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Migration Attractiveness of Kazakhstan: The Role of Real Income and Regional Disparities

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ABSTRACT

Migration is an important factor of socio-economic development, influencing labor markets, demographic structure, human capital, and regional development. This study aims to analyze the dynamics and spatial disparities of external migration in Kazakhstan for 2001–2024 and to assess the role of socio-economic factors, particularly real household income, in shaping migration inflows. The study applies comparative cross-country analysis, regional spatio-temporal analysis, Pearson correlation analysis, OLS regression with Newey–West standard errors, the Augmented Dickey–Fuller test, residual-based cointegration analysis, and a first-difference model. The results show that the highest positive migration balances were recorded in Almaty city, Almaty region, Mangystau region, and Astana city, while negative values remained in North Kazakhstan, East Kazakhstan, Karaganda, Abay, Zhambyl, and Ulytau regions. Correlation analysis revealed strong positive associations between migration and GDP ($r = 0.92$), investment ($r = 0.91$), construction volume ($r = 0.90$), and real household income ($r = 0.89$), while poverty showed a negative correlation ($r = -0.81$). The results of the OLS regression showed a statistically significant positive relationship between real incomes and migration inflows. However, the cointegration test did not confirm a stable long-term relationship ($p = 0.144$), and the first-differences model did not reveal a statistically significant short-term relationship ($p = 0.3454$). The results show that migration processes in Kazakhstan are related to the income level of the population, but at the same time depend on a broader set of factors, including the state of the labor market, regional differences, infrastructure and institutional conditions.

KEYWORDS: Migration, External Migration, Migration Strategy, Human Capital, Population Mobility, Regional Economy, Regional Development

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Миграционная привлекательность Казахстана: роль реальных доходов и региональных различий

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АННОТАЦИЯ

Миграция является важным фактором социально-экономического развития, оказывающим влияние на рынки труда, демографическую структуру, человеческий капитал и региональное развитие. Цель данного исследования заключается в анализе динамики и пространственных различий внешней миграции в Казахстане за 2001–2024 годы, а также в оценке роли социально-экономических факторов, в частности реальных доходов населения, в формировании миграционных притоков. В исследовании применяются сравнительный межстрановой анализ, региональный пространственно-временной анализ, корреляционный анализ Пирсона, OLS-регрессия со стандартными ошибками Ньюи–Уэста, тест Дики–Фуллера, коинтеграционный анализ на основе остатков и модель первых разностей. Результаты показывают, что наибольшие положительные значения миграционного сальдо были зафиксированы в городе Алматы, Алматинской области, Мангистауской области и городе Астана, тогда как отрицательные значения сохранялись в Северо-Казахстанской, Восточно-Казахстанской, Карагандинской, Абайской, Жамбылской и Улытауской областях. Корреляционный анализ выявил сильные положительные связи между миграцией и ВВП ($r = 0.92$), инвестициями ($r = 0.91$), объемом строительства ($r = 0.90$) и реальными доходами населения ($r = 0.89$), тогда как уровень бедности показал отрицательную корреляцию ($r = -0.81$). Результаты OLS-регрессии показали статистически значимую положительную связь между реальными доходами и миграционными притоками. Однако коинтеграционный тест не подтвердил наличие устойчивой долгосрочной связи ($p = 0.144$), а модель первых разностей не выявила статистически значимой краткосрочной связи ($p = 0.3454$). Полученные результаты показывают, что миграционные процессы в Казахстане связаны с уровнем доходов населения, но одновременно зависят от более широкого набора факторов, включая состояние рынка труда, региональные различия, инфраструктуру и институциональные условия.

КЛЮЧЕВЫЕ СЛОВА: миграция, внешняя миграция, миграционная стратегия, человеческий капитал, мобильность населения, региональная экономика, региональное развитие

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INTRODUCTION

In the context of globalization and increasing international population mobility, migration is becoming a key factor influencing the socioeconomic development of countries. International migration flows directly affect labor market formation, demographic structure, human capital formation, and economic growth dynamics (Borjas, 2014; Castles et al., 2014). In contemporary research, migration is viewed not only as a demographic phenomenon but also as an element of the macroeconomic system, closely linked to income levels, employment status, and the population's quality of life. The growth of international labor mobility creates a need to analyze the factors determining a country's attractiveness to migrants, as well as to understand the mechanisms by which migration flows are integrated into the economy (Hatton & Williamson, 2005; Ortega & Peri, 2013).

Such studies are of particular importance for countries with developing and transition economies, including Kazakhstan. Labor migration in these countries serves a dual function: on the one hand, it fills labor shortages and stimulates economic activity, while on the other, it leads to a brain drain, a decline in human capital, and increased social tension (Docquier & Rapoport, 2012; Beine et al., 2006).

Kazakhstan, as the largest economy in Central Asia with unique economic and institutional characteristics, serves as a country of origin, a transit territory, and a destination for migrants, shaping the nature and direction of migration flows (World Bank, 2023). The impact of economic factors on migration is not straightforward and may vary depending on both domestic and external conditions. For example, the COVID-19 pandemic led to a sharp decline in international mobility, followed by a gradual recovery of migration flows. In addition, geopolitical developments, changes in international economic relations, and shifts in labor demand continue to influence the intensity and direction of migration processes (Czaika & Reinprecht, 2022).

