



DEMOGRAPHIC RESEARCH

A peer-reviewed, open-access journal of population sciences

DEMOGRAPHIC RESEARCH

VOLUME 53, ARTICLE 23, PAGES 705–752

PUBLISHED 16 OCTOBER 2025

<https://www.demographic-research.org/Volumes/Vol53/23>

DOI: 10.4054/DemRes.2025.53.23

Research Article

The role of parenthood and gender in shaping circulation patterns of Ukrainian migration to Poland

Agata Górny

Govert Bijwaard

Magdalena Grabowska

© 2025 Agata Górny, Govert Bijwaard & Magdalena Grabowska.

This open-access work is published under the terms of the Creative Commons Attribution 3.0 Germany (CC BY 3.0 DE), which permits use, reproduction, and distribution in any medium, provided the original author(s) and source are given credit.

See <https://creativecommons.org/licenses/by/3.0/de/legalcode>.

Contents

1	Introduction	706
2	Duration of migration and transnational livelihoods	708
3	Ukrainian migration to Poland – contextual facts	710
4	Data and methods	711
4.1	Data	711
4.2	Methods	713
5	Results	717
6	Results of robustness checks	722
7	Discussion	723
8	Acknowledgements	725
	References	726
	Appendix	731

The role of parenthood and gender in shaping circulation patterns of Ukrainian migration to Poland

Agata Górny¹

Govert Bijwaard²

Magdalena Grabowska³

Abstract

BACKGROUND

Research on the interrelation of migration and family trajectories focuses on the familial events of long-term migrants in the destination country. For circular mobility the pattern is more complex, involving a series of migratory and familial decisions.

OBJECTIVE

The article evaluates the impact of the family situation and familial events on circular migration patterns, focusing on parenthood and gender.

METHODS

The article uses data from a 2019 survey of Ukrainian migrants to Poland (Warsaw) (N = 1314), and a similar 2015 survey (N = 642) to conduct robustness checks. The analytical strategy involves multistate discrete unobserved heterogeneity models, assessing the intensity of transitions from Poland to Ukraine and vice versa.

RESULTS

The family situation at the start of migration impacts the circulation patterns of women, while for men the obtained results are less obvious. Partnered mothers stay for shorter times in Poland and longer periods in Ukraine than partnered childless females, single mothers, and singles. Childbirth and marriage during the stay prolong the stay in both countries.

CONCLUSIONS

Familial and migratory trajectories are interlinked in circular migration, especially for female migrants, providing transnational livelihoods. These interrelations can be

¹ Faculty of Economic Sciences and Centre of Migration Research, University of Warsaw, Poland.
Email: a.gorny@uw.edu.pl.

² NIDI-KNAW/University of Groningen, the Netherlands.

³ Faculty of Economic Sciences, University of Warsaw, Poland.

interpreted within a framework that combines the role of capital accumulation (savings) during migration and the different separation costs for women and men.

CONTRIBUTION

The study goes beyond the approach of studying long-term migrants in the destination country. It turns its attention to the sending country context in order to understand the interrelations between familial and migratory events and the respective differences between men and women.

1. Introduction

Many migration moves are neither one-way nor permanent, but rather involve further re-migration decisions. Outward migration rates can be very high, up to 50% of an arrival cohort in certain contexts (Bijwaard 2010). However, the literature on re-immigration and repetitive migration remains scarce. The optimal life-cycle model provides suggestions as to why migrants who leave the host country re-immigrate (Dierx 1988). In a life-cycle context, migration and family trajectories are linked, contributing to the complexities of individual life course paths spanning regional and national borders. However, research on these interrelations mainly focuses on long-term and permanent migration. Consequently, its focus is usually the family trajectories of migrants in the destination country (Barbiano di Belgiojoso and Terzera 2018) and the impact of migration on family formation and dissolution (Caarls and de Valk 2017; Kraus 2019). Thus, these studies silently assume that it is migration that shapes family patterns, rather than the other way round. However, in the case of temporary and circular migration, the pattern of interrelations between migratory and familial trajectories is more complex, involving a series of decisions regarding consecutive moves in changing familial contexts in the life cycle.

Against this background, we investigate the impact of familial context on circular migration patterns (duration of stay in each country and the time between the migration moves), which differs from approaches in most studies of permanent migration. Our approach is inspired by the life cycle and economic conceptual frameworks, according to which the duration of cycles of repeated migration is shaped by migrants striving to maximise economic gains from the migration while minimising the costs, mainly for the family, of separation from the sending society (Dustmann and Görlach 2016; Stark and Fan 2007). Our approach also fits into the literature on transnational families (e.g., Caarls et al. 2018) (circular migrants are usually temporarily separated from their families) and into the concept of the economics of transnational living (Erdal and Carling 2021).

We aim to evaluate how a migrant's family situation – partnership-related status and particularly parenthood – in the home country at the start of the migration trajectory affects the duration of circular movements (number of migration spells, intervals between consecutive migratory trips). Our analyses refer to a nuclear family – parents and children. We hypothesise that the family situation has a stronger influence on the migration trajectories of women than of men due to higher separation costs when the migrant's family remains in the home country (Nakajima 2019; Stark and Fan 2007) as the result of different gender roles in domestic labour (Carling, Menjivar, and Schmalzbauer 2012; Magda, Cukrowska-Torzewska, and Palczyńska 2024; Modiri, Sadeghi, and Rahimi 2025). We focus on the family situation prior to the first trip to the destination country because we assume that, similar to occupational paths (Fuller 2015), the family context at the start of migration decisively influences the development of the migrant's trajectory. However, we also consider childbirths and marriages during the migration trajectory, and account for changes in the age and number of children over time.

Life-cycle theories imply that integration in the host country and migration decisions are correlated over time (Dierx 1988; Massey and Espinosa 1997). When these transitions involve repeated and multiple events, a multistate event history model (also known as multistate lifetable and increment-decrement life tables) is a proper choice. In demography, such processes include not only migration (Rogers 1975, 1995) but also other life course processes, such as changes in marital status (Courgeau and Lelièvre 1992; Willekens 1999). Our analysis of repeated migration is thus based on a dynamic model that takes into account the timing of migration moves (Bijwaard 2010; Bijwaard, Schluter, and Wahba 2014; Bijwaard and van Doeselaar 2014; Dustmann 2003; Hill 1987) and accounts for the correlation between the different migration moves using a correlated multistate model (Bijwaard 2014), which describes the migration transitions that people experience as life unfolds.

Using data on circular migration from Ukraine to Poland, we estimate a multistate model for transitions between two states, staying in Poland and staying in Ukraine, and allow these transitions to be correlated through observed and unobserved factors. For years, Ukrainian migration to Poland was mainly temporary and circular (Górny 2017). The beginnings of contemporary Ukraine-to-Poland migration date back to the late 1980s; thus some migrants have over 20 years' experience of circulating between the two countries (Górny et al. 2010). These contextual factors make the case of Ukrainian migration a fascinating example for investigating patterns of transnational living through the lens of migratory trajectories. We analyse data from a survey of Ukrainian migrants collected in 2019 in the Warsaw agglomeration (the main destination area of Ukrainian migrants in Poland). Thus, apart from revealing important mechanisms regarding interrelations between familial and migratory events from the life course perspective, the

results presented in this article offer a contextual picture of Ukrainian migration to Poland in the time preceding the COVID pandemic and the mass humanitarian migration from Ukraine following the 2022 full-scale Russian invasion.

2. Duration of migration and transnational livelihoods

The greater part of the literature on migration decision-making (implicitly) assumes that migrations are long-term or permanent. However, the intended length of stay in the destination country is an inherent part of migration decisions. According to Dustmann and Weiss (2007), the time spent in the destination country is determined by the migrants' optimisation strategies with regard to their life-long income and consumption. In this economic framework a decision about return migration can be considered a decision between permanent and temporary migration. Its extension to repeated migration involves, in turn, the possibility that migrants might split their optimal duration of stay in the destination country into shorter periods, broken by intervals spent in the home country (Dustmann and Görlach 2016). A series of consecutive stays in the destination and home countries can be seen as a migration trajectory shaped by individuals' life-long optimisation of income and consumption. At the same time, the initial individual context at the beginning of such a migration trajectory can be considered as decisive in shaping its path, as subsequent migratory trips are usually interrelated (Constant and Zimmermann 2012; Massey and Espinosa 1997). Durations of stays in either location can be considered a proxy for an optimisation strategy (Dustmann and Görlach 2016), where the time spent in the destination country is a period of capital accumulation and the time spent in the home country involves consumption and family time (although varying remitting behaviours make this picture more complex). Such a target-earner or target-saver perspective is frequently employed to explain temporary migration decisions, contrary to the strategies of long-term and permanent migrants striving for social and economic advancement in the destination country (Barbiano di Belgiojoso 2019; Bijwaard and Wahba 2019).

In our study of Ukrainian repeat migration to Poland we take the target-saver approach to analysing transitions between stays in Poland and Ukraine. Rather than focusing only on the time spent in the destination country (as most studies do: see e.g., Caarls and de Valk 2017; Constant and Zimmermann 2011), we reconstruct the entire trajectory of migrants, starting with their first arrival in Poland. As we study a specific pair of receiving (Poland) and sending (Ukraine) countries, and therefore a specific pair of labour markets, we assume that the accumulation of financial capital (savings) among migrants with similar individual characteristics depends mainly on the length of stay in the destination country. The longer the stay, the more capital is accumulated. The family

situation is one of the characteristics that can influence the economic needs of migrant households. Those with dependants, especially a higher number of children, can be expected to have greater economic needs than households of childless couples and single-person households.

However, the simple target-saver optimisation model is altered by the separation costs, which can be particularly high when a family is separated as a consequence of migration (Nakajima 2019; Stark and Fan 2007). Several studies on return migration demonstrate that migrants with families in their home countries are more likely to shorten their stays in the destination area (Constant and Zimmermann 2011, 2012; Dustmann and Kirchkamp 2002), which can be partly explained by separation costs. Addressing the problem of family separation in migration decisions, Stark and Fan (2007) propose a theoretical model distinguishing between three types of decisions: permanent migration alone, permanent migration with family, and seasonal migration alone. According to their model, temporary (seasonal) migration alone is the preferred option when separation costs and prices in the destination country are relatively high (relative to prices in the home country), i.e., income from migration is effectively used to support household expenditure in the home country. They do not, however, elaborate on factors shaping the level of the costs of separation, nor address decisions on duration of migration, where there are several in-between temporal options between permanent and seasonal migration.

The separation costs can be simple homesickness aggravated by a lack of physical contact, but also the burden stemming from the difficulty of performing caring duties at a distance. Nakajima (2019), using data on Mexican migration to the United States, provides evidence of the accumulation of homesickness over time in the host country. He argues that this explains why migrants chose to migrate in a circular manner instead of remaining in the destination country, even though it impedes financial capital accumulation. Separation costs related to caring duties usually change over the life course. Small children require different types of support than teenagers; the relationship with a partner may also evolve (Haddad and Caron 2023). Therefore, familial events and migratory decisions are interrelated, forming a dynamic context for studying life course developments in temporary, repeated migration. However, we also argue that similar to occupational paths (Fuller 2015), the family situation at the beginning of the migration trajectory is an important factor in explaining the development of the migration path. We therefore pay particular attention to this initial state when analysing the migration transitions between stays in Poland and in Ukraine (although we also account for marriages and childbirths afterwards). We hypothesise that separation costs, and consequently durations of stay, are influenced by the family situation, particularly parenthood. Migrants who leave children and a partner behind are more likely to have

higher separation costs than single migrants and childless partnered migrants, which shorten their stays in Poland and prolong the time spent in Ukraine.

When considering how the family situation shapes migratory trajectories, we also expect differences between men and women. While women's increasing labour market activity and the growing importance of dual-earner households contribute to the equalisation of gender roles in the home, cultural norms are still crucial drivers of the greater involvement of women in domestic work, including caring duties (Magda, Cukrowska-Torzewska, and Palczyńska 2024; Modiri, Sadeghi, and Rahimi 2025). In the context of migration, a household's separation costs are higher when the woman – the wife and/or mother taking care of the majority of home duties and children – moves abroad, compared to the migration of a man. In their overview of the central themes in transnational parenthood, Carling, Menjivar, and Schmalzbauer (2012) demonstrate the high psychological costs of separation encountered by migrating parents and children left behind. However, mothers – as those expected to provide childcare in the first place – struggle with an even greater psychological burden stemming from social norms. The higher separation costs of mothers also have a practical side, because it is not uncommon for a child to be cared for by other women in the family when the mother is away, regardless of the presence of the father. Such scenarios are particularly likely in sending areas where emigration is a common economic strategy (*ibid.*). These practices can be viewed from the perspective of the new economics of transnational living (Erdal and Carling 2021). Recognising the existence of a gender dimension in transnational practices related to work and care duties, we expect that the family situation influences the migration trajectories of women more than those of men.

3. Ukrainian migration to Poland – contextual facts

Since the late 1980s, Ukraine-to-Poland migration has been predominantly temporary circular labour migration (Górny et al. 2010). Consecutive changes in migration regulations in the 2000s, including the introduction of visas for Ukrainian citizens entering Poland, did not drastically challenge the circular pattern of Ukrainian migration to Poland (*ibid.*). Only the COVID-19 pandemic restrictions on border crossings reduced the intensity of circulation between Poland and Ukraine, leading some migrants to stay longer in Poland.

At the beginning of the 2010s, foreigners in Poland still accounted for less than 1% of Poland's population. The situation started to change quite dramatically in 2014 with the Russian invasion of the Donbas and Luhansk regions, and the annexation of Crimea (part of Ukraine), resulting in an unprecedented increase in emigration from Ukraine to Europe, directed mainly towards Poland. The drivers of this increase were a combination

of humanitarian (including the end of migration to Russia), economic (high demand in the Polish labour market), and political (liberal migration regulations in Poland) factors (Lücke and Saha 2019). These led to an increase in the number of migrant workers in Poland. The number of work permits rose from less than 300,000 in 2013 to almost two million in 2017 and 2019 (Ministry of Family and Social Policy data). Although in the 2010s most Ukrainian migrants were coming to Poland on short-term work permits,⁴ the number of more permanent migrants with Polish residence permits increased from 40,000 in 2013 to almost 215,000 in 2019 (Office for Foreigners data). Consequently, Ukrainians constituted the visible majority (70%–90% depending on category of migrant worker) of foreigners in Poland in the late 2010s.

