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A Comparative Statistical Analysis of Unemployment Rate in Bangladesh and Sri Lanka: Evidence from Unemployment, Youth Unemployment, and Gender Disparities

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Open Access

Abstract

This study presents a comparative statistical analysis of employment and unemployment dynamics in Bangladesh and Sri Lanka using annual labour market data from 2009-2024. While overall unemployment rates are statistically similar, Sri Lanka demonstrates significantly higher youth unemployment and a wider gender disparity. Various statistical test results confirm persistently elevated female unemployment in both countries, alongside disproportionately high youth unemployment relative to national averages. The findings point to structural skill mismatches, labour market rigidities, and weak academia-industry linkages as key drivers of graduate unemployment. The study underscores the need for education reform, enhanced employability skills, and stronger institutional coordination, contributing valuable insights to South Asian labour market research.

Keywords

Higher Education, Unemployment Rate, Sri Lanka, Bangladesh, Comparison

1. Introduction

Graduate unemployment has become an important concern for the labour market in South Asia, as tertiary education expands faster than the creation of suitable graduate-level jobs [1]. While higher education is expected to enhance individual earning which in turn will impact the national productivity, many graduates face a delay in finding a job [2]. Unemployment due to skills mismatch, weak industry connections, and structural inflexibilities in labour demand are the main factors

influencing the unemployment rates among graduates [3]. Bangladesh and Sri Lanka present an informative comparison, as both are developing countries in South Asian economies with rapidly expanding higher education systems, but differ in labour market institutions and education pathways [4].

In Bangladesh, graduate employability investigation frequently highlights gaps between curriculum and workplace needs, limited practical training, and constrained access to professional bodies [5]. These authors also show that insufficient development of soft skills has become a significant obstacle to graduate employability. Despite the increase in the number of tertiary graduates, the demand for skilled labour in many sectors remains an issue, resulting in rising graduate unemployment [6]. In addition, Bangladeshi graduates often have a strong preference for public sector employment due to job security and social prestige, leading to prolonged periods of job search [7]. Poor connections between higher education institutions and private companies further increased the transition from education to employment [8].

Additionally, socioeconomic obstacles such as limited access to professional networks, less availability of career advice and language proficiency impact the unemployment rate in Bangladesh [9]. Public universities which teach a large cohort of students from lower-income backgrounds often lack career support compared to private institutions [10]. Due to this, many graduates feel unprepared for the employment market expectations whilst holding qualifications [11].

In Sri Lanka, unemployment is a growing issue among graduates [12]. Although higher education is provided free in Sri Lanka through state universities, students struggle to land a job soon after their degrees are finished [13]. National labour force statistics consistently show an increase in unemployment rates among graduates with advanced qualifications, depicting that education alone will not align you to a guaranteed integration into the labour market [14]. This reflects the demand-side constraints, limited graduate-level job creation and field of study mismatches within the Sri Lankan labour force [15]. Moreover, Sri Lanka's graduate unemployment problem is often linked to the concentration of graduates in non-technical disciplines, especially in art and social sciences, which face comparatively weaker employment absorption [16]. While professional and vocational pathways exist, the transition from university to employment remains uneven, particularly during political and economic crises. Hence graduate may face delays and even accept jobs below their qualifications to survive their day-to-day life [17]. These aspects highlighted the challenges faced by Sri Lanka, which are similar to those faced by Bangladesh, while also highlighting the country-specific differences in the education system.

Accordingly, this study undertakes a comparative statistical analysis of unemployment and labour market dynamics in Bangladesh and Sri Lanka over the period 2009-2024. Through the examination of overall unemployment rates, gender-specific unemployment, youth unemployment, and related labour market indicators, the study identifies important similarities and differences in labour market

performance across the two countries. The analysis contributes to the limited comparative literature on South Asian labour markets and provides policy-relevant insights for addressing employment challenges and promoting inclusive labour market development.

This paper is organised as follows. Section 2 discusses the relevant literature on graduate unemployment and employability challenges in South Asia. Section 3 shows the materials and methods, including the data sources and statistical techniques used in the analysis. Section 4 presents the empirical results and Section 5 discusses the main findings. Section 6 concludes the paper by summarising the key findings and outlining policy implications, limitations and directions for future research.

