ACCSCIENCE PUBLISHING

International Journal of Population Studies

RESEARCH ARTICLE

Internal migration in Indonesia: Remapping trajectories

Agus Joko Pitoyo[1,2]*, Sukamdi Sukamdi[1,2], Muhammad Arif Fahrudin Alfana[1], and Nanang Widaryoko[3]

[1]Department of Enviromental Geography, Faculty of Geography, Universitas Gadjah Mada, Yogyakarta, Indonesia

[2]Center for Population and Policy Studies, Universitas Gadjah Mada, Yogyakarta, Indonesia

[3]Population Studies, The Graduate School, Universitas Gadjah Mada, Yogyakarta, Indonesia

Abstract

Most conventional perspectives depict internal migration as a straightforward process, starting in rural areas and culminating in urban centers. This study, utilizing data from the Indonesian Family Life Survey (IFLS), aims to explore alternative migration patterns in Indonesia beyond the traditional rural–urban migration. Analyzing five waves of IFLS data, this research employed sequence analysis and multinomial logistic regression, revealing a nuanced picture of internal migration in Indonesia. The results reveal that, contrary to the one-step rural-urban migration narrative, individuals in Indonesia often undergo multiple rural or urban migrations, influenced by factors such as gender, education, age, and migration motives. These findings underscore the complexity of internal migration patterns in Indonesia, challenging the conventional rural–urban migration model.

Keywords: Migration; Trajectory; Rural-urban migration; Contemporary

***Corresponding author:**
Agus Joko Pitoyo
(aguspit@ugm.ac.id)

Citation: Pitoyo AJ, Sukamdi S, Alfana MAF, Widaryoko N. (2025). Internal migration in Indonesia: Remapping trajectories. *International Journal of Population Studies*. 11(6): 116-129. https://doi.org/10.36922/IJPS025190084

Received: May 6, 2025

1st revised: July 7, 2025

2nd revised: July 28, 2025

Accepted: August 11, 2025

Published online: August 25, 2025

1. Introduction

Internal migration has long been integral to Indonesia's development (Pitoyo, 2018), reflecting the nation's strong nomadic culture (Tirtosudarmo, 2009). Despite its importance, ironically, internal migration in Indonesia tends to receive less attention (Randolph & Naik, 2017), in contrast to fertility and mortality, which are more widely studied (Muhidin, 2014). This neglect is particularly striking, given Indonesia's vast geographic and demographic complexity, a nation consisting of over 17,500 islands, home to more than 271 million people (BPS, 2023), and characterized by deep ethnic heterogeneity (Ananta *et al.*, 2023).

Spatial inequality further defines this context. Java, occupying only 7% of the land, hosts more than half the population (BPS, 2023) and anchors the growth of Jakarta and other major urban centers. Unsurprisingly, these urban centers have become powerful magnets for internal migrants originating from across the archipelago. This pattern has reinforced a dominant narrative: internal migration in Indonesia is typically conceptualized as a unidirectional movement from peripheral rural regions to urban cores (Randolph & Naik, 2017). Cattaneo and Robinson (2020) did note that internal migration, described as movement that starts in rural areas and ends in urban areas,

is common. However, does this linear portrayal still hold? Do migrants settle permanently after reaching the city?

This study is motivated by the need to revisit this oversimplified narrative. As Indonesia undergoes rapid spatial transformation, emerging empirical evidence suggests that internal migration is far more dynamic (Hugo, 1982; Randolph & Naik, 2017). Migrants often move repeatedly throughout their lives (Widaryoko *et al.*, 2023, 2025), calling into question the adequacy of unidirectional rural-urban migration.

The mobility turn (Sheller & Urry, 2006) urges us to rethink migration not as a single event, but as a recursive, life-course process, an insight echoed in both international (e.g., Bernard [2022a,b]; Takenaka [2007]) and internal migration studies (e.g., Chen *et al.* [2021]; Pardede *et al.* [2016]; Sugiyarto *et al.* [2019]; Widaryoko *et al.* [2023]; Yang *et al.* [2020]). However, within the Indonesian context, especially concerning rural-urban mobility, such dynamic patterns remain underexplored.

The novelty of this study lies in its reconstruction of lifetime internal migration trajectories using five waves of nationally representative longitudinal data from the Indonesian Family Life Survey (IFLS). Departing from static origin-destination classifications, the study employs sequence analysis, a method rarely applied in Indonesian migration research, to identify typologies of migration trajectories. These typologies are then examined through multinomial logistic regression to explore their associations with demographic, spatial, and motivational factors.

This integrated approach offers several key contributions. Empirically, it challenges the dominant linear paradigm by showing the diversity of migration experiences over time. Methodologically, it introduces a life-course perspective and dynamic techniques to study internal mobility in Indonesia. Theoretically, it bridges Indonesian migration scholarship with broader international debates on mobility. By doing so, the study provides a more nuanced understanding of how and why people move throughout their lives. Guided by this framework, the study addresses two central research questions: (i) How prevalent are rural-to-urban migration trajectories in Indonesia? and (ii) To what extent are different migration trajectories shaped by individual, household, and geographic characteristics?

1.1. Theoretical framework

The phenomenon of migrants persistently on the move is not entirely new (Wee & Yeoh, 2021). As early as the 19th century, Ravenstein (1885) introduced the concept of stepwise migration, wherein individuals relocate incrementally from rural to urban centers. Nevertheless, subsequent migration theories, such as Lewis's (1954) Dual Economy, E. Lee's (1966) Push–Pull Theory, Todaro's (1969) Neoclassical Framework, and Mabogunje's (1970) Systems Approach, have largely conceptualized migration as a one-time, unidirectional shift from origin to destination. This prevailing orientation reflects both an underlying assumption of permanent settlement and the historical absence of detailed data to trace individual migration histories (Cattaneo & Robinson, 2020; King & Skeldon, 2010; Paul & Yeoh, 2021).

However, since the early 2000s, migration studies have undergone a paradigmatic shift. Driven by growing recognition of dynamic life trajectories and advancements in mobility-enabling technologies, scholars have increasingly examined migration as a recursive, rather than one-way, process (Sheller & Urry, 2006; Zufferey *et al.*, 2021). This shift also corresponds with the emergence of more granular longitudinal datasets and analytical techniques, enabling scholars to trace individual migration histories over time and space. Building on this shift, a reconfiguration of theoretical approaches is necessary to better capture the complexities and temporalities of contemporary migration. In response, the present study adopts an integrative theoretical framework that synthesizes five complementary perspectives: Life Cycle Theory, Livelihood Theory, Institutional Theory, the Mobility Turn, and Translocal Migration.

Institutional Theory (North, 1990) underscored the significance of both formal and informal institutions, including legal frameworks, labor markets, bureaucratic systems, and cultural norms, in shaping mobility. It emphasized how institutions govern who can move, under what conditions, and with what consequences. Around the same time, Chambers and Conway (1991) introduced the ivelihoods Framework, which reconceptualized migration as a proactive, strategic response to economic vulnerability and livelihood insecurity. Rather than a singular act of relocation, migration was considered as part of a broader household strategy involving income diversification, risk management, and the use of social capital through circular or seasonal migration.

Extending the analysis temporally, Elder (1998) and Mulder (1993) developed Life Cycle Theory, offering a dynamic understanding of how migration decisions are patterned across the life course. Migration is linked to predictable transitions, education, employment, marriage, and caregiving, revealing that spatial mobility is not random but often follows life-stage contingencies shaped by shifting responsibilities and aspirations.

