QUARTERLY TRENDS IN SRI LANKAN UNEMPLOYMENT: A GENDER AND SECTORAL ANALYSIS

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Abstract

The unemployment rate serves as a critical indicator of labour market conditions, reflecting the balance between job supply and demand. This study investigates the quarterly variations in Sri Lanka's unemployment rate from 1990 to 2004 and from 2006 to 2022, focussing on gender and sector-specific trends. Using time series analysis techniques, including the ARIMA (1,1,1) model, the research identifies significant declines in unemployment over both periods and forecasts future rates for 2023 and 2024. The model selection was guided by the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC) to ensure accuracy. The study finds that although the overall unemployment rate has stabilised, gender and sector disparities persist, with female and urban unemployment remaining higher. These findings provide critical insights for policymakers to devise targeted strategies aimed at reducing unemployment, particularly among vulnerable groups. The results emphasise the need for ongoing monitoring and tailored interventions to sustain economic growth and labour market stability..

Keywords: Unemployment rate, Gender disparities, Sector analysis, Time series analysis, ARIMA model, Sri Lanka

INTRODUCTION

An important economic indicator that provides information on the state of the labour market and the overall state of a country's economy is the unemployment rate. This rate measures how well an economy generates employment opportunities to support its labour force by reflecting the balance—or imbalance—between job supply and demand. Understanding unemployment patterns is especially important in emerging nations like Sri Lanka, where a variety of socio-political and economic factors impact the economy. Because it has an impact on household stability, economic resilience, and individual livelihoods, unemployment is a major area of attention for socioeconomic study and policy development.

Gender roles, changes in the economy, and structural differences between the rural and urban sectors have all influenced Sri Lanka's unemployment trends during the last thirty years. In addition to having an impact on the overall unemployment rate, each of these variables has also led to significant differences between various demographic groups and geographical regions. For example, women's career options have been restricted by traditional gender norms, while rural areas frequently have greater economic hardships and fewer job openings than urban ones. By examining the quarterly fluctuations in Sri Lanka's unemployment rate between 1990 and 2022, with an emphasis on gender and sector-specific behaviour, this study aims to capture this complexity. It also seeks to forecast future unemployment rates for 2023 and 2024 using time series analysis techniques.

Economic and Social Context in Sri Lanka

The economic structure of Sri Lanka has changed significantly over the past few decades, moving from being centred on agriculture to one that is increasingly reliant on industry and services. The effects of this structural change on employment have varied, with urban areas seeing stronger job growth than rural ones. In addition, regional trade alliances and globalisation have affected Sri Lanka's labour market, changing the demand for workers in many industries. Rural communities still confront major obstacles to employment growth, nevertheless, such as restricted access to financial resources, educational opportunities, and infrastructure.

Employment dynamics are significantly shaped by sociocultural elements like gender norms in addition to these structural changes. A persistent gender disparity in employment rates has resulted from historically low female labour force participation due to traditional assumptions surrounding women's duties in the home. Even though women's access to school and work has improved recently, obstacles still exist, especially in rural areas. Therefore, it is crucial to comprehend gender-based unemployment trends in order to develop policies that promote a more inclusive labour market.

Research Problem

Even though unemployment is acknowledged as a serious economic problem on a global scale, the intricacies of sector- and gender-specific unemployment trends in Sri Lanka have not received enough attention on a quarterly basis. Numerous studies

now in existence concentrate on annual unemployment data, which are helpful for comprehending more general trends but lack the specificity required to capture seasonal and cyclical dynamics. These shorter-term swings are especially significant in Sri Lanka, where political upheavals, pressures from the global economy, or natural occurrences like monsoons can cause economic conditions to change quickly. Furthermore, the majority of unemployment research has been done at the national level or within large population subsets, which has left us with a lack of knowledge about how these trends change over shorter time periods across various demographic groups and economic sectors. Without this level of detail, policymakers would not have the knowledge they need to combat unemployment with tailored, targeted measures that take into consideration demographic-specific issues and time-sensitive changes.

Objective

This study fills this gap by performing a thorough quarterly analysis of Sri Lanka's unemployment rate from 1990 to 2022, concentrating on differences by gender and industry sector (rural and urban). The study intends to present a detailed picture of the variables influencing unemployment in various demographic groups and industries by spotting trends and patterns in these segmented data. The study models unemployment trends and produces accurate projections for 2023 and 2024 using the ARIMA (Auto-Regressive Integrated Moving Average) model, a powerful time series analysis method. These forecasts are intended to help policymakers and economic planners by providing information that allows for more focused measures meant to stabilise and lower unemployment in particular populations or areas of the nation.

