

J.S.Mukhamedov<sup>1\*</sup> , T.S.Sokira<sup>1</sup> , Z.Kuldasheva<sup>2</sup> , Y.K.Barlykov<sup>3</sup> <sup>1</sup> Al-Farabi Kazakh National University, Almaty c., Kazakhstan<sup>2</sup> Tashkent State University of Economics, Tashkent c., Uzbekistan<sup>3</sup> Kazakh National Agrarian Research University, Almaty c., Kazakhstan\*e-mail: [javokhir.mukhamedov@gmail.com](mailto:javokhir.mukhamedov@gmail.com)

## QUANTIFYING THE SOCIAL IMPACT OF MORTGAGE LENDING PROJECTS IN KAZAKHSTAN: THE INSTITUTIONAL ROLE OF OTBASY BANK

### Abstrakt

Despite the large-scale implementation of state mortgage programs in Kazakhstan, the academic literature still lacks a formalized quantitative assessment of their overall social impact viewed as a portfolio of socially oriented projects that simultaneously incorporates macroeconomic conditions, housing affordability parameters, and the institutional role of key operators. Existing studies are mainly confined to separate indicators (interest rates, housing prices, HAI, lending volumes) and therefore do not allow a comprehensive evaluation of the effectiveness of project-based governance in the housing policy domain. The purpose of the article is to develop and test an integral index of the social effect of mortgage programs (ISEH). as a tool for quantifying the effectiveness of public housing policy, considered as a portfolio of interrelated projects, as well as to determine the impact of macroeconomic, price and institutional factors on housing affordability and social efficiency of mortgage lending in Kazakhstan. This study addresses this gap by developing and empirically testing an Integral Social Effect Index for mortgage programs interpreted as an interconnected set of projects within the framework of state housing policy. The index combines real household income, housing prices, mortgage interest rates, the share of non-performing loans, housing provision per capita, and an institutional component represented by the market share of Otbasny Bank as a development institution and project operator. The results indicate that the social outcomes of mortgage projects are primarily driven by income levels and housing price dynamics, while institutional coordination performed by Otbasny Bank also exerts a statistically significant influence, reflecting its systemically important and countercyclical role in managing the portfolio of housing projects. The observed convergence of ISEH values across regions confirms the effectiveness of centralized project management in reducing territorial disparities in housing access and in strengthening the sustainability of the social impact of state mortgage programs.

**Keywords:** mortgage lending, social impact, Otbasny Bank, project management, housing affordability.

### Introduction

Mortgage lending in Kazakhstan is a key instrument for implementing state housing policy and an important factor for social stability in the context of demographic growth, urbanization, and regional differentiation. The macroeconomic context of recent years has been characterized by steady GDP growth, an increase in real household incomes, and increased investment activity, including in the construction sector, while inflation and interest rate risks remain due to tight monetary policy and external shocks [1].

According to [2], the total mortgage portfolio as of January 1, 2025, reached 6.1 trillion tenge, an increase of 14% compared to the previous year, and its share in GDP was about 5%, reflecting the growing role of mortgages in the structure of the financial system and consumer demand. At the same time, more than half of this volume (about 57%) is accumulated by Otbasny Bank, which occupies a dominant position in the market and is the main operator of state housing programs and the housing construction savings system [3].

An analysis of current dynamics shows that in 2024–early 2025, the market was influenced by two opposing trends simultaneously: on the one hand, rising housing prices and persistently high interest rates limited the availability of market mortgage products; on the other hand, the expansion of preferential programs and institutional support through Otbasny Bank supported aggregate demand. In the first quarter of 2025, the temporary reduction in mortgage lending was largely due to institutional factors, in particular, the delay in the payment of the state premium on housing savings deposits, which led to a decline in Otbasny Bank's activity and a change in the market structure in favor of commercial programs of other commercial banks, confirming its systemic and countercyclical role [4].



Figure 1 – Ecosystem of mortgage products of Otbas Bank across the housing finance lifecycle

Note: Compiled by the authors based on information from [5].

As illustrated in Figure 1, in the institutional architecture of housing finance, Otbas Bank acts not only as a credit institution, but also as a project operator and development institution, ensuring the translation of state housing policy into specific socially oriented financial products. Its product line forms an ecosystem of mortgage instruments differentiated by target groups, terms, and risk profiles (programs for young families, socially vulnerable groups, women, as well as market and transitional secondary market products), reflecting a project-oriented and life-cycle approach to ensuring housing affordability (Figure 1). The bank's sustainability reports and World Bank materials highlight its contribution to achieving the Sustainable Development Goals, particularly SDG 11 "Sustainable cities and communities" through preferential and "green" mortgage lending mechanisms, social and gender-oriented programs, and the integration of ESG principles into its strategy, operations, and corporate governance system, which strengthens its role as a systemically important and institutional anchor of the mortgage market [6-7].

At the same time, existing analytical reports and scientific studies tend to focus either on the macroeconomic dynamics and financial stability of the mortgage market, or on housing affordability indicators, or on the institutional role of Otbas Bank in a descriptive format. They lack a formalized quantitative assessment of the aggregate social impact of mortgage programs that would simultaneously take into account the influence of household income, housing prices, lending conditions, mortgage portfolio quality, and the institutional contribution of key operators at the regional level.

This study aims to fill this gap. The article proposes and empirically tests an integrated index of the social and institutional impact of mortgage programs (ISEH), which combines macroeconomic, financial, and institutional parameters, including Otbas Bank's share of the mortgage market as a proxy for its project coordination role. This allows us to consider mortgage lending not only as a segment of the financial market, but also as a system of socially oriented projects implemented within the framework of state housing policy, and to quantitatively assess the contribution of institutional mechanisms to the formation of sustainable social outcomes.

#### Literature review

The issues of housing affordability and mortgage lending sustainability in Kazakhstan are widely covered in scientific research. Contemporary literature shows that the social effectiveness of mortgage programs is shaped by both macroeconomic factors (household income, housing prices, interest rates, financial risks) and the institutional architecture of housing finance, including the role of state and quasi-state operators.

