IMPACT OF INFLATION TARGETING ON INFLATION IN LOW-INCOME ECONOMIES: Evidence from Uganda

Kiberu Brian, Nyang`oro Owen and Nyandemo Misati Samuel

University of Nairobi, Nairobi, Kenya

ABSTRACT

This study examines the effectiveness of the inflation targeting (IT) framework in reducing inflation, inflation volatility, inflation persistence, and inflation bias in a low-income economy, focusing on Uganda, which adopted IT in 2011. Using quarterly data from 2001Q1 to 2025Q1, the study employs a New Keynesian dynamic stochastic general equilibrium model that incorporates labour market segmentation, fiscal-monetary interactions, informality, and dollarization to estimate the model for pre-IT and post-IT periods. The findings show that IT significantly reduced inflation, cumulative inflation deviations, and inflation volatility, although inflation persistence remained elevated for some shocks. The framework also reduced the inflation bias gap and enhanced the central bank's response to inflation deviations. However, fiscal dominance continues to limit the full effectiveness of IT, with fiscal shocks becoming a prominent driver of inflation volatility after the framework's adoption.

Keywords: Inflation targeting, inflation bias, monetary policy effectiveness, DSGE model

JEL classification: E52, E63, E31, O23, E58, C11

1. Introduction

Inflation targeting (IT) has become a major monetary policy framework in developed and developing economies seeking to stabilize prices and manage inflation expectations. However, rigidities such as high debt, fiscal dominance (Ahmed et al., 2021), and dollarization (Koráb et al., 2023; Ogrokhina & Rodriguez, 2024), as well as regular supply and demand shocks and a vulnerable financial sector (Carare et al., 2023), continue to constrain its effectiveness.

Between 1970 and 1986, Uganda experienced multiple wars and coups (Mutebi, 2008) that significantly impacted the economy's performance. After 1986, inflation persisted for the next five years, ranging from 19.8% to 65.4% between 1988 and 1991 (Kuteesa et al., 2010). The Government of Uganda (GoU) implemented liberalization programmes under the supervision of the International Monetary Fund and the World Bank. These included liberalization, currency reforms, privatization, financial reforms, and the revision of the Bank of Uganda (BOU) Act (2000). The Act strengthened the central bank's independence in monetary policy management. Its primary objective was to achieve and preserve economic stability. The BOU adopted an IT framework in 2011, shifting from monetary targeting. The IT framework is a forward-looking regime based on regular inflation forecasts, frequent communication, independence in setting the policy rate, and a medium-term target of 5% for annual core inflation (Brownbridge & Kasekende, 2018). Uganda’s inflation trends are also influenced by several factors beyond the monetary policy regime, including global inflation trends, commodity price cycles (especially oil), exchange rate trends, foreign direct investment (FDI) flows and aid inflows.

Although advocates such as Mishkin (2000) and Walsh (2009) have long promoted the framework as a credible monetary policy regime for stabilizing inflation, the conventional IT model presupposes a set of ideal institutional and economic conditions, including low or absent fiscal dominance, minimal dollarization, deep and well-functioning financial markets, and a highly independent and transparent central bank.

Studies on Uganda (Brownbridge & Kasekende, 2018; Okello & Opolot, 2020) show that the framework improved inflation outcomes. However, the studies relied on reduced-form econometric techniques, including VAR, ARDL and panel approaches, which do not comprehensively capture the interactions among the frictions.

This paper contributes to the literature by modelling the 2011 policy regime shift as an explicit structural break in a DSGE framework that jointly integrates fiscal dominance, dollarization, informality, labour-market segmentation, and exchange-rate pass-through within a unified micro-founded structure, while isolating the marginal contribution of the regime change and measuring the implications for inflation outcomes.

2. Literature Review

The theoretical foundation of IT is rooted in its ability to address inflation bias, which refers to the average inflation above the socially desirable level. Kydland and Prescott (1977) observed that policymakers exploit the inflation-output trade-off in the short run by adopting expansionary policies to raise output above its potential level. Rogoff (1985) proposed the conservative banker approach to address the inflation bias. The approach involves "entrusting monetary policy to an independent conservative bank that puts a lower premium on employment stability than society" (Rogoff, 1985). While this solution eliminates inflation bias, it introduces another problem: stabilization bias (excessive variability in employment and output) (Svensson, 1997). Walsh (1995) proposed a contract that penalizes deviations from the target inflation rate while rewarding adherence. While the approach offsets the inflation bias, it faces practical and political difficulties (the linear cost to the banker is monetary, whereas the rest of the loss function is in utility units). The proposed contract faced political difficulties as it increased monetary benefits for the governor or board during periods of low inflation, a provision that may be perceived as offensive by the public if associated with increased unemployment.

Svensson (1997) proposed IT to mitigate the inflation and stabilization biases while avoiding the political and practical difficulties associated with Walsh's approach. The Svensson theory involves delegating monetary policy to a central bank governed by a conservative banker tasked with achieving a legislated inflation target. Accordingly, the conservative central bank eliminates the stabilization bias, while an appropriate inflation target eliminates the average and state-contingent inflation bias.

Recent studies show that IT can reduce inflation persistence, volatility, and bias when supportive institutional conditions are present (Bianchi et al., 2023; Carare et al., 2023; Mishkin & Kiley, 2025). A conducive environment must include an institutional framework that supports an autonomous central bank, price stability as the primary goal of monetary policy, well-developed financial markets, and transparent, central bank independence (Mishkin, 2000; Nair et al., 2025). The policy environment should be free of fiscal dominance (Blanchard, 2004; Bianchi et al., 2023), with structures in place to tame fiscal policy (Masson et al., 1997; Montes & Dantas, 2025; Mishkin & Kiley, 2025). The country's financial system must also be strong, and there should be no significant degree of (i.e., partial) dollarization (Mishkin, 2000; Lin & Ye, 2013).

Contrary to the above, low-income economies operate in environments characterized by exchange rate vulnerability, weak institutional credibility, fiscal dominance, dollarization, and high informality, all of which constrain the transmission of monetary policy to inflation outcomes. Early studies, including Bernanke et al. (1999), Ball and Sheridan (2003), and Mishkin and Schmidt-Hebbel (2007), and recent studies, including Fratzscher et al. (2020), confirm that countries that have adopted IT generally experience lower inflation, while Aye et al. (2020) observed that IT has no statistically significant influence on inflation. Angeriz and Arestis (2006) and Baxa et al. (2014) report inconclusive outcomes. Beyond the binary findings on whether IT is effective or ineffective in taming inflation, recent studies have shown that the framework's effectiveness depends on prevailing structural conditions. High exchange-rate pass-through and dollarization affect the ability of the central banks to anchor inflation expectations (Koráb et al., 2023; Ogrokhina & Rodriguez, 2024). Mishkin and Kiley (2025) found that external objectives constrain the framework in countries with high debt.

In South Africa, while the framework has successfully anchored inflation expectations, it has been affected by persistent supply-side pressures (Burger, 2025; Bricco et al., 2025). In Mauritius, the framework has been hindered by high import inflation and exchange rate pass-through (Pampusa et al., 2025). Tweneboah and Alagidede (2019) found that IT does not affect inflation in contexts similar to Ghana's. Musa and Sanusi (2020) show that interest rate changes, which are the main tool under IT, may lead to exchange rate depreciation rather than appreciation, contradicting the standard exchange rate channel of monetary policy.

Ojike et al. (2021) found that the monetary policy rate exerts a significant negative impact on external reserves, while the cash reserve ratio has a positive effect. This finding aligns with that of Okwori and Abu (2018), who found that both monetary and fiscal policies exert statistically insignificant effects on inflationary recession, revealing weak complementarity between the two policy arms. Goshit and Iorember (2020) found pronounced asymmetries in the pass-through of the monetary policy rate (MPR) to unemployment. While tightening of the MPR exerts a large, positive, elastic, and statistically significant long-run effect, easing produces only a small, inelastic, and insignificant reduction (incomplete pass-through). Cumulative tightening effects dominate, revealing important nonlinear frictions and weaknesses in the interest-rate transmission channel in a developing-economy setting.

Onanuga and Tella (2018) observed a unidirectional short-run relationship in which the monetary policy rate and treasury bill rate influence foreign portfolio investment (FPI) inflows (with FPI responding to monetary policy shocks), alongside long-run cointegration between FPI and the treasury bill rate but no overall long-run equilibrium between monetary policy and FPI, illustrating the importance of accounting for short-run capital-flow dynamics when setting policy rates.

These experiences show that the framework's success in achieving inflation outcomes depends on prevailing conditions in a given economy, beyond the formal adoption of the regime alone. Uganda presents an important case study because the economy simultaneously exhibits several structural rigidities. These include high informality, shallow financial markets, exchange-rate vulnerability, fiscal pressures, labour-market segmentation, and partial dollarization. Brownbridge and Kasekende (2018) found that IT was successful in stabilizing inflation rates within targeted levels in Uganda. Okello and Opolot (2020) found that IT reduced inflation persistence and volatility in Uganda.

Against this background, an important research gap remains. The literature falls short in explaining why IT outcomes differ across low-income economies with different structural rigidities. Existing studies do not jointly integrate the multiple rigidities within a unified structural framework.

