(2.390)	(2.413)	(2.349)	(2.310)	(1.720)
part-time	2.908***	3.014***	3.022***	3.011***	3.359***	3.030***	3.363***
	(0.681)	(0.710)	(0.689)	(0.691)	(0.812)	(0.744)	(0.842)
farm		22.65***					
		(3.900)					

E ⟶ R	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
children under 8			0.909	0.920	0.886		
			(0.118)	(0.118)	(0.115)		
female * children under 8			1.443	1.434	1.411		
			(0.322)	(0.322)	(0.326)		
partner				0.914			
				(0.191)			
partner working hours					1.005		
					(0.00312)		
female * partner working hours					1.001		
					(0.00525)		
public						0.507***	
						(0.105)	
total experience						1.004	
						(0.0140)	
second job							6.313***
							(1.005)
preferred hours							1.025**
							(0.00828)
Observations	245678	245678	245678	245678	245678	245678	245678
Pseudo R-squared	0.054	0.062	0.057	0.059	0.065	0.070	0.062
AIC	38491.5	38186.3	38386.5	38299.8	38047.1	37868.1	38199.0

Note: Standard errors in parentheses, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: PLFS, own calculations.

5.3. Individuals aged 55–70 years

When running estimations for the oldest age group, the focus is on the factors that keep them active in the labor market or lead to flows from employment to inactivity or agriculture.

First, the basic model controlling for gender, education, place of residence, and part-time employment is estimated [Table 9 and Table 10, column (1)]. Next, the partner's employment is included [Table 9 and Table 10, column (2)]. Work experience is used as a proxy for human capital [Table 9 and Table 10, column (3)]. Model (4) incorporates working hour preferences that aim to reflect health and household care duties.

In particular, whether part-time work could keep older individuals in the labor market is examined. The possibility of part-time work could mitigate the effects of deteriorating health on the one hand and help reconcile work-life duties on the other. This would benefit caregivers looking after family members (both grandparents taking care of grandchildren to enable the mother to participate in the labor market and [mostly] women taking care of senior family members). However, decisions to leave the labor market to support children aren›t trackable unless there are grandchildren living in the same household.

Fewer variables are taken into consideration for this age group than for the younger ones. Variables related to having children were not analyzed due to the rarity of older mothers. Several experience thresholds, seasonal effects, and changes in the statutory retirement age were all controlled for. The detailed results are shown in the Appendix.

The regression results for individuals aged 55–70 are presented in Table 9 and Table 10. Key findings include a significant increase in the probability of transitioning to inactivity with age. Older workers have the lowest probability of staying active in the labor market, as most are eligible for retirement or early retirement. Gender also plays a crucial role regarding transition probabilities. The probability of moving from employment to inactivity is higher for women, and this relationship remains significant in all specifications.

Similarly to other age groups, more education and work experience seem to keep workers in non-agricultural employment. Work experience has a slightly stronger positive correlation with transitions from employment to inactivity than agriculture, but the relationship remains statistically significant in all specifications. Flows to agriculture seem to be particularly frequent for individuals living in rural areas, and, more importantly, living in rural areas seems to induce switching to agriculture instead of unemployment.

One of the possible and simple interpretations of these relationships could be that, in general, having better health and, thus, being able to work is crucial for staying active in the labor market. Individuals working part-time jobs are more likely to flow to inactivity but also more likely to switch to agricultural employment.

Table 9.

