

RESEARCH ARTICLE

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Gender Pay Gap in Kazakhstan: The Impact of Social Factors and Structural Segregation

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EJGS**Abstract**

The gender pay gap remains a salient manifestation of social inequality and poses a significant barrier to attaining gender equality in the labour market. This study examines the structural, social, and institutional factors that influence the gender pay gap in Kazakhstan from 2013 to 2023. Based on a structural-dynamic macroeconomic approach, the research integrates descriptive analysis, correlation and regression modelling, and PESTEL analysis. The results show that the gender pay gap in Kazakhstan decreased from 32.2% in 2013 to 25.7% in 2023, with the lowest value recorded at 21.7% in 2021. A strong negative correlation was identified between the share of women with higher education and the gender pay gap ($r = -0.71$), confirming education as a primary factor in reducing inequality. The regression analysis also confirmed the significant impact of employment segregation: a high concentration of women in low-paid sectors, particularly trade (TradeRatio coefficient +2.27, $p \approx 0.064$), substantially contributes to maintaining the pay gap. Meanwhile, the unemployment rate among women showed a positive correlation with the gender gap ($r = +0.52$), though it was not statistically significant in the regression model. The PESTEL analysis highlights additional barriers, including insufficient institutionalisation of equal pay control mechanisms, entrenched social norms regarding female professions, limited access to high-tech and green sectors, and weak transparency in wage systems. Future research directions include micro-level analysis of individual factors and regional disparities, as well as the effects of digitalisation and flexible employment on gender pay equality.

Keywords: Structural Segregation, Education, Unemployment, Labour Market, Gender Policy, Gender Equality

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1. INTRODUCTION

Gender equality in the labour market is one of the most crucial tasks for sustainable socio-economic development and a key element of social justice in modern society. Despite significant achievements in the formal provision of equal rights and opportunities, the gender pay gap remains one of the most persistent and difficult-to-eliminate manifestations of economic inequality. This gap is not only an indicator of the income imbalance between men and women, but also reflects deeper structural and social barriers that exist in the labour market.

According to the OECD (2023), the gender pay gap persists in many countries worldwide, including those with developed legislation in the fields of gender equality and social policy. In Kazakhstan, this issue is becoming particularly relevant, given the country's transition to new socio-economic development models and its commitments under international agreements. Kazakhstan has ratified the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and approved several strategic documents aimed at reducing gender inequality, including the Concept of Gender and Family Policy for the period up to 2030.

Nevertheless, data from the Bureau of National Statistics of the Republic of Kazakhstan indicate that the actual wage gap between men and women remains significant. In 2023, women earned an average of 25% less than men, indicating a continuing structural and institutional imbalance in the labour market. Moreover, an analysis of the dynamics of this indicator over the past decade reveals that, despite a positive trend towards narrowing the gap, its absolute level remains high.

In recent years, research attention has shifted increasingly from studying individual factors of inequality, such as differences in education or seniority, to a more comprehensive analysis of structural, social, and institutional factors that affect the gender

pay gap. International Studies (Rubery & Grimshaw, 2015; UN Women, 2023; Blau, 2025) confirm that a significant part of the gap is caused not only by differences in the characteristics of employees, but also by the peculiarities of the labor market structure, gender stereotypes, uneven distribution of family responsibilities, as well as weak legal and institutional mechanisms aimed at ensuring equal pay.

Structural segregation of employment plays a particularly significant role in perpetuating the gender gap. In Kazakhstan, women continue to concentrate in sectors such as education, healthcare, and trade, industries characterised by lower wages and limited career opportunities (Kireyeva & Kenzheali, 2024; Nyussupova et al., 2023). At the same time, women's access to high-tech and capital-intensive sectors remains significantly limited. This is confirmed by both the data from national statistics and the results of the analysis of the sectoral structure of employment conducted within the framework of this study.

Social and cultural norms are equally important factors. In Kazakhstan, as in several other countries with economies in transition, traditional patterns of family responsibilities remain stable, which limits women's participation in full-time employment and reduces their opportunities for professional development. The insufficient accessibility of childcare infrastructure, weak work-life balance support, and limited opportunities for flexible employment exacerbate this problem (Kireyeva & Satybaldin, 2019; Altuzarra et al., 2022; Nyussupova et al., 2023).

Institutional factors also play an important role. Despite the existence of a fundamental legal framework and international obligations, the mechanisms for implementing equal pay standards in Kazakhstan remain weak. The lack of transparent labour evaluation systems, limited judicial practice in discrimination cases, and weak trade union activity of women contribute to the reproduction of informal discriminatory practices.

At the same time, positive trends have been observed in recent years. The proportion of women with higher education in Kazakhstan is steadily growing, which expands their professional opportunities. The development of the digital economy opens up new forms of employment that can help reduce the gap. However, as international research data and the results of this analysis demonstrate, improving the level of education alone is insufficient to close the gender gap; sustainable progress is impossible without overcoming structural and social barriers.

