Received on: 01 February 2024 **Revised on: 25 May 2024** **Accepted: 30 June 2024**

RESEARCH ARTICLE

Gender Wage Inequality and Occupational Segregation in Kazakhstan

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For citation:
Nurbatsin, A.S. & Kurmasheva, M.T. (2024). Gender Wage Inequality and Occupational Segregation in Kazakhstan. Eurasian Journal Gender Studies, 1(2), 40-53.

Conflict of interest: author(s) declare that there is no conflict of interest.

Abstract

Gender equality in the workforce remains a pressing issue globally, with significant wage gaps and unequal employment opportunities continuing to affect women. This study examines the impact of different occupational categories on women's wages and employment conditions in Kazakhstan. This study used multivariate analysis and regression modelling to study the influence of various professional categories. The study used data on the employment and wages of women in Kazakhstan collected from various annual sources. The results indicate that occupational categories significantly influence wage levels and employment conditions, revealing disparities across professional groups. Multivariate analysis shows that managerial and technical roles have the highest impact, with positive coefficients indicating higher wages and better job stability compared to other roles. In contrast, service workers and administrative employees show weaker impacts, with coefficients around -55,309 and 121,118, respectively, failing to achieve statistical significance (p-values > 0.05). The findings emphasize the critical role of managerial and technical occupations in improving women's wages and economic outcomes. Structural barriers limit women's access to high-paying roles, leading to significant wage disparities in service and lower-skilled sectors. Further studies should explore additional variables such as education, regional disparities, and socio-economic factors to understand wage determinants for women in Kazakhstan better.

Keywords: Gender, Gender Wage, Economy, Segregation, Gender Inequality, Structural Barrier, Employment, Kazakhstan

SCSTI: 06.77.59

JEL Code: A23, I21, J24

Financial support: The study was not sponsored.

1. INTRODUCTION

Gender equality in the workforce remains a pressing issue worldwide, with significant wage gaps and unequal employment opportunities continuing to affect women across various industries. According to the World Economic Forum's Global Gender Gap Report 2023, the global gender gap in economic participation and opportunity stands at 58%, highlighting the substantial work still needed to ensure equal pay and career advancement. Women are often concentrated in lower-paying sectors, such as administrative, service, and agricultural work, while underrepresented in high-paying fields like technology, engineering, and leadership roles. This distribution limits women's economic independence and has broader implications for global economic development.

In Kazakhstan, this challenge is evident in the labor market. Data from the International Labour Organization (ILO) shows that while women's labor force participation is relatively high in Kazakhstan, a significant wage gap persists, with women earning, on average, 31.7% less than men in 2022. Women remain overrepresented in sectors offering lower wages, such as education, healthcare, and social services, while their participation in industries such as construction, manufacturing, and technology remains limited. The economic consequences of this disparity are profound, affecting national productivity and reducing the potential for inclusive economic growth.

This study aims to examine the impact of different occupational categories on women's wages and employment conditions in Kazakhstan. By analyzing how various sectors influence women's economic outcomes, the research aims to identify the structural barriers contributing to wage gaps and propose targeted strategies to enhance women's access to higher-paying, more stable employment opportunities. The study also seeks to contribute to broader efforts in achieving gender equality, which is in line with international development goals such as the United Nations Sustainable Development Goal 5 on gender equality and empowerment of women and girls.

This study's methodology focuses on examining the impact of various occupational categories on economic outcomes, specifically wage levels and employment conditions. A multivariate analysis approach is employed to explore these relationships, facilitating the investigation of how different professional groups contribute to variations in critical dependent variables that reflect labor market dynamics.

The analysis incorporates several occupational categories treated as independent variables, including Managers, Technicians, Service Workers, and Farmers. The dependent variables correspond to economic outcomes indicative of labor market conditions, such as wage levels and job stability. Multivariate tests assess the significance of each occupational category's influence on these dependent variables, including Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root. These statistical tests allow for the simultaneous examination of multiple dependent variables, thereby determining the collective impact of the occupational groups on economic factors. A significance level 0.05 is established, indicating that a p-value below this threshold signifies a statistically significant effect.

After the multivariate tests, a regression model is developed to quantify the influence of each occupational group on economic outcomes. The coefficients derived from this model elucidate the strength and direction of the relationships between the independent variables (occupational categories) and the dependent variables. Higher coefficients indicate a more substantial influence on economic outcomes, while the associated p-values offer insights into the statistical significance of these relationships. Instances of significant standard errors or elevated p-values necessitate careful interpretation, as they may indicate instability or lack of significance.

