

RESEARCH ARTICLE

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Determinants of Women's Entrepreneurship in Rural Kazakhstan: A Panel Data Analysis

**Medet
Konyrbekov¹**

**Makhabbat
Zhamkeyeva²**

**Meruyert
Baimoldayeva^{3*}**

¹ International Centre for Academic Research and Innovation, Almaty, Kazakhstan

² Kazakhstan Industry and Export Centre QazIndustry, Astana, Kazakhstan

³ Kazakh National Agrarian Research University, Almaty, Kazakhstan

Corresponding author:

* Meruyert Baimoldayeva – Cand. Sc. (Econ.), Associate Professor, Kazakh National Agrarian Research University, Kazakhstan. Email: meruert.kz.79@mail.ru

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Abstract

Women's entrepreneurship in rural areas is an important factor in diversifying the regional economy, increasing employment and reducing gender inequality, but its development in Kazakhstan is hampered by financial, institutional, infrastructural and social constraints. The aim of this study is to identify and assess the key institutional, financial, infrastructural, and human capital determinants of women's entrepreneurship development in rural Kazakhstan using regional panel data. The research methodology includes descriptive and correlational analyses, the construction of an integrated index of women's entrepreneurship, content analysis of regulatory and strategic documents, and the evaluation of panel regression models. The initial information base consisted of official statistical data for 17 regions of Kazakhstan for 2019-2024, including 102 panel observations, as well as materials from international organisations and 45 regulatory and strategic documents. The results showed that the average value of the integral index of women's entrepreneurship increased from 0.42 in 2019 to 0.58 in 2024. In the fixed-effects model, government support has a positive and statistically significant impact on the proportion of female managers of small and medium-sized businesses. A positive impact was also found for the proportion of women with higher education (coefficient: 0.523) and the infrastructure index (coefficient: 2.891). At the same time, the gross regional product per capita has lost statistical significance after accounting for regional fixed effects. The results obtained substantiate the need to develop gender-oriented financial instruments, digital infrastructure, entrepreneurial education, and regionally differentiated government support measures.

Keywords: Gender, Gender Equality, Women, Women Empowerment, Entrepreneurial Activity, Human Capital, Digital Infrastructure, Rural Development

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1. INTRODUCTION

Women's entrepreneurship is an important factor in economic development and social transformation, especially in developing countries, where gender disparities in women's participation in economic activities and access to entrepreneurial opportunities persist (Brush et al., 2009). In rural areas of Kazakhstan, the development of women-led entrepreneurship has significant potential to address a range of socio-economic challenges, including reducing poverty, improving food security, diversifying employment, and stabilising the demographic situation in peripheral regions (Acs et al., 2018). The agricultural sector, which remains the backbone of the economy of rural communities in Kazakhstan, requires expanding entrepreneurial activity beyond traditional agriculture and animal husbandry to include agro-processing, rural tourism, handicrafts, cooperation, and digital services (OECD, 2025).

The Republic of Kazakhstan demonstrates a consistent commitment to gender equality through constitutional provisions, ratification of international conventions, and implementation of government programs to empower women (UNDP, 2023). However, the transformation of legal and regulatory guarantees into real economic outcomes for rural women remains limited due to structural barriers related to sociocultural norms, institutional deficiencies, limited access to financial resources, and imperfect market infrastructure (Kelley et al., 2021). The spatial specificity of Kazakhstan's rural areas, characterised by significant distances, climate risks, and uneven development of transportation, digital, and social infrastructure, further complicates the conditions for female entrepreneurs seeking to establish and sustain their businesses (World Bank, 2023).

Current research on female entrepreneurship in Central Asia remains relatively limited. However, a significant portion of existing research focuses on urban entrepreneurship or employs macro-level

analysis, thereby failing to fully capture the regional and social diversity of rural women's experiences (Welter et al., 2019). This research gap is particularly relevant in the context of Kazakhstan's strategic goals outlined in the Kazakhstan-2050 Strategy and the Auyt-El Besigi Rural Development Program, which prioritise inclusive economic growth, human capital development, and improving the quality of life for the population in rural areas.

The aim of this study is to identify and assess the key institutional, financial, infrastructural, and human capital determinants of women's entrepreneurship development in rural Kazakhstan using regional panel data. The study aims to systematise the institutional, financial, social, and infrastructure barriers to women's entrepreneurship in rural areas, analyse the effectiveness of existing government support mechanisms, assess the impact of gender norms and cultural factors on women's entrepreneurial behaviour, and provide evidence-based recommendations for improving the enabling environment for rural women's entrepreneurship.