Meanwhile, the Mobility Turn (Sheller & Urry, 2006) reoriented the analytical lens from migration as a bounded event to mobility as a continuous and multi-layered

condition. It emphasizes spatial fluidity, relational connections across locales, and the ongoing negotiation of belonging. This is extended by Translocal Migration Theory (Brickell & Datta, 2016), which conceptualizes migrants as being embedded in multiple places simultaneously, socially, economically, and symbolically.

Crucially, each of these perspectives addresses different but complementary dimensions of migration. The Mobility Turn and Translocal perspectives illuminate fluid spatial ties but tend to overlook the sequencing of moves over the life course and their economic rationales. Life Cycle and Livelihood theories incorporate timing and strategic considerations but give less attention to structural and institutional constraints. Institutional Theory provides this structural lens but does not fully capture the temporal fluidity of migration.

By integrating these five perspectives, this study conceptualizes migration as recursive (Mobility Turn), multi-sited (Translocal), life-stage dependent (Life Cycle), economically strategic (Livelihood), and institutionally shaped (Institutional Theory). This integrative approach enables the analysis to move beyond binary origin-destination models, toward a framework that captures return, circular, and multi-step migrations as adaptive strategies shaped by shifting life circumstances, structural constraints, and spatial opportunities.

2. Data and methods

2.1. Data source

This research utilized five waves of data from the IFLS, the largest longitudinal dataset in Indonesia. Ethical clearance was secured through Institutional Review Boards (IRBs) in both the United States and Indonesia. The survey instruments and datasets utilized in this research can be accessed through the following website: https://www.rand.org/well-being/social-and-behavioral-policy/data/Fls/iFls/access.html. The data cover the years 1993, 1997, 2000, 2007, and 2014, providing a solid foundation for our analysis.

The extensive reach and detailed data of the IFLS allow us to thoroughly examine migration patterns over time. Migration data were collected retrospectively, with respondents asked about their migration experiences from the age of 12 years to the last survey period. Our analysis is based on the life cycle framework, focusing on individuals aged 12–50. This age range ensures that participants are aware of their initial living locations and provides consistent observation periods across all samples (Bernard, 2022a; Chen *et al.*, 2021). In this study, an individual is considered a migrant if they move across district or city boundaries and reside in a new district or city for at least 1 year. We focused on rural migrants to explore the prevalence of the rural-urban migration pattern in Indonesia. Based on the sample criterion, we kept 3221 observations.

2.2. Variables

The variables used in this study are broadly categorized into two main groups. The first is the key variable: the individual's migration status, which serves as the primary outcome of interest. The second group comprises explanatory variables, which are primarily employed to examine who migrates and how individual characteristics vary across different migration types.

These explanatory variables include a range of sociodemographic attributes, geographic conditions, and migration-related information. The conceptual basis for including these variables is inspired by E. Lee's (1966) migration theory, particularly his emphasis on migrant selectivity. While E. Lee posited that migrants and non-migrants differ systematically in their characteristics, this study extends the notion by investigating whether such selectivity also applies across different types of migrants.

Specifically, the explanatory variables include gender, marital status, level of education, age, household welfare status, island of residence (included as a regional dummy), migration motives, and whether individuals migrated alone or with others. These variables provide a multidimensional perspective on the factors shaping different migration trajectories, thereby allowing a more nuanced understanding of migration selectivity within a dynamic and diversified internal migration context.

2.3. Methodology

The analysis method for this study was divided into several stages. First, we defined an individual's migration experience starting from the age of 12 years. To achieve this, we employed sequence analysis, a relatively new approach in migration studies (Kleinepier *et al.*, 2015). Sequence analysis is a data-driven technique for mapping individual life trajectories by encoding each life stage as a string of characters that represent yearly observations (Abbott & Tsay, 2000; Impicciatore & Panichella, 2019). While this method has been widely adopted in life-course research across various domains (Aassve *et al.*, 2007; Billari, 2001; Elzinga & Liefbroer, 2007; Ritschard & Oris, 2005; Vidal *et al.*, 2020), its application in migration studies remains relatively limited (Kleinepier *et al.*, 2015; Pollock, 2007). Sequence analysis allows us to systematically examine the order of migration events, providing a comprehensive understanding of individuals' migration trajectories over time.

Technically, we first defined the migration status for each individual within the age range of 12–50 years. Migration status was classified into three categories: "stay," "rural migration," and "urban migration." Individuals who had not migrated were categorized as "stay." "Rural migration" referred to those who moved to another rural district, while "urban migration" described those who relocated to an urban district. In addition, we distinguished between the stages of movement (first, second, third, and more) to capture the sequence of migration events (Bernard, 2022b). Using the optimal matching algorithm, we calculated dissimilarities between each migration sequence (Needleman & Wunsch, 1970) and then grouped similar migration sequences into specific clusters using hierarchical cluster analysis (Piccarreta & Billari, 2007), with a ward linkage approach (Brzinsky-Fay *et al.*, 2006).

In the second stage, we employed a multinomial logistic regression model to identify the sociodemographic characteristics associated with each migration cluster. This modeling approach was appropriate because the dependent variable, the migration trajectory cluster identified in the first stage, was categorical and nominal with more than two unordered outcomes. Multinomial logistic regression allowed us to examine the statistical association between multiple independent variables with the probability of belonging to each cluster. The model used in this second stage is shown in Equation (I), and the variables involved in the model are listed in Table 1.

$$Y_{ij} = \beta_0 + \beta_1 gender_{ij} + n_2 mar_{ij} + \beta_3 edu_{ij} + u_4 gender.edu_{ij} + n_5 age\ group_{ij} + o_6 welfare_{ij} + l_7 island_{ij} + l_8 motives_{ij} + t_9 migrate\ with_{ij} \quad (I)$$

Given the observational nature of the IFLS data and the use of a non-experimental design, the analysis identifies statistical associations rather than causal relationships. Interpretations of the results should therefore be understood as correlational.

3. Key findings

3.1. Describing the Indonesian rural-urban migration pattern

Table 2 presents an in-depth examination of internal migration patterns in Indonesia, which commences in rural regions and encompasses various movement sequences between rural and urban destinations. These sequences vary in the number of movements and types of destinations, offering a comprehensive perspective on migration dynamics. Among single movement patterns, migration within rural areas was the most prevalent, comprising 642 cases (19.93%), followed by migration from rural to urban areas, with 620 cases (19.25%). These figures indicate that despite significant urbanization, a substantial portion of the population remains in rural areas, suggesting that pull factors are not exclusive to urban areas and that strong sociocultural ties to rural origins may influence migration decisions (Debray & Ruyssen, 2023; He *et al.*, 2023). Internal migration from rural to rural is primarily driven by economic opportunities, improved living conditions, and social networks (Kumar, 2020; Liang *et al.*, 2002; Lucas, 2015; Shen *et al.*, 2024; Sugiyarto *et al.*, 2019). Bazzi *et al.* (2016) revealed that transmigration to obtain access to new land has caused the transmigration of villagers from Java and Bali to other villages outside. This is believed to be one of the causes of the high percentage of migration from rural to rural areas in Indonesia. These patterns resonate with the life-course perspective, which suggests that migration decisions are rarely isolated