In identifying the key socio-economic factors determining the inflow of migrants to Kazakhstan and quantitatively assessing their impact based on an analysis of time series for the period 2001–2024, particular attention is paid to the role of real household income as the primary indicator of living

standards and a factor in the country's migratory attractiveness.

The practical significance of this work lies in the potential to use the findings to develop state migration policy and socio-economic planning. Identifying the key determinants of migration attractiveness will enable the proposal of measures to attract a skilled workforce, raise the standard of living, and ensure sustainable economic development.

Previous empirical studies on Kazakhstan confirm the importance of income differentials and regional disparities in shaping migration flows (Aldashev & Dietz, 2012; Bokayev et al., 2021). However, most existing research focuses on descriptive analysis or cross-sectional comparisons and does not fully explore long-run relationships using time-series econometric techniques. In particular, issues related to stationarity, autocorrelation, and cointegration remain insufficiently addressed in the context of Kazakhstan's migration dynamics. The scientific novelty of the study lies in integrating international comparisons with the analysis of national time series, thereby enabling a more comprehensive identification of the mechanisms that shape migration processes. Unlike most existing studies, this study addresses multicollinearity and autocorrelation, enhancing the reliability of the results.

Thus, this study aims to analyze the dynamics and spatial disparities of external migration in Kazakhstan for 2001–2024 and to assess the role of socio-economic factors, particularly real household income, in shaping migration inflows. To achieve this objective, a comprehensive methodological approach is employed, combining comparative cross-country analysis and econometric modeling. Cross-country analysis allows us to determine Kazakhstan's place within the system of international migration flows and identify global trends in their evolution. In contrast, econometric analysis provides a quantitative assessment of the impact of economic factors on migration inflows.

LITERATURE REVIEW

The study of migration processes has evolved significantly over time, moving from simple explanations based on spatial and demographic factors to more complex, multidimensional frameworks that incorporate economic, institutional, and behavioral determinants. Early

migration theories primarily focused on individual decision-making driven by wage differentials and employment opportunities across regions. Lee (1966) conceptualized migration as a response to push and pull forces, emphasizing the role of unfavorable conditions in origin areas and attractive opportunities in destination regions. Building on this framework, Harris and Todaro (1970) formalized migration as an economically rational choice based on expected income differentials and labor market equilibrium, establishing the foundation for neoclassical migration theory.

In the 1990s and 2010s, migration studies became more empirically oriented. They began to take into account not only income differences, but also the quality of human capital, institutional conditions, migration policy, and spatial factors. Borjas (1994) systematized economic approaches to the study of immigration and showed that the effects of migration depend on the structure of migrants' skills, their adaptation to the labor market, and differences between countries of origin and destination. Zimmermann (1995) analyzed European migration processes, emphasizing that migration should be considered in close connection with employment, unemployment, regulatory policies, and integration of migrants in host countries. Taylor (2002) also emphasized the role of remittances within the New Economics of Labor Migration, arguing that migration may help households overcome market constraints and diversify income sources.

Furthermore, Chiswick (1999) developed the idea of migrant selectivity, showing that economic migrants often have higher motivation, entrepreneurial qualities, and a focus on success in the labor market. Karemera et al. (2000), using a modified gravity model, proved that international migration flows depend on political, economic, and demographic factors, as well as on the characteristics of the countries of origin and destination. Clark et al. (2007), using the example of immigration to the United States, showed that migration flows are determined not only by the levels of income and education in the countries of origin, but also by existing migration networks and migration policy restrictions. Lewer and Van den Berg (2008) confirmed the applicability of the gravity approach to immigration analysis by showing that migration flows between countries are explained by economic size, distance, and other factors of attraction. These

studies confirm that migration is a multifactorial process in which income, employment, human capital, migration networks, politics, and spatial characteristics work together.

A major development in migration literature was the emergence of the human capital approach. Within this framework, migration is interpreted as an investment decision in which individuals compare expected lifetime returns across alternative locations. Castles et al. (2014) argue that differences in wages, education returns, and skill transferability are key determinants of migration behavior. This shift in perspective expanded migration theory beyond simple income differentials, incorporating education, skill composition, and labor market structure as central explanatory factors. Subsequently, the New Economics of Labour Migration introduced a household-based perspective, challenging the assumption that migration decisions are made solely at the individual level. In this approach, migration is viewed as a collective strategy to diversify income sources, reduce risks, and overcome market imperfections. Migration decisions are therefore influenced not only by wage gaps but also by access to credit markets, income instability, and household risk management strategies. In addition, employment conditions and access to information infrastructure are increasingly considered important elements of socio-economic development that can influence population mobility. Salmanova (2022), using the case of Azerbaijan, shows that employment is closely linked to the development and accessibility of the information society, which is relevant to understanding how labor market conditions and access to modern infrastructure may affect migration-related decisions.

In the international empirical literature, migration flows are considered the result of the interaction among economic, demographic, institutional, and spatial factors. Mayda (2010), using panel data on migration inflows to OECD countries, shows that income differences between countries of origin and destination are among the key factors driving international migration. Similar conclusions are presented in the work of Ortega and Peri (2013), which proves that growth in per capita income in the destination country increases migration inflows, and that immigration policy can both stimulate and limit international mobility of the population.

