

Transmission of Monetary Policy Shocks and Inflation Dynamics in Burundi: A VAR Model Approach

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Abstract

This study investigates how monetary policy shocks influence inflation in Burundi using the VAR model. The findings reveal that an inflationary shock triggers a sharp rise in prices, followed by a gradual adjustment toward stability. The expansion of the money supply leads to a moderate but persistent increase in inflation, thereby confirming the quantity theory of money. Conversely, the effect of the interest rate appears more limited due to the structural constraints of the Burundian economy, particularly the weakness of the financial system and its reliance on external financing. Finally, the variance decomposition analysis

indicates that while past inflation dominates in the short run, the influence of monetary instruments becomes more pronounced in the long run.

Keywords: Monetary policy, Money supply, Interest rate, Inflation, VAR model, Burundi

1. Introduction

Inflation represents a major challenge for many developing economies, particularly in Sub-Saharan Africa, where price stability is undermined by exogenous shocks, structural constraints, and limited monetary credibility. Monetary policy, through the real interest rate and money supply, plays a central role in controlling these pressures, although its effectiveness depends on financial development, trade openness, institutional structures, and the expectations of economic agents.

In Burundi, the Bank of the Republic of Burundi has recently reformed its monetary policy, shifting from a money supply targeting framework to an approach partially based on the policy interest rate. In 2024, the policy rate was maintained at 12% as a restrictive measure to contain inflation¹. Meanwhile, the money supply has experienced rapid expansion, often linked to the monetary financing of public deficits, thereby fueling inflationary pressures². Inflation is currently extremely high (around 38-40% annually in 2025), posing serious challenges for both households and the credibility of macroeconomic policy³.

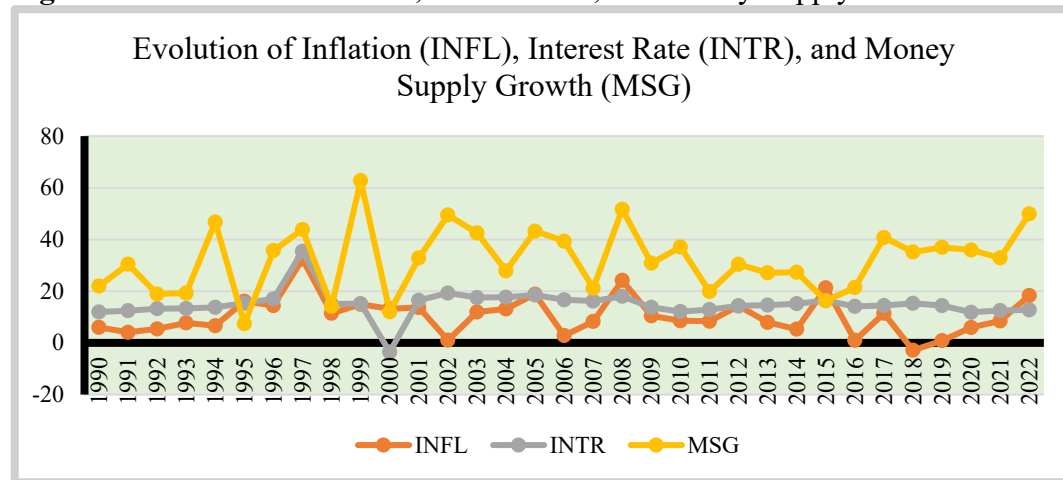
Although descriptive analyses and institutional reports (such as those by the IMF) have highlighted inflationary concerns, there remains a lack of rigorous modeling of the temporal transmission of monetary shocks in the country. Real interest rates and money supply are often analyzed separately in existing studies; however, their interaction, differing time lags, and structural correlation have been insufficiently examined in the Burundian context.

Accordingly, the central research question of this study is as follows: How do shocks to the real interest rate and money supply transmit to inflation in Burundi in terms of intensity, lag, and persistence?