Ukrainian migrants tend to head for large Polish cities (Górny and Śleszyński 2019). Before 2014 they were highly concentrated in certain areas, mainly in the capital Warsaw and in the Mazovian region. However, the diversity of Ukrainians' destinations in Poland has been growing. In 2019, the Mazovian region accounted for 24% of all work permits issued in Poland, compared to 55% in 2013. However, this region still had the highest number of Ukrainian workers of all the 16 Polish regions (Ministry of Family and Social Policy data). Warsaw, as a 'traditional' destination area in Poland, is a laboratory of Ukrainian migration to Poland, encompassing both older (e.g., from the 1990s and early 2000s) and more recent cohorts of Ukrainian migrants. Before 2014, Ukrainian migration to Warsaw was dominated by females; this gradually changed after the 2014 Russian invasion, when the general Poland-wide trend became one of most Ukrainian migrants being males (Central Statistical Office 2018). Warsaw, as the most important Polish receiving area for Ukrainian migrants, provides an opportunity to examine the role of family settings among migrants with migratory experiences of different durations, and with respect to gender variations.

4. Data and methods

4.1 Data

The data analysed in the article come from a survey of Ukrainian migrants in Poland (N = 1,314), conducted in the Warsaw agglomeration in 2019 (Górny, Madej, and Porwit 2020). The survey respondents were adult Ukrainian citizens who had arrived in Poland⁵ for non-tourist purposes, excluding those enrolled in full-time and evening studies in Poland at the time of the survey. In the PAPI questionnaire the trajectory of migration

⁴ So-called declarations of employers allowing for six months of work during a period of 12 months.

⁵ At least three months before the survey.

(overview of trips to Poland) was reconstructed on the basis of a bi-weekly calendar.⁶ These unique data allow us to examine the duration of consecutive stays in Poland and Ukraine through the overall migration trajectory of arrivals in Poland. Our analyses are conducted on all stays in Poland lasting for two months or more, and on the first and the last stays⁷ for which additional information was collected such as labour market status, sector of employment, and legal status.

The sampling method employed in the survey was respondent-driven sampling (RDS) designed for studies of ‘hard-to-reach’ populations, which has grown in popularity in migration studies (Tyldum and Johnston 2014). In this chain-referral sampling, respondents receive incentives for giving an interview and for recruiting new participants to the study (double-incentive system) (Heckathorn 1997). The study participants are allowed to recruit only a limited number of people (two people in our study). Characteristics of a sample recruited in this way are independent of the selection of initial interviewees (a small, diverse (in terms of sociodemographic characteristics) group invited by the researchers at the start of the study) when the equilibrium mix of recruits is reached (ibid.). Moreover, RDS frequency weights allow for obtaining unbiased estimators for the target population. The analyses in this article were conducted on an unweighted sample, following observations from previous methodological studies that results of multivariate analyses conducted on unweighted RDS data can be considered reliable (Heckathorn 2007; Sperandei et al. 2022). However, in order to better account for the sample design, we included an RDS weight as an independent variable in all estimated models. This weight is based on the Successive Sampling estimator (G-SS) (Gile 2011) and is inversely related to the size of respondents’ social networks (including individuals belonging to the studied group).

Women constitute a majority in the sample (57%) (Table A-1 in the Appendix). Regarding the family situation (household composition) prior to the first trip to Poland, among females, singles are the most common (38%), followed by partnered mothers (30%). The shares of partnered childless women and of single mothers are comparable at 15%–18%. The distribution of different familial situations is largely similar for men, but the share of singles is higher (51%), while the proportion of single fathers is very small, only 3%.⁸ It is worth noting that when single parents first arrive in Poland their children are more likely to be older than the children of partnered parents. For example, the share of single parents whose youngest child was under 6 years of age is 14% compared to 33% for partnered parents. Importantly, 47% of Ukrainian migrants were in Poland with some members of their close family – partner or children – at the time of the study, i.e., at the

⁶ If a migrant left Poland for a period of no more than two weeks during a given stay, we considered the stay to be uninterrupted.

⁷ The calendar was to help respondents reconstruct their trajectories and to check the data (dates) for those stays.

⁸ Due to small sample size, results relating to this category of respondents should be interpreted with caution.

end of the observed migration trajectories. This relatively high prevalence is a sign of changes in Ukrainian migration to Poland, presumably related to its growing permanency. For comparison, in 2015, based on a similar survey in the Warsaw agglomeration, the share of Ukrainian migrants who were living with family members did not exceed 20% (Górny, Madej, and Porwit 2020). More than 80% of the studied Ukrainians started their migration cycle to Poland after 2013 (and more than a half after 2016), while the share of persons with migration experience going back to 2007 or earlier is less than 6%. On average, a migrant started migration at the age of 31 and undertook about three trips to Poland. For the earlier cohorts of migrants the mean number of trips was greater. Those who started migration before 2014 had been, on average, in Poland eight times, while those who first arrived later had been in Poland around two and a half times. The mean duration of stays in Poland and Ukraine is comparable – around eight months. Further descriptive statistics of the studied sample are presented in Tables A-1 and A-2 in the Appendix.

4.2 Methods

We rely on duration analysis (event history analysis) to estimate the circular migration process, for several reasons. First, duration analysis focuses on the timing of the return decision and not just on whether it occurred. Second, not only migration decisions but also other relevant characteristics of individuals may change over time, such as their family situation and labour market status. Third, it is hardly ever possible to observe migration decisions over the whole lifetime of a migrant. However, the knowledge that the immigrant has been in the host country from when they arrived until the end of the observation period (censored) contains valuable information, and duration models account for all these issues.

In duration analyses the hazard function, the instantaneous probability that an individual leaves after a specific time spent in a country conditional on remaining in that country up to that time, is usually the focal point of estimation (van den Berg 2001). Both accounting for right-censoring, when the individual is only known to have remained in the country up to the end of the observation window, and time-varying covariates are easy to handle in hazard rate models. A common way to accommodate the presence of observed individual characteristics is to specify a proportional hazard (PH) model, in which the hazard is the product of the baseline hazard (duration dependence), the influence of the length of stay on the hazard, and a log-linear function of covariates. Neglecting confounding in inherently non-linear models, such as proportional hazard models, leads to biased inference in the effect of covariates on both the departure and the shape of the duration dependence (van den Berg 2001).

A common way to address this is to specify a mixed proportional hazard (MPH) model, in which the PH hazard is multiplied by a person-specific random term capturing unobserved heterogeneity (Lancaster 1979; Manton, Stallard, and Vaupel 1981).

We thus assume that both the conditional hazard of leaving Poland for Ukraine, $\theta_{PL}(t|\cdot)$ and the hazard of leaving Ukraine for Poland, $\theta_{UA}(t|\cdot)$ follow a mixed proportional hazard (MPH) model:

$$\theta_j(t|x(t), v) = v_j \lambda_{j0}(t) \exp(\beta_j' x(t)) \quad j = \{PL, UA\} \quad (1)$$

where $\lambda_{j0}(t)$ represents the baseline hazard, or duration dependence, of leaving Poland ($j = PL$) or Ukraine ($j = UA$), $x(t)$ are observed time-varying characteristics, and v_j are the unobserved characteristics (unobserved heterogeneity). The duration dependence is common to all individuals, and it is a function of t , the time spent in the country (Poland or Ukraine), alone. The MPH models assume a log-linear function of covariates. However, assuming two independent MPH models for movements from Poland to Ukraine and vice versa ignores that these processes are interdependent, both through observed and unobserved factors common in the two migration hazards. We therefore view the migrant behaviour as a semi-Markov process (the time spent in each country influences departure from that country) with individuals moving between Poland and Ukraine (Bijwaard 2014). The (alternating) multistate model we define is a stochastic process, in which at any point in time an individual is either in Poland or in Ukraine. We use an MPH model for each of the two origin–destination pairs: Poland–Ukraine and Ukraine–Poland.

The interdependence of the migration hazard is through the unobserved heterogeneity factor. We use a discrete unobserved heterogeneity distribution, in which it is assumed that the population consists of a couple of latent classes, each having a different intercept in the hazard functions (frailties). For example, when we have only two latent classes we may have (1) a high-risk subpopulation with a high hazard (leaving after a short time), and (2) a low-risk subpopulation with a low hazard (leaving after a long time), but the class membership for each individual is unknown. Thus, in general, V has discrete support $(V_1, \dots, V_M)$ with class probabilities $p_k = \Pr(V = V_k)$.⁹ It is important to note that the V_k s are vectors with two components $V_k = (V_{PLk}, V_{Uk})$, including the frailties for the transition from Poland to Ukraine and vice versa. In econometrics, such unobserved heterogeneity models are commonly applied in duration analysis (Bijwaard 2014; Heckman and Singer 1984; van den Berg 2001). The latent class probabilities and the frailty values are jointly estimated with the other parameters of the model maximising the likelihood function. The number of latent classes is determined using the non-parametric method described in Heckman and Singer (1984).

⁹ To assure that the probability is between 0 and 1, we estimate q_k with $p_k = e^{q_k} / (1 + \sum e^{q_j})$.

In our analytical strategy, we assume a piece-wise constant duration dependence. For each origin state, Poland or Ukraine, we use the time spent in that country, T_j durations $j = \{PL, UA\}$. If for individual i we observe M_{ij} $j = \{PL, UA\}$ transition spells, at sojourn times $t_1, \dots, t_M$, then the likelihood contribution of these M_{ij} transitions is:

$$L_j(V) = \prod_{m=1}^{M_{ij}} \theta_j(t_m | \bar{x}_j(t_m), V_j)^{\delta_{mj}} \exp(-\int_0^{t_m} \theta_j(s | \bar{x}_j(s), V_j) ds) \quad (2)$$

where $\delta_{mj} = 1$ for an uncensored j transition and 0 otherwise using the MPH hazards from (1).

The observed likelihood function for each individual is the probability weighted sum over all possible 'v's (assuming K latent classes):

$$L = \sum_{k=1}^K \prod_{j=PL, UA} L_j(V_k) p_k \quad (3)$$

We use maximum likelihood estimation in STATA to estimate all the coefficients.¹⁰

The Poland–Ukraine and Ukraine–Poland transitions are derived from migratory trajectories described by two states – ‘in Poland’ or ‘in Ukraine’ – in monthly intervals that start from the first arrival in Poland. The set of covariates, identical for all models regarding each transition type, includes variables pertaining to migrants’ family situation and familial events and indicators of migration history, as well as control variables relating to migrants’ individual characteristics and migration circumstances. Selected variables are measured for the given state/stay (stay in Poland or Ukraine), while others for the given migration cycle (stay in Poland plus stay in Ukraine before the next trip to Poland).

The main variable of interest is the family situation (household composition) in Ukraine prior to the first trip to Poland, coded in four categories: (1) partner and children, (2) partner only, (3) children only (single parent), (4) single person without a partner and children. We include an interaction term between gender and family situation prior to the first trip to Poland, acknowledging gendered patterns with regard to familial roles and caring duties (Carling, Menjivar, and Schmalzbauer 2012; Modiri, Sadeghi, and Rahimi 2025). We also include an indicator for the presence of parents in the Ukrainian household prior to the first trip to Poland. Moreover, we control for the fact that at the time of the study, the migrant was in Poland with a partner or children, i.e., with some members of their close family. Due to data limitations, it is the only, possibly imperfect, proxy for the fact that a person migrates alone or with the family at some stage of the migration trajectory. Additionally, for the beginning of each stay in Poland or Ukraine,

¹⁰ The standard errors are calculated using the outer-product of the gradient vector in the estimated parameter vector.

we account for the number and ages of children: the set of dummies coded into six age categories (0–2, 3–5, 6–15, 16–18, 19–25) denote that a migrant has at least one child in the respective age brackets. Finally, we measure two important familial events, marriage and childbirth, that occurred during the given stay in either Poland or Ukraine. In all variables relating to the presence of migrants' children we take into account only children aged 25 or under, i.e., those who are likely to be still maintained by parents, especially if they continue education.

To account for cohort effects, we include in the model the year of the first arrival in Poland, coded into five periods: (1) before 2002, (2) 2002–2007, (3) 2008–2013, (4) 2014–2016, (5) after 2016. In this way we account for the development of the migratory process between Ukraine and Poland and for the fact that migrants with longer and shorter migratory experiences at the moment of the study in 2019 are likely to differ with regard to the intensity of transitions between Poland and Ukraine. We also measure the order of the migratory cycle (stay in Poland followed by stay in Ukraine) to account for the development of individual migration trajectories.

The control variables encompass age at the beginning of the given stay in Poland or Ukraine, and the locality type and region of origin in Ukraine (where a migrant lived before the first arrival in Poland). For the given migration cycle, we include an indicator for long-term residence documents (e.g., residence permits) in Poland, as well as dummies for selected most common sectors (Górny and van der Zwan 2024) of employment in Poland: agriculture, industry, hospitality, construction, domestic service. We have excluded the education of migrants in the final model, as this factor was insignificant. This suggests a limited transferability of skills between Ukraine and Poland, which has been demonstrated in other studies (Górny 2017). Nor have we included the earnings of migrants in Poland and indicators of their remitting behaviour, because the only available information concerned the current stay (the moment of the study). Descriptive statistics of all variables used in the models and of the education of migrants can be found in Tables A-1 and A-2 in the Appendix.

In addition to the model for the whole 2019 sample, we also run several robustness checks. First, in order to assess differences in the results when the period between the time of migration initiation and the study is relatively long and relatively short, we estimate models for two sub-samples by entry period: (1) migrants who arrived in Poland before 2014 for the first time, and (2) migrants who started their migration later. The break point for sample splitting relates to the 2014 Russian invasion of Ukraine, which affected the scale and pattern of Ukrainian migration to Poland.

Second, we estimated an analogous model on a different sample from the similar RDS survey of Ukrainian migrants in the Warsaw agglomeration conducted in 2015 (N = 642) (Górny, Madej, and Porwit 2020). The group studied, the sample design, and the organisation of the fieldwork (even partly the research team) in this study were

identical to the 2019 survey analysed in this article. Importantly, the 2015 questionnaire – also very similar – included questions regarding the presence of the family in Poland during each stay lasting two months or longer, which is crucial information in the context of our analyses. Therefore, in the 2015 models we replaced the dummy denoting presence of a partner or children in Poland during the study with a dummy indicating their presence during the given stay in Poland (for the given migration cycle). Descriptive statistics of all variables used in the 2015 models can be found in Tables A-17 and A-18 in the Appendix.

