Статистика, учет и аудит, 3(102)2026. стр. 210-221
DOI: https://www.doi.org/10.51579/1563-2415.2026.-3.16

Finance
SRSTI 06.73.55
UDC 336.77

PORTFOLIO STRUCTURE AND LAGGED RELATIONSHIP BETWEEN MORTGAGE LENDING AND HOUSING PROVISION IN KAZAKHSTAN

J.S. Mukhamedov[1*], T.S. Sokira[1], Zh. Kusmoldayeva[1], Y.K. Barlykov[2]

[1]Al-Farabi Kazakh National University, Almaty, Kazakhstan
[2]Narxoz University, Almaty, Kazakhstan

**Corresponding author e-mail: javokhir.mukhamedov@gmail.com*

Abstract. *Mortgage lending in Kazakhstan has expanded unevenly over the past decade, while changes in housing provision have followed a smoother path. The purpose of this study is to examine the phase dynamics of mortgage lending in Kazakhstan in 2015–2024 and to assess whether changes in mortgage lending growth are associated with subsequent changes in housing provision. The analysis combines a portfolio review of six mortgage-financing projects with phase-based analysis of annual mortgage lending, housing provision, and interest-rate data. Portfolio structure is described using the Herfindahl–Hirschman Index (HHI), Shannon entropy, and the coefficient of variation, while the lag hypothesis is examined with Pearson correlations for one- and two-year shifts. For the two-year specification, the correlation is r = 0.656 (p = 0.077; 95% CI: −0.091 to 0.930; n = 8). The positive association remains positive in leave-one-out checks, although its magnitude varies across observations. These results indicate an empirical association rather than a causal effect and should be tested on a longer or more disaggregated dataset.*

Keywords: *mortgage lending, housing provision, portfolio structure, phase-based analysis, Kazakhstan.*

Main provisions. The analysis distinguishes three periods in Kazakhstan's mortgage lending dynamics over 2015–2024 and compares average growth in mortgage lending, housing provision, and interest rates. Six mortgage-financing projects supported by international financial institutions are examined in terms of portfolio concentration, variation in project duration, and the distribution of projects across life-cycle stages. With a two-year lag, mortgage lending growth is positively correlated with housing provision growth (r = 0.656, p = 0.077), while the one-year correlation is weak (r = 0.181, p = 0.641). Since the lag analysis is based on only eight paired annual observations, this result should be interpreted as an association and verified using a larger or more disaggregated dataset.

Introduction. Ensuring housing affordability remains an important socioeconomic challenge in transition economies. In Kazakhstan, rapid urbanization, population concentration in major agglomerations, and structural constraints on housing supply are putting additional pressure on the housing market [1]. Despite government housing programs and the expansion of mortgage lending, the relationship between households' financial capacity and their ability to afford housing remains an important issue.

Cite this article as: Mukhamedov J.S., Sokira T.S., Kusmoldayeva Zh., Barlykov Y.K. Portfolio structure and lagged relationship between mortgage lending and housing provision in Kazakhstan. *Statistics, accounting and audit.* 2026, *3*(102), 210-221. DOI: https://www.doi.org/10.51579/1563-2415.2026.-3.16

International organizations emphasize that the development of mortgage financing is an important tool for reducing the housing shortage in developing countries [2, 3]. At the same time, the effectiveness of expanding mortgage lending depends on the institutional environment, the stability of the financial sector, and the construction market's ability to convert credit resources into actual housing [4].

In Kazakhstan, the mortgage lending market has experienced periods of rapid growth, accompanied by changes in monetary policy and structural reforms. However, it remains unclear whether faster mortgage lending growth is associated with sustained improvements in housing provision and, if so, over what time lag.

The limited integration of financial and housing indicators in existing studies calls for a more comprehensive analysis of mortgage lending dynamics and their relationship with housing provision. The purpose of this study is to describe the portfolio structure of mortgage-financing projects in Kazakhstan and empirically assess the lagged relationship between mortgage lending growth and housing provision growth.

Literature review. In Kazakhstan, Akhmedyarova [5] demonstrates the sensitivity of the mortgage market to monetary shocks, while An, Becker, and Cheng [6] examine the relationship between housing prices and macroeconomic conditions. Anessova et al. [7] and Mukayev et al. [8] associate the expansion of mortgage lending with improvements in housing affordability indicators. Mukhamedov, Sokira, and Kuldasheva [9] examine a project-based approach to managing non-performing mortgage loans, highlighting the importance of project-oriented management in addressing risks within mortgage portfolios. However, these studies focus on specific financial and housing-market aspects, while the timing of the relationship between mortgage lending and housing provision remains less explored.

Institutional constraints in Kazakhstan's housing sector are discussed in detail in [1], which highlights structural imbalances in urbanization, limited housing provision, and institutional barriers to the development of the rental market. In the working paper [10], Seitz also points to the territorial concentration of demand and a mismatch between construction rates and the needs of rapidly growing cities. These findings suggest the need to examine how financial resources are translated into changes in housing provision.

International literature emphasizes the key role of housing provision. Baum-Snow and Duranton [11] link housing affordability to construction elasticity and institutional constraints, while Bratu, Harjunen, and Saarimaa [12] show that new construction affects the housing market as a whole through redistribution mechanisms. However, these studies do not directly examine mortgage financing as a source of investment momentum.

