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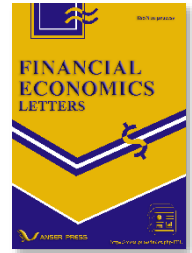
Nigeria's Transition to Full-Fledged Inflation Targeting: Insights from Ghana's Monetary Policy Frameworks

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ABSTRACT

In an effort to provide policy recommendations for Nigeria's transition to full-fledged inflation targeting, this study examines Ghana's monetary policy frameworks (monetary aggregates targeting and inflation targeting) using ARDL bounds test for cointegration and Error Correction Mechanism (ECM) on annual time series data spanning 1965 to 2022 obtained from the Bank of Ghana database and the World Bank database on World Development Indicators. The results demonstrate that monetary aggregates targeting has not been successful in both the short-run and long-run periods in moderating and stabilizing inflation; however, inflation moderated under inflation targeting in both the short run and the long term. This indicates that inflation targeting proves to be a superior monetary policy framework for inflation control.

KEYWORDS

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1. Introduction

In economic policy design, several approaches are often adopted to review economic conditions and set targets for achieving the desired objectives. This process which guides the initiation, analysis, implementation, and evaluation of policy is referred to as policy framework. The conduct of such policies is guided by rules, regulations and procedures embodied in laws resting statutorily with the monetary authorities. A central bank's main objective is to maintain price stability, which is achieved by implementing a monetary policy framework. Central Banks around the world adopt a number of monetary policy frameworks in response to the changes in macroeconomic conditions. The exchange rate peg, targeting of monetary aggregates, and targeting of the inflation rate are the three most widely used monetary policy frameworks (Ojo, 2013).

Historically, the use of monetary aggregates (M3, M2, or M1) in managing inflation started in the 1970s. However, the instability between monetary targeting and crucial economic indicators (such as inflation and income) made monetary targeting ineffective for managing inflation and promoting economic growth (Adaletey et.al, 2022). Considering this instability, advanced economies shifted to inflation targeting (IT) in the early 1990s with New Zealand being the first country to adopt inflation targeting as a monetary policy approach to control inflation. New Zealand's success in IT led many central banks in both developed and developing economies to adopt IT as their preferred framework for monetary policy.

The Bank of Ghana switched its monetary policy framework in 1981, transitioning from exchange rate targeting to monetary targeting. From 1982 to 1991, it adopted direct credit, and from 1992 to 2006, it employed open market operations. However, in 2007, the bank shifted to inflation targeting and has maintained the same policy framework since then. In the Nigerian context, the central bank adopted an exchange rate targeting framework since inception and commencement of operations in July 1959 to 1973, while in 1974 the Bank adopted the monetary aggregate targeting to stabilize prices by managing the pace of growth of broad money aggregates (Ojo, 2013). Recently, in December 2023, The Central Bank of Nigeria announced a switch from its current monetary targeting framework to a full fledge inflation targeting framework to bring down inflation to acceptable levels and to strengthen the monetary policy's credibility within the economy.

Over the policy period, inflation averaged 13.58 and 33.35 per cent during the period of inflation targeting and monetary aggregate targeting regime in Ghana respectively, however, in the case of Nigeria, inflation averaged 18.88 per cent during the period of the monetary aggregate targeting (Table 1). Inflation has been relatively volatile (figure 1) reaching 18.84 in Nigeria and 31.25 in Ghana in 2022. On a recent basis, Figure 2 shows that the inflation rate in Ghana starts at 53.60% in January 2023 and gradually decreases over the months to 23.20% by December 2023. Overall, inflation has generally been trending lower during the course of the year. However, unlike Ghana, Nigeria experiences a general upward trend in inflation throughout 2023 starting the year at 21.82 per cent to close at 28.92 per cent (figure 3). In efforts to stabilise inflation and stimulate growth, significant changes have occurred in both Nigeria's and Ghana's monetary policy frameworks over time.

Table 1. Descriptive Statistics of Inflation Rates in Ghana and Nigeria.

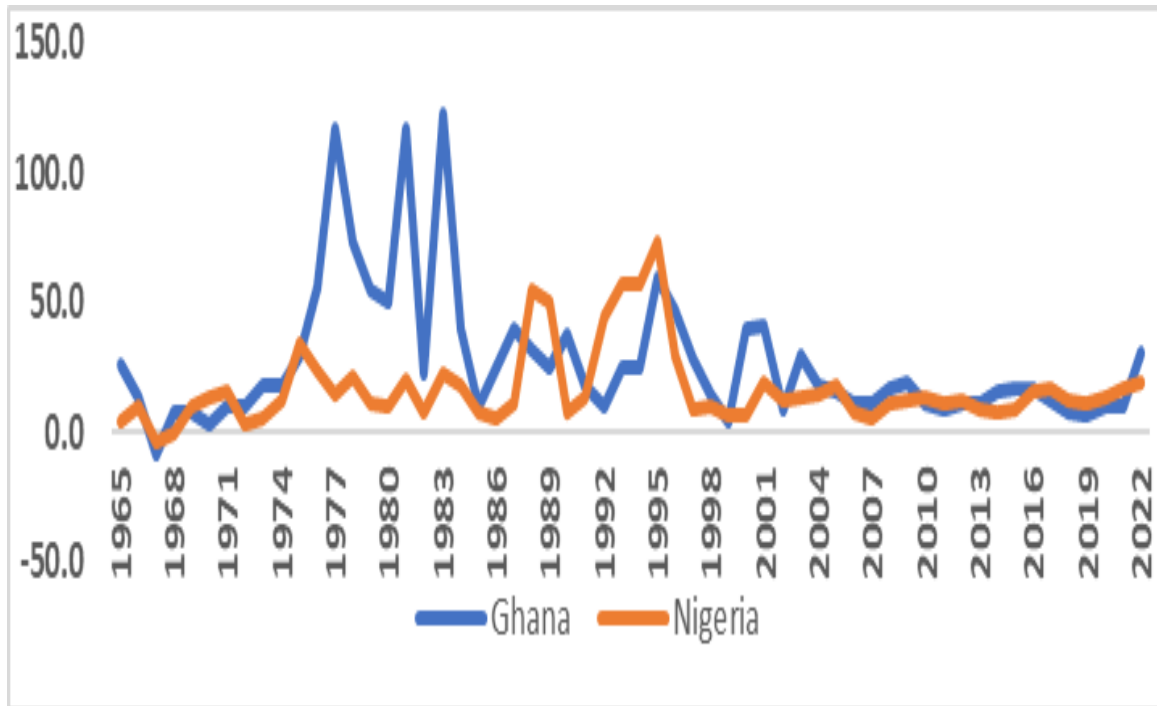|	Inflation Rates	
Panel 1 (period average)	Ghana	Nigeria
1965-1974	12.18	7.94
1975-1984	68.13	16.63
1985-1994	24.64	30.86
1995-2004	29.23	19.50
2005-2014	13.14	10.89
2015-2022	14.13	14.22
Panel 2 (Monetary Policy Frameworks)		
MTF	33.35	18.88
ITF	13.58	