5. Results

The results for the correlated unobserved heterogeneity model for the whole 2019 sample (Table 1 and Table A-3 in the Appendix presenting unobserved heterogeneity parameters) demonstrate that transition rates between Poland and Ukraine, i.e., the duration of stay in both countries, depend on history and circumstances of migration (e.g., legal status, employment sector), but are also related to familial factors, especially in the case of women. However, the results differ depending on whether we look at stays in Poland (emigration) or in Ukraine (back home).

We report hazard ratios, $\exp(\beta)$, in which a hazard ratio greater than 1 implies a faster departure (shorter stays) and a hazard ratio smaller than 1 implies a slower departure (longer stays). Based on the estimated hazard ratios for the family situation and gender interactions, we observe that the family situation in Ukraine prior to the first trip to Poland influences the transition rates between stays in Poland and Ukraine and vice versa, but mainly for female migrants (Figure 1, and Table A-4 in the Appendix including exact values of the coefficients). Importantly, the estimation results exhibit a regular pattern in which females' comparatively long stays in Poland are combined with relatively short stays in Ukraine in a circulation cycle, depending on familial context at the start of migration. Women who at the start of their migration trajectory to Poland were single mothers, partnered and childless, or single tended to leave Poland later and return sooner from Ukraine than women with a partner and children. This finding is (likely) connected to the caring duties of mothers with a partner and children in Ukraine (Carling, Menjivar, and Schmalzbauer 2012) and the relatively high and growing separation costs of remaining in Poland for longer periods while the family stays in Ukraine (Nakajima 2019). However, single mothers (at the start of migration), who also have caring duties, have a 30% lower hazard of leaving Poland and a 27% higher hazard of leaving Ukraine than partnered mothers. This finding can be related to the need of single-earner Ukrainian households to accumulate higher capital (savings), resulting in longer stays in Poland. At the same time, parents of children under two years tend to stay

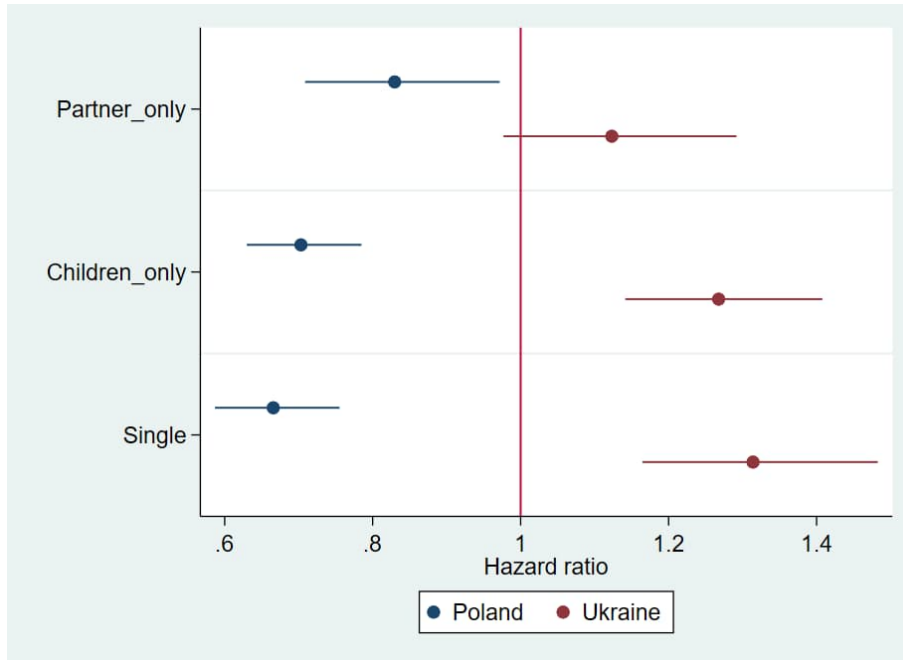
for a shorter time in Poland and longer in Ukraine than childless migrants. The effect of older children on the transition rates of leaving is less clear, but parents of adolescents (16–25 age bracket) leave Ukraine more quickly.

Table 1: Correlated model for transitions from Poland to Ukraine and from Ukraine to Poland

Variable	Poland to Ukraine		Ukraine to Poland	
	HR (SE)	P-value	HR (SE)	P-value
Female	1.136 (0.071)	0.041	0.897 (0.058)	0.093
Family in UA prior to 1 st trip (ref. partner & child.)				
partner only	1.016 (0.085)	0.852	1.059 (0.134)	0.650
children only	0.865 (0.113)	0.268	1.072 (0.145)	0.606
single	0.606 (0.042)	0.000	1.014 (0.075)	0.850
Interaction female # family in UA prior to 1 st trip				
female # partner only	0.817 (0.087)	0.057	1.061 (0.155)	0.686
female # children only	0.813 (0.113)	0.136	1.183 (0.169)	0.242
female # single	1.099 (0.081)	0.197	1.296 (0.098)	0.001
Parents present in UA household prior to 1 st trip	1.242 (0.054)	0.000	0.993 (0.043)	0.871
Family in PL - partner or children (current ¹)	0.756 (0.025)	0.000	1.080 (0.036)	0.021
Number of children (stay ²)	0.961 (0.038)	0.313	0.919 (0.034)	0.021
Child/children aged 0–2 (stay ²)	1.341 (0.090)	0.000	0.854 (0.055)	0.014
Child/children aged 3–5 (stay ²)	1.030 (0.066)	0.642	1.009 (0.064)	0.891
Child/children aged 6–15 (stay ²)	1.029 (0.061)	0.628	0.917 (0.051)	0.120
Child/children aged 16–18 (stay ²)	0.952 (0.055)	0.399	1.170 (0.067)	0.006
Child/children aged 19–25 (stay ²)	1.025 (0.063)	0.686	1.249 (0.073)	0.000
Childbirth during stay	0.494 (0.066)	0.000	0.237 (0.019)	0.000
Marriage during stay	0.448 (0.054)	0.000	0.399 (0.030)	0.000
Year of first arrival in PL (ref. before 2002)				
2002–2007	1.277 (0.076)	0.000	1.146 (0.064)	0.015
2008–2013	0.801 (0.042)	0.000	1.759 (0.085)	0.000
2014–2016	0.835 (0.043)	0.000	1.959 (0.106)	0.000
after 2016	0.713 (0.050)	0.000	2.470 (0.178)	0.000
Order of migration cycle	0.991 (0.003)	0.004	1.023 (0.003)	0.000
Age (stay ²)	0.915 (0.019)	0.000	1.080 (0.023)	0.000
Age sq. (stay ²)	1.079 (0.014)	0.000	0.961 (0.013)	0.004
Documents in PL – long-term (cycle ³)	0.251 (0.012)	0.000	1.240 (0.068)	0.000
Sector in PL – agriculture (cycle ³)	1.800 (0.088)	0.000	0.651 (0.030)	0.000
Sector in PL – industry (cycle ³)	1.184 (0.053)	0.000	0.868 (0.046)	0.007
Sector in PL – hospitality (cycle ³)	0.764 (0.034)	0.000	0.867 (0.045)	0.006
Sector in PL – construction (cycle ³)	1.173 (0.054)	0.000	1.028 (0.051)	0.574
Sector in PL - domestic service (cycle ³)	0.835 (0.039)	0.000	1.129 (0.057)	0.016
Locality type in UA (ref. countryside)				
town up to 50,000	0.729 (0.028)	0.000	1.080 (0.043)	0.051
town of 51,000–500,000	0.697 (0.032)	0.000	1.112 (0.051)	0.020
city of more than 500,000	0.629 (0.037)	0.000	0.883 (0.051)	0.033
Region of origin in UA (ref. south)				
western	0.976 (0.069)	0.737	0.784 (0.063)	0.003
central	0.817 (0.060)	0.006	0.794 (0.069)	0.008
eastern	0.800 (0.081)	0.027	0.723 (0.071)	0.001
Piecewise constant duration dependence:				
Interval 0–1.5 months	3.346 (0.279)	0.000	2.595 (0.163)	0.000
Interval 1.5–3.0 months	3.001 (0.251)	0.000	2.358 (0.149)	0.000
Interval 3.0–6.0 months	2.409 (0.204)	0.000	1.672 (0.110)	0.000
Interval 6.0–12.0 months	1.813 (0.161)	0.000	1.343 (0.095)	0.000
RDS weight	1.005 (0.018)	0.805	0.928 (0.015)	0.000

Note: ¹ At the moment of the study – current stay in Poland; ² stay refers to stay either in Poland or Ukraine; ³ cycle refers to stay in Poland and subsequent stay in Ukraine.

Figure 1: Hazard ratio with 95% CI for transition rates from Poland and Ukraine for women in different familial situations prior to the first trip to Poland



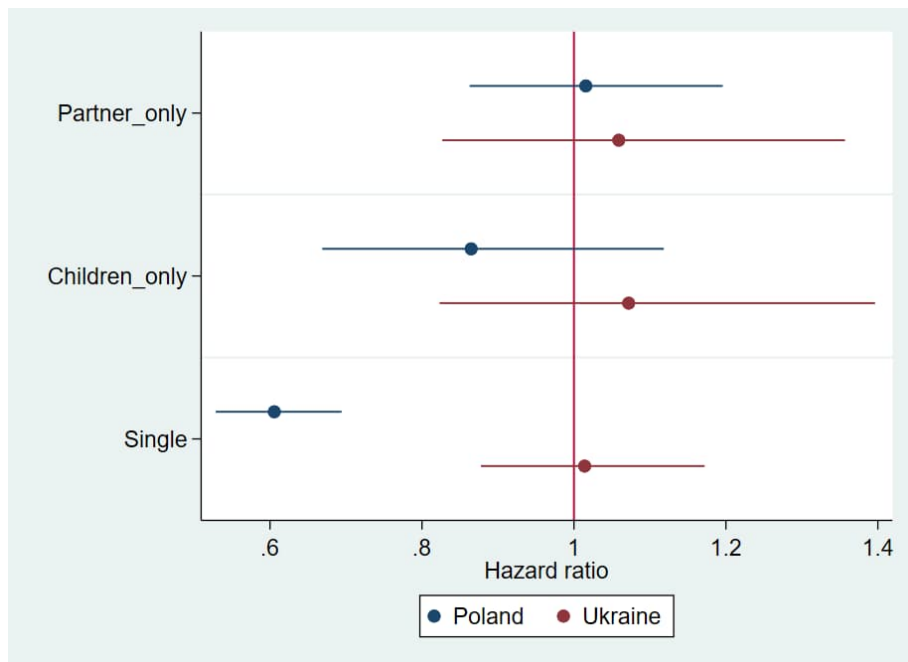
Note: Reference category: women with a partner and children. Exact values for interactions are presented in Table A-4 in the Appendix.

Of all females, the women who began their migration to Poland as single and childless (thus potentially the most independent, with relatively low separation costs) have the lowest hazard of leaving Poland (33% smaller than partnered mothers) and the highest hazard of leaving Ukraine (31% higher than partnered mothers). Their stays in Poland are thus relatively long, interrupted only by short stays in Ukraine. Partnered childless females have only a 17% lower hazard of leaving Poland and a 12% higher hazard ($p = 0.103$) of leaving Ukraine than partnered mothers. Thus, these women are most similar to partnered mothers, with relatively short stays in Poland and long stays in Ukraine. This might be explained by the pain of separation from their partners when they migrate alone, while the economic needs of their child-free households might be relatively small (especially when compared to single-mother households).

The effects for men relating to different family situations at the start of migration are smaller than for women and usually insignificant, but their signs (observed patterns)

are somewhat similar (Figure 2, and Table A-5 in the Appendix including exact values of the coefficients). Just as for females (looking at significant results), single men have a visibly smaller hazard of leaving Poland (39% smaller than partnered fathers), but the effect for transitions from Ukraine to Poland is very small and insignificant ($p = 0.850$). These findings suggest separation costs play a relatively small role in shaping the pattern of temporary mobility for partnered fathers (at the start of migration) migrating alone. Presumably, these costs are exceeded by the economic benefits of staying longer periods abroad for work. These extended work periods allow for higher capital accumulation (savings), while the household in Ukraine is presumably managed by their partner. This is supported by the result that partnered mothers tend to stay for a shorter time in Poland and longer in Ukraine ($p = 0.093$) than partnered fathers (Figure A-1 and Table A-6 including exact values of the coefficients).

Figure 2: Hazard ratios along with 95% CI for transition rates from Poland and Ukraine for men in different familial situations prior to the first trip to Poland



Note: Reference category: men with a partner and children. Exact values for interactions are presented in Table A-5 in the Appendix.

The obtained results thus show differential transnational practices (Erdal and Carling 2021) in the households of Ukrainian males and females in different familial situations at the beginning of migration to Poland. These practices are also related to the presence of migrants' parents in the Ukrainian household, which makes migrants leave Poland sooner (the opposite effect for stays in Ukraine is insignificant, $p = 0.871$). This can be linked to separation costs related to both emotions and care for elderly parents. Given the relatively old mean age of migrants (31 years at the start of migration), help from (grand)parents in a household appears to be less decisive in shaping mobility patterns. At the same time, unsurprisingly, migrants who are living with some members of their household – partner or children – in Poland at the time of the study have a lower hazard of leaving Poland and a higher hazard of moving from Ukraine to Poland. Moving with their family means that migrants are less exposed to separation costs while in Poland, which correlates with longer stays. Unfortunately, due to data limitations, we are unable to control for whether members of the Ukrainian household accompany a migrant to Poland during the given stays in Poland. Therefore, these results should be interpreted with caution.¹¹ However, we do account for the migrant's number of children at the beginning of the given stay in either country. The more children the longer the stay in Poland ($p = 0.313$)¹² and in Ukraine ($p = 0.021$). It is likely that a larger family involves greater economic needs, which might induce migrants to spend more time working in Poland. Familial events such as childbirth or marriage decrease the intensity of leaving both Poland and Ukraine. Such events apparently anchor a migrant in place, as leaving a new-born child or newlywed partner involves relatively high emotional separation costs, while migrating together might be difficult or costly. This finding emphasizes the importance of mutual links between the life course and migratory trajectories in the context of repeat migration.