The underutilization of women's entrepreneurial potential is both a manifestation of gender inequality and a factor of economic inefficiency. In this regard, the development of targeted support mechanisms tailored to Kazakhstan's institutional and sociocultural characteristics is of particular importance (Smagulova et al., 2023).

2. LITERATURE REVIEW

The theoretical foundations of the study of women's entrepreneurship can be traced back to classical works in gender economics, human capital theory, and labour sociology. Becker (1981) laid the groundwork for understanding gender differences in economic activity through his theory of time allocation and specialisation within the household, demonstrating how the traditional division of roles between men and women affects their participation in market activities. Schultz (1964), in developing the concept of human capital, emphasised the importance of

investment in education and healthcare for economic development, a point directly relevant to the analysis of the barriers faced by women in the entrepreneurial field. Lewis (1954), within the framework of the dual-sector model, explained economic development through the gradual movement of surplus labour from the traditional agricultural sector to the more productive modern sector. This approach is relevant to the study of rural women's entrepreneurship because limited employment opportunities and low labour productivity in rural areas may encourage women to engage in entrepreneurial activity as an alternative source of income. Akerlof (1970) made an important contribution to understanding market imperfections, including discrimination in the labour and credit markets, which is particularly significant for women's access to financial resources.

In the context of entrepreneurship, Schumpeter's (1934) classic work on the innovative role of the entrepreneur and Kirzner's (1973) perspective on entrepreneurship through the identification and exploitation of market opportunities have provided a theoretical framework for analysing entrepreneurial activity. However, gender differentiation in entrepreneurship has only recently received systematic attention. Moore (1990) and Fischer et al. (1993) identified specific barriers faced by female entrepreneurs, including limited access to capital, industry segregation, discriminatory practices, and the high burden of unpaid domestic labour.

Modern research on female entrepreneurship has significantly expanded the theoretical and empirical tools in this field. Brush et al. (2009) proposed an integrative model of female entrepreneurship that considers the interaction of institutional, social, and individual factors. Avnimelech and Rechter (2023) found that women entrepreneurs face barriers in accessing entrepreneurial networks, mentorship, legitimacy, and financial capital, although participation in business accelerators can help reduce some of these constraints. Welter et al.

(2019), examining entrepreneurship in post-Soviet countries, highlighted the specific institutional barriers in transformational economies, including the influence of informal practices, administrative restrictions, and corruption risks.

A separate area of research concerns women's participation in the agricultural sector. Aguilar et al. (2015) examined gender differences in agricultural productivity in Ethiopia and identified disparities associated with access to productive resources, household characteristics, and agricultural inputs. Doss (2018) analysed gender differences in access to land resources, agricultural technologies, and productive assets, which are crucial for assessing women's opportunities in agricultural entrepreneurship. International organisations have also made significant contributions to shaping the research agenda. For example, the OECD's (2025) report on gender policy in Central Asia identified systemic barriers for women in entrepreneurship, while the World Bank's (2023) materials highlight the importance of digitalisation as a tool for reducing gender gaps in rural areas.

Kazakhstani researchers have also made significant contributions to the study of gender-related aspects of economic development. Niyazbekova and Brodunov (2020) analysed the development of the food industry and food security in Kazakhstan's regions, noting the gender-specific participation of the population in the agro-industrial complex. Zhaksybayeva (2023) examined institutional support for women entrepreneurs in Kazakhstan, focusing on government policies and local initiatives aimed at improving women's access to business development opportunities. Bogoviz et al. (2017) addressed the challenges of socio-economic inequality in their research on regional economics, including gender disparities in employment and entrepreneurial activity.

Onyusheva and Meyer (2020) addressed women's entrepreneurship in Kazakhstan, examining its development patterns, institutional barriers, and socioeconomic

prospects. Amanbayeva and Kossybayev (2019) analysed innovation activity in Kazakhstan's agricultural sector, while Dabkienė et al. (2025) highlighted gender-specific barriers that may limit women's participation in agricultural and technological innovation. In some studies of the labour market, gender segregation in the agricultural sector and the need for targeted support mechanisms for female entrepreneurs were highlighted.