3. Methodology

3.1 Model specification

In line with the foundational work of Calvo (1983) and Rotemberg (1987), the present study utilizes a modern New Keynesian Dynamic Stochastic General Equilibrium (DSGE) framework characterized by nominal rigidities, micro-founded optimization, and forward-looking expectations. The model is extended to incorporate recent advances (Bianchi et al., 2023; Carare et al., 2023; Iania et al., 2023; Koráb et al., 2023; Mishkin & Kiley, 2025; Gupta, 2024; Nair et al., 2025; Ogrokhina & Rodriguez, 2024) in DSGE modelling that account for structural factors constraining monetary policy. The model assumes the presence of monopolistic competition, Calvo price stickiness, segmented labour markets, and non-neutral monetary policy in the short run.

3.1.1 *Household Preferences and Consumption*

A representative household maximizes expected lifetime utility.

$$U_t = \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \left[\frac{(C_t - \chi C_{t-1})^{1-\sigma_c}}{1-\sigma_c} - \frac{H_{t+s}^{1+\varphi}}{1+\varphi} \right] \quad (1)$$

where:

C_t = consumption

H_t = total labour supply

β = discount factor

σ_c = relative risk aversion coefficient

χ = habit persistence parameter

φ = inverse Frisch elasticity

The marginal utility of consumption (UC_t) and labour (UH_t) are derived as follows:

$$UC_t = (1-\varrho)(1-\sigma_c)\left(\frac{C_t}{1-\chi} - \frac{\chi C_{t-1}}{1-\chi}\right)^{-\sigma_c} + \varrho(\sigma_c - 1)\frac{h^{ss}}{1-h^{ss}}H_t \quad (2)$$

$$UC_{t+1} = UC_t - R_{t+1} \quad (3)$$

$$UH_t = -UC_t - \left(\frac{C_t}{1-\chi} - \frac{\chi C_{t-1}}{1-\chi}\right) - \frac{h^{ss}}{1-h^{ss}}H_t \quad (4)$$

$$W_t = -UH_t - UC_t \quad (5)$$

where: R_t is the real interest rate, h^{ss} is the steady-state labour supply (calibrated at 0.33) and ϱ is the labour disutility weight computed as follows:

$$\varrho = \frac{1-h^{ss}}{1+h^{ss}(c^y(1-\chi)/\propto -1)} \quad (6)$$

with c^y representing the steady-state consumption to output ratio.

3.1.2 *Labour Supply and Segmentation*

The labour-supply condition equates the marginal rate of substitution between consumption and leisure to the real wage. Labour-market segmentation between the formal and informal sectors is introduced to capture inefficiencies in allocation (Equations 7 and 8) and wage-setting (Equations 9 and 10). Wage equations take the form:

$$Hform_t = H_t - INFLAB_{SWITCH}.informality_t - INFLAB_{SWITCH}.labour_{gap_t} \quad (7)$$

$$Hinf_t = H_t + INFLAB_{SWITCH}.informality_t + INFLAB_{SWITCH}.labour\_gap_t \quad (8)$$

$$Wform_t = W_t + INFLAB_{SWITCH}.\eta_{wage\_gap}.labour\_gap_t \quad (9)$$

$$Winf_t = W_t - INFLAB_{SWITCH}.\eta_{wage_{gap}}.labour_{gap_t} - INFLAB_{SWITCH}.informality_t \quad (10)$$

where $informality_t$ is an exogenous AR (1) shock to the size of the informal sector (steady-state_ss=0.7), $labour\_gap_t$ is an exogenous labour market slack shock, η_{wage_gap} controls the wage sensitivity to labour slack, and $\psi_{\inf\_mc}$ measures the direct effect of informality on marginal costs. $INFLAB_{SWITCH}$ sets the entire segmentation block to either 1 or 0 for robustness.

3.1.3 *The Firms*

Production

Firms produce using the Cobb-Douglas technology.

$$Y_t = \propto (A_t + Hform_t) + (1-\propto)K_{t-1} - INFLAB_{SWITCH}.\psi_{inf-y}.informality_t - INFLAB_{SWITCH}.\psi_{lab_y}.labour_{gap_t} - DOL_{SWITCH}.\psi_{dol_y}.dol_t - FISCAL_{SWITCH}.\psi_{debt_y}.debt_t \quad (11)$$

where:

Y = output

A_t = technology shock

K_t = capital stock

$\propto$ = labour share

natural output (Y_t^F) uses HF_t and the same additive adjustment terms

Capital Accumulation and Investment

$$K_t = \delta I_t + (1-\delta)K_{t-1} \quad (12)$$

Investment is subject to quadratic adjustment costs. Tobin's Q equations are:

$$X_t = \frac{R^{ss} - 1 + \delta_k}{R^{ss}}(MC_t + Y_t - K_{t-1}) + \frac{1-\delta_k}{R^{ss}}Q_t \quad (13)$$

$$R_{t+1} + prem_{t+1} = X_{t+1} - Q_t \quad (14)$$

$$\left(1+\frac{1}{R^{ss}}\right)I_t = \frac{1}{R^{ss}}\mathbb{E}_t I_{t+1} + I_{t-1} + \frac{1}{2\phi_X}Q_t \qquad (15)$$

where:

I_t = investment,

Q_t = Tobin's Q and

δ = depreciation

ϕ_X = adjustment cost parameter

Marginal Cost

$$\begin{aligned} MC_t \ &= Wform_t + Hform_t - Y_t \\ &+ INFLAB_{SWITCH}.\psi_{lab_{mc}}.informality_t \\ &+ INFLAB_{SWITCH\psi_{lab,mc}}.labour_{gap_t} + DOL.SWITCH.\psi_{dol_{pi}}.dol_t \\ &+ FISCAL_{SWITCH}.\psi_{debt,pi}debt_t \end{aligned} \qquad (16)$$

Structural frictions are introduced through switchable channels. These are activated through binary switches that include: (i) DOL_SWITCH, which captures the effect of dollarization on risk premium, marginal costs, the two Phillips curves, aggregate demand and the monetary policy reaction function; $FISCAL_{SWITCH}$, which captures the influence of public debt dynamics on government spending, taxation, risk premium, marginal costs, the two Phillips curves and the central bank reaction to inflation bias; and $INFLAB_{SWITCH}$, which captures the labour market segmentation and informality which directly enter the marginal costs, production and policy rule functions (Carare et al., 2023).

Price Setting and Inflation Dynamics

Firms set prices with Calvo pricing, where a proportion of firms with probability ξ, partially index to past inflation

Food inflation

$$\pi_t^F = \frac{\beta}{(1+\beta\gamma_{pF}^{eff})}\mathbb{E}_t\pi_{t+1}^F + \frac{\gamma_{pF}^{eff}}{(1+\beta\gamma_{pF}^{eff})}\pi_{t-1}^F + \frac{(1-\beta\xi_F)(1-\xi_F)}{(1+\beta\gamma_{pF}^{eff})}(\lambda_{mc,f}MC_t + \epsilon_{Food,t}) +$$
$$\psi_{\pi f,reer}rer_t + 0.5.DOL_{SWITCH}.\psi_{dol\_pi}.dol_t +$$
$$0.5.INFLAB_{SWITCH}.\psi_{\inf\_pi}.informality_t + 0.5.FISCAL_{SWITCH}.\psi_{debt,pi}debt_t \quad (17)$$

Core (Non-Food) Inflation

$$\begin{aligned}\pi_t^{NF} = {} & \frac{\beta}{(1+\beta\gamma_{pNF}^{eff})}\mathbb{E}_t\pi_{t+1}^{NF} + \frac{\gamma_{pNF}^{eff}}{(1+\beta\gamma_{pNF}^{eff})}\pi_{t-1}^F \\ & + \frac{(1-\beta\xi_{NF})(1-\xi_{NF})}{\left(1+\beta\gamma_{pNF}^{eff}\right)}(\lambda_{mc,nf}MC_t + MS_t + \epsilon_{NFood,t}) \\ & + \psi_{\pi nf,reer}rer_t + DOL_{SWITCH}.\psi_{dol_{pi}}.dol_t \\ & + INFLAB_{SWITCH}.\psi_{\inf\_pi}.informality_t \\ & + FISCAL_{SWITCH}.\psi_{debt,pi}debt_t \qquad (18)\end{aligned}$$

Aggregate inflation

$$\pi_t = w_F\pi_t^F + w_{NF}\pi_t^{NF} \qquad (19)$$

where: π_t is inflation, w_F, w_{NF} are weights for food inflation and non-food inflation, respectively, and κ is the slope of the Phillips curve

Flexible Price Economy

Natural output

$$Y_t^F = \propto (A_t + H_t^F) + (1-\propto)K_{t-1}^F \qquad (20)$$

Adjusted Natural Output

$$Y_t^F = \cdots - \psi_{inf,y} inf_t - \psi_{lab,y} lab_t - \psi_{dol,y} dol_t - \psi_{debt,y} debt_t \qquad (21)$$

Output gap

The welfare-relevant output gap is given by:

$$x_t = Y_t - Y_t^F \qquad (22)$$

Inflation bias

Inflation bias is the extent to which actual inflation exceeds the socially optimal inflation rate.

$$bias_{gap_t} = \pi_t^{NF} - \pi_{target}^{eff} \qquad (23)$$

where:

$bias_{gap_t}$	=	inflation bias,
π_t^{NF}	=	non-food (core) inflation
π_{target}^{eff}	=	regime-specific inflation target rate.

The inflation bias enters both the Phillips curve and the policy rule in order to quantify the impact of IT.