Monetary policy and regulatory dynamics are examined in [13], which demonstrates the impact of loan-to-value (LTV) restrictions on credit cycles. Study [14] shows that mortgage choice is influenced by inflation expectations, while [15] identifies behavioral effects in refinancing decisions. Study [16] demonstrates a link between housing market conditions and macroeconomic instability.

Institutional aspects of the financial sector are examined in [17], which emphasizes the role of digital transformation in banking, and in [18], which focuses on the development of credit risk assessment methods. Study [19] emphasizes the need for an institutionally oriented approach to sustainable mortgage lending.

Research Gap and Hypotheses. Existing studies on mortgage lending in Kazakhstan have primarily focused on macroeconomic factors, housing prices, housing affordability indicators, or regulatory conditions. Less attention has been paid to the timing of the relationship between changes in mortgage lending and housing provision. Therefore, this

study focuses on the observed relationship between mortgage lending growth and subsequent changes in housing provision rather than attempting to establish a causal transmission mechanism.

The empirical question is whether annual growth in mortgage lending is associated with subsequent growth in housing provision. Two lag lengths are examined because the conversion of financial resources into completed housing is unlikely to occur within a single calendar year. The first lag provides a short-term comparison, while the second captures a longer implementation interval.

H1: Growth in housing provision is positively correlated with earlier growth in mortgage lending in Kazakhstan.

The hypothesis is tested using Pearson correlation coefficients for one- and two-year lags. The analysis is descriptive and does not establish causality.

Materials and methods. This study combines two complementary components: a descriptive review of six mortgage-financing projects implemented with the support of international financial institutions and a phase-based analysis of annual mortgage-market indicators for Kazakhstan over 2015–2024. The portfolio component describes the distribution and concentration of financing resources. The phase-based component compares periods with different rates of mortgage lending growth and examines the timing of changes in housing provision.

The empirical base consists of project information from international financial institutions and official national statistics on mortgage lending, interest rates, and housing provision. Mortgage lending is represented by the annual mortgage loan portfolio and its year-on-year growth rate. Housing provision is measured in square metres per capita, with its annual growth rate calculated from the corresponding annual levels. Mortgage interest rates are expressed as percentages. The 2014 observations are included as preceding-year values required to calculate the initial growth rates for 2015.

The annual indicators used in the analysis are presented in Table 1.

Table 1 – Annual macroeconomic indicators used in the analysis, Kazakhstan, 2014–2024

Year	Mortgage loan portfolio, bln KZT	Mortgage lending growth, %	Housing provision, m²/person	Housing provision growth, %	Mortgage interest rate, %
2014	861.00	–	21.0	–	10.30
2015	900.78	4.62	21.0	0.00	9.43
2016	983.35	9.17	21.4	1.90	9.28
2017	1,096.55	11.51	21.6	0.93	8.61
2018	1,303.33	18.86	21.9	1.39	8.01
2019	1,767.15	35.59	22.2	1.37	7.60
2020	2,373.22	34.30	22.6	1.80	7.50
2021	3,270.34	37.80	23.2	2.65	8.57
2022	4,637.22	41.80	23.4	0.86	8.66
2023	5,297.33	14.24	23.9	2.14	9.10
2024	6,063.76	14.47	24.5	2.51	9.30

Notes: 1) According to the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, the National Bank of the Republic of Kazakhstan; 2) The authors' calculations are based on official national statistics.

The annual growth rate is calculated as (Xt /Xt-1 − 1) ×100. For example, mortgage lending growth in 2015 is calculated as (900.78 / 861.00 − 1) ×100 = 4.62%. Similarly, housing provision growth in 2015 is calculated as (21.0 / 21.0 − 1) ×100 = 0.00%. Thus, the observational data for 2014 serve as the base year for the first calculation of growth rates.

The empirical portfolio consists of six mortgage-financing projects supported by international financial institutions. Their main characteristics are presented in Table 2.

Table 2 – Characteristics of mortgage-financing projects included in the Kazakhstan portfolio

Project	IFI	Financing, USD mln	Start year	Completion year	Duration, years	Life-cycle stage
Promoting Inclusive and Green Housing Finance Project	ADB	173.59	2024	2026	2	Initiating
Promoting Gender Equality in Housing Finance Project	ADB	100.00	2020	2024	4	Closing
Kazkommertsbank Syndicated Loan	EBRD	100.00	2007	2012	5	Closing
Bank Center Credit Mortgage Finance Facility	EBRD	10.00	2004	2009	5	Closing
BTA IPOTEKA – Mortgage Loan II	EBRD	10.00	2004	2009	5	Closing
Mortgage Loan: BTA IPOTEKA	EBRD	5.00	2002	2009	7	Closing
Note: Authors' compilation based on the Asian Development Bank project database and the European Bank for Reconstruction and Development project database.						

Three descriptive indicators are used for the project portfolio. The coefficient of variation (CV) describes dispersion in project implementation periods relative to their mean. The Herfindahl–Hirschman Index (HHI) describes the concentration of financing across projects. Shannon entropy describes how evenly projects are distributed across the specified life-cycle stages. These indicators characterize portfolio structure; they are not treated as direct measures of management quality.