Despite the growing scientific interest in this topic, a comprehensive analysis of the barriers and opportunities for female entrepreneurship in rural Kazakhstan remains underdeveloped. Existing studies tend to focus on specific aspects such as financial access, education, infrastructure, or employment, or adopt a macro-level approach without considering regional heterogeneity. In this regard, the present study aims to address this scientific gap by conducting an integrative analysis that combines institutional, economic, and sociocultural approaches to the study of women's entrepreneurship in rural areas of Kazakhstan.

3. METHODOLOGY

The present study is based on a comprehensive methodological approach that combines quantitative and qualitative data analysis, ensuring triangulation of results and increasing the reliability of the findings (Creswell & Plano Clark, 2017). To achieve the research objective, the methods of statistical analysis, index analysis, econometric modeling, content analysis of legal acts, and structural-functional analysis were used.

The study's empirical base includes official statistical data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of Kazakhstan for 2020-2024, materials from the International Monetary Fund (IMF, 2024), the World Bank (World Bank, 2023), the United Nations Development

Programme (UNDP, 2023), and national strategic and program documents.

Methods of descriptive statistics and index analysis were used to analyze the dynamics and structure of female entrepreneurship in rural areas. The study developed a comprehensive Gender Entrepreneurship Index (GEI), which includes four components: access to financial resources, education and business competencies, infrastructure availability, and socio-cultural barriers. The index is calculated using the following formula (1):

$$GEI_i = \sum_{j=1}^4 w_j \cdot I_{ij} \quad (1)$$

where:

GEI_i – the value of the gender entrepreneurship index for region i ;

w_j – the weight of the j -th component, determined by the analytic hierarchy process (Saaty, 1990);

I_{ij} – the normalised value of the j -th indicator for region i .

The component weights satisfy the condition shown in formula (2):

$$\sum_{j=1}^4 w_j = 1 \quad (2)$$

Normalisation of the indicators was carried out using the minimax method shown in formula (3):

$$I_{ij} = (X_{ij} - \min(X_j)) / (\max(X_j) - \min(X_j)) \quad (3)$$

where:

x_{ij} – the actual value of the indicator;

$\min(x_j)$ and $\max(x_j)$ – the minimum and maximum values of the corresponding indicator among all regions.

To identify the determinants of women's entrepreneurship development, we used panel regression on data from 17 regions of Kazakhstan for the period 2019-2024. The basic model specification is as follows (4):

$$Y_{it} = \alpha + \beta_1 GS_{it} + \beta_2 GDP_{it} + \beta_3 URB_{it} + \beta_4 EDU_{it} + \beta_5 HDI_{it} + \beta_6 INF_{it} + \mu_i + \varepsilon_{it} \quad (4)$$

where:

Y_{it} – the proportion of female heads of small and medium-sized businesses in rural areas of the region i per year t , %;

$\beta_1 GS_{it}$ – the volume of government support for SMEs per capita, thousand tenge;

$\beta_2 GDP_{it}$ – the gross regional product per capita, thousand tenge;

$\beta_3 URB_{it}$ – the level of urbanisation, %;

$\beta_4 EDU_{it}$ – the proportion of women with higher education, %;

$\beta_5 HDI_{it}$ – the human development index;

$\beta_6 INF_{it}$ – the infrastructure index;

μ_i – the individual effect of the region;

ε_{it} – the accidental error.

The study estimated three model specifications: pooled OLS, assuming the absence of individual regional effects; a fixed effects model (Fixed Effects, FE), allowing for unobserved heterogeneity of regions; and a dynamic specification with a lagged dependent variable, considering the inertia of the processes of women's entrepreneurship development (Wooldridge, 2010), shown in formula (5):

$$Y_{it} = \alpha + \rho Y_{i,t-1} + \beta_1 GS_{it} + \beta_2 GDP_{it} + \beta_3 URB_{it} + \beta_4 EDU_{it} + \beta_5 HDI_{it} + \beta_6 INF_{it} + \mu_i + \varepsilon_{it} \quad (5)$$

To test the robustness of the results, the Hausman test is used to select between fixed-effect and random-effect models, and the Wald test is used to assess the joint significance of the regressors.

The qualitative component of the study aims to gain a deeper understanding of the institutional and sociocultural barriers that limit the development of women's entrepreneurship in rural areas. To do this, a content analysis of 45 legal acts and strategic documents was conducted, along with an analysis of secondary data from empirical studies conducted in rural areas of Kazakhstan in 2020-2024 (UN Women, 2022; OECD, 2025). Structural-functional analysis was used to assess the alignment between the stated goals of government programs and the mechanisms and outcomes achieved.

