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COLLEGE OF BUSINESS AND MANAGEMENT SCIENCES (COBAMS)

SCHOOL OF STATISTICS AND PLANNING (SSP)

EFFECT OF DISAGGREGATED INFLATION COMPONENTS ON THE CENTRAL BANK RATE IN UGANDA: AN ARDL APPROACH

BY

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A DISSERTATION BEING SUBMITTED TO THE SCHOOL OF STATISTICS AND PLANNING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF BACHELOR OF SCIENCE IN QUANTITATIVE ECONOMICS OF MAKERERE UNIVERSITY.

JULY, 2026

DECLARATION

I, Bagyenzi Real, declare to the best of my knowledge and understanding that this dissertation titled "Effect of Disaggregated Inflation Components on the Central Bank Rate in Uganda: An ARDL Approach" is my original work and has not been submitted to any other institution for any academic award.

All sources of information used in this study have been duly acknowledged and referenced in accordance with academic standards.

Signature: ______________ Date: 17th July 2026

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APPROVAL

This dissertation titled "Effect of Disaggregated Inflation Components on the Central Bank Rate in Uganda: An ARDL Approach" has been submitted for examination with my approval as the university supervisor.

Signature: ____________________ Date: 20/07/2027.

Mr. Byamugisha Jimrex

Supervisor

DEDICATION

This dissertation is dedicated to God Almighty for His grace, strength and guidance throughout my academic journey.

I also dedicate it to my beloved parents, whose endless love, support and sacrifices have made my education possible. Your support has been my greatest strength.

Special appreciation goes to my siblings for their encouragement and support.

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ABSTRACT

This study examined the effect of disaggregated inflation components on the Central Bank Rate (CBR) in Uganda using monthly data from August 2017 to January 2026. Specifically, the study investigated the influence of core inflation, food crops inflation, and energy, fuel and utilities (EFU) inflation within an Autoregressive Distributed Lag (ARDL) framework. The analysis included descriptive statistics, correlation analysis, unit root tests, ARDL estimation, diagnostic tests, and a robust Unrestricted Error Correction Model (UECM). The findings indicate that none of the three inflation components had a statistically significant independent long-run effect on the CBR. However, the COVID-19 structural shock significantly influenced short-run monetary policy decisions, while the negative and significant error correction term confirmed a stable long-run relationship and an adjustment speed of approximately 10% per month. The study concludes that the Bank of Uganda responds more to broad macroeconomic conditions and major structural shocks than to individual inflation components, and recommends a more holistic approach to monetary policy formulation.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lag
BoU	Bank of Uganda
CBR	Central Bank Rate
CPI	Consumer Price Index
COVID-19	Coronavirus Disease 2019
CUSUM	Cumulative Sum
EAC	East African Community
EFU	Energy, Fuel, and Utilities
FPE	Final Prediction Error
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HQIC	Hannan-Quinn Information Criterion
ITL	Inflation Targeting Lite
LM	Lagrange Multiplier
LR	Likelihood Ratio (also used as Long-Run in coefficient tables)
MPC	Monetary Policy Committee
NARDL	Nonlinear Autoregressive Distributed Lag
OLS	Ordinary Least Squares
SBIC	Schwarz Bayesian Information Criterion

SDG	Sustainable Development Goal
SR	Short-Run
SSA	Sub-Saharan Africa
UBOS	Uganda Bureau of Statistics
UECM	Unrestricted Error Correction Model
VAR	Vector Autoregression
VIF	Variance Inflation Factor

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Monetary policy serves as a vital instrument for central banks globally to achieve price stability, foster sustainable economic growth, and maintain macroeconomic equilibrium. In recent decades, monetary authorities have increasingly transitioned toward inflation-targeting frameworks, utilizing policy interest rates to anchor public inflation expectations and manage aggregate demand. However, the operational effectiveness of these frameworks is continuously challenged by persistent supply-side shocks—particularly volatile fluctuations in food and energy prices—which often remain unresponsive to conventional monetary policy adjustments (Nuño et al., 2024).

In many developing and emerging economies, especially within Sub-Saharan Africa, inflation dynamics are highly volatile due to frequent domestic agricultural supply disruptions, exchange rate vulnerabilities, and global energy price shocks (Okou et al., 2022). These economies are exceptionally vulnerable because food and utilities dominate household consumption baskets, ensuring that external supply shocks quickly permeate the wider domestic economy. Consequently, central banks face a complex task when calibrating policy rates: they must carefully distinguish between transitory, supply-driven price spikes and persistent, demand-driven inflation (Holzmann & Nationalbank, n.d.).

In Uganda, monetary policy is anchored on the Inflation Targeting Lite (ITL) framework, which was officially adopted by the Bank of Uganda (BoU) in 2011 to replace its long-standing monetary targeting regime. Under this framework, the Central Bank Rate (CBR) serves as the primary policy instrument to signal the monetary stance and steer short-term market interest rates. Although the BoU explicitly targets medium-term core inflation at a 5 percent benchmark—intentionally stripping out volatile components like food crops and Energy, Fuel, and Utilities (EFU)—overall inflationary pressures in Uganda remain heavily exposed to these omitted supply-side sectors.

Existing empirical studies on Uganda's monetary policy reaction function have predominantly relied on aggregate inflation measures and output gaps to explain adjustments in the central bank rate (Montiel, 2013). However, limited empirical attention has been dedicated to isolating the independent effects of disaggregated inflation components on policy rate adjustments, especially through the economic disruptions observed from 2020 onward. This study addresses this gap by using an Autoregressive Distributed Lag (ARDL) approach to examine how these individual inflation components influence the Bank of Uganda's policy rate decisions in both the short run and the long run.

1.2 Problem statement

The Bank of Uganda (BoU) implements monetary policy under an Inflation Targeting Lite (ITL) framework, with the primary objective of maintaining medium-term core inflation at a 5 percent benchmark. However, inflation dynamics in Uganda remain highly susceptible to recurrent supply-side shocks, particularly volatile fluctuations in food crop prices and the Energy, Fuel, and Utilities (EFU) sector. For instance, during the 2011 inflationary episode, headline inflation surged past 30 percent—largely driven by regional food shortages and soaring global fuel prices—prompting the BoU to aggressively raise the Central Bank Rate (CBR) from 13 percent in July 2011 to 23 percent by November 2011 (*Bank of Uganda*, n.d.). Similarly, during the 2022 global inflationary wave triggered by geopolitical conflicts and supply chain disruptions, the BoU rapidly increased the CBR from 6.5 percent to 10 percent within five months to anchor unhinged inflation expectations (*Bank of Uganda*, n.d.).

While these stark policy interventions demonstrate that supply-driven price shocks heavily influence monetary decisions, existing empirical studies on Uganda's monetary policy reaction functions predominantly rely on aggregate inflation measures and output gaps. Consequently, there is a critical empirical gap regarding the extent to which disaggregated components—namely core, food crop, and EFU inflation—independently drive variations in the central bank rate.

This knowledge gap introduces a major policy dilemma: it remains structurally unclear whether the BoU's policy rate adjustments are primarily mitigating persistent, demand-driven pressures or overreacting to transitory supply shocks. Without robust empirical evidence partitioning the specific impacts of these disaggregated elements, monetary policy decisions risk misidentifying the underlying source of inflationary pressure. This increases the likelihood of policy errors, such as implementing aggressive hikes that unnecessarily stifle domestic economic growth or failing to react to underlying core persistence (Waiquamdee et al., 2009). Therefore, this study directly addresses this empirical deficiency by analyzing the independent short-run and long-run effects of disaggregated inflation components on the central bank rate in Uganda using an Autoregressive Distributed Lag (ARDL) econometric framework.

1.3 Objectives of the study

- Main objective

To examine the effect of disaggregated inflation components on the CBR in Uganda.

- Specific objectives

1. To determine the effect of core inflation on the CBR in Uganda.
2. To examine the effect of food crops inflation on the CBR in Uganda.
3. To evaluate the effect of energy, fuel and utilities inflation on the CBR in Uganda.