There are still very few case studies in Kazakhstan that integrate all these aspects. Most existing work is either limited to cross-sectional analysis for individual years or focuses mainly on the individual characteristics of employees, without considering the structural and institutional aspects.

This paper fills this gap by employing a structural-dynamic macroeconomic approach and conducting a comprehensive analysis based on data for the period 2013-2023. The study combines methods of descriptive analysis, correlation and regression modelling, and PESTEL analysis, providing a comprehensive understanding of the formation of the gender pay gap in Kazakhstan.

The purpose of this study is to assess the multifaceted impact of structural, social, and institutional factors on the dynamics of the gender pay gap in Kazakhstan from 2013 to 2023, as well as to identify the principal barriers and potential drivers for its reduction under current socio-economic conditions.

2. LITERATURE REVIEW

The gender pay gap remains a significant topic in contemporary scientific discourse, both within the framework of social economics and in research on labour market policy and gender equality. The wage gap between men and women is not only an integral indicator of economic inequality but also a marker of the effectiveness of implementing equal opportunity principles in national labour

markets.

According to the OECD definition (2023), the gender pay gap is interpreted as the difference between the average earnings of men and women, expressed as a percentage of the average earnings of men. It is noteworthy that this indicator demonstrates stability even in countries with developed legislation in the field of equality, which highlights the complex nature of this phenomenon, due to both the objective characteristics of workers and institutional, social and cultural mechanisms.

In the scientific literature, the study of the determinants of the gender pay gap is grounded in several theoretical approaches. One of the fundamental theories is the theory of human capital (Becker, 1971), which explains differences in wages by differences in the amount of accumulated human capital, specifically, the level of education, qualifications, and professional experience. According to this approach, lower wages for women can be explained, in particular, by the fact that women, on average, are more likely to interrupt professional activities due to family responsibilities and have less seniority, which creates differences in economic remuneration. However, numerous empirical studies demonstrate that even when the level of education and experience is controlled, a significant portion of the gap remains unexplained (Paul et al., 2022; Kruse et al., 2022).

An important explanatory factor is the segregation of labour, horizontal and vertical (Arora et al., 2022; Zheng & Weeden, 2023). Horizontal segregation manifests itself in the concentration of women in industries with relatively low wages (education, healthcare, trade), while vertical segregation results in limited career opportunities for women (a glass ceiling), which reduces the likelihood of their reaching higher income levels even in “female” sectors of the economy.

Additionally, international research highlights the role of institutional barriers and implicit bias. As noted by Rubery & Grimshaw (2015), the mechanisms of institutional reproduction of inequality include insufficient

transparency of payment systems, weak mechanisms for monitoring compliance with equal pay standards, and limited prevalence of job evaluation practices. This contributes to the preservation of informal discrimination practices even in conditions of formally equal rights.

Social and cultural norms also significantly contribute to the perpetuation of the gap. Alesina et al. (2013) emphasise that persistent stereotypes regarding male and female professions, as well as the traditional distribution of family responsibilities, form an institutional environment that restricts women's participation in higher-paying sectors of the economy. Additionally, the unbalanced distribution of family responsibilities reduces women's willingness to fully participate in work and professional competition.

Global practice indicates that, despite advanced legislation, the actual gender pay gap persists. Thus, Blau & Kahn (2017) show that in the USA in 2015, the unexplained part of the gap was 38%. In OECD countries, the gap ranges from 5% (Belgium) to more than 30% (Korea) (OECD, 2023), mainly due to differences in the sectoral structure of employment and the effectiveness of institutional controls.

Nieto-Aleman et al. (2025) note that high flexibility of working hours and the development of work-life balance practices are factors contributing to reducing the gender gap. On the contrary, a high degree of horizontal segregation and weak enforcement mechanisms (especially in the private sector) support the existing income differentiation based on gender.

Special attention in international studies is paid to countries with economies in transition, where the institutional maturity of law enforcement is lower and the influence of social stereotypes is more pronounced. In the context of Kazakhstan, research on the gender pay gap is still in its early stages of development. Research data (Meurs et al., 2021; Bekbossinova, 2024; Kireyeva et al., 2025) indicate that women in Kazakhstan earn, on average, 25-30% less than men. At the same

time, the educational level of women consistently exceeds that of men, which confirms the presence of an unexplained part of the gap.

At the same time, the structure of women's employment exhibits a pronounced horizontal segregation, with women predominating in fields such as education, healthcare, and trade, which are characterised by relatively low wages. Their representation remains extremely low in high-tech and capital-intensive industries. According to a study by Yemelina et al. (2024), approximately 50% of the gap is attributed to the sectoral structure of employment, while the remaining 50% is related to institutional barriers and social stereotypes.

