

Gender Differences in the Kazakhstan Labor Market and Their Impact on Economic Growth

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Abstract

The problem of gender inequality in the labor market remains as the most important factor limiting the use of human capital and the potential for sustainable economic growth. The aim of the study is to assess the dynamics of the gender wage gap and empirically verify its relationship with GDP and inflation for 2019-2023. The methodological framework includes descriptive and comparative statistical analysis, calculation of the gender pay gap coefficient (hereinafter – GPG), as well as correlation and regression analysis aimed at identifying the relationship between the gap level and macroeconomic indicators. The data from the Bureau of National Statistics of the Republic of Kazakhstan, official collections and open sources on average salaries of men and women by sector and region were used as initial data. The results of the study show that, on average, women earned 24-27% less than men in 2019, while by 2023 the gap had narrowed to 21%, indicating a partial convergence of incomes. However, in a number of industries (construction, industry, finance) A gap of over 30% remains, while in education and healthcare it is decreasing to 15-18%. The analysis revealed a moderate negative correlation between the dynamics of GDP and the level of the gender gap ($r \approx -0.45$), which indicates a partial dependence of income equality on the general state of the economy. Thus, despite the positive trends, eliminating gender inequality requires comprehensive measures aimed at increasing wage transparency, increasing women's access to high-paying sectors, and fostering an inclusive corporate culture.

Keywords: gender gap, gender policy, social inequality, discrimination, social access, wages, labor market

Қазақстанның еңбек нарығындағы гендерлік айырмашылықтар және олардың экономикалық өсуге әсери

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Түйін

Еңбек нарығындағы гендерлік теңсіздік мәселесі адами капиталды толық пайдалануды және тұрақты экономикалық өсудің әлеуетін шектейтін маңызды әлеуметтік-экономикалық фактор болып қала береді. Зерттеудің максаты – жалақыдағы гендерлік айырмашылықтың динамикасын бағалау және оның ЖІӨ мен инфляциямен өзара байланысын эмпирикалық түргыдан тексеру 2019–2023 жж.. Әдістемелік негіз ретінде дескриптивтік және салыстырмалы статистикалық талдау, жалақыдағы гендерлік айырмашылық коэффициентін (GPG) есептеу, сондай-ақ айырмашылық деңгейі мен макроэкономикалық көрсеткіштер арасындағы тәуелділікті айқындауға бағытталған корреляциялық-регрессиялық талдау қолданылды. Бастапқы деректер ретінде Қазақстан Республикасының Үлттүк статистика бюросының мәліметтері, реңми жинақтар мен ерлер мен әйелдердің орташа жалақылары бойынша ашық дереккөздер пайдаланылды. Зерттеу нәтижелері көрсеткендегі, 2019 жылды әйелдердің жалақысы ерлерге қараганда орта есеппен 24–27 % төмен болды, ал 2023 жылға қарай айырмашылық 21 %-ға дейін қысқарды, бұл табыстардың біртіндеп жақындағанын білдіреді. Дегенмен, кейбір салаларда (құрылым, өнеркәсіп, қаржы) айырмашылық 30 %-дан асады, ал білім беру және деңсаулық сақтау сияқты әлеуметтік бағыттағы салаларда ол 15–18 %-ға дейін төмендеді. Талдау нәтижесінде ЖІӨ динамикасы мен гендерлік айырмашылық деңгейі арасында орташа теріс корреляция анықталды ($r \approx -0.45$), бұл табыс теңдігінің экономикалық жағдайға ішінша тәуелді екенін көрсетеді. Сонымен, он үрдістерге қарамастан, гендерлік теңсіздікті жою үшін жалақының ашықтығын арттыруға, әйелдердің жоғары жалақылы секторларға қолжетімділігін кеңейтуге және инклузивті корпоративтік мәдениетті қалыптастыруға бағытталған кешенді әлеуметтік саясат қажет.

Түйін сөздер: гендерлік алшақтық, гендерлік саясат, әлеуметтік теңсіздік, кемсітүшілік, әлеуметтік қол жетімділік, жалақы, еңбек нарығы