A number of studies focus on the macroeconomic and financial determinants of the mortgage market. For example, [8] based on correlation and regression analysis for 2007–2023, show a significant impact of GDP, interest rates, and the level of non-performing debt on the dynamics of mortgage lending, emphasizing the countercyclical role of state programs and specialized institutions in ensuring the stability and social orientation of the market. Similarly, [9] and [10] substantiate the impact of credit risks and price dynamics on the financial stability of banks and housing affordability, identifying the role of NPLs and price “preference shocks” as key factors shaping the stability of demand and supply of mortgage resources.

Issues of housing affordability in regional and social terms are studied in detail in the works of [11] and [12]. Based on the HAI, HPI indices and the D-HAQ model, the authors show that households in Kazakhstan face double constraints—insufficient initial savings and limited solvency—and that the effect of preferential programs (“7-20-25” and others) is partially compensatory and regionally heterogeneous. The conclusion is that interest subsidies without income growth and institutional support do not ensure a sustainable increase in housing affordability.

The institutional structure of the mortgage market and the role of the state are revealed in studies by [13] and [14]. The authors show that the expansion of mortgage lending and housing construction in Kazakhstan is largely ensured by the implementation of state programs and the activities of Otbas Bank as a systemic operator coordinating mechanisms for savings, subsidies, and long-term lending. There is a high regional concentration of demand, housing affordability depends on income and interest rates, and the state plays a countercyclical role in times of crisis.

Individual studies complement this approach with institutional and methodological aspects. [15] considers mortgage lending not only as a financial and banking instrument, but above all as an element of state social policy aimed at improving the quality of life and providing the population with affordable housing. The author emphasizes that the effectiveness of mortgages is determined by the degree of state participation through a system of guarantees, subsidies, the development of the secondary market, risk insurance, and targeted programs for socially vulnerable groups and middle-income citizens, which allows the interests of households, banks, the construction sector, and the state to be aligned within a unified housing strategy. [16] show that the digitization of mortgage processes reduces transaction costs and expands financial inclusion, but its social impact is only realized in combination with government programs. Ecosystem and ESG approaches to assessing the social effectiveness and sustainability of financial institutions are presented in the works.

[17] and [18], which emphasize the role of institutional quality, coordination, and sustainable governance in shaping long-term social impact.

At the same time, the literature review reveals a number of significant limitations. First, most studies consider either housing affordability indicators (HAI, HPI, D-HAQ) or macroeconomic and financial determinants of the mortgage market, without integrating them into a single model for assessing the overall social impact of government mortgage programs. Second, the institutional role of Otbas Bank as a key operator in the project and program implementation of housing policy is usually analyzed descriptively and is not formalized as a quantitative factor in econometric models. Third, existing studies lack an integrated indicator that would allow for the simultaneous consideration of macroeconomic conditions, financial stability, and institutional contributions to the formation of social impact.

This study aims to fill these gaps. Unlike previous works, the article proposes and empirically tests an integral index of the social and institutional effect of mortgage programs (ISEH), which allows for a quantitative assessment of the cumulative impact of income, prices, interest rates, credit risks, and the institutional presence of Otbas Bank on the social performance of mortgage lending at the regional level. Thus, the study combines approaches from the theory of housing affordability, institutional economics, and project management, forming a comprehensive econometric model for assessing the social effectiveness of state mortgage programs.

#### Research Gap and Hypotheses

A review of the literature shows that the social impact of mortgage programs in Kazakhstan is typically assessed using individual indicators of housing affordability or macroeconomic factors, without integrating them into a single model and without formalizing the institutional role of Otbas

Bank. Regional differences and possible convergence effects under centralized management also remain insufficiently researched.

In this paper, mortgage programs are considered as a portfolio of socially oriented projects, and their effectiveness is assessed using an integral social impact index (ISEH).

Based on the identified theoretical gaps and the proposed conceptual model, the following hypotheses are formulated and empirically tested in the study:

H1. Otbas Bank's share of the mortgage market has a positive and statistically significant effect on ISEH.

H2. Real household income and housing prices are key determinants of the social impact of mortgage projects.

H3. Centralized implementation of mortgage programs leads to regional convergence of social impact in Kazakhstan.

### Materials and methods of research

The empirical basis of the study is formed on the basis of official statistical and departmental data characterizing the development of the mortgage market and the activities of Otbas Bank JSC as a key operator of state housing programs in the Republic of Kazakhstan. The information base includes:

- data from the National Statistics Bureau of the Republic of Kazakhstan;
- reports and publicly available analytical materials from Otbas Bank JSC;
- aggregate indicators from the National Bank of the Republic of Kazakhstan;
- author's calculations.

The observation period covers 2015–2024 and is presented in annual data. The spatial structure of the sample includes three territorial clusters: Astana, Almaty, and the rest of Kazakhstan (RoK), which allows for regional differentiation of the social impact of mortgage programs.

The dependent variable used is the integral index of the social impact of mortgage programs (ISEH), which reflects the cumulative impact of mortgage lending on housing affordability, living space provision, and household financial stability. This index is used as a comprehensive indicator of the effectiveness of mortgage lending projects within the framework of state housing policy. Unlike the traditional Housing Affordability Index (HAI), which mainly reflects the financial aspect of mortgage demand, the Integral Social Effect Index (ISEH) allows for a comprehensive assessment of the implementation of mortgage projects, taking into account institutional coverage, portfolio quality, income dynamics, and housing security, which is consistent with the objectives of analyzing the social effectiveness of state housing policy and the project role of Otbas Bank.

The vector of explanatory variables includes institutional and macroeconomic factors:

$OTBS\_SHARE_{it}$  — market share of Otbas Bank in the total mortgage market (%);

$RATE_{it}$  — weighted average mortgage interest rate (%);

$NPL_{it}$  — share of non-performing mortgage loans (%);

$SQM_{it}$  — housing provision (square meters per capita);

$INCOME_{it}$  — real household income;

$PRICE_{it}$  — average price per square meter of housing.