Grogger and Hanson (2011) complement this approach by showing that migration is related not only to income levels but also to differences in earnings by skill level, which affects the selection and distribution of migrants between destination countries. A broader approach is proposed by Docquier et al. (2014), who distinguish between potential and actual migration. More recent studies emphasize the multidimensional nature of migration determinants, highlighting the role of economic performance, policy regimes, and global shocks in shaping migration dynamics (Czaika & Reinprecht, 2022). Their results show that individual and country characteristics shape the desire to migrate, whereas actual migration depends on conditions in the destination country, migration restrictions, distance, and existing migration networks.

In parallel with microeconomic approaches, spatial and macro-structural frameworks have become increasingly important in migration research. Gravity models are a key analytical tool in this context, where migration flows are determined by population size, distance, and the socioeconomic characteristics of the origin and destination regions. Recent extensions of the gravity framework incorporate additional explanatory variables such as income levels, unemployment rates, migration networks, and institutional conditions (Backhaus et al., 2015; Cameron & Poot, 2019). More advanced models, including generalized gravity and radiation models, further improve explanatory accuracy by accounting for heterogeneous population structures, spatial constraints, and mobility costs (Park et al., 2018; Alis et al., 2021; Kotsubo & Nakaya, 2021; Caballero Reina et al., 2024).

Recent studies on immigrant entrepreneurship also emphasize the importance of knowledge exchange, social networks, and adaptation mechanisms in shaping migrants' economic integration. For example, Jamaludin et al. (2023), in a qualitative study of immigrant entrepreneurs in Malaysia, show that the distribution of knowledge among immigrant entrepreneurs plays an important role in business development, opportunity recognition, and integration into the host economy.

Another important stream of literature focuses on migration as part of labor market adjustment and urbanization processes. Migration is closely linked to structural changes in employment, wage formation, and sectoral transformation. Urban areas act as

major centers of labor demand, attracting population inflows due to higher wages, better employment opportunities, and improved access to public services. As a result, migration contributes to both regional convergence and divergence, reinforcing spatial inequalities between urban and rural areas.

In the context of Central Asia, migration is strongly shaped by post-Soviet economic transformation, regional disparities, and labor market restructuring. Persistent income differences, uneven development, and strong cross-border labor mobility characterize the region. These structural conditions generate stable migration corridors, particularly toward economically more developed urban and industrial centers. Migration in this context functions both as a mechanism of labor redistribution and as a response to regional inequality.

In studies on Kazakhstan and Central Asia, migration is considered as a result of the interaction of economic, institutional, and spatial factors. Aldashev and Dietz (2012) analyze inter-regional migration in Kazakhstan and show the role of income, unemployment, distance, and population size. Ryazantsev et al. (2017) show that Kazakhstan, together with Russia, is one of the key centers of attraction for labor migrants from Central Asian countries within the Eurasian migration area. Amrin et al. (2020) examine migration processes in Kazakhstan in the context of the formation of the Silk Road Economic Belt and emphasize that international mobility of the population is associated not only with economic opportunities, but also with the geographical location of the country, transport connectivity, and regional integration. Bodaukhan et al. (2020) analyze migration from southern to northern Kazakhstan and show that migration flows are associated with differences in employment, demographic burden, labor availability, and the effectiveness of government resettlement programs. Based on a sociological survey and expert interviews, Bokayev et al. (2021) show that the reasons for emigration from Kazakhstan include not only income levels, but also quality of life, professional opportunities, access to education, the state of social services, and trust in institutions. Thus, existing studies confirm that migration processes in Kazakhstan are multifactorial.

A summary of the key areas of migration research and their relationship to this study is presented in Table 1.

Table 1. Main directions of migration research and their relevance to the present study

Research direction	Authors	Main focus
Classical migration theories	Lee (1966); Harris and Todaro (1970)	Push-pull factors, wage differentials, expected income, and employment opportunities
Human capital and household approaches	Borjas (1994); Chiswick (1999); Taylor (2002); Castles et al. (2014)	Migration as an investment decision and a household strategy for risk diversification
International empirical studies	Mayda (2010); Grogger and Hanson (2011); Ortega and Peri (2013); Docquier et al. (2014); Czaika and Reinprecht (2022)	Income differences, migration policy, demographic factors, migrant networks, destination-country conditions
Spatial and gravity models	Karemera et al. (2000); Clark et al. (2007); Lewer and Van den Berg (2008); Backhaus et al. (2015); Cameron and Poot (2019); Caballero Reina et al. (2024)	Distance, population size, economic size, migration networks, spatial interaction
Employment, infrastructure, and migrant integration	Salmanova (2022); Jamaludin et al. (2023)	Employment conditions, information infrastructure, knowledge exchange, and migrant entrepreneurship
Central Asia and Kazakhstan	Aldashev and Dietz (2012); Ryazantsev et al. (2017); Amrin et al. (2020); Bodaukhan et al. (2020); Bokayev et al. (2021)	Regional disparities, labor migration, migration corridors, causes of emigration, and state policy

Note: compiled by the authors

Summarizing the presented research shows that migration is a multifactorial process shaped by economic, demographic, institutional, and spatial conditions. Classical theories explain migration through differences in wages, expected incomes, and employment opportunities. More recent approaches expand this understanding by focusing on human capital, household strategies, migration networks, and the quality of institutions.

Despite the growing body of literature, several important gaps remain. First, there is limited evidence from time-series econometric analyses that account for non-stationarity and dynamic relationships in migration data. Second, existing studies rarely examine both short-run and long-run relationships simultaneously using cointegration techniques. Third, there is a lack of integrated approaches that combine international comparative analysis with national-level econometric modeling.

