

# Revisiting the Phillips Curve in Keralam: An Empirical Analysis of Inflation-Unemployment Dynamics

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## Abstract

Research on the pattern of unemployment and inflation in Keralam from 2017-2025 is aimed at establishing the existence of Phillips curve in the economy. There is ample evidence of the fact that higher unemployment is related to the rates of inflation. Unemployment is high among the educated youth and women while low inflation has continued to be associated with supply-side elements including price of food and fuel. Using data the study was conducted to ascertain whether there was an inverse relationship between inflation and unemployment. Phillips curve theory has not been applied to Keralam's economy. The cost-push dynamics and significant unemployment have been attributed to this.

**Keywords:** Keralam; economy; trends; dynamics; inflation; Phillips curve; unemployment

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## Introduction

Two crucial macroeconomic indicators for assessing the stability and performance of the economy are unemployment and inflation. Both significantly affect people's well-being and economic growth (Subhash & Karunakaran, 2025). While working for the UK economy in 1958, A.W. Phillips developed the notion of this link. The correlation has been impacted by global stagflation of 1970s. The study conducted by economists like Friedman and Phelps on the subject are crucial. The relation may be influenced by several factors (Blanchard, 2018; Ball & Mazumder, 2019). Debate on the relationship raised doubt on Phillips Curve's validity. Paul (2009) observed no empirical evidence supporting the concept. Govind (2019) and Kumar and Vashist identified structural problems between variables. Some studies find a kind of correlation between this and suggested some degree of co-movement (Shekhar, 2019 and Choudhary & Singh, 2021). As noted by the Reserve Bank of India (2020) and Mohanty & John (2015), it may be the cause without necessarily demonstrating the connection. The relationship in India is quite complex to make sense (Johnson & Karunakaran, 2026). Understanding the relationship (Devasia & Karunakaran, 2021) globally has been primarily caused by supply chain problems, pandemics, and geopolitics, instability, and energy costs. Supply shocks have contributed in the post-pandemic era, and this combination appears to have

contributed in numerous nations (IMF, 2023).

Examining India's peculiar situation becomes especially fascinating. Due to advancements in literacy, life expectancy, and education brought about by healthcare and human development, the people of Keralam, have high levels of education, particularly among women. The two elements' existence is quite unusual (Krishnan, 2004; Dronagiri, 2023). Growth of its service sector and remittance flows Keralam distinguishes itself from other regions. The primary issues in Keralam that hinder the creation of jobs are highly educated unemployment, lack of skills, demographics, and aging labour market (Keralam State Planning Board, 2023). It is typically caused by supply-side factors also. Behera et al (2017) revealed that while the connection between inflation and unemployment varies in different states of India, it is particularly so for Keralam. Global pandemic, together with post-pandemic recovery, has resulted in altered trends in employment and inflation (Johnson, et. al., 2026). The emerging pattern in the present economy necessitates reconsideration of the Phillip's curve in relation to Keralam. Given this background, the paper examines the trends of unemployment and inflation in Keralam from 2017 to 2025 to determine whether or not the Classical Phillips Curve operates within the Keralam economy.

## Review of literature

The relationship between unemployment and inflation has been a topic of discussion in macroeconomics. Paul (2009) reveals a short-run inverse relationship between unemployment and inflation in India; however, this relationship does not exist in long-run economics. Govind (2019), Kumar and Vashist observed aspects of India which make the trade-off between inflation and unemployment. Shekhar (2019) and Choudhary and Singh (2021) claims unemployment and inflation in India have a positive correlation, which runs counter to the fundamental idea of Phillips curve. Blanchard (2018) argued that various factors have combined to alter the reaction of inflation to changes in unemployment rates. Other studies have found little correlation between inflation and changes in the labour market across most countries (Ball and Mazumder, 2019 and Conrad, 2023). Mohanty & John (2015) proved to contribute significantly to the inflation rate. Reserve Bank of India (2020) explained some roles played by supply constraints in determining the inflation rate. IMF (2023) observed that post-pandemic inflation has been attributed to some supply-side factors. Krishnan (2004) found that the presence of working-age individuals available to the labour force results in a situation of persistent unemployment. Bhalotra (2017) concludes that labour market results in India depend on the patterns of participation and the economy's ability to supply job. Dronagiri (2023) and Gabhane (2025) found that educated youth are having difficulty in accessing suitable employment. Behera et al. (2017) shows the existence of a weak, limited and unstable link between inflation and unemployment.

## Research gap and Objectives

There is a dearth of research on the applicability of Phillips curve to Keralam's economy. Existing literature has either supported the theory of the Indian economy in general by comparing different states without considering the socio-economic factors. The relationship between inflation and unemployment has undergone a paradigm shift as a result of the COVID-19 epidemic, supply chain management issues, and price increases for food, gasoline, and energy. Little if any of the existing literature examines the use of the Phillips curve with respect to the state of Keralam from 2017-2025 or provides any insight into how localized labour market dynamics would affect the relationship.