It should be noted that Kazakh literature has not been sufficiently studied in terms of aspects such as the influence of social factors (for example, stereotypes and the role of the family), as well as the dynamics of the long-term gender gap. Based on the analysis of existing literature, it becomes apparent that the study of the gender pay gap in Kazakhstan faces several significant limitations, both theoretical and empirical (Khamzina et al., 2021; UN Women, 2023). Firstly, the mechanisms by which structural segregation impacts employment dynamics and the institutional barriers that hinder the effective implementation of equal pay principles have not been sufficiently studied. A significant gap remains in the weak elaboration of the social component of the problem, in particular, the role of gender stereotypes and the distribution of family responsibilities in the reproduction of inequality. In addition, most studies are cross-sectional in nature and do not account for long-term changes, which limits our understanding of sustainable trends and their underlying factors. The lack of an integrated approach that combines structural, social, and institutional factors highlights the need for a systematic analysis based on dynamic data.

Based on the review of the scientific literature and the identified empirical patterns, the following hypotheses are formulated in the framework of this study:

H1. Increasing the level of education of women (the proportion of women with higher education) helps to reduce the gender pay gap.

H2. An increase in the unemployment rate among women leads to an increase in the gender pay gap by increasing their economic vulnerability.

H3. The structural segregation of women's employment has a significant impact on the level of the gender gap: the high proportion of women in low-paid industries contributes to its increase.

3. METHODOLOGY

This study employs a structural and dynamic macroeconomic approach to analyse long-term trends in the gender wage gap in Kazakhstan, as well as to identify the impact of several key structural factors, including the sectoral structure of women's employment, education level, and unemployment rate. The use of time series for the period 2013–2023 enables not only the determination of the current levels of the gap, but also to track the dynamics of its changes, as well as to identify stable relationships between the main factors.

To ensure the consistency of the analysis and transparency of the research logic, a consistent structure of work stages was built (see Figure 1), including both quantitative and qualitative methods of analysis.

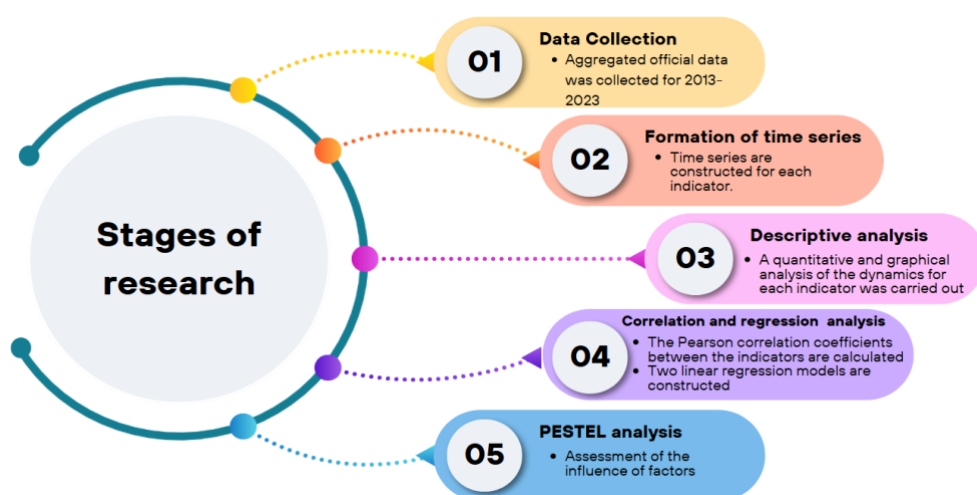


Figure 1. Stages of the study

Stages of research

1. Data collection

At the first stage of the study, aggregated official data were collected from open sources for the period 2013–2023. The primary data source was the Bureau of National Statistics of the Republic of Kazakhstan, which provided comprehensive and comparable time series for the primary labour market indicators. The dataset included information on the average salaries of men and women across the economy, enabling the calculation of the gender pay gap, the sectoral distribution of

female employment in major economic sectors, gender-specific unemployment rates, and educational attainment levels, measured by the proportion of men and women with higher education. This rich dataset formed the empirical foundation for the subsequent structural-dynamic, correlation-regression, and PESTEL analyses conducted within the study.

2. Formation of time series

At this stage, the necessary time series indicators were systematically constructed to enable comprehensive analysis. The gender pay gap was calculated as the percentage

difference between the average salaries of men and women, relative to the average male salary, providing a standardised measure of income inequality. Parallel series were formed to capture the unemployment rates separately for men and women, allowing for the analysis of gender-differentiated labour market dynamics. In addition, sectoral employment profiles were developed by calculating the share of women employed in five main sectors of the economy—industry, wholesale and retail trade, financial and insurance activities, education, and healthcare and social services, thus reflecting the extent of horizontal labour market segregation. Finally, educational attainment series were constructed based on the proportion of men and women with higher education, facilitating the assessment of the role of human capital differences in shaping gender disparities in wages. The use of time series enables the tracking of trends and the assessment of how the structural parameters of gender inequality have changed over the study period.

3. Descriptive analysis

At this stage, a descriptive time series analysis was conducted to identify the main trends in the dynamics of the gender pay gap in Kazakhstan during the study period. Special attention was paid to the evolution of the structure of women's employment by industry, which enabled the assessment of changes in the distribution of women across various sectors of the economy. At the same time, the dynamics of the unemployment rate among women were analysed, as well as changes in the level of their educational training compared to men. The results of the analysis were presented in the

form of graphs and tables, which provided visibility and facilitated a deeper understanding of the nature of changes in principal indicators within the context of gender inequality in the labour market.