Different cohorts of migrants differ in the intensity of transitions between Poland and Ukraine. Those who arrived in Poland after 2007 are more likely to stay in Poland for longer periods. This indicates a growing permanency of Ukrainian migration to Poland, which has been suggested by other studies, especially those comparing pre- and post-2014 war Ukrainian migration to Poland (Górny and van der Zwan 2024). This finding is strengthened by the results showing increasing intensities of transitions from Ukraine to Poland (i.e., shorter stays in Ukraine) in later cohorts of migrants. The hazard of leaving Poland decreases with subsequent migratory cycles, while with each migration cycle the stay in Ukraine becomes shorter. This shows the process of growing permanency of migration due to migratory experience. It also agrees with intuition and the findings of earlier studies (Constant and Zimmermann 2011), as with each trip

¹¹ However, we account for this factor in the robustness check analysing the survey from 2015.

¹² The effect is significant in all the models estimated for the robustness checks.

migrants develop more attachments to Polish society. However, the observed effects are rather small.

Control variables pertaining to migratory circumstances also influence transition rates in a rather intuitive way. The relationship between age at the start of a given stay and the transition rates is quadratic both for stays in Poland and for stays in Ukraine. The youngest and oldest migrants tend to stay for a shorter time in Poland (minimum intensity of leaving around age 41) and longer in Ukraine (maximum intensity of leaving around age 45) during migration cycles, presumably due to links with relatives and friends in Ukraine that are important to these migrants. Unsurprisingly, migrants with a relatively stable legal status in Poland (residence permit) during the given migratory cycle tend to stay longer in Poland and for a shorter period in Ukraine. Transition rates also depend on the migrants' employment sector, which intersects with seasonality of work. For example, migrants working in the rural sector during a given stay have particularly high intensities of leaving Poland and a very low likelihood of leaving Ukraine. Those who live in the Ukrainian countryside, as compared to those living in towns and cities, tend to stay in Poland for shorter periods, while the impact of urban residency in Ukraine on stays in Ukraine is mixed. Inhabitants of southern Ukraine tend to stay for a shorter time in both Poland and Ukraine than migrants from other Ukrainian regions.

6. Results of robustness checks

The results of the robustness checks on the 2019 sub-samples (split into migrants who started their migration before 2014 and afterwards) and on the 2015 sample are largely similar regarding the variables' effects. Only their sizes differ, and the significance changes for certain variables. However, especially for women, the effects of family-situation-related variables are significant in most cases, for stays in Poland, in Ukraine, or both, which form the circulation cycle. In the 2015 model we control for the presence of a partner or children in Poland during the given migration cycle, which is impossible for the 2019 dataset due to data limitations. Having a partner or children in Poland tends to prolong stays in Poland, while for Ukraine the effect is very small and insignificant ($p = 0.838$). Thus, the effect for the stays in Poland is the same as in the 2019 models, where we only included information about the presence of the family during the study.

In general, for women, the pattern of the relationship between the family situation in Ukraine at the start of migration and mobility patterns is stable across models and is the same as in the main 2019 model. However, the size of the coefficients differs between the models, and for the 2015 sample the effects for partnered childless women and for

single mothers' stays in Ukraine (compared to partnered mothers) are insignificant.¹³ This can be linked to controlling for the presence of a partner or children in Poland during the given migration cycle in 2015 (not for the moment of the study, as in 2019), which can be particularly important in the case of single parents.

For men, just as in the main 2019 model, the impact of the family situation on mobility patterns at the start of migration is not only less visible than for women, but also less stable across the models. While the tendencies regarding longer and shorter stays in Poland and Ukraine by family situation are somewhat similar in terms of effects signs, the size of the effects and their significance differ. The results for single fathers are particularly unstable, which is presumably related to their very small share in all samples. However, the effect that partnered mothers stay for a shorter time in Poland and longer in Ukraine than partnered fathers is quite stable across the models. Detailed results of the additional models and analysed interactions are presented in the Appendix: Tables A-7–A-16 and Figures A-2–A-7 for the 2019 sub-samples models and Tables A-19–A-23 and Figures A-8–A-10 for the 2015 model.

7. Discussion

The empirical findings of our study of Ukraine-to-Poland migration emphasize that besides conventional migration characteristics (migrant cohort, legal status, employment sector), familial trajectories should also be taken into account when explaining temporary and circular migration patterns. In particular, our results show that the familial setup in the home country prior to the first departure for Poland shapes the migratory trajectories of female migrants, while for males the pattern is less straightforward. It is clear that this relationship is not static, involves mutual interactions between familial and migratory events, and depends on the contextual factors of migration and its history. Importantly, for Ukrainian females in different familial situations we find a regular pattern in the cycles of circular migration in which relatively long stays in Poland are combined with comparatively short stays in Ukraine.

Motherhood at the start of migration plays a particularly important role in shaping migration patterns. Partnered mothers have a higher transition rate for leaving Poland and a smaller transition rate for leaving Ukraine than women in other familial situations. We link these findings to the relatively high separation costs of parents when they migrate alone, including caring duties, which are apparently comparatively low when a partnered father migrates and the mother remains in Ukraine to care for the children. This has also

¹³ Moreover, for the 2019 sub-sample including the pre-2014 cohort, single mothers tend to stay longer in Poland and for a shorter time in Ukraine than partnered childless women (which differs from other models). However, the hazard ratios for the transitions of these two groups are very close.

been found in studies in other contexts (Carling, Menjívar, and Schmalzbauer 2012). At the same time, single Ukrainian mothers tend to stay longer in Poland than partnered mothers. We interpret this finding as single mothers needing to accumulate higher levels of income while in Poland than the average partnered mother, due to being breadwinners in their households. However, single Ukrainian parents start their migration to Poland when their children are older than the children of partnered parents, which involves less intensive caring duties. Single parents may also meet new partners in either Poland or Ukraine, which could influence their separation costs. It is more likely that Ukrainian women have a Polish spouse than Ukrainian men (Górny and Kępińska 2004), which is conducive to longer stays in Poland where the new partner lives. Although we account for marriages contracted during migration, we are unable to follow the formation of informal relationships due to data limitations. In both Poland and in Ukraine, marriage and childbirth during a given stay prolong the stay. These familial events operate as anchors to the given country, which demonstrates the importance of interrelations between family and mobility trajectories.

The role of separation costs in shaping migration patterns is further supported by the result that migrants staying in Poland with some members of their family – a partner or children – stay longer in Poland.¹⁴ The economic side of migrants' transnational livelihoods materialises in the tendency of migrants to stay longer in Poland the more children they have at the beginning of the given migratory stay.¹⁵ This presumably allows for accumulating more capital (savings), thus serving the relatively high needs of a big household.

Overall, our study demonstrates that when examining migratory patterns of temporary migrants it is imperative to account for the context of the sending country. In our analyses we focus on the familial context, but we also account for correlations (due to both observed and unobserved factors) between transition rates from the destination country to the home country and vice versa. By studying the duration of stays in both Poland and Ukraine, i.e., reconstructing migrants' overall migration trajectory, we contribute to the economics of transnational living (Erdal and Carling 2021).

Although we conducted extensive robustness checks demonstrating the stability of our results, especially regarding the relationship between the family situation in Ukraine at the beginning of migration and the mobility patterns of female migrants, our study has some limitations. First, due to data limitations we were unable to reconstruct whole familial trajectories and, more importantly, to observe in the analysed dataset from 2019 whether a person migrated to Poland with their family at the various stages of the migration project. However, we controlled for whether the migrant was with their family

¹⁴ In the model for 2019 we only control for the presence of family at the moment of the study due to data limitations, but we observe this effect in the model for 2015, where we have an adequate variable.

¹⁵ This effect is significant for all the robustness checks, but not in the main model for 2019.

in Poland at the time of the study in 2019. Moreover, we estimated an additional model for a similar dataset from 2015, where information on the presence of family in Poland was collected for the given migration cycle, which we treat as an important robustness check. Second, while assuming in our analyses that the duration of stays in Ukraine – intended to spend income from migration – correlates with the level of capital accumulated on emigration in Poland, we miss out the role of remittance by migrants during their stays in Poland (i.e., income from migration might be spent when the migrant is still in Poland), as we do not have data on migrants' remitting behaviour during the whole migration trajectory. Data allowing a full reconstruction of the familial and mobility trajectories of temporary migrants are scarce due to the challenge of collecting such information in surveys and the limitations of registries. In particular, unavailability of high-quality migration registry data in Central Europe makes it impossible to conduct such analyses. Therefore, the data analysed in this article, albeit imperfect, is unique.

8. Acknowledgements

The analyses presented in this article were conducted within the Bekker 2020 Programme, funded by the Polish National Agency for Academic Exchange. We are grateful to anonymous reviewers for their insightful comments and to colleagues from the Centre of Migration Research, University of Warsaw, for discussions and valuable suggestions that greatly contributed to improving the final version of the paper.

References

- Barbiano di Belgiojoso, E. (2019). The occupational (im)mobility of migrants in Italy. *Journal of Ethnic and Migration Studies* 45(9): 1571–1594. doi:10.1080/1369183X.2017.1414585.
- Barbiano di Belgiojoso, E. and Terzera, L. (2018). Family reunification – who, when, and how? Family trajectories among migrants in Italy. *Demographic Research* 38(28): 737–772. doi:10.4054/DemRes.2018.38.28.
- Bijwaard, G. (2010). Immigrant migration dynamics model for The Netherlands. *Journal of Population Economics* 23(4): 1213–1247. doi:10.1007/s00148-008-0228-1.
- Bijwaard, G. (2014). Multistate event history analysis with frailty. *Demographic Research* 30(58): 1591–1620. doi:10.4054/DemRes.2014.30.58.
- Bijwaard, G., Schluter, C., and Wahba, J. (2014). The impact of labor market dynamics on the return migration of immigrants. *Review of Economics and Statistics* 96(3): 483–494. doi:10.1162/REST_a_00389.
- Bijwaard, G. and van Doeselaar, S. (2014). The impact of changes in the marital status on return migration of family migrants. *Journal of Population Economics* 27(4): 961–997. doi:10.1007/s00148-013-0495-3.
- Bijwaard, G. and Wahba, J. (2019). Immigrants’ wage growth and selective out-migration. *Oxford Bulletin of Economic and Statistics* 81(5): 1067–1094. doi:10.1111/obes.12295.
- Caarls, K. and de Valk, H.A.G. (2017). Relationship trajectories, living arrangements, and international migration among Ghanaians: Relationship trajectories, living arrangements, and international migration. *Population, Space and Place* 23(6): 1–18. doi:10.1002/psp.2046.
- Caarls, K., Haagsman, K., Kraus, E.K., and Mazzucato, V. (2018). African transnational families: Cross-country and gendered comparisons. *Population, Space and Place* 27(4): 1–16. doi:10.1002/psp.2162.
- Carling, J., Menjivar, C., and Schmalzbauer, L. (2012). Central themes in the study of transnational parenthood. *Journal of Ethnic and Migration Studies* 38(2): 191–217. doi:10.1080/1369183X.2012.646417.
- Central Statistical Office (2018). *Foreigners on the national labour market: Regional approach*. Central Statistical Office.

- Constant, A.F. and Zimmermann, K.F. (2011). Circular and repeat migration: Counts of exits and years away from the host country. *Population Research and Policy Review* 30(4): 495–515. doi:10.1007/s11113-010-9198-6.
- Constant, A.F. and Zimmermann, K.F. (2012). The dynamics of repeat migration: A Markov Chain Analysis. *International Migration Review* 46(2): 362–388. doi:10.1111/j.1747-7379.2012.00890.x.
- Courgeau, D. and Lelièvre, E. (1992). *Event history analysis in demography*. Clarendon Press. doi:10.1093/oso/9780198287384.001.0001.
- Dierx, A. (1988). A life-cycle model of repeat migration. *Regional Science and Urban Economics* 18(3): 383–397. doi:10.1016/0166-0462(88)90015-4.
- Dustmann, C. (2003). Return migration, wage differentials, and the optimal migration duration. *European Economic Review* 47(2): 353–369. doi:10.1016/S0014-2921(01)00184-2.
- Dustmann, C. and Görlach, J.S. (2016). The economics of temporary migrations. *Journal of Economic Literature* 54(1): 98–136. doi:10.1257/jel.54.1.98.
- Dustmann, C. and Kirchkamp, O. (2002). The optimal migration duration and activity choice after re-migration. *Journal of Development Economics* 67(2): 351–372. doi:10.1016/S0304-3878(01)00193-6.
- Dustmann, C. and Weiss, Y. (2007). Return migration: Theory and empirical evidence from the UK. *British Journal of Industrial Relations* 45(2): 236–256. doi:10.1111/j.1467-8543.2007.00613.x.
- Erdal, M.B. and Carling, J. (2021). New economics of transnational living. *Population, Space and Place* 27(5): 1–11. doi:10.1002/psp.2410.
- Fuller, S. (2015). Do pathways matter? Linking early immigrant employment sequences and later economic outcomes: Evidence from Canada. *International Migration Review* 49(2): 355–405. doi:10.1111/imre.12094.
- Gile, K.J. (2011). Improved Inference for respondent-driven sampling data with application to HIV prevalence estimation. *Journal of the American Statistical Association* 106(493): 135–146. doi:10.1198/jasa.2011.ap09475.
- Górny, A. (2017). All circular but different: Variation in patterns of Ukraine-to-Poland migration. *Population, Space and Place* 23(8): e2074. doi:10.1002/psp.2074.