¹ Bank of the Republic of Burundi. (2025, mars). *Monetary Policy Statement for the First Quarter of 2025*. ABP/Burundi News Agency. https://en.abpinfo.bi/monetary-policy-statement-for-the-first-quarter-of-2025/?utm_source=chatgpt.com

² International Monetary Fund. (2024, janvier). *Discussions for the First Review under the Extended Credit Facility Arrangement with Burundi*. IMF. https://www.imf.org/en/News/Articles/2024/01/22/pr2419-burundi-imf-staff-conducted-discussions-for-the-first-review-under-ecf-arrangement?utm_source=chatgpt.com

³ International Monetary Fund. (2025, mars). *IMF Urges Urgent Reforms as Inflation Hits 39% in Burundi*. IMF. https://www.burunditimes.com/imf-urges-urgent-reforms-as-inflation-hits-39-in-burundi/?utm_source=chatgpt.com

Figure n°1: Trends in Inflation, Interest Rate, and Money Supply Growth

Source: Authors, based on World Bank data (2024)

2. Literature Review

Monetary policy refers to the set of measures implemented by monetary authorities, typically the central bank, to control the money supply and the cost of credit. Its primary objective is to maintain price stability while supporting economic growth. Monetary policy operates through instruments such as policy interest rates, open market operations, and reserve requirements, which directly affect financing conditions in the economy⁴.

The relationship between the money supply and the general price level is a central issue in economics. Traditionally viewed as positively correlated, this relationship remains at the core of both theoretical and empirical debates. Monetarists, including [10], [13], [2], [12], and [9], argue that inflation is essentially a monetary phenomenon caused by excessive money creation.

In contrast, modern Keynesian approaches ([16]; [17]) attribute inflation to cost-push pressures, relegating the money supply to a secondary role. More sophisticated models, which incorporate agents' expectations and fluctuations in supply and demand ([12]; [17]), provide a more nuanced understanding of this relationship. Theoretically, the relationship between interest rates and inflation is grounded in Fisher's theory, according to which the nominal rate equals the sum of the real rate and expected inflation. Studies by [15] and [7] demonstrate that careful management of the real rate helps stabilize inflation, while [5] confirm that real rates influence inflationary expectations.

Empirical evidence corroborates this link. [1] in Pakistan and [14] in India find cointegration between interest rates and inflation. [6] shows that the gap between the natural and real rate correlates with inflation. In contexts with near-zero real rates (Japan, Eurozone), [11] and [8] highlight the limited effectiveness of monetary policy alone, advocating for complementary fiscal measures.

⁴ <https://www.cashbee.fr/lexique/politique-monetaire>

Finally, [3] identify a temporal paradox: an increase in the real interest rate induces short-term inflation but acts as a stabilizer in the medium and long term. [4], examining Algeria, confirm a bidirectional causality between the interbank interest rate and inflation, with a stronger influence of inflation on rates.

3. Methodological approach of the study

This study analyzes the transmission of monetary policy shocks, measured by money supply growth (MSG) and the real interest rate (INTR), on the dynamics of inflation (INFL) in Burundi, incorporating real GDP per capita (GDP) as a control variable.

The data are sourced from the World Bank (2024). The chosen model is a reduced-form VAR(p), where the vector of variables is defined as: $\mathbf{Y}_t = (\mathbf{INFL}_t, \mathbf{MSG}_t, \mathbf{INTR}_t, \mathbf{lnGDP}_t)$.

The inflation equation lies at the core of the analysis:

$$\begin{aligned} \mathbf{INFL}_t = & \beta_0 + \sum_{i=1}^p \alpha_1 \mathbf{INFL}_{t-i} + \sum_{j=1}^p \alpha_2 \mathbf{MSG}_{t-i} \\ & + \sum_{j=1}^p \alpha_3 \mathbf{INTR}_{t-i} + \sum_{j=1}^p \alpha_4 \mathbf{lnGDP}_{t-i} + \varepsilon_t \end{aligned}$$

The empirical approach will follow the following steps: (i) estimation of the VAR (Vector Autoregressive) model; and (ii) analysis of impulse response functions (IRF) and forecast error variance decomposition (FEVD) to assess the impact of money supply growth (MSG) and the interest rate (INTR) shocks on inflation. This approach provides an empirical understanding of the role of monetary policy in the dynamics of inflation in Burundi.