4. Correlation and regression analysis

A correlation analysis was conducted to assess the relationship between the dynamics of the gender pay gap and key structural factors. At this stage of the analysis, Pearson correlation coefficients were calculated to assess the strength and direction of relationships between the gender pay gap and a set of core structural and socio-economic indicators. Specifically, the analysis examined correlations between the gender gap in average wages (calculated as the percentage difference between men’s and women’s average earnings), the share of women employed in the main sectors of the economy (industry, trade, finance, education, healthcare), the gender-specific unemployment rates, and the level of education measured by the proportion of women and men with higher education. This allowed for an initial exploration of how each of these factors might be associated with variations in the gender pay gap over the study period. The purpose of this stage is to determine the extent to which changes in the gender gap and changes in structural factors are related. Correlation analysis allowed us to identify the factors that have the most significant impact on the dynamics of the gender gap.

As part of the regression analysis, two linear regression models were constructed in Table 1.

TABLE 1. Structure of variable regression models

Model	Dependent variable	Independent variable
Model 1	Gender pay gap	Female Unemployment, Female Higher Education Ratio, Female Economic Activity
Model 2	Gender pay gap	The proportion of women in: Industry, Trade, Finance, Education, Health

Note: compiled by authors

Model 1 allowed us to assess the impact of socio-economic factors, and Model 2 – the role

of the sectoral structure of women's employment in shaping the gender gap.

5. PESTEL analysis

At the final stage of the quantitative analysis, a PESTEL analysis was additionally performed. The inclusion of this method is due to the need to take into account not only quantitative relationships, but also a broader institutional, social and legal context.

The following aspects were considered in the framework of the PESTEL analysis:

1) Political factors – the availability and effectiveness of equal pay control mechanisms;

2) Economic factors – the structure of the economy (the share of female and male industries), the level of informal employment;

3) Social factors – gender stereotypes, division of roles in the family;

4) Technological factors – the impact of digitalisation of the labour market;

5) Legal factors – legislative and regulatory acts in the field of labour and equality;

6) Environmental factors – indirect influence (through the ESG agenda, corporate standards).

The PESTEL analysis enabled the qualitative interpretation of the quantitative results and the identification of systemic

barriers and opportunities that affect the dynamics of the gender gap.

Thus, the proposed methodological scheme, which combines structural and dynamic time series analysis, correlation and regression analysis, and qualitative PESTEL analysis, enables us to obtain a comprehensive understanding of the formation of the gender wage gap in Kazakhstan. An integrated approach provides both a quantitative assessment of the dynamics of key indicators and a qualitative understanding of the institutional and external factors that influence the reproduction of inequality.

4. RESULTS AND DISCUSSION

Figure 2 illustrates the primary trends in the dynamics of the gender pay gap, the unemployment rate of women, the level of education (represented by the proportion of women with higher education), and the level of economic activity of women during the period under review.

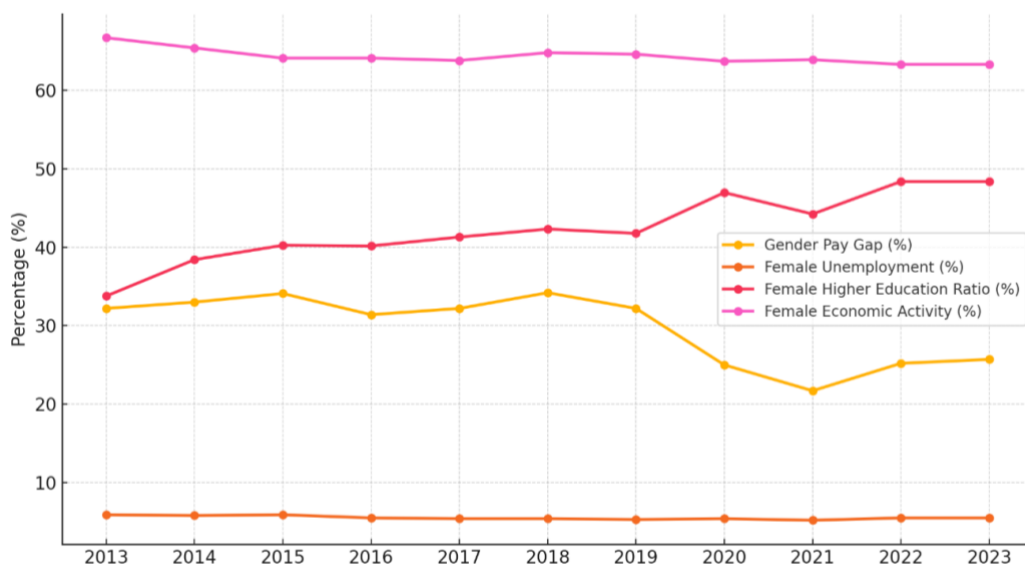


Figure 2. Dynamics of the gender pay gap, unemployment rate, education level and economic activity of women in Kazakhstan for 2013-2023

As shown in the graph above, the gender pay gap generally exhibits a downward trend over the review period. After steady values in the range of 31-34% (2013-2018), there was a noticeable reduction in the gap to 21.7% in 2021, followed by a slight correction to ~25% in 2022-2023.