Accordingly, this study addresses these gaps by integrating comparative cross-country evidence with time-series econometric analysis for Kazakhstan over the period 2001–2024. The focus is on identifying the role of macroeconomic conditions, particularly real household income, in shaping migration inflows, while also testing for both short-run dynamics and long-run equilibrium relationships.

RESEARCH METHODS

The methodological complexity of analyzing migration processes lies in the high interdependence of economic indicators such as GDP, investment, and household income. The presence of multicollinearity complicates the interpretation of results and reduces the reliability of estimates, necessitating the use of modern econometric methods that account for time-series characteristics, including autocorrelation and heteroscedasticity (Gujarati & Porter, 2009). The methodology of this study is based on a combination of comparative statistical and econometric approaches, which allowed for a comprehensive analysis of migration processes in Kazakhstan. The study distinguishes between two migration indicators. The external migration balance is used for cross-country and regional analyses, enabling the identification of spatial differences and the dynamics of net migration. The number of migrants arriving is used in econometric analysis, as this indicator captures migration inflows and allows us to assess its relationship with the population's real incomes.

At the first stage, a spatio-temporal analysis of external migration balances was conducted at both the national and regional levels for 2000, 2010, 2020, and 2024. This indicator was used to assess net migration dynamics and regional migration

disparities. To assess long-term changes and identify persistent regional imbalances, indicators of migration balance dynamics and relative change were applied. The selection of countries includes Kazakhstan, Central Asian states, the Russian Federation, and developed economies in Europe, Asia, and North America. This made it possible to determine Kazakhstan's place within the system of international migration flows. The World Bank database served as the data source.

To examine the determinants of migration attractiveness, a system of socio-economic and demographic indicators was developed based on classical migration theories, including the push-pull framework, neoclassical migration theory, and human capital theory. The selected variables include indicators of economic development, labor market conditions, population welfare, demographic structure, and social infrastructure. The analysis includes the following variables: gross domestic product (GDP); investment in fixed capital; volume of construction works; employment level; average monthly wage; real household income; share of population with incomes below the subsistence minimum; population size; urbanization level; and number of physicians.

To identify the direction and strength of relationships between migration inflows and socio-economic conditions, Pearson correlation analysis was employed for the period 2003–2024. Correlation coefficients were calculated to assess the degree of association between migrant inflows and indicators of regional socio-economic development.

The Pearson correlation coefficient can be represented by formula (1):

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}} \quad (1)$$

where:

x_i, y_i – observed values of variables X and Y;

$\bar{x}, \bar{y}$ – mean values;

n – sample size;

r_{xy} – correlation coefficient.

In the second stage, an econometric analysis of time series for Kazakhstan for 2001–2024 was conducted. The number of arriving migrants was used as the dependent variable, while macroeconomic indicators, including real household income, employment, investment, urbanization level, and inflation, were considered as explanatory variables.

To avoid spurious regression and ensure the validity of the econometric analysis, the stationarity of the time series was tested using the Augmented Dickey–Fuller (ADF) test. The test results showed that both the number of arriving migrants and real household income are non-stationary in levels. Therefore, the estimated relationships should be interpreted primarily as long-run statistical associations.

In the initial stage, multicollinearity was diagnosed using the correlation matrix and the variance inflation factor (VIF). Due to the high correlation between several variables (above 0.95), redundant predictors were excluded from the model. The final model specification was formed based on the principle of parsimony.

Regression analysis was subsequently applied to quantitatively estimate the impact of socio-economic conditions on migration inflows. The baseline regression model is specified by formula (2):

$$Migration_t = \beta_0 + \beta_1 Income_t + \varepsilon_t \quad (2)$$

where:

$Migration_t$ – number of arriving migrants;

$Income_t$ – average per capita real income of the population;

β_0 – constant term;

β_1 – coefficient reflecting the association between real household income and migration inflows;

ε_t – random error terms.

The stationarity of the variables was tested using the ADF test. The results are presented in Table 2.

Table 2. Results of the ADF test for variables in levels

Variable	Model	t-statistic	p-value	Conclusion
migrants	with constant	1,98082	0,9999 > 0.05	Non-stationary in levels
real income	with constant	-1,36696	0,6001 > 0.05	Non-stationary in levels

Note: compiled by the authors

The ADF test results indicate that both variables are non-stationary in levels. Therefore, regression results based on level values should be interpreted with caution, as non-stationary time series may yield spurious regression results. To address this issue, cointegration analysis and a first-difference model were additionally applied.

Newey–West is used only to correct for standard errors in autocorrelation and heteroscedasticity. However, due to the non-stationarity, it is impossible to assert a causal effect, so the OLS results should be interpreted as a statistical relationship. To further assess the validity of the relationship, ADF tests, cointegration analysis, and a first-difference model were additionally applied.

Several limitations of the study should also be acknowledged. First, the analysis is based on aggregated macroeconomic indicators and does not account for migrants' individual behavioral motivations. Second, institutional, political, and cultural determinants of migration are not directly incorporated into the econometric specification. Third, the relatively small sample size limits the application of more complex multifactor models. Nevertheless, the selected methodological approach provides a robust framework for identifying the long-

term patterns and socio-economic determinants of external migration in Kazakhstan.