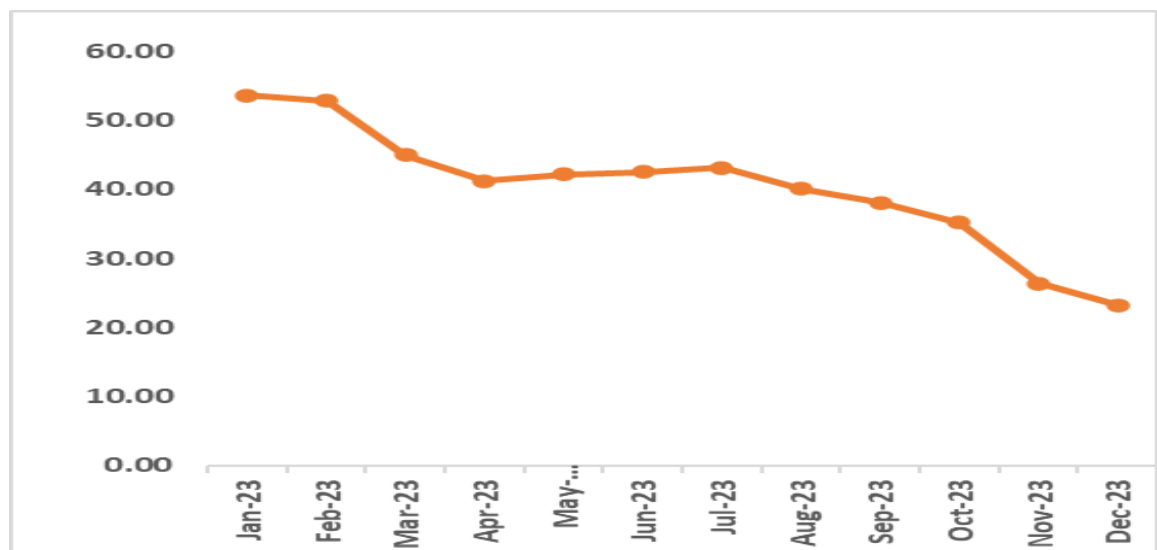**Figure 1.** Trends in Ghana and Nigeria's Inflation Rate (1965-2022).

Figure 2. Trends in Ghana's Inflation Rate (January-December, 2023).

The current monetary policy framework in Nigeria has not effectively achieved its main objective of maintaining price stability. This is evident from the consistently high and unpredictable inflation rates, as shown in figures 1 and 3 Despite the Central Bank of Nigeria's ongoing efforts to implement an inflation targeting framework, there is a lack of comprehensive empirical analysis and comparative assessments, especially within the Nigerian context. This study aims to address this gap by analyzing Ghana's experience with inflation targeting. The goal is to identify potential adjustments and factors that are specific to the Nigerian context. The motivation for this study stems from the need to bolster monetary policy frameworks in emerging economies, particularly in achieving enduring economic stability and growth. Nigeria confronts challenges in effectively balancing inflation management with economic growth resulting in being partially effective or insignificant in controlling inflation (Garba 2023 and

Anachedo, Okeke, and Ubah 2023). The move towards comprehensive inflation targeting (IT), as seen in Ghana provides a valuable case study for Nigeria. By exploring Ghana's experience with IT implementation, this study aims to make a substantial contribution to the conversation on the ideal framework for monetary policy, offering central banks and policymakers insightful advice as they struggle to fulfill their mandates for price stability in their individual countries. By using dummy variables to capture the effects of the policy regimes with updated data covering 1965 to 2022, the purpose of this paper is to assess the effectiveness of monetary aggregates targeting and inflation targeting frameworks in Ghana, with the aim of deriving insights for Nigeria as the Central Bank of Nigeria embarks on implementing comprehensive inflation targeting measures.