Fiscal Block

Debt Dynamics

$$debt_t = \rho_{Debt} debt_{t-1} + \psi_g G_t - \psi_{tax} tax_t + \varepsilon_t^{Debt} \qquad (24)$$

where:

$debt_t$	=	public debt
G_t	=	government spending
tax_t	=	taxes

External Sector and Dollarization

Dollarization

$$dol_t = \rho_{Dol} dol_{t-1} + \epsilon_{Dol,t} \tag{25}$$

Risk Premium

$$prem_t = \rho_{Prem} prem_{t-1} + DOL_{SWITCH}.\psi_{dol,prem} dol_t + FISCAL_{SWITCH}.\psi_{debt,prem} debt_t \tag{26}$$

Monetary Policy

$$\mathrm{R}_t^n = \rho_{r,t}\mathrm{R}_{t-1}^n + (1-\rho_{r,t})\left[(\theta_{\pi,t} - \psi_{debt,policy}\mathrm{debt}_t)(\pi_t^{NF} - \pi_t^*) + \theta_{y,t}x_t + \psi_{dol,policy}\mathrm{dol}_t + \psi_{inf,policy}\mathrm{inf}_t\right] + \varepsilon_t^M \tag{27}$$

$$Rn_t = \rho_r^{eff} Rn_{t-1} + (1-\rho_r^{eff})\left[(\theta_\pi^{eff} - FISCAL_{SWITCH}.\psi_{debt,policy}\mathrm{debt}_t).bias\_gap_t + \theta_y^{eff}.xgap_t + DOL_{SWITCH}.\psi_{dol,policy}\mathrm{dol}_t + INFLAB_{SWITCH}.\psi_{inf,policy}\mathrm{inf}_t\right] + \epsilon_{M,t} \tag{28}$$

$$R_t = Rn_{t-1} - \pi_t \tag{29}$$

$$ER_t = Rn_t - \pi_{t+1} \tag{30}$$

$$bias_{gap_t} = \pi_t^{NF} - \pi_{target}^{eff} \tag{31}$$

where: R_t^n is the nominal interest rate, (θ_π, θ_y) are policy coefficients for inflation and output respectively

Inflation targeting regime

The model incorporates an explicit regime-switch observable ($ITobs$) and interaction parameters that allow monetary-policy coefficients, inflation targets, price indexation behaviour, and structural rigidities to evolve following the adoption of inflation targeting. The IT regime shift is modelled using the observable variable indicator $ITobs_t$, which equals 0 prior to 2011Q3 and 1 thereafter.

$$ITobs_t = \rho_{IT} ITobs_{t-1} + \varepsilon_t^{IT} \tag{32}$$

The inflation target evolves according to:

$$\pi_t^* = \pi^{pre} + \pi^{IT} IT_t \tag{33}$$

The monetary policy coefficients evolve as:

$$\phi_{\pi,t} = \phi_\pi^{pre} + \Delta\phi_\pi IT_t \tag{34}$$

$$\phi_{y,t} = \phi_y^{pre} + \Delta\phi_y IT_t \tag{35}$$

$$\rho_{r,t} = \rho_\pi^{pre} + \Delta\rho_\pi IT_t \tag{36}$$

Furthermore, the degree of inflation indexation in both core inflation and food inflation is allowed to change after the regime shift. This structure ensures that inflation targeting is captured as a systemic change in both policy behaviour and price-setting dynamics rather than a binary policy label.

Exogenous Processes

All shocks follow AR (1) processes.

$$A_t = \rho_A A_{t-1} + \varepsilon_t^A \tag{37}$$

$$rer_t = \rho_{REER} rer_{t-1} + \varepsilon_t^{REER} \tag{38}$$

Measurement Equations

$$dy_t = \Delta Y_t + trend_y \tag{39}$$

$$dp_t = \pi_t^{NF} + trend_\pi \tag{40}$$

$$dr_t = R_t^n + trend_r \tag{41}$$

$$dreer_t = rer_t + trend_{reer} \tag{42}$$

$$ddol_t = dol_t + trend_{dol} + \varepsilon_t^{meas} \tag{43}$$

3.2 Estimation techniques

The DSGE model is estimated using Bayesian methods. The approach combines the Kalman filter's likelihood function with the prior distribution assigned to each model's structural parameter to form the posterior distribution (An and Schorfheide, 2007; Herbst and Schorfheide, 2016). The approach estimates model parameters i that maximize the posterior probability given by:

$$p(\theta|Y^T, i).$$

The posterior density of a model parameter is computed as follows:

$$p(\theta|Y^T, i) = \frac{L(Y^T|\theta, i)p(\theta|i)}{\int L(Y^T|\theta, i)p(\theta|i)\partial\theta} \tag{44}$$

where: $p(\theta|i)$ is the prior density and $L(Y^T, \theta, i)$ is the likelihood conditional on the observed data.

The likelihood function takes the following form:

State Equation: $X_{t+1} = \Gamma_1 X_t + \Gamma_2 \varepsilon_{t+1}$ (45)

Measurement equation: $Y_t = GX_t + H\nu$ (46)

The proposed New Keynesian model has a solution of the form.

$$X_{t+1} = \Gamma_1 X_t + \Gamma_2 \varepsilon_{t+1} \tag{47}$$

The posterior distribution is produced using the Metropolis-Hastings sampling technique (Adjemian et al., 2011). The model is estimated using both the data and priors in the study. The Markov Chain Monte Carlo approach was used to produce estimates as posterior draws. The study uses the Kalman filter to calculate the likelihood function, then further utilizes impulse response functions from the model, variance decomposition analysis, and counterfactual simulations to compare inflation dynamics under pre-IT and post-IT regimes. The identification diagnostics are conducted through prior-posterior comparisons to ensure that the data are sufficiently informative about key structural parameters.

3.3 Calibration of prior distributions

The paper uses priors from Smets and Wouters (2007), Adolfson et al. (2007), Clarida et al. (2000), Christiano et al. (2018), and Berg et al. (2010). Priors are calibrated using specific evidence from Uganda, including Anguyo et al. (2020), Okot (2020), Okello and Opolot (2020), and Bank of Uganda publications (Table 1).

Table 1: Key Parameters Calibration Values

Parameter	Prior Mean	Prior Type	Prior Std. Dev.	Source
Inflation target – pre-IT	0.018	Normal	0.006	Anguyo et al. (2020); Okot (2020)
Inflation target – IT regime	-0.006	Normal	0.003	Anguyo et al. (2020); Okot (2020); Pourroy et al. (2016)
Taylor-rule inflation response (pre-IT)	1.2	Normal	0.12	Clarida et al. (2000); Anguyo et al. (2020); Okot (2020).
Taylor-rule inflation response (IT)	0.35	Normal	0.08	Clarida et al. (2000); Christiano et al. (2018); Anguyo et al. (2020); Okot (2020)
Taylor-rule output-gap response (pre-IT)	0.18	Gamma	0.05	
Taylor-rule output-gap response (IT)	-0.05	Normal	0.03	Anguyo et al. (2020); Okot (2020)
Price indexation – formal sector (IT)	-0.05	Normal	0.03	
Price indexation – informal sector (IT)	-0.1	Normal	0.04	
Interest-rate smoothing (pre-IT)	0.5	Beta	0.06	Smets and Wouters (2007); Anguyo et al. (2020); Okot (2020).
Interest-rate smoothing (IT)	0.1	Normal	0.03	Smets and Wouters (2007); Christiano et al. (2018); Anguyo et al. (2020); Okot (2020).
Price indexation – formal sector (pre-IT)	0.25	Beta	0.05	
Price indexation – informal sector (pre-IT)	0.4	Beta	0.06	Smets and Wouters (2007); Anguyo et al. (2020); Okot (2020).
Trend inflation	0.012	Normal	0.003	
AR (1) inflation cost-push persistence	0.85	Beta	0.06	Smets and Wouters (2007); Pourroy et al. (2016); Anguyo et al. (2020); Okot (2020).
Std. dev. of inflation cost-push shock	0.06	Inv-Gamma	∞	Pourroy et al. (2016); Anguyo et al. (2020); Okot (2020).

The monetary policy rule priors reflect Uganda's transition from a weak monetary targeting framework before 2011Q3 toward a more credible IT regime thereafter. The Taylor-rule inflation response pre-IT coefficient is centred at Normal (1.20, 0.12). This matches evidence from Uganda before IT, which shows that monetary policy did not adequately respond to inflationary pressures because it was constrained by exchange-rate management, fiscal pressures, and weak anchoring of expectations (Brownbridge & Kasekende, 2018; Okello & Opolot, 2020).

The IT regime prior is centred at N (0.35, 0.08), allowing a stronger post-IT response to inflation deviations (Okello & Opolot, 2020). The output gap response under IT is centred at N (−0.05, 0.03), reflecting greater inflation stabilization. The interest rate smoothing parameter is centred at N (0.10, 0.03). The inflation-target priors are calibrated using the BOU medium-term core inflation objective. The pre-IT target is centred at N (0.018, 0.006) while the inflation-targeting regime shift is centred at N (−0.006, 0.003). These priors are consistent with Uganda's gradual transition toward the medium-term 5% core inflation target formally adopted by the central bank.

The inflation-indexation priors are calibrated to capture Uganda's highly persistent, backward-looking inflation process prior to IT. Food-sector indexation is centred at 0.25 (Beta, s.d. 0.05) while non-food indexation is centred at 0.40 (Beta, s.d. 0.06). The higher persistence in non-food inflation reflects Uganda's sluggish price adjustment in the formal sectors, and the persistence of exchange-rate pass-through into domestic prices. This is also consistent with evidence from Uganda, where core inflation remained relatively sticky despite temporary declines in headline inflation.