The main limitation of the study is the lack of disaggregated data by gender at the district and rural district levels, which necessitated regional-level aggregation. In addition, the qualitative analysis is based primarily on secondary data, which limits the depth of interpretation of individual female entrepreneurs' strategies. However, the combination of quantitative and qualitative approaches provides a comprehensive understanding of the factors, barriers, and opportunities for the development of female entrepreneurship in rural Kazakhstan.

4. ANALYSIS AND RESULTS

This section presents the results of an empirical analysis of the factors influencing the development of women's entrepreneurship in rural Kazakhstan. The analysis is structured sequentially, starting with a descriptive analysis of the variables and their interregional differentiation, followed by a correlation analysis of key indicators, and then moving on to a dynamic analysis of the comprehensive gender entrepreneurship index and panel econometric modeling. This approach not only reveals general trends but also identifies the factors that have the most significant impact on the representation of women in the management of small and medium-sized enterprises in rural areas.

The data cover 17 regions of the Republic of Kazakhstan for the period 2019-2024, which is 102 observations in the panel sample. The average share of female heads of small and medium-sized enterprises in rural areas is 38.4%. At the same time, there is significant interregional variation: the minimum value was recorded in Western Kazakhstan at 28.1% in 2019, while the maximum was recorded in North Kazakhstan and Kostanay at 47.6% in 2023. The standard deviation of 6.2 percentage points indicates the significant heterogeneity of regional conditions for the development of women's entrepreneurship.

The average per capita amount of government support for SMEs in rural areas is 12.3 thousand tenge. However, the distribution of this indicator by region remains highly uneven: in the Almaty region, it exceeds 21,500 tenge, while in the Zhambyl region, it does not reach 7,800 tenge. The GDP per capita ranges from 2.1 million to 8.7 million tenge, reflecting differences in the region's economic bases. The level of urbanisation remains

relatively stable at an average of 42.3%. At the same time, the share of women with higher education is increasing, from 18.4% in 2019 to 22.7% in 2024. This indicator is positively correlated with the growth of the share of female SME managers, with a Pearson correlation coefficient of 0.67, which is statistically significant at the 1% level. The empirical analysis begins with descriptive statistics of key variables, presented in Table 1.

Table 1. Descriptive statistics of variables (N = 102)

Variable	Average	Standard deviation	Minimum	Maximum
Share of female SME managers, % (Y)	38,42	6,23	28,10	47,60
State support for SMEs, thousand tenge/person (GS)	12,34	4,18	7,80	21,50
GDP per capita, million tenge (GDP)	4,56	1,89	2,10	8,70
Urbanization rate, % (URB)	42,31	8,45	28,50	61,20
Share of women with higher education, % (EDU)	20,15	3,12	15,20	26,80
Human Development Index (HDI)	0,72	0,08	0,58	0,89
Infrastructure Index (INF)	0,54	0,15	0,31	0,82

Note: compiled by the authors

The strongest positive correlation is observed between the proportion of female SME managers and the amount of government support ($r = 0.74$), and between the dependent variable and the infrastructure index ($r = 0.69$). GDP per capita shows a moderate positive correlation with the development of women's entrepreneurship ($r = 0.52$), whereas urbanisation shows a negative association ($r = -0.31$). The latter reflects the specifics of rural areas, where a higher level of urbanisation may be accompanied by an outflow of women's entrepreneurial potential to urban centres.

Interregional differences in the correlation structure are also significant. In Northern Kazakhstan, the correlation between government support and the share of female managers is 0.89, whereas in Southern Kazakhstan it is only 0.43. This indicates that

the effectiveness of institutional support mechanisms varies with regional context, levels of infrastructure development, and socio-cultural conditions. In 2019, the average index value in Kazakhstan was 0.42, indicating a relatively low level of development of women's entrepreneurship in rural areas. By 2024, this indicator had increased to 0.58, indicating a positive trend. Despite overall growth, interregional disparities persist.

The pairwise correlation matrix in Table 2 reveals statistically significant relationships between the dependent variable and most explanatory factors.

