**FMDB** *Transactions on Sustainable Management Letters*

# Analyzing Uneven Distribution of Sectoral Employment in Uzbekistan Adopting Panel Data Approach

**Rajneesh Kler[1, *], Nodir Gulyamov Baxtiyorovich[2], Rasulmat Supiev[3]**

[1,2,3] Department of Management and Social Sciences, Amity University, Tashkent, Uzbekistan.
rkler@amity.uz[1], nodir.baxtiyorovich@s.amity.edu[2], rasulmat.supiev1@s.amity.edu[3]

**Abstract:** This paper investigates the phenomenon of skewness in sectoral employment in Uzbekistan, employing a panel data approach to provide a comprehensive analysis. The country's transition from a centrally planned to a market-oriented economy since independence in 1991 has led to shifts in employment structure, impacting productivity, income distribution, and socio-economic development. Despite progress, disparities persist across industries, posing challenges to balanced sectoral development. This study addresses the research gap in analyzing skewness in sectoral employment through panel data methodology, allowing for a nuanced examination of dynamics over time and regions. The objectives are to empirically assess the skewness extent and identify contributing determinants, aiming to inform policy interventions for promoting balanced sectoral development and inclusive growth. The paper is structured to include a literature review on sectoral employment and panel data analysis, followed by a methodology outlining data collection and empirical strategy. Results and analysis sections present findings, culminating in implications, limitations, and recommendations for future research. Through its rigorous analysis, this study contributes to understanding sectoral employment dynamics and provides insights for policymakers to address economic disparities in Uzbekistan.

**Keywords:** Sectoral Employment; Skewness Panel; Data Analysis; Economic Transition Uzbekistan; Economy Inclusive Growth; Nuanced Examination of Dynamics.

**Received on:** 02/11/2023, **Revised on:** 23/12/2023, **Accepted on:** 11/01/2024, **Published on:** 01/03/2024

**Journal Homepage:** https://www.fmdbpub.com/user/journals/details/FTSML

**DOI:** https://doi.org/10.69888/FTSML.2024.000160

**Cite as:** R. Kler, N. G. Baxtiyorovich, and R. Supiev, "Analyzing Uneven Distribution of Sectoral Employment in Uzbekistan Adopting Panel Data Approach," *FMDB Transactions on Sustainable Management Letters*., vol. 2, no. 1, pp. 29–38, 2024.



## 1. Introduction

The dynamics of employment within sectors play a pivotal role in shaping the economic landscape of nations, influencing growth, development, and overall welfare. In the case of Uzbekistan, a country with a transitioning economy, understanding employment distribution across sectors is paramount [1]; [2]. This paper aims to delve into skewness in sectoral employment in Uzbekistan, employing a panel data approach to provide a comprehensive analysis. Uzbekistan has undergone significant economic reforms since gaining independence in 1991, transitioning from a centrally planned to a market-oriented economy. These reforms have led to shifts in the employment structure, with implications for productivity, income distribution, and socio-economic development. Despite progress, challenges remain in achieving balanced sectoral development, with disparities persisting across industries.

*Corresponding author.

The research problem addressed in this study revolves around the uneven distribution of employment across sectors in Uzbekistan and its implications for economic stability and social welfare. While previous studies have examined aspects of sectoral employment in the country, there remains a gap in the literature regarding the analysis of skewness, particularly through the lens of panel data methodology.

By adopting a panel data approach, this study seeks to overcome limitations associated with cross-sectional or time-series analyses, allowing for a more robust examination of the dynamics of sectoral employment over time and across different regions. Panel data analysis enables incorporating individual and time-specific effects, offering a nuanced understanding of the factors driving skewness in sectoral employment [18]-[19].

The objectives of this study are twofold: first, to empirically assess the extent of skewness in sectoral employment in Uzbekistan, and second, to identify the determinants contributing to such skewness. By elucidating the factors influencing the distribution of employment across sectors, this research aims to provide insights that can inform policy interventions to promote balanced sectoral development and foster inclusive growth [20]-[21].

To achieve these objectives, this paper is structured as follows: after the introduction, the literature review section provides a theoretical framework and examines relevant literature on sectoral employment and panel data analysis. The methodology section outlines the data collection process, econometric techniques, and the adopted empirical strategy. Subsequent sections present the data analysis and results, followed by a discussion of findings, concluding with implications, limitations, and recommendations for future research.