- Górny, A., Grabowska-Lusińska, I., Lesińska, M., and Okólski, M. (ed.) (2010). *Immigration to Poland: Policy, employment, integration*. Warsaw: Wydawnictwo Naukowe Scholar.
- Górny, A. and Kępińska, E. (2004). Mixed marriages in migration from the Ukraine to Poland. *Journal of Ethnic and Migration Studies* 30(2): 353–372. doi:10.1080/1369183042000200740.
- Górny, A., Madej, K., and Porwit, K. (2020). *Ewolucja czy rewolucja? Imigracja z Ukrainy do aglomeracji warszawskiej z perspektywy lat 2015–2019* (CMR Working Papers 123/181).
- Górny, A. and Śleszyński, P. (2019). Exploring the spatial concentration of foreign employment in Poland under the simplified procedure. *Geographia Polonica* 92(3): 331–345. doi:10.7163/GPol.0152.
- Górny, A. and van der Zwan, R. (2024). Mobility and labor market trajectories of Ukrainian migrants to Poland in the context of the 2014 Russian invasion of Ukraine. *European Societies* 26(2): 438–468. doi:10.1080/14616696.2023.2298425.
- Haddad, M. and Caron, L. (2023). Transregional spouses, parents and children: How gender and family shape return migration in the French overseas. *Population, Space and Place* 29(3): 1–18. doi:10.1002/psp.2629.
- Heckathorn, D. (1997). Respondent-driven sampling: A new approach to the study of hidden populations. *Social Problems* 44(2): 174–199. doi:10.1525/sp.1997.44.2.03x0221m.
- Heckathorn, D. (2007). Extensions of respondent-driven sampling: Analyzing continuous variables and controlling for differential recruitment. *Sociological Methodology* 37(1): 151–208. doi:10.1111/j.1467-9531.2007.00188.x.
- Heckman, J. and Singer, B. (1984). A method for minimizing the impact of distributional assumptions in econometric models for duration data. *Econometrica* 52(2): 271–320. doi:10.2307/1911491.
- Hill, J. (1987). Immigrant decisions concerning duration of stay and migratory frequency. *Journal of Development Economics* 25(1): 221–234. doi:10.1016/0304-3878(87)90082-4.
- Kraus, E.K. (2019). Family formation trajectories across borders: A sequence analysis approach to Senegalese migrants in Europe. *Advances in Life Course Research* 42(100290): 1–13. doi:10.1016/j.alcr.2019.100290.

- Lancaster, T. (1979). Econometric methods for the duration of unemployment. *Econometrica* 47(4): 939–956. doi:10.2307/1914140.
- Lücke, M. and Saha, D. (2019). Labour migration from Ukraine: Changing destinations, growing macroeconomic impact (Policy Studies Series). German Advisory Group.
- Magda, I., Cukrowska-Torzewska, E., and Palczyńska, M. (2024). What if she earns more? Gender norms, income inequality, and the division of housework. *Journal of Family and Economic Issues* 45(1): 1–20. doi:10.1007/s10834-023-09893-0.
- Manton, K.W., Stallard, E., and Vaupel, J.W. (1981). Methods for comparing the mortality experience of heterogeneous populations. *Demography* 18(3): 389–410. doi:10.2307/2061005.
- Massey, D.S. and Espinosa, K.E. (1997). What’s driving Mexico–U.S. migration? A theoretical, empirical, and policy analysis. *American Journal of Sociology* 102(4): 939–999. doi:10.1086/231037.
- Modiri, F., Sadeghi, R., and Rahimi, A. (2025). The gendered division of household labor and decision-making in Tehran, Iran. *International Journal of Population Studies* 11(2): 109–117. doi:10.36922/ijps.3212.
- Nakajima, K. (2019). Homesickness and repeated migration. *Applied Economics* 51(32): 3451–3464. doi:10.1080/00036846.2019.1581908.
- Rogers, A. (1975). *Introduction to multiregional mathematical demography*. New York: Wiley. doi:10.2307/1966354.
- Rogers, A. (1995). *Multiregional demography: Principles, methods and extensions*. New York: Wiley.
- Sperandei, S., Bastos, L. S., Ribeiro-Alves, M., Reis, A., and Bastos, F. I. (2022). Assessing logistic regression applied to respondent-driven sampling studies: A simulation study with an application to empirical data. *International Journal of Social Research Methodology* 26(3): 319–333. doi:10.1080/13645579.2022.2031153.
- Stark, O. and Fan, C.S. (2007). The analytics of seasonal migration. *Economics Letters* 94(2): 304–312. doi:10.1016/j.econlet.2006.10.017.
- Tyldum, G. and Johnston, L. (eds.) (2014). *Applying respondent driven sampling to migrant populations. Lessons from the field*. Palgrave Macmillan. doi:10.1057/9781137363619.

- van den Berg, G.J. (2001). Duration models: Specification, identification and multiple durations. In: Heckman, J. and Leamer, E. (eds.). *Handbook of econometrics Volume 5*. Amsterdam: Elsevier: 3381–3460. doi:[10.1016/S1573-4412\(01\)05008-5](https://doi.org/10.1016/S1573-4412(01)05008-5).
- Willekens, F. (1999). Life course: Models and analysis. In: van Wissen, L.J.G. and Dykstra, P.A. (eds.). *Population issues: An interdisciplinary focus*. New York: Plenum Press: 23–51. doi:[10.1007/978-94-011-4389-9_2](https://doi.org/10.1007/978-94-011-4389-9_2).

Appendix

Table A-1: Descriptive statistics of the 2019 sample, by gender

Variable	Total		Males		Females	
	N	Mean/%	N	Mean/%	N	Mean/%
Age on first arrival in PL	1,314	31.5	562	29.7	752	32.8
Family in UA prior to 1 st trip						
partner & children	393	30.0	171	30.5	222	29.6
partner only	199	15.2	87	15.5	112	14.9
children only	147	11.2	15	2.7	132	17.6
single	572	43.6	287	51.3	285	38.0
Parents present in UA household prior to 1 st trip						
yes	567	43.2	258	46.0	309	41.0
no	747	56.8	303	54.0	444	59.0
Family in PL - partner or children (current ¹)						
single	694	52.8	315	56.2	379	50.3
partner or children	620	47.2	246	43.9	374	49.7
Childbirth(s) during migration trajectory	91	6.9	48	8.6	43	5.7
Marriage(s) during migration trajectory	120	9.1	61	10.9	59	7.8
Year of first arrival in PL						
before 2002	47	3.6	18	3.2	29	3.9
2002–2007	28	2.1	6	1.1	22	2.9
2008–2013	122	9.3	55	9.8	67	8.9
2014–2016	419	31.9	188	33.5	231	30.7
after 2016	698	53.1	294	52.4	404	53.7
Number of migration cycles ²	1,314	3.3	561	3.1	753	3.4
Locality type in UA						
countryside	294	22.4	105	18.7	189	25.2
town up to 50,000	308	23.5	143	25.5	165	22.0
town of 51,000–500,000	407	31.0	172	30.7	235	31.3
city of more than 500,000	303	23.1	141	25.1	162	21.6
Region of origin in UA						
western	542	41.3	222	39.6	320	42.5
central	511	38.9	229	40.8	282	37.5
eastern	171	13.0	71	12.7	100	13.3
southern	84	6.4	36	6.4	48	6.4
Education						
primary or vocational	532	40.5	240	42.8	292	38.8
secondary or post-secondary	199	15.1	90	16.0	109	14.5
higher	583	44.4	231	41.2	352	46.8
N	1,314	100.0	561	42.7	753	57.3

Note: ¹ At the moment of the study – current stay in Poland; ² cycle refers to stay in Poland and following it subsequent stay in Ukraine.

Table A-2: Descriptive statistics of stays in Poland and Ukraine (2019 – full sample)

Variable	Stays in Poland		Stays in Ukraine	
	N	Mean/%	N	Mean/%
Duration of stay (months)	4,352	7.6	3,038	7.8
Age (stay ²)	4,350	34.5	3,037	35.0
Gender				
male	1,763	40.5	1,202	39.6
female	2,589	59.5	1,836	60.4
Family in UA prior to 1 st trip				
partner and children	1,479	34.1	1,086	35.8
partner only	543	12.5	344	11.3
children only	544	12.5	397	13.1
single	1,778	40.9	1,206	39.8
Parents present in UA household prior to 1 st trip				
yes	2,001	46.0	1,434	47.2
no	2,351	54.0	1,604	52.8
Family in PL - partner or children (current ¹)				
single	2,429	55.8	1,735	57.1
partner or children	1,923	44.2	1,303	42.9
Number of children ⁴ (stay ²)	2,164	1.60	1,553	1.63
Child/children aged 0–2 (stay ²)	253	5.8	202	6.7
Child/children aged 3–5 (stay ²)	306	7.0	201	6.6
Child/children aged 6–15 (stay ²)	983	22.6	669	22.1
Child/children aged 16–18 (stay ²)	454	10.5	326	10.8
Child/children aged 19–25 (stay ²)	893	20.6	669	22.1
Childbirth during given stay	49	1.1	54	1.8
Marriage during given stay	51	1.2	71	2.3
Year of first arrival in PL				
before 2002	616	14.2	569	18.7
2002–2007	287	6.6	259	8.5
2008–2013	705	16.2	583	19.2
2014–2016	1,362	31.3	943	31.0
after 2016	1,382	31.8	684	22.5
Locality type in UA				
countryside	1,407	32.4	1,113	36.7
town up to 50,000	1,129	26.0	821	27.0
town of 51,000–500,000	1,110	25.5	703	23.2
city of more than 500,000	703	16.2	400	13.2
Region of origin in UA				
western	2,524	58.0	1,982	65.2
central	1,250	28.7	739	24.3
eastern	359	8.3	188	6.2
southern	198	4.6	114	3.8
Documents in PL – long-term (cycle ³)	554	12.8	225	7.5
Sector in PL – agriculture (cycle ³)	396	9.1	368	12.1
Sector in PL – industry (cycle ³)	560	12.9	372	12.2
Sector in PL – hospitality (cycle ³)	623	14.3	353	11.6
Sector in PL – construction (cycle ³)	927	21.3	670	22.1
Sector in PL – domestic service (cycle ³)	773	17.8	601	19.8

Note: ¹ At the moment of the study – current stay in Poland; ² stay refers to stay in either Poland or Ukraine; ³ cycle refers to stay in Poland followed by stay in Ukraine; ⁴ excluding persons without children.

Table A-3: Unobserved heterogeneity in the correlated model (2019 – full sample)

Variable	Poland to Ukraine		Ukraine to Poland	
	Coefficient	P-value	Coefficient	P-value
V_{PL1}/V_{UA1}	-2.468	0.000	-3.621	0.000
V_{PL2}/V_{UA2}	-2.972	0.000	-2.509	0.000
V_{PL3}/V_{UA3}	-1.852	0.000	-2.601	0.000
V_{PL4}/V_{UA4}	-5.235	0.000	-3.250	0.000
$Pr(V = V_{PL1}/V_{UA1})$	0.197	0.000	.	.
$Pr(V = V_{PL2}/V_{UA2})$	0.238	0.000	.	.
$Pr(V = V_{PL3}/V_{UA3})$	0.270	0.000	.	.
$Pr(V = V_{PL4}/V_{UA4})$	0.296	0.000	.	.

Table A-4: Hazard ratio for transition rates for women in different familial situations prior to first trip to Poland,¹ linear combinations of interaction terms (2019 – full sample)

Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner only	0.830	0.021	1.123	0.103
Children only	0.703	0.000	1.268	0.000
Single	0.666	0.000	1.314	0.000

Note: ¹ Reference category: women with a partner and children.

Table A-5: Hazard ratio for transition rates for men in different familial situations prior to first trip to Poland,¹ linear combinations of interaction terms (2019 – full sample)

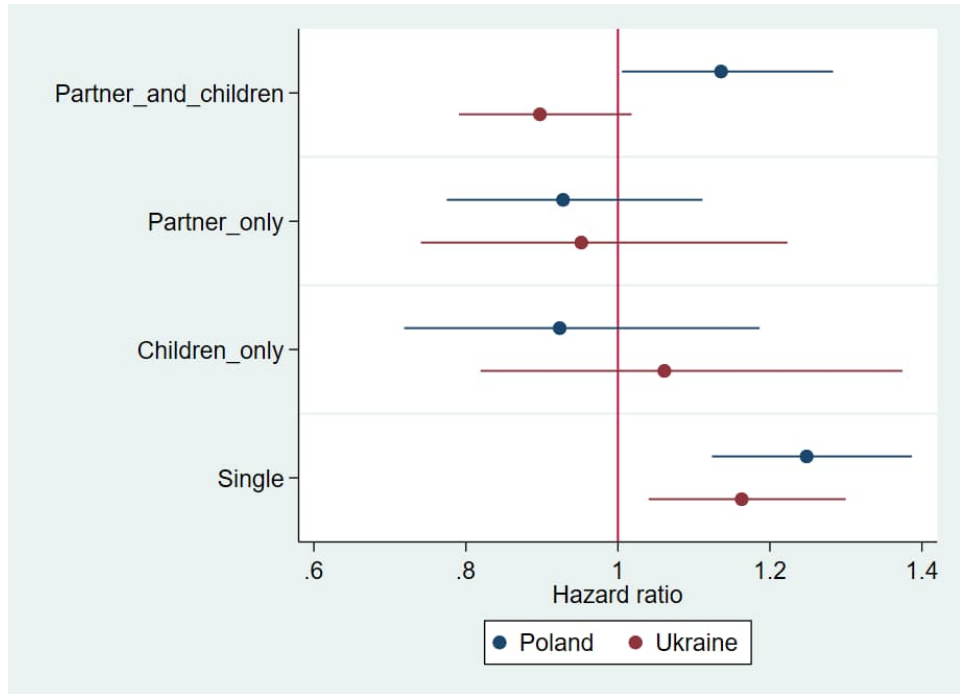
Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner only	1.016	0.852	1.059	0.650
Children only	0.865	0.268	1.072	0.606
Single	0.606	0.000	1.014	0.850

Note: ¹ Reference category: men with a partner and children.

Table A-6: Hazard ratio for transition rates for women versus men in different familial situations prior to first trip to Poland, linear combinations of interaction terms (2019 – full sample)

Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner & children	1.135	0.041	0.897	0.093
Partner only	0.928	0.416	0.952	0.700
Children only	0.923	0.533	1.061	0.653
Single	1.248	0.000	1.163	0.008

Figure A-1: Transition rates with 95% CI for women versus men in different familial situations prior to first trip to Poland, interaction terms (2019 – full sample)



Note: Exact values for interactions are presented in Table A-6.

