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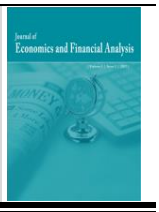

Inflation Dynamics and the New Keynesian Phillips Curve in Sub-Saharan Africa

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Abstract

This paper empirically investigates inflation dynamics in Sub-Saharan African economies within a New Keynesian Phillips Curve framework over the period 1995–2024. While the Phillips Curve has been extensively examined in advanced economies, evidence from Sub-Saharan Africa remains fragmented and inconclusive. Using a panel of Sub-Saharan African countries and a hybrid New Keynesian Phillips Curve estimated via Generalized Method of Moments, the study evaluates the relative importance of forward-looking expectations, inflation persistence, and real economic slack. The findings indicate that inflation in the region is characterized by strong persistence and a limited forward-looking component, with marginal costs providing a more robust measure of inflationary pressure than output gaps. The Phillips relationship weakens substantially during periods of macroeconomic instability, supporting the view that the inflation–activity trade-off in Sub-Saharan Africa is conditional on the economic environment. The results highlight the importance of structural and institutional factors in shaping inflation dynamics and suggest that standard New Keynesian models require regional adaptation when applied to low- and middle-income economies.

Keywords: *New Keynesian Phillips Curve; Inflation Dynamics; Sub-Saharan Africa; Expectations; Marginal Costs; Panel GMM.*

JEL Classification: *E31; E12; C23; E52; O55.*

1. Introduction

The Phillips Curve remains one of the most debated relationships in macroeconomics, linking inflation dynamics to real economic activity and expectations. While early formulations emphasized a stable trade-off between inflation and unemployment, subsequent theoretical and empirical developments have repeatedly questioned the universality and stability of this relationship. The emergence of the New Keynesian Phillips Curve reframed the debate by grounding inflation dynamics in forward-looking price-setting behavior under nominal rigidities (Mankiw & Reis, 2002), thereby placing expectations and marginal costs at the center of inflation determination (Gali and Gertler, 1999).

Despite substantial progress, the empirical performance of the Phillips Curve varies widely across countries and time periods. Evidence from advanced economies suggests that inflation has become increasingly forward-looking and weakly responsive to traditional measures of economic slack, a phenomenon often described as the flattening of the Phillips Curve (Hazell et al., 2022). At the same time, recent inflationary episodes have renewed interest in whether the Phillips relationship has merely weakened or temporarily re-emerged under specific macroeconomic conditions.

In contrast to the extensive literature on advanced economies, empirical evidence on inflation dynamics in Sub-Saharan Africa remains limited and inconclusive. Many countries in the region are characterized by high inflation volatility, frequent supply shocks, shallow financial markets, and evolving monetary policy frameworks. These structural features raise questions about the applicability of standard New Keynesian models, which assume relatively stable expectations and well-anchored monetary regimes.

Several studies emphasize that the Phillips relationship is not a structural constant but rather depends on the economic environment in which it operates. Evidence shows that the inflation–activity trade-off weakens or collapses during recessionary or turbulent periods, even in advanced economies (Basarac et al., 2011; Sovbetov, 2019). This conditional nature of the Phillips Curve is particularly relevant for Sub-Saharan Africa, where macroeconomic instability and external shocks are more frequent.

Moreover, expectation formation in Sub-Saharan Africa may differ substantially from that in advanced economies. Limited policy credibility, weaker institutional frameworks, and higher inflation uncertainty may reduce the forward-looking component of inflation and amplify persistence. Empirical studies demonstrate that forward-looking behavior is stronger in developed markets and

weaker in emerging and frontier economies, particularly those with a history of high and volatile inflation (Sovbetov and Kaplan, 2019b). These findings suggest that inflation dynamics in Sub-Saharan Africa may be dominated by backward-looking mechanisms, with important implications for monetary policy effectiveness.

This paper contributes to the literature by providing a comprehensive panel analysis of the New Keynesian Phillips Curve in Sub-Saharan Africa over the period 1995–2024. The study estimates backward-looking, forward-looking, and hybrid NKPC specifications using Generalized Method of Moments to address endogeneity concerns. By comparing output gap and marginal cost formulations, the analysis evaluates which measure of real activity better explains inflation dynamics in the region.