The IT-induced declines in indexation are centred at Normal (−0.05, 0.03) for food and Normal (−0.10, 0.04) for non-food. These priors directly capture the theoretical prediction that inflation targeting reduces backward-looking price-setting behaviour by improving policy credibility and anchoring expectations (Svensson, 1997; Mishkin & Schmidt-Hebbel, 2007).

The priors governing Uganda's low-income-country structural features are calibrated explicitly to match observed institutional realities. The steady-state informality share is fixed at 0.70. This calibration is strongly supported by Ugandan labour-market evidence indicating that approximately 70% or more of employment and production occurs outside the formal sector. The large informal economy weakens monetary-policy transmission because a substantial proportion of firms and workers operate outside formal credit, taxation, and wage-setting systems.

Labour-market persistence is centred at 0.75 (Beta, s.d. 0.08) with the associated wage-gap elasticity parameter centred at 0.10 (Gamma, s.d. 0.04). These priors reflect the persistent labour-market rigidities, segmented employment structures, and slow wage adjustment documented in Uganda. Dollarization persistence is centred at 0.80 (Beta, s.d. 0.08), reflecting the high degree of currency substitution and foreign-currency pricing observed in Uganda's banking and import sectors. The effect of dollarization on the sovereign risk premium is centred at 0.20 (Gamma, s.d. 0.05). In this model, dollarization affects inflation, output, the risk premium, and the monetary policy rule simultaneously.

The fiscal-dominance parameters are calibrated to capture the persistent interaction between fiscal policy and monetary stabilization in Uganda. Government-debt dynamics are centred at 0.10 (Gamma, s.d. 0.04) while the influence of debt on monetary-policy behaviour is centred at 0.05 (Gamma, s.d. 0.015). These priors capture Uganda's history of fiscal pressures, which constrain monetary policy independence and effectiveness. The calibration is also consistent with recent DSGE literature showing that fiscal dominance weakens inflation targeting by forcing monetary authorities to partially accommodate fiscal imbalances (Bianchi et al., 2023; Blanchard, 2004; Ahmed et al., 2021).

The Calvo stickiness parameters are calibrated differently across sectors to reflect Uganda's production structure and inflation dynamics. Food-sector stickiness is centred at 0.75 (Beta, s.d. 0.05) while non-food stickiness is centred at 0.88 (Beta, s.d. 0.03). The lower degree of stickiness in food inflation shows the relatively rapid adjustment of agricultural prices to weather and supply shocks. By contrast, the higher persistence in core inflation captures slower adjustment in non-food prices. These calibrations are particularly important in Uganda, where food inflation is highly volatile while core inflation remains substantially more persistent (Pourroy et al., 2016).

The shock processes are calibrated using emerging-market DSGE benchmarks while remaining consistent with Uganda's macroeconomic volatility. Persistence parameters generally follow Beta distributions centred between 0.75 and 0.85, reflecting the persistence of inflation, exchange-rate, fiscal, and productivity shocks observed in Uganda. Standard deviations follow inverse-gamma distributions, allowing sufficient flexibility while preserving economically plausible ranges. The measurement-error variance for the dollarization observable is intentionally tightened (stderr = 0.005) to address weak identification arising from latent dollarization dynamics. This modification ensures dollarization is both a structural state variable and an observable transmission channel affecting inflation, output, monetary policy, and sovereign risk premia.

The negative priors do not imply parameter instability; they encode theoretically expected directional shifts associated with the IT and the structural characteristics of low-income economies like Uganda. The negative priors are imposed where IT or structural frictions are theoretically expected to reduce the magnitude of inflation persistence, exchange rate pass-through, output accommodation and monetary transmission effectiveness (An & Schorfheide, 2007; Adolfson et al., 2007). The study models IT as an explicit structural regime shift, estimates pre-IT and post-IT models, conducts robustness tests and conducts identification diagnostics.

3.4 Data description and source

This study uses BOU and the Uganda Bureau of Statistics quarterly data from 2001Q1 to 2025Q1. The observable variables include core inflation, real GDP, nominal interest rates, the exchange rate, investment, and a dummy variable for pre-IT and post-IT. The observable series are seasonally adjusted and transformed into stationary form before estimation. Variables expressed at levels are log-linearized, while selected financial variables are expressed as deviations from steady-state values. The dollarization variable is transformed using demeaned log ratios to ensure consistency with DSGE estimation requirements.

4. Results and Discussion

Table 2 presents the key indicators used to examine the dynamics of monetary policy behaviour before and after IT. The inflation response (θπ) increased from 1.22 before IT to 1.58 after IT, suggesting a stronger commitment to the Taylor principle. The output gap decreased from 0.1336 before IT to 0.1024 after IT, indicating that the BOU increasingly prioritized stabilizing inflation over output after adopting IT. Relatedly, the interest-smoothing parameter increased from 0.5085 before IT to 0.6041 after IT, suggesting greater policy smoothing.

Table 2: Inflation Dynamics and Monetary Policy Coefficients

Parameter	Pre-IT Mean	Posterior Std. Dev.	90% HPD	Post-IT Mean	Posterior Std. Dev.	90% HPD
Inflation response	1.2247	0.0249	[1.18–1.27]	1.5824	0.0293	[1.552–1.613]
Output-gap response	0.1336	0.0124	[0.11–0.15]	0.1024	0.0131	[0.094–0.111]
Interest-rate smoothing	0.5085	0.0067	[0.50–0.52]	0.6041	0.0083	[0.594–0.614]
Inflation target	0.0167	0.0005	[0.016-0.017]	0.0081	0.0005	[0.0077–0.0085]
Non-food indexation	0.3471	0.0053	[0.34–0.36]	0.2457	0.0113	[0.226–0.265]
Food indexation	0.2239	0.0044	[0.21–0.23]	0.2224	0.0068	[0.212–0.233]
Inflation bias gap	0.1074			0.1175		

Inflation persistence remained elevated and increased after IT. The improvements in the Taylor-rule coefficients (θπ and θy) are consistent findings by Brownbridge and Kasekende (2018) and Okello and Opolot (2020), who reported improved policy credibility and a shift toward inflation-focused stabilization in Uganda during the early years of the monetary framework's implementation.

Inflation Bias and Macroeconomic Stabilization

The results presented in Table 3 suggest that the framework is associated with improved inflation outcomes. Steady-state inflation declined, while the inflation bias and overall policy-loss function fell between the two periods. The estimated inflation target was reduced in the post-IT regime. Consistent with Svensson's (1997) framework, the reduction of the inflation target is associated with a lower inflation bias gap in the post-IT period. However, inflation bias remained large in the post-IT period, implying that monetary policy credibility remained incomplete.

Table 3: Inflation Bias and Policy-Loss Comparison

Parameter	Pre-IT	Pre-IT HPD	Post-IT	Post-IT HPD
Steady-state inflation	18.59%	[17.60%, 19.58%]	12.56%	[12.36%, 12.76%]
Inflation target	1.67%	[1.59%, 1.75%]	0.81%	[0.78%, 0.84%]
Inflation bias gap	15.57%	[14.58, 16.56]	10.74%	[10.54, 10.94]
Policy loss	0.0322	[0.0265, 0.0379]	0.0158	[0.0142, 0.0174]
Inflation-loss component	0.0316	[0.0260, 0.0372]	0.0157	[0.0141, 0.0173]

Note: Inflation targets are expressed as quarterly steady-state rates implied by the DSGE estimation

However, this paper's findings also show that the remaining inflation bias (10.74 pp) stems from persistent structural constraints. The remaining bias aligns with evidence from Aye et al. (2020), Angeriz and Arestis (2006), and Baxa et al. (2014), in settings with weak transmission.

Volatility and Persistence of Inflation Indicators

The volatility results show that, after IT adoption, the standard deviation of the non-food inflation indexation shocks declined significantly. In contrast, the standard deviation of monetary policy shock volatility increased from 0.18 to 1.32, showing a more active policy stance towards stabilizing inflation expectations (Table 4).

Table 4: Volatility and Persistence of Inflation Indicators

Parameter	Pre-IT	Pre-IT (Posterior Std. Dev.)	Post-IT	Post-IT (Posterior Std. Dev.)
Inflation persistence	0.8500	0.0600	0.9737	0.0124
Inflation shock volatility	0.0600	∞	0.1150	0.0197
Monetary shock volatility	0.1800	∞	1.3196	0.1076
Non-food inflation indexation	0.3471	0.0053	0.2457	0.0113

4.1 Impulse response functions

4.1.1 *Inflation Response to Monetary Policy Shock*

The contractionary monetary shock (Figure 1) causes an immediate reduction in headline inflation (PIE), core inflation (PIENF) and output gap (xgap). However, the decline in both headline and core inflation is smaller under IT, with both returning to steady state faster after 12 quarters, compared with the 15-20 quarters observed before IT. The inflation bias response decays faster and converges to a steady state with lower cumulative deviation during the post-IT period. The lower inflation response and faster convergence under the monetary framework signal the benefits of anchoring expectations, as reported in advanced economies (Iania et al., 2023; Gupta, 2024).

4.1.2 *Responses to an Inflation-Target Shock*

Before IT, the inflation target shock (Figure 2) leads to larger and more persistent deviations in both core and non-food inflation, signalling weaker anchoring of private-sector expectations. After IT, the shock leads to smaller responses and faster decay towards the steady-state, highlighting the improved anchoring of private-sector expectations. Core inflation returns to steady-state after 8 quarters, while headline inflation returns to steady-state after 5 quarters post-IT, both much faster than before IT.