Table A-7: Correlated model for transitions from Poland to Ukraine and transitions from Ukraine to Poland (2019 – sub-sample: first migration to Poland before 2014)

Variable	Poland to Ukraine		Ukraine to Poland	
	HR (SE)	P-value	HR (SE)	P-value
Female	1.939 (0.162)	0.000	0.641 (0.055)	0.000
Family in UA prior to 1 st trip (ref. partner & child.)				
partner only	0.306 (0.037)	0.000	1.150 (0.138)	0.245
children only	1.227 (0.226)	0.268	1.196 (0.196)	0.277
single	0.320 (0.030)	0.000	1.231 (0.114)	0.025
Interaction female # family in UA prior to 1 st trip				
female # partner only	0.725 (0.109)	0.032	1.773 (0.251)	0.000
female # children only	0.273 (0.056)	0.000	1.273 (0.233)	0.188
female # single	0.778 (0.078)	0.012	2.404 (0.232)	0.000
Parents present in UA household prior to 1 st trip	0.900 (0.048)	0.047	1.119 (0.062)	0.043
Family in PL – partner or children (stay ²)	0.982 (0.041)	0.673	1.153 (0.047)	0.000
Number of children ⁴ (stay ²)	0.880 (0.041)	0.006	0.710 (0.033)	0.000
Child/children aged 0–2 (stay ²)	1.142 (0.100)	0.130	1.116 (0.087)	0.158
Child/children aged 3–5 (stay ²)	0.841 (0.073)	0.047	1.313 (0.108)	0.001
Child/children aged 6–15 (stay ²)	1.020 (0.078)	0.792	1.224 (0.090)	0.006
Child/children aged 16–18 (stay ²)	0.915 (0.066)	0.223	1.373 (0.099)	0.000
Child/children aged 19–25 (stay ²)	0.938 (0.073)	0.412	1.885 (0.145)	0.000
Childbirth during stay	0.534 (0.089)	0.000	0.259 (0.024)	0.000
Marriage during stay	0.315 (0.052)	0.000	0.330 (0.031)	0.000
Year of first arrival in PL (ref. before 2002)				
2002–2007	1.115 (0.068)	0.075	0.757 (0.042)	0.000
2008–2013	0.771 (0.038)	0.000	1.640 (0.079)	0.000
2014–2016	N.A	N.A	N.A	N.A
after 2016	N.A	N.A	N.A	N.A
Order of migration cycle	0.999 (0.004)	0.742	1.000 (0.034)	0.002
Age (stay ²)	0.837 (0.026)	0.000	1.482 (0.043)	0.000
Age sq. (stay ²)	1.067 (0.018)	0.000	1.016 (0.019)	0.419
Documents in PL – long-term (cycle ³)	0.334 (0.022)	0.000	1.067 (0.082)	0.400
Sector in PL – agriculture (cycle ³)	1.200 (0.121)	0.000	0.836 (0.049)	0.002
Sector in PL – industry (cycle ³)	1.027 (0.081)	0.741	1.395 (0.124)	0.000
Sector in PL – hospitality (cycle ³)	0.663 (0.051)	0.000	0.819 (0.070)	0.019
Sector in PL – construction (cycle ³)	1.491 (0.102)	0.000	1.345 (0.095)	0.000
Sector in PL - domestic service (cycle ³)	0.434 (0.027)	0.000	1.334 (0.080)	0.076
Locality type in UA (ref. countryside)				
town up to 50,000	1.132 (0.057)	0.014	1.047 (0.050)	0.332
town of 51,000–500,000	1.718 (0.116)	0.000	0.676 (0.044)	0.000
city of more than 500,000	1.096 (0.100)	0.313	0.473 (0.042)	0.000
Region of origin in UA (ref. south)				
western	5.813 (0.780)	0.000	1.223 (0.205)	0.229
central	2.945 (0.412)	0.000	1.503 (0.264)	0.020
eastern	5.376 (0.978)	0.000	1.807 (0.395)	0.007
Piecewise constant duration dependence:				
Interval 0–1.5 months	3.322 (0.398)	0.000	2.706 (0.222)	0.000
Interval 1.5–3.0 months	2.906 (0.350)	0.000	2.517 (0.207)	0.000
Interval 3.0–6.0 months	2.320 (0.284)	0.000	1.827 (0.158)	0.000
Interval 6.0–12.0 months	1.877 (0.240)	0.000	1.459 (0.134)	0.000
RDS weight	0.949 (0.031)	0.108	0.956 (0.020)	0.033

Note: ¹ at the moment of the study – current stay in Poland; ² stay refers to stay in either Poland or Ukraine;

³ cycle refers to stay in Poland followed by stay in Ukraine; ⁴ excluding persons without children.

Table A-8: Unobserved heterogeneity in the correlated model (2019 – sub-sample: first migration to Poland before 2014)

Variable	Poland to Ukraine		Ukraine to Poland	
	Coefficient	P-value	Coefficient	P-value
V_{PL1}/V_{UA1}	-2.639	0.000	-2.570	0.000
V_{PL2}/V_{UA2}	-4.685	0.000	-2.685	0.000
V_{PL3}/V_{UA3}	-3.717	0.000	-4.076	0.000
V_{PL4}/V_{UA4}	-5.443	0.000	-3.589	0.000
$Pr(V = V_{PL1}/V_{UA1})$	0.086	0.000	-	-
$Pr(V = V_{PL2}/V_{UA2})$	0.210	0.000	-	-
$Pr(V = V_{PL3}/V_{UA3})$	0.348	0.000	-	-
$Pr(V = V_{PL4}/V_{UA4})$	0.356	0.000	-	-

Table A-9: Hazard ratio for transition rates for women in different familial situations prior to first trip to Poland,¹ linear combinations of interaction terms (2019 – sub-sample: first migration to Poland before 2014)

Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner only	0.222	0.000	2.038	0.000
Children only	0.335	0.000	1.522	0.000
Single	0.249	0.000	2.958	0.000

Note: ¹ Reference category: women with a partner and children.

Table A-10: Hazard ratio for transition rates for men in different familial situations prior to first trip to Poland,¹ linear combinations of interaction terms (2019 – sub-sample: first migration to Poland before 2014)

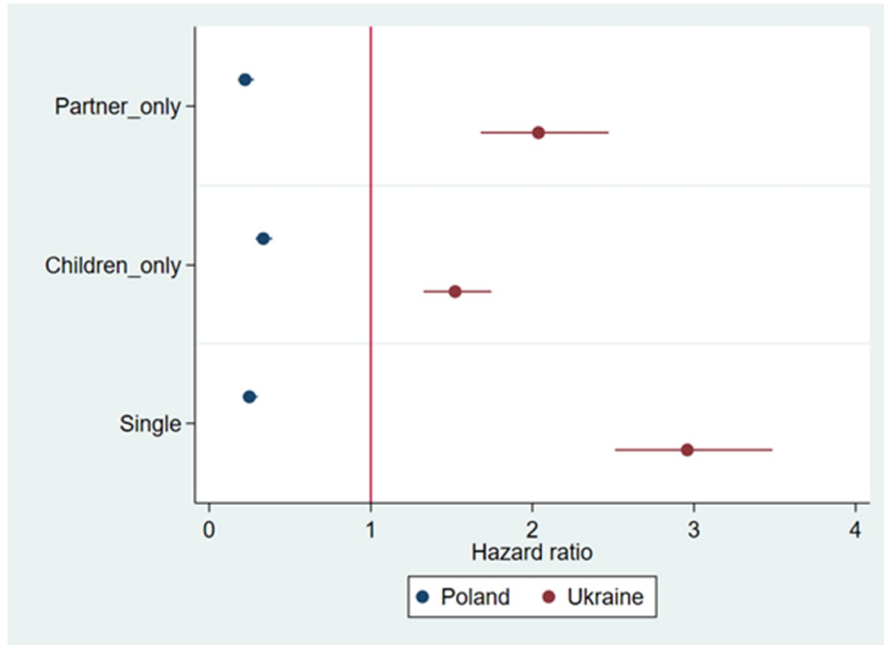
Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner only	0.306	0.000	1.150	0.245
Children only	1.226	0.268	1.196	0.277
Single	0.320	0.000	1.230	0.025

Note: ¹ Reference category: men with a partner and children.

Table A-11: Hazard ratio for transition rates for women versus men in different familial situations prior to first trip to Poland, linear combinations of interaction terms (2019 – sub-sample: first migration to Poland before 2014)

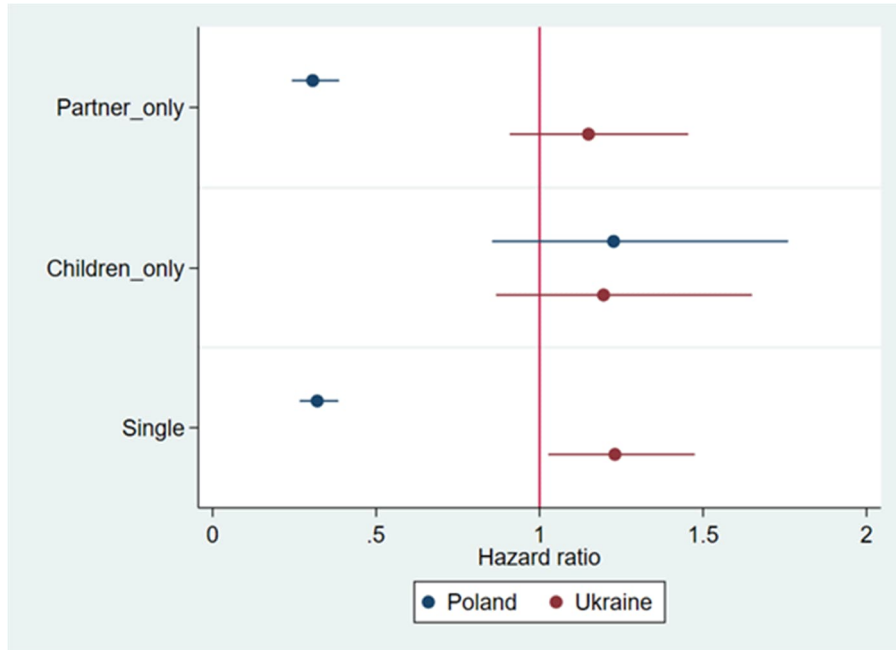
Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner and children	1.939	0.000	0.641	0.000
Partner only	1.406	0.013	1.137	0.311
Children only	0.529	0.001	0.816	0.243
Single	1.508	0.000	1.542	0.000

Figure A-2: Hazard ratio with 95% CI for transition rates from Poland and Ukraine for women in different familial situations prior to first trip to Poland (2019 – sub-sample: first migration to Poland before 2014)



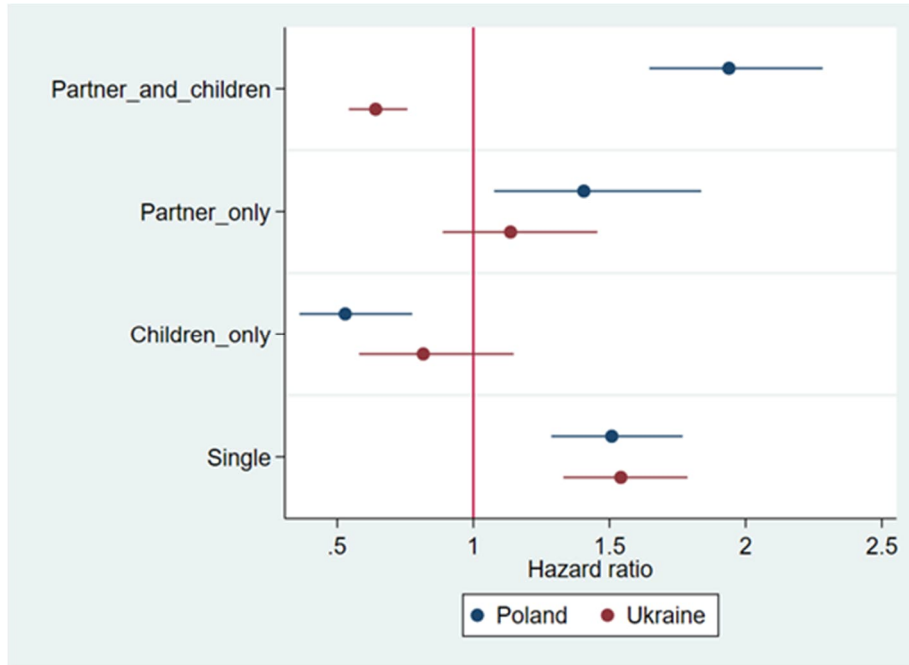
Note: Exact values for interactions are presented in Table A-9.

Figure A-3: Hazard ratios with 95% CI for transition rates from Poland and Ukraine for men in different familial situations prior to first trip to Poland (2019 – sub-sample: first migration to Poland before 2014)



Note: Exact values for interactions are presented in Table A-10.

Figure A-4: Transition rates along with 95% CI for women versus men in different familial situations prior to first trip to Poland, interaction terms (2019 – sub-sample: first migration to Poland before 2014)



Note: Exact values for interactions are presented in Table A-11.