The findings of the study reveal that monetary aggregates targeting has not been successful in both the short- and long-term periods in moderating and stabilizing inflation; however, inflation moderated under the inflation targeting framework in both the short- and long-term periods. This indicates that inflation targeting is a better monetary policy framework in keeping inflation under control. While acknowledging that the effectiveness of a policy framework may be country-specific, at least in the context of the study analysis, Nigeria's decision to transit to full fledge inflation targeting is appropriate and timely. The study recommends that policymakers need to carefully use the short-term interest rates to manage broad money growth to ensure it is consistent with the inflation target and to also adjust the policy stance or use interventions to manage the exchange rate in a way that supports the inflation target.

Subsequently, the paper is laid out as follows: methodology will be presented in the next section, followed by the presentation and discussion of estimation results in Section 3, and concluding with policy recommendations for decision-makers in Section 4.
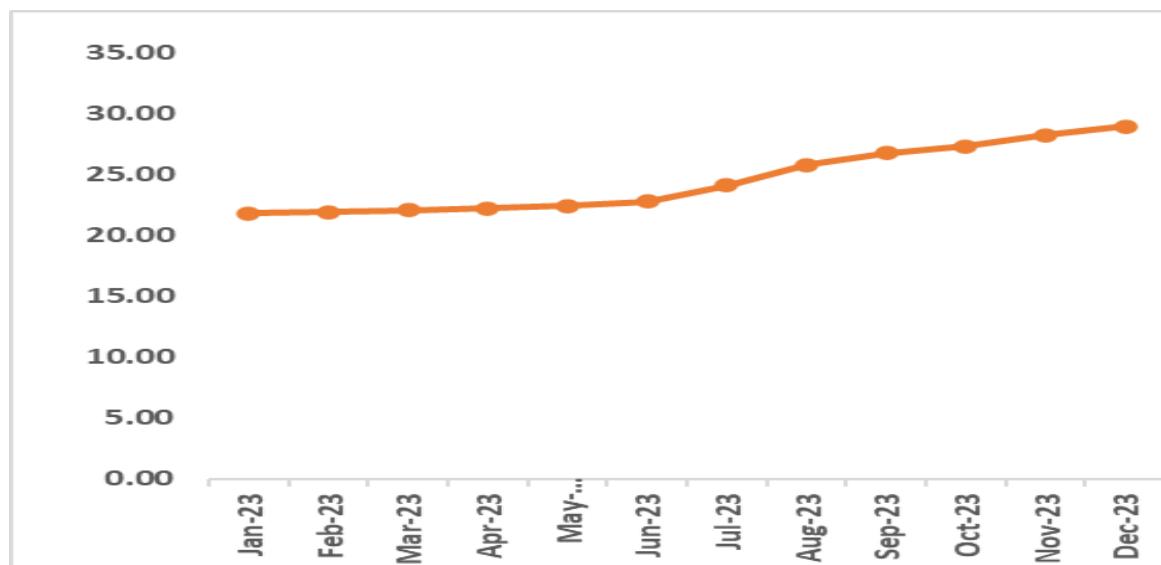

Figure 3. Trends in Nigera's Inflation Rate (January-December, 2023).

2. Literature review

This study utilizes a basic concept in monetary economics the Quantity Theory of Money (QTM) which establishes a connection between the amount of money in an economy and the level of prices to analyse the effectiveness of Ghana's monetary policy frameworks particularly inflation targeting and the monetary aggregates targeting in achieving price stability mandate. QTM is typically expressed through the equation of exchange, $MV = PQ$, where M represents the money supply and V represents the velocity of money. P stands for the level of price while the real output of goods and services is denoted by Q. According to this hypothesis, variations in the money

supply have a direct effect on the level of prices and, consequently, on inflation. Thus, it is anticipated that an increase in the money supply will result in a corresponding rise in prices, assuming steady output and velocity. Applying the QTM to Ghana entails analysing how shifts in the money supply, which are impacted by monetary policy frameworks, affect shifts in the level of general prices(inflation).

A plethora of empirical studies have had varying findings regarding the impact of the various monetary policy frameworks (monetary aggregate targeting and inflation targeting) on inflation. The findings of the studies that were reviewed are summarized in Table 2.

Table 2. Findings from Empirical Studies.

Authors	Findings
Valogo et.al. (2023)	• exchange rate has a positive and significant impact on IT.
Adaletey et.al (2022).	• formal adoption of IT significantly reduces both the volatility and rate of inflation • Adopting a pilot-based IT will not achieve the gains of the policy framework within the piloting period
Nene et.al (2022)	• IT is ineffective in reducing inflation uncertainty in South Africa. • Inconclusive effect of IT in Ghana • IT has a detrimental impact on economic growth in African countries
Gwaison, and Ogba (2021).	• Nigeria should consider embracing IT as a comprehensive framework for its primary monetary policy.
Ekong and Effiong (2020).	both monetary policy and fiscal policy play crucial roles in exerting a significant impact on inflation, both in the short term and in the long term. • evidence supporting the efficacy of coordinating monetary and fiscal policies in Nigeria's approach to IT.
Abdulai (2020)	compared to the previous period, there has been a decrease in both inflation and its volatility during the IT period. • limited effectiveness of MAT on inflation stability
Bleaney, Morozumi, and Mumuni (2020).	• in Ghana, inflation would have been even higher since 2007 if IT had not been implemented.
Allor (2020).	• bi-directional relationships between inflation, exchange rates and money supply
Amaning and Seidu, (2020)	• money supply has positive significant effect on inflation in both the long and the short run
Abango, Yusif and Issifu (2019)	• MAT reduces inflation only in the short run • IT lowers inflation in short and long run periods • Neither MAT nor IT kept inflation within the target band
Ardakani et al. (2018)	• IT is inadequate in reducing inflation
Puni, Osei, and Barnor (2014).	• inflation rate in the post-IT period is significantly lower compared to the pre-IT period.
Karahan (2012)	• IT is inadequate in reducing inflation uncertainty
Kyereboah-Coleman (2012).	• IT has reduced the persistence of inflation
Chinaemerem and Akujuobi (2012)	• Nigeria and Ghana are not suitable candidates for IT regime.
Aliyuand Englama, (2009).	• Nigeria should not pursue full fledged IT • Nigeria should pursue IT lite
Bawumia, Amoah and Mumuni (2008).	• IT has increased convergence towards the inflation targets • IT has significantly reduced inflation volatility