Table 1. The variables involved in the multinomial logistic regression model

Variables	Definitions and coding
Y_{ij}	The likelihood of migrant *i* being included in migration cluster *j*
β	β_0 denotes the constant term, while β_1–β_9 represent the regression coefficients that measure the relationship between the independent (predictor) variables and the dependent (outcome) variable with more than two categories
$gender_{ij}$	Gender of migrant *i* in migration cluster *j*, 0=male, 1=female
mar_{ij}	Marital status of migrant *i* in migration cluster *j*, 0=unmarried, 1=married, 2=ever married
edu_{ij}	Level of education of migrant *i* in migration cluster *j*, 0=low (elementary school and lower), 1=middle (junior high school or equivalent), 2=high (senior high school and higher)
$gender.edu_{ij}$	Interaction of gender and education level of migrant *i* in migration cluster *j*, 0=others, 1=female with high education level
$age\ group_{ij}$	Age group of migrant *i* in migration cluster *j*, 0=<20 year, 1=20–30 year, 2=31–44 year, 3=45 year+
$welfare_{ij}$	Welfare status of migrant households of migrant *i* in migration cluster *j*, 0=poor, 1=near poor, 2=not poor
$island_{ij}$	Island of origin of migrant *i* in migration cluster *j*, 0=other, 1=Java, 2=Sumatera
$motives_{ij}$	The migration motive of migrant *i* in cluster *j*, 0=others, 1=work, 2=education, 3=marriage, 4=migration with family, 5=to be closer with family, 6=pregnancy/other family reasons
$migrate\ with_{ij}$	With whom migrants *i* in migration cluster *j* migrate, 0=alone, 1=others

Table 2. Top 10 sequences of rural-urban migration

Number of movements	Sequence-pattern	Frequency	Percent (%)	Cumulative percentage (%)
1	Rural→rural	642	19.93	19.93
1	Rural→urban	620	19.25	39.18
2	Rural→urban→rural	388	12.05	51.23
2	Rural→rural→rural	285	8.85	60.07
2	Rural→urban→urban	193	5.99	66.07
3	Rural→urban→urban→urban	91	2.83	68.89
3	Rural→rural→rural→rural	78	2.42	71.31
3	Rural→urban→urban→rural	76	2.36	73.67
2	Rural→rural→urban	64	1.99	75.66
3	Rural→urban→rural→rural	52	1.60	77.27
Other sequence patterns		732	22.73	100

Source: Author's calculations based on the Indonesian Family Life Survey data from 1993, 1997, 2000, 2007, and 2014.

events but unfold over time in relation to shifting needs, aspirations, and life transitions. What appears as rural-rural movement at one stage may be part of a longer strategic trajectory shaped by work, marriage, or housing transitions.

For individuals involving two moves, the pattern of migrating from rural to urban areas and then back to rural areas (388 cases, 12.05%) is notably more common than moves from rural areas to other rural destinations (285 cases, 8.85%). This trend highlights a significant tendency for return migration, where individuals initially relocate to urban areas but eventually return to rural areas, possibly for economic, family, or social reasons (Cattaneo & Robinson, 2019; Gillespie *et al.*, 2022; He *et al.*, 2023; Lindstrom, 1996; Stark, 2019). In addition, migrants who continue to move and consistently choose another rural area may do so to find a location similar to their place of origin, easing the adaptation process. This aligns with Liu *et al.*'s (2023) research, which indicated that internal migrants' location choices were influenced by the ease of adapting to the cultural, institutional, and social differences between their origin and destination areas. This also aligns with circular migration theories, which emphasize the fluid and reversible nature of mobility decisions. Return migration does not signify failure, but rather reflects adaptive strategies under changing household or labor conditions. In contrast, continuous rural-to-urban migration accounted for 193 cases (5.99%), indicating that some individuals prefer to remain in urban environments after migrating, likely due to their comfort with urban living.

Sequences involving three movements demonstrated a wide range of patterns. The most frequent was multiple urban migrations, with 91 cases (2.83%), indicating a strong tendency for sustained urban residence among some individuals. Multiple rural migrations, with 78 cases (2.42%), also demonstrated a strong preference for rural areas among some individuals over multiple moves. The diverse sequence of moves, such as relocating from rural areas to two different urban areas and then returning to rural areas (76 cases, 2.36%), reflects the complex decision-making process of migrants as they transition from one place to another. These multi-step movements illustrate how migration decisions are shaped both by individual agency and structural constraints. Each move can be seen as a negotiated step within the dynamic interaction between personal goals and institutional or geographic opportunities and limitations.

A substantial proportion of migration patterns is classified under the category of "Other Sequence Patterns," which accounts for 732 cases (22.73%). These sequences encompass a multitude of combinations that are not encompassed by the primary categories, thereby underscoring the complexity and diversity of migration behaviors. This category highlights that a considerable number of migrants embark on unique journeys that may not align with more prevalent patterns. These patterns challenge the conventional assumption of linear rural-to-urban migration, instead revealing a highly individualized and stratified migration landscape shaped by intersecting economic, cultural, and familial motivations over time.

Table 2 suggests that internal migration in Indonesia is not a straightforward linear process from rural to urban areas. Instead, it involves multiple steps and various destination sequences. The proportion of one-way rural-to-urban migration trajectories, constituting only about one-fifth of all trajectories, indicates that rural-to-urban migration is not the predominant pattern. This complexity

aligns with the findings of Cattaneo and Robinson (2020) and Chen *et al.* (2021), who argued that internal migration is a multifaceted phenomenon. For example, some sequences involve migrants making two urban moves before returning to rural areas, while others show an initial move to an urban area followed by two rural relocations. These varied patterns reflect the diverse motivations and circumstances that influence migration decisions, such as economic opportunities, social networks, and personal preferences.

3.2. Rural-urban migration in the life course perspective

The migration trajectories of individuals across their life course provide insightful perspectives on the complexities of rural-urban migration in Indonesia. By mapping migration events from ages 12 to 50 years and clustering them based on sequence, time, and number of movements, distinct migration patterns emerge, reflecting various socioeconomic and demographic dynamics.

Analysis of these patterns, as visualized in the sequence index plot in Figure 1, reveals six primary migration clusters characterized by differing frequencies and types of movements. The selection of six major migration clusters was based on a procedure in sequence analysis, where the number of clusters displaying the maximum Calinski–Harabasz pseudo-F statistic indicates the optimal cluster number (Caliński & Harabasz, 1974). We found that the highest Calinski–Harabasz pseudo-F statistic occurred in six clusters (Figures 2-7).

Cluster 1, the largest group, comprises individuals who undertake a single rural migration. These one-step rural migrants move from one rural district to another and then remain settled. This pattern suggests that these migrants may seek opportunities in rural areas with similar characteristics to their original locations, possibly due to limited resources or a preference for staying within a familiar rural environment (He *et al.*, 2023; Kumar, 2020).