Гендерные различия на рынке труда Казахстана и их влияние на экономический рост

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Аннотация

Проблема гендерного неравенства на рынке труда сохраняется как важнейший фактор, ограничивающий использование человеческого капитала и потенциал устойчивого экономического роста. Целью исследования является оценка динамики гендерного разрыва в заработной плате и эмпирическая проверка его взаимосвязи с ВВП и инфляцией за 2019-2023 гг. Методологическая основа включает дескриптивный и сравнительный статистический анализ, расчёт коэффициента гендерного разрыва в оплате труда (далее – GPG), а также корреляционно-регрессионный анализ, направленный на выявление зависимости между уровнем разрыва и макроэкономическими индикаторами. В качестве исходных данных использованы сведения Бюро национальной статистики Республики Казахстан, официальные сборники и открытые источники по средним заработным платам мужчин и женщин по секторам и регионам. Результаты исследования показывают, что в среднем женщины зарабатывали на 24-27 % меньше мужчин в 2019 г., при этом к 2023 г. разрыв сократился до 21 %, что свидетельствует о частичном сближении доходов. Однако в ряде отраслей (строительство, промышленность, финансы) сохраняется разрыв выше 30 %, тогда как в образовании и здравоохранении он снижается до 15–18 %. Анализ выявил умеренную отрицательную корреляцию между динамикой ВВП и уровнем гендерного разрыва ($r \approx -0.45$), что указывает на частичную зависимость равенства доходов от общего состояния экономики. Таким образом, несмотря на положительные тенденции, устранение гендерного неравенства требует комплексных мер, направленных на повышение прозрачности оплаты труда, расширение доступа женщин к высокооплачиваемым секторам и формирование инклюзивной корпоративной культуры.

Ключевые слова: гендерный разрыв, гендерная политика, социальное неравенство, дискриминация, социальный доступ, заработка плата, рынок труда

Introduction

Gender inequality in the labor market remains one of the most serious obstacles to inclusive socioeconomic development in modern economies. Despite global advances and increased awareness, inequality persists: women, on average, earn less than men. This phenomenon, known as the gender pay gap, is exacerbated by the concentration of women in low-paid sectors, pervasive barriers to career advancement, often described as a “glass ceiling” and various forms of direct and indirect discrimination. These problems are not limited to any one economic model or level of national income; they represent systemic inefficiencies that hinder both social justice and overall economic potential.

In the context of Kazakhstan, an upper-middle-income country with a historically resource-based economy, addressing this issue is particularly important. As the country undergoes significant structural transformation and strives to diversify its economic base, fully utilizing its human capital is paramount. The underrepresentation and undervaluation of women's work represent not only social inequality but also missed economic opportunities. Therefore, promoting equal access to employment opportunities, ensuring fair wages, and eliminating career barriers can become powerful catalysts for sustainable and stable economic growth, directly contributing to the country's long-term development goals.

While the existence of the gender pay gap in Kazakhstan is widely recognized, an accurate quantitative understanding of its recent dynamics and its relationship with key macroeconomic indicators is crucial for evidence-based policymaking. This study aims to fill this gap by conducting a detailed analysis of gender income inequality in Kazakhstan over the past five years, from 2019 to 2023. The primary goal is to go beyond simple observation and build robust quantitative models that explore the relationship between the gender pay gap and fundamental macroeconomic indicators, particularly gross domestic product.

To achieve this goal, the study will first calculate the dynamics of changes in the average monthly wages of men and women, allowing for an assessment of the resulting wage gap in both absolute and relative terms. Key trends over this period will then be identified and analyzed. Ultimately, the interpretation of these empirical results will serve as the basis for practical recommendations for decision-makers and highlight key areas for future research. By elucidating the economic dimensions of gender inequality, this article seeks to emphasize that promoting income equality is not simply a social imperative but also a fundamental component of Kazakhstan's sustainable economic progress.

The aim is to assess the dynamics of the gender pay gap in Kazakhstan in 2019-2023 and empirically verify its relationship with key macro indicators (primarily GDP) based on official statistics.

Historical, cultural, and structural factors have long contributed to the persistence of gender inequality in Kazakhstan. Traditional societal norms, which often emphasize women's role in the home, continue to influence women's participation in the labor market and career trajectories. Despite significant increases in women's educational attainment in recent decades, its impact on equitable labor market outcomes remains uneven. Women are often concentrated in sectors such as education, healthcare, and retail, which typically

offer lower wages and limited career opportunities compared to male-dominated sectors such as energy, finance, and engineering. This occupational segregation not only exacerbates the gender wage gap but also limits the full utilization of the country's skilled labor force.

Furthermore, structural transformations in Kazakhstan's economy, including the transition from a resource-based model to a more diversified industrial and service-oriented economy, pose both challenges and opportunities. While emerging sectors require new skills and offer higher-paying positions, women's underrepresentation in these fields can perpetuate inequality. Strategic policies that promote inclusive employment, support women's entrepreneurship, and ensure equal access to professional development can significantly reduce wage inequality and contribute to broader economic growth.