Notes: MAT=monetary aggregates targeting, IT= inflation targeting

3. Methodology

This study in line with Abango, Yusif and Issifu (2019), assumes that both monetary and non-monetary factors influence inflation dynamics. The study makes use of secondary annual time series data spanning 1965 to 2022 from the World Bank database on World Development Indicators (WDI) and the Bank of Ghana database. Inflation is the dependent variable while the main independent variables of interest are the dummy variables of Inflation Targeting Framework (ITF) and Monetary Aggregates Targeting Framework (MTF). MTF is a dummy policy variable that captures the effect of the monetary targeting policy framework, it takes a value of 1 for the period 1981–2006 and 0 otherwise. ITF quantifies the impact of an inflation targeting framework on the inflation rate. It assigns a value of 1 to the period 2007–2022 and 0 otherwise. Broad money growth, GDP growth, exchange rate and crude oil price that enters the model were selected as they are important determinants of inflation in Ghana see Valogo et.al, (2023), Amaning and Seidu, (2020), Allor (2020), and Abango, Yusif and Issifu (2019).

Following Nwachukwu et al. (2014) and Abango, Yusif and Issifu (2019), an inflation model is created for Ghana using the monetarists' theory as a foundation and to further account for the influence of non-monetary factors on inflation in developing economies, we altered the monetarists' hypothesis as follows (Equ. 1):

$$Inf_t = f(P_t, Q_t) \tag{1}$$

Were

Inf_t denotes inflation rate,

P_t represents the monetary determinant of inflation,

Q_t denotes the non- monetary determinants of inflation in Nigeria and

From the above model, two semi log linear operational models are specified as follows to capture the objective of the study with Equation (2) estimating the impact of inflation targeting on the inflation rate while Equation (3) captures the impact of monetary aggregate targeting framework on inflation rate in Ghana.

Model 1

$$inf_t = \beta_0 + \beta_1 bm_t + \beta_2 gdp_t + \beta_3 er_t + \beta_4 oil_t + \beta_5 ITF_t + \mu_t \tag{2}$$

Model 2

$$inf_t = \beta_0 + \beta_1 bm_t + \beta_2 gdp_t + \beta_3 er_t + \beta_4 oil_t + \beta_5 MTF_t + \mu_t \tag{3}$$

Where:

inf = Inflation rate,

bm = Money supply

gdp = Gross domestic product,

er = Exchange rate,

oil = Crude oil price,

MTF = Monetary aggregate targeting,

ITF = Inflation targeting,

β_0 = constant and β_1 to β_5 = coefficients to be estimated,

μ_t = Error term

The parameter estimates are expected to exhibit the following signs: β_1 is expected to be positive as an increase in money supply is expected to increase inflation and vice versa (supporting the assertion of the quantity theory of money). Similarly, β_2, β_3 , and β_4 are all expected to be negative, implying that an increase in them will lead to a decrease in inflation and vice versa. Our dummy variables of MTF and ITF are also expected to be negative as the main target is achieving price stability (inflation).

The series stationarity is one of the preliminary tests that establishes the approach to take while analyzing time series data. The stationarity of the series was examined using the Phillip-Perron tests, which are more robust to serial correlation than the ADF. The null hypothesis states that a series contains a unit root. I(0) refers to series that are stationary at levels, while I(1) refers to series that become stationary after the first difference. The estimation of equation 4 as shown below is typically included in the Phillips-Perron test for stationarity:

$$y_t = \alpha + \rho y_{t-1} + \partial t + u_t \tag{4}$$

The ARDL bound test is employed in this study because it does not require that our variables have the same order; instead, it requires a combination of integration at levels I(0) and order one I(1) eliminating the possibility of an incorrect result (Pesaran and Shin, 1998). Additionally, ARDL combines both dependent and independent variables, which makes it a better model than others that considered all variables as it considers the behaviour of both the explained and explanatory variables (eg, VAR). It is also a better alternative in a state where there could be an Engle and Granger structural collapse or the two-step process due to possible endogeneity, therefore it gets rid of problems with endogeneity and serial correlation in variables (Rahman and Kashem, 2017). Therefore, given the above features of ARDL as well as the objective of this study, the paper evaluated both the Error Correction

Mechanism (ECM) model and the ARDL suggested in Pesaran, Shin, and Smith (2001) to determine the short- and long-term correlations of the given variables.

4. Results and Discussions

The outcomes of the Phillips–Perron (PP) and the Augmented Dickey-Fuller (ADF) unit root tests conducted are shown in Table 3. For both PP and ADF tests, Exchange rate, crude oil price, monetary targeting and inflation targeting were not stationary at levels, this indicates that while inflation, money supply and GDP growth are I(0) series, exchange rate, crude oil price, MT and IT are I(I) series. The ARDL bounds technique was chosen, taking into account the mixed orders of integration I(I) and I(0). The table below presents a summary of the unit root test results for each variable.

Table 3. Summary of Phillips–Perron Unit Root Test Results.

