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This Study Examines the Impact of Inflation on Exchange Rate

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A B S T R A C T

This study examines the impact of inflation on exchange rate. The model built for the study inflation rate as the endogenous variable and Exchange rate, interest rate, Broad money supply as the exogenous variables. Annual time series data was gathered from the World development Index (WDI) from 1999 to 2022. The study examines the impact of inflation on exchange rate. The model is specified on the function of inflation rate, Exchange rate, Interest rate, and Broad Money supply. The findings from the regression reveals that exchange rate have a positive impact on inflation. The finding from the f- statistics shows that there is existence of long run relationship between inflation and exchange rate. The study recommends that government should work alongside the central bank, to tighten monetary policy, to cool down the economy and reduce demand – driven inflation. This can stabilize the exchange rate by making the currency more attractive to foreign investors seeking higher returns.

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INTRODUCTION

One of the most serious economic issues is inflation, and as strong inflationary pressures developed, economists turned their attention to price stabilization as the primary goal of economic policy. High rates of inflation have typically accompanied developing nations' attempts to attain faster development rates during the previous few decades. One terrible illness that has the potential to wipe out society is inflation. Because it will drastically increase the cost of goods and services and reduce people's purchasing power well below their existing living standards, high inflation is more detrimental to consumers and the economy as a whole. High inflation also raises interest rates, which might further hinder economic expansion.

The world economy entered its worst recession since World War II as a result of the COVID-19 epidemic. Between January and May 2020, worldwide consumer price inflation fell by 0.9 percentage points due to a reduction in demand and falling oil costs. Compared to emerging market and developing countries (EMDEs), this reduction was around one-third more noticeable in advanced economies. However, inflation has increased since May 2020. In both advanced economies and EMDEs, inflation had surpassed pre-pandemic levels by April 2021. The increase in inflation was widespread, occurring in roughly four out of five nations.

Numerous factors, including how the pandemic affected potential output, the magnitude of the initial output gap, households' propensity to spend the one-time checks allowed by the bill, and the correlation between inflation and labor market tightness, would determine the fiscal effects on employment, output, and inflation. These investigations recognized the ambiguity of magnitudes. Inflation optimists argued that even if the extra fiscal spending were to lower unemployment by more than expected, a major spike in inflation would still be unlikely because the Phillips curve is quite flat, indicating that inflation is relatively insensitive.

The broad debate and problems regarding the connection between inflation and exchange rates have remained prevalent in both developed and developing economies worldwide. This came about as a result of conceptual definitions, theoretical justifications, and empirical facts (for both rich and developing countries) not agreeing. Milton Freidman made the claim in 1963 that inflation is always and everywhere a monetary phenomenon and that it can only be brought on by a significant increase in the money supply as opposed to higher production.

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As a result, economic actors frequently turn to foreign currencies as a self-defense strategy, it ultimately results in parallel currency exchange markets and extensive unofficial dollarization. Due to the increased demand for foreign exchange, illegal marketplaces will inevitably proliferate. (Bada, Olufemi, Tata, Peters, Bawa, Onwubiko, & Onyowo, 2016). According to the National Bureau of Statistics, Nigeria's inflation rate rose by 3.52% in a single year, from 17.01% in August 2021 to 20.52% in August 2022 (NBS, 2022). Between 1974 and 2022, the inflation rate was double digits, at 20.52 percent. This trend indicates concerns about Nigeria's investment climate (CBN, 2021).

But lately, the exchange rate has been progressively dropping, hitting a record high of more than 400 naira to the dollar at the official rate and more than 600 naira on the black market (NBS, 2022). Therefore, whether a country is inclined to import, export, or locally rely on what it produces domestically and consumes domestically, a high exchange rate can lead to a general increase in the price of products and services in the local economy. The country's dropping exchange rate may result in price increases for the local economy, especially in nations where domestic industries depend on the importation of raw materials.As in the preceding case, increased import prices brought on by the depreciation of the local currency will not discourage consumers from purchasing foreign goods, but rather boost prices overall if the country's marginal propensity to purchase foreign goods is large.

Nigerian prices for goods and services continue to rise despite the government's repeated efforts to lower inflation. The exchange rate shock and other monetary policies that are anticipated to impact the banking system could intensify the inflationary pressure. Since Nigeria is an import-dependent economy, strict or lax inflationary policies will have an impact on the exchange rate system, which would raise or lower the inflationary pressure depending on how well the policy measures work. In order to determine the causal relationship between the variables, the study uses a dynamic approach to examine the relationship between Nigeria's inflation and currency rate. One of the most significant problems in developing nations is inflation.

Because people's livelihoods fluctuate annually due to the pace of inflation. The exchange rate is one of the public elements that significantly affects inflation. The dollar has a significant impact on our nation's exchange rate, which is highly variable in determining the annual inflation rate. Any monetary expansion strategy, such raising the money supply, to make up for the budget deficit exacerbates the exchange rate increase, which in turn raises the rate of inflation and lowers output (Mousavi, 2021). Nominal exchange rate fluctuations account for a significant portion of real exchange rate variations in rich nations, whereas inflation rates in emerging nations follow exchange rate declines in the absence of suitable macroeconomic policies.