Analyzing the gender pay gap in the context of macroeconomic indicators, particularly GDP, provides valuable insights into the economic costs of inequality. Research has shown that countries with smaller gender pay gaps tend to exhibit higher overall labor productivity and more stable economic development. Therefore, understanding the relationship between wage inequality and macroeconomic indicators is crucial for developing effective policy measures. This study, covering the period from 2019 to 2023, reflects recent labor market trends, including the impact of technological change, global economic fluctuations, and post-pandemic adjustments, which may have disproportionately affected female workers. Ultimately, studying the gender pay gap in Kazakhstan is not just a matter of social equality; it is also a matter of economic efficiency and national competitiveness. By identifying patterns of inequality, assessing their determinants, and linking them to broader economic indicators, this study aims to provide evidence-based recommendations that can help policymakers, business leaders, and civil society promote a more equitable and productive labor market.

Literature Review

The gender pay gap is a multifaceted problem, typically divided into "explained" and "unexplained" components. The explained portion of the gap is often attributed to measurable differences in human capital and occupational characteristics, such as educational attainment, professional experience, industry, employment type, number of working hours, and specific job roles. In contrast, the unexplained portion is more often linked to deeper, systemic issues, such as discrimination, entrenched social norms, structural barriers within organizations, and pervasive gender stereotypes.

Empirical research consistently shows that behavioral patterns, such as women's greater tendency to work part-time or take career breaks for maternity leave, significantly exacerbate the observed inequality (Warren & Walters, 1998; Álvarez & Miles-Touya, 2016; Barbieri et al., 2019). It is important to note, however, that even after accounting for these observed factors, a persistent "residual" gap often remains, which is widely interpreted as a potential manifestation of hidden discrimination in the labor market. From a macroeconomic perspective, a growing body of research shows that greater female participation in the economy and a more equitable income distribution are not simply social goals but also play a key role in ensuring more stable and sustainable

economic growth (ILO, 2023). The positive correlation between increased female employment, reduced income inequality, and key indicators such as GDP and overall labor productivity highlights the significant economic costs of gender inequality (Alpysbayev, 2024).

In the context of Kazakhstan, recent statistical publications present a mixed picture; they indicate that, in nominal terms, women's incomes are growing faster than men's, which may indicate a gradual process of convergence (Kuanova & Anessova, 2024). However, this optimistic view should be tempered with analytical caution. This economic reality challenges the idea that the observed nominal reduction in the wage gap will automatically lead to a significant and long-term reduction in inequality.

This complex interplay between the narrowing of the nominal wage gap and challenging economic realities underlies the aim of this study. By focusing specifically on the case of Kazakhstan and conducting a thorough quantitative analysis of the relationship between the gender wage gap and key macroeconomic indicators of recent years, this study aims to provide relevant and evidence-based data (Beisembayev, 2025). The results are intended to complement existing research and inform targeted policies aimed at achieving genuine income equality (Olzhebayeva, 2024).

The gender pay gap is a multifaceted issue, typically divided into “explained” and “unexplained” components. The explained portion of the gap is often attributed to measurable differences in human capital and occupational characteristics, such as educational attainment, professional experience, industry, type of employment, number of working hours, and specific job roles (OECD, 2017). These observable factors are crucial for understanding the structural aspects of the pay gap, as they provide a framework for analyzing differences that may arise based on career choice, skill accumulation, and the sectoral structure of employment. For example, women are more likely to work in service-oriented sectors such as education, healthcare, and retail, which tend to offer lower wages and fewer opportunities for career advancement compared to male-dominated industries such as energy, finance, and information technology (Erickcek, 2019). This occupational segregation is a widely recognized factor contributing to the gender pay gap in Kazakhstan and remains a persistent feature of the national labor market.

In contrast, the unexplained portion of the pay gap is more often associated with deeper systemic problems, including discrimination, entrenched social norms, structural barriers within organizations, and pervasive gender stereotypes (Kireyeva & Kenzheali, 2024). Empirical research consistently shows that even with comparable education and professional experience, women often face barriers to career advancement. These barriers can include limited access to leadership positions, gender-specific performance evaluations, and unequal distribution of mentoring opportunities. In Kazakhstan, societal expectations regarding women's role in childcare continue to influence labor market participation, forcing many women to take career breaks or work part-time while caring for children, which in turn impacts their overall work experience and overall income (An et al., 2018; Meurs et al., 2021; Kireyeva et al., 2022).