## 2. Literature Review

Shalihah et al. [3] propose a framework emphasizing the interplay between skills, tasks, and technologies in shaping employment patterns. They argue that technological advancements and shifts in demand for specific skills influence labor allocation across sectors, leading to structural changes in the economy.

Abduraimova [4] examines the relationship between investments and employment outcomes in Uzbekistan. The study investigates how investments contribute to job creation and impact economic well-being. The study focuses on the role of investments in driving employment growth in transitioning economies like Uzbekistan. The study uses empirical analysis and econometric techniques to evaluate the effectiveness of investments in various sectors of the Uzbek economy in generating employment opportunities. The research findings provide insights into employment dynamics in Uzbekistan. The study highlights the importance of targeted investments in fostering job creation and reducing unemployment rates. It also emphasizes the need for strategic planning and policy interventions to maximize the employment impact of investments in different sectors.

Usmonov [5] explores inclusive employment and its impact on Uzbekistan's socio-economic landscape. The study investigates necessary reforms for inclusive employment practices, providing opportunities for marginalized individuals to participate in the labor market. Usmonov critically evaluates employment in Uzbekistan, identifying barriers to inclusive practices. Upashevna et al. [6] emphasize comprehensive reforms to promote inclusivity in the labor market. Combining theoretical analysis with empirical insights, Usmonov highlights the potential benefits of inclusive employment for Uzbekistan's economy and society. The study underscores the necessity of policy interventions and institutional changes to ensure equal access to employment opportunities for all.

Khalmurovodna [7] investigated strategies to enhance youth employment prospects in Uzbekistan. The authors analyzed various policies and initiatives to increase opportunities for young people in the labor market. Uzbekistan is no exception to the global concern of youth unemployment. The study thoroughly examined the unique context of Uzbekistan and identified factors contributing to youth unemployment while proposing potential solutions. Askarova [8] employed qualitative and quantitative analyses to evaluate existing policies and recommended targeted interventions. The findings highlight the complex nature of youth unemployment in Uzbekistan and emphasize the need for comprehensive strategies. The study identifies barriers to young people's access to employment and provides insights into the role of education, skills development, and labor market policies in improving youth employability.

Nurdinova [9] explores the impact of reforms on employment and unemployment dynamics in Uzbekistan. Employing a functional approach, the authors examine the effectiveness of policy measures and institutional changes to address unemployment challenges and foster greater labor market participation. The study delves into the functional aspects of employment policies and assesses their outcomes regarding job creation, skill development, and labor market integration. Through qualitative analysis and case studies, the study evaluates the implementation and impact of various reform initiatives. Tojiyeva and Ibragimov [10] comprehensively analyze Uzbekistan's labor market dynamics and employment trends. Drawing on various quantitative and qualitative data sources, the authors examine various aspects of the labor market, including

employment patterns, labor force participation, and unemployment rates. The study employs a multidisciplinary approach, integrating insights from geography, economics, and sociology to provide a holistic understanding of the labor market dynamics in Uzbekistan.

Amirdjanova [11], through empirical analysis and theoretical insights, explores various facets of the labor market, including employment trends, labor force participation, and unemployment rates. Complex factors, including demographic shifts, economic restructuring, and policy interventions, characterize Uzbekistan's labor market. The study employs quantitative and qualitative methods to analyze labor market data and identify key determinants of employment outcomes. The research findings shed light on the evolving nature of the labor market in Uzbekistan and highlight important trends and patterns. The study reveals disparities in employment across different demographic groups and regions, emphasizing the need for targeted interventions to address inequalities and promote inclusive growth by analyzing the labor market from macro and micro perspectives. The research gaps are summarized in Table 1 [12]-[14].

