Unveiling the linkages between housing conditions and outward migration dynamics: a case study

Kunduzkul Niiazalieva¹, Elmira Derbisheva², Zhao Haijun³, Aidar Assylbayev¹*, and Turatbek Suranaev⁴

¹ Kyrgyz State Technical University named after I. Razzakov, International Higher School of Logistics, Bishkek, Kyrgyz Republic
² Kyrgyz State Technical University named after I. Razzakov, Director of Secondary vocational education (College), Bishkek, Kyrgyz Republic
³ Kyrgyz State Technical University named after I. Razzakov, Bishkek, Kyrgyz Republic
⁴ International University of the Kyrgyz Republic, Bishkek, Kyrgyz Republic
⁵ Kyrgyz-Russian Slavic University named after the First President of the Russian Federation B.N. Yeltsin, Department of Accounting and Audit, Bishkek, Kyrgyz Republic

Abstract. This study seeks to enhance the existing body of knowledge by examining the intricate relationship between housing conditions and patterns of outward migration. By drawing on relevant literature and empirical evidence, the research explores the diverse ways in which housing conditions impact the decision-making process of individuals and communities regarding migration to foreign countries. The analysis encompasses a comprehensive investigation into the influence of housing affordability, quality, availability, and stability on the dynamics of external migration. Methodologically, a mixed approach is employed, combining quantitative analysis of demographic and housing data with qualitative correlation analysis to capture the multifaceted nature of the phenomenon under investigation. The study aims to examine the effects of external migration on key indicators of the housing stock, particularly the commissioning of housing and the provision of living space for the population. A thorough understanding of the complex relationship between housing conditions and outward migration dynamics can inform the development of targeted interventions and policies to address migration-related challenges and improve housing conditions, thus reducing population outflows. Moreover, the research outcomes contribute to broader discussions on sustainable urban development, equitable housing, and social cohesion in the context of contemporary migration trends.

Keywords: housing demography, housing conditions, outward migration, dynamics, migration, housing stock, correlation, sustainable urban development.

1 Introduction

Migration has undergone a significant transformation, evolving from a domestic concern to a global system of demographic processes. The changing dynamics in the scale, goals, methods,
and various other aspects of migration have necessitated the implementation of systematic measures at both national and international levels to address the emerging challenges, particularly those related to the housing needs of migrants. It is noteworthy that the concept of "migration" inherently includes the notion of establishing a sense of "attachment" to the new place of residence, particularly in the context of citizenship change.

While the term "migration" finds no explicit definition in the UN Charter or the Universal Declaration of Human Rights of 1948, it is important to recognize that the latter document legally enshrines the fundamental human right to freely move and change one's place of residence. As highlighted by the authors of the extended migration profile of Kyrgyzstan for the period 2010-2015, G.K. Ibraeva and M.K. Ablezova, as well as A. Pokhlebaeva, a researcher of international law from Belarus, the absence of a precise definition underscores the complexity of migration as a multifaceted phenomenon [1].

The distinguishing characteristic of migration lies in the change of residence, even if such changes are temporary in nature. In essence, the presence of a migration process is predicated on the relative transformation of the place of residence.

The primary objective of this scientific article is to investigate the impact of external migration on the development of housing stock indicators, with a particular emphasis on the commissioning of housing and the provision of adequate living space to the population. Furthermore, the study aims to examine the influence of external migration factors on both the quantitative and qualitative aspects of the housing stock. By analyzing these relationships, a deeper understanding can be gained regarding the intricate dynamics between migration patterns and housing conditions. Such insights are crucial for policymakers, urban planners, and housing professionals in designing targeted interventions and formulating effective policies to address migration-related issues, enhance housing conditions, and mitigate population outflows. Additionally, the findings of this study contribute to the broader discourse on sustainable urban development, fair housing, and social cohesion within the context of prevailing migration trends.

2 Materials and Methods

2.1 Review of references:

To gather relevant information and scientific sources on migration-related issues, an extensive review of the literature was conducted. The works of foreign authors including R. Coulter [2], J. Scott [2], F. B. Deborah [3], B.J. Gillespie [4], C. H. Mulder [4; 5; 6], S. H. Bairamukov [7], and Yu Zhang et al. [8] were consulted. Additionally, studies conducted by authors such as S. V. Ryazantsev [9; 10], A. A. Kazantsev [11], L. Yu. Gusev [11], and others, who focused on migration issues within the post-Soviet countries, were considered due to their relevance to the territorial scope of this study. Pertinent works on housing demography and urbanization by authors such as L.B. Karachurin [12], A. Breslavsky [13], A.N. Asaul [14; 15] were also examined. Furthermore, the research considered the contributions of domestic scientists who have extensively studied the intersection of housing demography and migration, including K.B Assylbayev, K.N. Niyazaliev [16; 17], N.A. Brovko [17], A.B. Asylbaev [18; 19; 20; 21], E.V. Ploskikh [22], and G.V. Kumskov [23; 24].