The most significant increase in GEI was recorded in the Akmola Region (+0.21) and the Almaty Region (+0.19). This trend may be related to the implementation of regional programs to support women's entrepreneurship

Table 2. Pearson's Pairwise Correlation Matrix

Code	Y	GS	GDP	URB	EDU	HDI	INF
Y	1,00						
GS	0,74***	1,00					
GDP	0,52***	0,48***	1,00				
URB	−0,31**	−0,22*	0,15	1,00			
EDU	0,67***	0,58***	0,41***	−0,18	1,00		
HDI	0,61***	0,55***	0,63***	0,12	0,71***	1,00	
INF	0,69***	0,62***	0,51***	−0,08	0,49***	0,58***	1,00

*, **, *** - statistical significance at the 10%, 5%, and 1% levels

Note: compiled by the authors

the development of agro-tourism infrastructure, and the expansion of women's access to educational and advisory services. In contrast, the index remains consistently low in the Mangystau and Atyrau Regions, ranging from 0.35 to 0.38. This is due to the dominance of extractive industries, limited diversification of agricultural specialisation, and insufficient institutional support for women entrepreneurs. An analysis of the GEI components shows that

improvements in access to education and business competencies contribute the most to the index's growth. At the same time, the infrastructure accessibility component shows the lowest dynamics, indicating persistent infrastructure deficits as a key constraint on the development of women's entrepreneurship in rural areas.

Table 3 shows the dynamics of the GEI by regions of Kazakhstan.

Table 3. Dynamics of the GEI by regions of Kazakhstan

Region	2019	2021	2024	Growth, 2019–2024
Akmola	0,45	0,52	0,66	+0,21
Aktobe	0,38	0,43	0,51	+0,13
Almaty	0,48	0,56	0,67	+0,19
Atyrau	0,33	0,35	0,38	+0,05
East Kazakhstan	0,41	0,47	0,55	+0,14
Zhambyl	0,39	0,44	0,52	+0,13
West Kazakhstan	0,36	0,40	0,46	+0,10
Karaganda	0,40	0,46	0,54	+0,14
Kostanay	0,44	0,50	0,61	+0,17
Kyzylorda	0,37	0,42	0,49	+0,12
Mangystau	0,32	0,34	0,36	+0,04
Pavlodar	0,42	0,48	0,57	+0,15
North Kazakhstan	0,46	0,53	0,64	+0,18
Turkestan	0,43	0,49	0,58	+0,15
Kazakhstan, average value	0,42	0,48	0,58	+0,16

Note: compiled by the authors

In the Pooled OLS specification, the coefficient for the government support variable (GS) is 0.847 and is statistically significant at the 1% level. This indicates a positive association between increased funding for SME support programs and the growth of female leadership.

However, the Pooled OLS model assumes regional homogeneity, which does not reflect Kazakhstan's actual interregional structure. The significance of the F-test for the joint significance of the regional dummy variables ($F = 14.32$; $p < 0.001$) confirms the need to consider regional specifics. The fixed effects

(FE) model, which accounts for unobserved regional heterogeneity, shows a higher coefficient on the GS variable, which is significant at the 5% level. This means that an increase in government support of 1,000 tenge per capita is associated with a 2.67 percentage-point increase in the share of female SME managers, controlling for regional characteristics.

When interpreting this result, it is important to consider the potential endogeneity: regions with a higher share of female entrepreneurs may receive more government support, which

could create a reverse causal relationship. To partially adjust for this effect, we used a dynamic specification with a lagged dependent variable. In this model, the coefficient for GS is reduced to 1.834 but remains statistically significant at the 5% level, confirming the stability of the main conclusion about the positive impact of government support. The panel regression results presented in Table 4 confirm the significant impact of government support on the development of women's entrepreneurship in rural areas.

Table 4. Panel regression results

Variable	Pooled OLS	Fixed Effects	The dynamic model
Constant	12,456*** (3,21)	8,734** (2,45)	5,123* (1,89)
Government support (GS)	0,847*** (4,12)	2,671** (2,38)	1,834** (2,15)
GDP per capita (GDP)	1,234** (2,56)	0,412 (0,87)	0,356 (0,76)
Urbanization rate (URB)	-0,156** (-2,34)	-0,089 (-1,12)	-0,067 (-0,89)
Share of women with higher education (EDU)	0,678*** (3,89)	0,523** (2,41)	0,489** (2,28)
Human Development Index (HDI)	2,345 (1,56)	1,876 (1,23)	1,654 (1,11)
Infrastructure index (INF)	3,456*** (4,67)	2,891*** (3,45)	2,456** (2,67)
Lagged dependent variable (Y_{t-1})	—	—	0,312** (2,34)
R ²	0,62	0,78	0,81
Number of observations	102	102	85
F-test	18,45***	22,13***	24,56***
Hausman test	—	18,76***	—