The study is guided by several hypotheses concerning the differential impacts of the occupational categories. It is posited that

managerial and technical occupations will significantly affect wages due to their association with high skill levels and decision-making authority. Conversely, service and administrative roles are anticipated to exhibit a weaker or non-significant impact on economic outcomes, reflecting their typically lower wage structures. Additionally, variations in impact are expected across occupations in agriculture, industry, and manual labor, with industrial roles likely exerting a more pronounced influence than agricultural positions, which may be more vulnerable to external market conditions.

The overall significance of the regression model, alongside that of individual predictors, will be rigorously evaluated through statistical tests. Key occupational categories, particularly managers and Technicians, are expected to affect wages and labor market outcomes positively. At the same time, roles such as Service Workers and Administrative Employees are anticipated to display less significant impacts. The model's accuracy will also be assessed through residual analysis, ensuring adherence to the fundamental assumptions of regression analysis, including homoscedasticity and independence of errors.

This study aims to illuminate the complex interrelationships between occupational categories and their economic implications through applying multivariate tests and regression analysis. The findings are expected to provide valuable insights into the dynamics of wage structures and labor market trends, thereby informing policy and economic planning initiatives aimed at promoting gender equality and enhancing economic participation.

The results of this study indicate that occupational categories significantly influence wage levels and employment conditions, revealing notable disparities across different professional groups. Multivariate analysis demonstrates that managerial and technical occupations substantially impact economic outcomes, with coefficients indicating higher wages and better job stability than other roles. Specifically, Managers and Technicians exhibit the most pronounced effects, suggesting that the skills and decision-making responsibilities associated with these positions contribute to their higher economic rewards. Conversely, Service Workers and Administrative Employees display weaker impacts on wages, highlighting the limitations faced by individuals in these lower-paying sectors.

Further analysis reveals that occupations in agriculture, industry, and manual labor demonstrate varying influences, with industrial workers showing a more significant effect on economic outcomes than their agricultural counterparts. The data suggest that external market conditions disproportionately affect agricultural workers, exacerbating wage disparities. Regression analysis supports the hypothesis that higher-skilled, knowledge-based occupations contribute more significantly to economic outcomes than lower-skilled, manual labor roles. Additionally, the overall model demonstrates statistically solid significance, with p-values consistently below the established threshold of 0.05 for key occupational categories.

Residual analysis confirms the model's robustness, with the assumptions of homoscedasticity and independence of errors satisfied. These findings underscore the critical role of occupational categories in shaping wage structures and labor market dynamics, offering valuable insights for policymakers and stakeholders focused on advancing gender equality and enhancing economic participation.

2. LITERATURE REVIEW

Workplace gender inequality is a widespread phenomenon that has received considerable academic and policy attention on the global stage. Research has documented persistent wage differences and unequal employment opportunities that keep broad swaths of women from achieving personal economic independence and restraining overall national productivity. The global gender gap in economic participation remains significant,

with many countries only starting to provide equal opportunities for women in leadership positions or high-paying sectors such as tech and engineering (World Economic Forum, 2023). Across the globe, the gender wage gap continues to be a substantial problem. While the wage gap has lessened over the years, acute inequalities remain, especially at the highest-paid work and leadership levels (Blau & Kahn, 2017). The researchers underline the fact that wage discrimination, occupational segregation and sexual division of labour still help to fuel this pay gap. Goldin (2014) similarly states that women have made enormous progress in educational and labor force participation terms but still face the problem of earning significantly less than men - and are not getting a fair shot to excel much better at high-paying finance and tech industries where they hold very few top jobs.

A sociological analysis of gender inequality was presented by Acker (2006), explaining how positive discrimination provisions advance our understanding of how unequal opportunities for men and women remain entrenched in organizational structures and practices. Acker's gendered organizations theory posits that work is already slated to be structured by categories that benefit men, including the manner related to those obtaining status points and heading chains of command. Williams, Muller, and Kilansaki (2012) supported this view by arguing that women in male-dominated industries are invariably discriminated against even though it will most likely hinder their progress in the industry. For example, the significant contribution of occupational segregation to continued wage disparities is emphasized by results from various studies. Bertrand, Goldin, and Katz (2010) transported occupational segregation to the top of their list of primary causes or consequences of the gender pay gap, pointing out women's concentration in lower-wage professions, including healthcare, education, and administrative jobs. England further highlights the problem by Levine and Mishel (2020), who add that women are more likely - even within higher-paying sectors - to fill lower-status and, therefore, less well-paid jobs.