Such behavior patterns significantly exacerbate the observed inequalities. However, research shows that even after controlling for factors such as education, experience, and sector of employment, a residual pay gap remains, suggesting hidden

discrimination or structural inefficiencies that are not readily apparent in labor statistics (Kredina et al., 2024). This residual component is often interpreted as a manifestation of implicit bias within organizations, as well as broader societal expectations that influence employer decisions and corporate culture. In Kazakhstan, this problem is particularly acute in high-paying industries, where women remain underrepresented in management and leadership positions despite increasing numbers of women enrolling in higher education and vocational training programs (Lipovka & Nugmanova, 2024). From a macroeconomic perspective, a growing body of research emphasizes that gender equality in the labor market is not simply a social goal but also a critical factor in economic performance and stability (ILO, 2023; OECD, 2017). Increasing female labor force participation contributes to higher aggregate labor productivity and has a positive impact on GDP growth, highlighting the economic costs of persistent wage inequality (He & Wu, 2019). Empirical models show that economies with a smaller gender wage gap are more resilient to economic shocks, as a more inclusive labor market allows for a more efficient allocation of human capital and increases the overall flexibility of labor supply (Mukhamadieva et al., 2024; Alpysbayev et al., 2024).

In the specific context of Kazakhstan, recent statistical publications paint a mixed picture. On the one hand, women's nominal wages are growing faster than men's, suggesting a gradual process of convergence and a potential narrowing of the wage gap (Bureau of National Statistics, 2024). However, this nominal improvement should be interpreted with caution. High inflation rates, fluctuations in commodity prices, and economic shocks, including the impact of the COVID-19 pandemic, have significantly reduced real wage growth, challenging the idea that nominal convergence automatically leads to genuine economic equality (ILO, 2023). For example, despite wage growth across all sectors, the real purchasing power of female workers often remains lower than that of their male counterparts, limiting the tangible impact of apparent nominal improvements (Olzhebayeva, 2024).

This complex situation is further exacerbated by regional disparities in Kazakhstan. Data suggest that gender inequality in labour market outcomes is more pronounced in rural areas. These observed trends highlight the importance of considering gender wage dynamics within a broader macroeconomic and regional context. While nominal wage growth suggests potential convergence, real income disparities and uneven regional development indicate that underlying structural and economic factors continue to shape gender inequality. Differences in sectoral employment, access to professional opportunities, and local economic conditions mean that some groups of women continue to experience disadvantage, despite overall improvements in labor market outcomes. Understanding these nuances requires a comprehensive approach that links individual wage patterns to macroeconomic indicators such as GDP growth, inflation, and the changing structure of the economy. This approach allows for a more accurate assessment of the true state of gender inequality and its impact on sustainable economic development.

Methodology

The study conducted a comprehensive analysis of the labor market and macroeconomic indicators in Kazakhstan for the period 2019–2023, covering various

phases of the economic cycle, including the pre-crisis period, the pandemic shock, and the subsequent recovery. The main objective of the study was to examine gender differences in wages, employment, and labor market participation, and to assess their relationship with macroeconomic dynamics such as GDP growth, the sectoral structure of the economy, and inflation.

The empirical basis of the study consists of official annual data from the National Statistical Office of the Republic of Kazakhstan. Key variables include average monthly nominal wages by gender, the gender wage gap, the unemployment rate, the share of employed women in the total labor force, GDP, GDP growth rate, and the consumer price index. To more thoroughly assess the structural factors influencing wage inequality, additional data on sectoral employment, regional wage structure, job levels, age groups, and compensation patterns (bonuses and allowances) were also examined.

The analysis was conducted in several stages. Initially, descriptive statistical methods were used to assess trends in average wages, the gender wage gap, and employment indicators. Visualization techniques, including line graphs, comparison charts, and scatterplots, were employed to illustrate time trends and highlight periods of convergence and divergence in wages between men and women. In the second stage, quantitative methods were employed to examine the relationships between labor market indicators and macroeconomic variables. This included Pearson correlation analysis to assess the strength and direction of the relationship between wages and GDP, economic growth rates, and inflation. Correlation coefficients were interpreted according to thresholds for the strength and direction of the relationship, providing insight into the structural and cyclical factors influencing income distribution (see Table 1).

