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UNEMPLOYMENT, REGIME CHANGE, AND INFLATION IN KENYA, 1991–2025: FRICTIONAL AND STRUCTURAL EVIDENCE FROM PHILLIPS CURVE AND EXPECTATIONS-AUGMENTED PHILLIPS CURVE ESTIMATES

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ABSTRACT

Purpose of the study: This study examines whether unemployment explains inflation in Kenya over 1991–2025 and whether the relationship differs between 1991–2016 and 2017–2025.

Short introduction of problem statement: Existing Kenyan Phillips curve studies mostly treat total unemployment as a single variable, assume a stable relationship over time and end before the post-2016 rise in unemployment. Policy makers therefore cannot tell whether that rise reflects a cyclical trade-off against lower inflation or a structural change that monetary policy cannot reverse.

Method/methodology: Secondary annual data, mainly World Bank indicators complemented by Central Bank of Kenya (CBK) and Kenya National Bureau of Statistics (KNBS) publications (35 observations), are analysed using ordinary least squares estimates of the traditional Phillips curve, a regime-moderated Phillips curve, and an adaptive-expectations augmented Phillips curve. Stationarity is tested with augmented Dickey-Fuller and KPSS tests, and trends are estimated explicitly.

Results of the study: Unemployment is non-stationary in levels and rises at about 0.076 percentage points a year over the sample, while inflation is stationary and falls by about 0.45 points a year. Unemployment is stable at about 2.8% until 2016, then rises to 5.4–5.7%, implying a structural component of 2.6–2.9 percentage points. Mean inflation falls from 12.2% to 5.9%. The pooled unemployment coefficient is negative but not significant (−2.25, $p = .117$), as is the structural component ($p = .115$). The regime interaction is significant ($p = .021$) but

arises mainly from a positive pre-2017 slope and a level shift, not from a downward-sloping trade-off. In the expectations-augmented specification unemployment is insignificant (p = .913), while last year's inflation is significant (coefficient 0.52, p = .002).

Conclusion and policy recommendation: Kenyan inflation is driven by persistence and supply-side shocks more than by labour-market slack. The Central Bank of Kenya should not rely on a stable unemployment-inflation trade-off and should focus on anchoring expectations, while the post-2016 rise in unemployment should be addressed through skills and labour-market policy rather than demand management.

Keywords: *unemployment, inflation, Phillips curve, expectations-augmented Phillips curve, structural unemployment, Kenya*
JEL classification: E24, E31, C22, O55

1. INTRODUCTION

Unemployment and inflation are two of the main indicators used to judge macroeconomic performance, and the way they move together has shaped monetary and labour-market policy for more than sixty years. Early work reported that lower unemployment was associated with faster wage growth (Phillips, 1958), but later work showed that this relationship depends on expectations and on the natural rate of unemployment (Friedman, 1968; Phelps, 1967). Whether a trade-off exists in a particular economy is therefore an empirical question that depends on the period studied, the data used and the structure of the economy.

This article first presents the background, significance and scope of the study, and then the statement of the problem, the objectives, the research questions and the hypotheses. It then reviews the theoretical and empirical literature, sets out the conceptual framework and the research methodology, presents and discusses the results, and ends with the conclusions and recommendations.

Background of the Study

The relationship between unemployment and inflation is central to macroeconomic policy. Phillips (1958) reported an inverse relationship between unemployment and money wage growth in the United Kingdom, and Samuelson and Solow (1960) interpreted it as a menu of choices available to policy makers. Phelps (1967) and Friedman (1968) later argued that the trade-off is temporary: once expectations adjust, unemployment returns to its natural rate and inflation depends on expected inflation and on the gap between actual and natural unemployment.

Kenya offers a demanding test of these ideas. The economy has a large informal sector, a rapidly growing young labour force, and a history of inflation shocks linked to exchange-rate movements, food supply constraints and political disruption (Durevall & Ndung'u, 2001; Mutiso, 2015). Annual consumer price inflation reached about 46% in 1993 and 26% in 2008, and has remained within a 4–8% band since 2013, inside the Central Bank of Kenya's target range of 2.5–7.5% (Central Bank of Kenya [CBK], n.d.). Measured unemployment was close to constant near 2.8% for 26 years and then rose to over 5% after 2016. At the same time, KNBS data show that most new jobs created in recent years are in the informal sector (Kenya

National Bureau of Statistics [KNBS], n.d.), and the World Bank describes Kenyan youth unemployment as both structural and frictional in nature (World Bank, n.d.-a). The World Bank (2025) reports that almost all employment growth over the past decade has been informal, with formal wage employment growing at less than 1% a year, and the Kenya Institute for Public Policy Research and Analysis (KIPPRA, 2024) identifies investment in skills and productivity, including in the informal economy, as priorities for inclusive growth. These patterns raise the question of whether, and how, unemployment and inflation are related in Kenya, and whether that relationship changed after 2016.

Significance of the Study

The study contributes to the Kenyan literature in four ways. It documents trends and tests the stationarity of the series before drawing inferences. It separates frictional and structural unemployment so that the post-2016 rise can be interpreted. It tests explicitly whether the unemployment-inflation relationship differs across regimes, instead of assuming stability. It applies the expectations-augmented specification alongside the traditional Phillips curve, so that conclusions do not depend on one functional form. The findings are relevant to the Central Bank of Kenya, the National Treasury, KNBS and labour-market policy makers.

Scope of the Study

The study covers annual data for 1991–2025. The 1990 observation is excluded because the unemployment value is not available. The analysis is limited to national aggregates and does not consider youth, gender or regional unemployment, or underemployment in the informal sector.