Three quantitative indicators are used to describe the structure of the project portfolio. The coefficient of variation is used to assess the stability of conditions:

$$CV = \frac{\sigma}{\mu} \quad (1)$$

where σ is the standard deviation of project duration and μ is its arithmetic mean. A higher CV indicates greater relative dispersion in project duration.

The Herfindahl–Hirschman Index is calculated as the sum of squared project funding shares:

$$HHI = \sum_{i=1}^{n} s_i^2 \quad (2)$$

where s_i is the share of project *i* in total portfolio funding. Higher HHI values indicate a more concentrated distribution of financing. No qualitative label such as "high" or "manageable" is assigned solely from the observed value.

The distribution of projects across life-cycle stages is described with Shannon entropy:

$$\text{Entropy} = -\sum_{i=1}^{k} p_i \ln(p_i) \tag{3}$$

where p_i the share of projects in life-cycle stage i and k is the number of stages. The entropy used in the analysis is the unnormalized Shannon entropy, with a theoretical maximum of $ln(k)$. Accordingly, the observed value is not interpreted using universal "low", "moderate", or "high" thresholds.

The phase component uses annual growth rates to describe changes in the mortgage portfolio and housing provision. The mortgage lending growth rate is calculated from the current and preceding annual portfolio values:

$$gt = \left(\frac{X_t}{X_{t-1}}\right) - 1 \times 100\% \tag{4}$$

where X_t is the mortgage loan portfolio in year t and X_{t-1} is the corresponding value in the preceding year. The annual growth rate of housing provision is calculated using the same expression.

The annual change in the mortgage interest rate is expressed in percentage points:

$$\Delta r_t = r_t - r_{t-1} \tag{5}$$

For descriptive comparison, 2015–2024 is divided into three periods according to the observed trajectory of mortgage lending growth: gradual expansion (2015–2018), accelerated expansion (2019–2022), and structural adaptation (2023–2024). The division is descriptive and is not interpreted as a direct measure of institutional maturity.

The lag test compares mortgage lending growth in year t with housing provision growth in year *t+1* and *t+2*. Pearson's correlation coefficient is calculated for each specification. The two-year specification contains eight paired observations (2015–2022 mortgage growth matched with 2017–2024 housing provision growth). The two-year lag was not selected from a multivariate optimization procedure; it was compared directly with the one-year specification to assess whether the association changes with the assumed implementation interval.

The study has several limitations. The lag analysis uses only eight annual paired observations, and the national aggregates do not capture regional differences or project-specific completion dates. For this reason, no multivariable regression model is estimated. Confidence intervals and leave-one-out checks are reported to show the uncertainty associated with the correlation estimate. A longer annual series or quarterly and regional observations would allow a more demanding test of the lag relationship.

Results. The portfolio consists of six mortgage-financing projects supported by international financial institutions, with total reported financing of US$398.6 million. The calculated indicators are used only to describe the portfolio's structural characteristics: *HHI* = 0.32, *Shannon entropy* = 0.45, *average project duration* = 4.67 years, and *CV* = 0.32.

The calculated portfolio indicators are presented in Table 3.

Table 3 – Portfolio Structure Indicators of Mortgage Projects in Kazakhstan

Indicator	Value
Number of projects	6
Total financing (mln USD)	398.6
Distribution by financing institution (USD mln; share, %)	
Asian Development Bank	273.59 (68.7%)
European Bank for Reconstruction and Development	125 (31.3%)
Structural concentration	
Herfindahl–Hirschman Index (project-level)	0.32
Entropy (life-cycle stage distribution)	0.45
Average project duration (years)	4.67
Coefficient of variation (project duration)	0.32
Notes: 1) Authors' compilation based on the Asian Development Bank project database and the European Bank for Reconstruction and Development project database; 2) HHI, Shannon entropy and the coefficient of variation are calculated by the authors.	

The HHI value of 0.32 indicates that project financing is not evenly distributed across the six projects. The entropy value of 0.45 is reported on the unnormalized Shannon scale and therefore should be interpreted relative to the number of life-cycle stages rather than against a universal threshold. The CV of 0.32 indicates the relative dispersion of project durations. These statistics describe the portfolio structure and do not, by themselves, demonstrate the quality or effectiveness of project management.

The annual series shows a marked difference between mortgage lending growth and housing provision growth. Mortgage lending accelerated after 2018, reaching 34.3–41.8% in 2019–2022, before slowing to 14.2–14.5% in 2023–2024. Housing provision growth remained within a substantially narrower range, from 0.0% to 2.7%. The divergence between the two series motivates the lag analysis rather than a direct comparison of their contemporaneous levels.