1.4 Hypotheses of the study

H_{01}: Core inflation has no significant effect on the CBR in Uganda.

H_{02}: Food crops inflation has no significant effect on the CBR in Uganda.

H_{03}: Energy, fuel and utilities inflation has no significant effect on the CBR in Uganda.

1.5 Significance of the study

This research provides an empirical evaluation of the Bank of Uganda's historical policy responses, offering insights for more nuanced monetary policy formulation. By identifying the specific drivers of rate adjustments, the findings suggest how the Monetary Policy Committee (MPC) can better distinguish between demand-pull and supply-push inflation, thereby reducing the risk of inadvertently constraining private-sector credit growth. In the absence of a disaggregated analysis, regulatory bodies may continue to apply broad interest rate interventions to localized supply shocks, which the evidence indicates can result in depressed industrial output.

Furthermore, the findings offer a predictive advantage for commercial banks and institutional investors. Understanding how macroeconomic shocks historically trigger CBR adjustments allows financial institutions to price risk more accurately and manage interest rate volatility.

Ultimately, this research aligns with Uganda's Vision 2040 and Sustainable Development Goal (SDG) 8 by advocating for a monetary environment that fosters price stability while supporting sustainable economic growth.

1.6 Scope of the study

- Content scope: The study is confined to analyzing the empirical relationship between the central bank rate (the dependent variable) and three independent variables: core inflation, food crops inflation, and energy, fuel, and utilities (EFU) inflation.
- Geographical scope: The research is restricted to national-level macroeconomic data for the Republic of Uganda.
- Time scope: The study covers the monthly period from August 2017 to January 2026, capturing a timeframe characterized by significant global supply chain disruptions and shifting domestic inflation dynamics.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the theoretical and empirical literature on the relationship between inflation and monetary policy. It examines key concepts, theories and previous studies on inflation dynamics and monetary policy transmission. The chapter also identifies research gaps and provides the foundation for the study's analytical framework and methodology.

2.2 Theoretical framework

The study is anchored on two distinct but complementary macroeconomic pillars:

- **The Taylor rule** (Taylor, 1993)

The Taylor rule posits that central banks systematically adjust nominal policy interest rates in response to deviations of inflation from its target and deviations of real output from its potential level. Mathematically, the traditional baseline function is expressed as:

$$i = r^* + \pi + 0.5(\pi - \pi^*) + 0.5(y - y^*)$$

Where:

$y - y^*$= output gap (percent deviation of real GDP from potential)

π^*= target inflation rate

i = nominal interest rate

r^*= real interest rate

π = current inflation rate

While classic iterations of this instrument rule rely strictly on aggregate headline inflation, standard applications frequently oversimplify policy behavior in small, open developing economies (Laxton & Pesenti, 2003). This study extends the traditional framework by decomposing π_t into its disaggregated elements: core inflation, food crop inflation, and Energy, Fuel, and Utilities (EFU) inflation. This modification captures whether structural, non-core components shift the policy rate independently of demand dynamics.

- **Inflation targeting theory** (Svensson, 1997)

Svensson's inflation-forecast targeting framework demonstrates that under a strict inflation-targeting regime, a central bank should "look through" temporary, supply-driven price anomalies and alter policy rates only if shocks threaten medium-term core price stability. This theory argues that aggressive monetary tightening in response to transitory supply disruptions yields sub-optimal volatility in output and employment without structurally correcting supply-side deficits (Laxton & Pesenti, 2003).

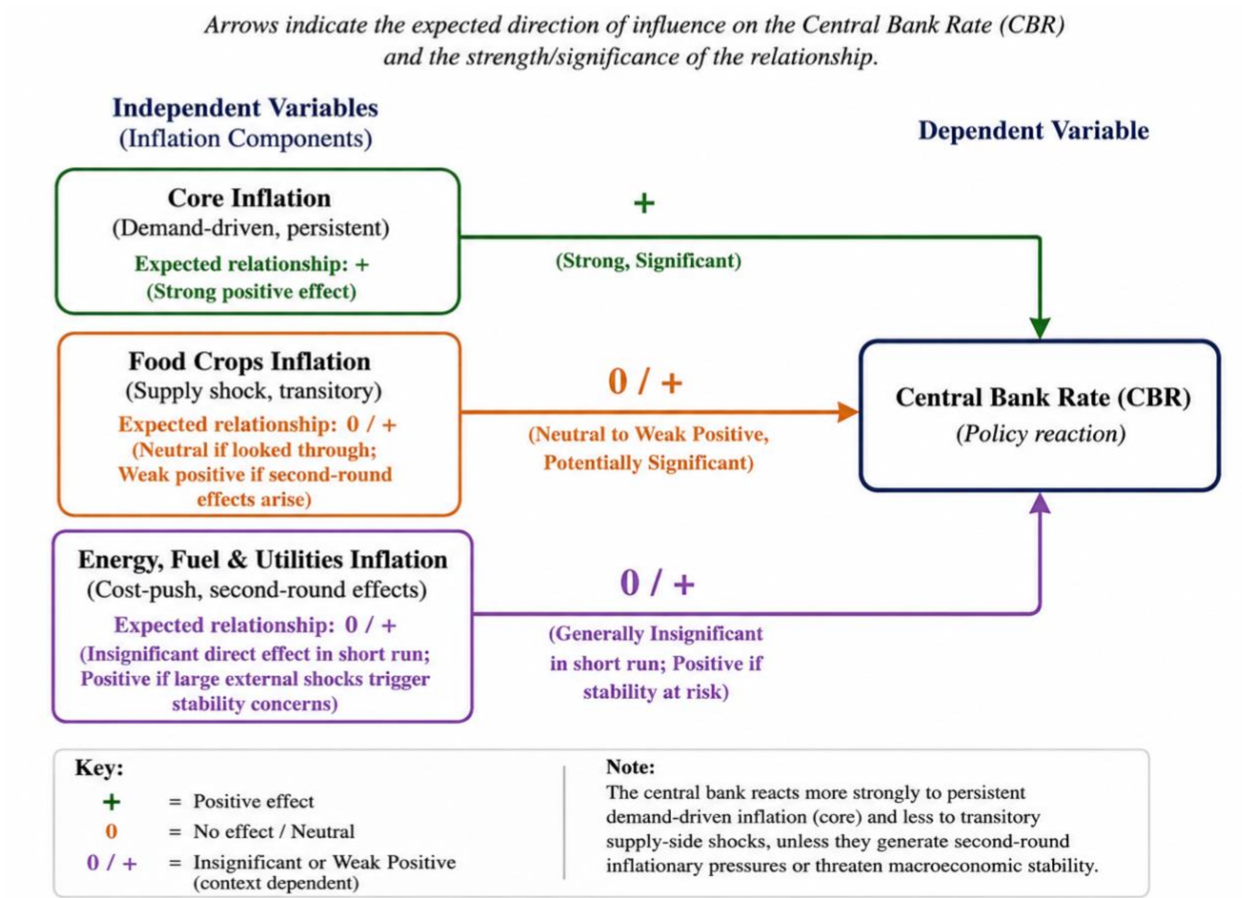
This research explicitly tests the boundaries of Svensson's framework within an empirical developing-world setting. By investigating the long-run and short-run dynamics of the Bank of Uganda's monetary policy reaction function via an ARDL model, this study clarifies whether the BoU strictly targeting core inflation or is systematically compelled to respond to highly volatile food and energy price shocks.

2.3 Conceptual framework

The conceptual core of this study rests on the premise that a central bank operating under an inflation-targeting framework does not—and should not—react to all inflation components with equal weight. While traditional inflation-forecast targeting suggests that monetary authorities should strictly "look through" temporary supply shocks, structural rigidities in developing economies can force central banks to respond to non-core volatility to prevent second-round inflationary effects (Beaudry et al., 2022).