The main objectives are: (i) to examine the unemployment and inflation trends in Keralam (2017-2025), and (ii) to examine the existence of Phillips curve in the Keralam scenario.

## Materials and methods

With quantitative research studied the rates and are suitable and efficient in Keralam (2017 to 2025). Periodic Labour Force Survey (PLFS), National Sample Survey Office (NSSO), Reserve Bank of India (RBI), and the Keralam State Planning Board are data sources. The Unemployment rate, labour force participation rate (LFPR), worker population ratio (WPR), and consumer price index (CPI) are collected every year. The analysis included three stages: (i) the trend analysis evaluated unemployment and inflation and a graph determined if there are fluctuations in the trend; (ii) Pearson's correlation statistics applied to analyze unemployment and inflation; and (iii) OLS regression analyzed the influence of inflation on unemployment and labour market indicators; it ascertain how each labour market indicator or inflation impacts unemployment while accounting for the effects of inflation and other labour market variables. To verify that all of the OLS regression's assumptions were met, diagnostics were carried out. Diagnosis showed no heteroscedasticity, multicollinearity and autocorrelation and the distribution of residuals was roughly normal depicting statistical reliability in the regression model. The regression model is specified as:

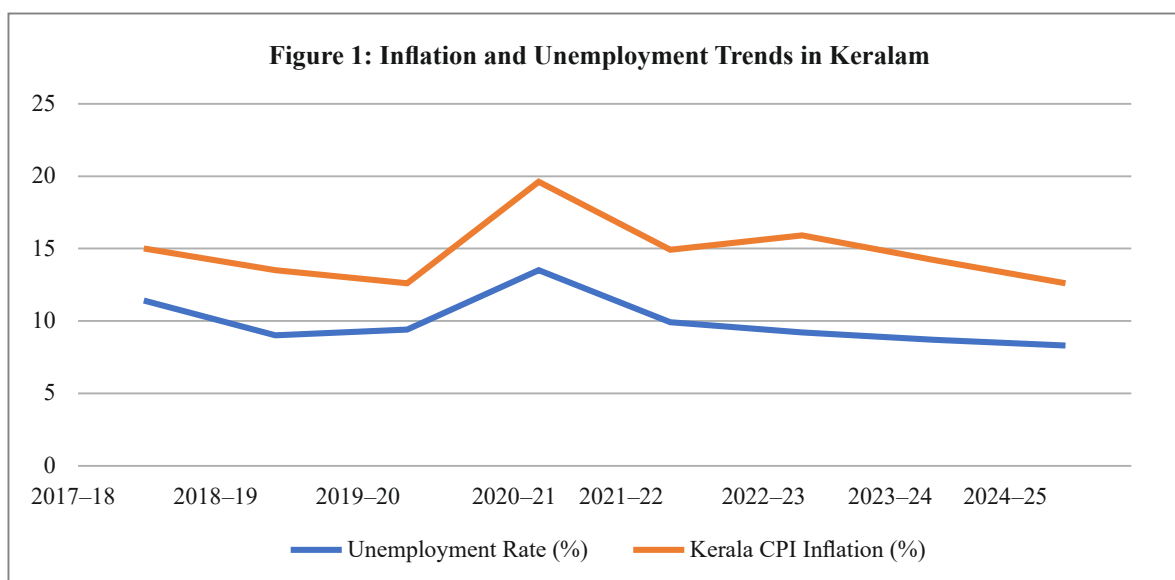
$$U = \beta_0 + \beta_1(LFPR) + \beta_2(WPR) + \beta_3(Inflation) + \epsilon$$

- U = Unemployment Rate
- LFPR = Labour Force Participation Rate
- WPR = Worker Population Ratio
- INF = Consumer Price Inflation Rate
- $\beta_0$  = Constant term
- $\beta_1, \beta_2, \beta_3$  = Regression coefficients
- $\epsilon$  = Error term

The sample size is constrained as the analysis is based on yearly data from 2017 to 2025. The regression estimates' statistical feasibility and power will be impacted by this. However this research provides us with important information as well as the state of Keralam at a period of severe economic disruption of COVID-19 pandemic and the subsequent recovery from this disruption.

## Results and discussion

To understand inflation and rates of unemployment are very important with the Keralam economy (Singh Jyoti, et al, 2024). Inflation during 2017-18 to 2019-20 remained constant and stable (figure 1); hit 6.1% in 2020-21, driven by supply chain and logistics issues and higher costs of production; followed by a period of increased inflation and it has decreased to 4.3% by 2024-25. Unemployment decreased prior to COVID-19, but increased to 13.5% in 2020-21, continued to decrease with economic recovery dropping to 8.3% by 2024-25. This shows that the job market is improving and the efforts of economic recovery are working progressively.



Source: Authors' calculation

**Figure: 1**

Looking at Keralam's data during the period, do not see the typical relationship between inflation and unemployment defined by the Phillips Curve model. During 2020-21, Keralam experienced stagflation due to COVID-19. While the economy grew 13 percent in 2021-22 resulting in a drop in the unemployment rate; inflation remained high, indicating that the economy was "over-heating" or oscillating. In contrast, between 2023-24 and 2024-25, inflation and unemployment both declined together, providing evidence of a more balanced and healthy economy.