All variables were normalized to the [0;1] interval in order to eliminate scale differences and ensure comparability of the estimated coefficients.

The econometric model is specified in the form of a multiple linear regression:

$$ISEH_{it} = \beta_0 + \beta_1 OTBS\_SHARE_{N_{it}} + \beta_2 RATE_{N_{it}} + \beta_3 NPL_{N_{it}} + \beta_4 SQM_{N_{it}} + \beta_5 INCOME_{N_{it}} + \beta_6 PRICE_{N_{it}} + \varepsilon_{it} \quad (1)$$

where  $i$  denotes the regional cluster,  $t$  denotes the time period,  $\beta_0$  is the intercept,  $\beta_k$  are the estimated model parameters, and  $\varepsilon_{it}$  is the random error term.

The study was conducted in several stages:

Descriptive and spatial analysis of ISEH dynamics and interregional differences (Tables 1 and 2);

Correlation analysis of the relationship between ISEH and key factors in the development of the mortgage market (Table 3);

Regression and factor (contribution) analysis aimed at quantitatively assessing the contribution of institutional and macroeconomic determinants to the formation of the social effect of mortgage projects and ranking them according to their degree of influence (Tables 4 and 5).

The quality and adequacy of the model were assessed based on the coefficient of determination ( $R^2$ ), normalized  $R^2$ , F-criterion, and levels of statistical significance of the coefficients. The methodological approach used allows us to quantitatively substantiate the institutional contribution of Otbas Bank as a project operator of state housing policy to the formation of the social impact and regional convergence of housing affordability.

### Results and their discussion

#### Descriptive analysis of ISEH dynamics

The data in Table 1 show a steady increase in the integral index of the social effect of mortgage programs (ISEH) in all regional clusters of Kazakhstan in 2015–2024. The most pronounced acceleration is observed in the period 2019–2021, which coincides with the large-scale expansion of state programs for preferential mortgage lending and the strengthening of Otbas Bank's project role as a housing policy operator.

An important trend is the convergence of ISEH values between the capital regions and the rest of the country: while in 2015 the gap between Astana and the regions was 0.11 points, by 2024 it had narrowed to 0.02 points. This indicates the effect of regional convergence of the social outcome of mortgage projects, due to the unification of lending conditions, the expansion of the network of housing savings institutions, and the scaling of project financing mechanisms.

The stabilization of the index at 0.60–0.65 after 2021 reflects the transition from a phase of intensive expansion of mortgage program coverage to a phase of institutional consolidation of their social impact and increased sustainability of the mortgage lending system.

Table 1 – Dynamics of the Integral Social Effect Index of mortgage programs (ISEH) by regions of the Republic of Kazakhstan, 2015–2024

Year	Astana	Almaty	Rest of Kazakhstan (RoK)
2015	0.33	0.30	0.22
2016	0.39	0.37	0.31
2017	0.40	0.35	0.28
2018	0.47	0.41	0.44
2019	0.54	0.50	0.56
2020	0.65	0.60	0.66
2021	0.67	0.68	0.67
2022	0.61	0.65	0.70
2023	0.62	0.59	0.60
2024	0.64	0.61	0.61

Note: ISEH denotes the Integral Social Effect Index of mortgage lending programs. The values are normalized in the range from 0 to 1 and calculated by the authors for Astana, Almaty, and the rest of Kazakhstan (RoK) for the period 2015–2024 based on data from [2] and [6].

For a clear visualization of the identified trends, the dynamics of ISEH by regional clusters are presented in Figure 2.

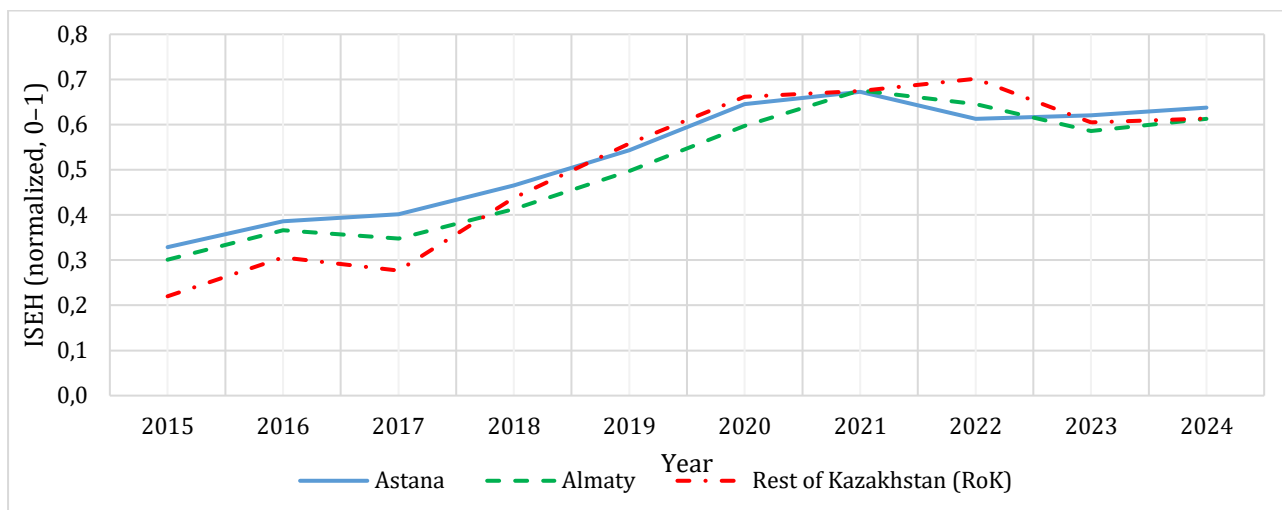


Figure 2 – Dynamics of the Integral Social Effect Index (ISEH) for Astana, Almaty and the rest of Kazakhstan, 2015–2024 (normalized, 0-1)

Note: authors’ calculations based on the regression results.