Cluster 2 involves a two-step urban-rural migration. Individuals in this cluster initially move to an urban area and then relocate to a rural area. This pattern may indicate a temporary urban stay for certain reasons, such as employment or education, followed by a return to rural roots driven by familial or economic reasons. This is in line with findings from Lee & Sugiura (2018) and He *et al.*

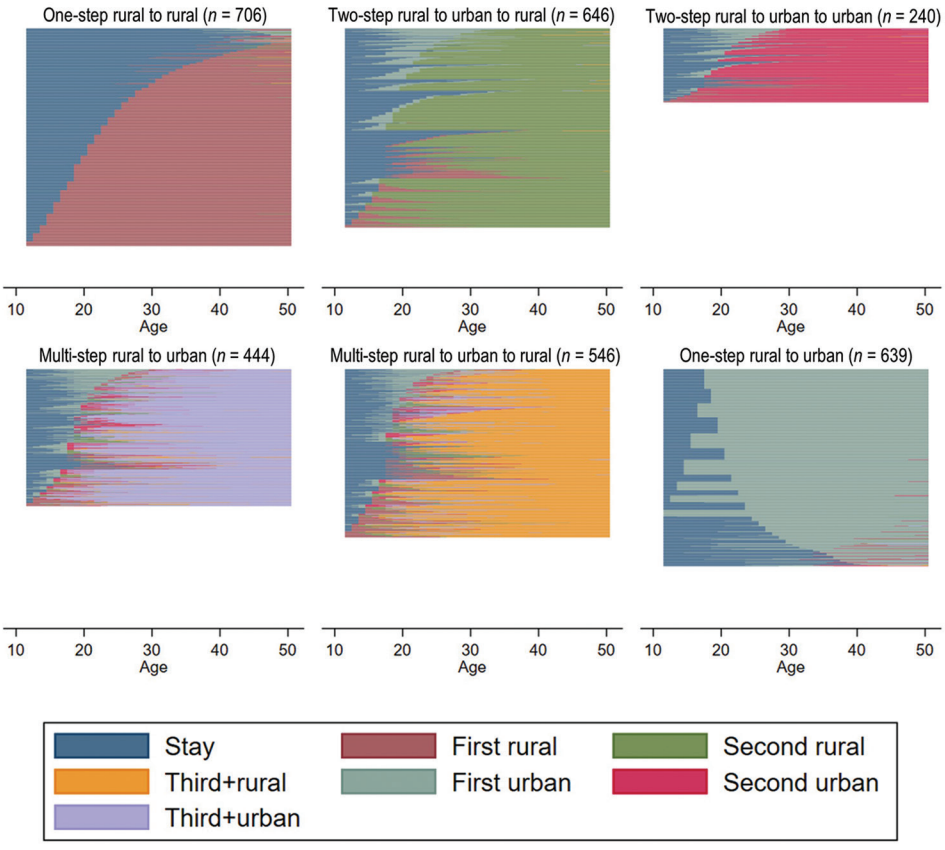

Figure 1. Rural-urban migration trajectories
Source: Author's calculations based on Indonesian Family Life Survey data from 1993, 1997, 2000, 2007, and 2014.

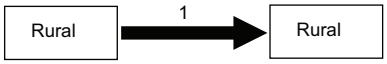

Figure 2. Cluster 1 of the six clusters with the highest Calinski-Harabasz pseudo-F statistic

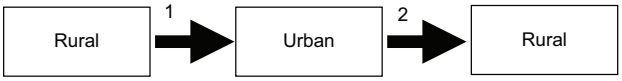

Figure 3. Cluster 2 of the six clusters with the highest Calinski-Harabasz pseudo-F statistic

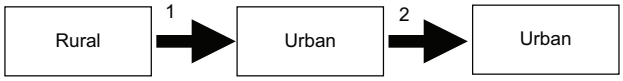

Figure 4. Cluster 3 of the six clusters with the highest Calinski-Harabasz pseudo-F statistic

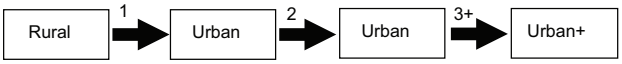

Figure 5. Cluster 4 of the six clusters with the highest Calinski-Harabasz pseudo-F statistic

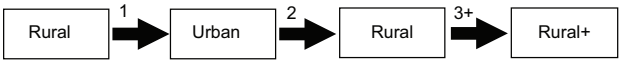

Figure 6. Cluster 5 of the six clusters with the highest Calinski-Harabasz pseudo-F statistic

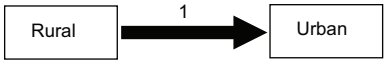

Figure 7. Cluster 6 of the six clusters with the highest Calinski-Harabasz pseudo-F statistic

(2023), which show that attachment to hometown and the work-life balance available are the causes of these migrants choosing to return to rural areas.

Cluster 3, the smallest cluster, comprises individuals who experience two-step urban migration. These migrants move between urban areas, suggesting a search for better opportunities within urban settings. Unlike Cluster 2, these individuals remain within the urban hierarchy, indicating a preference or necessity for staying in urban environments.

Cluster 4, known as multi-step urban migration: urban first, followed by various urban hierarchies, and stopped in urban areas. The + sign suggests that urban destinations may still emerge along the trajectory. This pattern reflects a dynamic urban lifestyle, likely driven by career advancement, better living conditions, or other urban-centric motivations. These migrants exhibit a high degree of mobility and adaptability within urban settings.

Cluster 5, named multi-step urban–rural migration, involves multiple movements that start in urban areas and eventually settle in rural areas. The + sign suggests that rural destinations may still emerge along the trajectory. This pattern might be indicative of individuals who initially seek urban opportunities but later prefer the tranquility or affordability of rural living. It suggests a lifecycle approach to migration, where early urban experiences pave the way for later rural settlement.

Cluster 6, one-step urban migration, captures individuals who move once to an urban area and remain there. This pattern is common among younger migrants who move to cities for education or early career opportunities. The stable urban settlement reflects the attractiveness of urban areas for long-term residence, driven by various factors, such as better infrastructure, services, and job prospects.

3.3. Analysis of migration typologies

The analysis of migration typologies through multinomial regression uncovers a noteworthy correlation between sociodemographic characteristics and migration patterns in Indonesia (Table 3). Males show a marked inclination toward multi-step urban-rural migration, suggesting a propensity for multiple moves. This result aligns with Cattaneo & Robinson's (2019) research, which concluded that males are more likely to undertake multiple migrations. Conversely, females exhibit a preference for one-step rural migration, a pattern that aligns with marriage-related motives. Cindy Fan & Huang (1998) observed that women frequently encounter barriers in accessing urban labor markets and achieving social and economic advancement, prompting many to migrate to and marry into rural areas in more developed regions to overcome these obstacles. This gender disparity highlights the influence of sociocultural factors on migration choices, indicating that females may prioritize the stability and familial bonds found in rural settings. Findings from Devi *et al.* (2009) in India also found that the majority of migration was from one rural area to another due to marriage in the case of females.

These gendered patterns underscore the influence of institutional and socio-cultural structures on migration decisions. Limited access to urban employment, gendered household roles, and prevailing cultural norms collectively shape and often restrict women's spatial and strategic mobility. This aligns with Institutional Theory (North, 1990), which emphasizes how both formal and informal institutions regulate individual behavior. Ultimately, migration outcomes reflect not only individual agency but also the structural conditions that enable or constrain mobility along the intersecting lines of gender, class, and geography.