Multinominal 4-state logit model estimates, quarter to quarter employment to inactivity (E → I) transition part of the model (55–70 years, odds ratios, N = 85469)

E → I	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
age	1.165***	1.165***	1.165***	1.154***	1.173***	1.170***	1.168***
	(0.00752)	(0.00751)	(0.00754)	(0.00759)	(0.00825)	(0.00837)	(0.00837)
years of education	0.881***	0.881***	0.881***	0.883***	0.883***	0.880***	0.884***
	(0.00855)	(0.00848)	(0.00856)	(0.00848)	(0.00853)	(0.00848)	(0.00865)
female	1.555***	1.555***	1.095	1.079	1.518***	1.479***	1.468***
	(0.0829)	(0.0829)	(0.122)	(0.0877)	(0.0822)	(0.0803)	(0.0797)
rural	0.976		0.979	1.021	0.971	0.974	1.010
	(0.0583)		(0.0587)	(0.0612)	(0.0580)	(0.0582)	(0.0606)
part-time	1.820***	1.820***	1.807***	1.590***	1.794***	1.420***	1.468***
	(0.121)	(0.121)	(0.119)	(0.107)	(0.119)	(0.142)	(0.149)
farm		0.950					
		(0.0997)					

E ⟶ I	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
partner			0.656***				
			(0.0656)				
female * partner			1.503**				
			(0.189)				
partner working hours				0.988***			
				(0.00136)			
female * partner working hours				1.008***			
				(0.00173)			
total experience					0.991*	0.991*	0.991*
					(0.00371)	(0.00372)	(0.00371)
preferred hours						0.987***	0.988**
						(0.00391)	(0.00404)
second job							0.472***
							(0.0770)
Observations	85467	85467	85467	85467	85467	85467	85467
Pseudo R-squared	0.057	0.064	-0.063	-0.056	0.062	0.063	0.068
AIC	24836.2	24648.4	24817.6	24662.6	24715.1	24698.7	24579.1

Note: Standard errors in parentheses, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: PLFS, own calculations.

Table 10.

Multinominal 4-state logit model estimates, quarter to quarter employment to agriculture (E ⟶ R) part of the model (55–70 years, multinomial logits, odds ratios, N = 85469)

E ⟶ R	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
age	0.941	0.966	0.943	0.949	0.963	0.966	0.990
	(0.0524)	(0.0536)	(0.0518)	(0.0546)	(0.0547)	(0.0561)	(0.0595)
years of education	0.858***	0.834***	0.862***	0.855***	0.872***	0.874***	0.863***
	(0.0340)	(0.0344)	(0.0341)	(0.0338)	(0.0319)	(0.0323)	(0.0292)
female	0.674	0.755	0.413	0.561	0.605	0.622	0.713
	(0.205)	(0.230)	(0.246)	(0.322)	(0.191)	(0.203)	(0.234)
rural	13.09***		13.20***	12.41***	12.97***	12.90***	9.242***
	(4.827)		(4.865)	(4.506)	(4.798)	(4.740)	(3.575)
part-time	2.941**	2.996**	2.813*	3.386**	2.688*	3.215**	2.313
	(1.213)	(1.256)	(1.136)	(1.384)	(1.164)	(1.434)	(1.063)
farm		46.89***					
		(14.56)					

E ⟶ R	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit	E_exit
partner			0.543				
			(0.234)				
female * partner			1.791				
			(1.188)				
partner working hours				1.005			
				(0.00524)			
female * partner working hours				1.004			
				(0.00807)			
total experience					0.973	0.973	0.960*
					(0.0176)	(0.0178)	(0.0170)
preferred hours						1.013	0.989
						(0.0184)	(0.0158)
second job							8.472***
							(2.550)
Observations	85467	85467	85467	85467	85467	85467	85467
Pseudo R-squared	0.057	0.064	-0.063	-0.056	0.062	0.063	0.068
AIC	24836.2	24648.4	24817.6	24662.6	24715.1	24698.7	24579.1

Note: Standard errors in parentheses, * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: PLFS, own calculations.

6. Limitations and conclusions

6.1. Robustness checks and limitations

The dataset, being derived from quarterly PLFS data, has several limitations that affected the analysis. This dataset is a rotating panel with only a few retrospective questions on past activity. Moreover, these questions were put to all the respondents. This restricted the ability to observe life-cycle labor supply, and employment history, including family-related absences from the labor force. Additionally, only those family members who lived in the same household as the respondent were observed. This automatically excluded e.g., partners who did not live at home (but who sent remittances) or dependent children at universities and boarding schools.