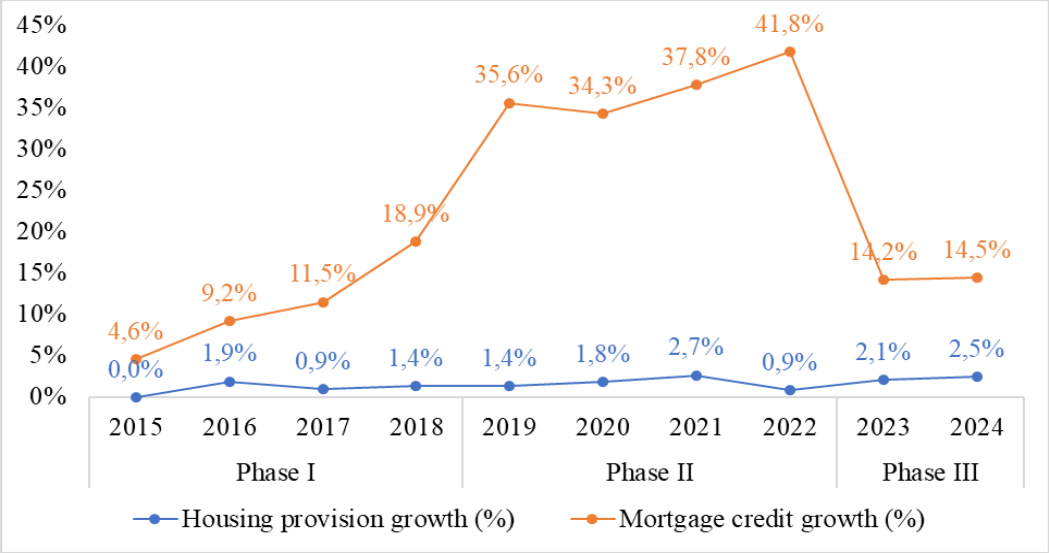


Figure 1 – Annual Growth Rates of Mortgage Lending and Housing Provision by Descriptive Phase

Note: Authors' calculations based on the data in Table 1

The dynamics of mortgage lending and housing provision growth rates in 2015–2024 show a pronounced cyclicality (Figure 1). After 2018, there was a sharp acceleration in mortgage lending growth, which reached 34–42% in 2019–2022, followed by a slowdown to 14–15% in 2023–2024. The growth in housing provision is characterized by a smoother trajectory and a smaller amplitude of fluctuations.

The annual series is consistent with the possibility of a delayed relationship: the strongest mortgage-lending growth occurs before the higher housing-provision growth observed in later years. This visual pattern is treated as a reason for testing lags, not as evidence of a transmission mechanism.

Across the three descriptive periods, average mortgage lending growth was 11.0% in 2015–2018, 37.4% in 2019–2022, and 14.4% in 2023–2024. Average housing provision growth was 1.1%, 1.7%, and 2.3%, respectively. The corresponding average interest rates were 8.8%, 8.1%, and 9.2%. These period averages show that housing provision continued to increase when mortgage lending growth slowed, which is consistent with a lagged interpretation but does not establish causality.

Aggregating the indicators across the three descriptive phases shows the same pattern (Figure 2). In Phase I (2015–2018), average mortgage lending growth was 11.0%, while housing provision growth averaged 1.1% and the average mortgage interest rate was 8.8%. In Phase II (2019–2022), mortgage lending growth increased to 37.4%, while housing provision growth averaged 1.7% and the average interest rate was 8.1%. In Phase III (2023–2024), mortgage lending growth slowed to 14.4%, while housing provision growth reached 2.3% and the average interest rate increased to 9.2%.

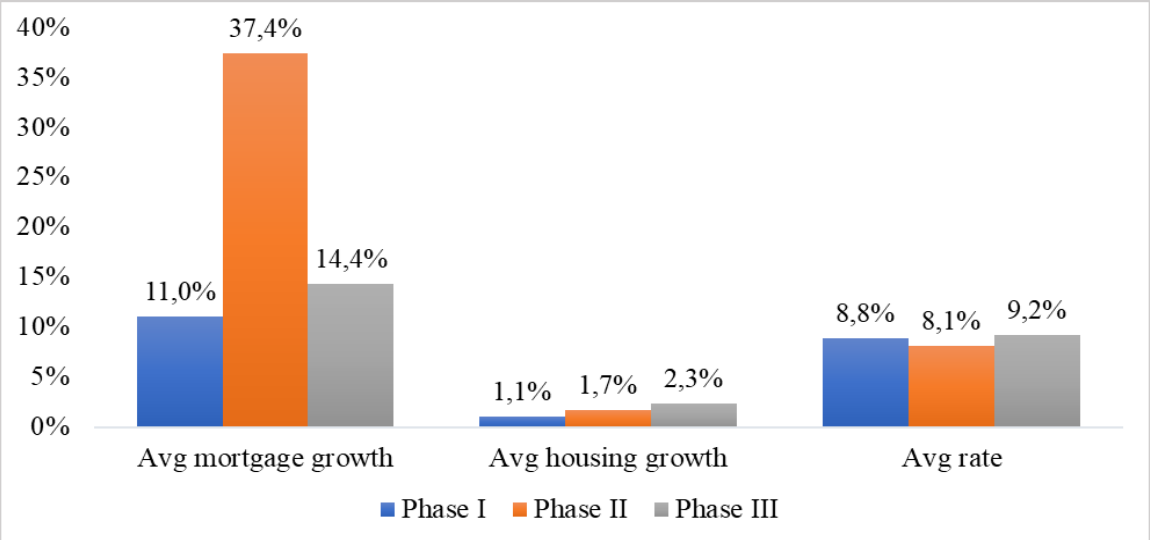


Figure 2 – Average Financial Indicators by Descriptive Phase

Note: Authors' calculations based on the data in Table 1

To test H1, Pearson correlations were calculated for one- and two-year lags. The one-year specification gives $r = 0.181$ ($p = 0.641$; $n = 9$), indicating little linear association in this specification. The two-year specification gives $r = 0.656$ ($p = 0.077$; $n = 8$), with a 95% confidence interval from -0.091 to 0.930. Thus, the two-year coefficient is positive and

reaches the 10% significance level, but the confidence interval is wide and includes zero. In leave-one-out calculations, the correlation coefficient remains positive, ranging from 0.538 to 0.935, showing that its sign is not reversed by removal of a single observation. The variation in magnitude nevertheless confirms the sensitivity of the estimate to the small sample.