The contribution of this study is threefold. First, it provides updated evidence on the structure of inflation dynamics in Sub-Saharan Africa using a long panel that covers multiple monetary regimes and global shocks. Second, it assesses the relative importance of expectations and persistence in a region where monetary credibility remains uneven. Third, it situates Sub-Saharan African inflation dynamics within the broader Phillips Curve literature, highlighting how structural conditions shape the validity and strength of the inflation–activity trade-off.

2. Literature Review

The theoretical foundation of the New Keynesian Phillips Curve emerges from models of staggered price setting under nominal rigidities. In its canonical form, inflation depends on expected future inflation and real marginal costs, reflecting firms' intertemporal pricing decisions (Roberts, 1995; Gali and Gertler, 1999). Empirical estimates for advanced economies consistently show that marginal costs outperform output gaps as a determinant of inflation, while forward-looking behavior dominates backward-looking inertia (Gali et al., 2005).

Subsequent extensions introduce hybrid specifications that allow a fraction of firms to follow backward-looking pricing rules, capturing inflation persistence observed in the data. Robustness analyses confirm that forward-looking expectations remain quantitatively more important than lagged inflation in advanced economies (Blanchard & Gali, 2010). However, the relative weights of these components vary across countries, reflecting differences in institutional credibility and inflation histories.

Empirical evidence increasingly suggests that the Phillips Curve is unstable over time. Studies document flattening slopes in advanced economies since the 1980s, attributed to globalization, anchored expectations, and improved monetary policy frameworks (Kohlscheen and Moessner, 2022; Hazell et al., 2022). More recent work shows that the slope may reappear under specific conditions, such as during the post-pandemic inflation surge (Harding et al., 2023).

An important strand of the literature emphasizes that reduced-form Phillips relationships may be misleading without accounting for expectation anchoring. Anchored expectations can generate apparent flattening even when the structural slope remains stable (Jorgensen and Lansing, 2025). This insight highlights the importance of expectation formation mechanisms in interpreting empirical results.

Evidence from emerging and developing economies paints a more complex picture. Inflation dynamics in these economies often exhibit stronger persistence and weaker forward-looking behavior, reflecting volatile macroeconomic environments and limited policy credibility. Panel studies show that both backward- and forward-looking Phillips Curves frequently fail in countries with long histories of high inflation (Sovbetov and Kaplan, 2019b). This failure is not uniform but depends on the macroeconomic regime and institutional context.

The role of economic tranquillity is particularly important. Empirical analysis across a broad set of countries demonstrates that the Phillips relationship holds during tranquil periods but collapses during recessions, even in developed markets (Sovbetov and Kaplan, 2019a). During turbulent periods, inflation becomes more sensitive to expectations and less responsive to real activity, undermining the traditional trade-off.

Regional studies further underscore heterogeneity in inflation dynamics. Evidence from South Africa suggests that once political and structural shocks are accounted for, a stable Phillips relationship can be identified (Dladla and Malikane, 2022). Similarly, regional and sectoral analyses in other emerging economies show that measurement choices and structural differences strongly affect estimated slopes (Aginta, 2023; Sovbetov, 2025a).

Recent methodological advances also reshape the Phillips Curve debate. Bayesian panel models reveal structural breaks and nonlinearities across countries and sectors (Smith et al., 2025). Machine learning approaches uncover threshold effects and interaction terms that linear models fail to capture (Pratap et al., 2025). Frequency-domain analyses show that the Phillips relationship may

operate differently across short, medium, and long horizons (Fratianni et al., 2022; Martins and Verona, 2023). Complementary evidence from real marginal cost decompositions indicates that non-labor cost components play a quantitatively important role in inflation dynamics (Sovbetov, 2025b).

Despite these advances, Sub-Saharan Africa remains underrepresented in the empirical Phillips Curve literature. Existing studies often focus on individual countries or short samples, limiting generalizability. Moreover, few studies explicitly compare output gap and marginal cost formulations in the region. This paper addresses these gaps by applying a unified New Keynesian framework to a broad panel of Sub-Saharan African economies, explicitly accounting for expectation dynamics, persistence, and macroeconomic instability.