Marital status shows varied impacts on migration behavior. While married individuals do not display

Table 3. Multinomial logistics model of migrant's typologies

Social demographic characteristics	Migrants' typologies[a] (ref. model: one-step rural)				
	Two-step urban-rural	Two-step urban	Multi-step urban	Multi-step urban-rural	One-step urban
Gender (ref. male)					
Female	0.785**	0.794*	0.812**	0.766***	1.040
Marital status (ref. unmarried)					
Married	1.096	0.782**	0.910	0.932	0.930
Ever married	0.756**	0.849	0.633***	0.567***	0.702***
Level of education (ref. low)					
Middle (junior high school/equivalent)	1.138	1.871***	2.447***	1.181	1.702***
High (senior high school and higher)	1.442**	2.212***	4.453***	1.646***	2.100***
Gender and level of education					
Female with higher education	1.433*	1.335	1.251	1.330	1.205
Age group (ref. <20 years)					
20–30 years	1.713***	2.381***	1.259	2.308***	0.728**
31–44 years	1.665**	2.406***	1.609**	2.649***	0.572***
45+year	0.939	1.193	0.980	1.521*	0.411***
Welfare status (ref. poor)					
Near poor	1.134	1.651***	1.950***	1.373***	1.728***
Not poor	1.189*	1.528***	2.642***	1.241**	1.930***
Island of origin (ref. others)					
Java	1.876***	1.070	3.112***	1.392***	2.721***
Sumatera	1.396***	0.870	1.443***	1.152	1.323**
Migration motives (ref. other motives)					
Work	0.765**	1.403**	1.651***	1.600***	1.058
Education	1.897***	2.076***	1.572**	3.001***	1.943***
Marriage	0.382***	0.383***	0.259***	0.261***	0.797
Migration with family	0.963	0.878	0.754*	0.627***	0.908
To be closer to family	1.799***	1.153	0.837	1.572***	0.757*
Pregnancy/other family reasons	1.079	0.873	0.676**	0.705**	0.781
Migrate with (ref. alone)					
Others	0.690***	0.820*	1.216**	0.939	0.901
Constant term (β_0)	0.467***	0.193***	0.109***	0.330***	0.466***

Notes: Statistical significance: *p<0.1, **p<0.05, ***p<0.001, [a]starting from rural.
Source: Author's calculations based on Indonesian Family Life Survey data from 1993, 1997, 2000, 2007, and 2014.
Abbreviation: Ref.: Reference.

significant differences across migration clusters, single individuals, both unmarried and ever married, are more likely to migrate. This can be attributed to the fewer social ties and responsibilities that single individuals have compared to their married counterparts (Folger & Rowan, 1953). This is also confirmed when the coefficients in the multi-step cluster are compared between unmarried and ever-married individuals. The large difference between the two indicates that unmarried individuals (single) are more mobile than those who are ever married, supporting findings from Kleinepier *et al.* (2015) and Pardede *et al.* (2020), but contrasting with Takenaka (2007) and Zufferey (2019), who found that multiple migrants are often married.

Education is strongly associated with variations in migration patterns, with higher levels of education correlating with an increased likelihood of migration, especially toward urban destinations. This result is in line with Gould (1982) and Haapanen & Böckerman (2017), who emphasized the preference of highly educated migrants

for urban areas. The notably high odds ratios for multi-step urban migration among the highly educated suggest a strong association between educational attainment and greater mobility to urban areas. This finding is consistent with Nekby (2006), Takenaka (2007), and Agrawal (2016). Ritsilä & Haapanen (2003) also reported that highly educated migrants tend to relocate to urban areas in Finland. Similarly, Paweenawat & Liao (2023) concluded that higher education increases the likelihood of migration to cities in Thailand. Interestingly, a significant association between gender and education is observed only in the two-step urban-rural cluster, where higher education is correlated with a greater likelihood of migration among females. This suggests that although education is positively associated with mobility for both genders, males tend to exhibit higher overall mobility.

Age is another factor that shapes migration patterns. Migrants in all clusters are predominantly over 20 years old, except in the one-step urban cluster, where younger individuals under 20 are more prevalent. In the case of Indonesia, this finding is consistent with Malamassam's (2016; 2022) studies, which concluded that young migrants typically move to cities. This indicates a trend where younger individuals initially move to urban areas for education or early career opportunities, whereas older individuals, particularly those aged 31–44, are more common in multi-step migration clusters. These mature migrants have likely accumulated diverse migration experiences, reflecting a lifecycle approach to migration (Bernard *et al.*, 2022) where early urban experiences facilitate subsequent relocations.

In terms of welfare status, migrants are, on average, drawn from non-poor households, underscoring the financial capital required for migration. This finding aligns with Kothari's (2003) assertion that migration is a crucial livelihood strategy for many impoverished individuals, but it necessitates certain forms of capital that not all possess. The high odds ratio for the non-poor variable in the multi-step urban cluster suggests that repeated moves between urban areas entail higher costs compared to other clusters. This reinforces the notion that economic resources are crucial for sustaining multiple relocations, aligning with the idea that migration is often accompanied by financial investment. Widaryoko *et al.* (2023) also found that multiple migrants predominantly come from affluent families. The strong association between repeated migration and non-poor status also suggests that migration serves as a livelihood diversification strategy, with migrants leveraging financial and social capital to mitigate risk and access new opportunities. This aligns with the notion of migration as a calculated, resource-intensive endeavor, rather than a spontaneous act, according to Livelihood Theory (Chambers & Conway, 1991).

From a spatial perspective, Table 3 demonstrates that Java consistently attracts migrants of all typologies, reflecting its status as Indonesia's most populous region, offering abundant economic opportunities and comprehensive facilities. However, this observation should be interpreted with caution, as the analysis is limited to island-level comparisons and does not account for intra-island disparities, urban hierarchies, or physical barriers, such as inter-island seas, that may influence migration costs. This preference for Java underscores its role as both a major origin and destination for migration, drawing people from various regions in search of better livelihoods. This finding somewhat contradicts Pardede *et al.*'s (2020) research, which suggested that while residents of Java are more likely to migrate, they tend to do so only between provinces.

Migration motives further differentiate the clusters. Migrants who engage in repeated migration (multi-step migration), whether moving to urban and then rural or to various urban areas, are primarily driven by employment motives. This is consistent with the concept of migration as spatial interaction, as proposed by Norris (1972), which posits that migrants will always seek out opportunities and relocate to new areas as long as these opportunities are profitable. Haandrikman & Hassanen (2014) also observed that Somali migrants in Sweden, who move onward to the United Kingdom or Australia, are often driven by job-related motives.

Migrants who migrate for education typically follow a multi-step urban-rural trajectory (as indicated by the highest odds ratio value). Meanwhile, marriage, migration with family, and pregnancy/other family reasons are commonly connected with one-step rural migration trajectories. Migrants who relocate for these three reasons prefer rural areas that are geographically closer to their place of origin (rural). Meanwhile, migrants who migrate to be closer to family typically follow a two-step urban-rural trajectory. It is probable that this group of migrants moves to large cities for work and then returns to their hometowns to be with their relatives.

Finally, migration patterns also vary in terms of companionship. Migrants in the two-step urban-rural and two-step urban clusters are more likely to move alone, whereas those in the multi-step urban migration cluster often relocate with family members. This distinction highlights the differing social dynamics within migration clusters, where repeated urban migrants may involve their families in their relocations, while others prefer individual mobility.

4. Concluding remarks

This study fundamentally reexamines internal migration in Indonesia, challenging the long-standing narrative that frames it primarily as a linear, rural-to-urban process. By conceptualizing migration as a recursive, life-stage-dependent, and structurally embedded process, this study offers a novel empirical and theoretical lens for understanding population mobility in Southeast Asia. Drawing on longitudinal data from the IFLS and employing sequence analysis alongside multinomial logistic regression, our findings suggest that internal migration is far more complex and dynamic. Rather than a one-time relocation, migration often unfolds as a series of movements, multi-directional, non-linear, and closely intertwined with life-course transitions. The dominance of the rural-urban paradigm, often treated as the norm, is empirically contested: only around 20% of observed trajectories follow this path. In contrast, certain patterns, such as rural to rural, urban to rural, and multi-step urban migrations, are both frequent and significant, illustrating that migration is often a recursive, adaptive strategy shaped by broader socioeconomic and institutional contexts.