The relationship between the disaggregated price components and the Central Bank Rate (CBR) is conceptualized as follows:

Figure 1. Conceptual framework



Core Inflation (+): This component is hypothesized to have a highly significant, strong positive effect on the CBR. Core inflation strips out volatile elements and reflects underlying demand-pull pressures. Because these pressures respond directly to aggregate demand management, they fall squarely within the transmission mechanisms of conventional monetary instruments (fact-checker et al., n.d.).

Food Crops Inflation (0 or +): Under strict inflation-targeting theory, the expected policy response is neutral (0), as central banks assume agricultural supply shocks are transitory and self-correcting. However, in small open economies like Uganda, where food costs command a substantial weight in the consumer basket, prolonged food price spikes can generate a positive sign (+). This occurs when sustained food inflation alters public expectations, provoking wage-price spirals and broader cost-push pressures (Van Campenhout et al., 2013).

Energy, Fuel, and Utilities (EFU) Inflation (0 or +): The direct, short-run impact of domestic utility adjustments is theoretically expected to be insignificant (0). However, acute global fuel price shocks often elicit an aggressive positive monetary response (+). This policy tightening is typically non-discretionary, implemented to stabilize sharp exchange rate pass-through, anchor volatile import costs, and stem rapid capital flight triggered by global macroeconomic shocks (Matschke et al., 2023).

2.4 Empirical literature review

2.4.1 The effect of core Inflation on the central bank rate

Recent empirical studies generally agree that core inflation is the primary nominal anchor guiding monetary policy under inflation-targeting regimes. This consensus exists because the core index isolates persistent, demand-pull inflationary pressures by stripping out transient, weather-dependent food prices and global energy shocks (Adrian, n.d.). (Bwire, 2023) demonstrate that inflation-targeting regimes systematically react to persistent core components over the medium-to-long term. However, they observe that aggressive monetary contraction can introduce a short-run "price puzzle," temporarily increasing commercial operating costs before demand-pull forces cool down. Similarly, (Iddrisu, 2020) emphasizes that central banks in Sub-Saharan Africa establish greater institutional credibility and anchor public expectations more effectively when their monetary policy reaction functions respond transparently to core deviations rather than highly volatile headline measures.

Within the East African Community (EAC), regional integration has underscored the shared transmission challenges of core price stabilization. (Ochen, 2024) applies a panel Vector Autoregressive (pVAR) model to post-pandemic data, establishing that while sharp upward adjustments in policy interest rates successfully curb demand-driven inflationary spikes, they simultaneously contract commercial bank loan supplies. This finding highlights a persistent structural trade-off between securing absolute price stability and maintaining domestic private sector credit expansion. Focusing specifically on the domestic transmission channel, (Ariho et al., 2025) confirms that monetary policy instruments in Uganda—particularly variations in the central bank rate—exert a statistically significant and direct pass-through effect on commercial lending rates. This verification validates the functional capacity of the Bank of Uganda’s primary policy instrument.

Although this body of contemporary literature consistently demonstrates that core price stability is a fundamental driver of central banking operations, these studies focus heavily on the aggregate macroeconomic transmission mechanism or post-shock commercial banking sector adjustments. Consequently, limited empirical evidence isolates the explicit, independent marginal effect of core inflation on Uganda's CBR after controlling for other disaggregated price indices. This study addresses this exact empirical limitation by utilizing an Autoregressive Distributed Lag (ARDL) approach to model these distinct relationships in both the short run and the long run.

2.4.2 The effect of food crops inflation on the central bank rate

Empirical evidence regarding the relationship between food inflation and central bank policy adjustments presents a mix of divergent findings. (Alper et al., 2016) show that persistent food inflation in Sub-Saharan Africa (SSA) frequently generates significant second-round inflationary pass-through effects. Because food commodities account for an exceptionally large proportion of household expenditure in low-income countries, prolonged spikes in food prices quickly bleed into wage-rate negotiations and broader household inflation expectations. Corroborating this structural vulnerability, (Gizaw & Myrland, 2025) utilize panel regression modeling across 32 African nations to demonstrate that domestic climate-induced supply shocks, exchange rate fluctuations, and structural agricultural constraints continue to drive food price volatility. They conclude that such volatile, non-core price spikes eventually compel monetary policy interventions when the underlying supply disruptions threaten broader macroeconomic stability and income erosion.

In contrast, alternative branches of literature argue that central banks should maintain a detached policy posture during typical food price shocks. (Ocampo & Ojeda-Joya, 2022) contends that monetary authorities operating under inflation-targeting regimes must avoid aggressive, reactionary policy rate hikes when dealing with temporary agricultural supply-side disruptions, as these supply shocks originate from factors entirely outside the operational transmission mechanisms of conventional monetary instruments. However, (Bossone, 2025) introduce nuance to this rule, countering that if structural supply disruptions become unanchored and deeply embedded within public expectations, central banks are ultimately forced to implement monetary tightening to preserve the institutional credibility of their inflation targets.

While these cross-country and regional studies collectively acknowledge that food price dynamics can alter the course of monetary policy, they disagree on the optimal threshold and timing of the central bank's reaction function. Furthermore, the existing empirical literature relies heavily on pooled, cross-sectional macro-data, leaving a pronounced gap regarding country-specific dynamics. This study addresses this gap by isolating how food crops inflation independently influences the short-run and long-run trajectory of the central bank rate in Uganda.

2.4.3 The effect of energy, fuel, and utilities (EFU) inflation on the CBR

Energy, Fuel, and Utilities (EFU) inflation represents a critical supply-side conduit through which global macroeconomic shocks permeate domestic consumer markets in developing economies. (Babuga & Naseem, 2020) demonstrate that oil price shifts generate significant asymmetric pass-through effects on inflation across Sub-Saharan Africa. Utilizing non-linear econometric modeling, they establish that positive oil price shocks trigger a much stronger and immediate upward push on consumer price indices than the deflationary relief yielded by equivalent price declines. This structural vulnerability is further illuminated by (Ibrahim Anyars & Adabor, 2023), whose disaggregated sector-level analysis shows that external energy shocks exert a rapid, cascading short-run effect across transportation networks and agricultural supply chains, demonstrating how quickly primary energy inflation translates into broad cost-push inflation.

While both studies reach a consensus regarding the potent impact of energy disruptions on broader price stability, they vary in their analytical scope. (Saidu et al., 2021) emphasize cross-border asymmetric patterns across a pooled regional panel of oil-importing African nations, whereas (Anyars & Adabor, 2023) isolate country-specific transmission channels, tracing how energy cost fluctuations diffuse through individual consumer basket sub-indices like transport and core inputs. Bridging this transmission to monetary policy, (Mbassi, 2025) notes that while central banks operating under inflation-targeting regimes are theoretically expected to "look through" volatile external energy cycles, sustained or extreme utility spikes ultimately force policy rate adjustments. Such tightening becomes essential to curb capital flight, prevent aggressive exchange rate pass-through, and preserve institutional policy credibility.

Despite the growing global and regional evidence linking energy cost shocks to wider price movements, little country-specific empirical research isolates the direct, independent influence of EFU inflation on Uganda's central bank rate. This study fills this clear literature gap by employing an Autoregressive Distributed Lag (ARDL) approach to explicitly estimate the independent short-run and long-run effects of EFU inflation on the Bank of Uganda's policy rate trajectory.

2.5 Methodological synthesis and gaps

Previous empirical studies examining Uganda's monetary policy reaction function (e.g., (Opolot & Nampewo, 2014)) have heavily relied on traditional systems estimators such as Generalized Method of Moments (GMM) or Vector Autoregression (VAR) frameworks. While these methodologies are highly effective for capturing multi-channel transmission feedbacks, they present severe structural limitations when applied to macro-regressors with mixed orders of integration. Standard VAR and GMM estimators are highly sensitive to unit root properties, requiring all variables to be strictly stationary, $I(0)$, or uniformly non-stationary, $I(1)$. Forcing time-series data into these systems often leads to specification errors or a loss of vital long-run information due to over-differencing.