The data in Table 1 and Figure 2 reflect steady growth in the integral index of the social effect of mortgage programs (ISEH) in all regional clusters of Kazakhstan in 2015–2024. The most intense positive dynamics are observed in 2019–2021, which coincides with the large-scale expansion of state programs for preferential mortgage lending and the strengthening of Otbasly Bank's project role as a housing policy operator.

A characteristic feature is the convergence of ISEH trajectories in Astana, Almaty, and other regions: while in 2015 the differences between the capital and regional values were significant, by 2024 the index had stabilized within a narrow range of 0.61–0.64. This indicates a process of regional convergence in the social impact of mortgage projects, driven by the unification of financing conditions, the scaling up of the savings system, and institutional equalization of access to government programs.

The stabilization of the ISEH after 2021 at a relatively high level indicates a transition from a phase of extensive expansion of mortgage programs to a phase of institutional consolidation of their social impact and increased sustainability of the project management system in the field of mortgage lending.

#### Gap analysis

Interregional differences in the level of the integral social effect of mortgage programs are presented in Table 2.

Table 2 – Interregional differences (Gap Analysis) of the Integral Social Effect Index of mortgage programs (ISEH) in the Republic of Kazakhstan, 2015–2024

Year	ISEH Astana	ISEH Almaty	ISEH RoK	Astana–RoK	Almaty–RoK
2015	0.33	0.30	0.22	0.11	0.08
2016	0.39	0.37	0.31	0.08	0.06
2017	0.40	0.35	0.28	0.12	0.07
2018	0.47	0.41	0.44	0.03	-0.02
2019	0.54	0.50	0.56	-0.01	-0.06
2020	0.65	0.60	0.66	-0.02	-0.06
2021	0.67	0.68	0.67	0.00	0.00
2022	0.61	0.65	0.70	-0.09	-0.06
2023	0.62	0.59	0.60	0.02	-0.02
2024	0.64	0.61	0.61	0.02	0.00

Note: RoK denotes the rest of Kazakhstan. Positive gap values indicate higher ISEH in metropolitan regions relative to other regions, whereas negative values indicate higher ISEH in the rest of Kazakhstan. The values are based on normalized ISEH estimates for the period 2015–2024 and authors’ calculations using data from [2] and [6].

To clearly interpret the dynamics of interregional gaps, we use an analysis of the difference in ISEH values between metropolitan regions and the rest of the country.

The data in Table 2 show a significant reduction in interregional differences in the social impact of mortgage programs in Kazakhstan in 2015–2024. In the initial period of observation, Astana and Almaty were ahead of other regions in terms of ISEH by 0.08–0.12 points, reflecting the concentration of mortgage resources and institutional capabilities in the largest agglomerations.

Starting in 2019, the gaps narrowed significantly, and in 2020–2022, a number of regions even surpassed others in terms of ISEH, indicating a leveling of access to state mortgage programs and an expansion of their territorial coverage.

The stabilization of gaps in the range from -0.02 to 0.02 points in 2023–2024 indicates the formation of a regional convergence effect of the social outcome of mortgage projects, due to the unification of project financing mechanisms, standardization of the bank's Otbasyl product line, and institutional alignment of housing policy implementation conditions throughout the country.

#### Correlation analysis

The relationship between the integral index of the social effect of mortgage programs (ISEH) and key factors in the development of the mortgage market is presented in Table 3.

Table 3 – Correlation between the Integral Social Effect Index (ISEH) and key factors of mortgage market development

Factor	Correlation coefficient with ISEH (r)	Type of relationship
Market share of Otbasyl Bank (OTBS_SHARE_N)	0.944	Very strong positive
Weighted average mortgage rate (RATE_N)	0.134	Weak positive
Non-performing loan ratio (NPL_N)	0.740	Strong positive
Housing provision (SQM_N)	0.343	Moderate positive
Real household income (INCOME_N)	0.719	Strong positive
Housing price per sq. m (PRICE_N)	-0.495	Moderate negative

Note: r denotes the Pearson correlation coefficient. All values are calculated for normalized variables for the period 2015–2024 based on authors' calculations using data from [2] and [6]. Positive values indicate a direct relationship, whereas negative values indicate an inverse relationship between ISEH and the corresponding factor.

The results of the correlation analysis indicate a close statistical relationship between ISEH and institutional, financial, and socioeconomic parameters of mortgage market development. The strongest direct correlation was recorded between the social impact index and Otbasyl Bank's share of the mortgage lending market ( $r = 0.944$ ), indicating the key role of this institution in shaping the social outcomes of state housing programs.

A significant positive correlation was also found with the level of real household income ( $r = 0.719$ ) and the quality of the mortgage portfolio, characterized by the share of overdue debt ( $r = 0.740$ ), which reflects the dependence of the social effect on the solvency of households and the stability of financial lending mechanisms.

A moderate positive correlation between ISEH and housing provision ( $r = 0.343$ ) confirms that improving housing conditions is an important but not the only factor in shaping social outcomes. At the same time, the negative correlation with the price per square meter of housing ( $r = -0.495$ ) indicates that rising real estate prices have a restraining effect on housing affordability and the social effectiveness of mortgage projects.

The obtained dependencies form an empirical basis for subsequent regression analysis, allowing us to assess the net contribution of each factor to the formation of ISEH, all other things being equal.

#### Regression results

The results of the assessment of the multiple linear regression model reflecting the impact of institutional and macroeconomic factors on the integral social effect of mortgage programs are presented in Table 4.

Table 4 – Results of the regression analysis of the impact of institutional and macroeconomic factors on the Integral Social Effect Index of mortgage programs (dependent variable – ISEH)

Variable	Coefficient $\beta$	t-statistic	p-value	Lower 95%	Upper 95%
Constant	-0.2879	-8.9	<0.001	-0.3548	-0.2209
OTBS_SHARE_N	0.1729	11.1	<0.001	0.1407	0.2051
RATE_N	0.1485	12.54	<0.001	0.124	0.173
NPL_N	0.1503	11.65	<0.001	0.1236	0.1769
SQM_N	0.1872	10.74	<0.001	0.1512	0.2233
INCOME_N	0.4584	12.81	<0.001	0.3844	0.5325
PRICE_N	0.4499	15.25	<0.001	0.3889	0.5109

Note:  $\beta$  denotes standardized regression coefficients. t-statistics and p-values correspond to two-tailed tests. The model is estimated using normalized variables for the period 2015–2024 based on authors’ calculations using data from [2] and [6].  $R^2$ , adjusted  $R^2$ , and the F-statistic indicate the overall goodness of fit and statistical significance of the regression model.