2. STATEMENT OF THE PROBLEM

Policy discussion in Kenya often assumes that inflation and unemployment are linked, so that tighter policy to reduce inflation raises unemployment and vice versa. Empirical evidence for Kenya is mixed. Some studies report a significant but small trade-off in monthly data (Duncan et al., 2019), while others find an insignificant negative relationship in annual data and conclude that the Lucas critique applies (Masese, 2017). Studies of Kenyan inflation more broadly emphasise the exchange rate, money supply, food prices and inflation inertia over labour-market slack (Durevall & Ndung'u, 2001; Mutiso, 2015). Existing Phillips curve studies mostly treat total unemployment as a single variable, assume a stable relationship over time, and end before the post-2016 rise in unemployment. They do not separate frictional and structural components, and they do not test the stationarity properties of the series on which the conclusions rest. Without this evidence, policy makers cannot tell whether the observed rise in unemployment reflects a cyclical trade-off against lower inflation, or a structural change that monetary policy cannot reverse.

3. RESEARCH OBJECTIVES

The general objective was to examine the relationship between unemployment and inflation in Kenya over 1991–2025. The specific objectives are:

1. To establish the trends and stationarity properties of unemployment and inflation in Kenya.
2. To decompose Kenya's unemployment into frictional and structural components.

3. To estimate the effect of unemployment on inflation using the traditional Phillips curve.
4. To determine whether the relationship between unemployment and inflation is moderated by the policy and structural regime (1991–2016 versus 2017–2025).
5. To estimate the expectations-augmented Phillips curve for Kenya under adaptive expectations.

4. RESEARCH HYPOTHESES/QUESTIONS

Research Questions

1. What are the trends in unemployment and inflation in Kenya, and are the series stationary?
2. What are the frictional and structural components of unemployment in Kenya?
3. What is the effect of unemployment on inflation in Kenya?
4. Does the regime period moderate the relationship between unemployment and inflation?
5. Does unemployment explain changes in inflation after allowing for expected inflation?

Research Hypotheses

H01: Unemployment has no significant effect on inflation in Kenya.

H02: Structural unemployment has no significant effect on inflation in Kenya.

H03: The regime period has no significant moderating effect on the relationship between unemployment and inflation.

H04: Unemployment has no significant effect on the change in inflation after allowing for expected inflation.

5. THEORETICAL REVIEW/FRAMEWORK

The Traditional Phillips Curve

Phillips (1958) found a stable inverse relationship between unemployment and the rate of change of money wages in the United Kingdom for 1861–1957, and Lipsey (1960) provided a theoretical explanation based on labour-market excess demand. Samuelson and Solow (1960) restated the relationship in terms of price inflation, suggesting that policy makers could choose a combination of unemployment and inflation. The traditional curve is written as: inflation = a + b(unemployment), with $b < 0$.

The Natural Rate Hypothesis and the Expectations-Augmented Phillips Curve

Friedman (1968) and Phelps (1967) argued that workers and firms care about real, not nominal, wages. If inflation is higher than expected, real wages fall and employment rises temporarily. Once expectations adjust, unemployment returns to the natural rate. The expectations-augmented Phillips curve is written as: inflation = expected inflation - beta(unemployment - natural rate), with beta > 0. Under adaptive expectations, expected inflation equals last period's inflation, so the change in inflation depends on the unemployment gap. The natural rate is the sum of frictional and structural unemployment. Gordon (1997) and Staiger et al. (1997) showed

that the natural rate is itself time-varying and imprecisely estimated, which is important when unemployment shifts to a new level.

Rational Expectations and the Lucas Critique

Lucas (1972, 1976) argued that if agents form expectations rationally, only unanticipated policy changes can have real effects, and estimated relationships may shift when policy regimes change. This implies that the Phillips curve need not be stable across regimes, which motivates the moderating variable used in this study.

The New Keynesian Phillips Curve

The New Keynesian approach derives inflation from forward-looking price setting with nominal rigidities (Calvo, 1983). Inflation depends on expected future inflation and a measure of real marginal cost or slack (Galí & Gertler, 1999). Evidence from developed economies suggests that the slope of the curve has become flat (Blanchard, 2016; Hazell et al., 2022; Mankiw, 2001), meaning that large changes in unemployment are associated with small changes in inflation.

Theories of Frictional and Structural Unemployment

Frictional unemployment arises from the time needed for workers and vacancies to match, as in search and matching models (Mortensen & Pissarides, 1994). Structural unemployment arises from persistent mismatches between the skills and locations of workers and the requirements of employers; Lilien (1982) showed that shifts in the sectoral composition of demand can raise unemployment for extended periods. For developing economies, Harris and Todaro (1970) explain how rural-urban migration can raise urban unemployment even when formal jobs are scarce. These theories support treating the stable, low pre-2017 rate as largely frictional and the later excess as structural.

6. EMPIRICAL REVIEW

Phillips Curve Evidence for Kenya

Duncan et al. (2019) used two-stage least squares on monthly data for 2006–2016 and reported a significant trade-off in which a 1% rise in unemployment reduced inflation by about 2.09%, with forward-looking expectations and oil shocks driving observed inflation more than money supply. Masese (2017), in a Kenyatta University master's research project, estimated short- and long-run Phillips curves for 1977–2015 using ordinary least squares and found an insignificant negative relationship, estimated the non-accelerating inflation rate of unemployment at 8.7%, and concluded that the Lucas critique is evident in Kenya. Maina (2021) analysed inflation, unemployment and growth in Kenya for 1960–2019 with a vector error correction model and found no direct long-run relationship between unemployment and GDP per capita growth.