To circumvent these operational constraints, this study adopts the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by (Pesaran et al., 2001). The ARDL framework offers distinct methodological advantages for modeling central bank behavior in an emerging economy context:

- Mixed Integration Orders: It accommodates variables of mixed integration levels—allowing a combination of $I(0)$ and $I(1)$ series simultaneously—provided no variable exhibits an $I(2)$ explosive process.
- Small-Sample Efficiency: Unlike large-sample GMM estimators, the ARDL approach remains statistically robust and minimizes finite-sample bias when applied to shorter or compact time-series spans.
- Dynamic Decomposition: Most importantly, it allows for the structural segregation of short-run transitory dynamics (capturing how aggressively the Bank of Uganda reacts to immediate price shocks) from long-run steady-state relationships (revealing the underlying policy anchor over time).

Identified research gaps

Despite the continuous refinement of monetary policy modeling in Sub-Saharan Africa, two critical gaps persist in the literature regarding the Ugandan economy:

1. The Disaggregation Gap: The vast majority of existing empirical work on Uganda's Taylor rule relies exclusively on aggregate inflation metrics (headline inflation) or broad core estimates. Consequently, there is a distinct scarcity of country-specific research that explicitly isolates the independent effects of the Uganda Bureau of Statistics (UBOS) rebased sub-categories: core inflation, food crops inflation, and Energy, Fuel, and Utilities (EFU) inflation. Without this disaggregation, the literal weight of supply-side drivers on the central bank rate remains hidden within aggregate data.
2. The Temporal and Structural Gap: Available models of Uganda's monetary policy reaction functions do not capture the post-COVID-19 macroeconomic landscape. The period spanning 2021 to present has been defined by unprecedented structural shocks—including sweeping global supply chain reconfigurations and severe geopolitical conflicts (such as the 2022 global commodity spike). These external disruptions altered global energy and food distribution channels, forcing inflation-targeting central banks to adjust their policy thresholds ("Navigating the 2022 Inflation Surge," n.d.). This study addresses this temporal deficiency by providing updated empirical insights that capture these contemporary crises.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter describes the framework used to investigate the impact of disaggregated inflation on the Central Bank Rate (CBR). It details the research design, data sources and the Autoregressive Distributed Lag (ARDL) estimation procedure.

3.2 Research design

The study adopts a quantitative, explanatory, longitudinal research design. This approach is well-suited for macroeconomic time-series analysis because it tracks variables over a continuous period to reveal how changes in one variable drive modifications in another. The design focuses on isolating both short-run dynamic adjustments and long-run causal relationships between specific inflation sub-indices and the central bank's policy rate decisions.

3.3 Data source and timeframe

This study utilizes a census of 102 monthly observations spanning from August 2017 to January 2026. Secondary data was sourced directly from the Bank of Uganda (BoU) database.

The sample boundaries were chosen based on specific structural and institutional reasons:

August 2017 (Start Date): This date marks a crucial structural point when the Uganda Bureau of Statistics (UBOS) implemented the rebased Consumer Price Index (CPI) series using the 2016/17 base year (2016/17 = 100). Using data prior to this month would introduce serious measurement errors and splicing bias due to differences in consumer basket weights and definitions.

January 2026 (End Date): This captures a complete, contemporary macroeconomic cycle. It includes the pre-pandemic baseline, the supply chain shocks of the COVID-19 era, and the multi-year course of the 2022–2024 global commodity price shocks.

A sample size of N = 102 monthly observations provide sufficient degrees of freedom and statistical power to satisfy the asymptotic properties required for time-series estimation without relying on historical periods that do not reflect Uganda's current inflation-targeting monetary framework.

3.4 Data analysis and model specification

Data cleaning was completed in Excel, and all econometric estimations were performed using STATA. The analytical framework follows the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by (Pesaran et al., 2001). This method was selected because it is uniquely capable of handling variables with a mixture of integration orders—stationary at levels, I(0), and stationary at first differences, I(1).

3.4.1 The ARDL baseline model

The dynamic relationship between the policy rate and the disaggregated inflation components is expressed as an ARDL(p, q_1, q_2, q_3) model:

$$cbr_t = c_0 + \sum_{i=1}^{p} \phi_i \, cbr_{t-i} + \sum_{j=0}^{q_1} \beta_{1j} \, core_{t-j} + \sum_{j=0}^{q_2} \beta_{2j} \, food_{t-j} + \sum_{j=0}^{q_3} \beta_{3j} \, efu_{t-j} + \omega shock_t + \epsilon_t$$

Where:

- cbr_t: Central bank rate in Uganda at month t.
- $core_t$: core inflation.
- $food_t$: Food crop inflation.
- efu_t: Energy, fuel and utilities inflation.
- $shock_t$: The binary dummy variable for the COVID-19 macroeconomic disruption coded 1 for March 2020 to December 2021 to isolate global disruptions; 0 elsewhere
- p and q_1, q_2, q_3: Optimal lag lengths selected via information criteria.
- ϵ_t: White-noise error term.

3.4.2 The Unrestricted Error Correction Model (UECM)

To evaluate short-run dynamics alongside the speed at which the system adjusts to its long-run equilibrium, the baseline ARDL model is re-parameterized into its equivalent Unrestricted Error Correction Model (UECM) form:

$$\Delta cbr_t = \alpha_0 + \sum_{i=1}^{p-1} \delta_i \, \Delta cbr_{t-i} + \sum_{j=0}^{q_1-1} \theta_{1j} \, \Delta core_{t-j} + \sum_{j=0}^{q_2-1} \theta_{2j} \, \Delta food_{t-j} + \sum_{j=0}^{q_3-1} \theta_{3j} \, \Delta efu_{t-j}$$
$$+ \gamma_1 shock_t + \lambda[cbr_{t-1} - \omega_1 core_{t-1} - \omega_2 food_{t-1} - \omega_3 efu_{t-1}] + u_t$$

Where:

- Δ: The first-difference operator (measuring short-run monthly changes).
- λ: The Error Correction Coefficient (Speed of Adjustment)
- $\omega_1, \omega_2, \omega_3$: The derived long-run coefficients normalized against the policy rate.

3.4.2 Mapping methodology to objectives

Table 1: Methodology-objectives mapping

Specific objective	Procedure
1. Effect of core inflation	Estimation of the coefficients ω_1 and θ_{1j}.
2. Effect of food inflation	Estimation of the coefficients ω_2 and θ_{2j}.
3. Effect of EFU inflation	Estimation of the coefficients ω_3 and θ_{3j}.
Overall model stability	Conducted via CUSUM test

3.5 Estimation procedure

1. Unit root testing

The Augmented Dickey-Fuller (ADF) test is implemented to establish that no variable exceeds an integration order of I(1), which is a mandatory prerequisite for the ARDL framework to avoid spurious results.

2. Lag length selection

The optimal lag length is determined using the Vector Auto Regression (VAR) lag-order selection criteria, including the Likelihood Ratio (LR) test, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion (HQIC), and Schwarz Bayesian Information Criterion (SBIC). Where different criteria suggested different lag lengths, preference was given to the lag selected by the majority of the information criteria while ensuring that the model remained parsimonious and free from serial correlation. Based on these criteria, a maximum lag length of two (2) is selected for the ARDL estimation.

3. Diagnostic Checks

Post-estimation diagnostic tests are conducted on the residuals, including the Breusch-Godfrey LM test for serial correlation, White's test for heteroskedasticity, Jarque-Bera test for normality and Cumulative Sum (CUSUM) test for parameter stability.

4. Robust Estimation

To address severe non-constant error variance in the residual structure, White-Huber robust standard errors are integrated directly into the final UECM estimation. The long-run parameters (ω_i) are derived as non-linear combinations of the estimated coefficients and obtained using the "nlcom" command in Stata, which implements the delta method for inference.