Table A-12: Correlated model for transitions from Poland to Ukraine and transitions from Ukraine to Poland (2019 – sub-sample: first migration to Poland after 2013)

Variable	Poland to Ukraine		Ukraine to Poland	
	HR (SE)	P-value	HR (SE)	P-value
Female	1.167 (0.120)	0.132	0.881 (0.070)	0.111
Family in UA prior to 1 st trip (ref. partner & child.)				
partner only	0.919 (0.114)	0.496	1.074 (0.106)	0.469
children only	0.839 (0.179)	0.410	0.783 (0.138)	0.163
single	0.695 (0.078)	0.001	1.081 (0.102)	0.409
Interaction female # family in UA prior to 1 st trip				
female # partner only	0.945 (0.139)	0.701	1.212 (0.144)	0.106
female # children only	0.980 (0.222)	0.929	1.854 (0.351)	0.001
female # single	0.928 (0.108)	0.519	1.250 (0.113)	0.014
Parents present in UA household prior to 1 st trip	1.256 (0.075)	0.000	0.927 (0.046)	0.128
Family in PL - partner or children (stay ²)	0.825 (0.042)	0.000	1.045 (0.042)	0.271
Number of children ⁴ (stay ²)	0.779 (0.070)	0.005	0.935 (0.062)	0.310
Child/children aged 0–2 (stay ²)	1.443 (0.199)	0.008	0.979 (0.101)	0.833
Child/children aged 3–5 (stay ²)	1.121 (0.147)	0.383	0.943 (0.091)	0.540
Child/children aged 6–15 (stay ²)	1.126 (0.144)	0.354	1.161 (0.109)	0.111
Child/children aged 16–18 (stay ²)	1.351 (0.156)	0.009	1.223 (0.108)	0.023
Child/children aged 19–25 (stay ²)	1.427 (0.164)	0.002	0.993 (0.087)	0.931
Childbirth during stay	0.328 (0.066)	0.000	0.527 (0.092)	0.000
Marriage during stay	0.599 (0.104)	0.003	0.843 (0.096)	0.133
Year of first arrival in PL (ref. 2014–2016)				
2002–2007	N.A	N.A	N.A	N.A
2008–2013	N.A	N.A	N.A	N.A
2014–2016 (ref.)	N.A	N.A	N.A	N.A
after 2016	0.759 (0.040)	0.000	1.495 (0.061)	0.000
Order of migration cycle	0.806 (0.012)	0.000	1.096 (0.016)	0.000
Age (stay ²)	0.971 (0.028)	0.300	0.998 (0.024)	0.947
Age sq. (stay ²)	1.003 (0.022)	0.881	0.960 (0.017)	0.024
Documents in PL – long-term (cycle ³)	0.230 (0.016)	0.000	1.262 (0.098)	0.003
Sector in PL – agriculture (cycle ³)	1.175 (0.104)	0.067	0.728 (0.056)	0.000
Sector in PL – industry (cycle ³)	1.038 (0.060)	0.521	0.772 (0.040)	0.000
Sector in PL – hospitality (cycle ³)	0.786 (0.043)	0.000	0.883 (0.046)	0.017
Sector in PL – construction (cycle ³)	0.960 (0.063)	0.532	0.936 (0.057)	0.276
Sector in PL – domestic service (cycle ³)	0.785 (0.059)	0.001	1.123 (0.078)	0.096
Locality type in UA (ref. countryside)				
town up to 50,000	0.914 (0.065)	0.205	1.109 (0.059)	0.053
town of 51,000–500,000 thousand	0.826 (0.053)	0.003	1.101 (0.057)	0.062
city of more than 500,000	0.778 (0.062)	0.002	0.971 (0.061)	0.641
Region of origin in UA (ref. south)				
western	1.372 (0.144)	0.003	0.761 (0.062)	0.001
central	0.983 (0.101)	0.865	0.789 (0.062)	0.003
eastern	1.007 (0.121)	0.954	0.843 (0.079)	0.067
Piecewise constant duration dependence:				
Interval 0–1.5 months	3.084 (0.362)	0.000	2.848 (0.279)	0.000
Interval 1.5–3.0 months	2.884 (0.339)	0.000	2.541 (0.250)	0.000
Interval 3.0–6.0 months	2.321 (0.275)	0.000	1.793 (0.180)	0.000
Interval 6.0–12.0 months	1.734 (0.215)	0.000	1.345 (0.144)	0.006
RDS weight	1.042 (0.022)	0.049	0.891 (0.015)	0.000

Note: ¹ At the moment of the study – current stay in Poland; ² stay refers to stay in either Poland or Ukraine;

³ cycle refers to stay in Poland followed by stay in Ukraine; ⁴ excluding persons without children.

Table A-13: Unobserved heterogeneity in the correlated model (2019 – sub-sample: first migration to Poland after 2013)

Variable	Poland to Ukraine		Ukraine to Poland	
	Coefficient	P-value	Coefficient	P-value
V_{PL1}/V_{UA1}	-3.422	0.000	-1.831	0.000
V_{PL2}/V_{UA2}	-1.666	0.000	-2.184	0.000
V_{PL3}/V_{UA3}	-2.500	0.000	-2.660	0.000
V_{PL4}/V_{UA4}	-8.224	0.000	-3.636	0.000
$Pr(V = V_{PL1}/V_{UA1})$	0.197	0.000	.	.
$Pr(V = V_{PL2}/V_{UA2})$	0.111	0.000	.	.
$Pr(V = V_{PL3}/V_{UA3})$	0.469	0.000	.	.
$Pr(V = V_{PL4}/V_{UA4})$	0.224	0.000	.	.

Table A-14: Hazard ratio for transition rates for women in different familial situations prior to first trip to Poland,¹ linear combinations of interaction terms (2019 – sub-sample: first migration to Poland after 2013)

Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner only	0.869	0.248	1.301	0.011
Children only	0.823	0.048	1.451	0.000
Single	0.645	0.000	1.352	0.001

Note: ¹ Reference category: women with a partner and children.

Table A15: Hazard ratio for transition rates for men in different familial situations prior to first trip to Poland,¹ linear combinations of interaction terms (2019 – sub-sample: first migration to Poland after 2013)

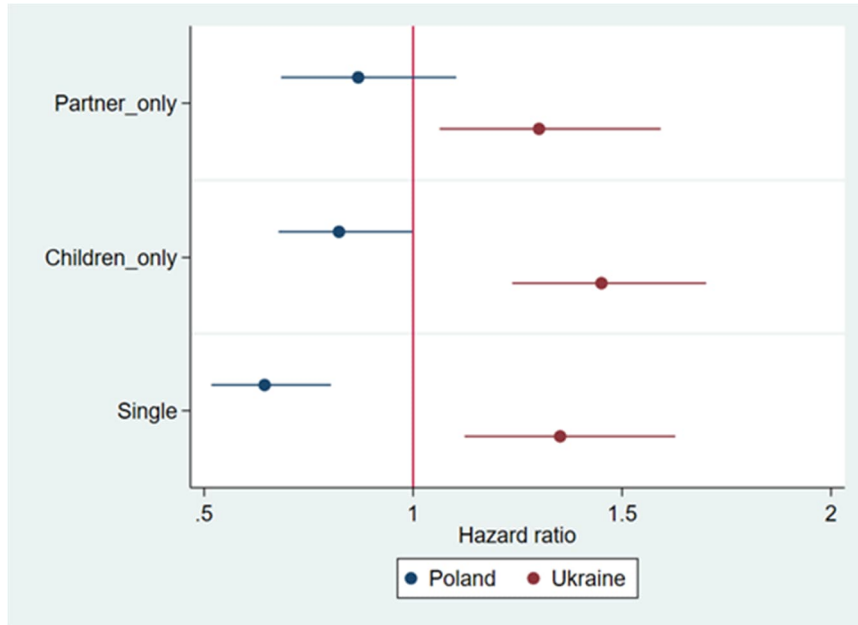
Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner only	0.919	0.496	1.074	0.496
Children only	0.839	0.410	0.783	0.163
Single	0.695	0.001	1.081	0.409

Note: ¹ Reference category: men with a partner and children.

Table A-16: Hazard ratio for transition rates for women versus men in different familial situations prior to first trip to Poland, linear combinations of interaction terms (2019 – sub-sample: first migration to Poland after 2013)

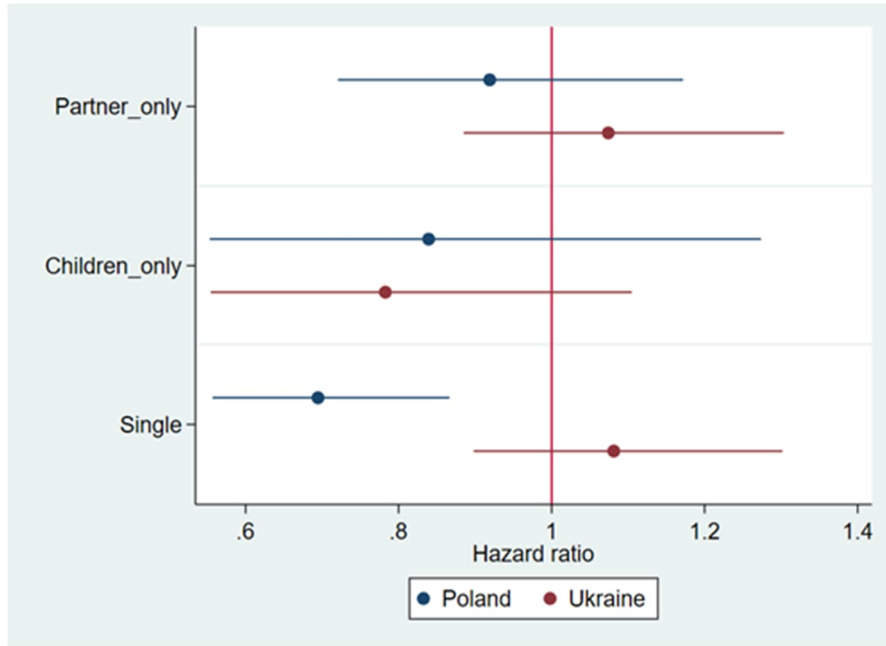
Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner and children	1.167	0.132	0.881	0.111
Partner only	1.103	0.412	1.068	0.499
Children only	1.144	0.520	1.634	0.006
Single	1.083	0.263	1.102	0.102

Figure A-5: Hazard ratio with 95% CI for transition rates from Poland and Ukraine for women in different familial situations prior to first trip to Poland (2019 – sub-sample: first migration to Poland after 2013)



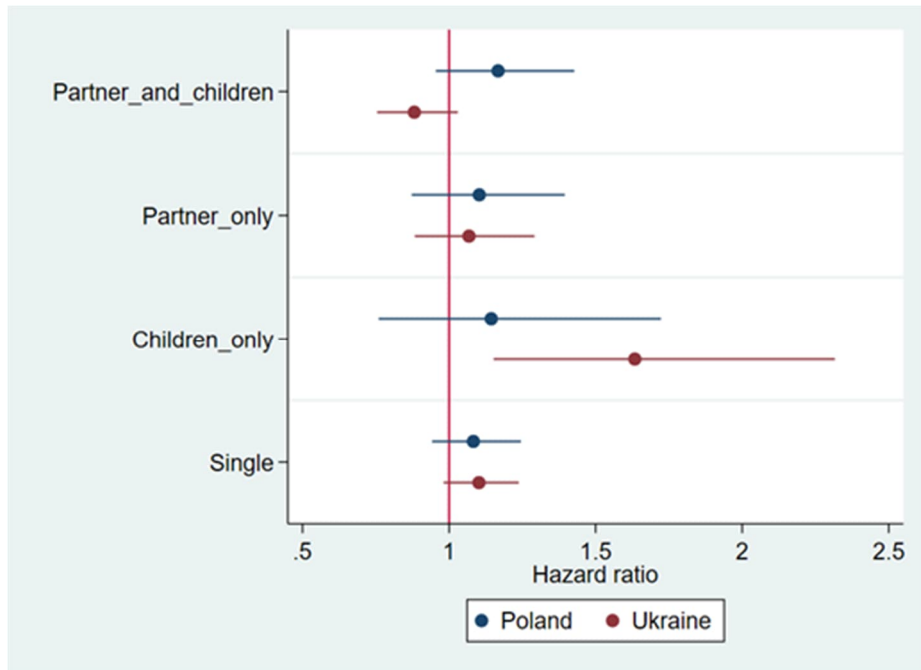
Note: Exact values for interactions are presented in Table A-14.

Figure A-6: Hazard ratios with 95% CI for transition rates from Poland and Ukraine for men in different familial situations prior to first trip to Poland (2019 – sub-sample: first migration to Poland after 2013)



Note: Exact values for interactions are presented in Table A-15.

Figure A-7: Transition rates with 95% CI for women versus men in different familial situations prior to first trip to Poland, interaction terms (2019 – sub-sample: first migration to Poland after 2013)



Note: Exact values for interactions are presented in Table A-16.

Table A-17: Descriptive statistics of the 2015 sample by gender

Variable	Total		Males		Females	
	N	Mean/%	N	Mean/%	N	Mean/%
Age on first arrival in PL	642	31.4	287	26.4	355	35.5
Family in UA prior to 1 st trip						
partner & children	192	30.0	71	24.7	121	34.3
partner only	62	9.7	26	9.1	36	10.2
children only	71	11.1	10	3.5	61	17.3
single	315	49.2	180	62.7	135	38.2
Parents present in UA household prior to 1 st trip						
yes	294	45.8	166	57.8	128	36.1
no	348	54.2	121	42.2	227	63.9
Family in PL – partner or children (current ¹)						
single	517	80.5	233	81.2	284	80.0
partner or children	125	19.5	54	18.8	71	20.0
Childbirth(s) during migration trajectory	45	7.0	25	8.7	20	5.6
Marriage(s) during migration trajectory	44	6.9	23	8.0	21	5.9
Year of first arrival in PL						
before 2002	64	10.0	17	5.9	47	13.2
2002–2007	59	9.2	11	3.8	48	13.5
2008–2013	212	33.0	84	29.3	128	36.1
after 2013	307	47.8	175	61.0	132	37.2
Number of migration cycles ²	642	4.1	287	2.7	355	5.2
Locality type in UA						
countryside	154	24.0	51	17.8	103	29.0
town up to 50,000	159	24.8	56	19.5	103	29.0
town of 51,000–500,000 thousand	179	27.9	94	32.8	85	23.9
city of more than 500,000	150	23.4	86	30.0	64	18.0
Region of origin in UA						
western	380	59.2	135	47.0	245	69.0
central	181	28.2	106	36.9	75	21.1
eastern	44	6.9	28	9.8	16	4.5
southern	31	4.8	16	5.6	15	4.2
Education						
primary or vocational	47	7.3	26	9.1	21	5.9
secondary or post-secondary	348	54.2	148	51.6	200	56.3
higher	247	38.5	113	39.4	134	37.8
N	642	100.0	287	44.7	355	55.3

Note: ¹ At the moment of the study – current stay in Poland; ² cycle refers to stay in Poland followed by stay in Ukraine.