Determinants of Inflation in Kenya

Durevall and Ndung'u (2001) modelled inflation in Kenya for 1974–1996 with an error correction model and found that the exchange rate, foreign prices and the terms of trade drive inflation in the long run, while money supply and interest rates matter only in the short run; food supply constraints, proxied by maize prices, also affected inflation. They found that about 40% of inflation carried over to the next quarter until 1993 and about 10% afterwards, which indicates that persistence changed across regimes. The same study was issued earlier as an

International Monetary Fund (IMF) Working Paper (Ndung'u & Durevall, 1999). Mutiso (2015) used Kenya National Bureau of Statistics data for 1997–2013 and found that the exchange rate and money supply affect inflation in the long run, while money supply and food prices have short-run effects. These studies suggest that supply-side and external factors are central to Kenyan inflation, and that labour-market slack is not the main driver.

Unemployment in Kenya

World Bank project documentation on youth employment describes Kenyan youth unemployment as both structural and frictional, with a structural mismatch between skills and employer needs, and notes that job growth in the informal sector has exceeded that in the formal wage sector (World Bank, n.d.-a). KNBS Economic Survey data likewise show that formal employment creation is small relative to the number of new labour market entrants and that the large majority of new jobs are informal (KNBS, n.d.). More recent World Bank (2025) analysis shows that formal employment fell to 15.5% of the workforce in 2024 from 18.5% in 2010, and that total employment grew by about 3.9% a year over the past decade almost entirely through informal, lower-quality jobs. KIPPRA's Kenya Economic Report series, which assesses macroeconomic performance and employment creation each year, similarly points to skills, labour productivity and employment creation as constraints on inclusive growth (KIPPRA, 2020, 2024). This supports the use of a structural component in the analysis and implies that headline unemployment can understate underemployment.

International Evidence

The mixed Kenyan evidence is consistent with international findings that the estimated slope depends on data frequency, sample, and treatment of expectations and supply shocks (Blanchard, 2016; Mankiw, 2001). Hazell et al. (2022) found a flat slope for the United States once expectations are anchored, and Gordon (1997) found that allowing the natural rate to vary over time substantially changes inferences. Studies using higher-frequency data and explicit supply-shock controls tend to find a trade-off more often than studies using long annual samples.

Research Gap

Existing Kenyan studies either use short monthly samples or long annual samples that end before the post-2016 rise in unemployment. None reviewed separates frictional from structural unemployment, reports the stationarity properties of the series, or tests formally for a regime moderation of the relationship. This study fills that gap using data through 2025.

7. CONCEPTUAL FRAMEWORK

The study treats the unemployment rate, decomposed into frictional and structural components, as the independent variable and the inflation rate as the dependent variable. The regime period (1991–2016 versus 2017–2025) is the moderating variable, because the Lucas critique, the change in inflation persistence reported by Durevall and Ndung'u (2001), and the observed shift in unemployment suggest that the slope may differ across periods. Expected inflation, proxied by last year's inflation, is an intervening variable in the expectations-augmented specification. Supply shocks, the exchange rate and monetary policy affect inflation but are outside the data available for this study.

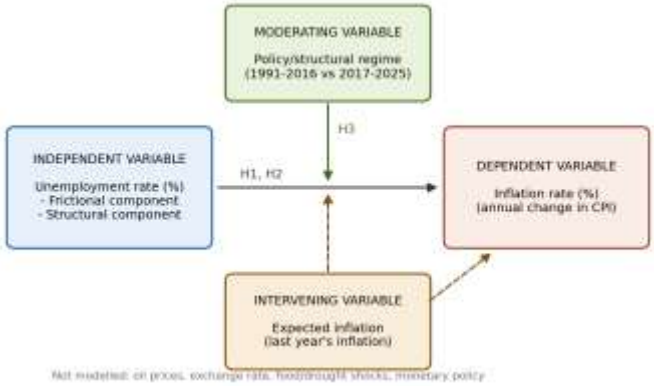


Figure 1: Conceptual Framework of the Study

Note. Source: Author's conceptualisation based on Phillips (1958), Friedman (1968) and Lucas (1976).

8. RESEARCH METHODOLOGY

Research Design

The study uses a quantitative, causal (explanatory) research design based on annual time-series data. The design is appropriate because the objective is to estimate the direction, size and significance of the relationship between two macroeconomic variables, following designs used in earlier Kenyan Phillips curve studies (Duncan et al., 2019; Masese, 2017).

Sources of Data

The study relies on secondary data. The data come mainly from World Bank indicators (World Development Indicators), supplemented by publications of the Central Bank of Kenya (CBK) and the Kenya National Bureau of Statistics (KNBS), including the KNBS Economic Survey, and by published survey papers and research studies, including KIPPRA and IMF publications, used to cross-check the series and interpret the results. Specifically:

- Inflation (annual % change in consumer prices) is from World Bank World Development Indicators, series FPCPITOTLZGKEN (World Bank, n.d.-b), retrieved from FRED, Federal Reserve Bank of St. Louis. CBK and KNBS publications report the same consumer price index and are used to check the direction and size of the main movements, such as the 1993 and 2008 peaks.
- Unemployment (% of labour force) is a published annual series taken from a tabulation supplied by the researcher, consistent with World Bank/ILO modelled indicators; KNBS labour force and Economic Survey publications are used as the reference for interpretation. Because the original source label on the supplied table is truncated, the exact vintage should be confirmed against the World Bank or ILO database before publication.

The sample covers 1991–2025 (35 annual observations). The 1990 observation is excluded because the unemployment value is missing.