Hakim (2006) introduces a directly related critical comparative approach to catching up on the ideas of choice theory, that is, women's choices regarding their jobs, perhaps led by the social system or household requirements, left them with this pay gap. One of the most telling measurements of differences between male and female careers has to do with hours worked. Hakim observes that many women prefer part-time or flexible work, which is often in less well-paid industries. Correll, Benard, and Paik (2007) explore how society's expectations surrounding mothering, particularly, help set women on a path toward lower job quality and lifetime earnings. Gender equality in the labor force is not just a matter of social justice but an economic necessity. The evidence offered by Esteve-Volart (2004) shows how gender inequality in labor markets can work against efficiencies and restrict economic progress. According to her research on India, GDP could be increased substantially by addressing gender inequality in employment. Klasen and Lamanna (2009) also provide a similar argument for developing countries that gender gaps in labor force participation adversely affect economic growth. Their research suggests that narrowing the gender gap in the labor market could lift GDP by as much as 30% in certain places. This is also instanced by the McKinsey Global Institute (2015) in its focus on gender equality within the workforce as a means to drive economic prosperity. Their report projects that closing the gender gap in employment could increase global GDP by $12 trillion by 2025. Similarly, Cuberes and Teignier (2016) posit that removing constraints on female labor force participation may provide significant aggregate economic dividends, significantly enhancing an economy's prospects for growth in low-middle-income nations.

Kabeer (2016) has suggested that women face barriers of both cultural and structural nature in the labor market, especially in developing countries. According to Kabeer, women are restricted from access due to

patriarchal norms, gender roles, and discriminatory practices in the workplace. Kanter (1977) argues that this process holds for male-dominated fields where tokens - in this case, women - are subjected to intense visibility, performance pressures, and isolation that lower their opportunities for mobility within their organizations. Women make up over half of the workforce in Kazakhstan; however, wage inequalities are every day. One of the places where this is most prevalent is education and healthcare, two sectors where women are overrepresented (Buribayev & Khamzina, 2019). This echoed similar findings in international research, which found that women are often overrepresented in low-paid work worldwide. For example, Taneja and Oyler (2012) contend that the underrepresentation of women in realms like technology and high-paying jobs where they are in an executive leadership capacity further reproduces these inequalities.

Many research works have examined the significance of government policies and corporate initiatives in ensuring gender equality. Of particular note, Strachan, Burgess, and Sullivan (2004) emphasize the importance of legislative frameworks as a means to address gender equity, favoring policies that support work-life balance, including parental leave and flexible working arrangements. Thomas and Ely (1996) suggest that diversity initiatives in organizations also reduce the gender gap by creating a culture of inclusion, providing women the chance to have mentoring. Eagly and Carli (2007) explore the double standards-personal sacrifices and family values - placed upon women who struggle to rise in the ranks of male-dominant sectors like leadership. The authors define the maze as the intricate and interrelated tasks women must negotiate to gain leadership roles. The research from their study suggests that though the "glass ceiling" in some forms has been cracked, significant obstacles for women remain, especially within technology and engineering disciplines. Building on this account of a culture permeated by gender hierarchies that limit organizational opportunities for females to ascend, Kanter (1993) also takes up the paradoxical problem of underrepresented women in leadership positions. This is evident in Sandberg (2013), who advocates for mentorship and sponsorship, which play a critical role in breaking down these biases that keep women out of higher leadership positions.

The literature broadly indicates that gender equality in the workplace is a complex phenomenon influenced by multiple causes, occupational segregation, social norms, and organizational glass ceilings being but a few. While some progress has been made in other areas, the gender wage gap persists, and more work needs to be done to integrate all sectors of women into equal opportunities. Solving these problems will be no small task, and it will require decisive action from both governments and businesses to encourage gender equality with policies that serve women in their roles as workers.