These patterns are not random but appear to be associated with key demographic, socioeconomic, and spatial characteristics. Gender, for instance, emerges as a critical axis of differentiation: males are more likely to engage in multi-step, economically oriented migrations, often undertaken independently, whereas females are disproportionately represented in one-step rural migrations, often linked to marriage. These trends reflect persistent gender norms and barriers to women's participation in urban labor markets. Similarly, higher educational attainment is strongly associated with participation in complex, urban-oriented migration trajectories, suggesting that education may expand individuals' capacity to access urban economic opportunities. Economic status also appears to influence migration complexity, with non-poor individuals more frequently involved in cost-intensive, repeated migrations. Spatially, Java functions as a major hub for internal migration across all typologies, underscoring its economic centrality while also highlighting underexplored spatial disparities within and across regions. This finding reinforces the need for future migration research to incorporate spatial analytics that capture not only movement between regions but also across urban hierarchies and economic corridors within islands.

These insights demand a recalibration of policy. First, the prominence of rural-rural and urban-rural migrations points to the economic vitality and social anchorage of rural areas, warranting investments in rural employment, land access, and infrastructure to offset urban congestion. Second, migration policy must be gender-responsive, expanding women's options beyond marriage-led rural moves by investing in female education, skill-building, and care services. Third, Indonesia needs policies that acknowledge and support circularity in migration, such as portable benefits, multi-location housing rights, and mobility-aware urban planning, to harness migrants' contributions to both sending and receiving regions. Taken together, these recommendations emphasize the importance of designing internal migration policy not only as a demographic response but also as an instrument for achieving inclusive and spatially balanced development.

While this study contributes to our understanding of migration patterns, it is essential to acknowledge its limitations and identify areas for future research. First, the current analysis focuses mainly on general migration trends. Analyzing rural-urban migration behavior based on subsamples of economic backgrounds (such as poor and non-poor) and gender could provide a more comprehensive understanding of migration dynamics. This disaggregation would help reveal intersectional inequalities that shape individuals' capacity and constraints to move.

Second, the study relies on retrospective migration histories drawn from the IFLS, which may be subject to recall bias, particularly among older respondents or those with complex migration experiences. Although the dataset's longitudinal design provides valuable depth, its reliance on self-reported events may limit the accuracy of reconstructed trajectories. Future research would benefit from triangulating such data with administrative records or real-time migration tracking to enhance reliability.

Third, despite the analytical strengths of the IFLS, its quantitative design constrains the exploration of the gendered, emotional, and culturally embedded aspects of migration decision-making, particularly among women. Addressing this gap requires the integration of qualitative methods that can capture how women navigate familial responsibilities, gender norms, and perceived risks in shaping their mobility strategies. Such approaches would provide a more holistic, human-centered understanding of migration, not merely as a structural or economic response, but as a deeply lived and negotiated process.

Moreover, it is important to note that this analysis is based on data collected up to 2014, before significant policy developments, such as the post-2020 capital relocation plan and expansive regional development initiatives. While the study does not capture the impact of these more recent transformations, its primary aim is to reconstruct long-term migration trajectories, particularly rural-urban patterns, based on a rich and representative longitudinal

dataset. As such, it offers a valuable historical baseline for understanding migration dynamics before Indonesia's ongoing spatial restructuring. Future research should build on this foundation using updated data, predictive modeling, or integrating spatial and administrative sources to better capture the evolving complexity of internal migration in Indonesia.

Finally, this study's spatial analysis is limited to island-level comparisons. It does not distinguish between intra-island variations, such as provincial disparities or urban hierarchies, which may mask significant geographic nuances in migration patterns. Future research could benefit from incorporating finer spatial units to better understand the diversity of internal migration trajectories. In addition, substantial geographic barriers between regions, such as the sea separating Java and Sumatra, are likely to impose significant costs and constraints on migration flows. Recognizing and incorporating these physical barriers and their influence on migration decisions would further enrich the analysis in future studies.

Acknowledgments

We would like to thank the RAND Corporation for providing the IFLS data.

Funding

This research was funded by Universitas Gadjah Mada through the Academic Excellence Grant Scheme A of 2024, notification number 6513/UN1.P1/PT.01.01/2024, dated May 30, 2024.

Conflict of interest

The authors declare they have no competing interests.

Author contributions

Conceptualization: All authors
Investigation: Agus Joko Pitoyo, Nanang Widaryoko, Muhammad Arif Fahrudin Alfana
Methodology: Nanang Widaryoko
Writing–original draft: Nanang Widaryoko, Muhammad Arif Fahrudin Alfana
Writing–review & editing: All authors

Ethics approval and consent to participate

The IFLS surveys and their associated procedures underwent rigorous ethical review and received approval from IRBs in both the United States (via RAND) and Indonesia. Specifically, IFLS1 and IFLS2 were approved by the IRB at Universitas Indonesia, IFLS3 and IFLS4 by the IRB at Universitas Gadjah Mada, and IFLS5 by the IRB at Survey Meter. Consequently, all required protocols for obtaining informed consent from both adult and child participants were fulfilled and formally authorized by the respective authorities before the initiation of fieldwork.

Consent for publication

Not applicable.

Availability of data

The data supporting these findings are available at: https://www.rand.org/well-being/social-and-behavioral-policy/data/FLS/IFLS/access.html. Alternatively, the data are available from the corresponding author upon request.

References

Aassve, A., Billari, F.C., & Piccarreta, R. (2007). Strings of adulthood: A sequence analysis of young british women's work-family trajectories. *European Journal of Population*, 23(3-4), 369-388.

https://doi.org/10.1007/s10680-007-9134-6

Abbott, A., & Tsay, A. (2000). Sequence analysis and optimal matching methods in sociology: Review and prospect. *Sociological Methods and Research*, 29(1):49-64.

https://doi.org/10.1177/0049124100029001001

Agrawal, S.K. (2016). Twice migrants in canada: Who are they and how do they perform economically? *Journal of International Migration and Integration*, 17(3):669-686.

https://doi.org/10.1007/s12134-015-0428-y

Ananta, A., Nurvidya, E., Ari, A., & Paul, P. (2023). Does diversity matter for development? New evidence of ethnic diversity's mediation between internal migration and economic growth across Indonesia's regions. *Journal of Population Research*, 40(13):1-21.

https://doi.org/10.1007/s12546-023-09304-z

Bazzi, S., Gaduh, A., Rothenberg, A.D., & Wong, M. (2016). Skill transferability, migration, and development: Evidence from population resettlement in Indonesia. *American Economic Review*, 106(9):2658-2698.

https://doi.org/10.1257/aer.20141781

Bernard, A. (2022a). *Internal Migration as a Life-Course Trajectory: Toward a Research Agenda on Repeat Migration*. Vol. 53. Berlin: Springer, p.171-187.

https://doi.org/10.1007/978-3-031-05423-5_9

Bernard, A. (2022b). Sequence analysis of lifetime internal migration trajectories: Onward, return, and circular migration. In: Lynch, S.M., editor. *Internal Migration as Life-Course Trajectory: Concepts, Methods and Empirical Aplications*. Berlin: Springer, p.133-146.