Variables and Measurement

Table 1: Operationalisation of Variables and Data Sources

Variable	Role	Measurement	Symbol	Source
Inflation	Dependent	Annual % change in CPI	INF	World Bank WDI (CBK, KNBS cross-check)
Unemployment	Independent	% of labour force unemployed	U	World Bank/ILO-type series (KNBS reference)
Structural unemployment	Independent	Max(U - 2.8, 0)	S	Author's computation
Regime	Moderating	Dummy: 1 for 2017–2025, else 0	D	Author's construction
Expected inflation	Intervening	Previous year's inflation	INF(-1)	Author's computation

Decomposition of Unemployment

Frictional unemployment is proxied by the mean unemployment rate for 1991–2016 (2.8%), a long period of low and stable unemployment consistent with job-to-job movement and little persistent slack. Structural unemployment is the excess of the actual rate over 2.8%. Excess unemployment that did not decline after the 2020 shock is treated as structural. This is an identifying assumption, not a measured quantity, since the data contain only total unemployment.

Trend Analysis and Stationarity Tests

Trends are estimated by regressing each series on a linear time index and are shown graphically. Stationarity is tested using two complementary tests. The augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1979) has a unit root as the null hypothesis and is applied with one lag, first with a constant and then with a constant and trend. The KPSS test (Kwiatkowski et al., 1992) has stationarity as the null hypothesis and is applied with a Bartlett window of three lags, with a constant (level stationarity) and with a constant and trend (trend stationarity). Using both tests guards against the low power of the ADF test in small samples. ADF statistics are compared with approximate MacKinnon (1996) critical values for this sample size: with a constant, 1%: -3.63, 5%: -2.95 and 10%: -2.61; with constant and trend, 1%: -4.26, 5%: -3.55 and 10%: -3.21. KPSS critical values are 0.739 (1%), 0.463 (5%) and 0.347 (10%) for the level test, and 0.216, 0.146 and 0.119 for the trend test. Perron (1989) showed that structural breaks bias unit-root tests towards non-rejection, which is relevant for unemployment in Kenya.

Model Specification

Model 1 (traditional Phillips curve): $INF(t) = a0 + a1\ U(t) + e(t)$.

Model 2 (structural component): $INF(t) = b0 + b1\ S(t) + e(t)$.

Model 3 (moderation): $INF(t) = c0 + c1\ U(t) + c2\ D(t) + c3\ [U(t) \times D(t)] + e(t)$. A significant c3 indicates moderation.

Model 4 (expectations-augmented, adaptive expectations): INF(t) - INF(t-1) = d0 + d1 U(t) + e(t), where the natural rate is -d0/d1 and a negative d1 is expected.

Model 5 (persistence): INF(t) = g0 + g1 INF(t-1) + g2 U(t) + e(t).

Estimation and Diagnostic Tests

Models are estimated by ordinary least squares. Residual diagnostics are the Durbin-Watson statistic for autocorrelation, the Jarque-Bera test (Jarque & Bera, 1987) for normality, and the Breusch-Pagan test (Breusch & Pagan, 1979) for heteroskedasticity. Robustness checks include a log-inflation specification, exclusion of the 1992–1994 high-inflation years, Spearman rank correlation, and separate estimates for each sub-period. Significance is assessed at the 5% level, and results at the 10% level are described as weak.

Ethical Considerations

The study uses only secondary, publicly available aggregate data and involves no human participants. Sources are cited and the data are reported in Appendix A so that the analysis can be replicated.

9. RESULTS AND DISCUSSIONS

This section presents and discusses the results of the analysis in the order of the study objectives. It begins with descriptive statistics and the trends in unemployment and inflation, then reports the stationarity tests that determine how the series can be used in regressions. It then presents the decomposition of unemployment into frictional and structural components, followed by the estimates of the traditional Phillips curve, the regime-moderated curve and the expectations-augmented curve. The section ends with robustness checks, diagnostic tests, a summary of the hypothesis tests and a discussion that relates the findings to the earlier Kenyan and international studies. Every table and figure is titled and refers to the sources described in the research methodology section.

Descriptive Statistics

Table 2: Descriptive Statistics, 1991–2025 (n = 35)

Variable	Mean	Median	Std. dev.	Min	Max	Skew.	Ex. kurt.
Unemployment (%)	3.41	2.80	1.08	2.60	5.70	1.35	-0.01
Inflation (%)	10.62	7.67	9.05	1.55	45.98	2.26	5.32

Note. Ex. kurt. = excess kurtosis. Source: Author's computation.

Mean unemployment is 3.41% with a median of 2.80%, which is below the mean because of the rise after 2016. Inflation has a mean of 10.62%, a median of 7.67% and a very high standard deviation (9.05), driven by the 1992–1994 and 2008 peaks; its positive skewness (2.26) and excess kurtosis (5.32) show a heavy right tail and indicate that non-normal residuals are likely.

The two sub-periods differ sharply. Mean inflation falls from 12.2% in 1991–2016 to 5.9% in 2017–2025 (Welch $t = 3.12$, $p = .004$), and its standard deviation falls from 10.0 to 1.5. Mean unemployment rises from 2.8% to 5.1% ($t = -9.25$, $p < .001$).

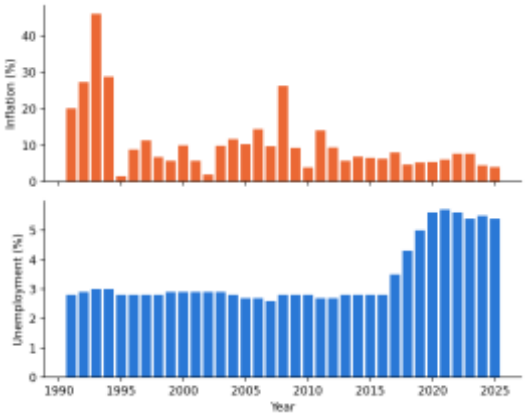


Figure 2: Inflation and Unemployment in Kenya, 1991–2025

Note. Source: Author's computation from World Bank indicators and supplied unemployment series.