Table 1. List of indicators and data sources used in the study

Code	Variable	Unit of measurement	Data source
GDP	Wage growth to GDP growth	Percentage of GDP	Bureau of National Statistics
Women	Women salary	in tenge (KZT)	Bureau of National Statistics
Men	Men salary	in tenge (KZT)	Bureau of National Statistics
Growth rate	GDP growth rates in relation to years	Percentage points	Bureau of National Statistics
Wage gap	The difference in wages between men and women	Percentage points	Bureau of National Statistics
R	The correlation coefficient	Value between (-1 to +1)	Bureau of National Statistics
CPI	Consumer Price Index	Percentage	Bureau of National Statistics

Note: compiled by the authors based on Bureau of National Statistics (2024)

All data processing, statistical calculations, and visualization were performed in Microsoft Excel, ensuring the consistency and reproducibility of the results. This methodological framework combines descriptive and analytical approaches, allowing not only for a detailed presentation of wage dynamics and gender inequality trends but also for a robust assessment of the interactions between labor market indicators and

macroeconomic conditions. This approach also allows for the identification of structural differences across sectors, facilitating the development of practical policy recommendations aimed at supporting equitable income growth and gender equality in the labor market.

Results

The study is based on data from the Bureau of National Statistics of the Republic of Kazakhstan on average monthly nominal wages for 2019–2023. This period is of particular interest for analysis, as it encompasses different phases of the economic cycle: the pre-crisis period, the 2020 pandemic shock, and the subsequent recovery, largely driven by the commodity sector. Using absolute wage indicators allows us not only to calculate the gender gap but also to track its transformation in a changing economic environment. This approach allows for a more detailed understanding of how economic fluctuations affect different groups of workers and provides insight into the sustainability of wage equality over time. By monitoring trends over multiple years, we can better identify patterns that may not be immediately apparent in shorter-term data and assess the factors contributing to the narrowing or widening of inequality.

Analyzing the relationship between the sectoral structure of the economy and the gender wage gap is particularly important. The resource-based nature of Kazakhstan's economy creates the preconditions for significant income differentiation based on the gender structure of employment across various sectors, allowing us to formulate and test hypotheses about the structural causes of persistent inequality. This analysis also helps identify sectors in which women are systematically underrepresented in high-paying positions, providing a basis for developing targeted policy recommendations. Table 2 presents the main dataset for this analysis, illustrating nominal wage dynamics for both genders.

Table 2. Medium wage of employees of Kazakhstan

Year	Women (thousands tenge)	Men (in thousands tenge)	GDP (in million tenge)	Growth rate, in p.p.
2019	100 997	127 586	3 778 948	59.7
2020	133 979	153 303	3 798 335	58.8
2021	159 110	173 379	4 441 883	35.8
2022	196 946	214 189	5 321 309	13.4
2023	234 561	273 864	6 032 439	

Note: compiled by the authors based on Bureau of National Statistics (2024)

Kazakhstan saw steady growth in nominal average wages for both women and men between 2019 and 2023, accompanied by significant economic expansion. Men's average monthly wages increased from 127,586 tenge in 2019 to 273,864 tenge in 2023 (an increase of approximately 114.7%), while women's average wages increased from 100,997 tenge to 234,561 tenge over the same period (an increase of approximately 132.2%). These data indicate that women's nominal incomes grew faster in relative terms than men's, partially offsetting the initial wage gap. When looking at the gender pay gap

as a percentage (the percentage of women who earn less than men), it narrowed from approximately 20.9% in 2019 to a low of around 8.2%–8.1% in 2021–2022, but rose again to approximately 14.3% in 2023. This dynamic suggests a two-phase process: the first three to four years of economic recovery and structural change contributed to the convergence of average incomes (increased employment of women in new sectors and an increase in their skills), while the sharp increase in the gap in 2023 is likely due to concentrated wage growth in high-income—predominantly male—sectors (e.g., oil and gas, transport, IT) and/or the expansion of bonuses and incentives in male-dominated segments. At the same time, the economy is showing a noticeable recovery: nominal GDP increased from 3,778,947 million tenge in 2019 to 6,032,439 million tenge in 2023. The annual growth rate (relative to the previous year) was uneven: weak growth in 2020 (~0.5%), followed by a significant recovery in 2021–2022 (approximately 16.9% and 19.8%, respectively), and a slowdown in 2023 (~13.4% compared to 2022). Taken together, this suggests a strong economic recovery following the shock and that the main contribution to GDP growth occurred in 2021–2022.

The ratio of GDP growth to wage dynamics shows that the economic recovery was generally accompanied by an increase in the wage bill, but the distribution of benefits was uneven across sectors and by gender. Despite significant relative growth in women's earnings, the persistence and partial reversal of the gender gap in 2023 highlights the existence of structural factors—sectoral differences in employment, differences in access to high-paying positions, and possible differences in compensation patterns (bonuses, allowances, and allowances).