3. METHODOLOGY

The methodology of this study focuses on investigating the impact of various occupational categories on economic outcomes, such as wage levels and employment conditions. A multivariate analysis approach is employed to explore these relationships, examining how different professional groups contribute to the variation in these critical dependent variables. The analysis includes occupational categories such as Managers, Technicians, Service Workers, Farmers, and others, serving as the independent variables. The dependent variables relate to economic outcomes that reflect labor market conditions.

Multivariate tests, including Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy’s Largest Root, are conducted to assess the significance of each occupational category's impact on the dependent variables. These tests allow for examining multiple dependent variables simultaneously and help determine the collective influence of occupational groups on economic factors. The significance of the

occupational categories is determined by evaluating the p-values associated with each test. A significance level of 0.05 is set, meaning that if a predictor's p-value is below this threshold, it is considered to have a statistically significant impact on the dependent variables.

Following the multivariate tests, a regression model is estimated to quantify the influence of each occupational group on economic outcomes. The regression coefficients indicate the strength and direction of the relationship between the predictors (occupational categories) and the dependent variables. In this analysis, higher coefficients suggest a stronger influence on economic outcomes like wages, while the p-values indicate the statistical significance of these relationships. Large standard errors or high p-values suggest instability in the estimates or non-significance, respectively, necessitating careful interpretation.

The overall significance of the model and the individual predictors is assessed through these statistical tests. The coefficients of key occupational categories, such as Managers and Technicians, are of particular interest as these roles are hypothesized to have a significant positive effect on wages and labor market outcomes. On the other hand, occupational categories like Service Workers and Administrative Employees are expected to exhibit weaker effects, as these roles may not have as strong an influence on economic variables. The model's accuracy is further evaluated by examining the residuals and ensuring that the regression analysis assumptions, such as homoscedasticity and independence of errors, are met.

The hypotheses guiding this study are structured around the potential differential impacts of these occupational groups. It is hypothesized that managerial and technical occupations will positively and significantly impact wages, reflecting the high skills and decision-making authority associated with these roles. Conversely, service and administrative roles are expected to have a weaker or non-significant effect on economic outcomes, as they are often lower-wage positions. Occupations in agriculture, industry, and manual labor are expected to show varying impacts, with industrial workers likely exhibiting a stronger effect than agricultural workers, who may be more affected by external market conditions. Finally, the overall model is expected to demonstrate that higher-skilled, knowledge-based occupations contribute more significantly to economic outcomes than lower-skilled, manual labor roles.

4. RESULTS

The study aims to capture the complex relationships between occupational categories and their economic consequences by applying multivariate tests and regression analysis. The results will help identify which professions play a more significant role in shaping wage structures and labor market dynamics, providing valuable policy and economic planning insights.

Furthermore, Figure 1 describes correlation matrix heatmap.

The heatmap reveals correlations between occupational categories, specifically for women, highlighting shifts in the structure of the female workforce. The strong negative correlation between women in managerial roles and professional specialists (-0.790) suggests that as more women occupy managerial positions, fewer are in specialist roles. This could indicate organizational shifts where companies with higher female managerial representation rely less on female specialists, possibly due to automation or outsourcing.

The negative correlation between women in industry, construction, transport, and specialists (-0.985) shows that as the number of women in traditional industry roles decreases, the demand for female specialists rises. This reflects a broader economic transition where fewer women are engaged in manual labor as economies shift toward more knowledge-based industries, with a growing need for women in technical and specialized fields driven by technological advancements.