2.2 Study Methodology:

This article aligns with the Sustainable Development Goals outlined in the "Transforming Our World: The 2030 Agenda for Sustainable Development" plan. The study addresses several key goals, including 17.19.2, which involves providing analytical information on population and housing census in the Kyrgyz Republic; 10.7.2, which aims to establish an effective migration policy that supports legal and safe migration while ensuring decent housing conditions; and 11.1, which sets the objective of ensuring access to adequate housing and housing conditions, including for migrants, by 2030 [25; 26; 27]. The research methodology employed general methods of information systematization, demographic analysis, and synthesis. Corel software
was utilized for calculations, applying the Pearson model and statistical data classification and extraction methods. Moreover, the study drew upon the experience of analyzing the convergence of disparate factors of development [28].

3 Results:

3.1 A Theoretical Review of the Relationship between Migration and Housing:

According to the Law of the Kyrgyz Republic "On External Migration," migration refers to the movement of individuals from the Kyrgyz Republic to other states, from other states to the Kyrgyz Republic, or within the territory of the Kyrgyz Republic, with the purpose of permanently or temporarily changing their place of residence [29]. This legal definition aims to encompass all categories of migrants, including transit migrants and refugees. However, a crucial aspect addressed by the law is the notion of "place of residence," which refers to the location where a citizen of the Kyrgyz Republic permanently or predominantly resides. It is important not to conflate migration with the mobility of residents. Resident mobility involves moving to a new place of residence within the same area, often driven by factors related to family household or housing. Despite the existence of different definitions of migration and migrants, most of them fail to provide a comprehensive understanding of migrants' status and the legal regulation of the migration process. Instead, these definitions primarily focus on specific categories of migrants, neglecting others.

For instance, the International Organization for Migration (IOM) handbook defines migration as the process of population movement across state borders or within a country. It explicitly states that migration encompasses various types of movements, such as refugees, displaced individuals, and economic migrants. Furthermore, a migrant is defined as a person involved in the migration process, considering departure in relation to the territory left and arrival in relation to the territory entered [30].

Migration, as described by C.H. Mulder, should be understood as any change in the place of residence that entails a significant shift in people's daily activities [31]. It should be recognized that the availability or absence of housing can influence migration patterns. Adequate housing can attract migrants, while inadequate housing can hinder population outflows or prevent the arrival of migrants.

The circumstances under which the relationship between housing and migration operates, or does not operate, are crucial. A closer connection between housing and migration is observed when the necessity for migration is less pressing. For instance, refugees are unlikely to base their migration decisions solely on housing considerations, although the host country may be concerned about housing issues, particularly in the case of mass refugee influx.

In individual cases, the responsibility for addressing housing issues may be shifted to the migrant. However, the urgency and purpose of migration vary among different types of migrants. Those who relocate for housing-related reasons generally have more flexibility compared to those moving due to changes in education or employment. Migrants motivated by housing concerns can postpone or alter their relocation plans and, in extreme cases, even cancel them. Conversely, individuals moving due to job or educational changes may be willing to accept substandard living conditions. International labor migrants often choose very inexpensive housing options that are affordable for them but may not meet basic sanitary standards of living. Sanitary living standards encompass not only the presence of sanitary facilities in a dwelling but also the violation of minimum standards of 6-9 square meters per person.

For example, it is widely known that in Moscow, more than 10 migrants may rent a one-room apartment originally designed for a maximum of three people from one family. While this arrangement benefits the migrants and the apartment owner financially, it creates disadvantages for the cohabitants and the surrounding community due to issues such as instability, strain on infrastructure, and network congestion [32].
Thus, within the context of the Eurasian Union, where international labor migration is expected to increase, it is advisable to address the housing demands of migrants rather than influencing their choice of migration destination based on housing availability. A prevalent approach worldwide involves attracting migrants to areas experiencing demographic decline by offering affordable housing. However, this approach merely postpones the demographic crisis without resolving the underlying issues. It results in the division of society into segregated areas comprising migrants and local residents, similar to the situations observed in the United States and Western Europe. Housing stratification, in our perspective, signifies societal housing stratification, wherein some individuals reside in elite housing or towns while others cannot afford such accommodations. Consequently, housing stratification can give rise to social tensions within society [33]. To achieve a comprehensive solution, it is imperative to implement comprehensive measures across various sectors of the economy, extending beyond the housing sector. However, catering to the housing needs of migrants through a dedicated program that provides affordable and decent housing for all migrants, regardless of the region, would encourage the successful permanent relocation of individuals seeking to establish residency.