Previous Work

Macroeconomic and demographic factors that impact labour market changes annually or collectively have historically been the focus of research on unemployment in Sri Lanka. Early research explored the effects of economic policies on job creation and emphasised the significance of unemployment as a vital indication of the health of the national economy. These studies included work by Bell et al. (1999) and analysis by the Central Bank of Sri Lanka. Sectoral and gender-specific unemployment data, which provide important insights into the dynamics of Sri Lanka's labour market, have been made available by other significant research carried out by the Department of Census and Statistics. These studies, however, usually only look at annual data, underexamining quarterly fluctuations and shorter-term patterns.

Globally, criteria for analysing labour market trends by gender and sector have been established by unemployment studies carried out by institutions like the OECD, Eurostat, and the U.S. Bureau of Labour Statistics. These studies underscore the need to examine unemployment data according to demographic characteristics, emphasising the complex ways that industry and gender disparities affect employment outcomes. Given that rural and urban labour markets frequently function under different economic circumstances, other international research emphasises the importance of evaluating unemployment differences within dual economies. The

results of this overseas research are rarely specifically applied to the Sri Lankan context, despite the fact that they offer useful frameworks. Our capacity to completely comprehend Sri Lanka's labour market dynamics is limited by the absence of quarterly analysis that takes into account both gender and sectoral data.

Contribution

This study adds to the body of knowledge on unemployment and labour economics in developing nations in two main ways. First of all, it provides a thorough quarterly examination of Sri Lanka's unemployment rate over more than thirty years, taking sectoral and gender patterns into account. The distinct patterns that impact particular demographic groups, like women or rural people, at different times of the year are shown by this detailed research, which offers insights into seasonal and cyclical swings in unemployment that are frequently overlooked in annual data.

Second, the paper makes a contribution by employing proven time series models to forecast future unemployment rates for 2023 and 2024. By giving policymakers a forward-looking perspective on unemployment patterns, these forecasts are a useful tool that can guide more data-driven and responsive policies. In addition to addressing a vacuum in the empirical literature on Sri Lanka's labour market, this work adds to the larger conversations on labour economics and unemployment studies in developing nations by utilising rigorous statistical methodology and sophisticated forecasting tools. It seeks to assist in the creation of sector-specific and gender-sensitive employment policies that cater to the particular requirements of Sri Lanka's heterogeneous workforce.

LITRATURE REVIEW

Understanding the present level of research in the subject and finding gaps that this study can address need a thorough evaluation of the body of existing literature. The literature review that follows synthesises pertinent published work, identifies significant theoretical and empirical contributions, and emphasises the need for more research on Sri Lanka's quarterly unemployment rates by sector and gender.

1. Review of Published Work:

With economic stability and social welfare. Foundational studies, including those by Bell et al. (1999) and the Central Bank of Sri Lanka, have examined unemployment within the context of national economic conditions, highlighting its role as a significant indicator of economic health. These studies underscore that unemployment data helps in evaluating the health of the labor market, which reflects not only the availability of jobs but also the efficiency of policies aimed at reducing joblessness. In Sri Lanka, research has often focused on annual unemployment rates, with an emphasis on macroeconomic factors such as inflation, GDP growth, and economic reforms that impact the labor market.

Historical publications from the U.S. Bureau of Labor Statistics (BLS), OECD, and Eurostat contribute to a standardized definition of unemployment, classifying individuals as unemployed if they are out of work, available for work, and actively seeking employment within a specified period. These definitions serve as a

benchmark, making unemployment data more comparable across countries. For example, the BLS considers people unemployed if they did not work during the survey reference week, were available for work, and had actively searched for work within the preceding four weeks. Similarly, the OECD emphasizes a seasonally adjusted unemployment indicator to capture fluctuations in labor demand and supply across different economic cycles.

In Sri Lanka, research from the Department of Census and Statistics and the Central Bank has provided insights into sectoral and gender unemployment trends, especially regarding the disparities between urban and rural areas. These studies indicate that rural unemployment tends to be higher due to limited job opportunities and lower industrial growth in rural regions. Gender-based unemployment disparities also persist, with women often facing greater barriers to employment due to social norms, limited educational access, and fewer opportunities in certain sectors.

Despite the wealth of studies available, much of this research relies on annual data, which can mask important seasonal or cyclical trends. This limitation is significant because unemployment rates are sensitive to short-term economic fluctuations and labor market policies, which can have different impacts on gender and sectoral groups over shorter periods. For instance, economic downturns may temporarily reduce employment opportunities in specific sectors, leading to a rise in unemployment that could be obscured in annual data. A quarterly analysis, as this study proposes, is essential for capturing these fluctuations and enabling policymakers to develop more responsive and targeted labor market interventions.