The practical significance of these findings: the narrowing gender gap in 2021–2022 indicates positive changes (increased education, digitalization, and women's participation in new professions). However, the widening gap in 2023 demonstrates that these achievements are unstable and sensitive to the sectoral structure of economic growth. Sustainable reduction of the gap requires policies aimed at expanding women's access to high-paying sectors (retraining, entrepreneurship support programs, and encouraging women's participation in technology and extractive industries) and measures to ensure wage transparency in enterprises. Recommendation: As a practical measure, it would be advisable to implement a pilot program for retraining women in high-income industries and simultaneously introduce public reporting on the compensation structure within large companies (by gender and job level). This should help redistribute economic benefits more evenly during the next growth cycle.

Additional data for in-depth analysis: annual industry breakdown of employment (the number of women and men in each industry), regional salary structure, distribution by job level and age cohort, and data on bonuses and administrative payments. These additional variables will allow us to more accurately identify the specific factors that caused the widening gap in 2023 and where targeted interventions are needed.

Table 3 presents the calculated gender pay gap alongside primary wage data, providing a consolidated view of key indicators for this period.

Table 3. Dynamics of average wages and gender pay gap for 2019–2023

Year	Men salary (tenge)	Women salary (tenge)	Wage gap, in p.p.
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2019	127 586	100 997	0.21
2020	153 303	133 979	0.13
2021	173 379	159 110	0.08
2022	214 189	196 946	0.08
2023	273 864	234 561	0.14

Note: compiled by the authors based on Bureau of National Statistics (2023)

According to the analyzed data for 2019-2023, there is a steady downward trend in the gender wage gap (in p.p.), accompanied by an overall increase in nominal wages for both men and women. In 2019, the average salary for men was 127,586 tenge, and for women – 100,997 tenge, while the wage gap reached 0.21 p.p. In subsequent years, the dynamics shows a consistent decrease in differences: in 2020 – 0.13 p.p., in 2021-2022 (0.08 p.p.), reflecting a trend towards income equalization and an increased role of women in the economy. In 2023 There is a partial increase in the gap to 0.14 p.p., which may be due to the sectoral and structural features of the labor market, in particular, the high concentration of men in high-income industries (oil and gas, transport, ICT) and the predominance of women in socially oriented sectors (education, health, services). Thus, in general, over the analyzed period 2019-2023, the gender pay gap decreased by 0.07 p.p., which confirms the presence of positive trends in ensuring equality of economic opportunities. The most favorable situation was observed in 2021-2022, when the gender gap reached a minimum value of 0.08 p.p., which can be considered as a result of increasing the educational level of women, their involvement in the digital economy and strengthening government policies on gender equality.

The data presented in Figure 1 illustrate a steady upward trend in the average wages of men and women in Kazakhstan from 2019 to 2023, accompanied by significant changes in the gender pay gap.

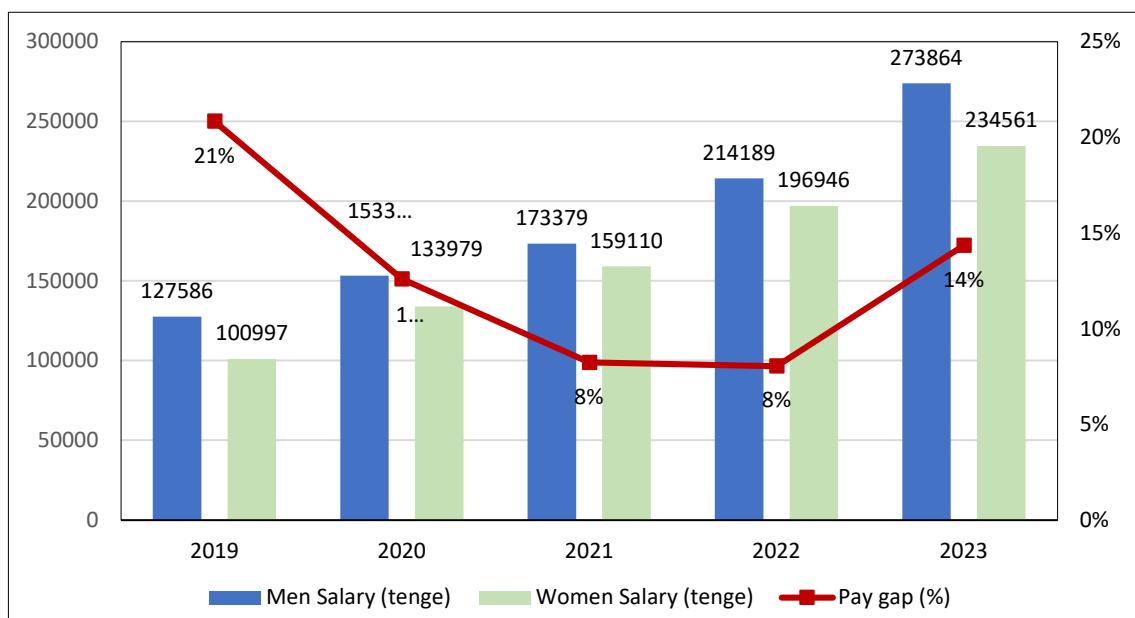


Figure 1. Dynamics of average wages and gender pay gap (2019–2023)