*Model fit statistics:*

*Multiple correlation coefficient (R) = 0.998*

*Coefficient of determination ( $R^2$ ) = 0.995*

*Adjusted coefficient of determination (Adj.  $R^2$ ) = 0.994*

*F-statistic = 816.61 ( $p < 0.001$ )*

*Number of observations (N) = 30*

The results of the multiple linear regression model assessment are presented in Table 4. The model quality indicators demonstrate its high explanatory power:  $R = 0.998$ ,  $R^2 = 0.995$ , Adj.  $R^2 = 0.994$ ,  $F = 816.61$  at  $p < 0.001$ , which confirms the statistical significance of the model as a whole and the adequacy of the selected specification.

All variables included in the model are statistically significant at the  $p < 0.001$  level, which indicates their systemic influence on the formation of the integral index of the social effect of mortgage programs (ISEH). The largest contribution to the dynamics of the index is made by the level of real income of the population ( $\beta = 0.458$ ), reflecting the key role of household solvency in ensuring the social effectiveness of mortgage projects.

Significant coefficients for housing prices ( $\beta = 0.450$ ) and the bank's market share ( $\beta = 0.173$ ) confirm that the social impact of mortgage programs in Kazakhstan is determined not only by market conditions, but also by institutional mechanisms of state support and the project activities of the key operator of housing policy. Positive assessments of portfolio quality (NPL), housing provision (SQM), and interest rates (RATE) reflect the impact of financial system stability and lending parameters on the overall social outcome.

Overall, the results of the regression analysis indicate that the formation of ISEH is due to a combination of macroeconomic factors and the institutional role of Otbas Bank as the project operator of state housing programs.

*Contribution analysis*

The results of ranking factors according to their contribution to the overall social impact of mortgage programs are presented in Table 5.

Table 5 – Economic interpretation and contribution of factors to the formation of the Integral Social Effect Index of mortgage programs (ISEH)

Factor	Standardized coefficient $\beta$	Impact rank	Economic interpretation
Real household income (INCOME_N)	0.458	1	Core social driver: income growth directly increases mortgage affordability and household financial resilience
Housing price per sq. m (PRICE_N)	0.45	2	Price dynamics represent the main constraint on affordability and act as a trigger for institutional and countercyclical policy responses reflected in the overall social effect
Housing provision (SQM_N)	0.187	3	Improvement in housing conditions strengthens the social outcomes of mortgage programs
Market share of Otbas Bank (OTBS_SHARE_N)	0.173	4	Key institutional factor: Otbas Bank plays a central role in shaping the social effect of housing policy as a development institution and project operator
Non-performing loan ratio (NPL_N)	0.15	5	Portfolio quality and financial stability enhance the long-term social sustainability of mortgage lending
Mortgage interest rate (RATE_N)	0.148	6	Interest rate policy exerts a secondary but statistically significant influence on the social effect
Note: Standardized $\beta$ -coefficients are obtained from the regression model estimated using normalized variables for the period 2015–2024 based on authors’ calculations using data from [2] and [6]. Rank 1 corresponds to the factor with the largest contribution to the formation of the Integral Social Effect Index (ISEH).			

The results of the factor contribution analysis show that the level of real income of the population ( $\beta = 0.458$ ) has the greatest impact on the formation of the integral social effect of mortgage projects, reflecting the fundamental dependence of housing affordability and mortgage demand stability on the solvency of households.

The second most important factor is the price per square meter of housing ( $\beta = 0.450$ ), reflecting the key role of price dynamics as a factor that activates mechanisms of institutional compensation and state support.

The institutional contribution of Otbas Bank, measured by its share in the mortgage lending market ( $\beta = 0.173$ ), occupies a stable position in the structure of factors, indicating the systemic role of this bank as a project operator of state housing policy and coordinator of long-term housing financing mechanisms.

Housing availability, mortgage portfolio quality, and interest rates have a less significant but statistically significant impact, forming a financially stable basis for the social impact of mortgage programs. Taken together, the results obtained allow us to interpret the social effect of mortgage lending as the result of the interaction of macroeconomic conditions and institutional mechanisms of project management implemented through Otbas Bank.

Thus, the results of correlation-regression and factor analysis confirm that the social impact of mortgage programs in Kazakhstan is shaped by the dominant influence of macroeconomic conditions (income and housing prices) with significant institutional support from Otbas Bank as the key project operator of the state housing policy.

Interpretation of correlation and regression results

In the first stage, a correlation analysis was conducted of the relationship between the integral index of the social effect of mortgage programs (ISEH) and key macroeconomic and institutional factors. The results presented in Table 3 show that the closest positive correlation is observed between ISEH and Otbas Bank's share in the total mortgage market ( $r = 0.944$ ), which indicates the decisive role of this institution in shaping the social impact of state housing policy.