1.1. Literature Review

1.1.1. Graduate Unemployment and Mismatches

Unemployment among graduates has been widely investigated, especially in South Asian countries and the growing mismatch between higher education outputs and the labour market requirements. Existing literature points out that while tertiary education expands rapidly in developing economies, the structure of the labour market fails to recruit graduates [18]. Skills mismatch, particularly within academic knowledge and job-specific competencies, has been identified as a critical role in graduate unemployment [19]. Employing companies emphasise the importance of practical experience, problem-solving abilities and communication skills, but graduates' lack of exposure to these components paves the way for an increase in unemployment rates [20].

Considering South Asian countries, this mismatch is further intensified by the limited integration between companies and universities. Weak collaborations between the two also reduce internships, apprenticeships and work-based learning opportunities, which will in turn help the graduates with the transition into employment. As a result, graduates often enter the labour market inadequately prepared for workplace expectations [21] [22].

1.1.2. Graduate Employability Challenges in Bangladesh

Previous studies in Bangladesh consistently highlight structural deficiencies in the higher education and labor market. Researchers have found that university curricula often fall behind industry needs, offering limited practical training and not highlighting the importance of developing soft skills [23]. In the private sector and technology-driven industries, graduates face challenges in aligning their qualifications with employer expectations [24]. Despite the growing number of graduates, the creation of skilled employment opportunities has remained constrained, contributing to the rise in the unemployment rate [25]. Several studies also report that students show a strong preference for public-sector employment over the private sector, citing job security and social status [7] [26]. Also, weak connections between the universities and employers reduce graduates' exposure to the labour market [8]. Socioeconomic aspects like limited access to career guidance and un-

equal support within institutions further disadvantage graduates from low-income backgrounds [9].

1.1.3. Graduate Employability Challenges in Sri Lanka

Sri Lanka presents a contrasting yet equally complex graduate unemployment context. Despite the provision of free higher education through state universities, graduate unemployment remains a significant concern [27]. Previous literature suggests that unemployment rates tend to increase with higher levels of educational attainment, suggesting that education alone cannot guarantee employment [28]. Slow private sector expansion and limited formation of graduate-level jobs have been identified as a major contributor to this issue [29]. Additionally, field-of-study imbalances play a vital role in shaping graduate employment outcomes. Research also indicates that a concentration of graduates in non-technical disciplines, particularly arts and social sciences, experience weaker absorption in the employment market [30]. Although vocational and professional direction in careers exists within the island, political and economic instability over the last few years has increased the unemployment rate drastically [17].

1.1.4. Research Gap and Contribution

Although previous research has examined unemployment and employability challenges within Bangladesh and Sri Lanka, there is limited comparative evidence on how labour market outcomes have evolved across the two countries over time. Existing studies largely adopt country-specific perspectives and often focus on education and employability issues without considering broader labour market dynamics. Consequently, there remains a need for comparative analyses that investigate unemployment patterns and labour market characteristics within a wider economic context. Addressing this gap, this study undertakes a comparative statistical analysis of Bangladesh and Sri Lanka using annual labour market data for the period 2009-2024. Through an examination of overall unemployment, gender-specific unemployment, youth unemployment, and related labour market indicators, the study contributes to the comparative labour market literature and provides evidence-based insights for policymakers seeking to enhance employment outcomes in South Asian economies.

2. Data Collection and Statistical Analysis

2.1. Research Design

This study adopts a descriptive and comparative research design to examine labour market outcomes in Bangladesh and Sri Lanka over the period 2009-2024. The focus is on analysing unemployment trends, including overall unemployment, gender unemployment and youth unemployment, alongside selected labour market indicators to understand structural differences between the two economies.

2.2. Data Sources

Secondary data were obtained from internationally recognised sources including

national labour force surveys, the World Bank and International Labour Organisation databases. The dataset includes annual observations for Bangladesh and Sri Lanka from 2009 to 2024 and covers labour force size, overall unemployment rates, unemployment by gender and youth unemployment (ages 15 - 24), labour force participation and self-employment indicators.