Discussion. The phase-based analysis identifies three distinct periods in the annual mortgage lending series: gradual expansion in 2015–2018, accelerated expansion in 2019–2022, and structural adjustment in 2023–2024. These periods are defined by the observed dynamics of mortgage lending growth, while interest rates and housing provision provide additional descriptive context.

The second period records the strongest growth in mortgage lending, whereas housing provision changes more gradually. In the final period, mortgage lending growth declines to 14.2–14.5%, while housing provision growth reaches 2.1–2.5%. This sequence is consistent with a possible delayed response; however, housing provision may also be influenced by other factors, including construction capacity, household income, housing prices, government programmes, and regional supply conditions. The available dataset does not allow these factors to be isolated.

Portfolio indicators provide additional structural information for the phase analysis. The Herfindahl–Hirschman Index (HHI) measures the concentration of project financing, entropy describes the distribution of projects across life-cycle stages, and the coefficient of variation (CV) measures dispersion in project duration. Taken together, these indicators show that the six-project portfolio has measurable concentration and variation in implementation periods. They should not be used to infer that the portfolio is “manageable” or that its management is effective without additional performance indicators.

Conclusion. This study examined the phase dynamics of mortgage lending in Kazakhstan and the structure of a six-project mortgage-financing portfolio. Three descriptive periods were identified for 2015–2024 based on the observed trajectory of mortgage lending growth. Portfolio analysis yielded *HHI* = 0.32, *Shannon entropy* = 0.45, and *CV* = 0.32; these indicators describe financing concentration, stage distribution, and variation in project duration rather than institutional maturity or management quality.

The lag analysis indicates a positive association between mortgage lending growth and housing provision growth at a two-year lag ($r = 0.656$, $p = 0.077$; 95% *CI*: -0.091 to 0.930; $n = 8$). The one-year association is weak ($r = 0.181$, $p = 0.641$; $n = 9$). The positive sign of the two-year coefficient is preserved in leave-one-out checks, although the coefficient varies materially across specifications.

The results therefore support H1 only in the sense of an observed positive correlation at the two-year lag. They do not establish a causal relationship or demonstrate a specific mechanism through which mortgage lending affects housing outcomes. The findings should be reassessed using a longer time series and, where possible, quarterly or regional data incorporating additional measures of housing-market conditions.

The main limitation is the small number of annual observations available for the lag analysis and the use of national aggregates. Future research could extend the analysis to regional data, project-level completion dates, housing prices, household income, mortgage-payment burden, and housing construction volumes. Such data would allow the relationship between mortgage financing and housing provision to be examined with greater statistical precision.