At the same time, there is a steady positive trend in the level of education of women: the proportion of women with higher education has consistently increased throughout the period, which indicates the growing educational potential of the female workforce.

The female unemployment rate has decreased from the initial 5.9% in 2013 to

~5.2–5.5% in recent years, with slight fluctuations, which can be interpreted as a stabilisation of the situation regarding female employment.

At the same time, the level of economic activity among women remains relatively stable (63-67%), with a slight downward trend observed after 2015, which may indicate the impact of external economic shocks and social barriers on women's participation in economic activity.

Figure 3 illustrates the evolution of women's employment in five key sectors of the economy: industry, trade, finance, education, and healthcare.

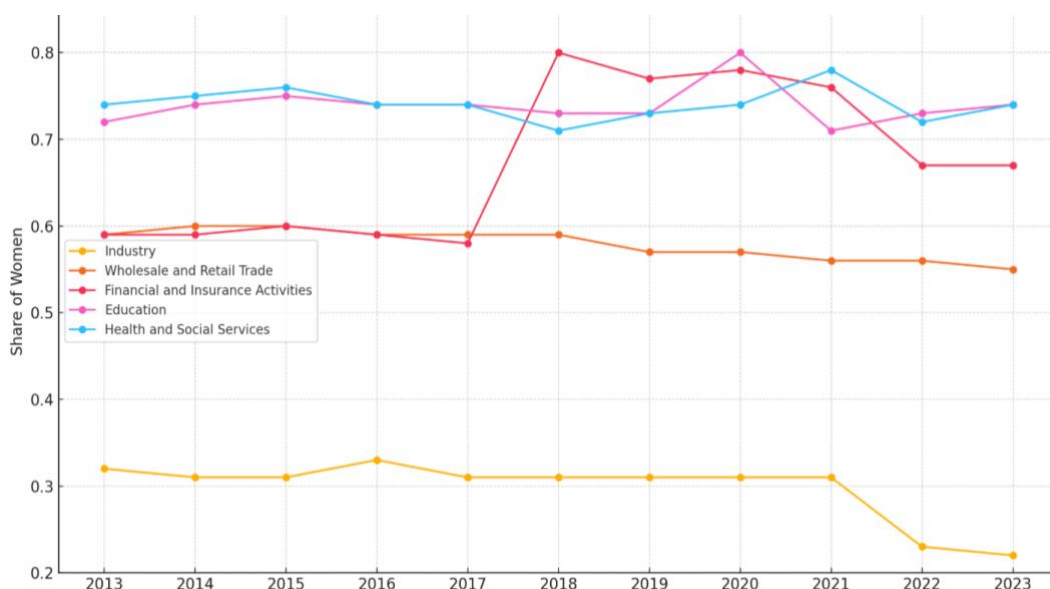


Figure 3. Dynamics of the proportion of women in the main sectors of Kazakhstan's economy for 2013-2023

The graph shows that the structure of female employment in Kazakhstan remains highly segregated throughout the period under review. The most pronounced concentration of women is evident in the education and healthcare sectors, where their share consistently amounts to about 70-75%, reflecting the characteristic features of the so-called "female" sectors of the economy. A similar situation is observed in the wholesale and retail trade, where the proportion of women is approximately 55-60%, indicating

the significant employment of women in this relatively low-paid sector. In the financial sector, the female share ranges from 67% to 80%, indicating moderately high values with some fluctuations over the years. At the same time, the female share in industry remains consistently low, in the range of 20-32%, which indicates the presence of persistent barriers to women's access to capital-intensive, technologically complex and traditionally male sectors of the economy.

The conducted descriptive analysis shows that, despite a significant increase in the level of education of women and a moderate improvement in the unemployment situation, the structural segregation of women's employment by industry persists. At the same time, the gradual decrease in the gender pay gap in recent years seems to be primarily due to the improvement of women's educational characteristics, while structural barriers (horizontal segregation, concentration in “low-wage” industries) continue to have a lasting impact.

For a deeper understanding of the mechanisms that determine the dynamics of the gender gap and a quantitative assessment of the

degree of influence of individual factors, a correlation and regression analysis were conducted within the framework of the study. This stage allowed not only to determine the directions and strengths of the links between the leading indicators (education, unemployment, employment structure) and the level of the gender gap, but also to identify the factors that most contribute to its reproduction or, conversely, its reduction. The results of this analysis are presented below.

A correlation analysis was conducted to further verify the relationship between structural and socio-economic factors and the level of the gender pay gap. The results are shown in Figure 4 (heatmap of correlations).