Levels Test Results				
Variable	PP test statistics	Probability value	ADF test satatistics	Probability value
Inf	-36.894	0.0002	-4.882	0.0003
Bm	-27.972	0.0015	-4.588	0.0011
gdp	-40.719	0.0000	-5.658	0.0000
Er	9.636	1.0000	-0.846	0.9616
Oil	-13.373	0.2887	-2.483	0.3364
ITF	-6.763	0.6419	-1.893	0.6583
MTF	-4.029	0.8591	-1.391	0.8634
1ˢᵗ Difference Test Results				
Variable	PP test statistics	Probability value	ADF test satatistics	Probability value
Er	-53.295	0.0691	-4.360	0.0025
Oil	-44.098	0.000	-6.328	0.0000
ITF	-56.244	0.000	-7.497	0.0000
MTF	-56.074	0.000	-7.454	0.0000

Applying the ARDL bounds test that was suggested by Pesaran, Shin, and Smith (2001), the results show that the computed F-statistic values of 11.615 for model 2 and 13.077 for model 1 exceed the upper bound critical value of 4.68 at ninety-nine per cent (99%) confidence levels. This suggests that the inflation rate and the independent variables exhibit cointegration, at least at the one per cent (1%) significance level. The following is a sample of the co-integration results (table 4):

Table 4. The ARDL Bound Test Results.

			Critical Values	
Model	F-statistics	Sig(%)	I(0)	I(1)
1	13.077	1	3.41	4.68
2	11.615	1	3.41	4.68

To ensure the two models passed the statistical sufficiency test, the estimated models underwent model diagnostic and stability tests. In Table 5, estimates of the error correction terms are provided, demonstrating how quickly the inflation rate adjusts to its long-run equilibrium. Notably, the negative sign of the ECT coefficient in both models, in accordance with theory, indicates evidence of convergence should the long-run equilibrium be disrupted. The ECT's value of --1.08 for model 1 and -1.05 for model 2 (prob value = 0.0000), suggest an oscillatory convergence (fluctuate forward before settling to equilibrium), that is, instead of monotonically converging to the equilibrium path directly, dampening fluctuations around the long-run value are evident in the error correction process. However, once this process is complete, convergence to the equilibrium path is rapid. See Narayan and

Smyth (2006) and Loayza and Ranciere (2006).

Additionally, the table demonstrates that the model passed the tests for heteroscedasticity and serial correlation in addition to the elimination of the issues of serial correlation by the bounds test (Rahman and Kashem, 2017). Furthermore, it can be inferred from the Ramsey Reset test that the model is properly specified while figures 4 and 5 depict that parameter stability is maintained within the critical point boundary according to the CUSUM and CUSUM of square tests.

Table 5. Model Diagnostics.

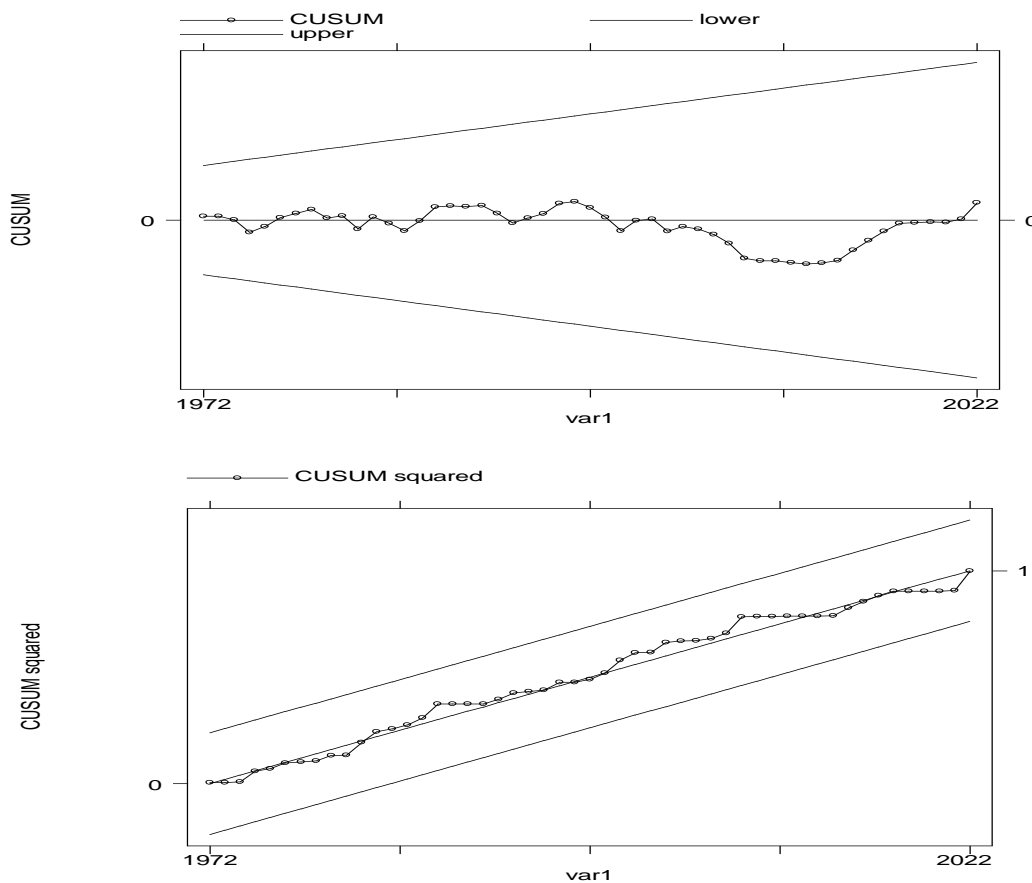| Test	Model 1	Model 2
Ecm(-1)	-1.078438	-1.048569
	(0.0000)	(0.0000)
Heteroscedasticity	40.73	56.00
	(0.5704)	(0.4371)
Functional Form	1.14	0.71
	(0.3443)	(0.5513)
Durbin-Watson	2.373641	1.944077
CUSUM	Stable	Stable
CUSUMSQ	Stable	Stable