**Table 1:** Research Gaps

| Researcher | Research Focus | Methodology | Key Findings | Research Gap |
|---|---|---|---|---|
| Abduraimova [4] | Relationship between investments and employment | Empirical analysis, econometrics | Targeted investments foster job creation and reduce unemployment rates in Uzbekistan. | Lack of analysis on the effectiveness of investments across different sectors in generating employment opportunities. |
| Usmonov [2] | Inclusive employment and necessary reforms | Theoretical analysis, empirical | Inclusive employment practices are essential for socio-economic development in Uzbekistan. | Insufficient exploration of specific policy interventions and their effectiveness in promoting inclusive employment. |
| Khalmurovodna [7] | Strategies to enhance youth employment prospects | Qualitative and quantitative | Comprehensive strategies are needed to address youth unemployment challenges in Uzbekistan. | Limited examination of the role of education and skills development in improving youth employability. |
| Upashevna et al. [6] | Impact of reforms on employment dynamics | Functional approach, case studies | Reforms are crucial in addressing unemployment challenges and fostering labor market participation. | Lack of comprehensive analysis of the outcomes and effectiveness of specific reform initiatives in Uzbekistan. |
| Tojiyeva and Ibragimov [10] | Analysis of labor market dynamics in Uzbekistan | Multidisciplinary approach | Provides a holistic understanding of the labor market dynamics, including employment patterns and disparities. | Limited exploration of specific demographic and regional factors influencing employment outcomes in Uzbekistan. |
| Amirdjanova [11] | Analysis of labor market dynamics in Uzbekistan | Quantitative and qualitative | Highlights disparities in employment across demographics and regions emphasize the need for targeted interventions. | Insufficient exploration of the effectiveness of policy interventions and institutional changes in promoting inclusive growth. |

Table 1 compares the major studies focusing on various aspects of Uzbekistan's labor market and employment dynamics. Each study addresses specific research gaps and employs distinct methodologies to analyze the topic. While some studies provide theoretical frameworks, others offer empirical analyses or combine both approaches.

Key findings include the influence of technological advancements on employment patterns, the importance of targeted investments in fostering job creation, and the necessity of comprehensive reforms to promote inclusive employment practices. However, gaps remain in the empirical validation of theoretical frameworks, effectiveness of investments across sectors, and exploration of specific policy interventions for promoting inclusive employment.

### 2.1. Research Objectives

- To empirically evaluate the distribution of employment in various sectors in Uzbekistan based on the differences in the nominal wage rates and inflation rate.
- To assess the outcomes and effectiveness of specific policy interventions and institutional changes aimed at promoting inclusive employment practices and addressing disparities in employment in Uzbekistan.

## 3. Methodology

The methodology employed in analyzing quarterly observations from 2017 quarter 1 to 2022 quarter 4 across eight core sectors in Uzbekistan involves a static panel data model. This model specification enables the examination of the relationship between sectoral employment, real nominal wage rates, and the rate of inflation over time [15]-[17]. As the dependent variable, sectoral employment numbers are studied using real nominal wage rates and the inflation rate. Real nominal wage rates reflect the purchasing power of wages, while the inflation rate captures the general price level dynamics within the economy showing the methodology flow in Figure 1.

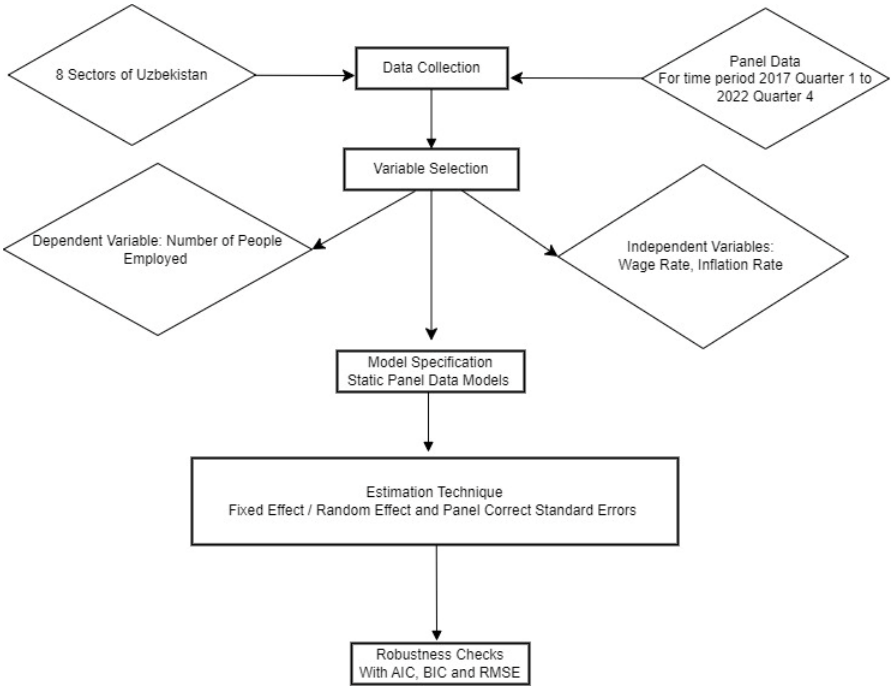


**Figure 1:** Flow of Methodology

Two estimation techniques are applied to the panel data: random effect estimation and PCSEs (Panel Corrected Standard Errors) estimation. Random effect estimation allows for considering time-invariant and time-varying factors that may influence sectoral employment across the observed quarters. Meanwhile, PCSEs estimation addresses potential biases arising from heteroscedasticity and serial correlation within the panel data structure. By employing these complementary techniques, the analysis aims to provide robust insights into the determinants of sectoral employment dynamics in Uzbekistan's core sectors while accounting for both time and sector-specific effects.