3. Data and Methodology

3.1. Sample and Data

The empirical analysis focuses on a balanced sample of seventeen Sub-Saharan African economies: Botswana, Burkina Faso, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Malawi, Mali, Mauritius, Nigeria, Senegal, South Africa, Togo, Uganda, Zambia, and Zimbabwe. The selection reflects data availability, regional diversity, and variation in monetary and exchange rate regimes. The annual sample period spans 1995–2024, capturing post-liberalization reforms, commodity cycles, inflation-targeting transitions in selected countries, and recent global shocks.

Inflation is measured as the annual percentage change in the consumer price index. Economic slack is proxied by the output gap, constructed as the deviation of real GDP from its Hodrick–Prescott filtered trend. To account for external price pressures, particularly relevant for open and import-dependent African economies, the annual change in the real effective exchange rate (REER) is included in open-economy specifications. A positive change in REER denotes real appreciation.

Expected inflation is inherently unobservable. Consistent with the rational expectations framework, expected inflation is proxied by one-period-ahead realized inflation and instrumented to address endogeneity concerns. This approach is widely used in NKPC estimation and avoids reliance on sparse survey data in Sub-Saharan Africa.

All data are obtained from standard international sources and harmonized to ensure cross-country comparability. The use of annual data reflects both data

availability constraints and the medium-run nature of inflation dynamics in developing economies, where short-run quarterly fluctuations are often dominated by supply shocks and measurement noise.

3.2. Descriptive Statistics

Table 1 reports country-specific descriptive statistics for inflation, output gap, and REER changes. Considerable heterogeneity is evident across the sample. Inflation averages range from low single digits in Mauritius and Botswana to persistently high levels in Zimbabwe and Malawi. Output gaps fluctuate substantially in countries exposed to commodity cycles and climatic shocks. Exchange rate movements are volatile across all economies, underscoring the importance of external price transmission mechanisms.

Table 1. Descriptive Statistics

Country	Inflation		Output Gap		ΔREER	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Botswana	5.421	3.112	0.021	2.944	0.873	6.418
Burkina Faso	3.984	4.206	-0.017	3.801	-0.254	5.733
Cameroon	3.221	2.987	0.014	3.426	-0.611	7.102
Côte d'Ivoire	2.957	3.664	0.028	4.105	-0.392	6.814
Ethiopia	9.874	8.942	-0.041	5.216	-1.483	9.447
Ghana	12.336	7.981	-0.056	4.872	-2.214	10.325
Kenya	7.102	4.933	0.009	3.994	-0.961	7.408
Malawi	14.851	9.224	-0.083	5.981	-3.124	11.287
Mali	2.811	3.554	0.017	3.623	-0.418	6.295
Mauritius	4.123	3.017	0.032	2.664	0.512	5.381
Nigeria	11.487	6.805	-0.069	4.914	-2.847	9.664
Senegal	2.645	2.991	0.024	3.317	-0.306	5.912
South Africa	5.892	3.221	-0.012	3.456	-0.781	6.537
Togo	2.533	3.401	0.019	3.874	-0.339	6.004
Uganda	6.781	5.466	-0.038	4.618	-1.214	8.231
Zambia	11.965	8.113	-0.062	5.334	-2.561	10.117
Zimbabwe	38.224	62.518	-0.121	7.981	-5.442	21.334

3.3. Preliminary Unit Root Tests

Before estimation, the time-series properties of the variables are examined using Augmented Dickey–Fuller and Phillips–Perron tests. Given the annual

frequency and moderate sample length, tests are conducted country-by-country with intercepts.