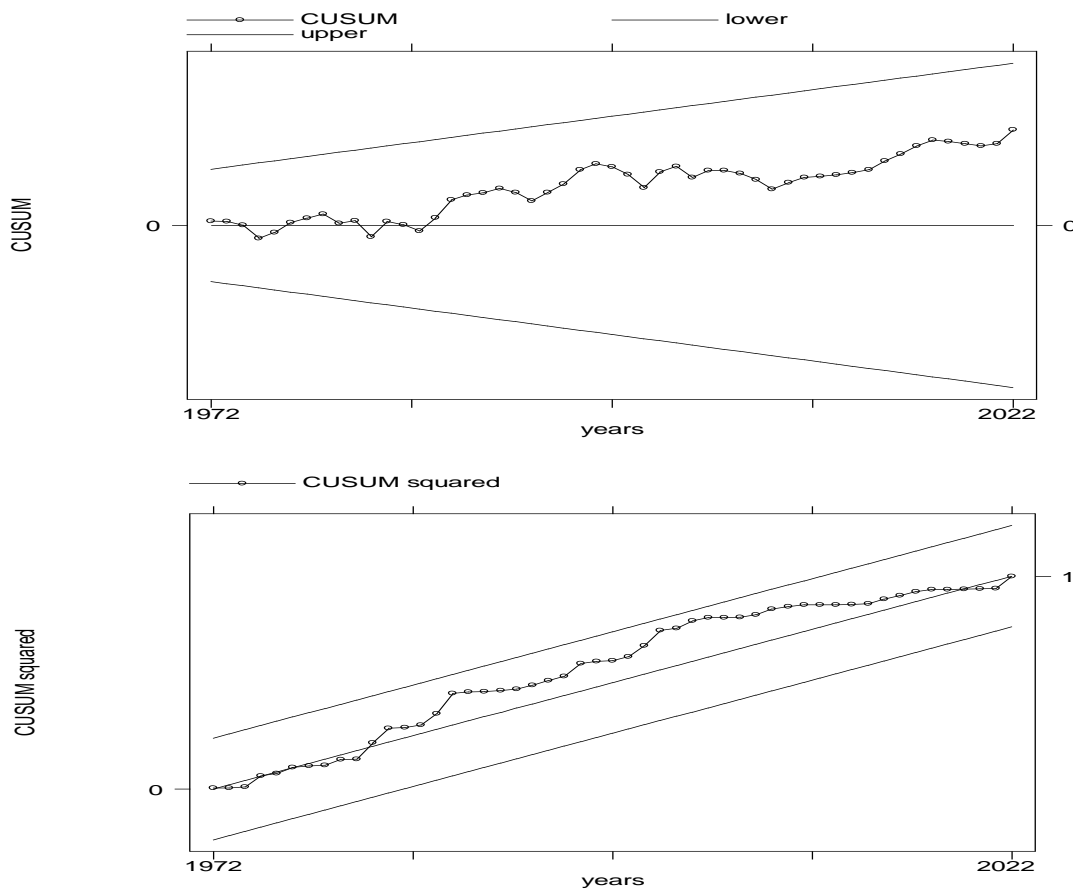

Figure 4. CUSUM and CUSUMSQ results for model 1.

Figure 5. CUSUM and CUSUMSQ results for model 2.

Table 6. Results of the Long run ARDL Model.

Independent Variables	Model 1	Model 2
Broad money growth	0. 7972226	0.7928276
	(0.000)	(0.000)
GDP growth	-0. 1292164	-0.1398341
	(0.000)	(0.000)
Exchange rate	-0. 157514	-0.1168503
	(0.017)	(0.137)
Crude oil Price	-0. 0281904	-0.0964218
	(0.762)	(0.467)
Inflation Targeting	-0. 2625806	
	(0.095)	
Monetary Aggregates Targeting		0.1710833
		(0.606)

Tables 6 and 7 illustrate the outcomes of the estimated long-run and short-run autoregressive distributed lag (ARDL) models. The analysis reveals that broad money growth has a positive and significant correlation with inflation while GDP growth maintains a statistically significant negative relationship with inflation in both monetary aggregates and inflation targeting regimes both in the short and long run. This is in line with the apriori expectation and also in line with the findings of Abango, Yusif and Issifu (2019) and Amaning and Seidu, (2020). The exchange rate has a negative significant relationship in the long-run under the inflation targeting regime but was not significant in monetary aggregates targeting, However, in the short run period, it has a positive significant relationship in inflation targeting (in line with Valogo et.al, 2023) but also an insignificant relationship under the

monetary aggregates targeting regime. Crude oil price is found to have a statistically insignificant impact either under the inflation targeting regime or the monetary aggregates targeting regime respectively in line with the findings of Abango, Yusif and Issifu (2019).

Table 7. Results of the Short run ARDL Model.