### 3.1. Model Specification

The following equations can represent the econometric form of the two models:

### 3.2. Random Effect Model

$$\text{Sectoral employment}_{it} = \beta_0 + \beta_1 \text{Real Nominal Wage Rate}_{it} + \beta_2 \text{Rate of Inflation}_{it} + \sum j = J \gamma \text{sectorDummy}_{ij} + \mu_{it}$$

### 3.3. PCSEs Model

$$\text{Sectoral Employment}_{it} = \beta_0 + \beta_1 \text{Real Nominal Wage Rate}_{it} + \beta_2 \text{Rate of Inflation}_{it} + \sum j = J\gamma \text{sectorDummy}_{ij} + \mu_{it} + \alpha_i + \epsilon_i$$

Where:

- Sectoral employment represents the sectoral employment in sector *i* at time *t*.
- Real Nominal Wage Rate represents the real nominal wage rate in sector *i* at time *t*.
- Rate of Inflation represents the inflation rate in sector i at time t.
- Sector Dummy$ij$ is a dummy variable indicating whether the observation belongs to sector j.
- β0, β1and β2 are the coefficients to be estimated.
- $\gamma j$ represents the effect of each sector dummy.
- uit is the random error term in the random effect model.
- αi is the individual-specific effect in the PCSE model.
- ϵit is the idiosyncratic error term in the PCSE model.

Both models include sector dummies for unobserved sector-specific heterogeneity, allowing a more accurate estimation of the relationships between sectoral employment, real nominal wage, and inflation rates.

## 4. Results

### 4.1. Model Evaluation: Random Effects Model

#### 4.1.1. The overall fit of the Model

- R-squared (within): This value of 0.1321 suggests that the independent variables included in the Model explain approximately 13.21% of the total variation in sectoral employment.
- R-squared (overall): The overall R-squared of 0.9950 indicates that the Model explains around 99.50% of the total variation in sectoral employment, suggesting a good overall fit to the data.

#### 4.1.2. Variance Components:

- sigma_u (Between-Group Variance): The estimated variance component for the between-group effects (sector-specific effects) is zero, suggesting no variation in sectoral employment across sectors that the included independent variables cannot explain.
- sigma_e (Within-Group Variance): The estimated variance component for the within-group effects (idiosyncratic errors) is 0.043, indicating the extent of residual variability in sectoral employment not accounted for by the Model.

#### 4.1.3. Coefficients

- nominal wages (Real Nominal Wage Rate): The coefficient of 0.047 suggests that, on average, a one-unit increase in the real nominal wage rate is associated with a 0.047 % increase in sectoral employment, holding other variables constant. This coefficient is statistically significant at the 0.05 level, indicating that changes in real nominal wages significantly impact sectoral employment.
- Inflation (Rate of Inflation): The coefficient of 0.031 indicates that, on average, a one-unit increase in the rate of inflation is associated with a 0.031 % increase in sectoral employment, although it is statistically significant only at the 0.1 level (borderline significance).
- Sector Dummy Variables (Industry to Health and services): Each sector dummy variable captures the average difference in sectoral employment compared to the reference category (Base being Agriculture). Negative coefficients for Industry to other sectors suggest that, on average, these sectors have lower levels of employment compared to Agriculture, with the magnitude of the differences varying across sectors.

The results are shown in Figure 2 below.