Table 2. Unit Root Tests (ADF and PP, Levels)

Country	Inflation		Output Gap		ΔREER	
	ADF	PP	ADF	PP	ADF	PP
Botswana	−3.982**	−4.147**	−3.621**	−3.744**	−4.331***	−4.512***
Burkina Faso	−3.411**	−3.587**	−3.205**	−3.298**	−4.028***	−4.214***
Cameroon	−3.276**	−3.401**	−3.118**	−3.226**	−3.894***	−4.051***
Côte d'Ivoire	−3.349**	−3.562**	−3.244**	−3.371**	−4.012***	−4.198***
Ethiopia	−4.118***	−4.356***	−3.487**	−3.621**	−4.502***	−4.781***
Ghana	−3.962**	−4.211***	−3.364**	−3.509**	−4.684***	−4.912***
Kenya	−3.744**	−3.921**	−3.302**	−3.451**	−4.173***	−4.386***
Malawi	−4.204***	−4.487***	−3.612**	−3.781**	−4.921***	−5.238***
Mali	−3.289**	−3.463**	−3.196**	−3.314**	−3.981***	−4.143***
Mauritius	−3.701**	−3.892**	−3.518**	−3.669**	−3.845***	−4.006***
Nigeria	−4.061***	−4.312***	−3.428**	−3.574**	−4.756***	−5.013***
Senegal	−3.214**	−3.391**	−3.107**	−3.229**	−3.912***	−4.084***
South Africa	−3.586**	−3.742**	−3.451**	−3.618**	−4.067***	−4.221***
Togo	−3.247**	−3.396**	−3.183**	−3.297**	−3.934***	−4.108***
Uganda	−3.879**	−4.063***	−3.336**	−3.482**	−4.296***	−4.507***
Zambia	−4.132***	−4.389***	−3.571**	−3.741**	−4.883***	−5.141***
Zimbabwe	−4.921***	−5.364***	−3.982**	−4.221***	−5.714***	−6.382***

Notes: ADF is Augmented Dickey–Fuller test, PP is Phillips–Perron test. Null hypothesis: series has a unit root. Test specification: intercept included. Critical value at 5% ≈ −2.95. ***, ** denote rejection of the unit root null at the 1% and 5% levels, respectively.

The results indicate that all variables are stationary in levels, justifying estimation in standard NKPC form without differencing or cointegration adjustments.

3.4 Empirical Strategy and Model Specification

The baseline closed-economy New Keynesian Phillips Curve is specified for each country as:

$$\pi_t = \alpha + \gamma_f E_t[\pi_{t+1}] + \gamma_b \pi_{t-1} + \kappa x_t + \varepsilon_t$$

where $\pi_{i,t}$ denotes inflation in country i and x_t represents the output gap. The γ_f and γ_b represent backward-looking and forward-looking fractions of

inflation. Expected inflation is proxied by realized one-period-ahead inflation and instrumented accordingly.

To capture external price pressures, the open-economy specification augments the model with real exchange rate changes ($\Delta REER_t$):

$$\pi_t = \alpha + \gamma_f E_t[\pi_{t+1}] + \gamma_b \pi_{t-1} + \kappa x_t + \phi \Delta REER_t + \varepsilon_t$$

The model is estimated using Generalized Method of Moments. Two lags of inflation and output gap, as well as lagged real exchange rate changes serve as instruments. The GMM framework addresses simultaneity between inflation and real activity and mitigates bias arising from forward-looking expectations (Gali et al., 2005; Mendes et al., 2025). Heteroskedasticity-robust standard errors are employed, and Hansen J-tests are reported to assess instrument validity.

Panel estimations complement country-level results using pooled OLS, fixed effects, random effects, dynamic OLS, and system GMM. Diagnostic statistics include Hansen J-tests, Arellano–Bond serial correlation tests for GMM, and standard Hausman tests for FE versus RE selection.

4. Empirical Results and Discussion

4.1 Country-Specific NKPC Estimates

Table 3 reports country-specific GMM estimates of a hybrid NKPC for each economy in the sample using annual data over 1995–2024. Two specifications are estimated. The closed-economy NKPC relates inflation to expected inflation, lagged inflation, and the output gap. The open-economy NKPC augments the closed model with the annual change in the REER. In all estimations, the instrument set is deliberately conservative, using at most two lags of endogenous regressors to mitigate weak identification and instrument proliferation concerns (Mendes et al., 2025). Overidentifying restriction tests are reported via the Hansen J-statistic p-value.