Literature cited

1. Seitz W. Urbanization in Kazakhstan: Desirable cities, unaffordable housing, and the missing rental market // International Journal of Urban Sciences. – 2021. – Vol. 25, Suppl. 1. – P. 135–166. – DOI: 10.1080/12265934.2019.1709534.
2. Lee H. S., Singh A. Adequate and Affordable Housing: Enhancing ADB's Support to Developing Member Countries. – Asian Development Bank. – 2022. – 78 p. – DOI: 10.22617/WPS220353-2.
3. United Nations Economic Commission for Europe. Challenges and priorities for improving housing affordability in the UNECE region. – 2025. – ECE/HBP/225. [Electronic resource]. – URL: https://unece.org/housing-and-land-management/publications/challenges-and-priorities-improving-housing-affordability (accessed: 30.01.2026).
4. International Finance Corporation. Housing finance: Strategic interventions to expand access and address financing gaps in emerging markets. – World Bank Group. – 2024. [Electronic resource]. – URL: https://www.ifc.org/content/dam/ifc/doclink/latest/housing-finance-factsheet-ifc-financial-institutions-group.pdf (accessed: 30.01.2026).
5. Akhmedyarova A. Housing market dynamics in Kazakhstan: An estimated DSGE model // International Real Estate Review. – 2023. – Vol. 26, No. 3. – P. 421–464. – DOI:10.53383/100369.
6. An G., Becker C., Cheng E. Housing price appreciation and economic integration in a transition economy: Evidence from Kazakhstan // Journal of Housing Economics. – 2021. – Vol. 52. – Art.101765. – DOI: 10.1016/j.jhe.2021.101765.
7. Anessova A.G., Adambekova A.A., Abdullaeva B.A. The impact of mortgage loans on housing affordability in Kazakhstan // Economy: Strategy and Practice. – 2022. – Vol. 17, No. 1. – P. 185–198. – DOI: 10.51176/1997-9967-2022-1-185-198.
8. Mukayev D., Shalbolova U., Tanaś J. Housing affordability analysis in Kazakhstan based on D-HAQ model // Journal of International Studies. – 2022. – Vol. 15, No. 4. – P. 28–42. – DOI: 10.14254/2071-8330.2022/15-4/2.
9. Mukhamedov J.S., Sokira T.S., Kuldasheva Z. A Project-Based Approach to Managing Non-Performing Mortgage Loans: Evidence from Europe and Asia // Economy: Strategy and Practice. – 2026. – Vol. 21, No. 1. – P. 65–78. – DOI: 10.51176/1997-9967-2026-1-65-78.
10. Seitz W. Urbanization in Kazakhstan: Desirable cities, unaffordable housing, and the missing rental market. – Washington, DC: World Bank, 2018. – (Policy Research Working Paper; No. 8530). – [Electronic resource]. – URL: https://documents1.worldbank.org/curated/en/956811531481933385/pdf/WPS8530.pdf (accessed: 30.01.2026).
11. Baum-Snow N., Duranton G. Housing supply and housing affordability // Handbook of Regional and Urban Economics. – 2025. – Vol. 6. – P. 353–461. – DOI: 10.1016/bs.hesreg.2025.05.003.
12. Bratu C., Harjunen O., Saarimaa T. JUE Insight: City-wide effects of new housing supply: Evidence from moving chains // Journal of Urban Economics. – 2023. – Vol. 133. – Art. 103528. – DOI: 10.1016/j.jue.2022.103528.
13. Forster R., Sun X. Taming the housing crisis: An LTV macroprudential policy // Economic Modelling. – 2022. – Vol. 108. – 105761. – DOI: 10.1016/j.econmod.2022.105761.
14. Cenzon J., Szabó B.E. Mortgage choice and inflation experiences in the Eurozone // Journal of Monetary Economics. – 2024. – Vol. 147, Supplement. – Art. 103611. – DOI: 10.1016/j.jmoneco.2024.103611.
15. McCartney W.B., Shah A.M. Household mortgage refinancing decisions are neighbor influenced, especially along racial lines // Journal of Urban Economics. – 2022. – Vol. 128. – Art.103409. – DOI: 10.1016/j.jue.2021.103409.
16. Balcılar M., Usman O., Yülek M., Ağan B., Erdal B. House price connectedness and consumer sentiment in an era of destabilizing macroeconomic conditions: Empirical evidence from Türkiye // Borsa Istanbul Review. – 2024. – Vol. 24, No. 1. – P. 14–34. – DOI: 10.1016/j.bir.2023.08.006.
17. Rodrigues L.F., Oliveira A., Rodrigues H. Technology management has a significant impact on digital transformation in the banking sector // International Review of Economics & Finance. – 2023. – Vol. 88. – P. 1375–1388. – DOI: 10.1016/j.iref.2023.07.040.
18. Crosato L., Domenech J., Liberati C. Websites' data: A new asset for enhancing credit risk modeling // Annals of Operations Research. – 2024. – Vol. 342, No. 3. – P. 1671–1686. – DOI: 10.1007/s10479-023-05306-5.
19. Mukhamedov J., Sokira T., Kuldasheva Z. Sustainable development of mortgage lending: Economic challenges and prospects // Journal of Economic Research & Business Administration. – 2025. – Vol. 152, No. 2. – P. 68–79. – DOI: 10.26577/be202515225.