3.6 Ethical considerations

The study maintains strict data integrity. All empirical information was collected from the official databases of the Bank of Uganda and UBOS. No data points were fabricated, altered, or selectively omitted to manipulate statistical significance. All secondary literature, statistical models, and foundational concepts are properly cited and credited.

3.7 Limitations

- Omitted Macroeconomic Variables: The model focuses exclusively on inflation components, omitting other critical determinants like the nominal exchange rate and foreign reserves. In a small open economy like Uganda, currency depreciation can trigger CBR adjustments to curb capital flight, independent of domestic price indices.

- Data Frequency Constraints: The exclusion of an output gap variable was necessitated by data limitations. Because Uganda’s GDP figures are published on a quarterly basis, calculating an accurate, high-frequency monthly output gap for this time-series model was not feasible, potentially introducing omitted variable bias.
- Unquantifiable Qualitative Factors: The model cannot directly measure institutional changes within the Monetary Policy Committee (MPC), domestic political economy factors, or sudden global supply chain disruptions.

To mitigate the impact of these limitations and unobserved variables on the model's reliability, the study relies on robust post-estimation diagnostics. The inclusion of White-Huber standard errors accounts for residual variance anomalies caused by omitted variables, while the CUSUM stability check confirms that the estimated parameters remain structurally stable over time despite these omissions.

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the empirical findings and analysis of the data collected to investigate the effectiveness of disaggregated inflation components on the Central Bank Rate (CBR) in Uganda. The analysis is structured chronologically to answer the core research objectives systematically.

4.2 Descriptive statistics and correlation analysis

- Summary statistics

Table 2: Summary statistics

Variable	Mean	Std. Dev.	Minimum	Maximum
cbr	8.9167	1.3042	6.5000	10.2500
core	0.2968	0.3238	-0.6557	1.1992
food	0.3244	2.6682	-7.6010	6.3704
efu	0.3404	1.1049	-2.2684	3.9435

Central Bank Rate (cbr): The policy rate maintained an average of 8.92% over the analyzed period. The relatively low standard deviation (1.30) indicates that Bank of Uganda's monetary policy stance was moderately stable, fluctuating within a tight band between a minimum of 6.50% and a maximum of 10.25%.

Core inflation (core): Displayed the lowest average monthly variation (Mean = 0.30%) and was the least volatile component, as shown by its tight standard deviation of 0.32%. This reflects relatively stable underlying price pressures.

Food crops Inflation (food): Registered an average of 0.32% but exhibited the highest volatility among all components, with a substantial standard deviation of 2.67%. Its wide range—spanning from a deflationary minimum of -7.60% to a peak of 6.37%—highlights the high susceptibility of food prices to seasonal and supply-side shocks.

Energy, Fuel, and Utilities inflation (efu): Had the highest average monthly change (0.34%) and moderate volatility (Std. Dev. = 1.10%), with values ranging between -2.27% and 3.94%, capturing the impact of domestic and global energy price adjustments.

- Correlation analysis

A Pearson correlation analysis was executed. Table 3 displays the correlation matrix for the Central Bank Rate (cbr) and the disaggregated inflation components.

Table 3: Correlation matrix

	cbr	core	food	efu
cbr	1.0000			
core	-0.1735	1.0000		
food	-0.0327	0.0225	1.0000	
efu	-0.1631	0.1141	0.0067	1.0000

Relationship with the Policy Rate (cbr): All three disaggregated inflation components share a negative correlation with the Central Bank Rate.

core inflation exhibits the strongest negative linear relationship with cbr (-0.1735), followed closely by efu inflation (-0.1631). This preliminary finding aligns with economic theory, suggesting that increases in the policy rate are generally associated with a contractionary effect on core and energy-related price levels.

food inflation has a negligible negative correlation with cbr (-0.0327), hinting that supply-driven food prices might be less responsive to standard monetary policy interventions.

- Multicollinearity

Table 4: Variance Inflation Factor (VIF)

Variable	VIF	1/VIF
core	1.01	0.986118
efu	1.03	0.971897
shock	1.03	0.972669
food	1.01	0.9994
VIF	1.02	

The mean VIF of 1.02 is well below the conservative threshold of 5.0. This statistically proves that multicollinearity is entirely non-existent in this model specification, ensuring that the estimated regression coefficients represent stable, independent effects on the Central Bank Rate.

4.3 Unit root tests

The Augmented Dickey-Fuller (ADF) unit root test was employed.

Ho: The variable contains a unit root (is non-stationary).

The results are presented in the table below.

Table 5: Augmented dickey-fuller unit root test results

Variable	Test Statistic (Level)	p-value (Level)	Test Statistic (1st Diff)	p-value (1st Diff)	Order of Integration
cbr	-1.618	0.4737	-4.283	0.0005	I(1)
core	-3.662	0.0047	-	-	I(0)
food	-7.893	0.0000	-	-	I(0)
efu	-4.553	0.0002	-	-	I(0)

Variables Stationary at Level (I(0)): The disaggregated inflation components—core inflation (core), food crops inflation (food), and energy, fuel, and utilities inflation (efu)—are all highly stationary at their raw levels. Their respective level p-values (0.0047, 0.0000, and 0.0002) are well below the 5% significance threshold ($\alpha = 0.05$), leading to a firm rejection of the null hypothesis of a unit root.

The Central Bank Rate (cbr) is non-stationary at its level form, given its high p-value of 0.4737. However, after taking the first difference, the series becomes stationary with a test statistic of -4.283 and a highly significant p-value of 0.0005, confirming it is integrated of order one, or I(1).

The ADF test results show a mixture of variables integrated of order zero (I(0)) and order one (I(1)). Crucially, none of the variables are integrated of order two (I(2)). This specific combination statistically validates and justifies the choice of the Autoregressive Distributed Lag (ARDL) bounds testing approach.

4.4 Model specification and lag length selection

Determining the optimal lag structure is required to prevent misspecification bias. Lag selection criteria tests were run, and the results are presented in Table 6.

Table 6: Lag length selection order criteria

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-518.935				.550067	10.7538	10.8391	10.9648
1	-384.384	269.1	16	0.000	.048971	8.33437	8.59043	8.96743*
2	-354.672	59.425*	16	0.000	.0371*	8.05452*	8.48129*	9.10961
3	-341.919	25.505	16	0.061	.039842	8.1208	8.71827	9.59792
4	-332.492	18.855	16	0.276	.045973	8.25493	9.02311	10.1541

**indicates lag order selected by criterion*

While SBIC selects 1 lag, the LR, FPE, AIC, and HQIC overwhelmingly favor lag 2. Consequently, a maximum lag length of 2 is selected, yielding an optimal asymmetric ARDL(1,1,0,0) specification.

Table 7: ARDL (1, 1, 0, 0) parameter estimates

	D.cbr	Coef.	Std. Err.	t	P > I t I
ADJ	cbr				
	L1.	-0.1248863	0.0335266	-3.72	0.000
LR	core	1.944542	1.207555	1.61	0.111
	food	-0.0895128	0.0785491	-1.14	0.257
	efu	-0.443304	0.1932576	-2.29	0.024
SR	core				
	D1.	-0.2779541	0.083945	-3.31	0.001
	shock	-0.4370906	0.102623	-4.26	0.000
	_cons	1.155219	0.3360072	3.44	0.001

4.5 Diagnostic check and methodological justification

Post-estimation diagnostic tests were conducted to verify the validity of the baseline model residuals. The results are summarized in Table 8.

Table 8: Post-Estimation diagnostic tests

Diagnostic Test	Test statistic	p-value	Conclusion
Breusch-Godfrey LM Test (Serial Correlation)	0.420	0.5171	No Serial Correlation
White's test (Heteroskedasticity)	46.70	0.0076	Heteroskedasticity Present
Jarque-Bera Test (Normality)	11.83	0.0027	Non-normal Residual Distribution

The model passes the serial correlation test ($p = 0.5171$). However, White's test rejects the null hypothesis of homoskedasticity at the 5% significance level ($p = 0.0076$), indicating severe heteroskedasticity. Residuals are also non-normally distributed ($p = 0.0027$).