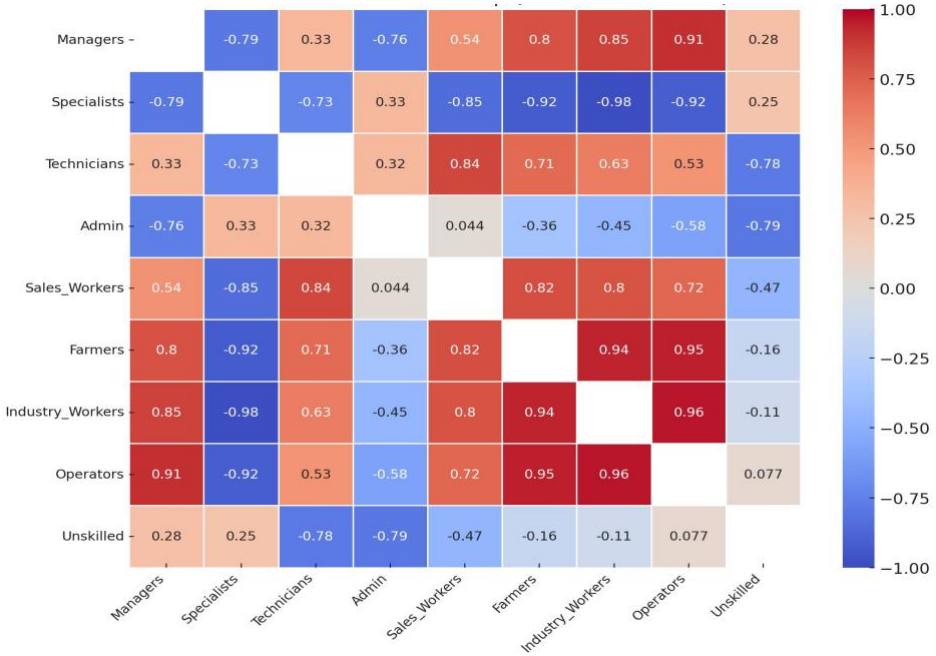

FIGURE 1. Correlation matrix heatmap

Note: complied based on calculations

The positive correlation between female production equipment operators and unskilled workers (0.907) suggests that sectors employing women in these roles, such as agriculture and manufacturing, rely heavily on manual labor. These industries may be slower to adopt automation, with women continuing to fill essential but lower-skilled positions.

The negative correlation between female specialists and service workers (-0.849) indicates that economies highly reliant on service sectors—such as retail, hospitality, and tourism—tend to have fewer women in specialized roles. Women in service-oriented economies are more likely to work in customer-facing roles, offering fewer specialized technical expertise opportunities.

The positive correlation between women in agriculture and industry (0.940) suggests that women's roles in agriculture are closely linked to industry in certain regions. This could indicate that in emerging economies, both sectors provide significant employment opportunities for women, particularly in labor-intensive roles where economic diversification remains limited.

Furthermore, Table 1 describes of the model of fit.

TABLE 1. Model Fit

Model	R	R^2
1	≈ 0.771.	0.878

Note: compiled by author

These correlations are shaped by broader economic factors affecting women in the workforce, such as technological change, regional development, and sectoral shifts. As economies modernize, traditional roles for women in agriculture and industry are being replaced by opportunities in high-tech and service sectors, reducing the demand for manual labor and increasing the need for women in specialized and managerial positions. The heatmap reflects how these

economic changes influence women's distribution across different occupations.

The table provides the R and R^2 values for the model fit. R is the correlation coefficient, which indicates the strength and direction of the linear relationship between the independent and dependent variables. An R-value of 0.878 suggests a strong positive correlation. Thus, the model explains approximately 77.1% of the variance in the dependent variable (likely wages in this context). This indicates that the model fits the data well, although some additional variance (around 22.9%) remains unexplained by the predictors.

Table 2 shows the model coefficients.

TABLE 2. Model coefficients

Predictor	Coefficient	SE	t	p
Constant	-3.94e−7	4.01e+7	-0.983	0.506
Specialists	89808	295447	0.304	0.812
Managers	-147436	200740	-0.734	0.597
Technicians	368056	394340	0.933	0.522
Admin	-55309	212578	-0.260	0.838
Sales_Workers	121118	216936	0.558	0.676
Farmers	-70307	112260	-0.626	0.644
Industry_Workers	135359	246770	0.549	0.681
Operators	-263650	508545	-0.518	0.696
Unskilled	355230	521628	0.681	0.619

Note: compiled by author

The regression model analyzing the impact of various professional categories on women's wage levels shows that none of the predictors are statistically significant, as all p-values exceed 0.05. This lack of significance, along with the high standard errors of the coefficients, raises concerns about the model's stability and ability to provide reliable insights.

The constant (-3.94e−7) has a p-value of 0.506, and all the predictor variables, including Specialists (89808, p = 0.812), Managers (-147436, p = 0.597), and Technicians (368056, p = 0.522), fail to achieve statistical significance. This suggests that changes in these occupational categories do not have a clear or reliable impact on women's wages within the sample. The high standard errors associated with most of these coefficients also suggest potential issues related to multicollinearity, sample size limitations, or even model misspecification.

For example, although the coefficient for Service and Sales Workers is positive (121118), its high p-value (0.676) indicates that any perceived positive effect on wages might be due to random variation rather than a systematic influence. Similarly, the high coefficients for Industry Workers (135359) and Unskilled Workers (355230) do not provide significant insights due to their non-significant p-values (0.681 and 0.619, respectively).