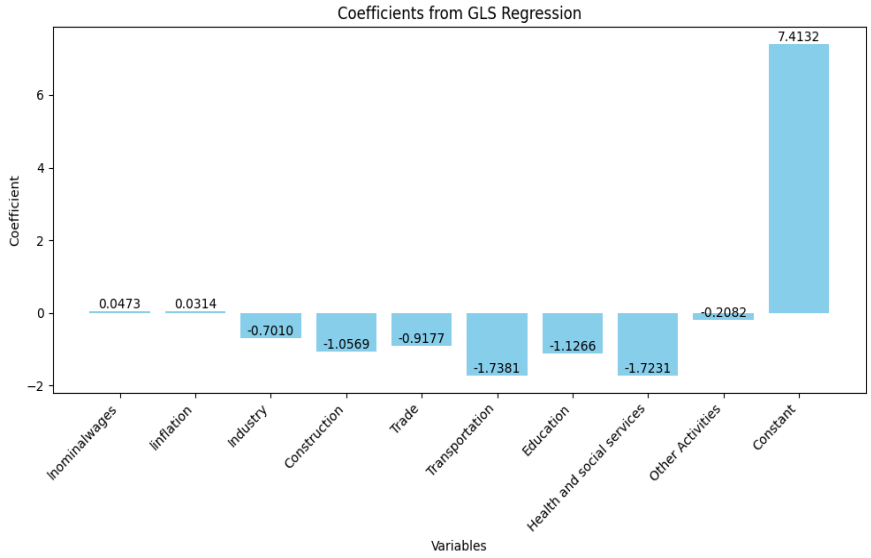


**Figure 2:** Random Effect GLS Model Results

The analysis above highlights the significant influence of real nominal wages on sectoral employment, while the impact of inflation appears less conclusive. Additionally, sector-specific factors significantly affect employment levels, with certain sectors exhibiting lower employment compared to Agriculture, the reference category.

### 4.2. Model Evaluation: PCSEs Model

#### 4.2.1. Overall Model Fit

- The R-squared value is 0.9950, indicating that the included independent variables explain approximately 99.50% of the total variation in sectoral employment.
- The Wald chi-square statistic of 230592.84 with 9 degrees of freedom tests the joint significance of all coefficients. The p-value (Prob > chi2 = 0.0000) indicates that the Model is statistically significant.

#### 4.2.2. Variance Components

- The estimated covariance of 36 suggests considerable covariance between errors across different sectors. This implies that certain factors affecting sectoral employment might be common across multiple sectors, leading to similar error terms.
- In the provided results, the estimated autocorrelation is zero, suggesting that the errors within each sector do not exhibit any systematic correlation or pattern over time.

#### 4.2.3. Coefficients

- Nominal wages (Real Nominal Wage Rate): The coefficient of 0.0472986 suggests that, on average, a one-unit increase in the real nominal wage rate is associated with a 0.0473% increase in sectoral employment. This coefficient is statistically significant at the 0.001 level.
- Inflation (Rate of Inflation): The coefficient of 0.0313613 indicates that, on average, a one-unit increase in the rate of inflation is associated with a 0.0314% increase in sectoral employment. It is statistically significant at the 0.05 level.
- Sector Dummy Variables (Industry to Health and Services): Each sector dummy variable captures the average difference in sectoral employment compared to the reference category (Agriculture as a base). Negative coefficients for sectors 2 to 8 indicate that, on average, these sectors have lower employment levels than the reference sector, with varying magnitudes of difference.

The results are shown in Figure 3 below.

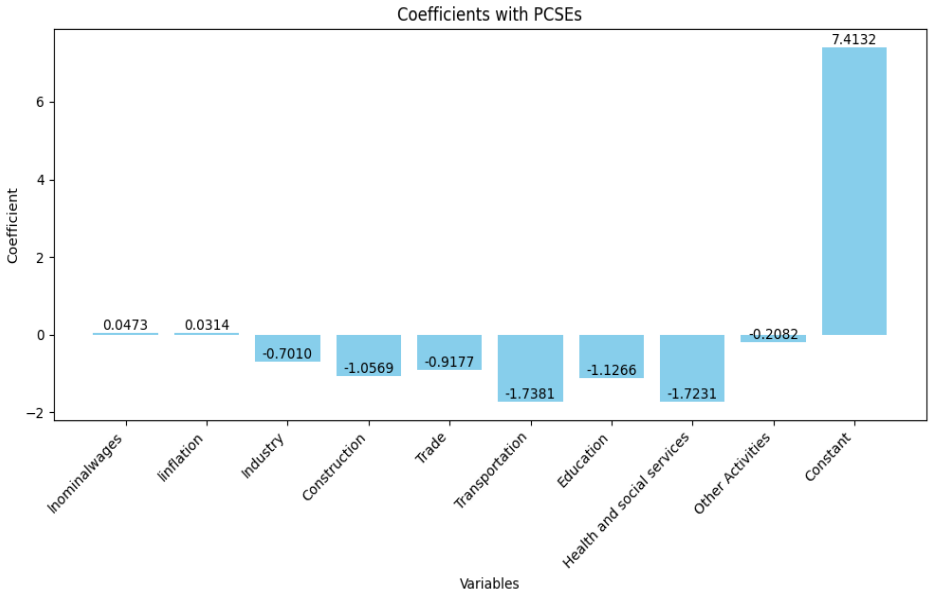


**Figure 3:** Model Results PCSE's

The analysis above highlights the significant influence of real nominal wages on sectoral employment, while the impact of inflation appears less conclusive. Additionally, sector-specific factors significantly affect employment levels, with certain sectors exhibiting lower employment compared to Agriculture, the reference category.