Bernard, A., Kalemba, S., & Nguyen, T. (2022). Do internal

migration experiences facilitate migration intentions and behavior? *Demography*, 59(4):1249-1274.

https://doi.org/10.1215/00703370-9986021

Billari, F.C. (2001). The analysis of early life courses: Complex descriptions of the transition to adulthood. *Journal If Population Research*, 18(2), 119-142.

https://doi.org/10.1007/BF03031885

BPS. (2023). *Hasil Long Form Sensus Penduduk 2020*. Jakarta: BPS.

Brickell, K., & Datta, A, editors. (2016). *Translocal Geographies Spaces, Places, Connections*. Milton Park: Routledge.

Brzinsky-Fay, C., Kohler, U., & Luniak, M. (2006). Sequence analysis with Stata. *Stata Journal*, 6(4):435-460.

https://doi.org/10.1177/1536867x0600600401

Caliński, T., & Harabasz, J. (1974). A Dendrite method foe cluster analysis. *Communications in Statistics*, 3(1):1-27.

https://doi.org/10.1080/03610927408827101

Cattaneo, A., & Robinson, S. (2019). Economic Development and the Evolution of Internal Migration Moving in Steps, Returnees, and Gender Differences. In: *FAO Agricultural Development Economics Working Paper Series*.

https://doi.org/10.13140/RG.2.2.15222.52809

Cattaneo, A., & Robinson, S. (2020). Multiple moves and return migration within developing countries: A comparative analysis. *Population, Space and Place*, 26(7):e2335.

https://doi.org/10.1002/psp.2335

Chambers, R., & Conway, G.R. (1991). Sustainable Rural Livelihoods: Practical Concepts for the 21th Century. In: *To the Hands of the Poor: Water and Trees*. [IDS Discussion Paper 296].

Chen, Z., Lu, Y., & Treiman, D.J. (2021). Determinants and consequences of rural-to-urban migration patterns in China: Evidence from sequence analysis. *Population, Space and Place*, 28(2):e2493.

https://doi.org/10.1002/psp.2493

Cindy Fan, C., & Huang, Y. (1998). Waves of rural brides: Female marriage migration in China. *Annals of the Association of American Geographers*, 88(2):227-251.

https://doi.org/10.1111/1467-8306.00092

Debray, A., & Ruyssen, I. (2023). The aspiration to stay: A global analysis. *International Migration Review*, 59(3):1385-1431.

https://doi.org/10.1177/01979183231216087

Devi, P.A., Geetha, K.T., & Gomathi, K.R. (2009). Rural out-migration: Two group discriminant analysis. *Social Change*, 39(1):85-101.

https://doi.org/10.1177/004908570903900105

Elder, G.H. (1998). The life course as developmental theory. *Child Development*, 69(1):1-12.

https://doi.org/10.1111/j.1467-8624.1998.tb06128.x

Elzinga, C.H., & Liefbroer, A.C. (2007). De-standardization of family-life trajectories of young adults: A cross-national comparison using sequence analysis. *European Journal of Population*, 23(3-4):225-250.

https://doi.org/10.1007/s10680-007-9133-7

Folger, J., & Rowan, J. (1953). Migration and marital status in ten southeastern cities. *Social Forces*, 32(2):178-185.

https://doi.org/10.2307/2573717

Gillespie, B.J., Mulder, C.H., & Von Reichert, C. (2022). The role of family and friends in return migration and its labor market outcomes. *Population Research and Policy Review*, 41(1):115-138.

https://doi.org/10.1007/s11113-021-09650-x

Gould, W.T.S. (1982). Education and internal migration: A review and report. *International Journal of Educational Development*, 1(3):103-111.

https://doi.org/10.1016/0738-0593(82)90047-5

Haandrikman, K., & Hassanen, S. (2014). Onward Migration of African Europeans: Comparing Attitudes to Migration Motives. In: *Stockholm Research Reports in Demography*, p.15. Available from: https://doi.org/10.17045/sthlmuni.14438993.v1 [Last accessed on 2024 Apr 22].

Haapanen, M., & Böckerman, P. (2017). More educated, more mobile?: Evidence from post-secondary education reform. *Spatial Economic Analysis*, 12(1):8-26.

https://doi.org/10.1080/17421772.2017.1244610

He, L., Mao, Y., & Kinoshita, T. (2023). Place attachment among rural migrants and returnees: Case of Shuangfeng County, China. *Frontiers in Psychology*, 14:1279679.

https://doi.org/10.3389/fpsyg.2023.1279679

Hugo, G.J. (1982). Circular migration in Indonesia. *Population and Development Review*, 8(1):59-83.

https://doi.org/10.2307/1972690

Impicciatore, R., & Panichella, N. (2019). Internal migration trajectories, occupational achievement and social mobility in contemporary Italy. A life course perspective. *Population, Space and Place*, 25(6):1-19.

https://doi.org/10.1002/psp.2240

King, R., & Skeldon, R. (2010). "Mind the Gap!" Integrating approaches to internal and international migration. *Journal of Ethnic and Migration Studies*, 36(10):1619-1646.

https://doi.org/10.1080/1369183X.2010.489380

Kleinepier, T., De Valk, H.A.G., & Van Gaalen, R. (2015). Life paths of migrants: A sequence analysis of polish migrants' family life trajectories. *European Journal of Population*, 31(2):155-179.

https://doi.org/10.1007/s10680-015-9345-1

Kothari, U. (2003). Staying put and staying poor? *Journal of International Development*, 15(5):645-657.

https://doi.org/10.1002/jid.1022

Kumar, S. (2020). A geographical analysis of rural male out-migration: A Case study of Bhagalpur district. In: Banerjee, A., Jana, N.C., & Mishra, V.K., editors. *Population Dynamics in Contemporary South Asia: Health, Education and Migration*. Singapore: Springer, p.331-355.

https://doi.org/10.1007/978-981-15-1668-9_14

Lee, E.S. (1966). A theory of migration. *Demography*, 3(1):47-57.

https://doi.org/10.2307/2060063

Lee, Y.J., & Sugiura, H. (2018). Key Factors in determining internal migration to rural areas and its promoting measures-a case study of hirosaki city, aomori prefecture. *Public Policy Review*, 14(1):153-177.

Lewis, W.A. (1954). Economic development with unlimited supplies of labour. *The Manchester School*, 22(2).

https://doi.org/10.1111/j.1813-6982.1962.tb02428.x

Liang, Z., Chen, Y.P., & Gu, Y. (2002). Rural industrialisation and internal migration in China. *Urban Studies*, 39(12):2175-2187.

https://doi.org/10.1080/0042098022000033926

Lindstrom, D.P. (1996). Economic opportunity in mexico and return migration from the United States. *Demography*, 33(3):357-374.

https://doi.org/10.2307/2061767

Liu, T., Shi, Q., & Zhuo, Y. (2023). Are adaptation challenges relevant to the location choices of internal migrants? Evidence from China. *Regional Studies*, 58(9):1674-1686.

https://doi.org/10.1080/00343404.2023.2281434

Lucas, R.E.B. (2015). Internal Migration in Developing Countries: An Overview. In: *KNOMAD Working Paper*. Vol. 6, p.1-31.