2. Exploring Online Resources and Databases

To understand the broader landscape of unemployment research, extensive searches were conducted on online academic resources such as Google Scholar, JSTOR, and PubMed. Key search terms, including "time series analysis of labor markets," "gender and sectoral unemployment," and "Sri Lanka unemployment rate," revealed a range of studies applying time series models like ARIMA and SARIMA to assess labor market trends. These models are particularly useful for analyzing short-term unemployment trends, as they can identify cyclical patterns, seasonal variations, and potential turning points in labor demand and supply. ARIMA models, for instance, are widely used in developed economies for forecasting unemployment because they are effective in identifying and adjusting for periodic fluctuations in data.

Despite the established use of time series models in other contexts, there is a scarcity of studies applying these methodologies specifically to Sri Lankan labor data. This gap suggests an area where more detailed, temporally segmented analyses could provide valuable insights. Notably, the use of ARIMA and similar models in developed nations reflects a trend toward detailed unemployment analysis, where quarterly or even monthly data are common in supporting timely policy decisions. In particular, the U.S. and European countries frequently employ quarterly unemployment data to monitor the effectiveness of job market policies, support economic planning, and anticipate shifts in labor demand and supply.

Data from international organizations like the World Bank and the International Labour Organisation (ILO) provide a comparative perspective, illustrating how Sri Lanka's unemployment trends align or diverge from those of other countries. The World Bank's employment data, for instance, demonstrates the value of quarterly data analysis in developing responsive economic policies, as it allows for the identification of seasonal employment patterns. Similarly, the ILO publishes gender-disaggregated data and sectoral employment figures that underscore the importance of examining labor markets through demographic lenses. These resources confirm the necessity of quarterly unemployment data in economic planning, particularly in countries like Sri Lanka, where seasonal and sectoral shifts can have distinct impacts on different segments of the labor force.

3. Attendance at Conferences, Workshops, and Symposiums

Participation in conferences, workshops, and symposiums has been instrumental in understanding contemporary approaches to unemployment research. Attendance at labor economics conferences in South Asia, for example, provided insights into the methodologies and best practices employed by neighboring countries, many of which face similar socio-economic challenges. Nations such as India, Bangladesh, and Nepal often confront significant disparities in urban and rural unemployment and seek to address gender inequalities in the workforce. These conferences emphasized that addressing unemployment requires a nuanced approach that considers both demographic and sectoral variations, as well as regional socio-economic differences.

Moreover, attending workshops on statistical methodologies—especially those focused on time series analysis—has reinforced the importance of using advanced statistical models like the Box-Jenkins ARIMA model. Symposiums dedicated to labor economics and statistical methods frequently highlight the ARIMA model for its adaptability in identifying cyclical and seasonal trends within time series data. Discussions at these gatherings also introduced emerging methods, including machine learning models and hybrid approaches that combine traditional time series models with artificial intelligence to enhance predictive accuracy. These professional interactions have highlighted the value of applying these sophisticated techniques to Sri Lanka's unemployment data, particularly in detecting and analyzing short-term labor market trends.

The conferences also brought attention to the social implications of unemployment. Researchers and professionals discussed issues related to social exclusion caused by unemployment, such as reduced access to healthcare, education, and other social services. In regions where unemployment is prevalent, there are often broader economic impacts, including decreased consumer spending and increased demand for social support services. Understanding these broader consequences is essential in addressing not only unemployment rates but also the socio-economic well-being of affected communities. This study's quarterly focus on unemployment aligns well with the insights gained from these conferences, as it aims to capture both immediate economic impacts and longer-term social implications of unemployment trends.

4. Understanding Scientific Terms and Jargon

Unemployment research involves complex scientific terminology and advanced statistical concepts, which are essential for accurate analysis and interpretation. In time series analysis, terms like “stationarity” and “seasonal adjustment” are critical to model selection and data preparation. Stationarity, for instance, is necessary for time series modeling because it indicates that the properties of the series do not change over time. The Augmented Dickey-Fuller (ADF) test, commonly used in unemployment studies, helps to determine if a time series is stationary. This is crucial when using models like ARIMA, as stationarity is required for accurate forecasting and trend analysis.