### 3.2 Dynamic Picture of External Migration in the Kyrgyz Republic

The external migration patterns in the Kyrgyz Republic exhibit a prevailing trend of higher emigration compared to immigration. During the analyzed period from 2011 to 2021, the number of arrivals amounted to only 41,116 individuals, while the number of departures was approximately three times higher, reaching 132,265 individuals (Figure 1).

![Figure 1 - Dynamics of the number of arrivals, departures, and net migration for the period from 2011 to 2021.](image)

Source: Prepared by the author based on data from the National Statistical Committee of the Kyrgyz Republic [34].

As depicted in the diagram, the highest number of emigrants was observed in 2011, totaling 45,740 individuals. Correspondingly, the peak value of migration outflow occurred in the same year, with 39,403 individuals leaving the country.

In accordance with the market law of supply and demand, the current trend suggests that the number of incoming migrants shapes the demand in the housing market. Consequently, this demand impacts not only the secondary housing market but also the primary market. For instance, if immigrants acquire housing from the secondary market from local residents, the locals, in turn, tend to prefer purchasing housing from the primary market to better fulfill their needs.

This scenario represents one of the housing market filtering models, whereby wealthier local residents opt for new housing, while less affluent immigrants tend to purchase secondary homes. Thus, a natural turnover of tenants occurs as the local population is gradually replaced by newcomers. However, this situation is advantageous for local residents as it facilitates the development of new homes with improved living conditions. Nonetheless, the possibility of
immigrants buying new housing cannot be discounted entirely. Nevertheless, due to limited knowledge of the housing market and its future prospects, immigrants typically opt for housing in existing favorable areas to minimize risks [35; 36]. Therefore, whether individuals purchase homes from the primary or secondary market, the demand for new housing remains prevalent in both cases.

3.3 The Relationship between the Number of Arrivals and the Commissioning of Residential Buildings for the Period from 2011 to 2021

To examine the relationship between the number of arrivals and the commissioning of residential buildings, a correlation analysis was conducted (Figure 2).

Figure 2 - Dynamics of the number of arrivals and the commissioning of residential buildings for the period from 2011 to 2021.

The presented diagram illustrates two graphs representing the number of arrivals and the commissioning of residential buildings. These graphs exhibit distinct opposing trends. The commissioning of new housing demonstrates an overall upward trajectory each year, although periods of decline are observed, introducing complexity and ambiguity when analyzing the development dynamics.

For the analyzed period from 2011 to 2021, the minimum amount of residential building commissioning occurred in 2011, with 865.2 thousand square meters of housing, while the maximum was recorded in 2017, amounting to 1472.041 thousand square meters. Dips in residential building commissioning are evident in 2012, 2016, 2018, and 2020.

The trend line for the commissioning of new dwellings is described by a polynomial cubic function $y = -2.3626x^3 + 28.38x^2 - 5.6104x + 804.41$, with an approximation coefficient of $R^2 = 0.8537$. However, it is important to note that the reliability of this function is not sufficiently high, as the approximation coefficient indicates 85% accuracy in describing the trend line using this function.

3.4 Correlation between the Number of People who Left (Persons) and the Total Area per Person (sq.m.) for the Period from 2011 to 2021

An essential aspect of the migration process is the dynamics of the number of citizens who have left the country. It is crucial to analyze how the departure of citizens influences the housing market, particularly in terms of housing provision indicators.

It is evident that the number of departing citizens contributes to an increase in available housing. This surplus of housing supply has a direct impact on the housing market's supply curve, leading to reduced housing costs and increased affordability. Simultaneously, this process generates a higher demand for more comfortable and improved housing for permanent residence, primarily among local citizens. As previously mentioned, visitors tend to purchase housing in a more secure and established secondary housing market. Local citizens strive to enhance their living conditions by expanding and improving their residences, which inevitably
affects the housing provision indicators for every individual in the country. This phenomenon is particularly evident in large metropolitan areas, where urban residents sell their existing housing to acquire more comfortable homes in the primary market, which they have analyzed and are familiar with.

In this context, it is necessary to analyze the correlation between the number of emigrants and the total area per person in the country. To accomplish this, we present the graphical representation of the dynamics of the number of departing citizens and the total area per person for the period from 2011 to 2021 (Figure 3).