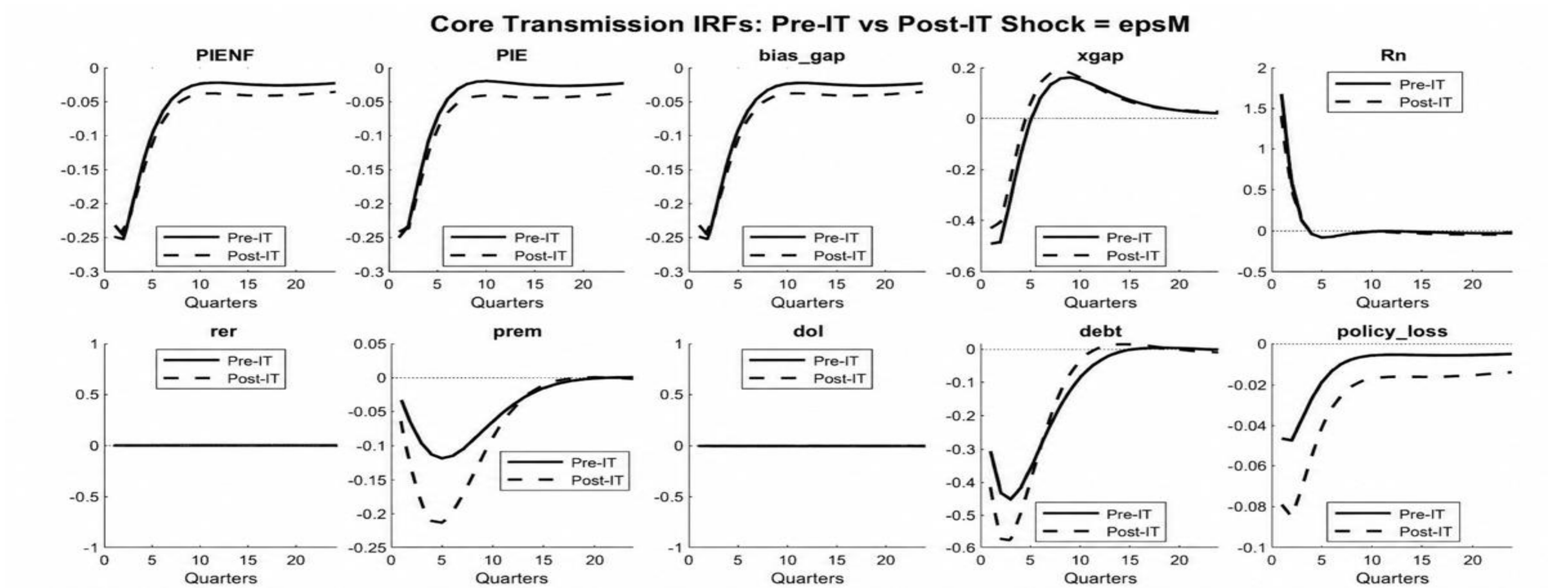

Figure 1: Core Transmission IRFs: Pre-IT vs Post-IT- Monetary policy Shock

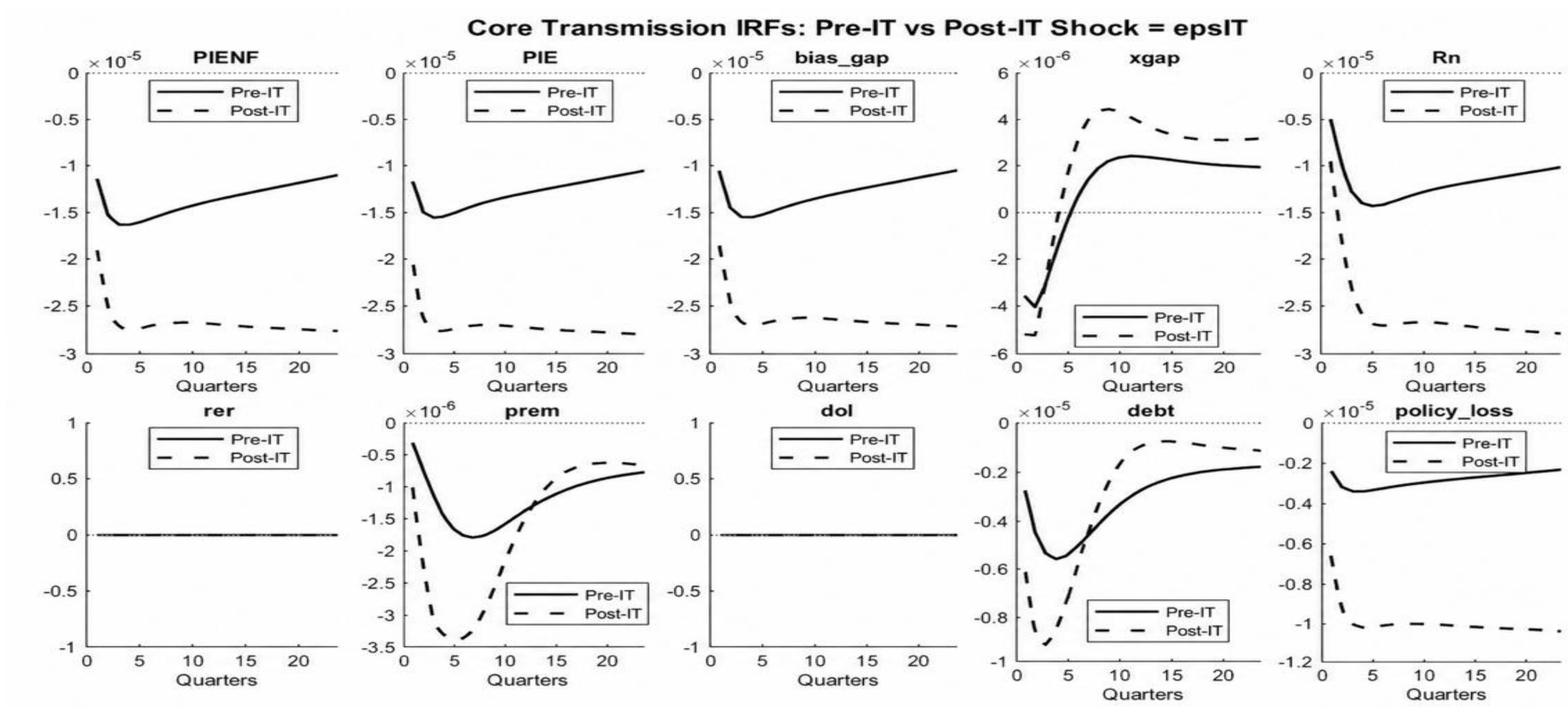

Figure 2: Core Transmission IRFs: Pre-IT vs Post-IT- Inflation target Shock

The inflation bias gap widens sharply under pre-IT but remains tightly contained after IT. The policy loss is lower and less persistent under the IT economy, showing the welfare benefit of a credible IT regime even when the central bank faces shocks towards its inflation target. The finding aligns with Svensson's (1997) theoretical prediction.

4.1.3 *Responses to an Inflation (Cost-Push) Shock*

Before IT, following the inflation shock (Figure 3), inflation (food, core, and headline) remains high for more than 15 quarters, compared to 10 quarters under post-IT, highlighting improved inflation stabilization under IT. The smaller, faster-decaying post-IT response is consistent with stronger inflation stabilization under IT.

The bias gap is larger and highly persistent before the adoption of IT. In contrast, the deviation of the bias gap is smaller and decays faster after the adoption of IT. Policy losses remain substantially lower and converge faster under the IT regime than before its adoption, suggesting that IT improved welfare outcomes. The reduced persistence of cost-push shocks contrasts with weaker transmission mechanisms documented in peer sub-Saharan economies. The results show that IT partially mitigates these frictions in Uganda, though structural rigidities remain binding.

4.1.4 *Core Transmission IRFs to a Real Exchange-Rate Shock*

Both headline (PIE) and non-food (PIENF) inflation rise sharply on impact across both regimes, but the post-IT responses, while initially comparable, exhibit lower long-run persistence (Figure 4). The finding aligns with open-economy DSGE evidence (Koráb et al., 2023; Carare et al., 2023).