Trends in Unemployment and Inflation (Objective 1)

Figure 3 shows the two series with fitted linear trends. Unemployment has a significant upward trend of 0.076 percentage points per year ($p < .001$, R-squared = .52), but the series is not a smooth trend: it is flat until 2016 and then rises steeply, so the linear trend summarises a step change. Within 2017–2025 alone, unemployment rises by about 0.20 percentage points a year ($p = .023$, $n = 9$). Inflation has a significant downward trend of 0.45 points per year ($p = .002$, R-squared = .25), reflecting the high values of the early 1990s and the stability after 2013.

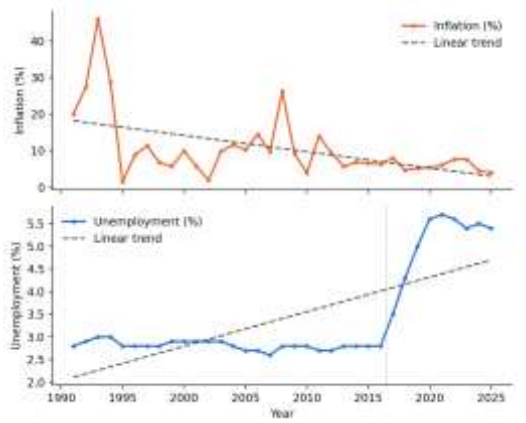


Figure 3: Trends in Inflation and Unemployment With Fitted Linear Trends

Note. Dotted vertical line marks the 2016/2017 regime break. Source: Author's computation from World Bank indicators and supplied unemployment series.

Table 3: Linear Trend Estimates (Regression on Time)

Series (sample)	Trend (pp/year)	Std. error	p-value	R-squared
Unemployment (1991–2025)	0.076	0.013	<.001	.52
Unemployment (2017–2025)	0.200	0.069	.023	.54
Inflation (1991–2025)	-0.446	0.133	.002	.25

Stationarity Tests (Objective 1)

Table 4 reports the ADF and KPSS tests for the levels and first differences of both series. For unemployment in levels, the ADF statistics (-1.36 with a constant, -2.45 with constant and trend) are above the 5% critical values, so the unit-root null is not rejected, and the KPSS statistics (0.590 and 0.203) exceed the 5% critical values (0.463 and 0.146), so stationarity is rejected. Both tests therefore agree that unemployment is non-stationary in levels, and that it is not trend-stationary either, which is consistent with a structural break around 2017 (Perron, 1989). For first differences of unemployment, the KPSS tests do not reject stationarity, whereas the ADF statistics are borderline, so the evidence is that unemployment is integrated of order one, with low power in small samples.

Inflation behaves differently. The ADF statistics (-3.38 and -3.83) are below the 5% critical values and the KPSS statistics (0.437 and 0.091) are below the 5% critical values, so inflation is stationary in levels both with and without a trend. Its first difference is strongly stationary. The two series therefore have different orders of integration, so a regression of inflation on the level of unemployment mixes a stationary and a non-stationary variable. The level results should be treated as descriptive, and the change-in-inflation specification (Model 4) is the more reliable test.

Table 4: Unit Root and Stationarity Tests

Series	ADF (constant)	ADF (const.+trend)	KPSS (level)	KPSS (trend)
Unemployment (level)	-1.36	-2.45	0.590	0.203
Unemployment (first difference)	-2.53	-2.64	0.218	0.067
Inflation (level)	-3.38	-3.83	0.437	0.091
Inflation (first difference)	-8.32	-8.73	0.063	0.059
5% critical value	-2.95	-3.55	0.463	0.146

Note. ADF null: unit root (reject if statistic is below the critical value). KPSS null: stationary (reject if statistic is above the critical value). Critical values are approximate. Source: Author's computation.

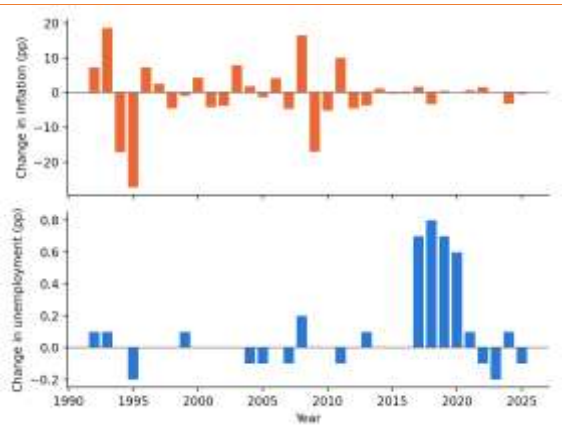


Figure 4: First Differences of Inflation and Unemployment

Note. Source: Author's computation from World Bank indicators and supplied unemployment series.

Figure 4 shows that after first differencing, both series fluctuate around zero without a persistent trend, apart from the clustered increases in unemployment in 2017–2020 and the large inflation swings in 1992–1995.

Frictional and Structural Unemployment (Objective 2)

With frictional unemployment set at 2.8%, structural unemployment is close to zero until 2016 and rises from 0.7 percentage points in 2017 to 2.9 in 2021, remaining between 2.6 and 2.8 afterwards (Table 5, Figure 5). By 2025, about 48% of measured unemployment is therefore structural.