![Figure 3 - The Number of People who Left (Persons) and the Total Area per Person (sq.m.) for the Period from 2011 to 2021.](image)

The presented diagram reveals the fluctuating and unstable behavior of the graph representing the total area per person within the analyzed period. Prominent peak periods can be observed in 2011 and 2012 with values of 14.5 sq.m. and 14.8 sq.m., respectively, while the lowest values occur in 2013 and 2014, reaching 12.8 sq.m. and 12.5 sq.m., respectively. Consequently, the trend line is described by a complex cubic function $y = -0.0106x^3 + 0.2296x^2 - 1.5353x + 16.129$, with a confidence factor of only 68% ($R^2 = 0.687$).

In contrast, the second graph depicting the number of departing citizens displays greater stability and a clear declining trend. The trend line is also described by a cubic function, $y = -162.94x^3 + 3641.6x^2 - 25342x + 61091$, with a higher approximation coefficient of $R^2 = 0.8395$, representing an approximate 84% confidence level. According to the graph, the maximum number of people who left the country was recorded in 2011, with 45,740 citizens, while the minimum was documented in 2020, totaling 5,822 people.

### 3.5 Relationship between Migration Gain or Outflow and Total Area per Person from 2011 to 2021

To establish a comprehensive coefficient representing the relationship between migration and the total area per person, we examined the correlation between the migration gain or outflow indicator and the housing provision coefficient. For this purpose, we constructed a diagram depicting the dynamic behavior of these two factors for the period from 2011 to 2021 (Figure 4).
Based on the presented diagram, it is evident that throughout the entire analyzed period, spanning from 2011 to 2021, there has been a consistent prevalence of departures over arrivals in Kyrgyzstan. The maximum migration outflow occurred in 2011, with a count of 39,430 individuals, while the minimum value was recorded in 2021, amounting to 769 individuals.

It is noteworthy to emphasize that the trend line of the migration outflow graph is described by a cubic function $y = 206.22x^3 - 4261.4x^2 + 27120x - 56645$, with a relatively modest approximation value of $R^2 = 0.8408$, indicating an 84% confidence level.

Meanwhile, the graph representing the total area per person and its corresponding polynomial trend line exhibit a slightly higher approximation compared to the graph of departed citizens.

### 4 Discussion

#### 4.1 Results for the First Factor of the Relationship: Theoretical Review of the Relationship between Migration and Housing

Migration, as a global phenomenon, possesses significant potential for theoretical research and scientific investigation. However, within the context of interdisciplinary studies, the scientific description and understanding of this phenomenon remain insufficient. In this study, the authors explore the relationship between migration and housing conditions in Kyrgyzstan for the first time, aiming to provide a more comprehensive theoretical framework. An appropriate hypothesis to explain the relationship between housing availability and internal migration is as follows: individuals are less inclined to consider moving to other regions when they have access to good housing options in their current place of residence. This concept aligns with the demographic principle known as "aging in place." Additionally, factors such as deteriorating social infrastructure, income disparities among citizens, and relative declines in living standards in certain regions of the country serve as drivers for migration.

#### 4.2 Dynamic Picture of External Migration in the Kyrgyz Republic

Migration often functions as a social corridor, alleviating population pressures in regions with limited living space. External migration helps reduce the strain on resource consumption in countries with constrained opportunities for production and material resource replenishment. As such, it mitigates the risk of the Kyrgyz Republic falling into the "Malthus trap," where housing becomes a scarce resource with significant barriers to acquisition and construction. Throughout history, the Kyrgyz Republic has experienced a consistent pattern of migration outflow exceeding population influx. The peak migration outflow occurred during the crisis-ridden and challenging years of the 1990s, following the collapse of the USSR. Non-titular citizens, who
had the opportunity to reside in their historical homeland, left the country during this period. Since then, migration volumes and balances have decreased, reaching their lowest values in the 2020s, representing the entire period of the country's independence.

4.3 The Relationship between the Number of People Who Arrived and the Commissioning of Residential Buildings for the Period from 2011 to 2021

To comprehensively examine the relationship between the number of arrivals and the construction of new dwellings, a detailed analysis was conducted using tabular data and the Pearson mathematical model within the Corel program. The obtained correlation coefficient was relatively low and displayed a negative relationship, which initially seemed inexplicable. The calculated correlation coefficient, $R(\text{correl}) = -0.604592214$, unequivocally indicates that the number of arrivals has no significant influence on new housing construction. Surprisingly, the analysis suggests that a decrease in the number of migrants corresponds to an increase in new housing construction. Consequently, it can be inferred that the growth in new housing construction primarily stems from natural population movements, including population growth, increased birth rates, household expansion, and changes in marriage and divorce rates. In summary, immigrants do not have a substantial impact on the development of the housing sector in the country.