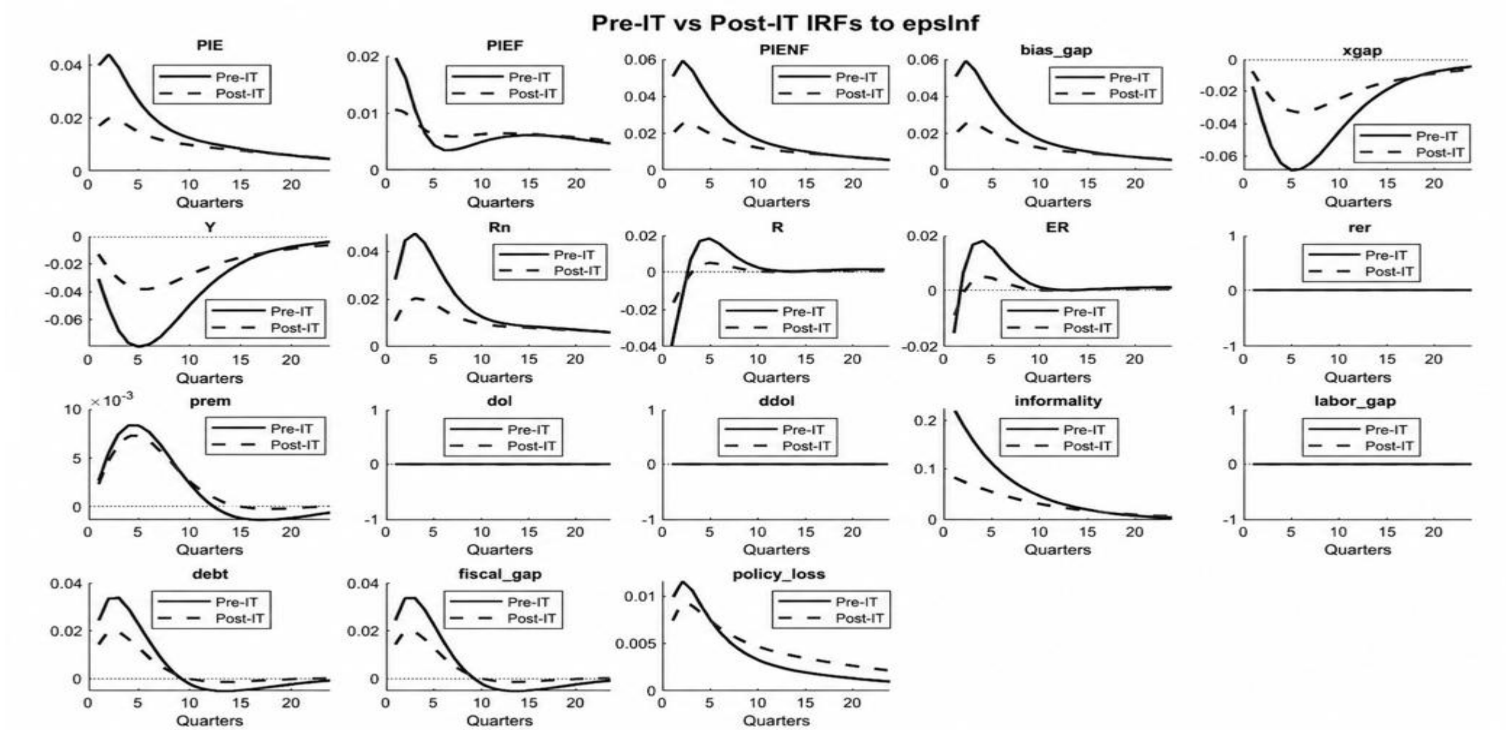

Figure 3: IRFs: Pre-IT vs Post-IT- Inflation (cost push) shock

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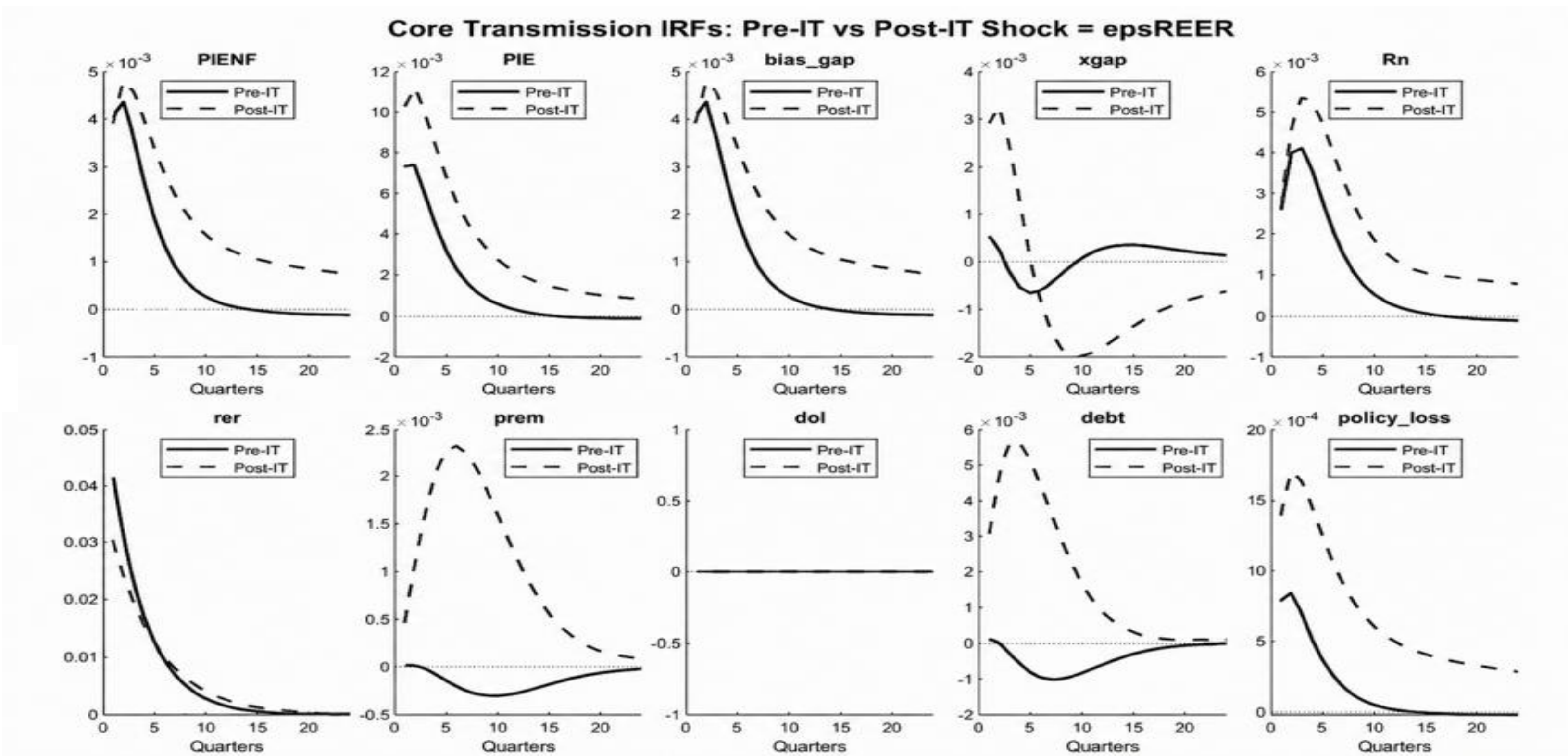


Figure 4: Core transmission IRFs to a real exchange-rate shock

Formal Impulse Response Metrics: Cumulative Responses, Attenuation Ratios, Convergence Speed, and Persistence: Pre-IT vs Post-IT Regimes

Under monetary policy shocks, the cumulative response of headline inflation declined from −0.526 pre-IT to −0.422 post-IT (attenuation ratio of 0.85), while core inflation fell from −0.566 to −0.380 (attenuation ratio of 0.70). The persistence index and half-life for headline inflation rose modestly from 3.20 to 3.50 quarters, while those for core inflation increased from 3.44 to 4.05 quarters, with the time to steady state for core inflation extending slightly from seven to eight quarters (Table 5).

Table 5: Impulse Response Statistics

Shock Type	Parameter	Cumulative Pre-IT	Cumulative Post-IT	Attenuation Ratio (Post/Pre)	Time to Steady State (Pre / Post)	Persistence Index (Pre / Post)
Monetary Policy Shock	Headline Inflation	-0.526	-0.422	0.85	7/7	3.20 / 3.50
Monetary Policy Shock	Core Inflation	-0.566	-0.38	0.7	7/8	3.44 / 4.05
Monetary Policy Shock	Inflation Bias Gap	-0.566	-0.38	0.7	7/8	3.44 / 4.05
Exchange Rate Shock	Headline Inflation	0.044	0.066	1.49	13 / 15	5.22 / 6.03
Fiscal Spending Shock	Headline Inflation	0.087	0.146	1.68	> simulation horizon	4.48 / 7.21
Dollarization Shock	Headline Inflation	0.083	0.028	0.33	> simulation horizon	10.94 / 7.90

Notes: Cumulative responses computed over 24 quarters. Attenuation ratio = post-IT / pre-IT cumulative response.

The results suggest that IT strengthened the central bank's ability to stabilize inflation following domestic and external disturbances, although persistence remained elevated for certain shocks. However, shocks including the fiscal and exchange-rate channels prolonged the adjustment process.

4.2 Findings: Implications of structural rigidities

Structural Implications of Fiscal Dominance: The volatility of fiscal shocks increased significantly, indicating greater fiscal disturbances. The debt policy interaction parameter also increased, suggesting greater pressure on the central bank to accommodate fiscal imbalances. The volatility of public debt shocks declined significantly, suggesting improved debt management during the post-IT period (Table 6).

Table 6: Fiscal Dominance Indicators

Parameter	Pre-IT	Post-IT	Post-IT HPD
Fiscal shock volatility	0.22	0.7589	[0.5485, 0.9693]
Debt persistence	0.85	0.7569	[0.7401, 0.7737]
Debt-policy interaction	0.05	0.0625	[0.0599, 0.0651]

These results point to persistent fiscal dominance that continued to constrain the full effectiveness of IT. Although some debt-related volatility eased, the increase in fiscal shock volatility and the stronger debt–policy linkage imply that fiscal authorities continued to exert significant indirect influence on inflation dynamics and monetary policy transmission. These findings also align with the fiscal-monetary interactions documented in SSA (Goshit & Iorember, 2020; Okwori & Abu, 2018). These interactions underscore the limits of monetary frameworks under fiscal pressure (Blanchard, 2004; Bianchi et al., 2023; Ahmed et al., 2021; Montes & Dantas, 2025).

Dollarization and Exchange-Rate Channels: Dollarization persistence increased in the IT period, suggesting that foreign-currency pricing and financial dollarization continued to weaken the domestic monetary transmission mechanism. Real exchange-rate persistence also stayed elevated at 0.7849 after IT. However, the volatility of dollarization shocks and exchange rate shocks declined during the IT period (Table 7). These reductions in volatility are consistent with some improvement in monetary-policy credibility and partial stabilization of external disturbances.