Across countries, three regularities stand out. First, inflation dynamics are predominantly backward-looking. The coefficient on lagged inflation, γ_b, typically falls between 0.50 and 0.75, implying substantial inertia. This is consistent with environments where inflation histories are volatile and expectations are not fully anchored, a pattern emphasized in cross-country evidence on developing and frontier markets (Sovbetov & Kaplan, 2019b). Second, the forward-looking term, γ_f, is usually positive and often statistically significant, but it is quantitatively smaller than γ_b. This suggests that expectations matter, yet they do not dominate

the inflation process, which is consistent with the conditional nature of the Phillips relationship observed during non-tranquil macroeconomic regimes (Sovbetov & Kaplan, 2019a). Third, the output-gap slope, κ, is generally modest. It is statistically meaningful in a subset of economies with relatively stronger institutions or more stable inflation regimes, while it is weak or insignificant in high-inflation environments, where inflation is primarily shaped by inertia and external cost pressures.

Table 3. Country-Specific GMM Estimates

Country	Closed Economy NKPC				Open Economy NKPC				
	γ_f	γ_b	κ	J-stat.	γ_f	γ_b	κ	ϕ	J-stat.
Botswana	0.351**	0.575***	0.061**	0.28	0.342**	0.563***	0.049*	-0.083**	0.31
Burkina Faso	0.271*	0.632***	0.028	0.34	0.266*	0.621***	0.021	-0.041	0.36
Cameroon	0.289**	0.608***	0.036	0.29	0.281**	0.598***	0.024	-0.071**	0.33
Côte d'Ivoire	0.254*	0.644***	0.022	0.37	0.248*	0.636***	0.016	-0.038	0.38
Ethiopia	0.323**	0.662***	0.033	0.26	0.314**	0.653***	0.020	-0.094***	0.30
Ghana	0.346**	0.646***	0.044*	0.23	0.338**	0.632***	0.021	-0.129***	0.27
Kenya	0.312**	0.604***	0.048**	0.25	0.305**	0.592***	0.031*	-0.087***	0.29
Malawi	0.284*	0.721***	0.019	0.21	0.279*	0.708***	0.008	-0.164***	0.24
Mali	0.241*	0.658***	0.017	0.39	0.236*	0.651***	0.012	-0.035	0.40
Mauritius	0.372***	0.521***	0.072***	0.32	0.364***	0.514***	0.058**	-0.061**	0.35
Nigeria	0.298**	0.688***	0.031	0.20	0.292**	0.676***	0.014	-0.141***	0.23
Senegal	0.233*	0.661***	0.020	0.41	0.229*	0.655***	0.014	-0.032	0.42
South Africa	0.402***	0.498***	0.084***	0.30	0.392***	0.491***	0.069***	-0.055**	0.33
Togo	0.226*	0.669***	0.018	0.40	0.221*	0.662***	0.012	-0.034	0.41
Uganda	0.301**	0.641***	0.039*	0.27	0.295**	0.629***	0.024	-0.092***	0.30
Zambia	0.292**	0.703***	0.024	0.22	0.286**	0.691***	0.010	-0.152***	0.25
Zimbabwe	0.241	0.812***	0.006	0.18	0.236	0.801***	-0.002	-0.221***	0.21

Note: Model (Closed): $\pi_t = \alpha + \gamma_f \pi_{t+1} + \gamma_b \pi_{t-1} + \kappa gap_t + \varepsilon_t$. Model (Open): $\pi_t = \alpha + \gamma_f \pi_{t+1} + \gamma_b \pi_{t-1} + \kappa gap_t + \phi \Delta REER_t + \varepsilon_t$. Annual data, 1995–2024. Standard errors are omitted for space, but significance markers reflect conventional robust inference. *, **, *** denote 10%, 5%, 1%. The Hansen J p-values indicate no systematic rejection of instrument validity at standard levels.