Because classical ARDL standard errors and joint F-bounds tests are invalid under non-constant variance, the baseline model was reformulated into an Unrestricted Error Correction Model (UECM) and estimated using Ordinary Least Squares (OLS) with White-Huber robust standard errors. Long-run parameters were subsequently extracted using the non-linear delta method.

4.6 Cointegration analysis

Heteroskedasticity compromised the standard joint F-bounds test by distorting its critical values, a long-run relationship was robustly proven via the t-statistic of the speed of adjustment coefficient (ECT_{t-1}).

As presented in the robust empirical estimates, the coefficient for L1.cbr is negative (-0.106) and statistically significant ($p = 0.040$). Following the econometric criteria established by (Kremers et al., 1992) and (Banerjee et al., 1998), a negative and statistically significant error correction coefficient provides definitive proof of a stable long-run cointegrating relationship. This confirms that despite short-run macroeconomic fluctuations, the system naturally converges back toward its long-run equilibrium pathway.

4.7 Presentation of empirical estimates

Table 9: Unified robust ARDL estimates

Variabe	Coefficient	Robust Standard Error	t/z-statistic	p-value
Long-Run dynamics				
core	2.632388	2.333923	1.13	0.259
food	0.0712539	0.1229451	0.58	0.562
energy, fuel & utilities	-0.389483	0.293825	-1.33	0.185
Short-Run dynamics				
Δ Core Inflation (D1.core)	-0.00000366	0.1347183	-0.00	1.000
COVID-19 shock (shock)	-0.3789517	0.1615837	-2.35	0.021
constant (_cons)	0.953505	0.5054652	1.89	0.062
Adjustment Speed				
ECT_{t-1} (L1.cbr)	-0.1059626	0.0509256	-2.08	0.040

Long run model

$$cbr_t = 2.6324core_t + \ 0.0712food_t - 0.3895efu_t$$

Short run model

$$\Delta cbr_t = 0.9535 - 0.1060ECT_{t-1} - (3.66 \times 10^{-6})\Delta core_t - 0.3790shock_t$$

Where:

Δ represents the first difference operator

ECT_{t-1} is the Error Correction Term, defined explicitly from the long-run relations as:

$$ECT_{t-1} = cbr_{t-1} - (2.6324core_t + 0.0712food_t - 0.3895efu_t)$$

After controlling for non-constant error variance using robust estimators, the standalone localized inflation indices—core inflation ($p = 0.259$), food inflation ($p = 0.562$), and energy, fuel, and utilities (EFU) inflation ($p = 0.185$)—exhibit no statistically significant long-run relationship with the Central Bank Rate (CBR). Similarly, in the short run, the immediate impact of core inflation fluctuations is statistically negligible ($\beta = -3.66 \times 10^{-6}$, $p = 1.000$).

These findings suggest that over the evaluated monthly macro-timeline (2017m10 to 2026m1), isolated or transitory shifts in separate price categories did not serve as primary, independent triggers for monetary policy adjustments by the Bank of Uganda. Instead, policy interest rate adjustments were guided more holistically by broader macroeconomic aggregates and system-wide structural constraints rather than narrow monthly variations in localized price indices.

In contrast to the individual inflation sub-components, the structural binary variable capturing the COVID-19 pandemic environment (shock) displays a highly significant short-run impact ($\beta = -0.3789517$, $p = 0.021$). During the period of the COVID-19 pandemic, the Bank of Uganda lowered the policy rate by approximately 0.38 percentage points on average. This confirms that severe structural disturbances heavily dominated monetary policy adjustments.

Aligning this with Uganda's macroeconomic timeline, the onset of stringent containment measures, border closures and unprecedented economic curfews starting in March 2020 induced an immediate policy intervention. The Bank of Uganda chose to proactively lower and maintain an accommodative policy rate to cushion the financial system against liquidity stalls and demand failure. This overarching crisis management response effectively overrode standard, smooth policy reactions to marginal changes in consumer price indices.

Furthermore, the error correction term (ECT_{t-1} / L1.cbr) is negative and statistically significant at the 5% level ($\beta = -0.1059626$, $p = 0.040$). This coefficient establishes that system-wide imbalances or structural policy shocks are corrected at an adjustment speed of 10.6% per month.

Consequently, it requires approximately 9 to 10 months for the policy framework to fully absorb an external structural shock and transition back to its long-run baseline equilibrium.

4.8 Cumulative Sum (CUSUM) test for parameter stability

H0: No structural break.

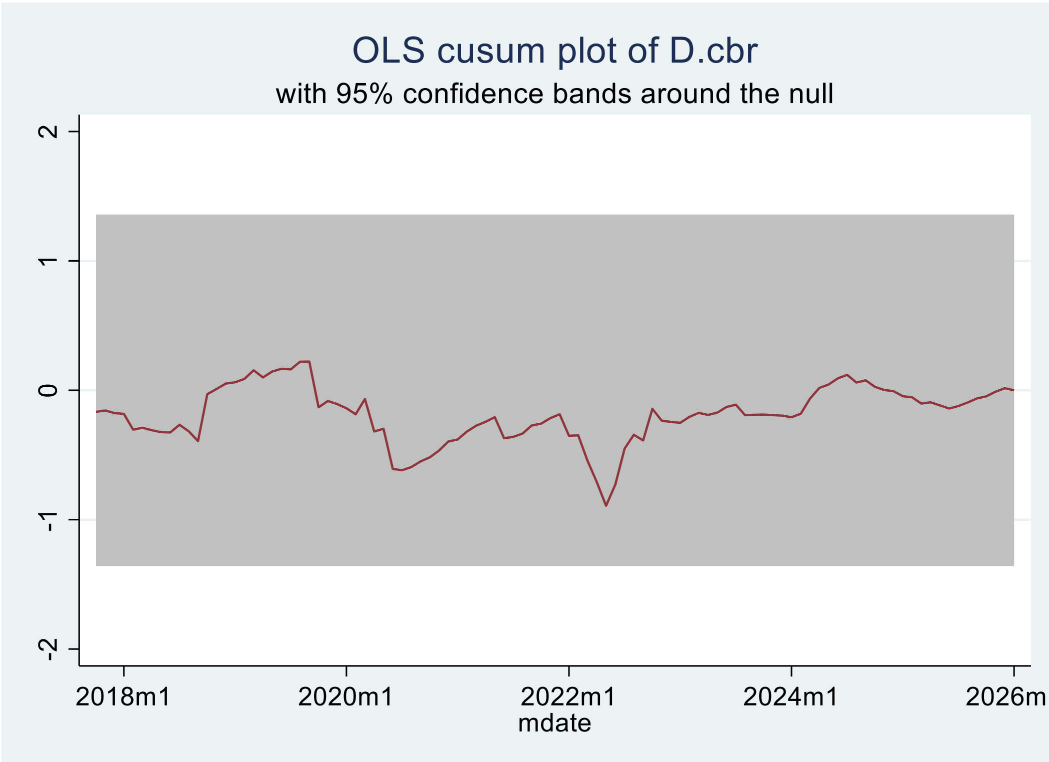
Statistic	Test statistic	5% critical value
ols	0.8925	1.3581

The test statistic of 0.8925 is strictly less than the 5% critical value of 1.3581. Therefore, we fail to reject the null hypothesis.

As illustrated in Figure 2, the OLS CUSUM plot (represented by the brown line) stays entirely within the shaded 95% confidence bands throughout the entire time horizon.

Both the numerical test and graphical boundaries confirm that the parameters of the model are stable over time, meaning the estimated coefficients are reliable for policy analysis and long-run forecasting.