References

1. Seitz W. Urbanization in Kazakhstan: Desirable cities, unaffordable housing, and the missing rental market. *International Journal of Urban Sciences*, 2021, *25*(suppl 1), pp. 135-166. DOI: 10.1080/12265934.2019.1709534.
2. Lee H. S., Singh A. Adequate and Affordable Housing: Enhancing ADB's Support to Developing Member Countries. Asian Development Bank, 2022, 78 p. DOI: 10.22617/WPS220353-2.
3. United Nations Economic Commission for Europe. Challenges and priorities for improving housing affordability in the UNECE region, 2025. ECE/HBP/225. https://unece.org/housing-and-land-management/publications/challenges-and-priorities-improving-housing-affordability (accessed: 30.01.2026).
4. International Finance Corporation. Housing finance: Strategic interventions to expand access and address financing gaps in emerging markets. World Bank Group, 2024. URL: https://www.ifc.org/content/dam/ifc/doclink/latest/housing-finance-factsheet-ifc-financial-institutions-group.pdf (accessed: 30.01.2026).
5. Akhmedyarova A. Housing market dynamics in Kazakhstan: An estimated DSGE model. *International Real Estate Review*, 2023, 26(3), pp. 421-464. DOI: 10.53383/100369.
6. An G., Becker C., Cheng E. Housing price appreciation and economic integration in a transition economy: Evidence from Kazakhstan. *Journal of Housing Economics*, 2021, 52, 101765. DOI: 10.1016/j.jhe.2021.101765
7. Anessova A. G., Adambekova A. A., Abdullaeva B. A. The impact of mortgage loans on housing affordability in Kazakhstan. *Economy: Strategy and Practice*, 2022, 17(1), pp. 185-198. DOI: 10.51176/1997-9967-2022-1-185-198.
8. Mukayev D., Shalbolova U., Tanaś J. Housing affordability analysis in Kazakhstan based on D-HAQ model. *Journal of International Studies*, 2022, 15(4), pp. 28-42. DOI: 10.14254/2071-8330.2022/15-4/2.
9. Mukhamedov J.S., Sokira T.S., Kuldasheva Z. A Project-Based Approach to Managing Non-Performing Mortgage Loans: Evidence from Europe and Asia. *Economy: strategy and practice*, 2026, 21(1), pp. 65-78. DOI: 10.51176/1997-9967-2026-1-65-78.
10. Seitz W. Urbanization in Kazakhstan: Desirable cities, unaffordable housing, and the missing rental market. Washington, DC: World Bank, 2018 (Policy Research Working Paper, 8530). URL: https://documents1.worldbank.org/curated/en/956811531481933385/pdf/WPS8530.pdf (accessed: 30.01.2026).
11. Baum-Snow N., Duranton G. Housing supply and housing affordability. *In Handbook of regional and urban economics*, 2025, 6, pp. 353–461. Elsevier. DOI: 10.1016/bs.hesreg.2025.05.003
12. Bratu C., Harjunen O., Saarimaa T. JUE Insight: City-wide effects of new housing supply: Evidence from moving chains. *Journal of Urban Economics*, 2023, 133, 103528. DOI: 10.1016/j.jue.2022.103528.
13. Forster R., Sun X. Taming the housing crisis: An LTV macroprudential policy. *Economic Modelling*, 2022, 108, 105761. DOI:10.1016/j.econmod.2022.105761
14. Cenzon J., Szabó B. E. Mortgage choice and inflation experiences in the Eurozone. *Journal of Monetary Economics*, 2024, 147(Supplement), 103611. DOI: 10.1016/j.jmoneco.2024.103611.
15. McCartney W. B., Shah A. M. Household mortgage refinancing decisions are neighbor influenced, especially along racial lines. *Journal of Urban Economics*, 2022, 128, 103409. DOI: 10.1016/j.jue.2021.103409.
16. Balcılar M., Usman O., Yülek M., Ağan B., & Erdal B. House price connectedness and consumer sentiment in an era of destabilizing macroeconomic conditions: Empirical evidence from Türkiye. *Borsa Istanbul Review*, 2024, 24(1), pp. 14–34. DOI: 10.1016/j.bir.2023.08.006.
17. Rodrigues L. F., Oliveira A., & Rodrigues H. Technology management has a significant impact on digital transformation in the banking sector. *International Review of Economics & Finance*, 2023, 88, pp. 1375–1388. DOI:10.1016/j.iref.2023.07.040.
18. Crosato L., Domenech J., Liberati C. Websites' data: A new asset for enhancing credit risk modeling. *Annals of Operations Research*, 2024, 342(3), pp. 1671–1686. DOI: 10.1007/s10479-023-05306-5.
19. Mukhamedov J., Sokira T., Kuldasheva Z. Sustainable development of mortgage lending: Economic challenges and prospects. *Journal of Economic Research & Business Administration*, 2025, 152(2), pp. 68–79. DOI: 10.26577/be202515225.

ҚАЗАҚСТАНДАҒЫ ИПОТЕКАЛЫҚ КРЕДИТТЕУДІҢ ПОРТФЕЛЬДІК ҚҰРЫЛЫМЫ ЖӘНЕ ИПОТЕКАЛЫҚ КРЕДИТТЕУ МЕН ТҰРҒЫН ҮЙМЕН ҚАМТАМАСЫЗ ЕТІЛУ АРАСЫНДАҒЫ ЛАГТЫҚ БАЙЛАНЫС

Ж.Ш. Мұхамедов[1*], Т.С. Сокира[1], Ж.Н. Кусмолдаева[1], Е.К. Барлықов[2]

[1]Әл-Фараби атындағы Қазақ ұлттық университеті, Алматы, Қазақстан
[2]Нархоз университеті, Алматы, Қазақстан

Түйін. *Қазақстанда ипотекалық кредиттеу соңғы онжылдықта біркелкі емес қарқынмен өсті, ал тұрғын үймен қамтамасыз етілу көрсеткіші салыстырмалы түрде баяу өзгерді. Зерттеудің мақсаты – 2015–2024 жылдардағы ипотекалық кредиттеудің фазалық динамикасын сипаттау және ипотекалық кредиттеу өсімі мен тұрғын үймен қамтамасыз етілу өсімі арасындағы кейінге қалдырылған байланысты бағалау. Зерттеуде халықаралық қаржы институттарының қолдауымен іске асырылған алты ипотекалық қаржыландыру жобасының портфельдік сипаттамалары және жылдық макроқаржылық көрсеткіштер қарастырылады. Портфель құрылымы Херфиндал–Хиршман индексі, Шеннон энтропиясы және вариация коэффициенті арқылы сипатталды, ал лагтық гипотеза бір және екі жылдық лагтар үшін Пирсон корреляциясы арқылы тексерілді. Екі жылдық лаг бойынша корреляция коэффициенті r = 0,656 (p = 0,077; 95% CI: −0,091–0,930; n = 8) болды. Нәтиже оң байланысты көрсеткенімен, себеп-салдарлық тәуелділікті дәлелдемейді және кеңейтілген деректер базасында қосымша тексеруді қажет етеді.*