2.3. Statistical Analysis

The analysis combines descriptive statistics with basic inferential statistical techniques. Trend analysis and graphical comparisons were used to identify unemployment patterns. Paired t-tests were conducted to compare gender unemployment gaps and youth versus overall unemployment differences. A two-way ANOVA without interaction terms was used to examine country and time effects. Pearson correlation analysis was also conducted to explore relationships between labour market indicators. Effect sizes were also calculated to analyse the results obtained [31] [32].

Given the macroeconomic nature of the dataset, the statistical analysis is interpreted as identifying patterns rather than causal relationships.

3. Results and Discussion

3.1. Statistical Comparison of Gender Unemployment Gaps

To formally examine whether female unemployment consistently exceeds male unemployment in both countries, paired t-tests were conducted comparing annual male and female unemployment rates over the 16-year study period (2009-2024).

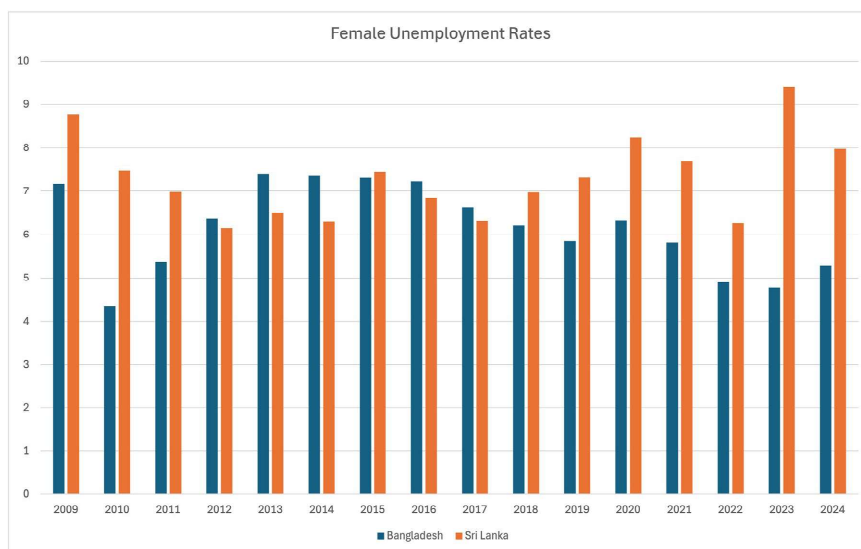


Figure 1. Female unemployment trends in Bangladesh and Sri Lanka, 2009-2024.

Figure 1 illustrates the trends in female unemployment in Bangladesh and Sri Lanka. The figure shows that female unemployment remained consistently higher in Sri Lanka throughout most of the study period, with noticeable increases during

periods of economic stress such as the COVID-19 pandemic and the 2022-2023 economic crisis. In contrast, Bangladesh shows comparatively lower female unemployment, although fluctuations are still visible across the period. These patterns suggest persistent structural barriers affecting female labour market outcomes, particularly in Sri Lanka.

Figure 2 presents the corresponding trends in male unemployment. Compared to female unemployment, male unemployment remains substantially lower in both countries and exhibits less volatility over time. The relatively stable pattern of male unemployment suggests stronger labour market attachment among men, while the consistent gap between male and female unemployment visually confirms the gender disparities later tested through statistical analysis.