Over the five years of this year, the average monthly wage of men increased from 127,586 to 273,864 tenge, while that of women increased from 100,997 to 234,561 tenge. This trend clearly reflects not only the growth of nominal incomes but also the overall development of the Kazakh economy and the gradual improvement in household living standards.

At the same time, the gender pay gap exhibited nonlinear dynamics. In 2019, women earned, on average, approximately 21% less than men, demonstrating significant inequality in the labor market. By 2020, this gap had narrowed to 13%, and in 2021–2022, it reached its minimum of approximately 8%. The narrowing of the gender pay gap during this period can be attributed to several factors: the recovery of female employment after the pandemic, women's active participation in the service sector, education, and digital technologies, and the implementation of government programs aimed at ensuring gender equality and labor market diversification.

However, in 2023, the gender pay gap widened again to 14%, indicating a partial reversal of this progress. This change likely reflects faster wage growth in male-dominated industries such as construction, mining, transportation, and energy, where wages traditionally exceed the national average. The return of inequality may also be due to the uneven post-crisis recovery across various economic sectors and the predominance of women in socially oriented, low-wage fields such as education and healthcare.

Overall, the data suggest a generally positive long-term trend toward reducing gender pay inequality. However, the recovery in 2023 demonstrates that gender parity remains fragile and depends largely on the structural makeup of the economy. Achieving sustainable progress on pay equality will therefore require continued government attention to promoting women's access to high-income and high-tech industries, increasing the transparency of wage structures, and supporting equal opportunities for career advancement.

The correlation analysis presented in Table 4 revealed that wage levels for men and women in Kazakhstan are closely linked to key macroeconomic indicators.

Table 4. Pearson correlation coefficients for wages and variables

Variable	R (correlation coefficient)	Interpretation
Women salary vs GDP	0.97	Very strong positive
Men salary vs GDP	0.98	Very strong positive
Women salary vs Growth rate	-0.95	Very strong negative
Men salary vs Growth rate	-0.96	Very strong negative
Women salary vs CPI (%)	0.99	Very strong positive
Men salary vs CPI (%)	0.99	Very strong positive

Note: compiled by the authors

The correlation coefficients between wages and GDP are 0.97 for women and 0.98 for men, indicating a very strong positive relationship. This result suggests that economic growth directly contributes to income growth, with men's wages demonstrating a somewhat stronger correlation, which may reflect structural features of the labor market.

An analysis of the relationship between wages and economic growth revealed a very strong negative correlation: $r = -0.95$ for women and $r = -0.96$ for men. This suggests

that during periods of accelerated economic growth, wage growth may be relatively moderate, while during periods of slower economic growth, income growth continues. This dynamic may be related to monetary policy adjustments and wage adjustments to account for inflation. The correlation between wages and inflation, measured by the consumer price index, was extremely high and positive ($r = 0.99$ for both groups). This suggests that nominal incomes grow in sync with price increases, reflecting the economy's response to rising costs of living and maintaining purchasing power.

Thus, the results presented in Table 4 confirm that economic factors play a key role in income formation, and differences in the strength of the correlation between men and women may indicate structural wage inequality. These results may be useful for further research on the impact of economic fluctuations on the incomes of various social groups and for the development of economic and social policies aimed at maintaining sustainable income growth.

Furthermore, Figure 2 presents the annual ratios of women and men among research workers in Kazakhstan from 2019 to 2023.