4.4 Correlation between the Number of People Who Left and the Total Area per Person for the Period from 2011 to 2021

To further explore the relationship between the number of emigrating citizens and the total area per person, a dynamic table was constructed and analyzed using the Pearson model within the Corel program. The resulting correlation coefficient, $R(\text{correl}) = 0.622003329$, indicates a relationship between these indicators. However, the coefficient is not sufficiently high to establish complete dependence between the two factors. Nonetheless, a moderately strong association is evident, supporting the hypothesis that a peak improvement in housing provision occurred in 2011 and 2012 due to a significant increase in emigration during those years. Overall, it can be concluded that external migration has a notable impact on the average housing provision in Kyrgyzstan.

4.5 Relationship between Migration Gain or Outflow and Total Area per Person from 2011 to 2021

To comprehensively analyze the relationship between migration gain or outflow and the total area per person, a dynamic table was constructed and analyzed using the Pearson model within the Corel program. The resulting correlation coefficient was calculated as $R(\text{correl}) = -0.592241507$. This coefficient indicates a stable relationship between these indicators, albeit not strong enough to suggest complete dependence between the two factors. However, the graphical representation of the data clearly demonstrates that during the active growth of population outflow in 2011 and 2012, there was a sharp increase in the provision of housing per person, reaching a record value of 14.8 square meters.

It is worth noting that in 2011 and 2012, there was a notable surge in the ratio of housing provision, coinciding with a peak in population outflow. Subsequently, in the following years, the number of individuals leaving the country decreased, and as a result, the housing provision ratio began to decline.

These findings highlight an interesting pattern: despite the relationship between migration and the total area per person being statistically significant, it does not indicate a strong dependence. The observed trend suggests that the increase in housing provision in 2011 and 2012 was primarily influenced by factors other than migration, as the provision ratio declined when the outflow of population decreased in subsequent years.

Overall, these results suggest that while migration plays a role in shaping the housing landscape, other factors such as population dynamics, construction rates, and economic conditions likely contribute to changes in the total area per person. Further research is necessary.
to explore the multifaceted dynamics of migration and housing provision in Kyrgyzstan and to better understand the complex interplay between these factors.

5 Conclusion

In conclusion, our study sheds light on the relationship between external migration and the coefficient of housing provision in Kyrgyzstan. The findings indicate that there is a correlation between migration and the indicator of living space provision. However, it is important to note that the impact of population outflow alone on the housing provision ratio is not substantial. Instead, it is the combination of various factors, including the active growth in the construction of new housing, that significantly influences the housing supply in the market.

The analysis revealed that during periods of high population outflow, there was an increase in the coefficient of provision of living space, indicating a larger area available per person. This suggests that the outflow of individuals from the country may contribute to a temporary increase in housing availability. However, it is crucial to consider other factors, such as population dynamics, economic conditions, and construction rates, to fully understand the dynamics of housing provision.

It is worth emphasizing that migration is a complex phenomenon influenced by numerous social, economic, and personal factors. While our study highlights the relationship between migration and housing provision, further research is needed to delve into the intricacies of this relationship and explore additional factors that contribute to changes in the housing market. Additionally, future studies should consider regional variations within Kyrgyzstan to gain a more comprehensive understanding of the migration-housing dynamics across different areas of the country.

Understanding the dynamics of migration and its impact on housing provision is crucial for policymakers, urban planners, and stakeholders involved in the housing sector. By recognizing the multifaceted nature of these processes, policymakers can develop more effective strategies to address housing needs, promote sustainable development, and improve the overall well-being of the population.

In conclusion, this study provides valuable insights into the relationship between external migration and housing provision in Kyrgyzstan. It highlights the need for further investigation to fully grasp the complex interplay between migration patterns, construction rates, and housing availability. Such research is essential for developing evidence-based policies and strategies to meet the housing needs of the population and ensure sustainable development in the country.

References

17 Assylbayev, A., Niiazalieva, K., Brovko, N., & Borbugulov, M. (2021). Problems of residential migration in the framework of the formation of “smart agglomeration”. E3S Web of Conferences, 311, 07002. DOI: 10.1051/e3sconf/202131107002
19 Niiazalieva, K. N., Assylbayev, A. B., Alymkulova, A. S., Ploskikh, V. V., & Assylbayev, K. B. (2023). Urbanization of the population within the context of urban agglomeration development: a scientific perspective. E3S Web of Conferences, 403, 01005. DOI: 10.1051/e3sconf/202340301005