*, **, *** - statistical significance at the 10%, 5%, and 1% levels

Note: compiled by the authors

A comparison of the specifications reveals an important feature. In the Pooled OLS model, the GRP per capita variable exhibits a positive and statistically significant coefficient (1.234; significant at the 5% level). However, in the fixed-effects specification, this variable is no longer statistically significant (0.412; $t = 0.87$). This suggests that the impact of macroeconomic welfare on female entrepreneurship in rural areas is mediated by regional institutional factors rather than being solely determined by income levels. After controlling regional heterogeneity, targeted support mechanisms and infrastructure accessibility play a key role, whereas overall economic growth does not.

The level of urbanisation has a negative and statistically significant impact on the Pooled OLS specification (-0.156), which confirms the hypothesis of an outflow of entrepreneurial potential to urban centres. However, in the fixed effects model, the significance of this indicator disappears. This indicates that the identified effect is primarily driven by interregional differences rather than intraregional dynamics.

The share of women with higher education demonstrates a steady positive effect in all specifications. The coefficient is 0.678 in the Pooled OLS model, 0.523 in the fixed-effects model, and 0.489 in the dynamic model, all remaining significant at the 5% level. This

confirms the critical role of human capital in the development of women's entrepreneurship, as a 1% increase in women's educational attainment is associated with a 0.5-0.7% increase in their representation in SME management.

The infrastructure index has the strongest impact among all the regressors. Its coefficient is 3.456 in the Pooled OLS model, 2.891 in the fixed effects model, and 2.456 in the dynamic model. This indicator is statistically significant at the 1% level in the first two specifications and at the 5% level in the dynamic model. The result highlights that access to transport, energy, and digital infrastructure is a fundamental condition for women's entrepreneurial activity in rural areas, where physical distances and logistical costs traditionally limit market access.

The Human Development Index does not achieve statistical significance in any specification. This may be due to multicollinearity with the education variable, as the correlation coefficient between HDI and EDU is 0.71. After controlling for educational level, the additional effect of the composite development index is no longer statistically significant.

The Hausman test ($\chi^2 = 18.76$; $p < 0.001$) rejects the null hypothesis of the preference of the random effects model in favour of the fixed effects model. This confirms the need to take regional specifics into account when analysing the factors in the development of female entrepreneurship. The coefficient for the lagged dependent variable in the dynamic model is 0.312 and is significant at the 5% level. Consequently, the development of women's entrepreneurship exhibits moderate inertia: the current level of women's entrepreneurial activity depends on the previous state, reflecting the gradual nature of institutional changes, the accumulation of human capital, and the formation of entrepreneurial networks.

An additional analysis of the impact of individual components of the infrastructure index shows that the digital infrastructure component, measured by the share of rural

households with broadband internet access, has the strongest correlation with the dependent variable. The correlation coefficient is 0.73 and is significant at the 1% level. The transport accessibility component, which reflects the density of paved roads, shows a correlation of 0.58, while energy accessibility shows a correlation of 0.49. These results underscore the importance of digitalisation as a tool to overcome spatial barriers for female entrepreneurs in rural areas.

An analysis of the structural changes in female entrepreneurship over the period 2019-2024 reveals a significant transformation in sectoral specialisation. The share of female managers in the agro-processing sector increased from 12.3% in 2019 to 18.7% in 2024, in rural tourism from 3.1% to 7.4%, in handicraft production from 8.5% to 11.2%. On the contrary, the share of traditional trade and catering decreased from 45.2% to 38.6%. This indicates a gradual diversification of women's entrepreneurial activities beyond low-margin sectors.

This structural shift is accompanied by an increase in the average income of female entrepreneurs from 1.2 million tenge in 2019 to 1.8 million tenge in 2024, in real terms, adjusting for inflation. The average annual growth rate was 8.4%. At the same time, income inequality remains significant: the income variation coefficient is 0.42, and the difference between the 90th and 10th percentiles is 4.3 times, exceeding the corresponding indicator for male entrepreneurs, which is 3.1 times.

Gender differences in access to financial resources are confirmed by the analysis of lending data. The average loan amount issued to female entrepreneurs in rural areas is 3.2 million tenge, compared to 5.8 million tenge for men. At the same time, the approval rate for women is 12 percentage points lower: 34% versus 46%.