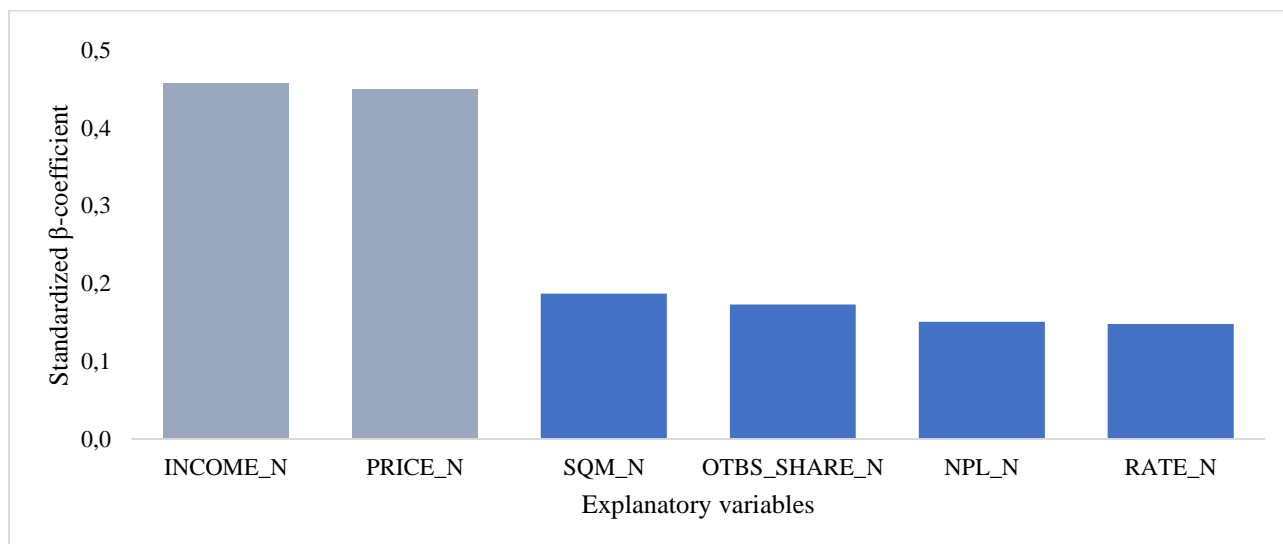


Figure 3 – Standardized regression coefficients explaining the Integral Social Effect Index (ISEH)

Note: standardized  $\beta$ -coefficients obtained from the regression model; compiled by the authors based on their own calculations.

A strong direct correlation was also found between ISEH and real household income ( $r = 0.719$ ), as well as with the indicator characterizing the state of the mortgage portfolio ( $r = 0.740$ ), which testifies to the importance of household solvency and the stability of financial lending mechanisms for achieving positive social results of mortgage programs.

A moderate positive correlation was found between ISEH and housing security ( $r = 0.343$ ), reflecting the impact of actual housing conditions on the integral social assessment. At the same time, the price per square meter of housing shows a moderate negative correlation with ISEH ( $r = -0.495$ ), confirming the restraining effect of rising real estate prices on the market affordability of housing. This relationship reflects the direct price effect characteristic of the market mechanism for shaping demand for mortgages.

To quantitatively assess the contribution of each factor, a multiple regression model was constructed using normalized variables. The results of the assessment presented in Table 4 indicate the high explanatory power of the model ( $R^2 = 0.995$ ;  $F = 816.61$  at  $p < 0.001$ ), which confirms the adequacy of the selected specification and the statistical significance of the cumulative impact of the included factors. The high explanatory power of the model is largely due to the use of normalized composite indicators and aggregated regional data, which reduces stochastic variation and allows us to identify systemic relationships between social effects and institutional factors.

The highest standardized coefficient was obtained for the indicator of real household income ( $\beta = 0.458$ ), which allows us to interpret income as the basic determinant of the social impact of mortgage programs. Housing prices ( $\beta = 0.450$ ), housing availability ( $\beta = 0.187$ ), and Otbas Bank's share of the mortgage lending market ( $\beta = 0.173$ ) also make a significant positive contribution to ISEH. The positive sign of the coefficient for the price factor in the regression model reflects not a direct market effect, but an institutional and countercyclical response of the system: in conditions of rising prices and increasing barriers to accessibility, the mechanisms of state support and Otbas Bank's project activities are activated, expanding the social coverage of mortgage programs, which is reflected in the dynamics of the ISEH integral index.

Positive and statistically significant coefficients for the variables OTBS\_SHARE\_N and NPL\_N confirm that the expansion of Otbas Bank's institutional presence and the strengthening of measures to maintain the stability of the mortgage portfolio contribute to the growth of the aggregate social effect. This indicates the role of Otbas Bank not only as a credit institution, but also as a key operator of state housing projects, performing a socially oriented and countercyclical function.

The results obtained provide an empirical basis for further discussion in Section 6, which will analyze the role of Otbas Bank in reducing regional disparities, increasing the stability of the

mortgage market, and achieving the goals of state housing policy in the context of project management.

### Conclusion

The article presents a quantitative assessment of the social impact of mortgage programs in Kazakhstan based on the integration of macroeconomic, financial, and institutional factors into a single econometric model. The proposed integrated index of social and institutional impact (ISEH) allows us to go beyond traditional indicators of housing affordability and consider mortgage lending as a system of socially oriented projects implemented within the framework of state housing policy and coordinated by a specialized development institution, Otbas Bank.

The empirical results confirm that the key determinants of the social impact of mortgage programs are real household incomes and price dynamics in the housing market, reflecting the fundamental importance of effective demand and market constraints. At the same time, the statistically significant influence of the institutional factor, approximated by Otbas Bank's share in the mortgage market, indicates the ability of program and project mechanisms to partially compensate for unfavorable interest rate and price conditions through expanded coverage, subsidies, and long-term financing.

The identified process of regional convergence of ISEH values indicates that a unified product architecture and centralized coordination of mortgage programs contribute to reducing territorial disparities in housing affordability. From the perspective of project management theory, mortgage lending in Kazakhstan is empirically justified as a portfolio of socially oriented projects managed by a single institutional operator and aligned with national sustainable development priorities, primarily SDG 11 "Sustainable Cities and Communities."

The results of the study are consistent with the conclusions of regulatory and analytical reports. Thus, a review by [19] confirms the high stability of the banking system and the systemic importance of the mortgage segment, which accounts for a significant share of long-term loans to the population with a relatively low level of non-performing debt. This justifies the inclusion of interest rate and portfolio quality indicators in the model as factors that form the institutional basis for the social impact of mortgage programs.