Independent Variables	Model 1	Model 2
Broad money growth	0. 2698415	0.2584559
	(0.050)	(0.070)
GDP growth	-0. 0354696	-0.0346788
	(0.034)	(0.055)
Exchange rate	0. 4937017	-0.4194909
	(0.040)	(0.101)
Crude oil Price	-0. 0304015	0.2431173
	(0.761)	(0.350)
Inflation Targeting	-0.6659548	
	(0.066)	
Monetary Aggregates Targeting		0.1793926
		(0.602)

As for the dummy variables of interest, monetary aggregates targeting deviated from the expectation by exhibiting an insignificant relationship in controlling inflation both in the short and long run period while inflation targeting, on the other hand, conforms to the expectation as it has a negative significant relationship with inflation both at the short and long run period, this corroborates the findings of Bawumia, Amoah and Mumuni, (2008), Abdulai, (2020), and Abango, Yusif and Issifu (2019). Therefore, a unit change in inflation targeting will bring about a 0.67 and 0.26 decrease in inflation in the short and long run period respectively.

5. Conclusion and Policy Recommendations

This study uses annual time series data covering 1965 to 2022 to investigate Ghana's monetary policy frameworks (monetary aggregates targeting and inflation targeting) to draw policy insights for Nigeria's Transition to Full-Fledged Inflation Targeting. Inflation is the dependent variable while the independent variables comprise the MTF (takes a value of 1 for the period 1981 – 2006 and 0 otherwise and ITF (assumes a value of 1 for the period 2007 – 2022 and 0 otherwise) which are dummy policy variables that capture the effect of monetary aggregates and inflation targeting framework on inflation. Other variables include broad money growth, GDP growth, exchange rate and crude oil price. Utilizing the ARDL model allowed for the verification of both long-run and short-run associations between the annual inflation rate and the explanatory variables.

Broad money growth and GDP growth were in line with the apriori expectation as the analysis reveals that broad money growth has a positive and significant correlation with inflation while GDP growth maintains a statistically significant negative relationship with inflation in both monetary aggregates and inflation targeting regimes both in the short and long run. Crude oil price is found to have a statistically insignificant impact either under the inflation targeting regime or the monetary aggregates targeting regime respectively, this is in line with the findings of Abango, Yusif and Issifu, (2019). Exchange rate on the other hand has a negative significant relationship in the long-run under the inflation targeting regime but was not significant in monetary aggregates targeting, However, in the short run period, it has a positive significant relationship in inflation targeting (in line with Valogo et.al, 2023). The results further demonstrate that monetary aggregates targeting has not been successful in both the short-run and long-term periods in moderating and stabilizing inflation; however, inflation moderated under inflation targeting in both the short- and long-term periods. This suggests that inflation targeting proves to be a superior monetary policy framework for maintaining inflation control.

Noting that a policy framework that is beneficial in one country may not necessarily be directly applicable to another as the effectiveness can be country-specific, at least in the context of the study analysis, Nigeria's decision to transit to full fledge inflation targeting is appropriate and timely, given the recent persistent increase in inflation. The significance of broad money and GDP growth as seen from the results suggests that policymakers need to carefully use the short-term interest rates to manage broad money growth to ensure it is consistent with the inflation target. Also established is the fact that changes in crude oil prices are not a robust predictor of inflation, therefore, policymakers may prioritise other factors like in this study exchange rate by adjusting the policy stance or using interventions to manage the exchange rate in a way that supports the inflation target in Nigeria.

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Conflict of interest

The author claims that the manuscript is completely original. The author also declares no conflict of interest.

Author contributions

This is a single-author study.

References

Abango, M. A., Yusif, H., and Issifu, A. (2019). Monetary aggregates targeting, inflation targeting and inflation stabilization in Ghana. *African Development Review*, 31(4), 448-461. https://doi.org/10.1111/1467-8268.12399

Abdulai, I. (2022). MONETARY POLICY, INFLATION STABILISATION AND OUTPUT GROWTH IN GHANA, 1980-2017. https://publication.aercafricalibrary.org/bitstreams/5a80f273-41f7-4c3d-9404-8a46fa6f2680/download

Adaletey, J. E., Feruta, E. S., Mbilla, S. A. E., and Achiyaale, R. A. (2022). The unique adoption of inflation targeting monetary policy: lessons from an emerging economy. *Asian Journal of Economics, Business and Accounting*, 481-494. https://doi.org/10.9734/ajeba/2022/v22i23888

Aliyu, S. U. R., and Englama, A. (2009). Is Nigeria Ready for Inflation Targeting?. https://www.researchgate.net/profile/Shehu-Usman-Rano-Aliyu/publication/46445701_Is_Nigeria_Ready_for_Inflation_Targeting/links/00b7d5217c543cca81000000/Is-Nigeria-Ready-for-Inflation-Targeting.pdf?_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6InB1YmxpY2F0aW9uIiwicGFnZSI6InB1YmxpY2F0aW9uIiwicHJldmlvdXNQYWdlIjoiX2RpcmVjdCJ9fQ

Allor, P. W. (2020). The effect of monetary policy and inflation on the exchange rate: A case study of Ghana. *Journal of Economics and International Finance*, 12(4), 151-163. http://dx.doi.org/10.5897/JEIF2020.1076

Amaning, E. O., and Seidu, A. N. (2020). A Monetary Analysis of Ghana: Examining the Impact and the Causal Relationship Between Monetary Policy and Inflation in Ghana. *American Journal of Economics*, 4(1), 1-14. http://dx.doi.org/10.47672/aje.460

Anachedo, C. K., Okeke, I., & Ubah, C. B. (2023). Monetary Policy A Catalyst for Inflation and Booster for Economic Growth; Evidence from Nigeria. *Iconic Research and Engineering Journals*, 6(11), 423-433. https://www.irejournals.com/formatedpaper/1704458.pdf