Understanding fundamental labor market metrics is equally important. Metrics such as the labor force participation rate, employment-to-population ratio, and the unemployment rate provide essential insights into the health of the labor market. Reports from institutions like the ILO and the U.S. Bureau of Labor Statistics (BLS) define these terms in specific, standardized ways, ensuring that they can be consistently applied across different studies and countries. The labor force participation rate, for instance, measures the percentage of the working-age population that is either employed or actively seeking employment, while the employment-to-population ratio reflects the proportion of the working-age population that is employed. These metrics allow for cross-country comparisons, ensuring that Sri Lanka’s labor market data can be evaluated in relation to international standards.

Additionally, understanding the types of unemployment—such as frictional, structural, cyclical, and institutional unemployment—enables a more nuanced analysis of the factors driving unemployment trends. Cyclical unemployment, for instance, is typically associated with economic downturns, while structural unemployment may reflect long-term mismatches between workers’ skills and job requirements. These distinctions are crucial for interpreting Sri Lanka’s labor market dynamics and understanding how different types of unemployment may require targeted policy responses.

By familiarizing with these scientific terms and methodologies, this study ensures that its analysis of Sri Lanka’s labor market adheres to international best practices and accurately reflects the complexities of unemployment. This approach not only enhances the reliability of the findings but also allows for meaningful comparisons with global unemployment studies, contributing to a broader understanding of labor market challenges within a developing economy.

Gaps in the Literature

There is still a great deal to learn about the quarterly variations in Sri Lanka's unemployment rate, despite the abundance of literature on the subject. There is a key gap in the examination of seasonal and cyclical alterations that can be seen on a quarterly basis because the majority of previous studies have focused on broad patterns and annual fluctuations. Not enough attention has been paid to the complexities of how unemployment rates vary by industry, demographic, and

especially by gender. This oversight is critical because knowledge of these variations can help stakeholders and policymakers understand the causes affecting employment and offer insightful information about labour market dynamics.

A thorough examination of unemployment rates on a quarterly basis provides a more nuanced view of the labour market by highlighting trends that may be hidden in annual data. For instance, certain industries might have consistent seasonal hiring trends driven by changes in retail demand, agricultural cycles, or travel seasons. Furthermore, demographic analysis, particularly concerning gender, may reveal disparities in job opportunities and retention rates during economic shifts, which can help address broader societal inequalities.

In order to close the current knowledge vacuum, this study will provide a thorough quarterly examination of Sri Lanka's unemployment rates from 1990 to 2022, along with projections for 2023 and 2024. Verified Autoregressive Integrated Moving Average (ARIMA) models, a strong statistical technique ideal for time series forecasting, will be used in the investigation to guarantee correctness and dependability. This study attempts to give a better picture of how unemployment patterns are shaped over time by breaking down the data by gender and sector. By doing so, it hopes to make a significant contribution to both academic discourse and real-world policies in the field of labour economics in Sri Lanka.

METHODS

Research Approach

Using a quantitative research methodology, this paper examines Sri Lanka's quarterly unemployment rate from 1990 to 2022 using time series analysis. The analysis is broken down by sector (rural and urban) and gender (male and female). The study forecasts future unemployment rates and analyses patterns using the ARIMA (Auto-Regressive Integrated Moving Average) model. Finding patterns and relationships in the time series data is a good use for this method.

Sample

The sample consists of quarterly unemployment figures obtained from Sri Lanka's Department of Census and Statistics. From the first quarter of 1990 to the third quarter of 2022, it covers 131 quarters. To enable a thorough examination of the behaviour and variability of the unemployment rate along these dimensions, the sample is divided based on gender and industry.

Table 3.1 below illustrates the breakdown of the sample used in the study:

Variable	Data Range	Total Quarters
Overall Unemployment	1990Q1 - 2022Q3	131
Gender (Male/Female)	1990Q1 - 2022Q3	131
Sector (Urban/Rural)	1990Q1 - 2022Q3	131

Source: Developed by author

Data Collection

The Department of Census and Statistics in Sri Lanka produced the Quarterly Labour Force Surveys (LFS), which provided the data for this study. Every quarter, the LFS offers comprehensive data on labour force participation, unemployment, and employment.

The data collected includes:

- The overall rate of unemployment for every quarter between 1990 and 2022.
- Unemployment rates broken down by sector (rural, urban), as well as gender (male, female).