Түйінді сөздер: *ипотекалық кредиттеу, тұрғын үймен қамтамасыз етілу, портфель құрылымы, фазалық талдау, Қазақстан.*

ПОРТФЕЛЬНАЯ СТРУКТУРА И ЛАГОВАЯ СВЯЗЬ МЕЖДУ ИПОТЕЧНЫМ КРЕДИТОВАНИЕМ И ОБЕСПЕЧЕННОСТЬЮ ЖИЛЬЕМ В КАЗАХСТАНЕ

Ж.Ш. Мухамедов[1*], Т.С. Сокира[1], Ж.Н. Кусмолдаева[1], Е.К. Барлыков[2]

[1]Казахский национальный университет имени аль-Фараби, Алматы, Казахстан
[2]Университет Нархоз, Алматы, Казахстан

Резюме. *В Казахстане ипотечное кредитование в течение последнего десятилетия развивалось неравномерно, тогда как обеспеченность населения жильём изменялась более плавно. Цель исследования – охарактеризовать фазовую динамику ипотечного кредитования в 2015–2024 гг. и оценить наличие лаговой связи между темпами роста ипотечного кредитования и обеспеченностью населения жильём. Исследование объединяет анализ шести проектов ипотечного финансирования, реализованных при поддержке международных финансовых институтов, и фазовый анализ годовых макрофинансовых показателей. Структура портфеля описывается с помощью индекса Херфиндаля–Хиршмана, энтропии Шеннона и коэффициента вариации; гипотеза о лаге проверяется с использованием корреляции Пирсона для лагов в один и два года. При двухлетнем лаге получена положительная корреляция r = 0,656 (p = 0,077; 95% ДИ: −0,091–0,930; n = 8). Результат указывает на статистическую связь, но не устанавливает причинную зависимость и требует проверки на более широкой выборке.*

Ключевые слова: *ипотечное кредитование, обеспеченность жильём, портфельная структура, фазовый анализ, Казахстан.*

Information about the authors:

Mukhamedov Javokhir Shukhratulla ugli* *– PhD student, Al-Farabi Kazakh National University, Almaty, Kazakhstan, e-mail: javokhir.mukhamedov@gmail.com, ORCID ID: 0009-0003-8955-7840.*

Sokira Tatyana Sergeevna *– Candidate of Economic Sciences, Al-Farabi Kazakh National University, Almaty, Kazakhstan, e-mail: t_sokira@mail.ru, ORCID ID: 0000-0002-4825-1189.*

Kusmoldayeva Zhazira *– PhD, Al-Farabi Kazakh National University, Almaty, Kazakhstan, e-mail: kusmoldaeva@mail.ru, ORCID ID: 0000-0002-6867-3442.*

Barlykov Yerbolat Kopsekbayevich *– Candidate of Economic Sciences, Associate Professor, Narxoz University, Almaty, Kazakhstan, e-mail: yerbolat.barlykov@narxoz.kz. ORCID ID: 0000-0002-2248-7310.*

Авторлар туралы ақпарат:

Мұхамедов Жавохир Шухратуллаұлы* *– PhD докторанты, әл-Фараби атындағы Қазақ ұлттық университеті, Алматы, Қазақстан, e-mail: javokhir.mukhamedov@gmail.com, ORCID ID: 0009-0003-8955-7840.*

Сокира Татьяна Сергеевна *– экономика ғылымдарының кандидаты, әл-Фараби атындағы Қазақ ұлттық университеті, Алматы, Қазақстан, e-mail: t_sokira@mail.ru, ORCID ID: 0000-0002-4825-1189.*

Кусмолдаева Жазира Нұрасылқызы – *PhD, әл-Фараби атындағы Қазақ ұлттық университеті, Алматы, Қазақстан, e-mail: kusmoldaeva@mail.ru, ORCID ID: 0000-0002-6867-3442.*

Барлықов Ерболат Көпсекбайұлы – *экономика ғылымдарының кандидаты, Нархоз университеті, Алматы, Қазақстан, e-mail: yerbolat.barlykov@narxoz.kz, ORCID ID: 0000-0002-2248-7310.*

Информация об авторах:

Мухамедов Жавохир Шухратулла угли* *– PhD докторант, Казахский национальный университет имени аль-Фараби, Алматы, Казахстан, e-mail: javokhir.mukhamedov@gmail.com, ORCID ID: 0009-0003-8955-7840.*

Сокира Татьяна Сергеевна *– кандидат экономических наук, Казахский национальный университет имени аль-Фараби, Алматы, Казахстан, e-mail: t_sokira@mail.ru, ORCID ID: 0000-0002-4825-1189.*

Кусмолдаева Жазира Нурасыловна – *PhD, Казахский национальный университет имени аль-Фараби, Алматы, Казахстан, e-mail: kusmoldaeva@mail.ru, ORCID ID: 0000-0002-6867-3442.*

Барлыков Ерболат Копсекбаевич – *кандидат экономических наук, Университет Нархоз, Алматы, Казахстан, e-mail: yerbolat.barlykov@narxoz.kz, ORCID ID: 0000-0002-2248-7310.*

Received: 26.02.2026
Accepted: 28.03.2026
Available online: 30.09.2026