RESULTS

An empirical analysis of migration processes in Kazakhstan shows that the country's position in the international migration system and its internal spatial structure are changing simultaneously. The results of the study reveal that migration dynamics are not merely a demographic movement but a complex phenomenon closely linked to socio-economic attractiveness, regional development inequality, and structural changes in the labor market.

At the first stage of the analysis, Kazakhstan's migration balance indicators were compared with those of selected countries. This comparison enabled the determination of the country's relative position in global and regional migration flows. Data for 2018 and 2022 revealed clear differences between the migration trajectories of developed countries and post-Soviet countries. To assess changes in migration flows during the post-pandemic period, the net migration balance between 2018 and 2022 was calculated. This made it possible to evaluate the extent of recovery in international mobility after the COVID-19 restrictions (Figure 1).

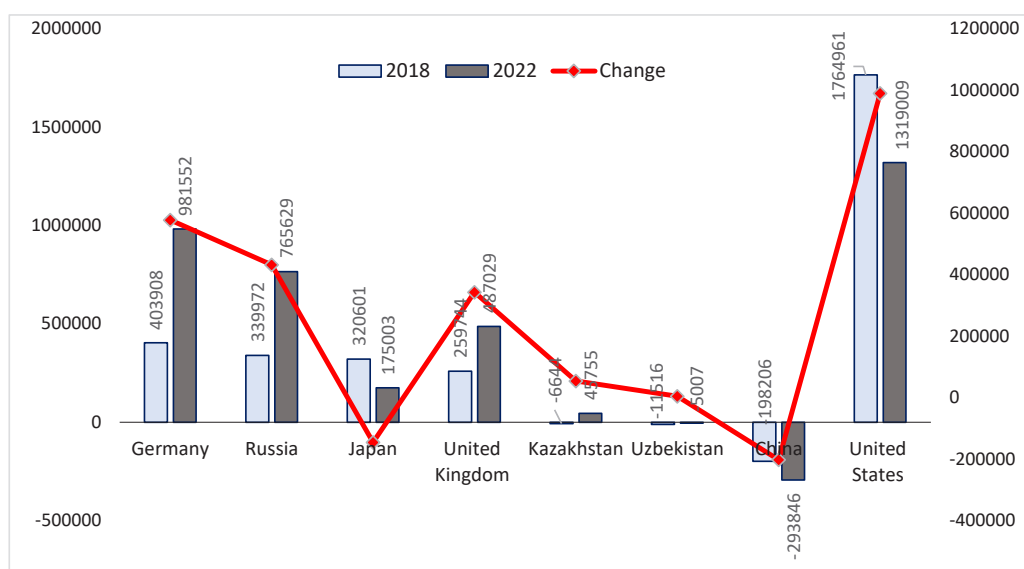


Figure 1. Change in the migration balance in selected countries in 2022 compared to 2018

The results show that migration dynamics in different countries varied during the post-pandemic period. The largest increases in the migration

balance are observed in Germany (+577.6 thousand people), Russia (+425.7 thousand people), and the United Kingdom (+277.3 thousand people). This

indicates their continued role as major centers of attraction for international migrants. At the same time, Japan, China, and the United States are experiencing declines in their migration balances. A particularly noticeable decrease was recorded in the United States (-446.0 thousand people), however, despite this, the absolute value of the migration balance in 2022 remains high. China maintains a negative migration balance, reflecting the predominance of emigration processes.

Positive changes have also been observed in Kazakhstan. If the migration balance was negative

in 2018, then in 2022, a positive indicator was recorded. This situation indicates an increase in the country's attractiveness as a migration destination and a resurgence of international mobility in the post-pandemic period. At the same time, the rate of growth in Kazakhstan remains low compared with developed migration centers, attributable to differences in labor market size and levels of socio-economic development.

To systematize different migration trajectories, Table 3 groups countries according to the main models of migration development.

Table 3. Country typology by migration dynamics in 2018-2022

Migration model	Country	Description
Stable centers of migration attraction	Germany, United Kingdom, Russian Federation	Positive net migration balance and growth in 2022 compared with 2018
Countries with improving migration dynamics	Kazakhstan, Uzbekistan	Improvement in net migration balance, including Kazakhstan's transition from negative to positive values
Countries with a declining positive migration balance	Japan, United States	Positive net migration balance in both years, but a decrease in 2022 compared with 2018
Countries with a persistent negative migration balance	China	Negative net migration balance in both years, with further deterioration in 2022

Note: compiled by the authors

The conducted typology showed that Kazakhstan occupies an intermediate position in the international migration system. On the one hand, the country is not among traditional immigration States; on the other hand, improvements in migration indicators in recent years indicate that its role as a regional migration center is growing. This trend is associated with the revival of economic growth, the expansion of the labor market, and the increase in the country's economic importance in Central Asia.

Therefore, when assessing the dynamics of migration in Kazakhstan, it is important to supplement the international comparison with internal changes at the national and regional levels. This approach allows us to determine not only the country's overall

migration position, but also which territories the migration flows are concentrated in and which regions experience a constant population outflow.

At the next stage of the study, the spatial structure of migration processes within Kazakhstan was analyzed. To assess long-term differences between regions, the dynamics of the external migration balance from 2000 to 2024 were examined. Such an approach makes it possible to determine not only changes in migration flow over time, but also which regions the population is concentrated in and from which territories it is steadily leaving.