Table 7: Dollarization and Exchange-Rate Channels

Parameter	Pre-IT	Post-IT	Post-IT HPD
Dollarization persistence	0.8	0.8474	[0.8275, 0.8673]
Dollarization volatility	0.08	0.0487	[0.0429, 0.0545]
Exchange-rate volatility	0.1	0.0357	[0.0311, 0.0403]

The persistently high dollarization aligns with the findings of Tweneboah and Alagidede (2019), who found that dollarization continued to undermine IT effectiveness in Ghana despite regime change. Similar findings are reported for other low-income economies (Koráb et al., 2023; Ogrokhina & Rodriguez, 2024; Carare et al., 2023).

Informality and Labour Market Segmentation: The labour-market persistence increased after IT, signalling greater labour-market rigidities. Similarly, the persistence of informality increased (Table 8), suggesting greater informality-related rigidities. The evidence indicates that a significant share of economic activity occurs outside the formal financial system, weakening the transmission of monetary policy and the responsiveness of wages, employment, and prices to changes in central bank policy rates (Nair et al., 2025).

Table 8: Informality and Labour-Market Structural Rigidities

Parameter	Pre-IT	Post-IT	Post-IT HPD
Labour-market persistence	0.75	0.8041	[0.7799, 0.8283]
Informality persistence	0.85	0.9737	[0.9533, 0.9941]
Steady-state informality share	0.33	0.256	[0.2349, 0.2771]

Financial Markets and Monetary Transmission: The estimates indicate an increase in financial premium volatility (Table 9), signalling persistent fragilities in financial intermediation. The findings also show an increase in monetary shock volatility and an increase in monetary policy shock persistence after IT. High volatility of monetary shocks implies that monetary policy transmission remained unstable due to limited financial depth, weak credit markets, and incomplete pass-through from policy rates to lending rates.

Table 9: Financial-Market Structure and Monetary Transmission

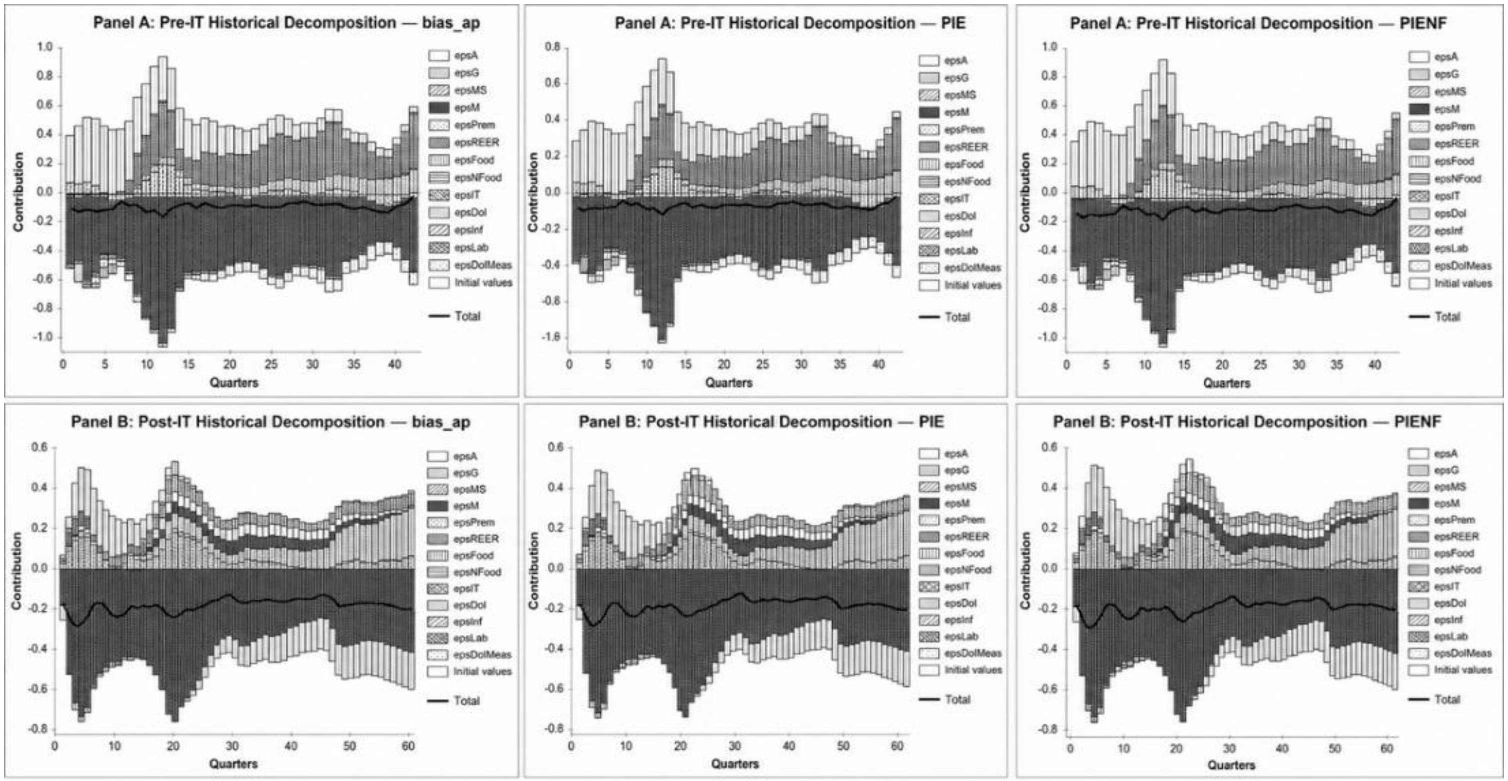
Parameter	Pre-IT	Post-IT	Post-IT HPD
Risk-premium persistence	0.72	0.6662	[0.6346, 0.6978]
Financial-premium volatility	0.12	0.6991	[0.6091, 0.7891]
Monetary-shock volatility	0.18	1.3196	[1.1426, 1.4966]
Interest-rate volatility	0.1496	0.1256	[0.1256, 0.1256]
Monetary policy shock persistence	0.65	0.6967	[0.6631, 0.7303]

4.3 Historical decompositions

The historical decompositions reveal a structural break around the 2011 regime shift. While monetary shocks remained the dominant driver of inflation, fiscal shocks became markedly more important in the post-IT period. During the pre-IT period (Panel A), monetary policy shocks were the main factor driving the historical decomposition of headline inflation (PIE), core inflation (PIENF), and the inflation bias gap, with fiscal shocks contributing only a very small share. In contrast, after the adoption of IT (Panel B), a structural shift occurred. Fiscal shocks increasingly became important in determining the decomposition of core inflation and inflation bias (Figure 5).

Posterior Variance Decomposition Results

Before IT, monetary shocks accounted for the largest share of volatility in headline inflation. These were followed by fiscal shocks and inflation-persistence shocks (Table 10). In contrast, during the post-IT period, the contribution of monetary shocks to headline inflation fell significantly, while fiscal shocks accounted for a larger share. The results show that while IT has reduced monetary dominance, it has increased the role of fiscal disturbances.



Note: Stacked bars show the contribution of each structural shock to the variable. The black line denotes the total (sum of shocks).

Figure 5: Historical Decompositions of Inflation Bias and Inflation

Table 10: Posterior variance decompositions of the variance of inflation

Inflation type	Regime	Monetary shock epsM	Fiscal shock epsG	Risk premium epsPrem	Inflation shock epsInf	REER shock epsREER	Labour shock epsLab
Headline inflation, PIE	Pre-IT	83.39	7.65	2.31	5.26	0.09	1.1
Headline inflation, PIE	Post-IT	60.47	34.84	2.67	1.18	0.15	0.15
Non-food inflation, PIENF	Pre-IT	80.69	8.45	1.88	7.58	0.02	1.08
Non-food inflation, PIENF	Post-IT	59.77	35.64	2.03	1.63	0.03	0.14

Conditional Variance Decomposition

Pre-IT Regime. In the short run, inflation dynamics are primarily driven by monetary policy shocks, with fiscal shocks contributing a modest proportion. As the horizon lengthens, the contribution of monetary policy declines as the contribution of fiscal shocks increases significantly (See Table 11).

Post-IT Regime. After IT, there is a significant change in the shocks' contributions. On impact, the share of monetary policy shocks reduces significantly, contributing less than under the pre-IT regime. However, over the medium- to long-run horizons, the role of fiscal shocks becomes more pronounced (see Table 12). The long horizon associated with fiscal policy between the two periods (pre-IT and post-IT) underscores the role of fiscal-monetary interactions in shaping inflation trends in Uganda's economy.

These findings show that the framework successfully anchors private agents' expectations and consequently improves policy transmission. However, the framework does not fully protect the economy from fiscal dominance. Thus, for low-income economies, the results show that successful inflation targeting requires not only credible monetary institutions but also complementary fiscal frameworks to prevent monetary policy from being systematically undermined.