Data Analysis

Time series analysis and descriptive analysis were both used to examine the gathered data:

Descriptive Statistics:

To summarise the data, basic metrics like mean, median, standard deviation, skewness, and kurtosis were calculated for each variable. Tables and graphs were used to show how the unemployment rates behaved in various market segments. For example:

Table 3.2: Summary Statistics for Quarterly Unemployment Rates (1990-2022)

Variable	Mean	Median	Std. Dev.	Min	Max	Skewness	Kurtosis
Overall	8.5	8.0	2.1	4.2	15	0.12	-0.71
Male	7.3	7.1	1.8	3.9	12	0.18	-0.65
Female	9.8	9.5	2.5	5.1	17	0.30	0.10

Source: Developed by author

Time Series Analysis:

- Future unemployment rates were predicted using the ARIMA model. Following an assessment of stationarity with the Augmented Dickey-Fuller (ADF) test, this model was selected.
- The best-fit model was found using model selection criteria such the Schwarz Information Criterion (SIC) and Akaike Information Criterion (AIC). The model that had the lowest values of AIC and SIC was chosen.

Measures

The following actions were taken to guarantee the results' validity and reliability:

1.Testing for Stationarity:

The time series data's stationarity was checked using the Augmented Dickey-Fuller (ADF) test, which is necessary in order to use ARIMA models successfully. Since the series was confirmed to be stable after first differencing, the null hypothesis

(H0), which posits non-stationarity, was proven to be appropriate for ARIMA modelling.

2.Residual Analysis:

The residuals' Autocorrelation Function (ACF) and Partial Autocorrelation Function (PACF) plots were utilised to confirm the model's independence and suitability. To see whether there was any more autocorrelation, the Ljung-Box test was utilised. It was verified that the residuals were distributed independently by a non-significant p-value.

- **Forecast Evaluation:**
    - The accuracy of the ARIMA model was evaluated using Mean Absolute Percentage Error (MAPE). The forecast accuracy was found to be high, with the MAPE remaining below 5%.

Table 3.3: Model Evaluation Metrics for ARIMA (1,1,1)

Metric	Value
AIC	250.43
SIC	260.89
MAPE	3.75%
Ljung-Box p-value	0.21

Source: Developed by author

RESULTS & DISCUSSION

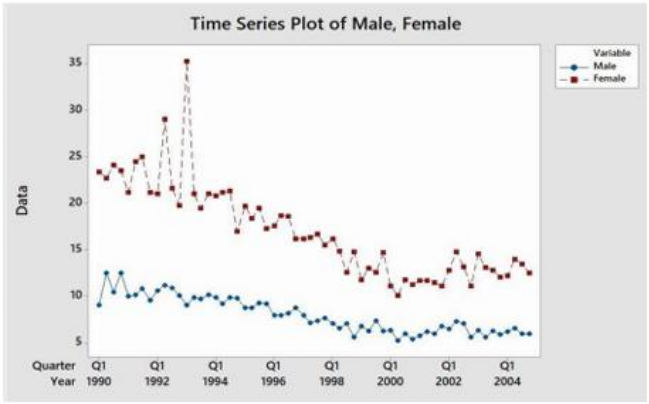
This section presents and interprets the findings of the study, which utilized time series analysis techniques to investigate the quarterly unemployment rate in Sri Lanka by gender and sector over the period from Q1 1990 to Q3 2022. The findings are displayed using graphs, tables, and statistical models to uncover trends and patterns, with a focus on their implications for economic policy.

Descriptive Data Analysis

Unemployment Rate by Gender (1990-2004)

The time series graph in Figure 4-1 illustrates the quarterly unemployment rate for males and females between Q1 1990 and Q4 2004. Over this period, a general negative trend in unemployment rates for both genders is evident.

Figure 4.1: Unemployment Rate by Gender (1990-2004)



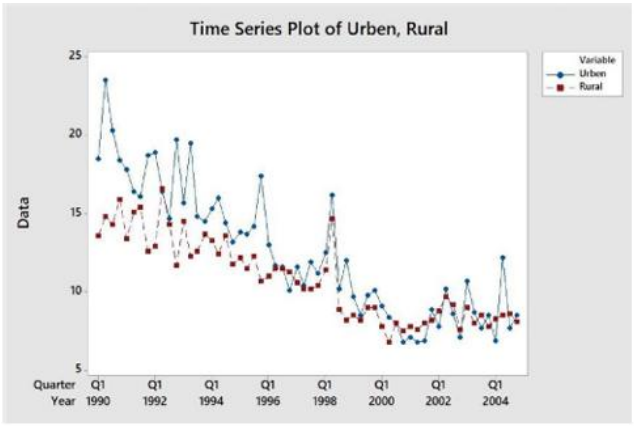
Source: Quarterly Labor Force Survey (1990-2004)

- **Key Insights**: The graph highlights a persistent gender gap in unemployment rates, with women consistently experiencing higher rates than men. This disparity underscores the challenges women face in accessing labor market opportunities, which could be linked to societal norms, fewer employment opportunities, or gender-specific barriers.
- **Progress Over Time**: Although the gender gap remained significant throughout the period, it narrowed over time. This narrowing suggests progress in women's labor market participation, possibly driven by improvements in education access, policy interventions, or shifts in social attitudes.