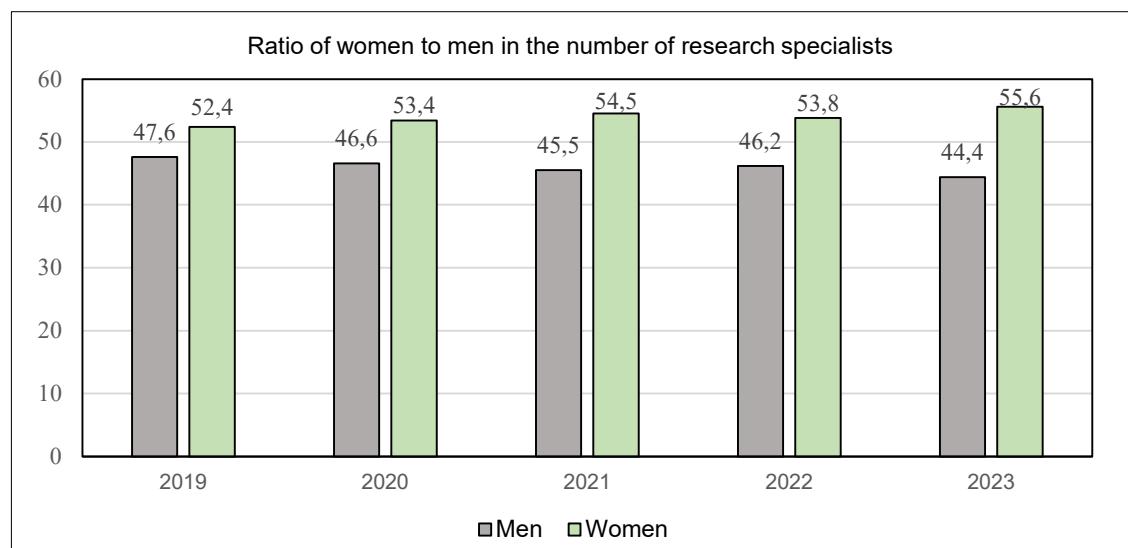


Figure 2. Ratio of women to men in the number of research specialists for 2019–2023

Women consistently constitute the majority of research workers, increasing from 52.4% in 2019 to 55.6% in 2023, while the share of men decreased from 47.6% to 44.4%. This trend indicates an increasing representation of women in highly skilled and innovative fields. These data are particularly relevant for analyzing gender representation in skilled occupations and its potential impact on wage dynamics, the employment structure by sector, and the gender pay gap. Figure 2. also provides a basis for correlation analysis between the gender composition of R&D personnel and macroeconomic indicators, allowing us to identify structural factors contributing to wage inequality. In the context of this study, Figure 2. complements the analyses presented in Table 4 by highlighting changes in the gender structure of the research workforce, offering insights into how shifts in representation may influence economic outcomes, and informing policy interventions to promote gender equality in knowledge-intensive sectors.

Conclusions

An analysis of the Kazakhstan labor market for the period 2019–2023 demonstrates both progress and persistent challenges in achieving gender pay equality. The overall trend observed over these years points to a gradual reduction in the gender pay gap, reflecting the positive impact of economic recovery, structural changes in employment, and the increased participation of women in developing sectors, including knowledge-intensive and digital industries. This period of convergence suggests that improving women's access to education, training, and opportunities in growing sectors can play a significant role in reducing inequality and increasing economic inclusion.

However, while nominal wage growth and rising female employment rates indicate encouraging trends, these improvements remain unevenly distributed across regions, sectors, and occupational levels, suggesting that progress is neither automatic nor uniform. At the same time, the recent partial widening of the pay gap highlights the fragility of these achievements and the impact of persistent structural barriers. The concentration of men in high-paying natural resource-based industries and women in traditionally low-paying social and service sectors continues to shape income distribution and career trajectories. This dynamic demonstrates that overall economic growth, while necessary, is insufficient on its own to achieve sustainable equality. The distribution of economic gains across sectors, coupled with women's equal access to high-paying positions, is becoming a critical factor in long-term progress and labor market efficiency.

Furthermore, the close correlation between wages and macroeconomic indicators, including GDP growth and inflation, underscores the close connection between income levels and broader economic conditions. However, the differential impact of these factors on men and women indicates persistent structural and institutional barriers that impede equitable wage growth. Women's increasing representation in scientific research, technology, and highly skilled occupations points to the potential for long-term transformation, yet differences in wage systems, including bonuses, allowances, and other incentive mechanisms, continue to exacerbate inequality.

Overall, despite Kazakhstan's significant progress in reducing the gender pay gap, these achievements remain dependent on sectoral composition, economic fluctuations, and the structural organization of the labor market. Achieving sustainable and meaningful progress will require a comprehensive and coordinated approach combining public policy, corporate responsibility, and societal engagement. Key measures include promoting women's access to high-paying and high-tech sectors, expanding retraining and upskilling programs, ensuring transparency in wage-setting mechanisms, and fostering an inclusive organizational culture. Only through such coordinated efforts can genuine gender parity be achieved, promoting not only social justice but also the efficient use of human capital, long-term economic growth, and ensuring equitable improvements in living standards for the entire population. Furthermore, proactively addressing these issues will strengthen labor market resilience, stimulate innovation, and foster the development of an inclusive economy that will benefit both current and future generations.

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