Table 5: Frictional and Structural Unemployment, 2017–2025

Year	Total (%)	Frictional (%)	Structural (pp)	Structural share
2017	3.5	2.8	0.7	20%
2018	4.3	2.8	1.5	35%
2019	5.0	2.8	2.2	44%
2020	5.6	2.8	2.8	50%
2021	5.7	2.8	2.9	51%
2022	5.6	2.8	2.8	50%
2023	5.4	2.8	2.6	48%
2024	5.5	2.8	2.7	49%
2025	5.4	2.8	2.6	48%

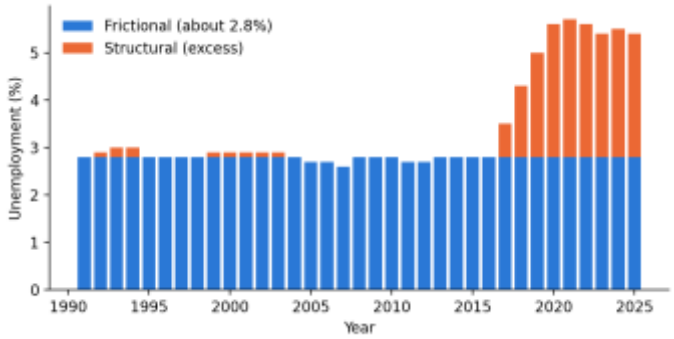


Figure 5: Frictional and Structural Components of Unemployment, 1991–2025

Note. Frictional component fixed at the 1991–2016 mean of 2.8%. Source: Author's computation from World Bank indicators and supplied unemployment series.

This pattern matches the descriptions of Kenyan unemployment in World Bank youth-employment documentation, which points to skills mismatch and slow formal job creation as sources of structural unemployment (World Bank, n.d.-a), and with the finding that formal wage employment has grown by less than 1% a year over the past decade (World Bank, 2025).

Correlation Between Unemployment and Inflation

Table 6: Correlation Between Unemployment and Inflation

Measure	Coefficient	p-value
Pearson	-.270	.117
Spearman (rank)	-.344	.043

Note. Source: Author's computation.

The Pearson correlation is negative but not significant at 5%. The rank correlation is larger and significant at 5%, which suggests a monotonic inverse association that is weakened by the extreme inflation observations.

Traditional Phillips Curve (Objective 3)

Table 7: Effect of Unemployment on Inflation (Dependent Variable: Inflation)

	Model 1: Total unemployment	Model 2: Structural unemployment
Constant	18.29 (5.00)***	12.05 (1.73)***
Unemployment / Structural	-2.25 (1.40)	-2.29 (1.41)
p-value (slope)	.117	.115
R-squared	.073	.074
F-statistic (p)	2.59 (.117)	2.62 (.115)
Observations	35	35

Note. Standard errors in parentheses. *** $p < .01$. Source: Author's computation.

The unemployment coefficient is negative (-2.25), consistent with the Phillips curve, but it is not statistically significant ($p = .117$) and the model explains only 7.3% of the variation in inflation. The structural component gives almost the same result (-2.29, $p = .115$). H01 and H02 are therefore not rejected at the 5% level.

Moderating Effect of the Regime (Objective 4)

Table 8: Regime-Moderated Phillips Curve (Model 3)

Variable	Coefficient	Std. error	p-value
Constant	-110.84	50.22	.035
Unemployment (U)	43.72	17.83	.020
Regime dummy (D)	119.28	54.15	.035
U x D	-44.21	18.26	.021
R-squared / adj. R-squared	.243 / .170		
F-statistic (p)	3.32 (.033)		

Note. Source: Author's computation.

The interaction term is significant (-44.21, $p = .021$), so H03 is rejected: the relationship differs between regimes. The sub-period slopes show the nature of the difference (Figure 6). In 1991–2016 the slope is positive (43.72, $p = .040$), which is the opposite of the Phillips curve; in 2017–2025 the slope is small, negative and not significant (-0.49, $p = .531$, $n = 9$). Interpretation requires caution. Unemployment varies only between 2.6% and 3.0% before 2017, so the positive slope depends on a few high-inflation years in 1992–1994 when unemployment was at its pre-2017 high. The significance of the interaction partly reflects the regime-level shift (lower and more stable inflation, higher unemployment), and the residuals show strong positive autocorrelation (Durbin-Watson = 0.89), which overstates t-statistics. The result supports regime dependence but not a trade-off in either regime.

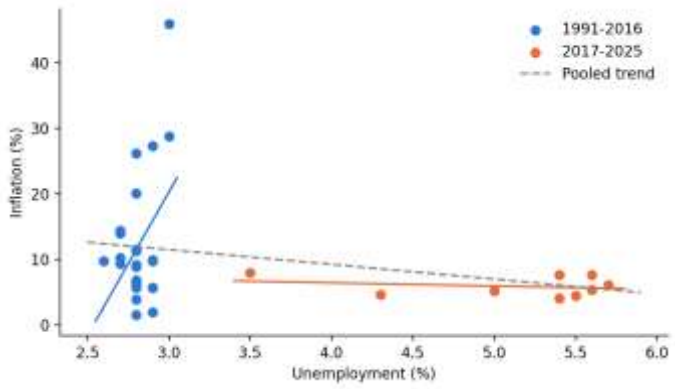


Figure 6: Inflation Against Unemployment by Regime, With Fitted Lines

Note. Source: Author's computation from World Bank indicators and supplied unemployment series.

Expectations-Augmented Phillips Curve (Objective 5)

Table 9: Expectations-Augmented Phillips Curve

	Model 4: Change in inflation	Model 5: Inflation (persistence)
Constant	-1.00 (4.97)	7.97 (5.23)
Unemployment	0.15 (1.38)	-0.94 (1.27)
Inflation (t-1)	-	0.52 (0.15)***
p-value (unemployment)	.913	.463
R-squared	.000	.319
Observations	34	34

Note. Standard errors in parentheses. *** $p < .01$. Source: Author's computation.

When the dependent variable is the change in inflation, which is stationary, the unemployment coefficient is 0.15 ($p = .913$) and R-squared is effectively zero. The sign is positive, contrary to the theory, and the implied natural rate is therefore not meaningful. H04 is not rejected. When last year's inflation is added as a regressor, it is highly significant (0.52, $p = .002$) while unemployment remains insignificant ($p = .463$), and R-squared rises to 0.319. About half of any inflation deviation therefore carries into the next year, in line with adaptive expectations, but unemployment adds no explanatory power.