5. DISCUSSION

The results confirm that the development of women's entrepreneurship in rural Kazakhstan

is determined not by a single factor but by the combined influence of human capital, government support, infrastructure, access to finance, and the regional institutional environment. In general, the study's findings are consistent with the theoretical provisions of Becker (1981) on the influence of the distribution of roles in the household on women's economic activity, as well as with the concept of human capital by Schultz (1964), according to which education increases women's economic opportunities.

The negative correlation between the level of urbanisation and the share of female SME managers in rural areas ($r = -0.31$) suggests that increased urbanisation may be accompanied by an outflow of skilled female labour to urban centres. However, the consistent positive impact of the education variable in all regression specifications indicates that education is an important resource for women who remain in rural areas. The EDU coefficient in the fixed-effects model is 0.523 and statistically significant at the 5% level, confirming the role of human capital in the development of women's entrepreneurship.

The results of the panel regression also confirm the findings of Brush et al. (2009) about the integrative nature of women's entrepreneurship. The positive and significant coefficient for the government support variable in the fixed-effects model (2.671; $p < 0.05$) indicates the importance of institutional support mechanisms. However, the effectiveness of these mechanisms varies significantly across regions, with correlations ranging from 0.43 in the south to 0.89 in the north. This supports the finding by Welter et al. (2019) that formal support measures are only effective in a favourable regional environment, which includes trust, entrepreneurial networks, access to information, and developed infrastructure.

The loss of statistical significance of the GRP per capita variable after accounting for regional fixed effects indicates that a region's overall level of economic development does not guarantee the expansion of women's entrepreneurship. Targeted support programs,

infrastructure accessibility, and distribution mechanisms within local communities play a more significant role. Therefore, government programs for SME development should be complemented by gender-sensitive tools, such as specialised counselling, grants, training, mentoring, and support for women entrepreneurs.

An analysis of structural shifts shows that women's entrepreneurship is gradually diversifying. The share of female executives in agro-processing has increased from 12.3% to 18.7%, in rural tourism from 3.1% to 7.4%, and in handicraft production from 8.5% to 11.2%. This indicates the expansion of women's entrepreneurial opportunities beyond traditional trade and catering. However, women's access to capital-intensive, export-oriented segments remains limited, indicating the persistence of structural barriers.

Unequal access to financial resources remains a significant challenge. The average loan size for female entrepreneurs in rural areas is 3.2 million tenge, compared to 5.8 million tenge for men, and the approval rate for women's applications is 12 percentage points lower. At the same time, the loan repayment rate for women is higher: 97.2% versus 93.8% for men. This indicates that the banking sector is underutilising women's entrepreneurial potential and that there is a need to improve credit-scoring models by incorporating gender-disaggregated data.

Digital infrastructure plays a crucial role. The correlation between rural households' access to broadband internet and the proportion of female SME managers is 0.73, the highest among the infrastructure components. For rural women, digital platforms reduce transportation and time costs, and provide access to markets, financial services, education, and counselling. Therefore, the digitalisation of the rural economy should be viewed not only as a technological process, but also as a tool for gender inclusion.

The interregional differentiation of the results confirms the significance of the structural features of the regional economy. Higher GEI values in the Akmola and Almaty

regions (0.66–0.67) contrast with lower values in the Mangystau and Atyrau regions (0.35–0.38). Regions with diversified agricultural specialisation and developed infrastructure create more favourable conditions for female entrepreneurs than monoprofile mining regions.

Thus, the development of women's entrepreneurship in rural Kazakhstan requires a shift from universal support measures to more targeted, gender-sensitive, and regionally adapted tools. The most promising areas include developing digital infrastructure, expanding women's access to financing, enhancing educational and entrepreneurial capabilities, and fostering sustainable women's entrepreneurial networks in rural areas.

6. CONCLUSION

The study of women's entrepreneurship in rural areas of the Republic of Kazakhstan revealed key factors, barriers, and areas for further development of this sector. The analysis shows that women's entrepreneurship in rural areas is growing, with the comprehensive gender entrepreneurship index increasing from 0.42 in 2019 to 0.58 in 2024. However, the remaining interregional disparities indicate that the current level of development is insufficient to fully realise women's entrepreneurial potential and achieve sustainable development goals.

The econometric analysis confirmed a statistically significant positive impact of state support for small and medium-sized businesses on the share of female managers in SMEs. In the fixed-effects model, the coefficient for the state support variable was 2.671 and was significant at the 5% level. This suggests that targeted support measures can increase women's participation in entrepreneurship, but their effectiveness depends on the regional institutional context, the level of infrastructure development, and the availability of support services.