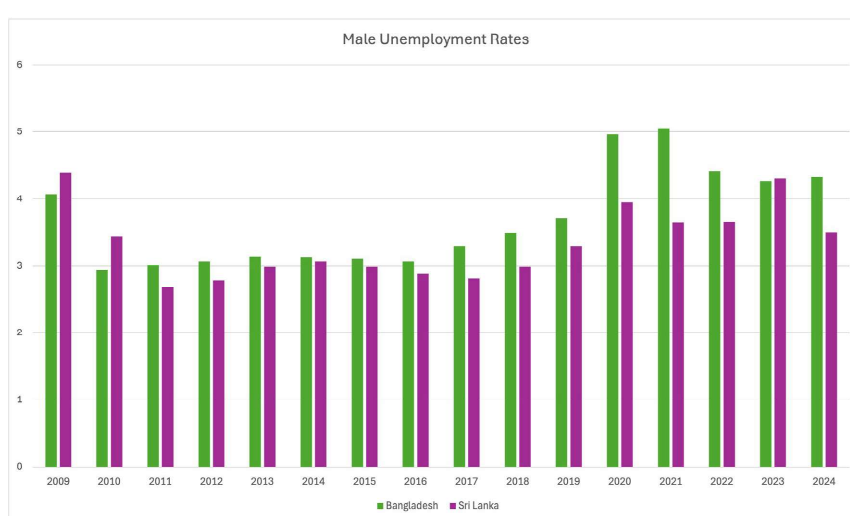


Figure 2. Male unemployment trends in Bangladesh and Sri Lanka, 2009-2024.

Taken together, these figures provide visual evidence of a persistent gender unemployment gap in both countries, with Sri Lanka showing a larger and more stable gap compared to Bangladesh. These descriptive patterns are formally confirmed by the paired t-test results presented in **Table 1**.

Table 1. Paired t-test results for gender unemployment gaps (2009-2024).

Country	Female	Male	Diff	t	df	p
<i>SriLanka</i>	7.30 (0.95)	3.36 (0.57)	3.94	13.42	15	<0.0001*
<i>Bangladesh</i>	6.15 (1.01)	3.70 (0.74)	2.45	9.18	15	<0.0001*

Note: pp = percentage points; SD in parentheses; * indicates significance at $\alpha = 5\%$.

In Sri Lanka, female unemployment (mean = 7.30%, SD = 0.95%) was significantly higher than male unemployment (mean = 3.36%, SD = 0.57%). The mean difference of 3.94 percentage points was statistically significant (paired t-test: $t = 13.42$, $df = 15$, $p < 0.0001$, 95% CI: 3.38 to 4.70). This confirms that the gender gap observed in **Figure 1** and **Figure 2** represents a persistent structural feature of the

Sri Lankan labour market rather than random annual variation.

In Bangladesh, female unemployment (mean = 6.15%, SD = 1.01%) also significantly exceeded male unemployment (mean = 3.70%, SD = 0.74%) across the study period. The mean difference of 2.45 percentage points was statistically significant (paired t-test: $t = 9.18$, $df = 15$, $p = 0.0014$, 95% CI: 1.82 to 2.88). The overall pattern confirms significantly higher unemployment rates for female graduates in both countries across the 16-year period.

The magnitude of the gender gap differs between countries, with Sri Lanka showing a larger average gap (3.94 percentage points) compared to Bangladesh (2.45 percentage points). This indicates more pronounced gender disparities in Sri Lanka's labour market. However, an independent samples t-test comparing these gaps found no statistically significant difference between countries ($t = 1.21$, $df = 8$, $p = 0.26$), suggesting that both South Asian economies face similarly severe gender disparities in graduate unemployment outcomes.

3.2. Youth Unemployment Analysis

Youth unemployment rates in both countries were substantially higher than overall unemployment rates throughout the 2009-2024 study period. Paired t-tests confirm that this difference is statistically significant in both countries as shown in **Table 2**.

In Sri Lanka, youth unemployment averaged 20.30% compared to 4.73% overall unemployment, representing a difference of 15.57 percentage points. In Bangladesh, youth unemployment averaged 10.33% compared to 4.30% overall unemployment, a difference of 6.03 percentage points. These results confirm that young labour market entrants face disproportionately higher employment challenges, particularly in Sri Lanka.

Table 2. Paired t-test results: Youth vs overall unemployment (2009-2024).

Country	Youth	Overall	Diff	t	df	p
<i>SriLanka</i>	20.30 (3.18)	4.73 (0.59)	15.57	20.84	15	<0.0001*
<i>Bangladesh</i>	10.33 (1.87)	4.30 (0.53)	6.03	14.27	15	<0.0001*

Note: pp = percentage points; SD in parentheses; * indicates significance at $\alpha = 5\%$.

An independent samples t-test comparing the youth-overall unemployment gaps between countries revealed that Sri Lanka's gap (15.57 pp) is significantly larger than Bangladesh's gap (6.03 pp) ($t = 7.84$, $df = 15$, $p < 0.0001$). This statistically confirms that the school-to-work transition challenge is substantially more severe in Sri Lanka than in Bangladesh.