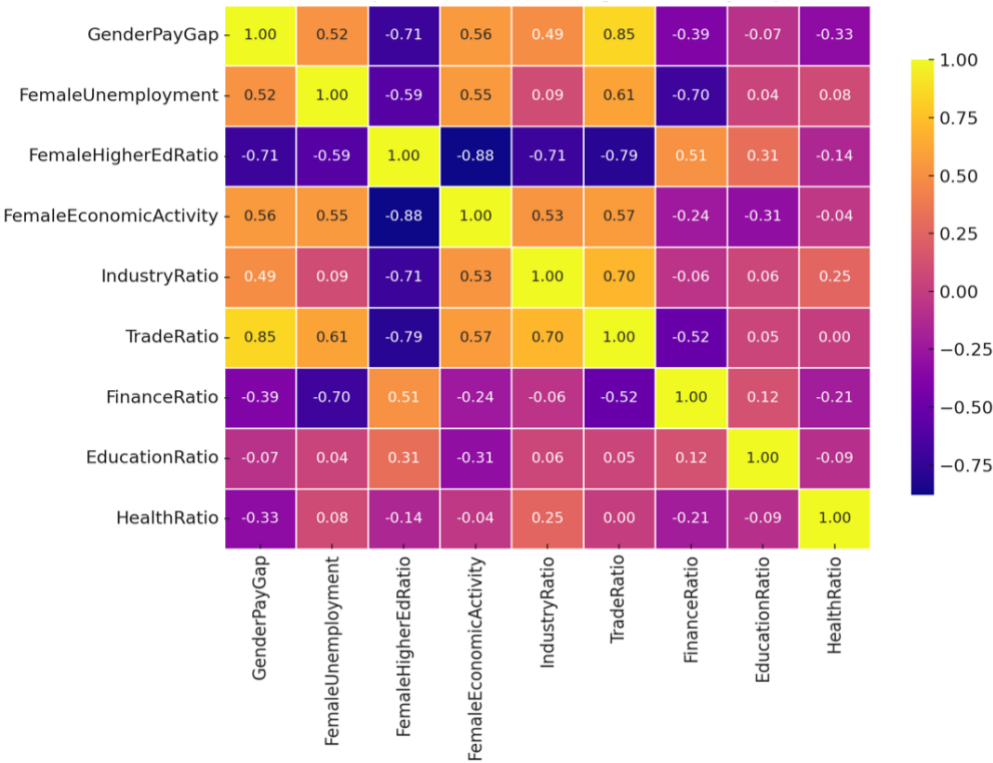


Figure 4. Correlation matrix of factors influencing the gender pay gap in Kazakhstan for 2013-2023

The analysis shows that the level of education of women has the most significant impact. The proportion of women with higher education shows a strong negative correlation with the level of the gender gap ($r = -0.71$), confirming the importance of education as a fundamental factor of social mobility and a

mechanism for overcoming inequality. A significant positive correlation is demonstrated by the unemployment rate of women ($r = +0.52$), which highlights the role of women's economic vulnerability as a factor exacerbating the pay gap. Special attention should be paid to the powerful positive relationship between the

proportion of women in trade and the level of the gender gap ($r = +0.66$), which indicates structural barriers associated with a high concentration of women in low-wage sectors.

The share of women in education and healthcare shows a negative but weaker relationship with the level of the gender gap, which confirms their role as more stable, but still not highly paid, sectors of women's employment.

As part of the regression analysis, two models were built: the first included socio-economic characteristics, the second included the sectoral structure of women's employment.

This approach made it possible not only to quantify the impact of various factors but also to identify the principal social barriers that perpetuate gender inequality in the labour market.

Model 1: The impact of socio-economic factors

The first model assessed the impact of socio-economic factors, including the unemployment rate of women, the proportion of women with higher education, and the level of economic activity of women, on the gender pay gap. The results are presented in Table 2.

TABLE 2. Regression results: the impact of socio-economic factors on the gender pay gap (Model 1)

Variable	Coefficient	Standard Error	t-value	p-value
FemaleUnemployment	+3.01	(4.98)	0.604	0.626
FemaleHigherEdRatio	-0.90	(0.58)	-1.55	0.145
FemaleEconomicActivity	-1.45	(2.32)	-0.63	0.554
Intercept (const)	+144.83	(177.12)	0.82	0.428
R ²	0.547	-	-	-
Adj. R ²	0.353	-	-	-

Note: compiled by authors

The results obtained indicate a significant influence of the sectoral structure on the formation of the gender gap. The contribution of the share of women in trade (TradeRatio) is particularly highlighted: the high concentration of women in this low-paid sector contributes to the strengthening of gender wage inequality ($p \approx 0.064$). At the same time, the proportion of women in industry, the financial sector, education, and healthcare has not demonstrated a statistically significant impact. However, the negative direction of the coefficients for education and healthcare confirms their potential role in reducing the gap.