The study is based on annual data from the World Bank database (WDI). The observation period spans from 1990 to 2022, covering a total of 33 years. Inflation (INFL), measured by the GDP deflator, serves as the dependent variable and is expected to have a positive sign. Money supply growth (MSG) and the real interest rate (INTR) are also expected to be positive, while the logarithm of GDP per capita (lnGDP) may have either a positive or negative effect depending on the context. All data are sourced from the World Bank (2024).

4. Model estimation results and discussion

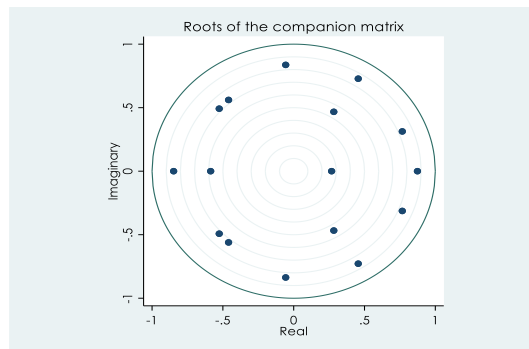
Table n°1: VAR model results

	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
INFL						
INFL						
L1.	-.4509549	.3959231	-1.14	0.255	-1.22695	.3250401
L2.	.4062787	.2446516	1.66	0.097	-.0732295	.885787
L3.	.5665451	.2885332	1.96	0.050*	.0010304	1.13206
L4.	-.0648119	.317596	-0.20	0.838	-.6872886	.5576648
MSG						
L1.	-.1101566	.1232164	-0.89	0.371	-.3516564	.1313432
L2.	.0864826	.1128193	0.77	0.443	-.1346391	.3076043
L3.	.2724777	.1145692	2.38	0.017*	.0479262	.4970291
L4.	.2752222	.1429384	1.93	0.054	-.0049318	.5553763
INTR						
L1.	-.3003811	.4071149	-0.74	0.461	-1.098312	.4975494
L2.	.6003681	.2424467	2.48	0.013*	.1251813	1.075555
L3.	.4134258	.2789243	1.48	0.138	-.1332557	.9601074
L4.	-.1605197	.3039878	-0.53	0.597	-.7563249	.4352854
lnGDP						
L1.	26.00502	49.1555	0.53	0.597	-70.33798	122.348
L2.	-147.017	77.14601	-1.91	0.057	-298.2204	4.1864
L3.	147.2603	77.97123	1.89	0.059	-5.560487	300.0811
L4.	-5.228849	52.03419	-0.10	0.920	-107.214	96.75629
cons	-127.5663	69.49211	-1.84	0.066	-263.7684	8.63571