3.3. Two-Way ANOVA Analysis: Main Effects of Country and Time

To examine whether unemployment differs significantly between countries and across time, a two-way analysis of variance (ANOVA) was conducted using unemployment rate as the dependent variable and country and year as fixed factors

as shown in **Table 3**. The interaction term was excluded because only one observation exists per country-year combination.

Table 3. Two-way ANOVA: Effects of country and year on unemployment rates (2009-2024).

Source	Sum of Squares	df	F-value	p-value
Country	0.310	1	1.79	0.201
Year	7.347	15	2.83	0.026*
Residuals	2.598	15		

Note: *indicates statistical significance at $\alpha = 5\%$.

The ANOVA results show no statistically significant difference in average unemployment between Bangladesh and Sri Lanka. However, unemployment varies significantly across years, indicating that macroeconomic conditions play a stronger role than country differences in explaining unemployment variation. **Figure 3** illustrates unemployment trends in Bangladesh and Sri Lanka over the period 2009-2024. The figure shows that Sri Lanka experienced greater fluctuation in unemployment over time, with noticeable increases during 2020 and 2023, whereas Bangladesh displayed comparatively more stable unemployment patterns, despite a temporary rise during the COVID-19 period. These visual trends are consistent with the ANOVA results, which indicate significant variation across years but no statistically significant overall difference between the two countries.

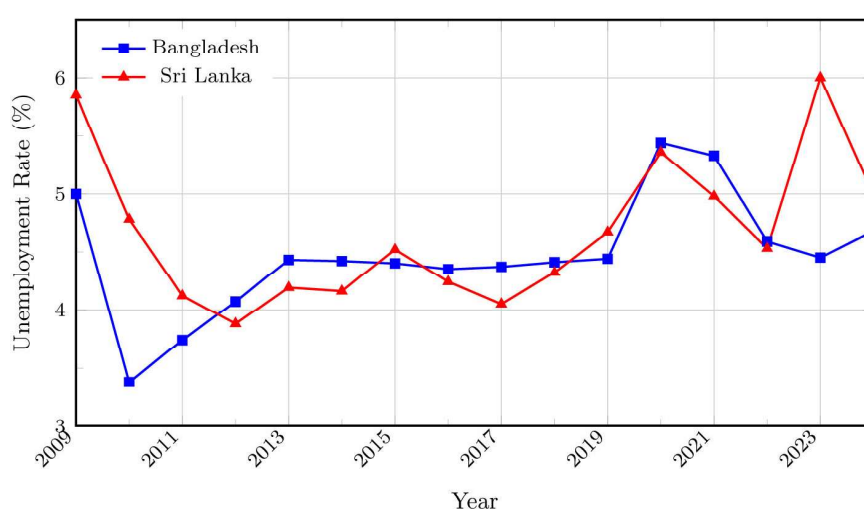


Figure 3. Unemployment trends in Bangladesh and Sri Lanka, 2009-2024.

Figure 3 reinforces the descriptive finding that Sri Lanka experienced greater volatility in unemployment over the study period, while Bangladesh maintained a relatively more stable trend. Although average unemployment rates do not differ significantly between the two countries, the temporal patterns suggest that macroeconomic shocks affected each labour market differently.

3.4. Correlation Analysis between Labour Market Indicators

Pearson correlation coefficients were calculated using the 16-year dataset (2009-2024) as depicted in **Table 4**. The larger sample improves statistical reliability compared to shorter time windows.

Strong positive correlations were found between overall unemployment and male unemployment in both countries. Sri Lanka also shows a very strong relationship between overall and female unemployment, suggesting that labour market shocks affect both genders simultaneously.

Youth unemployment shows strong positive correlations with overall unemployment in both countries, indicating that young workers are particularly sensitive to macroeconomic fluctuations.

Bangladesh shows a significant negative relationship between female labour force participation and female unemployment, suggesting improved participation may reduce unemployment risks. This relationship is weaker in Sri Lanka.

Self-employment shows moderate negative relationships with unemployment, suggesting a possible buffering effect, although these relationships are not statistically significant.

Table 4. Pearson correlation coefficients for labour market indicators (2009-2024).