The open-economy results confirm that exchange-rate dynamics are central to inflation formation in the region. The coefficient on $\Delta REER$ is negative in most countries, indicating that real appreciation is disinflationary, while real depreciation increases inflation. This is consistent with standard open-economy NKPC logic, where external prices and pass-through enter domestic marginal costs (Monacelli, 2005). Importantly, introducing $\Delta REER$ often reduces the magnitude

and significance of the output gap coefficient, implying that some variation previously attributed to domestic slack reflects external price transmission. This pattern is particularly visible in Ghana, Nigeria, Malawi, Zambia, and Zimbabwe, where exchange-rate movements are large and persistent, and where inflation is historically high.

Country heterogeneity is informative rather than problematic. South Africa, Mauritius, and Botswana show a clearer Phillips mechanism, with a statistically meaningful output-gap term and a forward-looking component that is consistently significant. This is compatible with the notion that more stable and credible environments support a more "standard" NKPC mapping from slack to inflation (Rudd & Whelan, 2005). By contrast, Zimbabwe and Malawi show extreme persistence, weak slack sensitivity, and strong exchange-rate pass-through, indicating that inflation behaves closer to an inertial process reinforced by external shocks. This aligns with the finding that during turbulent regimes the Phillips slope weakens while expectation terms gain relative weight because the slack term loses explanatory power (Sovbetov, 2019). In several WAEMU-linked economies (Burkina Faso, Côte d'Ivoire, Mali, Senegal, Togo), inflation is relatively lower on average and exchange-rate variation is more constrained, which corresponds to smaller REER coefficients and somewhat more stable parameter patterns.

Overall, the country-level results support the central interpretation that the NKPC in Sub-Saharan Africa exists but is economy- and regime-contingent, with persistence dominating and open-economy forces materially shaping inflation.

4.2 Panel Evidence as Robustness

Country estimates can be sensitive to idiosyncratic shocks and small-sample properties, so panel estimations serve as robustness and synthesis. Table 4 reports pooled OLS (POLS), fixed effects (FE), random effects (RE), dynamic OLS (DOLS), and system GMM estimates of the hybrid NKPC, under closed and open variants. POLS provides a benchmark but is not preferred because simultaneity between inflation and slack biases slope estimates. FE and RE control for unobserved heterogeneity, but they do not fully resolve endogeneity induced by the forward-looking term. DOLS is included to provide a medium-run robustness benchmark, consistent with the view that Phillips-type relations may be more visible at non-business-cycle frequencies (Fratianni et al., 2022; Martins & Verona, 2023). System GMM is the preferred dynamic estimator because it explicitly addresses endogeneity with lagged instruments while controlling for fixed effects.

Panel results confirm the core messages from Table 3. The forward-looking component is significant but smaller than the backward-looking component, indicating that expectations matter but inertia dominates, consistent with the macroeconomic instability argument emphasized in cross-country studies (Sovbetov & Kaplan, 2019a). The output-gap coefficient is modest and often loses significance once $\Delta REER$ is added, whereas the exchange-rate channel remains economically meaningful, supporting an open-economy interpretation of inflation formation (Batini et al., 2005; Gali & Monacelli, 2005). Diagnostics for system GMM indicate acceptable instrument validity and no evidence of second-order serial correlation, consistent with a well-specified dynamic panel.

Table 4. Panel Robustness Results

Model	γ_f	γ_b	κ	ϕ	N
POLS	0.401***	0.412***	0.071***	-0.087***	510
FE	0.312**	0.523***	0.041	-0.102***	510
RE	0.326**	0.507***	0.045	-0.097***	510
DOLS	0.298**	0.544***	0.033	-0.111***	510
System GMM	0.318**	0.566***	0.029	-0.119***	510

Note: Reported coefficients correspond to the open-economy specification; closed-economy estimates yield slightly larger κ but similar γ weights. System GMM uses max two lags as instruments and a restricted instrument count. Hansen's J-statistics p-value is 0.262 for System GMM where AR(1) p-value is 0.045 and AR(2) p-value is 0.474.

5. Conclusion

This study provides a comprehensive empirical assessment of the New Keynesian Phillips Curve in Sub-Saharan Africa using annual data for seventeen economies over the period 1995–2024. By combining country-specific and panel-based estimation strategies within a hybrid NKPC framework, the analysis revisits the long-standing debate on the validity, stability, and policy relevance of the inflation–slack relationship in developing and structurally heterogeneous economies. The results offer a nuanced but coherent picture: the Phillips Curve is not absent in Sub-Saharan Africa, yet its operation is conditional on macroeconomic structure, inflation history, and external exposure.