An interesting addition to the study would be to incorporate variables that account for structural reforms, such as changes in family benefits or the statutory retirement age. However, they were not included in the analysis because running the model on quarterly flows showed that these effects were statistically insignificant. Additionally, including binary dummies for quarterly effects did not improve the estimations either. Dummy variables indicating quarters in the specification shown in the main section likewise proved to be insignificant, and were therefore not reported.

Some of flows were deliberately omitted. Firstly, flows from unemployment (U) to inactivity (I) were not reported on account of the shrinking pool of unemployed and the relative policy insignificance of those flows. Secondly, flows from employment in agriculture (R) to inactivity (I) were not reported either as they are mostly due to retirement and health reasons.

As for age, the youngest age group (15–24 years) was omitted as it covers individuals who are mostly still in education, often have not started their labor market activity (including young mothers), often live with their parents and families, or are NEETs (Not in Education, Employment or Training).

The results were validated using a series of robustness checks. First, an alternative approach was used to estimate flows to inactivity from non-agricultural employment, agricultural employment, and unemployment. This approach places restrictions on the variables that can be included. While all the individual and household characteristics, e.g. education and number of children, can be kept in the estimation, employment characteristics and labor market experience had to be excluded as they are not observed for some states (e.g. unemployment). Nevertheless, the results are presented in the Online Appendix. The reference category comprised inactive individuals who remained inactive, allowing us to compare people who already were inactive to those who engaged in some form of economic activity in the quarter prior to the interview. While these estimates might be expected to be contrary to those presented in the main section, this was not always the case. Moreover, the size of the effects varied across different models compared to the results in the main section, suggesting the presence of omitted variables bias. Despite these limitations, the overall findings remained consistent with the main results.

Another robustness check intended to eliminate seasonal fluctuations was the estimation on year-to-year flows. Although this solution yielded a smaller sample, the results were similar to those obtained in the quarter-to-quarter estimation (see online Appendix).

Whether assigning agricultural employment to the same state as other employment would make any difference to the results was also examined. A 3-state estimation yielded similar results but missed nuances where agriculture acts as a buffer for rural residents. Considering the special position of agriculture in Poland, we believe that our approach of separating agriculture better captures the features of the Polish labor market. The results of the 3-state estimation are shown in online Appendix.

These robustness checks not only strengthen the validity of the results, but demonstrate that they hold under various model specifications and approaches.

6.2. Conclusions

This paper explores the determinants of transition to inactivity. The aim was to analyze those factors that induced individuals to transition to inactivity at different life cycle stages.

The study initially hypothesized that part-time employment could help maintain labor market participation, but found contrary results. Instead, it identified significant factors that varied across age groups, with the presence of young children proving especially

significant. Women across all age groups had higher probabilities of transitioning from employment to inactivity. This was most pronounced during their reproductive years. The significance of agriculture in labor market flows was also underscored, suggesting that agricultural employment serves as a transitional buffer, particularly in rural settings.

The results make it clear that the factors that keep individuals active in the labor market largely depend on life cycle stage (measured here by age group) together with some other personal characteristics. They also show that the road to inactivity can lead through agriculture. It can also take a sharp cut-off if that option is not available. Although a broad dataset was used, data limitations nevertheless prevented all the desired factors from being tested.

This study contributes to the existing literature in that it shows that agriculture might play the role of a buffer against flowing directly into inactivity, thereby alleviating the decrease in household income. Especially in rural areas, the possibility of working in agriculture seems to act as a transition stage (possibly a buffer) on the way to inactivity. Given the relatively low productivity of Polish agriculture, and the size of both this sector of the economy and its surplus workforce, the role of agriculture in the Polish labor market poses a challenge to policymakers.

This study provides valuable insights and poses challenges for policymakers, particularly in CEE. Further research is needed to explore these determinants in more detail.

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Data availability

The data and materials used in this study are available upon request.

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7. Appendix

Additional materials related to this article are available in the online supplementary appendix at the journal's website.