Variables	Bangladesh	Sri Lanka
Overall Unemployment × Female Unemployment	0.28 ($p = 0.285$)	0.95* ($p < 0.001$)
Overall Unemployment × Male Unemployment	0.83* ($p < 0.001$)	0.96* ($p < 0.001$)
Overall Unemployment × Youth Unemployment	0.81* ($p < 0.001$)	0.80* ($p < 0.001$)
Female LFPR × Female Unemployment	-0.68* ($p = 0.004$)	-0.32 ($p = 0.223$)
Self-Employment Rate × Overall Unemployment	-0.46 ($p = 0.087$)	-0.38 ($p = 0.163$)

Note: LFPR = Labour Force Participation Rate; * indicates at $\alpha = 5\%$ significance level; $n = 15$ years.

The correlation analysis reveals several important relationships between labour market indicators in both countries. A strong positive relationship exists between overall unemployment and male unemployment in both Bangladesh ($r = 0.83$) and Sri Lanka ($r = 0.96$), indicating that general labour market conditions strongly influence male employment outcomes. However, the relationship between overall and female unemployment differs between countries. Sri Lanka shows a very strong correlation ($r = 0.95$), suggesting that female unemployment closely follows overall labour market trends. In contrast, Bangladesh shows only a weak relationship ($r = 0.28$), indicating that female unemployment may be influenced by additional structural or socio-cultural factors.

Youth unemployment also shows strong positive correlations with overall unemployment in both countries (Bangladesh: $r = 0.81$; Sri Lanka: $r = 0.80$), suggesting that young workers are particularly vulnerable to economic fluctuations. This finding supports existing literature highlighting the difficulty of school-to-work transitions in developing economies.

The relationship between female labour force participation and unemployment differs between the two countries. Bangladesh shows a significant negative correlation ($r = -0.68$), suggesting that increased female participation may improve employment outcomes. Sri Lanka shows a weaker negative relationship ($r = -0.32$), indicating that participation alone may not fully explain female unemployment patterns.

Finally, moderate negative relationships were observed between self-employment and overall unemployment (Bangladesh: $r = -0.46$; Sri Lanka: $r = -0.38$), suggesting that self-employment may act as a partial labour market adjustment mechanism. Although these relationships are not statistically significant, they suggest that informal or self-employment sectors may absorb workers during periods of labour market pressure.

Overall, these correlations indicate that while macroeconomic conditions influence unemployment patterns in both countries, structural labour market differences shape how these relationships operate. The longer 16-year dataset provides stronger descriptive evidence of these patterns compared to shorter time series studies.

4. Discussion

This study set out to compare unemployment trends and labour market outcomes between Bangladesh and Sri Lanka over the period 2009-2024. The findings indicate that although average unemployment levels between the two countries are not statistically different, important structural differences exist in gender unemployment gaps, youth unemployment patterns and labour market dynamics.

One of the most consistent findings is the presence of a significant gender unemployment gap in both countries. Female unemployment remains significantly higher than male unemployment across the study period, with Sri Lanka showing a substantially larger gender gap. This finding supports previous research suggesting that labour market barriers, occupational segregation and field-of-study imbalances may disproportionately affect female graduates. In Bangladesh, although the gender gap remains significant, the smaller difference may reflect greater absorption of women into informal or self-employment sectors rather than stronger formal employment outcomes.

Youth unemployment was also found to be significantly higher than overall unemployment in both countries, confirming persistent school-to-work transition challenges. The considerably larger youth unemployment gap in Sri Lanka suggests greater difficulty in matching graduates to available jobs. This may be explained by limited graduate-level job creation, slower private sector expansion and

skill mismatches between university education and labour market needs. In Bangladesh, while youth unemployment remains elevated, the smaller gap may reflect labour market flexibility and the ability of the informal sector to absorb young workers.

The ANOVA results further suggest that unemployment variation is driven more by time effects than country differences. This indicates that macroeconomic conditions, including the COVID-19 pandemic and subsequent economic adjustments, had a stronger influence on unemployment patterns than structural country differences alone. This finding highlights the importance of economic resilience and labour market adaptability in shaping employment outcomes.