At the same time, an analysis by [20] on the impact of early use of pension savings on the housing market shows that large-scale socially oriented interventions can lead to an increase in real estate prices and thus partially neutralize the effect of increased affordability through the price channel. The identified price increases in a number of regions confirm the need to assess not individual support measures, but their aggregate social outcome, taking into account macroeconomic feedback and institutional coordination, which conceptually corresponds to the ISEH integral index proposed in this paper.

The main scientific contribution of the article is the formalization of the institutional factor in the econometric model of the social effect of mortgage lending and the development of the ISEH integral indicator, which combines macroeconomic conditions, financial stability parameters, and the role of the key project operator. Unlike existing studies that consider housing affordability, financial stability, and the activities of development institutions in isolation, the proposed approach allows for a quantitative assessment of their combined impact and determines the contribution of program-targeted mechanisms to the achievement of sustainable social outcomes.

Promising areas for further research include the inclusion of household microdata, indicators of housing quality and environmental characteristics of housing, as well as analysis of the long-term distributional effects of mortgage programs in the context of the ESG agenda and inclusive economic growth.

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## **КОЛИЧЕСТВЕННАЯ ОЦЕНКА СОЦИАЛЬНОГО ЭФФЕКТА ПРОЕКТОВ ИПОТЕЧНОГО КРЕДИТОВАНИЯ В КАЗАХСТАНЕ: ИНСТИТУЦИОНАЛЬНАЯ РОЛЬ ОТБАСЫ БАНКА**

### **Аннотация**

Несмотря на масштабную реализацию государственных программ ипотечного кредитования в Казахстане, в научных исследованиях до настоящего времени отсутствует формализованная количественная оценка их совокупного социального эффекта как портфеля социально ориентированных проектов, учитывающая одновременно макроэкономические условия, параметры доступности жилья и институциональную роль ключевых операторов. Преобладающие подходы ограничиваются анализом отдельных показателей (ставки, цены, NAI, объёмы кредитования) и не позволяют оценить результативность проектного управления в сфере жилищной политики. Цель статьи — разработать и апробировать интегральный индекс социального эффекта ипотечных программ (ISEH) как инструмента количественной оценки результативности государственной жилищной политики, рассматриваемой как портфель взаимосвязанных проектов, а также определить влияние макроэкономических, ценовых и институциональных факторов на доступность жилья и социальную эффективность ипотечного кредитования в Казахстане. В данной работе предложено решение указанной проблемы на основе разработки и апробации интегрального индекса социального эффекта ипотечных программ (ISEH), трактуемых как совокупность взаимосвязанных проектов в рамках государственной жилищной политики. Индекс объединяет реальные доходы населения, цены на жильё, ипотечные ставки, долю проблемной задолженности, обеспеченность жильём и институциональный фактор, представленный долей АО «Отбасы банк» как проектного оператора и института развития. Эмпирический анализ выполнен по данным 2015–2024 гг. для

трёх региональных кластеров (Астана, Алматы и остальные регионы) с использованием корреляционного, регрессионного и факторного анализа. Результаты показывают, что социальный эффект ипотечных проектов в наибольшей степени определяется уровнем доходов и ценовой динамикой, однако статистически значимую роль играет и институциональная координация, осуществляемая Отбасы банком, выполняющим системообразующую и контрциклическую функцию в управлении портфелем жилищных проектов. Выявленная региональная конвергенция значений ISEN подтверждает эффективность централизованного проектного управления в выравнивании доступа к жилью и повышении устойчивости социального результата государственных программ.

**Ключевые слова:** ипотечное кредитование, социальный эффект, Отбасы банк, проектное управление, доступность жилья.

## ҚАЗАҚСТАНДАҒЫ ИПОТЕКАЛЫҚ НЕСИЕЛЕУ ЖОБАЛАРЫНЫҢ ӘЛЕУМЕТТІК ӘСЕРІН САНДЫҚ БАҒАЛАУ: «ОТБАСЫ БАНКІНІҢ» ИНСТИТУЦИОНАЛДЫҚ РӨЛІ

### Аңдатпа

Қазақстанда мемлекеттік ипотекалық несиелеу бағдарламалары кең ауқымда іске асырылып отырғанына қарамастан, ғылыми зерттеулерде олардың жиынтық әлеуметтік әсерін әлеуметтік бағдарланған жобалар портфелі ретінде, яғни макроэкономикалық жағдайларды, тұрғын үйдің қолжетімділік параметрлерін және негізгі операторлардың институционалдық рөлін бір мезгілде ескеретін формалданған сандық бағалау әлі де жоқ. Қолданыстағы тәсілдер көбінесе жекелеген көрсеткіштерді (пайыздық мөлшерлемелер, бағалар, НАІ, несиелеу көлемдері) талдаумен шектеліп, тұрғын үй саясаты саласындағы жобалық басқарудың нәтижелілігін кешенді бағалауға мүмкіндік бермейді. Мақаланың мақсаты-өзара байланысты жобалар портфелі ретінде қарастырылатын мемлекеттік тұрғын үй саясатының нәтижелілігін сандық бағалау құралы ретінде ипотекалық бағдарламалардың әлеуметтік әсерінің интегралды индексі (ISEN) әзірлеу және сынақтан өткізу, сондай-ақ макроэкономикалық, баға және институционалдық факторлардың Қазақстандағы тұрғын үйдің қолжетімділігіне және ипотекалық кредиттеудің әлеуметтік тиімділігіне әсерін айқындау. Осы жұмыста аталған мәселені шешу мақсатында мемлекеттік тұрғын үй саясаты шеңберінде өзара байланысты жобалар жиынтығы ретінде қарастырылатын ипотекалық бағдарламалардың әлеуметтік әсерінің интегралдық индексі (ISEN) әзірленіп, эмпирикалық тұрғыда апробацияланды. Индекс нақты халық табыстарын, тұрғын үй бағаларын, ипотекалық пайыздық мөлшерлемелерді, проблемалық берешек үлесін, тұрғын үймен қамтамасыз етілу деңгейін және даму институты әрі жобалық оператор ретіндегі «Отбасы банк» АҚ-ның нарықтағы үлесімен сипатталатын институционалдық факторды біріктіреді. Эмпирикалық талдау 2015–2024 жылдар деректері негізінде үш өңірлік кластер (Астана, Алматы және Қазақстанның басқа өңірлері) бойынша корреляциялық, регрессиялық және факторлық талдау әдістерін қолдану арқылы жүргізілді. Нәтижелер ипотекалық жобалардың әлеуметтік әсері ең алдымен халық табыстарының деңгейі мен тұрғын үй бағаларының динамикасымен айқындалатынын, сонымен қатар Отбасы банк жүзеге асыратын институционалдық үйлестірудің де статистикалық тұрғыдан маңызды рөл атқаратынын көрсетеді. Банк тұрғын үй жобалары портфелін басқаруда жүйекұраушы және контрциклдік функция атқарады. ISEN мәндерінің өңірлік конвергенциясының анықталуы орталықтандырылған жобалық басқарудың тұрғын үйге қолжетімділікті теңестірудегі және мемлекеттік бағдарламалардың әлеуметтік нәтижесінің тұрақтылығын арттырудағы тиімділігін растайды.