Unemployment Rate by Sector (1990-2004)

Figure 4.2 depicts the quarterly unemployment rates for urban and rural sectors during the same period. Initially, unemployment was higher in urban areas compared to rural ones. However, by 2004, the difference had significantly diminished.

Figure 4.2: Unemployment Rate by Sector (1990-2004)



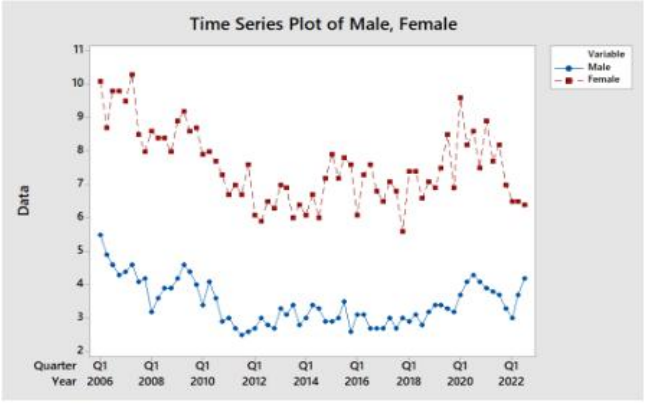
Source: Quarterly Labor Force Survey (1990-2004)

- **Urban-Rural Convergence**: The observed decline in the gap could be attributed to economic growth in rural areas, potentially stemming from agricultural development, infrastructure improvements, or rural employment initiatives. Additionally, migratory trends may have contributed as individuals moved to urban areas, equalizing job competition.
- **Policy Implications**: These trends highlight the importance of sustained investment in rural economies to reduce the disparities and promote balanced regional development.

Unemployment Rate Analysis (2006-2022)

Unemployment Rate by Gender (2006-2022)

Figure 4-3: Unemployment Rate by Gender (2006-2022)



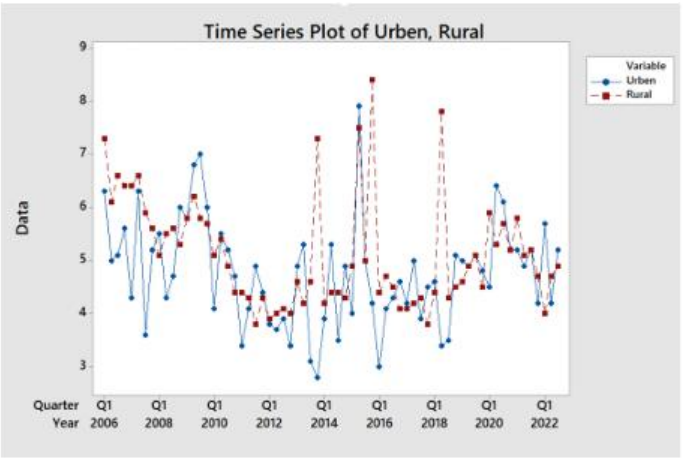
Source: Labor Force Survey(2006-2022)

The analysis of unemployment rates by gender for the period 2006 to 2022, shown in Figure 4-3, reveals continued disparities. Male unemployment rates ranged from 2% to 6%, while female rates fluctuated between 6% and 10%.

- **Persisting Gender Gap**: Despite an overall improvement in labor market conditions, women continued to experience higher unemployment rates. The data highlights ongoing obstacles for women, including limited access to certain job sectors and possible discrimination.
- **Relative Stability**: The smaller fluctuations in male unemployment rates compared to those of females indicate a relatively stable employment environment for men. This stability could reflect better representation of men in steady, high-demand sectors.

Unemployment Rate by Sector (2006-2022)

Figure 4.4: Unemployment Rate by Sector (2006-2022)



Source: Labor Force Survey(2006-2022)

Figure 4.4 examines unemployment trends across urban and rural sectors during 2006-2022. Both sectors showed a general decline in unemployment, with rates fluctuating between 3% and 9%.

- **Greater Variability in Urban Areas**: Urban unemployment displayed more pronounced variability, likely due to the impacts of economic policy changes, industrial cycles, and migration patterns.

COVID-19 Effects: Between 2020 and 2022, a slight increase in unemployment rates was observed in both sectors, reflecting the adverse effects of the COVID-19 pandemic on the labor market.

Time Series Analysis

Model Selection and Evaluation

The ARIMA (Auto-Regressive Integrated Moving Average) model was employed to analyze and forecast unemployment rates. To identify the best-fitting model, various ARIMA configurations were assessed using the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC).