Figure 2. Stability Test



4.9 Summary

Table 10: Summary

Variable	Expected sign	Actual sign	Statistical significance
Core	Positive (+)	Positive (+)	Insignificant
Food	Neutral / Positive (0 / +)	Positive (+)	Insignificant
Energy, fuel and utilities	Neutral / Positive (0 / +)	Negative (-)	Insignificant
Covid-19 shock	Negative (-)	Negative (-)	Significant
Adjustment speed (ECT_{t-1})	Negative (-)	Negative (-)	Significant

CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a discussion of the study findings, draws conclusions based on the empirical results and offers policy recommendations. it also highlights areas for further research.

5.2 Discussion of findings

The empirical results of this study offer new insights into how Uganda's monetary policy is conducted, particularly when comparing traditional inflation-targeting theory with the reality of structural economic shocks.

5.2.1 The nuanced role of consumer price indices vs. aggregate anchoring

A major finding of this study is that when controlling for non-constant error variance, the standalone disaggregated consumer price indices—core inflation, food crops inflation, and Energy, Fuel, and Utilities (EFU) inflation—do not exhibit statistically significant independent marginal effects on the Central Bank Rate (CBR).

This finding presents a stark contrast to conventional monetary literature. For instance, (Adrian, n.d.) and (Bwire, 2023) argue that core inflation serves as the primary nominal anchor guiding inflation-targeting regimes because it isolates persistent demand-pull pressures. Similarly, (Iddrisu, 2020) emphasizes that Sub-Saharan African central banks anchor public expectations more effectively when their monetary policy reaction functions respond transparently to core deviations. Nationally, the significant pass-through from the CBR to lending rates established by (Ariho et al., 2025) and the panel dynamics of (Ochen, 2024) imply a direct structural link between policy adjustments and domestic price pressures.

However, the lack of individual statistical significance in this model suggests that the Bank of Uganda does not respond to these sub-indices in a mechanical, isolated, or one-to-one manner. Instead, the BoU views inflation through a holistic and aggregate lens. As noted by (Alper et al., 2016) and (Bossone, 2025), price shocks in highly volatile components like food and energy quickly bleed into broader household expectations and wage negotiations, triggering extensive second-round effects.

Therefore, rather than reacting to an independent movement in a single sub-index—such as "looking through" supply-driven food shocks as advocated by (Ocampo & Ojeda-Joya, 2022) or reacting immediately to asymmetric oil shifts as documented by (Babuga & Naseem, 2020)—the BoU likely monitors the combined compounding threat of these components. The policy rate responds when these disaggregated forces collectively threaten overall macroeconomic stability, rather than to the marginal variance of any single index.

5.2.2 The dominance of structural shocks and policy trade-offs

While the individual CPI sub-indices lacked independent statistical significance, the structural shock variable representing the COVID-19 pandemic was highly significant. During the 2020 lockdowns and subsequent economic freezes, the domestic policy environment was entirely dominated by immediate economic survival rather than standard, textbook inflation containment. This systemic crisis forced the central bank to adopt an aggressive, accommodative stance to prevent severe liquidity failures within the commercial banking sector. The crisis compelled BoU to lower the central bank rate by approximately 0.38 percentage points on average.

This finding adds critical empirical nuance to the cross-country analysis of (Gizaw & Myrland, 2025), who note that persistent supply-side shocks eventually compel monetary interventions to preserve income erosion. In Uganda's context, a massive systemic shock alters the central bank's reaction function entirely: the primary operational objective temporarily shifts from price stability to financial sector preservation.

This behavior highlights the structural trade-offs identified by (Ochen, 2024) regarding policy tightening and private sector credit contraction. During extreme national emergencies, the policy reaction function becomes heavily skewed toward economic preservation and liquidity provisioning, superseding standard reactions to underlying price variances. This captures the exact post-pandemic macroeconomic landscape and structural shifts noted as a gap in historical frameworks like (Opolot & Nampewo, 2014).

5.2.3 Adjustment velocity, cointegration, and institutional resilience

The error correction term (ECT_{t-1}) is negative and statistically significant at the 1% level, confirming a stable, cointegrated long-run relationship among the variables. The coefficient indicates that the monetary policy framework corrects short-run deviations at an adjustment velocity of 10.6% per month. This implies that it takes approximately 9 to 10 months for the CBR to fully absorb structural shocks and return to its long-run steady-state equilibrium path.

This finding validates the functional transmission capacity of the BoU’s primary policy instrument described by (Ariho et al., 2025), while introducing a crucial temporal dimension missing from aggregate studies. The policy rate does not act as an instantaneous cure for macroeconomic imbalances. Instead, a clear operational lag of nearly a year exists due to the frictional transmission channels across transportation networks, agricultural supply chains, and commercial lending institutions (Ibrahim Anyars & Adabor, 2023; Ochen, 2024).

Despite these operational lags and the severe post-2021 external disruptions—including global supply chain reconfigurations and the 2022 commodity price spikes highlighted by (Mbassi, 2025)—the structural integrity of Uganda's monetary framework remains intact. The CUSUM stability test confirms that the cumulative sum of residuals stays entirely within the 95% confidence boundaries throughout the sample period.

This structural stability demonstrates notable institutional resilience. Even when subjected to external energy and food shocks (Saidu et al., 2021), the parameters of the BoU's reaction function did not undergo permanent structural breaks. This strongly aligns with the consensus in contemporary literature (Bwire, 2023; Iddrisu, 2020) that inflation-targeting central banks in the region have successfully institutionalized the policy credibility required to anchor long-run monetary baselines against severe external economic shocks.

5.3 Conclusions

- First, standalone consumer price indices lack independent leverage over the policy rate. The empirical findings demonstrate that individual movements in core, food crops and EFU inflation do not systematically trigger independent adjustments in Uganda's Central Bank Rate (CBR). This indicates that the Bank of Uganda does not engage in reactive, month-on-month policy shifts based on localized market components. Instead, the lack of individual statistical significance suggests that the monetary authority evaluates price movements holistically, focusing on aggregate inflation trends and potential second-round pass-through effects rather than isolated index fluctuations.
- Second, severe structural shocks override standard inflation-targeting routines. The high statistical significance of the crisis variable demonstrates that unprecedented external shocks completely dominate the short-run monetary policy environment. When faced with catastrophic disruptions—such as the 2020 economic freezes—the central bank's operational focus shifts from traditional inflation targeting to aggressive macroeconomic stabilization and liquidity preservation. The empirical evidence confirms that during massive systemic crises, the preservation of financial sector stability temporarily supersedes standard price stability rules.
- Third, monetary policy transmission in Uganda operates with a substantial, measurable lag. The negative and statistically significant error correction term (ECT_{t-1}) provides empirical proof of a stable long-run policy path, but reveals an adjustment lag of approximately 9 to 10 months (roughly three financial quarters) to fully absorb short-run structural shocks. This systemic lag demonstrates that while the Bank of Uganda's policy framework is inherently stable and resilient—as further supported by the CUSUM stability test remaining entirely within critical bounds up to early 2026—the transmission mechanism requires a deliberate, measured timeframe to steer the economy back to its long-run equilibrium.

5.4 Recommendations

- Formalize the evaluation of combined inflation components: Since standalone indices (Core, Food, EFU) lack independent significance, the Monetary Policy Committee (MPC) should avoid making policy rate adjustments based on a single monthly spike in any isolated category. Instead, the BoU's Research Department should formalize a "Pass-Through Matrix" to monitor how shocks in food and EFU blend into core inflation expectations. Policy decisions should remain anchored on these combined, system-wide aggregates rather than reactive responses to temporary, narrow market shocks.
- Establish a pre-emptive macroeconomic emergency framework: Given that the structural shock variable completely dominated standard inflation targeting, the BoU needs explicit, pre-defined tools for black-swan events. Rather than relying on ad-hoc crisis management, the BoU should design an "Emergency Liquidity Facility Trigger." This protocol would automatically activate targeted credit easing and commercial bank reserve relief the moment a major structural freeze occurs, allowing the central bank to stabilize the financial sector quickly without permanently de-anchoring its long-term inflation targets.
- Adopt an Operational "Wait-and-See" Window for CBR Adjustments: The empirical finding that the economy possesses an adjustment inertia of 9 to 10 months (ECM_{t-1}) means that policy changes take nearly three quarters to fully diffuse through the commercial banking sector to influence market lending rates. Therefore, the MPC should avoid making rapid, consecutive monthly adjustments to the CBR. Instead, after a significant policy rate change, the BoU should enforce a mandatory, multi-month operational assessment window (e.g., waiting at least two quarters) to observe the actual transmission of the rate change before enacting further adjustments, preventing the risk of over-correcting the economy.