Robustness Checks

Table 10: Alternative Specifications (Slope on Unemployment)

Specification	Coefficient	Std. error	p-value	n
Log of inflation	-0.186	0.108	.094	35
Excluding 1992–1994	-1.45	0.76	.068	32
Spearman rank correlation	-.344	-	.043	35

Note. Source: Author's computation.

Reducing the influence of extreme observations strengthens the negative association: the log specification ($p = .094$), the specification excluding 1992–1994 ($p = .068$), and the rank correlation ($p = .043$) all point to an inverse relationship, which is significant only at 10% or, for the rank correlation, 5%. The evidence for a Phillips-type association is therefore weak but not absent.

Diagnostic Tests

Table 11: Residual Diagnostics

Model	n	Durbin-Watson	Jarque-Bera (p)	Breusch-Pagan (p)
Model 1	35	0.96	<.001	.078
Moderation (M3)	35	0.89	.007	<.001
Change in inflation	34	2.24	.008	.036
Persistence	34	1.84	<.001	<.001
Log inflation	35	1.50	.303	.082

Note. Source: Author's computation.

Level models show strong positive autocorrelation (Durbin-Watson below 1), non-normal residuals and some heteroskedasticity. These problems mainly affect the level specifications, which is another reason to place more weight on the change-in-inflation and log specifications, where the diagnostics are better. Standard errors should be regarded as optimistic in the level models.

Summary of Hypothesis Tests

Table 12: Hypothesis Test Results

	Hypothesis	p-value	Decision (5%)
H01	Unemployment has no effect on inflation	.117	Not rejected
H02	Structural unemployment has no effect on inflation	.115	Not rejected
H03	No moderating effect of regime	.021	Rejected
H04	No effect on change in inflation	.913	Not rejected

Discussion of Findings

The findings agree with the part of the Kenyan literature that reports weak or insignificant Phillips curve evidence in annual data (Masese, 2017) and differ from the significant trade-off reported in monthly data for 2006–2016 (Duncan et al., 2019). Higher frequency data contain short-run movements in unemployment that annual modelled series smooth out, and supply shocks such as oil prices are controlled explicitly in the monthly study but not here.

The strong persistence of inflation (coefficient 0.52) is consistent with the inertia found by Durevall and Ndung'u (2001; see also Ndung'u & Durevall, 1999), although their estimate refers to quarterly data and an earlier period. The very high inflation observations in 1992–1994 and 2008 coincide with periods when exchange-rate, food-supply and external shocks were large, which agrees with the finding that these factors, and not labour-market slack, are the main drivers of Kenyan inflation (Durevall & Ndung'u, 2001; Mutiso, 2015). Because the

present model omits these variables, their effects appear in the residuals, which helps to explain the low R-squared values and the autocorrelation.

The regime result is consistent with the Lucas critique: the relationship is not stable across periods, and the shift in the unemployment level and the fall in inflation volatility after 2016 coincide with a changed policy environment, including inflation targeting. However, the timing does not prove causation, and the sub-period slopes do not support a trade-off in either period.

The stationarity results add an important caution. Because unemployment is non-stationary in levels while inflation is stationary, level regressions cannot be given a long-run interpretation, and the lack of any significant effect of unemployment on the change in inflation is the more reliable result. The decomposition suggests that the post-2016 rise in unemployment has persisted and has not reversed, which is more typical of structural than cyclical unemployment and is in line with descriptions of skills mismatch and slow formal job creation in Kenya (World Bank, n.d.-a). Under the natural-rate hypothesis (Friedman, 1968; Phelps, 1967), such a rise should not be reversible through demand-side policy.

10. CONCLUSIONS

Summary of Findings

Objective 1: Trends and Stationarity

Unemployment shows a significant upward trend (0.076 percentage points a year) driven by a step change after 2016, and is non-stationary in levels according to both ADF and KPSS tests, consistent with a structural break. Inflation shows a significant downward trend (-0.45 points a year) and is stationary in levels. Mean inflation fell from 12.2% in 1991–2016 to 5.9% in 2017–2025, and its standard deviation fell from 10.0 to 1.5.

Objective 2: Frictional and Structural Unemployment

Unemployment was stable at about 2.8% for 1991–2016, which is used as the frictional component. It rose to 5.4–5.7% from 2020 onwards, implying a structural component of 2.6–2.9 percentage points, or about 48% of the 2025 rate.

Objective 3: Traditional Phillips Curve

The unemployment coefficient has the expected negative sign (-2.25) but is not significant (p = .117). The same holds for structural unemployment (p = .115). Neither H01 nor H02 is rejected.

Objective 4: Moderating Effect of Regime

The interaction between unemployment and the regime dummy is significant (p = .021), so H03 is rejected. However, the pre-2017 slope is positive and the post-2016 slope is not significant, so neither period shows a trade-off.

Objective 5: Expectations-Augmented Phillips Curve

Unemployment does not explain changes in inflation (p = .913), whereas last year's inflation is highly significant (coefficient 0.52, p = .002). H04 is not rejected. Robustness checks that reduce the influence of extreme inflation years show a weak inverse association at the 10% level, and at the 5% level for the rank correlation.