The results of the correlation and regression analysis enable us to draw several important conclusions about the mechanisms underlying the reproduction of the gender wage gap in Kazakhstan. Firstly, the *pivotal* role of women's education has been confirmed: both correlation and regression analysis demonstrate a stable negative relationship between an increase in the proportion of women with higher education and a decrease in

the gender gap, underscoring the importance of educational policy as a tool to reduce inequality.

At the same time, the analysis revealed a significant impact of structural barriers related to industry segregation. This is most evident in the trade sector, where the high concentration of women combined with low wages has a substantial impact on the overall gender pay gap. The share of women in the education and healthcare sectors demonstrates a moderately compensating effect. In contrast, the industry and financial sectors do not exhibit a significant relationship with the level of the gender gap.

The empirical results obtained enable the verification of the initial research hypotheses formulated in the theoretical section of this study. The verification results are summarised in Table 4.

It is also noteworthy that the unemployment rate of women, contrary to preliminary expectations, did not exhibit a significant direct effect within the regression

model. However, a positive relationship was observed in the correlation analysis. This suggests a more complex and mediated nature

TABLE 4. Verification of Research Hypotheses

Hypothesis	Content	Confirmation Result
H1	Increasing the level of education of women (the proportion of women with higher education) helps to reduce the gender pay gap.	Confirmed. Strong negative correlation ($r = -0.71$) and significant negative coefficient in regression analysis indicate that higher education of women contributes to reducing the gender gap.
H2	An increase in the unemployment rate among women leads to an increase in the gender pay gap by increasing their economic vulnerability.	Partially confirmed. Positive correlation ($r = +0.52$), but statistically insignificant coefficient in regression model suggests an indirect and complex relationship.
H3	The structural segregation of women's employment has a significant impact on the level of the gender gap: the high proportion of women in low-paid industries contributes to its increase.	Confirmed. Positive and near-significant influence of the share of women in trade (TradeRatio coefficient $+2.27$, $p \approx 0.064$), along with descriptive analysis, supports this hypothesis.

Note: compiled by authors

of the relationship between women's employment status and wage outcomes, which may be influenced by additional institutional and social factors not fully captured in the current model. Thus, correlation and regression analysis confirmed that the reduction of the gender gap in Kazakhstan depends not only on the individual characteristics of women (education, activity) but is also largely determined by the structural characteristics of the labour market, primarily industry segregation.

To better understand the institutional and external factors that support or hinder the reduction of the gender pay gap, a PESTEL analysis was conducted as part of the study. This approach enables us to consider not only quantitative relationships but also the broader context of gender inequality formation, encompassing political, economic, social, technological, legal, and environmental aspects. The results of the PESTEL analysis are shown in Table 5.

TABLE 5. PESTEL analysis of factors influencing the gender pay gap in Kazakhstan

Factor	Barrier / Risk	Opportunities / Positive trends	Comment
Political	Insufficient institutionalization of equal pay control mechanisms; weak gender accountability in the private sector	Development of national strategies (The Concept of Gender and Family Policy until 2030); increasing attention to gender issues in the ESG agenda	Potential for developing mechanisms to monitor and promote equality
Economic	High concentration of women in low-paid sectors (education, healthcare, trade); limited access to high-tech industries	Potential for economic diversification; government programs for the development of women's entrepreneurship	A main factor in the structural gender gap
Social	Stereotypes about female and male professions; uneven	Gradual change of social norms among the younger	Systemic measures to

	distribution of family responsibilities; low availability of child care infrastructure	generation; development of work-life balance programs in the corporate environment	support social infrastructure are required
Technological	Digital gender gap; automation of female professions; limited access of women to retraining programs	The growth of flexible forms of employment; digital literacy programs	Targeted measures are needed to involve women in the digital economy
Legal	Insufficient transparency of labor evaluation systems; weak judicial protection in cases of wage discrimination; low trade union activity of women	Availability of the basic legal framework and international obligations of Kazakhstan (CEDAW, etc.)	Mechanisms for the implementation of legal norms in practice are required
Environmental	Underrepresentation of women in green industries and new sustainable development sectors	The inclusion of gender aspects in the policy of the green economy	Potential for gender-inclusive sustainable development

Note: compiled by authors

As the PESTEL analysis shows, the factors influencing the gender pay gap in Kazakhstan are multidimensional and interrelated. Despite positive changes in women's educational characteristics and the availability of strategic documents aimed at ensuring gender equality, structural barriers and institutional constraints remain in real economic practice.

The political and legal environment presents specific opportunities to promote equality; however, the effectiveness of these tools is limited by the weak implementation of control mechanisms and insufficient transparency in wage systems. The economic structure of the labour market continues to reinforce horizontal segregation, and social norms and the uneven distribution of family responsibilities further limit women's career opportunities.

Technological changes and digitalisation processes create both new opportunities and risks of increasing inequality, especially in conditions of insufficient access for women to new sectors and retraining programs. The transition to a green economy also requires more active integration of gender aspects in order to avoid the formation of new forms of sectoral segregation.