Changes in the external migration balance for Kazakhstan's regions during the main periods are presented in Table 4.

Table 4. Balance of external migration by regions of Kazakhstan in 2000, 2010, 2020 and 2024

Region	2000	2010	2020	2024	Growth
Kazakhstan	-108307	15516	-17718	16550	124857
Abay	-	-71	-973	-436	-365
Akmola	-11874	1	-1738	471	12345
Aktobe	-8687	17	-1336	636	9323
Almaty	-6151	2466	-166	4367	10518
Atyrau	-168	1826	-2	677	845
West Kazakhstan	-7078	599	-1005	406	7484

REGIONAL ECONOMY

Zhambyl	-4959	57	-838	-268	4691
Tokens	-	-219	21	65	284
Karaganda	-14827	-882	-3464	-485	14342
Kostanay	-18890	-1051	-2542	549	19439
Kyzylorda	-1629	175	-8	28	1657
Mangystau	1163	6760	2450	3606	2443
Pavlodar	-15924	-403	-2788	370	16294
North Kazakhstan	-6938	-973	-1759	-1692	5246
Turkestan	12286	3696	500	491	-11795
Ulytau	-	-346	-307	-16	330
East Kazakhstan	-10153	302	-2362	-584	9569
Astana c.	-6406	715	-742	2616	9022
Almaty c.	-8072	342	-960	5123	13195
Shymkent c.	-	2505	301	626	-1879

*For newly established regions, including Abay, Ulytau, and Zhetysu, the data should be interpreted with caution due to administrative-territorial changes. Their indicators are not fully comparable to those of regions that existed within stable boundaries throughout the entire period.

Note: compiled by the authors

The data show that migration processes in Kazakhstan are developing unevenly across space. Although the external migration balance in Kazakhstan has improved from -108,307 people in 2000 to +16,550 people in 2024, there remains clear regional polarization. In 2024, the highest positive balances were recorded in Almaty city (+5123 people), Almaty region (+4367 people), Mangystau region (+3606 people), and Astana (+2616 people), indicating the attractiveness of these territories for the labor market, economic activity, and social infrastructure. On the contrary, in North

Kazakhstan (-1692 people), East Kazakhstan (-584 people), Karaganda (-485 people), Abay (-436 people), Zhambyl (-268 people), and Ulytau (-16 people) regions, a negative balance remains, which determines the tendency for the population to shift from peripheral and industrial regions to large ones. agglomeration centers.

Based on the data presented, the regions were grouped according to direction, long-term stability of the migration balance, and the final value for 2024. The results of this classification are presented in Table 5.

Table 5. Typology of regions of Kazakhstan by migration dynamics

Region type	Classification criteria	Regions
Stable centers of migration attraction	Long-term maintenance of a positive balance or formation of a high positive value in 2024	Almaty c., Astana c., Mangystau region
Regions of average migration attraction	In 2024, there was a positive balance, but long-term stability was not fully formed	Almaty, Atyrau, Aktobe, Akmola, West Kazakhstan, Kostanay, Pavlodar regions
Regions with volatile migration dynamics	Changes in the direction of the migration balance at each stage and the absence of a stable trend	Kyzylorda, Turkestan, Zhetysu regions and the Shymkent c.
Regions with constant migration losses	Maintaining a negative migration balance for most of the study period or in 2024	North Kazakhstan, East Kazakhstan, Karaganda, Abay, Ulytau, Zhambyl regions

Note: compiled by the authors

The results show a clear spatial polarization of migration flows in Kazakhstan. The cities of Almaty, Astana, and the Mangystau region stand out as the main centers of population attraction, which is associated with their economic activity, labor market capacity, concentration of social infrastructure, and

resource specialization. Although there is a positive balance in regions of moderate attraction, their long-term stability is not yet fully established, and in regions with volatile dynamics, migration indicators depend on changes in economic conditions and the labor market. In regions experiencing constant

population loss, population outflows increase long-term risks, including weakened human capital, reduced labor resources, and decreased regional competitiveness. Thus, Tables 4 and 5 indicate the formation of a “center-periphery” migration structure in Kazakhstan and the need to strengthen efforts to ensure demographic stability and preserve labor potential in regional policy.

All variables included in the econometric analysis were derived from official statistical data of the Bureau of National Statistics of the Republic of Kazakhstan for 2001-2024. To assess the relationship between variables, a correlation analysis was conducted. The results are shown in Figure 2 as a heatmap.



Figure 2. Correlation links between migration and socio-economic indicators

The heatmap shows a strong relationship between migration indicators and socio-economic factors. The strongest positive correlation is observed between migration and gross domestic product ($r=0.92$), investment ($r=0.91$), construction volume ($r=0.90$), and the actual income of the population ($r=0.89$). This suggests that regions and periods with high levels of economic activity will also have high migration attractiveness. At the same time, the poverty level has a negative relationship with migration ($r=-0.81$), that is, as the well-being of the population decreases, migration indicators also deteriorate. Very high correlation coefficients (0.93–0.99) among the explanatory

variables indicate multicollinearity. In this regard, in the later econometric model, the population's real income was chosen as an integral indicator of migration attractiveness. In general, the results show that migration processes are closely related to the level of economic development and that increasing the population's well-being is one of the most important factors strengthening the country's attractiveness as a destination for migration.