Comparing the two models we see that both models provide coefficient estimates for each variable. In the comparison, we observe that the coefficient estimates for each variable are very similar between the RE and PCSEs models. For example, the coefficients for 'nominal wages,' 'inflation,' 'Industry,' 'Construction,' 'Trade,' 'Transportation,' 'Education,' 'Health and social services,' 'Other Activities', and 'Constant' are almost identical between the two models (Figure 4).

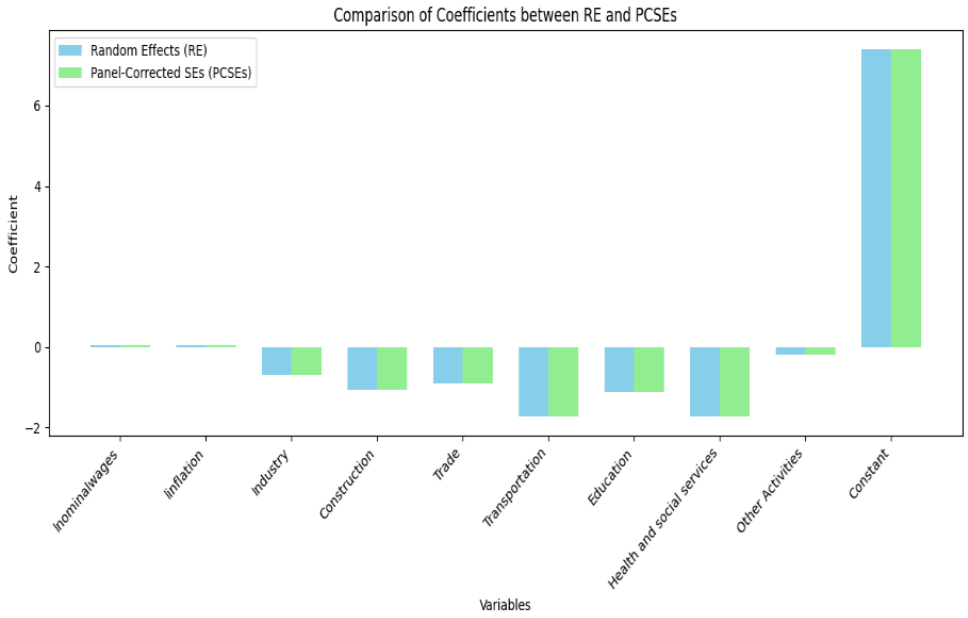


**Figure 4:** Comparison of the two Models

One significant difference between the two models lies in the standard errors associated with the coefficient estimates. In the PCSEs model, the standard errors are corrected for potential correlation within panels, providing more accurate estimates of uncertainty than the standard errors from the RE model, which assumes independence across panels.

## 5. Discussion and Conclusion

The analysis compares two distinct models, Random Effects (RE) and Panel-Corrected Standard Errors (PCSEs), to understand the relationship between sectoral employment and various independent variables across different sectors in Uzbekistan. In the RE model, coefficient estimates were obtained assuming independence across panels, while the PCSEs model corrected for potential correlation within panels to provide more accurate estimates of uncertainty. Both models yielded similar coefficient estimates for variables such as real nominal wage and inflation rates, suggesting consistent findings.

However, the key distinction lies in the interpretation of standard errors. PCSEs model accounted for panel-specific correlation, offering more reliable estimates of uncertainty than the RE model, which may underestimate uncertainty in the presence of panel-specific correlation. Furthermore, while the RE model assumes independence between individual-specific effects and independent variables, the PCSEs model does not require this assumption, making it more robust in accounting for panel-specific correlation. However, PCSEs estimation typically involves higher computational complexity. While both models provided similar coefficient estimates, the PCSEs model offered more reliable standard errors by correcting for potential correlation within panels. The choice between these models depends on dataset characteristics, underlying assumptions, and research objectives.