A comprehensive analysis, including descriptive, correlation-regression and PESTEL analyses, allows us to draw the following generalised conclusions:

First, women's education is a pivotal factor contributing to reducing the gender pay gap. Improving the educational level of women is directly related to narrowing the gap and increasing their economic mobility.

Secondly, structural barriers in the labour market persist as significant. The high concentration of women in low-paying industries (trade, education, healthcare) significantly limits the opportunities for achieving pay equality.

Thirdly, the institutional and legal aspects do not yet provide sufficient guarantees of absolute compliance with the principles of equal pay. The lack of transparent labour evaluation systems, weak protection of women's rights, and insufficient union activity all contribute to the persistence of informal, discriminatory practices.

Fourth, social and cultural norms, including the traditional allocation of family responsibilities, remain the most important barrier to women's active and equal participation in economic life.

The results obtained confirm the core provisions of theoretical approaches to studying the gender pay gap. First of all, they align with the conclusions of the human capital theory (Hong et al., 2019), which posits that education is the most significant factor in increasing women's economic opportunities. At the same time, data for Kazakhstan show that an increase in the level of education alone is insufficient to close the gap; institutional, structural, and social barriers continue to play a significant role.

The results also confirm the relevance of approaches related to the analysis of horizontal and vertical segregation (Kireyeva et al., 2023). In Kazakhstan, the structure of women's employment remains highly segregated, and the high proportion of women in low-paid sectors is one of the main factors supporting the gender gap. At the institutional level, these studies are consistent with the conclusions of Rubery and Grimshaw (2015) regarding the role of insufficient wage transparency and weak legal mechanisms in perpetuating inequality. A key finding is the confirmation of the importance of social norms, which aligns with the research of Alesina et al. (2013) and Zharkynbayeva et al. (2020). In Kazakhstan, it is the traditional models of gender roles and the uneven distribution of family responsibilities that significantly limit women's participation in higher-paying sectors of the economy.

Thus, the study's results emphasise the need for an integrated and intersectoral approach to addressing the gender pay gap in Kazakhstan. This should include not only measures to improve the level of education and professional training of women, but also deep institutional reforms aimed at increasing transparency of payment systems, supporting women in high-tech and “green” industries, as well as transforming social norms towards a more equal distribution of family and professional roles.

5. CONCLUSION

The study's results confirmed that the gender pay gap in Kazakhstan is formed under the influence of a complex of interrelated

factors, among which the leading role is played by the structural segregation of women's employment, institutional constraints, and social norms. Despite the positive trends associated with an increase in women's education and a partial narrowing of the gap in recent years, the analysis revealed that these achievements are insufficient to fully compensate for the impact of persistent barriers that perpetuate inequality in the labour market.

The use of structural and dynamic analysis revealed that, although increasing the educational level of women has a pronounced positive effect on reducing the gap, the main factor in maintaining it remains the high concentration of women's labour in low-paid sectors of the economy. Notably, the proportion of women in trade has had the most significant impact on reducing the gender gap. In contrast, women's participation in education and healthcare has a more moderate compensating effect. In turn, institutional barriers, including insufficient transparency of payment systems and weak mechanisms for monitoring compliance with the principles of equal pay, remain a significant constraint on progress in this area.

Additionally, the PESTEL analysis confirmed the importance of the political and legal context, socio-cultural factors, as well as the structural features of the economy that determine the nature of the reproduction of the gender gap. It has been established that institutional reforms and the transformation of social norms are no less important conditions for achieving real progress in ensuring equal pay than the development of educational and economic policies.

It should also be emphasised that a sustainable reduction of the gender gap in Kazakhstan is possible only through the implementation of comprehensive measures aimed at diversifying women's employment, strengthening law enforcement in the field of labour legislation, developing social infrastructure, and forming more balanced models for the distribution of family responsibilities. The results obtained during the study confirm the need to adopt a multi-level

approach in addressing this problem and provide an empirically sound basis for developing targeted recommendations in the fields of public and corporate policy.

At the same time, certain limitations of the present study should be acknowledged. Firstly, aggregated official statistics were used as a base, which did not allow for a full consideration of the impact of individual employee characteristics (for example, length of service, availability of children, type of employment). Secondly, a comprehensive analysis of the impact of job quality and informal employment, which can significantly contribute to the formation of the gender gap, has not been conducted. Thirdly, the PESTEL analysis allowed only a qualitative characterisation of the institutional and social context, which requires further quantitative refinement.

These limitations determine the directions for future research. It seems advisable to

conduct microdata panel studies that allow for a more in-depth study of the influence of social factors and women's life trajectories on the dynamics of the gender gap. Additionally, an in-depth study of institutional practices in specific sectors of the economy, along with an analysis of the impact of flexible forms of employment and digitalisation on labour market gender equality, is promising. An important area of future research is also the assessment of regional differences in the formation of the gender gap, taking into account the specific socio-economic development of various regions in Kazakhstan.

Thus, the results of this study form the basis for further empirical and applied work in this field, emphasising the need for a systemic transformation of socio-economic conditions that ensures a sustainable reduction of the gender wage gap in Kazakhstan.

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