Source : Authors, based on STATA 16 estimations

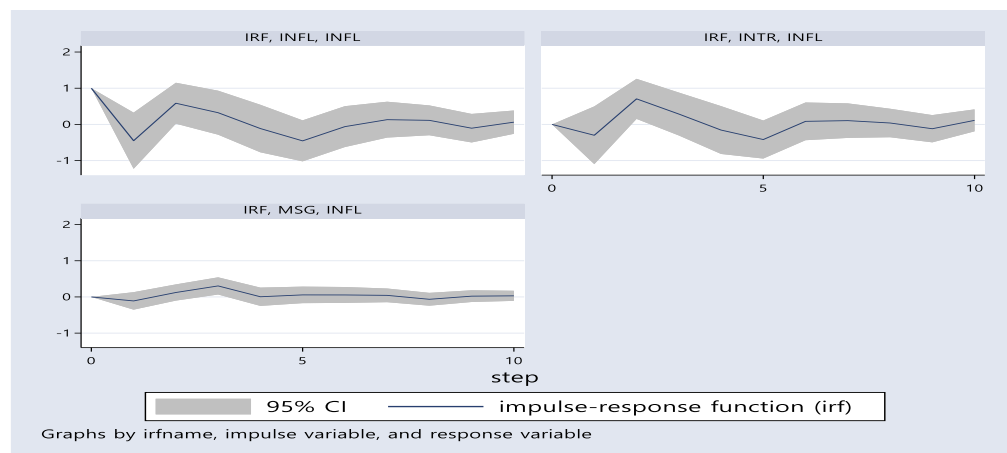
The results show that p-values below 0.05 are statistically significant at the 5% level. A 1% increase in inflation three periods ago (L3.INFL) leads to a 0.5665% rise in current inflation ($p = 0.050$), confirming the autocorrelation of inflation in Burundi and the inflationary inertia linked to economic agents' expectations.

Similarly, a 1% increase in the money supply three periods ago (L3.MSG) causes a 0.2725% increase in current inflation ($p = 0.017$), validating the quantity theory of money and illustrating the lag required for monetary expansion to influence prices. A more surprising result appears for interest rates: a 1% increase two periods ago (L2.INTR) leads to a 0.6004% rise in inflation ($p = 0.013$). Although theoretically an interest rate hike should curb inflation, this paradoxical effect can be explained by the pass-through of financial costs to prices (firms face higher borrowing costs due to elevated rates and pass this additional expense onto goods and services) and by the possibility that the rate increase was insufficient to counteract existing inflationary pressures in the economy.

Figure n°2: Model stability verification

Source : Authors, based on STATA 16 estimations

According to the results above, all eigenvalues lie within the unit circle. The VAR model therefore satisfies the stability condition.

Figure n°3: Impulse response analysis to examine the dynamic impact of shocks

Source : Authors, based on STATA 16 estimations

The graphs show that initial inflationary shocks trigger a sharp increase in prices, followed by a gradual adjustment, reflecting the Burundian economy's capacity to absorb such pressures, although their magnitude depends on policy measures and external shocks. Furthermore, inflation responds with a lag to interest rate changes and rises moderately but persistently with money supply expansion, confirming the classical effect of an expansionary monetary policy in a context of high import dependence and structural rigidities.

Table n°2: Variance decomposition of inflation

Inflation			
periods	MSG	INTR	INFL
0	0	0	0
1	.013287	0	.986713
2	.018062	.003663	.963624
3	.017446	.020744	.706855
4	.052791	.040196	.623442
5	.051423	.041311	.602295
6	.053599	.040739	.593557
7	.062744	.046288	.581851
8	.060884	.060773	.559491
9	.059753	.060981	.562676
10	.059884	.062575	.559356

Source : Authors, based on STATA 16 estimations

According to the table presented above, the analysis indicates that inflation in Burundi is highly autocorrelated, accounting for over 96% of its variance in the first two periods and still 55% after ten periods, reflecting strong inertia. From the third period onward, the money supply and interest rate gradually become influential, contributing 5.99% and 6.26% respectively at horizon ten, thereby confirming the role of money creation and the limited but increasing transmission of interest rates in an underdeveloped financial system.

Conclusion

The study, using the VAR model, shows that inflation in Burundi is highly autocorrelated, with past variations largely influencing its future trajectory. In the short term, past inflation dominates, whereas money supply and interest rates become more influential in the medium and long term. Monetary expansion leads to a gradual increase in prices, while the effect of interest rates remains limited due to financial rigidities. These findings highlight the need to strengthen the central bank's credibility, develop the financial sector, and better coordinate fiscal and monetary policies. The limitations of the analysis, particularly the exclusion of certain channels and data constraints, point to the need for future research, especially using more robust approaches such as the SVAR.

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Received: October 3, 2025; Published: November 7, 2025