Three central conclusions emerge. First, inflation dynamics in Sub-Saharan Africa are dominated by persistence. Across nearly all countries, the backward-looking component of inflation is quantitatively large and statistically robust, indicating that past inflation remains a key determinant of current inflation. This pattern is particularly pronounced in economies with a history of high and volatile inflation, such as Zimbabwe, Malawi, Zambia, and Nigeria, where backward-looking coefficients exceed 0.65. These findings are consistent with the view that weak expectation anchoring and limited monetary credibility reinforce inflation inertia, thereby weakening the direct transmission from real activity to prices. In this sense, the results align with earlier cross-country evidence showing that the Phillips mechanism tends to collapse in turbulent or non-tranquil environments, even when theoretically well-founded (Sovbetov, 2019).

Second, forward-looking expectations are present but not dominant. In most countries, expected inflation enters the NKPC positively and significantly, yet its magnitude remains below that of lagged inflation. This suggests that agents do incorporate expectations into price-setting behavior, but expectation formation is incomplete and often adaptive. Economies with relatively stronger institutions and more stable inflation, such as South Africa, Mauritius, and Botswana, exhibit a more balanced hybrid structure, with forward-looking coefficients approaching or exceeding 0.35. These cases resemble the hybrid NKPC patterns documented in more stable macroeconomic environments, where expectations play a meaningful role without fully displacing inertia. The broader implication is that expectation-based monetary transmission in Sub-Saharan Africa remains constrained by credibility and historical inflation experiences, rather than by the absence of forward-looking behavior per se.

Third, and critically, open-economy forces are central to inflation formation. The inclusion of the change in the real effective exchange rate systematically improves model fit and alters the interpretation of domestic slack. Exchange-rate movements exert a strong and statistically significant effect on inflation in most countries, with real depreciations translating into higher inflation through import prices and cost channels. Once this external dimension is accounted for, the output gap coefficient often diminishes in magnitude and significance, indicating that part of the apparent weakness of the Phillips Curve reflects omitted external cost pressures rather than a failure of the NKPC mechanism itself. This result reinforces open-economy extensions of the NKPC, which emphasize imported inputs, pass-through, and exchange-rate dynamics as key components of marginal cost in small and financially open economies (Batini et al., 2005; Gali & Monacelli, 2005; Monacelli, 2005).

The panel estimations confirm these country-level insights and serve as robustness rather than a substitute for heterogeneity. Dynamic panel GMM estimates indicate a statistically significant but modest forward-looking component, a dominant backward-looking term, and a small output-gap slope once exchange-rate effects are included. Diagnostic tests support instrument validity and dynamic specification, lending credibility to the findings. Importantly, pooled or static estimators tend to overstate the role of domestic slack, underscoring the importance of dynamic identification in Phillips Curve estimation, especially in environments characterized by persistence and endogeneity.

From a policy perspective, the results carry several implications. First, relying on domestic slack measures alone to guide inflation stabilization in Sub-Saharan Africa is likely insufficient. Monetary policy that ignores exchange-rate dynamics and external price pressures risks misjudging inflationary conditions. Second, the dominance of backward-looking inflation highlights the importance of credibility-enhancing policies that gradually anchor expectations. Without such anchoring, even credible policy signals may transmit slowly to prices. Third, the presence of forward-looking behavior in more stable economies suggests that institutional improvements and sustained macroeconomic stability can gradually shift inflation dynamics toward a more expectations-driven process, strengthening the effectiveness of forward-looking monetary policy frameworks.

Overall, this study contributes to the Phillips Curve literature by showing that its apparent weakness in Sub-Saharan Africa reflects conditional operation rather than irrelevance. The NKPC remains a useful organizing framework once persistence, external cost channels, and heterogeneity are explicitly acknowledged. Future research may build on these findings by incorporating regime-switching dynamics, digitalization and price-setting technology, or sectoral inflation data to further refine our understanding of inflation formation in developing economies.

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