Main Conclusions

1. Kenya's unemployment and inflation have moved in different directions since 2016: unemployment has risen to a new, higher level while inflation has become lower and less volatile. The two series have different time-series properties, so their relationship cannot be summarised by a single stable equation.
2. The rise in unemployment after 2016 appears structural and persistent. It has not reversed after the 2020 shock, and it is consistent with skills mismatch and limited formal job creation described in the literature.
3. Headline unemployment is a weak predictor of inflation in Kenya. The traditional and expectations-augmented Phillips curves do not show a reliable short-run trade-off, which is consistent with earlier findings of an insignificant relationship (Masese, 2017) and with evidence that exchange-rate, money, food-supply and external factors drive Kenyan inflation (Durevall & Ndung'u, 2001; Mutiso, 2015).
4. The relationship between the two variables is not stable over time, which is consistent with the Lucas critique, and inflation persistence is an important feature of the Kenyan inflation process.

Contribution to Knowledge

The study contributes to the literature in four ways. First, it extends the Kenyan evidence on the Phillips curve through 2025, beyond the periods covered by earlier studies. Second, it reports the trends and stationarity properties of the series with two complementary tests, which shows that the level of unemployment is non-stationary while inflation is stationary, and which supports the use of the change-in-inflation form of the curve. Third, it separates frictional and structural unemployment and links the post-2016 rise to a structural interpretation. Fourth, it tests regime moderation explicitly and shows that the sign and size of the relationship depend on the period, which adds empirical support for the Lucas critique in the Kenyan setting.

Limitations of the Study

- The unemployment series is a published annual tabulation that appears to be modelled, and its original vintage should be confirmed; modelled series smooth short-run variation and limit the power of any test of the Phillips curve.
- The frictional-structural split rests on an assumption that 1991–2016 unemployment is entirely frictional.
- Only nine observations are available for 2017–2025, unit-root tests have low power in 35 observations, and level regressions show autocorrelation and non-normal residuals.
- Supply shocks, the exchange rate, money supply and monetary policy variables are not included.

Final Remarks

Kenya's recent experience shows that low and stable inflation can coexist with higher unemployment. For policy makers, this means that price stability and employment creation are

best pursued with separate and well-targeted instruments, and that improved data are needed to measure labour-market slack more accurately.

11. RECOMMENDATIONS

Monetary Policy

The Central Bank of Kenya should not rely on a stable unemployment-inflation trade-off when setting policy. Inflation control should focus on anchoring expectations and on the exchange-rate, money-supply and supply-side drivers identified in the literature. Because last year's inflation is a strong predictor of current inflation, credible communication and a consistent inflation target are important for reducing persistence.

Fiscal and Food-Supply Policy

The National Treasury and the agricultural authorities should reduce the exposure of inflation to food-supply shocks by investing in storage, irrigation, market information and import-timing mechanisms during droughts, since food prices have been found to influence Kenyan inflation (Durevall & Ndung'u, 2001; Mutiso, 2015).

Labour-Market and Skills Policy

Because the post-2016 rise in unemployment appears structural, policy should address the causes of mismatch directly: align technical and vocational training and university curricula with employer demand, expand apprenticeships and internships including in the informal (Jua Kali) sector, support labour-intensive and export sectors, and reduce the costs of formal job creation for firms. Demand management alone is unlikely to bring unemployment back to its earlier level. These priorities are consistent with the emphasis on skills and productivity in KIPPRA (2024) and with the World Bank's (2025) finding that most new jobs are informal.

Data and Statistics

KNBS and development partners should publish regular survey-based unemployment and underemployment series, including youth, gender and informal-sector measures, and at quarterly or monthly frequency. This would reduce reliance on modelled series, improve the measurement of labour-market slack, and allow a more precise test of the Phillips relationship.

Coordination Between Institutions

The CBK, the National Treasury and KNBS should coordinate on a common framework for assessing the labour-market and price effects of policy, so that labour-market objectives are pursued mainly through structural policy and price stability mainly through monetary and supply-side policy.

Suggestions for Further Research

1. Replicate the analysis with verified survey-based or ILO series and with quarterly or monthly data.
2. Include supply-side controls, such as oil prices, food prices, exchange rate and rainfall, in a hybrid or New Keynesian Phillips curve.
3. Estimate time-varying natural rates (for example with Kalman filter methods) and test for structural breaks formally with endogenous break tests.

4. Use cointegration and error-correction methods with a longer sample, including money supply and the policy interest rate.
5. Study youth, gender, regional and informal-sector unemployment and underemployment separately, and test whether sectoral shifts explain the post-2016 rise.
6. Compare Kenya with other East African economies to test whether the weak Phillips relationship is specific to Kenya.

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APPENDIX A: DATA

Table A1: Unemployment and Inflation, Kenya, 1991–2025

Year	U (%)	INF (%)	Year	U (%)	INF (%)	Year	U (%)	INF (%)
1991	2.8	20.1	2003	2.9	9.8	2015	2.8	6.6
1992	2.9	27.3	2004	2.8	11.6	2016	2.8	6.3
1993	3.0	46.0	2005	2.7	10.3	2017	3.5	8.0
1994	3.0	28.8	2006	2.7	14.5	2018	4.3	4.7
1995	2.8	1.6	2007	2.6	9.8	2019	5.0	5.2
1996	2.8	8.9	2008	2.8	26.2	2020	5.6	5.4
1997	2.8	11.4	2009	2.8	9.2	2021	5.7	6.1
1998	2.8	6.7	2010	2.8	4.0	2022	5.6	7.7
1999	2.9	5.7	2011	2.7	14.0	2023	5.4	7.7
2000	2.9	10.0	2012	2.7	9.4	2024	5.5	4.5
2001	2.9	5.7	2013	2.8	5.7	2025	5.4	4.1
2002	2.9	2.0	2014	2.8	6.9			

Note. U = unemployment (% of labour force), supplied annual series (vintage to be confirmed); INF = inflation (annual % change in consumer prices), World Bank WDI via FRED. 1990 omitted (unemployment value missing).