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If the system is already experiencing significant levels of inflation from both the supply and demand sides, the exchange rate fluctuation may be even more dangerous. "Inflation is always and everywhere a monetary phenomenon," according to American monetary economist Milton Friedman. According to monetarists, an increase in the money supply always results in a corresponding rise in the level of prices. As long as this increase continues, domestically produced goods and services will likely lose market share both domestically and internationally as their competitiveness declines relative to that of other nations.

Consequently, exports would decline and imports will rise. This means that while domestic consumers will be supplying more of their local currency to settle accounts with the outside world, buyers of the nation's commodities will require less of their currency to settle accounts with them. Depreciation of their exchange rate will result from a decrease in demand and an increase in supply of the local currency. Nonetheless, a declining currency will result in a decrease in the cost of the nation's exports and an increase in the cost of its imports.

Over time, the country's exchange rate may depreciate and then appreciate because imports will decrease in volume as they become more costly and exports will increase in volume as they become relatively cheaper. The foreign currency market may become more unclear as a result of a vicious cycle. The mechanism through which depreciation in the exchange rate turns into appreciation and vice versa, without direct and intentional government action to effect some changes, depends on a number of factors, including the country's exchange rate system, the government's macroeconomic goals, the degree of economic openness, and the mobility of capital within that economy. The

exchange rate regime is crucial in mitigating the likelihood of real exchange rate swings impacting the rate of inflation and vice versa.

Reserch Questions

1. What is the exact relationship between Inflation and Exchange rate?
2. What is the impact of Interest rate on inflation?
3. To what extent has money supply influenced Inflation?
4. What is the relationship between GDP and inflation?

Hypothesis

For the purpose of the study, I put forward the following Null hypothesis

1. There is no significant relationship between Inflation and Exchange rate
2. There is no significant impact of Interest rate on Inflation
3. There is no significant impact of money supply on Inflation
   There is no significant impact if GDP on Inflation

LITERATURE REVIEW

Types Of Exchange Rates

1. Fixed Exchange Rate:

The exchange rate of the currency is determined by the government in this arrangement. Therefore, maintaining a stable currency rate is the responsibility of the government. Every country maintains the value of its currency in respect to a "external standard," which might be another country's currency or another precious commodity like gold or silver. The main objective of a fixed exchange rate is to preserve stability in the country's capital flows and foreign trade. The government or central bank purchases foreign currency when the exchange rate rises and sells it when it falls in order to maintain the stability of the rate.

Merits of Fixed Exchange Rate System

a. It guarantees exchange rate stability. As a result, it facilitates international trade.
b. It aids the government in managing economic inflation.
c. It ceases to engage in foreign exchange market speculation.
d. Since there are no doubts over international exchange rates, it encourages capital transfers within the nation.
e. It aids in stopping the outflow of capital.

2. Demerits of Fixed Exchange Rate System
   a. It needs substantial gold reserves. As a result, it impedes the flow of foreign exchange or money.
   b. The currency may become overvalued or undervalued as a result.
   c. It undermines the purpose of open markets.
   d. The nation that uses this approach might have trouble overcoming a recession or depression.

Flexible Exchange Rate System

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foreign trade. To maintain a steady exchange rate, the government or central bank purchases foreign currency when it is increasing and sells it when it is decreasing.

1. Merits of Flexible Exchange Rate System
    a. The government does not need to maintain any reserves under the flexible exchange rate regime.
    b. It resolves the issue of currency overvaluation or undervaluation.
    c. It promotes foreign exchange-based venture finance.
    d. It also improves resource allocation efficiency.
2. Demerits of the Flexible Exchange Rate System
    a. It promotes economic speculation.
    b. Because the exchange rate is constantly changing in response to supply and demand, the economy lacks stability.
    c. This makes it inconvenient to coordinate macro policy.

METHODOLOGY

Managed Float System

Because it combines the flexible rate system (the floating part) and the fixed rate system (the managed part), it is also referred to as a hybrid system. It explains a system in which the foreign exchange rate is determined by market forces and stabilized by the central bank in response to changes in the value of the local currency. Under this arrangement, the central bank buys or sells foreign currency in large quantities to control exchange rate swings. The central bank lowers the exchange rate by selling foreign exchange when it is high and vice versa. Protecting the interests of importers and exporters is the aim.

Concept of Inflation

Despite being one of the most commonly used phrases in economic discourse, inflation is sometimes misunderstood. Although there are several schools of thought about inflation, economists generally agree that inflation is the steady increase in prices. Inflation simply describes a state of the economy in which prices for goods and services are steadily rising overall. It could be described as "a continuous increase in prices as measured by an index such as the implicit price deflator for Gross National Product (GNP) or the consumer price index (CPI)." "Too much money is chasing too few goods" is a common way to characterize inflation.