The study offers valuable insights into the factors influencing employment dynamics across different sectors. By comparing Random Effects (RE) and Panel-Corrected Standard Errors (PCSEs) models, we have comprehensively understood the relationship between sectoral employment and independent variables such as real nominal wage and inflation rates. The consistent coefficient estimates obtained from both models underscore the importance of these variables in shaping sectoral employment patterns. However, the distinction in standard error interpretation highlights the significance of accounting for potential correlation within panels, as demonstrated by the PCSEs model. By providing more reliable estimates of uncertainty, the PCSEs approach enhances our confidence in the findings and conclusions drawn from the analysis.

## 6. Future Research Directions

In future research, a longitudinal analysis spanning a more extensive timeframe could provide a deeper understanding of the evolution of sectoral employment dynamics in Uzbekistan. By examining trends over time, researchers can discern patterns, identify key drivers of change, and assess the efficacy of past policies and interventions. This longitudinal approach would offer valuable insights into the long-term impact of economic reforms and external factors on sectoral employment patterns.

Moreover, conducting sector-specific studies would enable researchers to unravel the nuanced factors influencing employment dynamics within each sector. By delving into the unique characteristics, challenges, and opportunities of individual sectors such as agriculture, manufacturing, services, and others, researchers can tailor interventions to address sector-specific needs effectively. This targeted approach can contribute to developing more nuanced and effective policy recommendations for enhancing sectoral employment. Another promising avenue for future research involves investigating regional disparities in sectoral employment across Uzbekistan. By analyzing regional variations in employment patterns, researchers can identify regions with particularly acute challenges or opportunities in sectoral employment. This analysis can inform the design and implementation of regionally tailored policies to foster inclusive economic development and reduce disparities between urban and rural areas. Furthermore, exploring the role of labor market flexibility in shaping sectoral employment dynamics represents a critical area for future inquiry. By examining labor market regulations, workforce skill levels, and employment protection policies, researchers can elucidate how labor market flexibility influences sectoral employment outcomes. Understanding these dynamics can inform policy interventions promoting a more adaptable and resilient labor market.

Furthermore, studying the integration of the informal sector into formal employment channels represents an important area for future inquiry. Given the significant presence of the informal sector in many economies, understanding the drivers and implications of informal sector integration can shed light on opportunities for formalization and economic development. By analyzing the impact of formalization strategies on sectoral employment dynamics, researchers can provide evidence-based recommendations for promoting formal employment and reducing informality.

Finally, rigorous evaluations of existing policies and interventions promoting sectoral employment growth are essential for evidence-based policymaking. By assessing the effectiveness of past interventions, identifying best practices, and learning from

past successes and failures, policymakers can refine their strategies and optimize resource allocation for maximum impact. Future research could employ various evaluation methods, including impact evaluations, cost-benefit analyses, and case studies, to comprehensively assess the outcomes and impacts of sectoral employment policies. By pursuing these diverse research directions, scholars and policymakers can deepen our understanding of sectoral employment dynamics in Uzbekistan and develop more effective strategies for promoting inclusive and sustainable economic development.

**Acknowledgment:** We hereby declare that this research is our original work. The data used in the study is available from the Statistical Agency of the Republic of Uzbekistan at https://www.stat.uz/en/official-statistics/metadata.

**Data Availability Statement:** The data for this study can be made available upon request to the corresponding author.

**Funding Statement:** This manuscript was prepared without any financial support or funding.

**Conflicts of Interest Statement:** The authors declare no conflicts of interest; this work is original, with all citations and references appropriately included.

**Ethics and Consent Statement:** This research follows ethical guidelines, with informed consent obtained and confidentiality measures in place to protect participant privacy.