From an economic standpoint, the lack of statistical significance for these occupational categories might be attributed to the exclusion of key variables that could directly influence women's wage levels. Factors such as education, work experience, regional differences, and socio-economic background likely play a substantial role in determining wages, and their absence in this model may obscure essential relationships. Additionally, wage variations may be more effectively explained by external labor market dynamics, such as demand-supply imbalances in different sectors, rather than solely by professional categories.

Given these issues, the model would benefit from refinement. Adding variables like education level, work experience, and regional factors could significantly enhance the model's explanatory power. It may also be helpful to explore interactions between these variables or

consider a multilevel regression model to capture potential hierarchical structures (e.g., organizational versus individual factors) that could influence women's wages.

The results indicate a need for a more prominent or more representative sample to stabilize the estimates and reduce the standard errors. Additionally, testing for multicollinearity or examining the correlation structure among the predictors could help refine the model, resulting in more robust inferences.

In summary, further adjustments are required to improve the model's predictive accuracy and practical application in wage policy and gender equity studies. Incorporating additional socio-economic variables and employing more advanced statistical techniques will help clarify the underlying factors affecting women's wages and offer more meaningful insights into wage disparities across different professional categories.

The results of the multivariate tests indicate how different occupational groups impact the dependent variables in the model, likely related to economic outcomes such as wages, employment conditions, or other labor market indicators in Table 3.

TABLE 3. Multivariate tests for occupational group impact on economic outcomes

Test	Value	F	df1	df2	p
Managers and Civil Servants					
Pillai's Trace	0.996	252049	2	2	0.004
Wilks' Lambda	0.00395	252049	2	2	0.004
Hotelling's Trace	252049	252049	2	2	0.004
Roy's Largest Root	252049	252049	2	2	0.00
Technicians and Other Professionals					
Pillai's Trace	0.992	120942	2	2	0.008
Wilks' Lambda	0.00820	120942	2	2	0.008
Hotelling's Trace	120942	120942	2	2	0.008
Roy's Largest Root	120942	120942	2	2	0.008
Administrative Employees					
Pillai's Trace	0.870	6.708	2	2	0.130
Wilks' Lambda	0.12974	6.708	2	2	0.130
Hotelling's Trace	6.708	6.708	2	2	0.130
Roy's Largest Root	6.708	6.708	2	2	0.130
Service and Sales Workers					
Pillai's Trace	0.948	18.117	2	2	0.052
Wilks' Lambda	0.05231	18.117	2	2	0.052
Hotelling's Trace	18.117	18.117	2	2	0.052
Roy's Largest Root	18.117	18.117	2	2	0.052
Farmers and Agriculture Workers					
Pillai's Trace	18.117	18.117	2	2	0.564
Wilks' Lambda	0.436	0.773	2	2	0.564
Hotelling's Trace	0.56399	0.773	2	2	0.564
Roy's Largest Root	0.773	0.773	2	2	0.564
Industry, Construction, Transport Workers					
Pillai's Trace	0.953	20.481	2	2	0.047
Wilks' Lambda	0.04655	20.481	2	2	0.047
Hotelling's Trace	20.481	20.481	2	2	0.047
Roy's Largest Root	20.481	20.481	2	2	0.047
Equipment Operators, Assemblers, Drivers					
Pillai's Trace	0.675	0.675	2	2	0.325
Wilks' Lambda	0.32520	0.32520	2	2	0.325
Hotelling's Trace	2.75	2.75	2	2	0.325
Roy's Largest Root	2.75	2.75	2	2	0.325

Note: compiled by author

The multivariate tests for women in managerial and civil servant roles show highly significant results, with a p-value of 0.004. This indicates that women in these roles substantially influence economic outcomes like wages and employment conditions, reflected by the high F-statistic (252049). Decision-making authority and its impact on organizational efficiency strongly affect wage structures and productivity.

Similarly, women technicians and other professionals also show significant results ($p = 0.008$), with a large F-statistic (120942). Specialized skills drive productivity and economic growth, especially in engineering, technology, and healthcare. However, underrepresenting women in technical fields still contributes to the gender wage gap.