To quantify the relationship between the population's real income and migration, the least squares method (OLS) was used with the Newey-West adjustment. The results of the assessment are presented in Table 6.

Table 6. Results of assessing the relationship between migration and real incomes (OLS, Newey-West)

Variable	Coefficient	SE	t-Statistic	p-Value	95% CI
Real income	37.824	8.806	4.30	< .001	[19.561, 56.086]
Constant	-111,573.960	154,346.370	-0.72	.477	[-431,668.740, 208,520.810]

Note: compiled by the authors

According to the results of the OLS regression with robust Newey-West standard errors, a statistically significant positive relationship between the population's real income and migration indicators was found. The coefficient for the variable "real income" was 37,824 ($p < 0.001$), indicating significance at the 1% level. This means that the growth of real income is accompanied by an increase in the migration rate by an average of 37.8 units. The 95% confidence interval for the coefficient is 19.561–56.086 and does not include

zero, further confirming the stability of the identified relationship. The model constant is statistically insignificant ($p = 0.477$), so its interpretative value is limited. Thus, real income can be considered a significant factor in migration processes. However, the results reflect a statistical association rather than a direct causal relationship.

Cointegration analysis and the first-difference model were also used to test the model's stability. The results are presented in Table 7.

Table 7. Results of checking the stability of the relationship between migration and real incomes

Variable	Specification	t-statistic	p-value	Conclusion
Residuals	Model with constant	-2.393	0.144	No cointegration confirmed

Note: compiled by the authors

Cointegration analysis showed that the long-term model residuals are unstable ($t = -2.393$; $p = 0.144$). Since the p-value exceeds the significance level of 0.05, the null hypothesis of the presence of a single root is not rejected. This indicates the absence of a statistically confirmed cointegration relationship between migration and the population's real income. Although the OLS regression results revealed a statistically significant relationship among the indicators considered, the verification does not confirm the existence of a stable long-term equilibrium relationship between them. Consequently, the impact of real incomes on migration processes is not stable in the long term.

The results suggest that migration processes are determined not only by the population's income level but also by a broader range of socio-economic

factors. These include the state of the labor market, employment levels, urbanization, infrastructure development, the quality of life for the population, and the institutional conditions for regional development. Thus, the revealed relationship between income and migration reflects a short- or medium-term statistical relationship rather than a stable long-term pattern.

To assess short-term dynamics, a first-difference model was used. This approach reduces the effect of a common trend in the levels of variables and allows us to answer whether short-term changes in real incomes affect migration flows. The results of Table 8 show that there is no statistically significant correlation between short-term changes in real incomes and migration flows.

Table 8. First-difference model results

Variable	Coefficient	SE	t-statistic	p-value
Constant	97985.2	56325.9	1.740	0.0966
Δ Real income	-48.3966	50.1414	-0.965	0.3454

Note: compiled by the authors

According to the results of the first differences model, there is no statistically significant relationship between short-term changes in real incomes and migration flows. The coefficient for the variable Δ Real income is negative (-48.397), but its p-value is 0.345, which is significantly greater than the significance level of 0.05. This indicates that short-term fluctuations in real incomes do not have a statistically significant effect on changes in migration.

The model constant has a positive value (97985.2), but it is not statistically significant at the 5% level ($p = 0.097$). In general, the results of the first-difference analysis confirm the conclusions of the cointegration test and indicate the absence of a stable long-term or short-term relationship between migration and the population's real incomes. This suggests that migration processes are largely determined by socio-economic factors, including the labor market, urbanization levels, infrastructure

development, and regional differences in population quality of life.

The empirical analysis showed that migration processes in Kazakhstan are multi-level and multifactorial. Although Kazakhstan is one of the countries where the migration balance improved in the post-pandemic period, this change does not mean that a stable immigration model is fully formed. At the regional level, migration flows are concentrated in large agglomerations and economically active territories, and the trend of population outflow continues in the northern, eastern, and several industrial regions. Econometric estimates revealed a positive and statistically significant relationship between real gains and migration attractiveness; however, cointegration and first-difference models showed that this relationship was not fully consistent with a long-term, permanent, or short-term direct effect. Therefore, it is not enough to explain the dynamics of migration in Kazakhstan solely by income levels; it should be considered a complex socio-economic process shaped by the structure of the labor market, urbanization, the quality of infrastructure, regional inequality, and institutional conditions.

DISCUSSION

The study confirmed the complex and multi-level nature of migration processes in Kazakhstan. An international comparative analysis showed that migration flows are closely related to countries' levels of economic development and labor market opportunities. A stable positive migration balance in Germany, Great Britain, and other developed states confirms the basic principles of the neoclassical Migration Theory, according to which people seek to migrate to territories that offer higher incomes and a higher quality of life (Lee, 1966). At the same time, the results obtained are also consistent with the concept of migration as an investment in human capital.

However, the study's results showed that under Kazakhstan's conditions, economic factors cannot fully explain migration dynamics. Although econometric estimates revealed a positive statistical relationship between actual gains and migration, cointegration analysis did not confirm a long-term stable relationship, and the first difference model showed that the short-term effect was not

significant. This suggests that migration decisions are influenced not only by personal income levels but also by household risk management strategies, social ties, and institutional settings. Such a result is consistent with the principles of the new theory of Migration Economics, which treats migration as a collective household-level decision (Hatton & Williamson, 2005).