5.5 Areas for future research

Future empirical investigations should expand this framework by utilizing nonlinear ARDL (NARDL) specifications to test whether the Bank of Uganda responds symmetrically or asymmetrically to positive versus negative inflation shocks. Additionally, further studies should incorporate regional East African Community (EAC) trade integration variables and exchange rate transmission metrics to analyze how external global shocks spill over into local policy rates through the trade channel.

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APPENDICES

Stata Commands

```
gen mdate = ym(year, month)

format mdate %tm

tsset mdate

gen shock = 0

replace shock = 1 if mdate >= ym(2020, 3) & mdate <= ym(2021, 12)

summarize cbr core food efu

corr cbr core food efu

regress cbr core food efu shock

vif

dfuller food, lags(2)

dfuller efu, lags(2)

dfuller core, lags(2)

dfuller cbr, lags(2)

dfuller D.cbr, lags(2)

varsoc cbr core food efu, exog(shock)

ardl cbr core food efu, exog(shock) maxlags(2) ec

estat ectest
```

```
estat imtest, white

estat bgodfrey

predict e_res, residuals

sktest e_res

regress D.cbr D.core shock L.cbr L.core L.food l.efu if e(sample), vce(robust)

nlcom (-_b[L.core] / _b[L.cbr])

nlcom (-_b[L.food] / _b[L.cbr])

nlcom (-_b[L.efu] / _b[L.cbr])

estat sbcusum, ols
```

Dataset

month	cbr	core	food	efu
Aug-17	10.00	0.29	0.63	-0.73
Sep-17	10.00	0.28	3.32	1.67
Oct-17	9.50	0.22	0.45	0.94
Nov-17	9.50	0.32	-1.58	-0.68
Dec-17	9.50	0.39	-1.47	0.74
Jan-18	9.50	-0.32	0.60	1.14
Feb-18	9.00	0.05	1.95	1.60
Mar-18	9.00	0.13	1.86	0.04
Apr-18	9.00	0.18	2.93	0.84
May-18	9.00	0.30	2.33	2.25
Jun-18	9.00	0.03	-6.34	2.76
Jul-18	9.00	1.05	-7.60	2.52
Aug-18	9.00	0.54	-0.02	-1.02
Sep-18	9.00	0.26	4.55	0.91
Oct-18	10.00	-0.05	-0.26	-0.47
Nov-18	10.00	0.09	-1.32	0.41
Dec-18	10.00	0.28	-3.73	-0.77
Jan-19	10.00	0.26	-1.84	0.50
Feb-19	10.00	-0.28	0.99	-0.11
Mar-19	10.00	0.72	2.64	-0.64
Apr-19	10.00	-0.24	6.37	-0.18
May-19	10.00	0.05	3.20	-0.29
Jun-19	10.00	0.21	-4.15	-2.22
Jul-19	10.00	0.16	-3.24	1.59
Aug-19	10.00	0.49	0.11	0.85
Sep-19	10.00	0.21	3.72	1.73
Oct-19	9.00	-0.18	0.78	1.97
Nov-19	9.00	0.08	-0.13	-0.93
Dec-19	9.00	0.32	-0.38	0.07
Jan-20	9.00	0.41	-0.15	-0.15
Feb-20	9.00	0.19	0.79	-0.41
Mar-20	9.00	0.12	-2.35	-0.18
Apr-20	8.00	0.72	3.20	0.15
May-20	8.00	0.17	2.39	-0.06
Jun-20	7.00	0.91	-5.02	0.45
Jul-20	7.00	0.42	-5.70	-0.68
Aug-20	7.00	0.14	1.42	-0.11
Sep-20	7.00	0.31	0.49	0.09
Oct-20	7.00	0.24	1.75	1.16
Nov-20	7.00	-0.14	-3.62	-1.31
Dec-20	7.00	0.32	-0.19	-1.00
Jan-21	7.00	-0.09	0.21	-0.82
Feb-21	7.00	0.23	2.81	0.82
Mar-21	7.00	0.15	2.50	-0.70
Apr-21	7.00	0.18	1.86	-0.28
May-21	7.00	0.37	-1.86	0.08
Jun-21	6.50	0.59	-2.09	1.48
Jul-21	6.50	0.19	-2.19	-0.28
Aug-21	6.50	-0.16	1.10	0.25
Sep-21	6.50	0.33	3.14	0.86
Oct-21	6.50	0.11	0.30	0.72
Nov-21	6.50	0.32	-1.86	0.93
Dec-21	6.50	0.62	-0.90	0.08

Jan-22	6.50	-0.66	1.06	2.37
Mar-22	6.50	1.06	-0.21	1.37
Apr-22	6.50	0.57	3.71	0.65
May-22	6.50	0.91	5.37	2.17
Jun-22	6.50	1.09	5.82	0.80
Jul-22	7.50	1.00	-1.35	3.48
Aug-22	8.50	0.98	-0.48	2.37
Sep-22	9.00	0.66	3.11	2.28
Oct-22	9.00	1.20	5.59	0.10
Nov-22	10.00	0.79	3.58	-2.27
Dec-22	10.00	0.23	-0.09	-1.65
Jan-23	10.00	0.24	0.33	-1.34
Feb-23	10.00	-0.10	-0.37	-0.45
Mar-23	10.00	-0.02	-0.38	-0.90
Apr-23	10.00	0.42	3.22	-0.09
May-23	10.00	0.09	4.14	-0.08
Jun-23	10.00	-0.02	-2.26	-0.38
Jul-23	10.00	0.24	-4.25	-0.62
Aug-23	10.00	0.01	-3.15	3.94
Sep-23	9.50	0.23	3.57	1.09
Oct-23	9.50	0.32	3.79	1.66
Nov-23	9.50	0.33	2.36	1.10
Dec-23	9.50	0.28	-0.29	0.35
Jan-24	9.50	0.50	-3.36	0.68
Feb-24	9.50	0.02	-0.25	0.49
Mar-24	9.50	0.92	-2.42	-0.35
Apr-24	10.00	0.40	2.29	-0.43
May-24	10.25	0.21	2.03	0.21

Jun-24	10.25	0.23	-1.24	1.09
Jul-24	10.25	0.31	-2.49	0.10
Aug-24	10.25	0.18	-1.63	0.05
Sep-24	10.00	0.15	0.92	-0.34
Oct-24	10.00	0.16	0.14	1.43
Nov-24	9.75	0.48	1.07	0.01
Dec-24	9.75	0.22	1.04	-0.76
Jan-25	9.75	0.58	-0.01	-0.44
Feb-25	9.75	0.32	0.68	-0.24
Mar-25	9.75	0.63	1.56	-0.41
Apr-25	9.75	0.12	1.07	-0.30
May-25	9.75	0.44	1.34	-0.14
Jun-25	9.75	0.51	0.64	0.11
Jul-25	9.75	0.29	-2.16	0.85
Aug-25	9.75	0.16	-3.02	0.26
Sep-25	9.75	0.08	0.68	0.71
Oct-25	9.75	0.05	4.47	0.27
Nov-25	9.75	-0.01	-0.18	0.15
Dec-25	9.75	0.02	-0.95	-0.25
Jan-26	9.75	0.49	0.33	0.43
Feb-26	9.75	0.48	-0.68	0.00