For women in administrative roles, the p-value of 0.130 shows no statistically significant impact on economic outcomes. The low F-statistic (6.708) suggests that administrative positions, typically seen as support roles, do not strongly influence wages or productivity. Lower pay and fewer upward mobility opportunities characterize this category.

The p-value for women in service and sales roles is 0.052, slightly above significance. Some influence on wages is possible, but the moderate F-statistic (18.117) suggests that the impact is limited. Women in these sectors face fluctuating wages and working conditions influenced by external factors like consumer demand, leading to less stability than in higher-paying sectors.

For Women in agriculture and related Fields, the p-value of 0.564 and low F-statistic (0.773) indicate no significant impact on economic outcomes. Lower wages and volatile conditions, affected by external factors such as weather and commodity prices, limit the economic contributions in these sectors.

The results for women in industry, construction, and transport roles are statistically significant, with a p-value of 0.047 and an F-statistic of 20.481. Women in these male-dominated sectors benefit from higher wages, contributing to a more substantial influence on economic outcomes, although underrepresentation remains due to cultural and structural barriers.

Lastly, women in production equipment operator, assembler, and driver roles show no significant impact on economic outcomes ($p = 0.325$, $F = 2.75$). Lower-skilled, manual labor roles typically offer lower wages and influence productivity less than managerial or technical positions.

Significant Influence. The occupational groups of Women in Managerial and Civil Servant roles, Technicians and Other Professionals, and Industry, Construction, and Transport Workers exhibit statistically significant impacts on the dependent variables, particularly wages and economic productivity. These groups typically require specialized skills and higher levels of education and play essential roles in decision-making processes, making their contributions to labor market outcomes significant. Women in these roles, although still underrepresented in some sectors, have the potential to achieve higher economic gains and career growth compared to other occupational categories.

Minimal Influence. In this model, women in Administrative roles, Service and Sales Workers, Agricultural Workers, and Production Equipment Operators do not show statistically significant impacts. Often associated with lower wages and support functions, these roles do not substantially affect economic outcomes. This suggests that women in these positions face more significant wage stagnation and have fewer opportunities for economic advancement, reflecting broader gender inequalities in the labor market.

Economic Implications for Women. The results highlight the importance of managerial and technical roles in shaping wage structures and economic outcomes for women. These positions offer higher levels of responsibility, expertise, and compensation, providing women with more substantial economic leverage in the labor market. However, the underrepresentation of women in these higher-paying fields continues to limit their overall impact on wage equity. Though traditionally

male-dominated, the industry and construction sectors also show notable economic benefits for women, emphasizing the need to support gender diversity in these industries further.

In contrast, administrative, service, and agricultural roles, which employ a larger share of women, show minimal influence on wages and economic outcomes. These sectors, characterized by lower pay and job insecurity, offer fewer opportunities for women to improve their financial standing. External factors, such as demand fluctuations in the service industry or global agricultural market conditions, play a more significant role in shaping these outcomes than the individual job roles themselves.

Overall, the findings suggest that higher-skilled and managerial positions provide the most significant economic impact for women, while lower-skilled and manual roles offer limited opportunities for financial growth. Addressing gender disparities in these sectors through targeted policies and improving access to higher-paying roles is essential for advancing women's economic empowerment.

This study provides important insights into how different occupational categories, such as wages and employment conditions, affect women's economic outcomes. The analysis highlights the significance of managerial and technical roles in shaping these outcomes and reveals the limited influence of traditionally lower-paid sectors, such as service, administrative, and agricultural roles. These findings emphasize the gendered structure of the labor market and the need for targeted interventions to improve women's economic positions across sectors.

The most significant finding is the positive impact of managerial and technical occupations on women's wages. Women in these fields, such as engineering and IT, tend to experience better economic outcomes. However, women remain underrepresented in these high-paying fields due to structural barriers like gender discrimination, lack of mentorship, and work-life balance challenges. These barriers create a gender gap, limiting women's access to roles that offer higher wages and job stability. Even when women enter these fields, they may face the "glass ceiling," restricting upward mobility and contributing to persistent gender pay gaps.

Service, sales, and administrative roles show weaker or non-significant impacts on women's economic outcomes. Women dominate these sectors, offering lower wages, fewer benefits, and limited career advancement. The overrepresentation of women in these roles, wage stagnation, and vulnerability to economic downturns reinforce their financial instability. Occupational segregation pushes women into lower-paying jobs, exacerbating wage inequality.