Table 11: Pre-IT Conditional Variance Decomposition of Core Inflation

Horizon	Technology Shock	Fiscal Shock	Money Supply Shock	Monetary Policy Shock	Risk Premium Shock	REER Shock	Food Price Shock	Non-Food Price Shock	IT Credibility Shock	Dollarization Shock	Inflation Persistence Shock	Labour Market Shock	Public Debt Shock
1	0.17	6.2	3.97	84.22	0.96	0.19	0	0.2	0.55	1.16	2.1	0.23	0.05
4	0.09	18.74	1.25	74.83	0.42	0.11	0	0.02	0.21	0.16	3.72	0.32	0.13
8	0.05	28.15	0.48	69.4	0.1	0.04	0	0	0	0.04	1.51	0.13	0.08
12	0.07	29.87	1.66	61.48	1.77	0.28	0	0.03	2.05	0.91	1.52	0.25	0.11
16	0.09	30.79	2.4	56.21	2.28	0.43	0	0.04	3.03	1.38	2.77	0.41	0.18
24	0.08	33.38	0.5	62.59	1.45	0.03	0	0	0	0.05	1.69	0.14	0.09

Table 12: Post-IT: Core Inflation Conditional Variance Decomposition

Horizon	Technology Shock	Fiscal Shock	Money Supply Shock	Monetary Policy Shock	Risk Premium Shock	REER Shock	Food Price Shock	Non-Food Price Shock	IT Credibility Shock	Dollarization Shock	Inflation Persistence Shock	Labour Market Shock	Public Debt Shock
1	0.05	2.41	9.97	69.7	0.14	0.38	0	10.23	0.83	11.57	2.41	0	0.13
4	0.08	17.86	1.08	73.11	0.21	0.07	0	0.01	0.05	0.11	2.93	0.32	0.17
8	0.07	28.15	0.48	69.4	0.1	0.04	0	0	0	0.04	1.51	0.13	0.08
12	0.08	29.42	1.87	59.64	1.96	0.36	0	0.03	2.41	1.07	2.54	0.44	0.18
16	0.09	30.79	2.4	56.21	2.28	0.43	0	0.04	3.03	1.38	2.77	0.41	0.18
24	0.08	33.38	0.5	62.59	1.45	0.03	0	0	0	0.05	1.69	0.14	0.09

4.4 Counterfactual policy experiments, model comparisons, welfare analysis, and alternative regime simulations

The study conducted counterfactual experiments within the DSGE to isolate the marginal contribution of inflation targeting from other macroeconomic factors. The simulations compared the estimated IT regime with a hypothetical “no-IT” scenario in which the pre-2011 monetary policy rule coefficients, inflation target, and price indexation parameters remained unchanged after 2011Q3, while the economy continued to face the same patterns of structural and external shocks.

Counterfactual simulations comparing the observed inflation-targeting (IT) regime with a hypothetical counterfactual no-IT scenario suggest that adopting IT altered the transmission of inflationary disturbances. For instance, relative to the counterfactual no-IT regime, the cumulative response of headline inflation to monetary shocks under the observed IT framework declined from −0.526 to −0.422, corresponding to an attenuation ratio of 0.85. The reduction was more pronounced for core inflation, where the cumulative response declined from −0.566 in the hypothetical no-IT scenario to −0.380 under IT, implying a 30% attenuation in inflation transmission under the IT regime. The results also show that inflation persistence remained elevated post-IT despite headline inflation responses to monetary policy shocks having lower cumulative inflation deviations and slower convergence to the steady state. Taken together, the model-based counterfactual results are consistent with stronger anchoring of expectations and improved inflation stabilization relative to the hypothetical no-IT benchmark. The inflation bias gap declined from 15.57% in the pre-IT regime to 10.74% under the IT regime. The lower bias under the actual regime is consistent with the estimated implicit inflation target and a reduction in core inflation.

In addition to the above, the welfare analysis, built on the model’s quadratic policy loss function, quantifies the gains from inflation targeting. The loss function penalizes deviations of inflation from target, output-gap volatility, interest-rate variability, and distortions arising from dollarization, fiscal imbalances, and informality. The findings indicate that the inflation-loss component and the total policy losses declined in the IT regime. The decline in the inflation-loss component suggests that strengthened inflation stabilization was an important source of welfare improvement.

Despite the above, the counterfactual results highlight important limitations of the framework. For instance, after the adoption of the IT framework, fiscal shocks emerged as a major driver of inflation, accounting for approximately 35% of volatility in headline and core inflation (up from less than 9% pre-IT). In the no-IT counterfactual, the contribution of monetary shocks would have remained even more dominant, but overall inflation volatility would likely have been higher due to weaker anchoring of expectations. This pattern underscores a fundamental challenge in low-income economies: while inflation targeting strengthens the monetary policy transmission mechanism and improves credibility, it cannot fully neutralize the effects of persistent fiscal dominance.

Results from additional robustness exercises using alternative IT adoption dates (e.g., 2010Q1 or 2012Q1) also show improved inflation responses to policy changes, lower inflation targets, lower policy losses and better shock convergence under the IT framework.

4.5 Robustness and diagnostic checks

Model Solution and Steady-State: The Blanchard–Kahn rank-and-order conditions hold, as exactly 11 eigenvalues lie outside the unit circle, matching the number of forward-looking variables and confirming model stability, thereby ensuring a unique and stable rational expectations equilibrium (Blanchard & Kahn, 1980). The posterior mode improved substantially from −519463.04 to −554.43, indicating strong empirical support for the estimated structural specification. Bayesian convergence diagnostics based on multiple Markov chains, Geweke statistics, and inefficiency factors generally support the stability of the posterior.

Local Identification Analysis: The reduced-form Jacobian test of the steady-state and reduced-form matrices yields a full-rank result, indicating that the parameter vector is locally identified in the reduced-form representation.

However, the spectral identification test of Qu and Tkachenko and the moments-based test of Iskrev, show pairwise collinearity among the post-IT policy coefficients $\left(\theta_{y,IT}, \theta_{\pi,IT}\right)$, inflation-target adjustment parameter $(\pi_{target,IT})$, and a limited set of fiscal and trend parameters. Some shock standard deviations and persistence parameters are weakly identified because several structural shocks exceed the number of observables. The study imposes informative priors based on the DSGE literature and Uganda-specific institutional characteristics to mitigate the above identification concerns. Despite the above concerns, the key parameters central to this study, including the monetary policy coefficients, inflation targets, fiscal-debt interactions, and dollarization channels, remain economically interpretable and produce stable posterior distributions. Similarly, while some parameters remain weakly identified, the key objects of interest, the shift in the monetary policy response to inflation, the reduction in inflation bias, and the changing contribution of fiscal shocks, are robust across specifications.

Robustness to Alternative Specifications: The stability of the principal results is assessed using a wide range of robustness exercises. These include alternative prior distributions for policy-rule coefficients, shock persistence parameters, structural elasticities, as well as estimation across different sample periods (pre-IT and post-IT). In addition, the checks were extended to restricted specifications that shut down selected structural channels, including dollarization, informality, and fiscal-debt interactions; alternative measurement-error assumptions for key observables and sensitivity analyses using modified trend specifications and alternative starting values. Across all specifications, the central qualitative conclusions remain unchanged. The posterior for the IT interaction on the inflation response coefficient remains positive and significant, the inflation target shift stays negative and precisely estimated, policy losses continue to decline by approximately 45–55% post-IT, and fiscal shocks increase in importance in the variance decompositions.

5. Conclusion and Policy Implications

This study advances the existing literature in important ways. Unlike Berg et al. (2010) and Okot (2020), who developed DSGE models for Uganda without explicitly modelling the 2011 inflation targeting regime shift, and unlike reduced-form analyses by Brownbridge and Kasekende (2018) and Okello and Opolot (2020), this paper estimates a rich New Keynesian DSGE model that treats the IT adoption as a structural break while jointly incorporating fiscal dominance, dollarization, informality, and labour-market segmentation.

The findings suggest that the estimated IT regime was associated with a stronger inflation response by the central bank, a lower inflation target, reduced inflation bias, and lower policy losses. At the same time, fiscal shocks became a much more prominent driver of inflation volatility post-IT (rising to around 35%). These results close key research gaps by isolating the marginal contribution of IT, quantifying its conditional effectiveness in a low-income setting with multiple frictions, and highlighting both the gains from better expectation anchoring and the persistent constraints of fiscal dominance.

The estimates suggest that while some persistence parameters increased post-IT, cumulative inflation deviations, policy losses, and inflation volatility declined substantially. Fiscal dominance continues to limit the full effectiveness of IT, with fiscal shocks becoming a more prominent driver of inflation volatility post-IT adoption.

Overall, the evidence suggests that IT is associated with improved inflation performance in low-income economies. However, the extent to which the framework generates the intended benefits depends on the broader macroeconomic policy environment. The results show that, in addition to improving inflation outcomes, IT nurtured a measurable structural shift in monetary policy behaviour. IT strengthened the nominal anchor through a smaller inflation bias and a lower inflation target.

Several policy implications emanate from the findings of the study. First, low-income economies facing fiscal pressures need to ensure that the fiscal regime and the broader policy environment complement monetary policy efforts if the full benefits of inflation targeting are to be realized. These could include fiscal measures that reduce pressure on the central bank. Second, reducing financial dollarization should become a core component of monetary policy strategy if the full benefits of IT are to be achieved. This may include measures to deepen local-currency financial markets and expand the availability of local-currency savings instruments, thereby improving confidence in the domestic currency. Third, there is a need to deepen financial inclusion by implementing measures targeting informal-sector actors to improve monetary transmission. This would improve the pass-through from the policy rate to lending and deposit rates, increasing the effectiveness of IT in influencing aggregate demand and inflation expectations. Finally, there is a need to formulate fiscal reforms for the large informal sector in low-income economies like Uganda. Such reforms could include tax administration measures, business registration measures, and financial products tailored to the informal sector. The above would enhance the responsiveness of wages and prices to monetary policy.

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