Table A-18: Descriptive statistics of stays in Poland and Ukraine (2015)

Variable	Stays in Poland		Stays in Ukraine	
	N	Mean/%	N	Mean/%
Duration of stay (months)	2,635	5.7	1,998	9.7
Age (stay ²)	2,635	38.4	1,998	39.9
Gender				
male	784	29.8	497	24.9
female	1,851	70.3	1,501	75.1
Family in UA prior to 1 st trip				
partner and children	1,094	41.6	904	45.3
partner only	221	8.0	149	7.5
children only	423	16.1	354	17.7
single	903	34.3	589	29.5
Parents present in UA household prior to 1 st trip				
yes	991	37.6	698	34.9
no	1,644	62.4	1,300	65.1
Family in PL – partner or children (cycle ³)				
single	2,297	87.2	1,782	89.2
partner or children	338	12.8	216	11.8
Number of children ⁴ (stay ²)	1,485	1.7	1,231	1.7
Child/children aged 0–2 (stay ²)	120	4.6	87	4.4
Child/children aged 3–5 (stay ²)	141	5.4	104	5.2
Child/children aged 6–15 (stay ²)	577	21.9	480	24.0
Child/children aged 16–18 (stay ²)	380	14.4	316	15.8
Child/children aged 19–25 (stay ²)	774	29.4	653	32.7
Childbirth during given stay	14	0.5	40	2.0
Marriage during given stay	16	0.6	29	1.4
Year of first arrival in PL				
before 2002	695	26.4	633	31.7
2002–2007	530	20.1	472	23.6
2008–2013	984	37.3	773	38.7
after 2013	426	16.2	120	6.0
Locality type in UA				
countryside	856	32.5	703	35.2
town up to 50,000	840	31.9	684	34.2
town of 51,000–500,000	619	23.5	441	22.1
city of more than 500,000	320	12.1	170	8.5
Region of origin in UA				
western	2,117	80.3	1,751	87.1
central	357	13.6	177	8.9
eastern	87	3.3	43	2.2
southern	64	2.4	33	1.7
Documents in PL – long-term (cycle ³)	195	7.4	84	4.2
Sector in PL – agriculture (cycle ³)	382	14.5	479	24.0
Sector in PL – industry (cycle ³)	101	3.8	90	4.5
Sector in PL – hospitality (cycle ³)	207	7.9	110	5.5
Sector in PL – construction (cycle ³)	384	14.6	219	11.0
Sector in PL – domestic service (cycle ³)	1,259	47.8	885	44.3

Note: ¹ At the moment of the study – current stay in Poland; ² stay refers to stay in either Poland or Ukraine;

³ cycle refers to stay in Poland followed by stay in Ukraine; ⁴ excluding persons without children.

Table A-19: Correlated model for transitions from Poland to Ukraine and transitions from Ukraine to Poland (2015)

Variable	Poland to Ukraine		Ukraine to Poland	
	HR (SE)	P-value	HR (SE)	P-value
Female	1.454 (0.124)	0.000	0.907 (0.068)	0.192
Family in UA prior to 1 st trip (ref. partner & child.)				
partner only	1.473 (0.172)	0.001	2.523 (0.283)	0.000
children only	4.389 (0.838)	0.000	1.431 (0.221)	0.020
single	0.711 (0.083)	0.003	0.954 (0.089)	0.609
Interaction female # family in UA prior to 1 st trip				
female # partner only	0.661 (0.103)	0.008	0.448 (0.070)	0.000
female # children only	0.200 (0.040)	0.000	0.732 (0.118)	0.052
female # single	0.773 (0.086)	0.020	1.836 (0.172)	0.000
Parents present in UA household prior to 1 st trip	1.031 (0.052)	0.546	1.304 (0.059)	0.000
Family in PL - partner or children (stay ²)	0.710 (0.040)	0.000	0.989 (0.052)	0.838
Number of children ⁴ (stay ²)	0.871 (0.029)	0.000	0.914 (0.026)	0.001
Child/children aged 0–2 (stay ²)	1.156 (0.107)	0.116	0.888 (0.070)	0.134
Child/children aged 3–5 (stay ²)	1.213 (0.104)	0.024	0.890 (0.066)	0.113
Child/children aged 6–15 (stay ²)	1.359 (0.085)	0.000	0.915 (0.048)	0.090
Child/children aged 16–18 (stay ²)	1.226 (0.071)	0.000	1.210 (0.059)	0.000
Child/children aged 19–25 (stay ²)	1.125 (0.063)	0.036	1.033 (0.054)	0.536
Childbirth during stay	0.339 (0.059)	0.000	0.266 (0.026)	0.000
Marriage during stay	0.160 (0.047)	0.000	0.540 (0.062)	0.000
Year of first arrival in PL (ref. before 2002)				
2002–2007	0.793 (0.041)	0.000	1.048 (0.048)	0.305
2008–2013	0.946 (0.057)	0.354	1.349 (0.068)	0.000
after 2013	0.484 (0.050)	0.000	2.095 (0.261)	0.000
Order of migration cycle	1.003 (0.003)	0.366	1.024 (0.003)	0.000
Age (stay ²)	0.833 (0.025)	0.000	1.206 (0.033)	0.000
Age sq. (stay ²)	1.041 (0.016)	0.008	0.996 (0.014)	0.789
Documents in PL – long-term (cycle ³)	0.206 (0.014)	0.000	1.097 (0.094)	0.280
Sector in PL – agriculture (cycle ³)	1.194 (0.079)	0.007	0.753 (0.046)	0.000
Sector in PL – industry (cycle ³)	0.764 (0.071)	0.004	0.088 (0.070)	0.118
Sector in PL – hospitality (cycle ³)	0.700 (0.052)	0.000	0.995 (0.094)	0.958
Sector in PL – construction (cycle ³)	0.869 (0.064)	0.057	0.100 (0.075)	0.996
Sector in PL – domestic service (cycle ³)	0.739 (0.044)	0.000	0.972 (0.064)	0.669
Locality type in UA (ref. countryside)				
town up to 50,000	0.834 (0.036)	0.000	0.910 (0.034)	0.012
town of 51,000–500,000	0.930 (0.048)	0.154	1.004 (0.049)	0.935
city of more than 500,000	1.001 (0.076)	0.934	1.398 (0.102)	0.000
Region of origin in UA (ref. south)				
western	2.490 (0.320)	0.000	1.529 (0.215)	0.003
central	1.502 (0.208)	0.003	1.093 (0.167)	0.561
eastern	1.274 (0.208)	0.138	1.334 (0.236)	0.103
Piecewise constant duration dependence:				
Interval 0–1.5 months	3.881 (0.464)	0.000	2.662 (0.178)	0.000
Interval 1.5–3.0 months	3.320 (0.398)	0.000	2.447 (0.164)	0.000
Interval 3.0–6.0 months	2.456 (0.297)	0.000	1.729 (0.122)	0.000
Interval 6.0–12.0 months	1.715 (0.222)	0.000	1.325 (0.100)	0.000
RDS weight	1.035 (0.018)	0.050	1.010 (0.021)	0.652

Note: ¹ At the moment of the study – current stay in Poland; ² stay refers to stay in either Poland or Ukraine;

³ cycle refers to stay in Poland followed by stay in Ukraine; ⁴ excluding persons without children.

Table A-20: Unobserved heterogeneity in the correlated model (2015)

Variable	Poland to Ukraine		Ukraine to Poland	
	Coefficient	P-value	Coefficient	P-value
V_{PL1}/V_{UA1}	-5.419	0.000	-4.080	0.000
V_{PL2}/V_{UA2}	-2.735	0.000	-3.285	0.000
V_{PL3}/V_{UA3}	-3.349	0.000	-4.417	0.000
V_{PL4}/V_{UA4}	-3.800	0.000	-3.093	0.000
$Pr(V = V_{PL1}/V_{UA1})$	0.193	0.000	.	.
$Pr(V = V_{PL2}/V_{UA2})$	0.234	0.000	.	.
$Pr(V = V_{PL3}/V_{UA3})$	0.273	0.000	.	.
$Pr(V = V_{PL4}/V_{UA4})$	0.300	0.000	.	.

Table A-21: Hazard ratio for transition rates for women in different familial situations prior to first trip to Poland,¹ linear combinations of interaction terms (2015)

Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner only	0.973	0.779	1.130	0.242
Children only	0.877	0.018	1.048	0.331
Single	0.550	0.000	1.751	0.000

Note: ¹ Reference category: women with a partner and children.

Table A-22: Hazard ratio for transition rates for men in different familial situations prior to first trip to Poland,¹ linear combinations of interaction terms (2015)

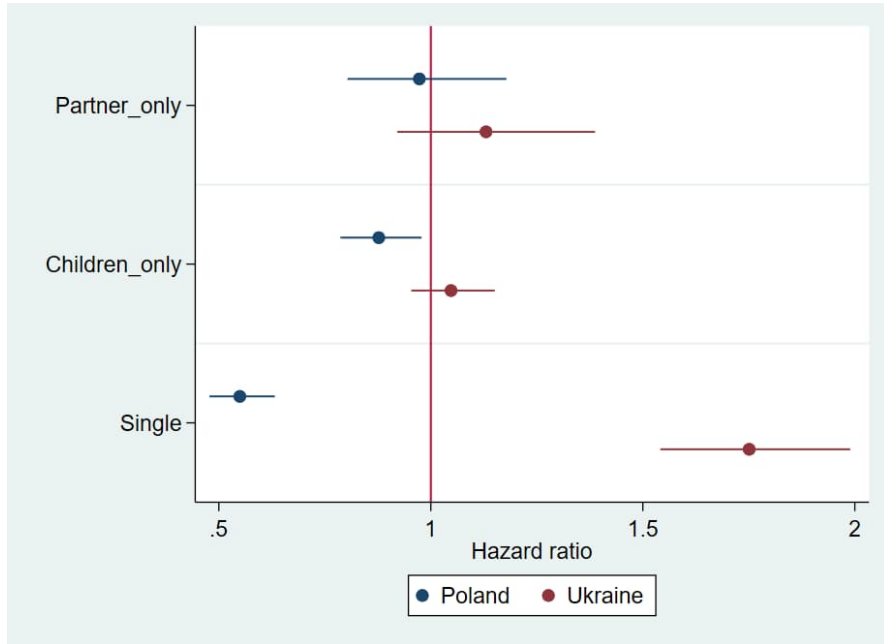
Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner only	1.473	0.001	2.523	0.000
Children only	4.389	0.000	1.431	0.020
Single	0.711	0.003	0.953	0.609

Note: ¹ Reference category: men with a partner and children.

Table A-23: Hazard ratio for transition rates for women versus men in different familial situations prior to first trip to Poland, linear combinations of interaction terms (2015)

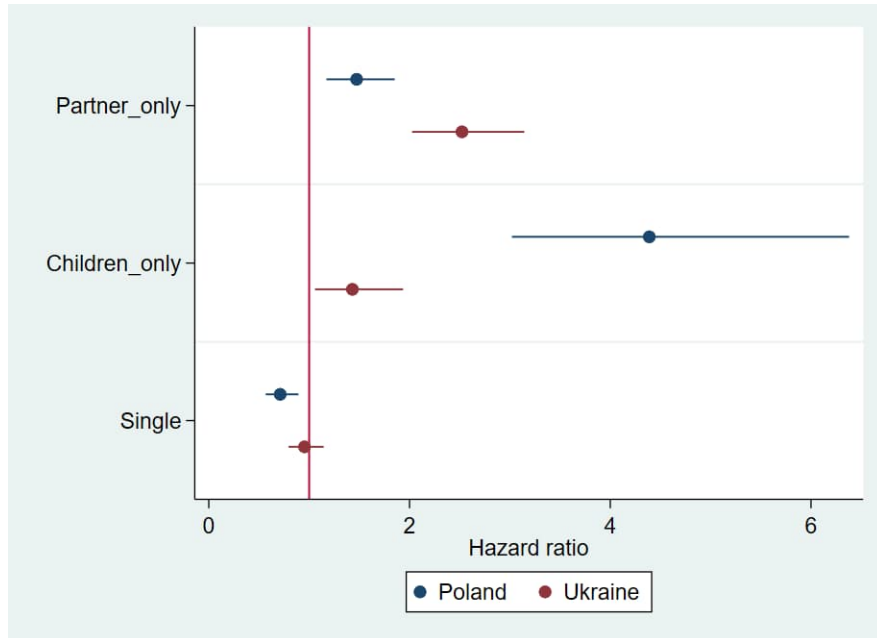
Family situation prior to 1 st trip to Poland	Poland to Ukraine		Ukraine to Poland	
	HR	P-value	HR	P-value
Partner and children	1.454	0.000	0.907	0.192
Partner only	0.961	0.790	0.406	0.000
Children only	0.291	0.000	0.664	0.006
Single	1.124	0.183	1.665	0.000

Figure A-8: Hazard ratio with 95% CI for transition rates from Poland and Ukraine for women in different familial situations prior to first trip to Poland (2015)



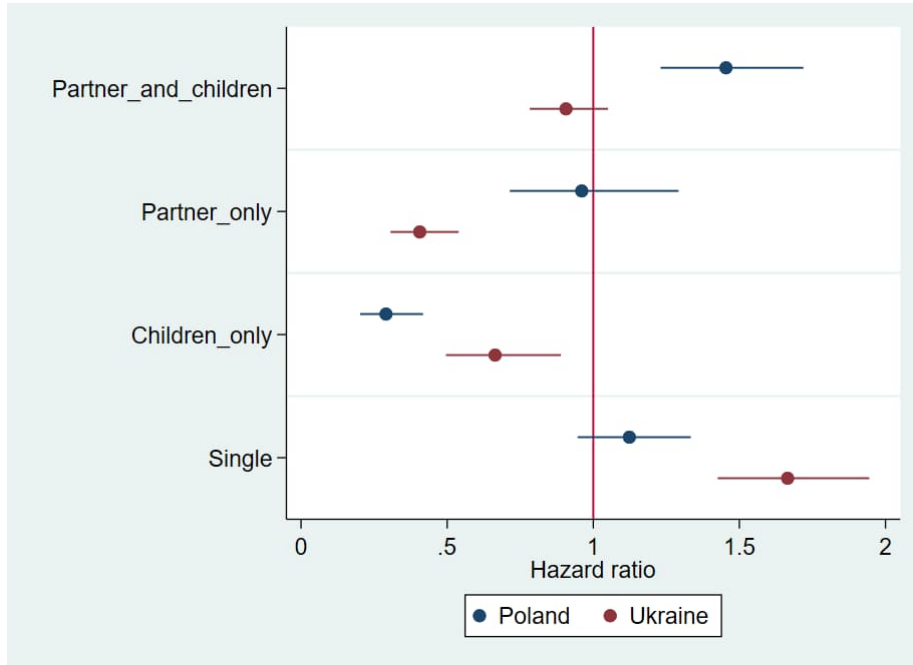
Note: Exact values for interactions are presented in Table A-21.

Figure A-9: Hazard ratios with 95% CI for transition rates from Poland and Ukraine for men in different familial situations prior to first trip to Poland (2015)



Note: Exact values for interactions are presented in Table A-22.

Figure A-10: Transition rates along with 95% CI for women versus men in different familial situations prior to first trip to Poland, interaction terms (2015)



Note: Exact values for interactions are presented in Table A-23.