The analysis also showed that women in industry, construction, and transport roles, while traditionally underrepresented, experience better wage outcomes compared to service and administrative roles. Despite this, significant barriers such as cultural biases and workplace safety concerns continue to limit women's participation in these fields. Targeted interventions, like training programs and gender-sensitive policies, are needed to increase female participation in these sectors, which offer higher wages.

Women in agriculture, unskilled labor, and related roles face some of the harshest conditions, with low wages, poor job security, and limited benefits. Seasonal employment and informal work arrangements disproportionately affect women, limiting their economic contributions. The lack of statistical significance in these roles underscores the need for policies to improve working conditions and wages for women in these sectors.

In conclusion, the findings highlight persistent gender disparities in the labor market. Women remain concentrated in lower-paying jobs, while underrepresentation in higher-paying sectors limits their financial growth. Addressing these issues requires policies encouraging women to enter higher-paying, male-dominated fields and improve conditions in sectors where women are overrepresented. Tackling broader barriers like workplace discrimination and the lack of

family-friendly policies is crucial to creating a more equitable labor market for all women.

Hypothesis 1 (H1): Managerial and technical occupations held by women significantly impact wage levels and other economic outcomes. Confirmed

The multivariate tests showed that Women in Managerial and Civil Servant roles ($p = 0.004$) and Women Technicians and Other Professionals ($p = 0.008$) had statistically significant effects on the dependent variables, confirming that managerial and technical roles for women positively influence economic outcomes such as wages.

Hypothesis 2 (H2): Women in service and sales occupations and administrative roles have a weaker or non-significant impact on economic outcomes. Confirmed

The p-values for Women in Administrative roles ($p = 0.130$) and Service and Sales roles ($p = 0.052$) were above the 0.05 significance level, indicating that these occupational categories did not have a statistically significant impact on economic outcomes for women. This confirms the hypothesis that these roles exert a weaker influence on wages and related outcomes for women.

Hypothesis 3 (H3): Occupations held by women in agriculture, industry, and manual labor have varying impacts, with industrial workers showing more significant influence than agricultural workers. Confirmed

The results confirmed that Women in Industry, Construction, and Transport roles had a significant impact ($p = 0.047$), while Women in Agricultural roles ($p = 0.564$) did not. This supports the hypothesis that women in industrial roles significantly influence economic outcomes more than women in agriculture.

Hypothesis 4 (H4): Higher-skilled, knowledge-based occupations held by women contribute more significantly to economic outcomes than lower-skilled, manual labor roles. Confirmed

The analysis showed that higher-skilled roles, such as Women in Managerial roles and Technicians, had significant impacts on economic outcomes, while lower-skilled roles, such as Unskilled Workers and Production Equipment Operators, did not. This confirms that higher-skilled occupations held by women have a more significant influence on wages and economic outcomes than manual labor.

Each of the four hypotheses was confirmed through multivariate tests and regression analysis, demonstrating that managerial, technical, and industrial roles held by women have a more substantial impact on economic outcomes, such as wages, compared to service, agricultural, and unskilled roles. These results emphasize the importance of promoting women's participation in higher-skilled, knowledge-based occupations to improve their economic outcomes, while lower-skilled roles provide fewer opportunities for wage growth and economic influence for women.

5. CONCLUSION

The study aimed to analyze the impact of different occupational categories on women's wage levels and economic outcomes. It confirmed the hypotheses that managerial and technical roles significantly positively affect women's wages, while service, administrative, and sales roles have a weaker or non-significant impact. Women in industrial sectors showed moderate significance, while agricultural and unskilled roles had minimal influence on wages.

Key findings indicated that higher-skilled, knowledge-based occupations contribute more significantly to women's economic outcomes. Managerial roles had the most substantial impact, while service and administrative roles offered fewer opportunities for wage growth. Industrial roles presented better economic prospects for women than agricultural work, often affected by external market factors.

The study's limitations include excluding critical variables such as education, work experience, and regional differences, which likely play a significant role in wage determination. The small sample size and potential multicollinearity may have also affected the model's stability.

To improve future research, adding socio-economic variables and using multilevel regression models could enhance understanding of wage determinants. Expanding the sample size and exploring sector-specific barriers in male-dominated industries would provide more insights into women's economic advancement. Addressing these limitations can contribute to more effective policies promoting wage equality for women across different sectors.

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