The correlation analysis provides additional insights into labour market dynamics. Strong relationships between overall unemployment and gender unemployment in Sri Lanka suggest that labour market shocks affect all groups more uniformly. In contrast, weaker relationships in Bangladesh indicate that structural or institutional factors may shape employment outcomes differently across demographic groups. The negative relationship between female labour force participation and unemployment in Bangladesh further suggests that increasing labour market participation may contribute to improved employment outcomes for women.

Overall, the results suggest that graduate unemployment in South Asia is influenced not only by education expansion but also by labour market structure, institutional coordination and economic conditions. These findings reinforce the need for stronger alignment between higher education systems and labour market requirements.

5. Conclusions

This study examined unemployment trends and labour market outcomes in Bangladesh and Sri Lanka using annual labour market data covering the period 2009-2024. The findings indicate that, although average unemployment rates are broadly similar across the two countries, important differences exist in labour market structure and unemployment patterns. In particular, Sri Lanka experiences substantially higher youth unemployment and wider gender disparities, while Bangladesh exhibits lower youth unemployment and a stronger role for self-employment within the labour market.

The statistical analysis revealed three main findings. First, female unemployment is significantly higher than male unemployment in both countries, highlighting persistent gender inequalities in labour market outcomes. Second, youth unemployment exceeds overall unemployment by a significant margin, particularly in Sri Lanka, suggesting challenges associated with labour market entry among young people. Third, variations in unemployment are driven more by changes over time than by differences between countries, emphasising the importance of broader macroeconomic conditions and labour market developments.

From a policy perspective, the findings highlight the need for measures that

reduce gender disparities, improve employment opportunities for young people, and strengthen labour market resilience. Policies that support skills development, workforce participation, entrepreneurship, and private-sector job creation may contribute to more inclusive labour market outcomes. In addition, targeted interventions aimed at improving school-to-work transitions and expanding opportunities for women and young workers could help address persistent employment challenges.

This study contributes to the limited comparative literature on labour market outcomes in South Asia by providing a long-term comparison of unemployment trends and related labour market indicators in Bangladesh and Sri Lanka. The findings offer useful evidence for policymakers, labour market planners, and researchers seeking to better understand employment challenges and labour market dynamics in developing economies.

6. Limitations

This study has several limitations that should be considered when interpreting the findings. First, the analysis relies on aggregate national labour market data rather than graduate-specific unemployment statistics. As a result, the findings reflect general labour market conditions rather than unemployment outcomes exclusively among university graduates.

Second, the study uses annual macro-level data, which limits the ability to identify causal relationships between variables. While statistical relationships are identified, they should be interpreted as descriptive associations rather than evidence of causality.

Third, differences in national data collection methods and labour market definitions may affect direct comparability between the two countries. Although internationally harmonised datasets were used where possible, measurement differences may still exist.

Finally, the relatively small number of time observations limits the complexity of statistical modelling that can be performed. More detailed micro-level datasets would allow more robust econometric analysis.

7. Future Research

Future research could extend this study in several important directions. First, future studies could incorporate graduate-specific employment datasets to better understand the transition from higher education to employment. Longitudinal graduate tracking surveys would provide deeper insights into employability outcomes.

Second, further research could examine sectoral employment patterns to understand whether unemployment differences are driven by industry structure. Including data on graduate fields of study could also improve understanding of skill mismatch dynamics.

Third, micro-level data could allow more advanced statistical modelling, in-

cluding regression analysis and causal inference techniques. Such approaches could better identify the factors that most strongly influence graduate unemployment.

Finally, expanding the analysis to include additional South Asian countries such as India, Pakistan or Nepal could provide a broader regional understanding of graduate unemployment challenges.

These directions would help build a more comprehensive understanding of graduate labour market transitions and inform more targeted policy responses.

Author's Contributions

The conceptual framework and core ideas underpinning this study were developed by the first author, who also led the overall quality assurance process and ensured the consistency of the work. The second author made a significant contribution by collecting and preprocessing the data, generating the tables presented in the paper, and drafting the manuscript.

AI Declaration

The authors used artificial intelligence tools only for language polishing and improving the readability of the manuscript. All intellectual contributions, including study design, analysis, interpretation, and writing of the scientific content, were undertaken by the authors.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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