**Table 1: Correlation Analysis between Unemployment and its determinants**

| Variable                   | Unemployment | Labour Force Participation | Worker Population Ratio | CPI Inflation (%) |
|----------------------------|--------------|----------------------------|-------------------------|-------------------|
| Unemployment Rate (%)      | 1.00         | -0.84                      | -0.86                   | +0.62             |
| Labour Force Participation | -0.84        | 1.00                       | +0.99                   | -0.41             |
| Worker Population Ratio    | -0.86        | +0.99                      | 1.00                    | -0.41             |
| CPI Inflation (%)          | +0.62        | -0.41                      | -0.44                   | 1.00              |

Source: Authors' calculation

From the correlation analysis negative relation between LFPR (-0.84) and unemployment (UNEM) and worker participation rate (WPR: -0.86). This implies that reduced UNEM levels in Keralam would result from increased absorption. Therefore, it will be particularly crucial in the workforce, such as women. LFPR and WPR have a nearly perfect positive correlation (0.99). This indicates that changes in LFPR and WPR are typically going in the same direction depicting Keralam's labour market structure is comparatively stable. The inflation in Keralam is primarily supply driven, floods and price increases globally, increase in costs of production, and epidemic situation have affected the labour market and availability of jobs in Keralam (table 1). The increased pressure on economy because of high prices causes more unemployment than employment. These factors make Keralam dependent on low income service sectors.

The relationship between inflation and both LFPR and WPR is weakly negatively correlated (-0.41, -0.44),

suggesting that as inflation increases, there real wages associated with rising prices; thus making entering less desirable. From the correlation matrix change in participation rate has become the most significant factor determining Keralam's inflation rate has a negative impact. It is also clear that Keralam depends on supply side shocks due to inflation and unemployment rate making policies requiring skills and also increasing participation of labour force will enable Keralam to achieve the objectives.

$$\text{Unemployment} = \beta_0 + \beta_1(\text{LFPR}) + \beta_2(\text{WPR}) + \beta_3(\text{Inflation}) + \epsilon$$

The regression results revealed that unemployment in Keralam was significantly influenced by LFPR, WPR and CPI. The model demonstrated a high degree of explanatory power with a  $R^2$  value of 0.85 thus indicating that 85% of Keralam's unemployment can be accounted for by the aforementioned variables. The high significance level was reinforced by the statistically significant F statistic (table 2). There exists a statistically significant ( $p < 0.05$ ) participation rate (LFPR) and unemployment; hence, when LFPR rises by 1%, the total number of unemployed people declines by 0.45%. It means more reductions in total unemployment of Keralam. In addition, there exists ( $p < 0.05$ ) rate (WPR) and total unemployment; hence, with the increase in WPR, the total number of unemployment declines. Therefore, there exist chances of creation of productive employment for young and women workers who are high-school educated (most of Keralam's unemployed workforce).

**Table 2: Regression analysis of Keralam's labour market and inflation data (2017-2025)**

| Predictor Variable     | Coefficient ( $\beta$ ) | Std. Error     | t-Value | p-Value        |
|------------------------|-------------------------|----------------|---------|----------------|
| LFPR (%)               | -0.45                   | 0.12           | -3.75   | 0.012          |
| WPR (%)                | -0.50                   | 0.15           | -3.33   | 0.018          |
| CPI Inflation (%)      | +0.30                   | 0.10           | +3.00   | 0.025          |
| Constant ( $\beta_0$ ) | +40.0                   | 5.20           | +7.69   | 0.001          |
| $R^2$                  | 0.85                    | Adjusted $R^2$ |         | 0.81           |
| F-Statistic            |                         |                |         | 21.4           |
|                        |                         |                |         | ( $p < 0.01$ ) |

Source: Authors' calculation

While examining inflation and unemployment in Keralam it is evident that the first factor role. Actuality one percent increase in the rate results 0.30 percent rises; such relationship goes against the Phillips Curve. In Keralam the unemployment level people looking for work and job places, not the inflation level.

## Conclusion

Keralam's unemployment and inflation rates to assess Phillips' application following the epidemic, the unemployment rate and curve became highly erratic. Phillips Curve does not indicate a negative relationship. Conversely, there is inflation due to supply chain interruptions, growing energy costs, and fluctuating product prices. In this instance, inflation is the result of decreased economic activity. This provides a clear explanation for both the situation's actuality and the Phillips Curve's expectations. Out of all the forecasts, one proved to be accurate in determining Keralam's unemployment rate. Unemployment

decreases when the labour force participation rate increases. Phillips curve thus does not apply to Keralam due to its unique features. There are some limitations in this paper as very limited data points utilized and it covers only one year. Thus, some caution should be taken in relation to interpretation of the findings. In terms of future research, the potential usage of quarterly and monthly data points more variables and some other advanced methods of research might be applied.

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