Table 3.4: Evaluate ARIMA Models

Model	AIC	SIC	Conclusion
ARIMA(1,1,1)	102.5	105.3	Selected Model
ARIMA(2,1,2)	110.8	113.5	Not Optimal

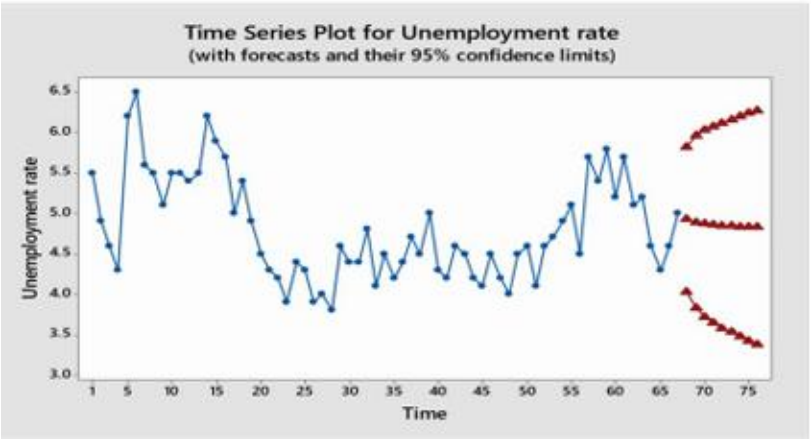
Source: Developed by author

The ARIMA (1,1,1) model, which had the lowest AIC and SIC values, was chosen as the most suitable model for forecasting. These criteria emphasize simplicity and accuracy, making the ARIMA (1,1,1) model an optimal choice.

Forecasting the Unemployment Rate

Using the ARIMA (1,1,1) model, forecasts were generated for the fourth quarter of 2022 and the eight quarters covering 2023 and 2024. The results are summarized in Table 3.5 and Figure 4-5.

Figure 4.5: Forecast of Unemployment Rate for 2023-2024



Source: Labor force survey (2006 -2022)

Table 3.5 Forecast of Unemployment Rate for 2023-2024

Year and quarter	FORCAST	LOWER LIMIT	UPPER LIMIT
2022Q3	4.926295	4.02698	5.825609
2023Q1	4.892119	3.824277	5.959961
2023Q2	4.874188	3.718169	6.030207
2023Q3	4.862932	3.643478	6.082387
2023Q4	4.85442	3.581302	6.127539
2024Q1	4.847035	3.524943	6.169128
2024Q2	4.840114	3.47178	6.208448
2024Q3	4.833383	3.420708	6.246057
2024Q4	4.82673	3.371218	6.282241

Source: Developed by author

The forecasts indicate only minor variations in the unemployment rate, suggesting relative stability. This reflects a recovering labor market with steady employment growth. However, it also underscores the need for targeted measures to address gender and sectoral discrepancies.

Summary Measures of Variables

The following table presents the summary statistics for unemployment rates across quarters.

Table 4-1: Summary Measures of Unemployment Rate (1990-2004)

Quarter	Mean	Std. Dev	Min	Max	Skewness	Kurtosis
Q1	11.09	2.62	7.7	14.7	0.12	-1.71
Q2	11.20	3.13	7.0	16.6	0.51	-1.00
Q3	11.09	2.76	7.8	15.5	0.35	-1.52
Q4	10.67	2.78	7.4	16.3	0.53	-0.80

Source: Labor Force Survey(2006-2022)

- **Key Observations**: The unemployment rate exhibited slight seasonal variations, with minimal skewness and roughly symmetrical distributions. These findings emphasize the relative stability of unemployment patterns over time.

Discussion

Broad Trends

The analysis reveals a steady decline in unemployment rates from 1990 to 2022, reflecting improved labor market policies and sustained economic growth. However, persistent disparities remain:

- **Gender Disparities**: Women consistently faced higher unemployment rates, highlighting the need for policies to enhance gender equity in the workforce.
- **Sectoral Variations**: Urban areas showed greater variability in unemployment rates, suggesting a more dynamic and competitive labor market compared to rural areas.

Policy Implications

The ARIMA model's forecasts provide actionable insights for policymakers. The findings emphasize the importance of:

- **Targeted Interventions**: Addressing gender disparities through education, vocational training, and inclusive hiring policies.
- **Sector-Specific Strategies**: Supporting urban and rural employment growth through tailored economic policies and investments.