Mabogunje, A.L. (1970). Systems approach to a theory of rural-urban migration. *Geographical Analysis*, 2(1):1-18.

https://doi.org/10.1111/j.1538-4632.1970.tb00140.x

Malamassam, M.A. (2016). Youth migration in Indonesia: Decision to move and to choose destination areas. *Indonesian Journal of Geography*, 48(1):62-72.

https://doi.org/10.22146/ijg.12469

Malamassam, M.A. (2022). Spatial structure of youth migration in Indonesia: Does education matter? *Applied Spatial Analysis and Policy*, 15(4):1045-1074.

https://doi.org/10.1007/s12061-022-09434-6

Muhidin, S. (2014). Migration patterns: People on the move. In: *Regional Dynamics in a Decentralized Indonesia*. Singapore: ISEAS Publishing, p.309-333.

https://doi.org/10.1355/9789814519175-020

Mulder, C.H. (1993). *Migration Dynamics: A Life Course Approach*. Missouri: Thesis Publishers.

https://doi.org/10.2307/2546807

Needleman, S.B., & Wunsch, C.D. (1970). A general method applicable to the search for similarities in the amino acid sequence of two proteins. *Molecular Biology*, 48(3):443-453.

https://doi.org/10.1016/b978-0-12-131200-8.50031-9

Nekby, L. (2006). The emigration of immigrants, return vs. Onward migration: Evidence from sweden. *Journal of Population Economics*, 19(2):197-226.

https://doi.org/10.1007/s00148-006-0080-0

Norris, R.E. (1972). Migration as spatial interaction. *Journal of Geography*, 71(5):294-301.

https://doi.org/10.1080/00221347208981672

North, D.C. (1990). In: Alt, J., & North, D.C., editors. *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.

Pardede, E.L., Mccann, P., & Venhorst, V. (2016). Step-wise migration : Evidence from Indonesia. *European Population Conference - EPC*, p.1-8. Availavle from: Available from: https://epc2016.eaps.nl/papers/160127 [Last accessed on 2024 Apr 22].

Pardede, E.L., McCann, P., & Venhorst, V.A. (2020). Internal migration in Indonesia: new insights from longitudinal data. *Asian Population Studies*, 16(3):287-309.

https://doi.org/10.1080/0032472031000145406

Paul, A.M., & Yeoh, B.S.A. (2021). Studying multinational migrations, speaking back to migration theory. *Global Networks*, 21(1):3-17.

https://doi.org/10.1111/glob.12282

Paweenawat, S.W., & Liao, L. (2023). The role of higher education on migration to cities in Thailand. *Cities*, 137:104309.

https://doi.org/10.1016/j.cities.2023.104309

Piccarreta, R., & Billari, F.C. (2007). Clustering work and family trajectories by using a divisive algorithm. *Journal of the Royal Statistical Society. Series A: Statistics in Society*, 170(4):1061-1078.

https://doi.org/10.1111/j.1467-985X.2007.00495.x

Pitoyo, A.J. (2018). Working in the global world: looking for more modern workplace overseas. *Earth and Enviromental Science*, 148:1-11.

https://doi.org/10.1088/1755-1315/148/1/012011

Pollock, G. (2007). Holistic trajectories : A study of combined employment, housing and family careers by using multiple-sequence analysis. *Journal of the Royal Statistical Society Series A*, 170(1):167-183.

https://doi.org/10.1111/j.1467-985X.2006.00450.x

Randolph, G.F., & Naik, M. (2017). An analysis of 'migrant-intensity' in India and Indonesia: Seeing internal migration patterns through a place-based lens. *Environment and Urbanization ASIA*, 8(1):40-58.

https://doi.org/10.1177/0975425316683861

Ravenstein, E. (1885). The laws of migration. *Journal of the Statistical Society of London*, 48(2):167-235.

https://doi.org/10.2307/2979181

Ritschard, G., & Oris, M. (2005). Life course data in demography and social sciences: Statistical and data-mining approaches. *Advances in Life Course Research*, 10(11):283-314.

https://doi.org/10.1016/S1040-2608(05)10011-2

Ritsilä, J., & Haapanen, M. (2003). Where do the highly educated migrate? Micro-level evidence from Finland. *International Review of Applied Economics*, 17(4):437-448.

https://doi.org/10.1080/0269217032000118765

Sheller, M., & Urry, J. (2006). The new mobilities paradigm. *Environment and Planning A*, 38(2):207-226.

https://doi.org/10.1068/a37268

Shen, H., Song, Y., & Shan, Z. (2024). Migration choices for farming households in rural areas: Why new countryside locations are important for the inhabitants of traditional agricultural areas in central China. *Growth and Change*, 55(2):1-19.

https://doi.org/10.1111/grow.12719

Stark, O. (2019). Behavior in reverse: Reasons for return migration. *Behavioural Public Policy*, 3(1):104-126.

https://doi.org/10.1017/bpp.2018.27

Sugiyarto, E., Deshingkar, P., & McKay, A. (2019). Internal migration and poverty: A lesson based on panel data analysis from Indonesia. In: Jayanthakumaran, K., Verma, R., Wan, G., & Wilson, E., editors. *Internal Migration, Urbanization, and Poverty in Asia: Dynamics and Interrelationships*. England: Springer Open, p.135-162.

https://doi.org/10.1007/978-981-13-1537-4_6

Takenaka, A. (2007). *Secondary Migration: Who Re-Migrates and why these Migrants Matter*. Migration Policy Institute. Available from: https://www.migrationpolicy.org/article/secondary-migration-who-re-migrates-and-why-these-migrants-matter [Last accessed on 2024 Apr 22].

Tirtosudarmo, R. (2009). Mobility and human development in Indonesia. In: *Human Development Research Paper*. Available from: https://mpra.ub.uni-muenchen.de/19201

Todaro, M.P. (1969). A model of labor migration and urban unemployment in less developed countries. *The American Economic Review*, 59(1):138-148.

Vidal, S., Lersch, P.M., Jacob, M., & Hank, K. (2020). Interdependencies in mothers' and daughters' work-family life course trajectories: similar but different? *Demography*, 57(4):1483-1511.

https://doi.org/10.1007/s13524-020-00899-z

Wee, K., & Yeoh, B.S.A. (2021). Serial migration, multiple belongings and orientations toward the future: The perspective of middle-class migrants in Singapore. *Journal of Sociology*, 57(1):94-110.

https://doi.org/10.1177/1440783320960521

Widaryoko, N., Sukamdi, & Pitoyo, A.J. (2023). Remapping internal migration: How complex are indonesian migration trajectories? *Journal of Population and Social Studies*, 32:56-77.

https://doi.org/10.25133/JPSSv322024.004

Widaryoko, N., Sukamdi, S., & Pitoyo, A.J. (2025). The economic and poverty impact of migration: Is repeated migration better than one-way migration? *Cogent Social Sciences*, 11(1):1-25.

https://doi.org/10.1080/23311886.2025.2495858

Yang, M., Dijst, M., & Helbich, M. (2020). Migration trajectories and their relationship to mental health among internal migrants in urban China: A sequence alignment approach. *Population, Space and Place*, 26(5):1-11.

https://doi.org/10.1002/psp.2304

Zufferey, J. (2019). Who are the serial movers? Sociodemographic profiles and reasons to migrate to switzerland among multiple international migrants. In: *IMISCOE Research Series*. Germany: Springer Science and Business Media, p.83-100.

https://doi.org/10.1007/978-3-030-05671-1_4

Zufferey, J., Steiner, I., & Ruedin, D. (2021). The many forms of multiple migrations: Evidence from a sequence analysis in Switzerland, 1998 to 2008. *International Migration Review*, 55(1):254-279.

https://doi.org/10.1177/0197918320914239