An important finding of the study is the confirmation of the role of human capital. The share of women with higher education shows a

steady positive effect across all model specifications, underscoring the importance of investing in women's education, training, and entrepreneurial skills. Additionally, infrastructure accessibility, particularly digital infrastructure, plays a crucial role in promoting women's entrepreneurship by addressing geographical barriers, transportation limitations, and limited mobility for rural women.

However, the study also reveals the persistence of systemic financial barriers. Women entrepreneurs receive smaller loan sizes than men, despite having higher levels of credit discipline. This indicates institutional and behavioural constraints in the financial sector, as well as the underutilization of women's entrepreneurial potential by banks and other lending institutions.

The analysis of the sectoral structure showed that women's entrepreneurship is gradually diversifying. There is an increase in women's participation in agro-processing, rural tourism, and handicraft production. However, access to capital-intensive and export-oriented segments remains limited. This indicates the need to shift from general support for women's entrepreneurship to more targeted mechanisms focused on business scaling, productivity enhancement, and women's integration into more complex value chains.

Based on the findings, several policy recommendations can be formulated. Firstly, it is advisable to implement gender-sensitive mechanisms for allocating grants, subsidies, and concessional loans within SME support programs, particularly in rural areas. Secondly, it is necessary to develop specialised credit products for women entrepreneurs with adapted collateral requirements, considering women's limited access to land and property assets. Thirdly, the accelerated development of digital infrastructure in rural areas, including broadband Internet, mobile payment systems, electronic trading platforms and digital educational platforms, should be a priority.

In addition, the institutionalisation of mentoring and business education programs for women in rural areas is required. Such

programs should focus on developing financial literacy, digital competencies, and skills in agribusiness management, marketing, and market entry. It is also important to create a system to regularly monitor the gender dimensions of agricultural and entrepreneurial policies, with mandatory disaggregation of statistical data by gender, region, industry, and type of settlement.

The practical significance of the study lies in the fact that its results can be used to develop government programs that support small and medium-sized businesses, rural development, gender equality, and the digitalisation of the agricultural economy. The proposed measures aim to create a more inclusive entrepreneurial environment in which women can not only

establish small businesses but also scale them up, increase their profitability, and contribute to the development of the regional economy.

Further research prospects include conducting micro-level surveys of female entrepreneurs in rural areas, which will enable a deeper understanding of individual strategies, motivations, and barriers to entrepreneurship. A comparative analysis of women's entrepreneurship in rural areas of Central Asian countries, a study of the impact of climate change on women's agricultural entrepreneurship, and an analysis of the role of migration, remittances, and digital platforms in shaping women's entrepreneurial potential are also relevant.

AUTHOR CONTRIBUTION

Writing – original draft: Medet Konyrbekov, Makhabbat Zhamkeyeva.

Conceptualization: Medet Konyrbekov, Makhabbat Zhamkeyeva.

Formal analysis and investigation: Medet Konyrbekov, Makhabbat Zhamkeyeva.

Development of research methodology: Medet Konyrbekov, Meruyert Baimoldayeva.

Resources: Medet Konyrbekov, Makhabbat Zhamkeyeva.

Software and supervision: Meruyert Baimoldayeva.

Data collection, analysis, and interpretation: Medet Konyrbekov, Makhabbat Zhamkeyeva, Meruyert Baimoldayeva.

Visualization: Makhabbat Zhamkeyeva, Meruyert Baimoldayeva.

Writing – review and editing: Medet Konyrbekov, Meruyert Baimoldayeva.

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AUTHOR BIOGRAPHIES

Medet Konyrbekov – PhD, Associate Professor, International Centre for Academic Research and Innovation, Almaty, Kazakhstan. Email: konyrbekov.m@gmail.com, ORCID ID: <https://orcid.org/0000-0001-5459-5167>

Makhabbat Zhamkeyeva – PhD, Kazakhstan Industry and Export Centre QazIndustry, Astana, Kazakhstan. Email: zh.makhabbat@mail.ru, ORCID ID: <https://orcid.org/0000-0003-4465-4754>

***Meruyert Baimoldayeva** – Cand. Sc. (Econ.), Associate Professor, Kazakh National Agrarian Research University, Almaty, Kazakhstan. Email: meruert.kz.79@mail.ru, ORCID ID: <https://orcid.org/0000-0002-8189-4338>