**References**

1. F. Doniyorova, “Institutional environment for regulation of youth employment in Uzbekistan,” Economics and education, vol. 23, no. 6, pp. 196–202, 2023.
2. Z. Usmonov, “The essence of inclusive employment and fundamental reforms in Uzbekistan,” IvT, vol. 24, no. 4, pp. 101–106, 2023.
3. F. Shalihah, S. Alviah, and I. A. Shob’ron, “The wages in employment relations in the tourism sector in Yogyakarta in justice perspective,” sucila, vol. 6, no. 2, p. 138, 2023.
4. N. Abduraimova, “The impact of investments in ensuring employment of the population of Uzbekistan,” International Journal of Economics and Innovative Technologies, vol. 11, no. 4, pp. 78–92, 2023.
5. Z. Usmonov, “Analysis of the situation of inclusive employment in Uzbekistan,” Economics and Education, vol. 24, no. 3, pp. 239–243, 2023.
6. A. L. Upashevna, S. N. Baratovna, and I. A. Khaydarov, “Reforms on employment and unemployment in Uzbekistan: Functional approach,” Psychology and Education, vol. 58, no. 1, pp. 2798–2803, 2021.
7. B. J. Khalmurovodna, “Increasing the opportunity for youth employment the case of the Republic of Uzbekistan,” J. Adv. Res. Dyn. Control Syst., vol. 12, no. SP4, pp. 1160–1167, 2020.
8. M. Askarova, “Regional aspects of private employment agencies activities in Uzbekistan,” Economics and Education, vol. 24, no. 3, pp. 210–215, 2023.
9. S. Nurdinova, “Human development and women employment in Uzbekistan: Situation and problems,” Reg. Form. Dev. Stud., vol 13, no. 2, pp. 88–95, 2021.
10. Z. Tojiyeva and L. Ibragimov, “Labour market and employment in Uzbekistan,” Geogr. Cas., vol. 73, no. 4, pp. 359–374, 2021.
11. S. Amirdjanova, “Analysis of the labor market and employment in Uzbekistan,” Economics and Innovative Technologies, vol. 10, no. 3, p.14, 2022, doi: 10.55439/eit/vol10_iss3/a5.
12. N. U. Abdugapparovich, “Measures to ensure employment in Uzbekistan through the support of small business and entrepreneurship,” Indonesian Journal of Social and Environmental Issues (IJSEI), vol. 1, no. 2, pp. 69–72, 2020.
13. M. Arora, G. Singh, D. Ather, N. Chaudhary, and R. Kler, “Forecasting inbound tourism in Uzbekistan: Leveraging AI and ARIMA models for economic growth insights,” in 2023 4th International Conference on Computation, Automation and Knowledge Management (ICCAKM), Dubai, United Arab Emirates, 2023.
14. N. Chaudhary, G. Singh, D. Ather, R. Kler, and M. Bhandwal, “Arduino-based monitoring of microclimatic variables for precision agriculture in sugarcane cultivation,” in 2023 4th International Conference on Computation, Automation and Knowledge Management (ICCAKM), Dubai, United Arab Emirates, 2023.
15. G. Singh, N. Chaudhary, D. Ather, R. Kler, and M. Arora, “Revolutionizing remote healthcare: Proposing an IoT & Arduino-based integrated approach for real-time health monitoring,” in 2023 4th International Conference on Computation, Automation and Knowledge Management (ICCAKM), Dubai, United Arab Emirates, 2023.
16. R. Kler, D. Ather, G. Singh, N. Chaudhary, and M. Arora, “Predicting agricultural growth in jizzax region using advanced machine learning techniques: An ARIMA-based approach,” in 2023 4th International Conference on Computation, Automation and Knowledge Management (ICCAKM), Dubai, United Arab Emirates, 2023.

17. D. Ather, N. Chaudhary, G. Singh, T. Beig, and R. Kler, “Enhancing used automobile valuations: A data-cleaning and linear regression approach for predicting prices in competitive market,” in 2023 4th International Conference on Computation, Automation and Knowledge Management (ICCAKM), Dubai, United Arab Emirates, 2023.
18. G. Singh, R. P. George, N. Ahmad, S. Hussain, D. Ather, and R. Kler, “A deep learning approach for evaluating the efficacy and accuracy of PoseNet for posture detection,” Research Square, 2024, Press.
19. S. Sarabhai, M. Chakraborty, M. Batra, R. Kler, S. Banerjee, and S. Mishra, “Using AI and machine learning to predict consumer buying behavior: Insights from behavioral economics in case of alcoholic beverages,” in 2023 3rd International Conference on Technological Advancements in Computational Sciences (ICTACS), Tashkent, Uzbekistan, 2023.
20. M. Chakraborty, R. K. Singh, T. M. Hussein, R. Kler, S. Khan, and S. Mishra, “Maslow’s hierarchy-inspired AI-driven employee satisfaction improvement,” in 2023 3rd International Conference on Technological Advancements in Computational Sciences (ICTACS), Tashkent, Uzbekistan, 2023.
21. M. Chakraborty, T. M. Hussein, I. S. Ray, R. Kler, S. Goel, and S. Mishra, “Forecasting the geopolitical impact among Russia and Ukraine on commodity export prices: An AI-based analysis,” in 2023 3rd International Conference on Technological Advancements in Computational Sciences (ICTACS), Tashkent, Uzbekistan, 2023.