**Негізгі сөздер:** ипотекалық несиелеу, әлеуметтік әсер, Отбасы банк, жобалық басқару, тұрғын үйдің қолжетімділігі.

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#### **Information about authors:**

Javokhir Mukhamedov - **corresponding author**, PhD student, Al-Farabi Kazakh National University, Almaty, Republic of Kazakhstan

E-mail: [javokhir.mukhamedov@gmail.com](mailto:javokhir.mukhamedov@gmail.com)

ORCID: <https://orcid.org/0009-0003-8955-7840>

Tatyana Sokira – Candidate of Economic Sciences, Al-Farabi Kazakh National University, Associate Professor of the Department of Management, Almaty, Republic of Kazakhstan.

E-mail: [t\\_sokira@mail.ru](mailto:t_sokira@mail.ru)

ORCID:<https://orcid.org/0000-0002-4825-1189>

Zebo Kuldashaeva – Doctor of Sciences, Tashkent State University of Economics, Associate Professor of the World Economy and International Economic Relations, Tashkent, Uzbekistan.

E-mail: [z.kuldashaeva@tsue.uz](mailto:z.kuldashaeva@tsue.uz)

ORCID:<https://orcid.org/0000-0002-6367-2192>

Yerbolat Barlykov - Candidate of economics sciences, Associate Professor. Kazakh National Agrarian Research University, Almaty, Republic of Kazakhstan.

E-mail: [barlykov.yerbolat@kaznaru.edu.kz](mailto:barlykov.yerbolat@kaznaru.edu.kz)

ORCID:<https://orcid.org/0000-0002-2248-7310>

#### **Информация об авторах:**

Жавохир Мухамедов - **основной автор**, PhD докторант, Казахский национальный университет имени аль-Фараби, г. Алматы, Республика Казахстан.

E-mail: [javokhir.mukhamedov@gmail.com](mailto:javokhir.mukhamedov@gmail.com)

ORCID: <https://orcid.org/0009-0003-8955-7840>;

Сокира Татьяна Сергеевна – кандидат экономических наук, доцент кафедры «Менеджмента», Казахский национальный университет имени аль-Фараби, г. Алматы, Республика Казахстан.

E-mail: [t\\_sokira@mail.ru](mailto:t_sokira@mail.ru)

ORCID: <https://orcid.org/0000-0002-4825-1189>;

Зебо Кулдашева – доктор экономических наук, доцент кафедры «Мировой экономики и международных экономических отношений», Ташкентский государственный экономический университет, г. Ташкент, Республика Узбекистан.

E-mail: [z.kuldashaeva@tsue.uz](mailto:z.kuldashaeva@tsue.uz))

ORCID: <https://orcid.org/0000-0002-6367-2192>.

Ерболат Барлықов - кандидат экономических наук, и.о., ассоциированного профессора, Казахский национальный аграрный исследовательский университет, г.Алматы, Республика Казахстан.

E-mail: [barlykov.yerbolat@kaznaru.edu.kz](mailto:barlykov.yerbolat@kaznaru.edu.kz)

ORCID: <https://orcid.org/0000-0002-2248-7310>.

**Авторлар туралы мәлімет:**

Жавохир Мұхамедов – негізгі автор, PhD докторанты, әл-Фараби атындағы Қазақ ұлттық университеті Алматы қ., Қазақстан Республикасы

E-mail: [javokhir.mukhamedov@gmail.com](mailto:javokhir.mukhamedov@gmail.com)

ORCID: <https://orcid.org/0009-0003-8955-7840>

Татьяна Сокира – экономика ғылымдарының кандидаты, «Менеджмент» кафедрасының қауымдастырылған профессоры, әл-Фараби атындағы Қазақ ұлттық университеті, Алматы қ., Қазақстан Республикасы

E-mail: [t\\_sokira@mail.ru](mailto:t_sokira@mail.ru)

ORCID: <https://orcid.org/0000-0002-4825-1189>

Зебо Кулдашева – экономика ғылымдарының докторы, «Әлемдік экономика және халықаралық экономикалық қатынастар» кафедрасының доценті, Ташкент мемлекеттік экономикалық университеті, Ташкент қ., Өзбекістан Республикасы

E-mail: [z.kuldasheva@tsue.uz](mailto:z.kuldasheva@tsue.uz)

ORCID: <https://orcid.org/0000-0002-6367-2192>.

Ерболат Барлықов - экономика ғылымдарының кандидаты, «Х.Д. Чурин ат. Менеджмент және агробизнесті ұйымдастыру» кафедрасының қауымдастырылған профессор м.а., Қазақ ұлттық аграрлық зерттеу университеті, Алматы қ., Қазақстан Республикасы

E-mail: [barlykov.yerbolat@kaznaru.edu.kz](mailto:barlykov.yerbolat@kaznaru.edu.kz)

ORCID: <https://orcid.org/0000-0002-2248-7310>