In addition, the results obtained confirm the importance of institutional and social factors in modern migration literature. As Ortega and Peri (2013) and Czaika and Reinprecht (2022) show, migration flows are significantly influenced by factors such as access to the labor market, efficiency of public institutions, housing conditions, social infrastructure and quality of life. In Kazakhstan, the formation of migration attractiveness, along with the level of income, depends on employment opportunities, the quality of the education system, the development of the housing market and the state of regional infrastructure.

The regional analysis showed that the concentration of population in the cities of Almaty and Astana, as well as in the Mangystau region, is increasing. These regions are distinguished by the concentration of high-performance jobs, investment resources, financial institutions, universities and innovative infrastructure. Such a trend confirms the basic principles of the theory of new economic geography, according to which economic activity and labor resources accumulate in centers with high agglomeration advantages (Aldashev & Dietz 2012). At the same time, the results also align with the theory of cumulative causality, as the concentration of population and capital further strengthens the region's attractiveness and generates new migration flows (Harris & Todaro, 1970).

On the contrary, constant migration losses in the northern and eastern regions indicate that regional development inequality remains. This phenomenon leads not only to a reduction in the population, but also to a weakening of human capital, a decrease in labor resources, and a decrease in the competitiveness of the regional economy. Similar trends are observed in many transition economies and are explained by increased spatial polarization (Alis et al., 2021). From this perspective, migration flows in Kazakhstan are an important indicator of socio-economic differences between regions.

Another important result of the study is

methodological in nature. Although correlation analysis has shown a strong correlation between migration and macroeconomic indicators, subsequent cointegration and first-difference models have shown that a significant part of this relationship can be explained by general long-term trends. This highlights the importance of studying stationarity and accounting for the problem of false regression in time-series migration studies (Gujarati & Porter, 2009).

From a practical point of view, the results show that the policy of increasing the attractiveness of migration should not be aimed solely at increasing the population's income. To reduce migration imbalances between regions, it is necessary to diversify the labor market, create quality jobs, increase housing affordability, improve education and health infrastructure, and reduce disparities in regional development policy. Especially in the northern and eastern regions, where there is a constant population outflow, measures aimed at preserving human capital are becoming increasingly important.

In general, the study found that migration processes in Kazakhstan arise from the interaction of economic, demographic, institutional, and spatial factors. Therefore, migration should be considered not only a demographic movement but also an important indicator of regional competitiveness, quality of life, and balanced territorial development.

CONCLUSION

The study enabled a comprehensive assessment of migration processes in Kazakhstan at the international, regional, and national levels. The results of the analysis showed that the dynamics of migration are closely related not only to economic factors, but also to the peculiarities of Spatial Development, regional inequality, and institutional conditions. An international comparative analysis showed that Kazakhstan has improved its migration position in recent years and achieved a positive migration balance in the post-pandemic period. However, the country's attractiveness as a destination for migration remains low compared to traditional immigration centers. This is explained by differences in indicators of the size of the labor market, the level of economic development and the quality of life. Regional analysis revealed

that migration flows are unevenly distributed throughout Kazakhstan. The cities of Almaty and Astana, as well as the Mangystau region, serve as the main centers of population attraction, while the northern and eastern regions experience constant population losses. This situation indicates an increase in spatial polarization in the country in the "center-periphery" pattern. The concentration of the population and human capital in economically active centers, although accelerating agglomeration development, increases the risk of weakening the demographic and labor potential of peripheral regions. The results of the econometric assessment showed a positive statistical relationship between the population's real income and migration. At the same time, cointegration analysis showed a long-term stable relationship, and the first model of differences did not confirm the short-term effect. This proves that it is not enough to explain migration processes only by the level of income, and their formation is influenced by the state of the labor market, the level of urbanization, the quality of social infrastructure, housing affordability and institutional factors.

The scientific novelty of the study lies in the empirical justification of the dependence of migration attractiveness in Kazakhstan on income levels, regional development inequality, and agglomeration effects. The results obtained indicate the need to consider migration not only as a demographic phenomenon, but also as an important indicator of regional competitiveness, quality of life and balance of territorial development.

From a practical point of view, in order to reduce migration imbalances, along with measures to increase incomes of the population, it is necessary to strengthen the policy in the direction of developing regional labor markets, creating quality jobs, improving social and engineering infrastructure, ensuring housing affordability and stimulating the preservation of human capital in the regions. Improving the effectiveness of regional development policy is of strategic importance, especially in regions experiencing a constant population outflow.

There are also certain limitations to the study. The analysis relied mainly on aggregated macroeconomic indicators and did not include migration decisions at the individual level, institutional indicators, and the impact of migration networks. The introduction

of regional panel data, institutional indicators and qualitative characteristics of the labor market in future studies will allow for a deeper interpretation of migration determinants.

Thus, migration processes in Kazakhstan are the result of the interaction of economic, demographic, institutional and spatial factors. Therefore, effective migration management should be considered as an important area of regional policy, human capital development, and ensuring territorial balance.

AUTHOR CONTRIBUTIONS

Conceptualization and theory: SK and SS; research design: SK, IS, ST and SS; data collection: IS and SS; analysis and interpretation: SK, ST and SS; writing draft preparation: ST and SS; supervision: SK and SS; correction of article: SK, IS and SS; proofread and final approval of article: SK, IS, ST and SS. All authors have read and agreed to the published version of the manuscript.

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