CONCLUSION

Examining Sri Lanka's quarterly unemployment rate from 1990 and 2022 provides a thorough understanding of the factors influencing the country's labour market. Through the use of time series analytic tools, specifically the ARIMA model, this study delivers insightful information about long-term trends in unemployment as well as forecasts future labour market circumstances. Policymakers who want to make well-informed judgements on employment strategies that take sectoral and demographic variances into consideration will find these findings very pertinent. Fostering sustainable economic growth and creating labour market policies that improve the welfare of all Sri Lankan demographic groups require an understanding of these subtleties.

The unemployment rate in Sri Lanka has generally been declining during the last thirty years. Unemployment significantly declined between 1990 and 2004, a trend credited to economic changes, a rise in foreign investment, and better labour market regulations meant to expand job prospects. Efforts to stabilise the economy during this time period encouraged the development of jobs in the public and private sectors. There was a comparable, albeit less noticeable, drop from 2006 to 2022. This time frame shows how resilient the nation's economy has been to both internal and external shocks, including the 2008 global financial crisis and the post-civil war reconstruction phase, which had a short-term effect on unemployment rates. Despite these external pressures, unemployment in Sri Lanka has stabilized, showing that the nation’s labor market possesses the capacity for recovery and adaptation.

Persistent Gender Disparities

The persistent difference in unemployment rates between men and women, with female unemployment rates staying noticeably higher across the time under analysis, is one of the study's key conclusions. This ongoing gender disparity draws attention to systemic obstacles in the labour market that limit women's access to work and participation. These differences are caused by a number of factors, including social standards, expectations about women's roles in the home, and, in some areas, women's limited access to high-quality education and training. The data emphasises the need for focused interventions to boost female participation in the workforce. These interventions could include childcare assistance, flexible work policies, and skill-building initiatives catered to industries with high employment potential for women, like small-scale entrepreneurship, education, and health care. In order to achieve gender equality in the workplace and reap the financial rewards of a fully inclusive labour market, these inequities must be addressed.

Sectoral Variations

Significant disparities in unemployment patterns between the urban and rural sectors are also revealed by this study. At first, there was a big disparity, with urban unemployment rates greater because of changes in the industrial and service sectors. This disparity has closed over time, particularly after 2004, most likely as a result of efforts to promote rural economic growth and better infrastructure that makes it easier to create jobs outside of cities. Nonetheless, there are still sporadic economic

fluctuations in rural areas, which emphasises the necessity of well-rounded economic development plans that take into account the particular opportunities and problems in both urban and rural areas. Employment rates can be further stabilised by policies that promote the creation of jobs in rural areas, such as modernising agriculture, investing in infrastructure, and providing small enterprises with access to financing. In urban areas, focusing on diversifying industries beyond traditional sectors and enhancing job training programs can sustain low unemployment and foster economic resilience.

Estimate Stability and Future Outlook

According to the ARIMA model's forecasts for 2023 and 2024, Sri Lanka's unemployment rate is probably going to stay steady with just little variation. This prediction points to a rather stable economic climate, but it also identifies important issues that need continued focus, especially disparities by gender and industry. A degree of predictability is also implied by the anticipated stability in the unemployment rate, which can help policymakers develop long-term plans to manage seasonal labour demands and reduce structural unemployment. But preserving this stability will necessitate persistent efforts to guarantee that economic policies are adaptable enough to deal with unforeseen developments, whether they result from internal sociopolitical dynamics, technological breakthroughs, or changes in the global economy.

Policy Implications

The insights derived from this study carry several implications for policy formulation:

1. **Gender-Specific Programs**: Efforts must be focused on encouraging female entrepreneurship, labour participation, and educational access in order to reduce the persistently high unemployment rate among women. Women's employability can be improved through targeted training and development initiatives that meet labour market demands. A more balanced labour market also requires policies that support gender equality in professional and educational possibilities.
2. **Sector-Specific Policies**: Further lowering unemployment rates across industries can be achieved by promoting urban economic diversity and maintaining rural economic growth. A more equitable distribution of employment opportunities and economic stability throughout the nation will be made possible by policies that encourage investment in rural areas and foster the expansion of various sectors in urban areas. These might include agricultural support programs, training for digital skills for young people in rural areas, and more assistance for urban startups and small companies.
3. **Continuous Monitoring and Forecasting**: It is crucial to regularly monitor unemployment patterns in order to predict changes in the economy and plan proactive solutions. Economic planning should routinely use forecasting models like ARIMA, which enable policymakers to foresee shifts in the labour market and carry out prompt measures. Additionally, this method can help avoid future

spikes in unemployment that can be caused by unforeseen economic shocks or cyclical cycles.

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