Ardakani, O. M., Kishor, N. K., and Song, S. (2018). Re-evaluating the effectiveness of inflation targeting. *Journal of Economic Dynamics and Control*, 90, 76-97. https://doi.org/10.1016/j.jedc.2018.01.045

Bawumia, M., Amoah, B., and Mumuni, Z. (2008). Choice of monetary policy regime in Ghana. Bank of Ghana Working

Paper7. https://www.bog.gov.gh/wp-content/uploads/2019/07/Choice-of-Monetary-Policy-Regime-in-Ghana.pdf

Bleaney, M., Morozumi, A., and Mumuni, Z. (2020). Inflation targeting and monetary policy in Ghana. *Journal of African Economies*, 29(2), 121-145. https://doi.org/10.1093/jae/ejz021

Chinaemerem, O. C., and Akujuobi, L. E. (2012). Inflation targeting and monetary policy instruments: evidence from Nigerian and Ghana. *Kuwait Chapter of Arabian Journal of Business and Management Review*, 33(847), 1-30. https://j.arabianjbmr.com/index.php/kcajbmr/article/view/301

Ekong, C. N., and Effiong, U. E. (2020). Monetary Policy and Inflation Targeting in Nigeria: The Need for Monetary-Fiscal Coordination. *American Journal of Theoretical and Applied Business*, 6(3), 37-46. https://doi.org/10.11648/j.ajtab.20200603.14

Garba, A. M. (2023). The threshold level of budget deficit and money supply that stabilize inflation in Nigeria. *Journal of Global Economics and Business*, 4(13), 88-96. http://dx.doi.org/10.58934/jgeb.v4i13.142

Gwaison, P. D., and Ogba, L. (2021). Inflation Targeting and the Demand for Money in Nigeria; An Auto Regressive Distributive Lag (Ardl) Approach. *International Journal of New Economics and Social Sciences (Ijoness)*, 14(2), 77-94. https://doi.org/10.5281/zenodo.5972339

Karahan, Ö. (2012). The relationship between inflation and inflation uncertainty: evidence from the Turkish economy. *Procedia economics and finance*, 1, 219-228. http://dx.doi.org/10.1016/S2212-5671(12)00026-3

Kyereboah-Coleman, A. (2012). Inflation targeting and inflation management in Ghana. *Journal of Financial Economic Policy*, 4(1), 25-40. https://doi.org/10.1108/17576381211206460

Loayza, N. V., and Ranciere, R. (2006). Financial development, financial fragility, and growth. *Journal of money, credit and banking*, 1051-1076. http://dx.doi.org/10.1353/mcb.2006.0060

Narayan, P. K., and Smyth, R. (2006). What determines migration flows from low-income to high-income countries? An empirical investigation of Fiji–Us migration 1972–2001. *Contemporary economic policy*, 24(2), 332-342. http://dx.doi.org/10.1093/cep/byj019

Nene, S. T., Ilesanmi, K. D., and Sekome, M. (2022). The effect of inflation targeting (IT) policy on the inflation uncertainty and economic growth in selected African and European countries. *Economies*, 10(2), 37. http://dx.doi.org/10.3390/economies10020037

Nwachukwu, P. O., Yaba, L., and Dibie, A. C. (2014). Error Correction Model Analysis of Determinants of Inflation in Nigeria (1970-2013). *Journal of Economics and Sustainable Development*, 5(4), 59–64. https://www.iiste.org/Journals/index.php/JEDS/article/viewFile/17504/17924

Ojo, M. O. (2013). Transition to full-fledged inflation targeting: A proposed programme for implementation by the Central Bank of Nigeria. https://dc.cbn.gov.ng/cbn_occasional_papers/9/

Pesaran, M. H., and Shin, Y. (1998). An Autoregressive Distributed-Lag Modelling Approach to Cointegration Analysis. In Econometrics and Economic Theory in the 20th Century. The RagnarFrisch Centennial Symposium, ed. S. Strøm, chap. 11, pp. 371–413. Cambridge: Cambridge University Press

Pesaran, M. H., Shin, Y., and Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289-326. https://doi.org/10.1002/jae.616

Puni, A., Osei, B. A., and Barnor, C. (2014). Effects of inflation targeting policy on inflation rates and gross domestic product in Ghana. European Journal of Business and Management, 6(21), 54-60. https://www.researchgate.net/profile/Albert-Puni/publication/281111444_Effects_of_Inflation_Targeting_Policy_on_Inflation_Rates_and_Gross_Domestic_Product_in_Ghana/links/55d62bfd08aed6a199a4c3df/Effects-of-Inflation-Targeting-Policy-on-Inflation-Rates-and-Gross-Domestic-Product-in-Ghana.pdf?_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6InB1YmxpY2F0aW9uIiwicGFnZSI6InB1YmxpY2F0aW9uIiwiHJldmlvdXNQYWdlIjoiX2RpcmVjdCJ9fQ

Rahman, M. M., and Kashem, M. A. (2017). Carbon emissions, energy consumption and industrial growth in Bangladesh: Empirical evidence from ARDL cointegration and Granger causality analysis. *Energy policy*, 110, 600-608. http://dx.doi.org/10.1016/j.enpol.2017.09.006

Valogo, M. K., Duodu, E., Yusif, H., and Baidoo, S. T. (2023). Effect of exchange rate on inflation in the inflation targeting framework: Is the threshold level relevant?. *Research in Globalization*, 6, 100119. http://dx.doi.org/10.1016/j.resglo.2023.100119