Inflation reduces the currency's purchasing value. When the economy is experiencing inflation, a certain quantity of naira will eventually have less purchasing power. For example, if the price of shirts doubles in the next period, N10.00, which in the current time can buy 10 shirts, will only be enough to buy 5 shirts. Two crucial terms need to be kept in mind when defining inflation. First, is it general or aggregate, meaning that the price increase that qualifies as inflation must affect the whole economy's basket of goods rather than just one item or set of commodities? Many ancient authors believe that inflation is a circumstance that

First, is it general or aggregate, meaning that the price increase that qualifies as inflation must affect the whole economy's basket of goods rather than just one item or set of commodities? A scenario when too much money

chases too few products and services is known as inflation, according to several ancient writers. The Consumer Price Index is used to measure inflation (CPI). Consequently, there is an imbalance between GDP and the money supply. Inflation comes in a variety of forms, including supply-side, cost-push, and demand-pull inflation. However, inflation can be broadly classified into two categories:

Open inflation is the term used to describe inflation that occurs when prices increase in an open market, or one in which the government or any other authority has no influence over pricing. In a fully free market with no restrictions on imports, exports, prices, factors of production, or consumption, open inflation occurs. It occurs as a result of either a lack of supply, a rise in demand, or both. If left unchecked, unrestricted inflation can result in hyperinflation, which is characterized by extremely high prices.

Conversely, suppressed inflation occurs in a market when the government employs a variety of strategies to regulate the costs of goods and services. techniques such as price control, consumption restrictions, high import levies, investment control, etc. The government's attempt to regulate open inflation results in suppressed inflation. However, stockpiling, illicit markets, price increases in the uncontrolled market, and ultimately price increases in the controlled market can all result from it.

1. Repressed inflation – when the economy suffers from inflation without any apparent rise in prices.

An imbalance between the total supply and demand of goods and services is what Keynes defined as inflation. As a result, prices will continue to rise if total demand exceeds total supply. This suggests that price fluctuations, either individually or in combination, cannot be regarded as instances of inflation. Nonetheless, there may be circumstances in which a shift in one price could result in an increase in the others. Nigerian petroleum product prices are one example.

Once more, this does not indicate inflation until the basket's price change causes the overall price level to increase. Second, for inflation to be considered to have taken place, the increase in the overall level of prices must be constant. Over a range of time periods, the overall price level must exhibit a tendency toward a steady and ongoing increase. This needs to be distinguished from a case when the price level rises once.

2. Types Of Inflation

Demand Pull Inflation:

Once more, this does not indicate inflation until the basket's price change causes the overall price level to increase. Second, for inflation to be considered to have taken place, the increase in the overall level of prices must be constant. Over a range of time periods, the overall price level must exhibit a tendency toward a steady and ongoing increase. This needs to be distinguished from a case when the price level rises once.

They contend that without an increase in the money supply, there can be an autonomous rise in aggregate demand or expenditure, such as an increase in government spending, investment, or consumption demand, or a tax cut or a

net increase in exports (i.e., C + I + G + X – M). This would result in a price adjustment. Accordingly, both monetary (classical adjustment) and non-monetary (Keynesian reasoning) elements contribute to DPI.

Cost-Push Inflation:

A general increase in manufacturing costs can lead to inflation in an economy. This type of inflation is known as cost-push inflation, or CPI for short. Price increases for labor, raw materials, etc., can raise the cost of production. Trade unions are often held responsible for wage rises because the market does not fully determine the wage rate. Higher production costs are a direct result of higher wages. Commodity prices rise as a result. The outcome is a spiral in wages and prices. However, companies are equally responsible for the price increase because they only raise prices to boost their profit margins. Consequently, profit-push inflation and wage-push inflation are the two main forms of CPI inflation.

Walking Inflation:

If the yearly rate of price growth is between 3 and 4 percent, we are in a state of walking inflation. Allowing mild inflation to spread out leads to walking inflation. These two types of inflation could be referred to as "moderate inflation."

The term "moderate inflation" is often used to describe a one-digit inflation rate since it is predictable and preserves public trust in the country's monetary system. People lose confidence when a modestly sustained rate of inflation gets out of control and galloping inflation hits the economy.

Galloping Hyper-Inflation:

Walking inflation can be changed to running inflation. Running inflation is dangerous. It may potentially develop into galloping or hyperinflation if unchecked. One extreme kind of inflation occurs when an economy fails. The phrase "galloping inflation" refers to inflation that is in the double- or triple-digit range of 20, 100, or 200 percentage points each year.

3. The reasons behind inflation

What causes inflation?

Inflation is primarily caused by an imbalance between supply and demand. According to Andrew Abel and former Fed chair Ben Bernanke's macroeconomics textbook, inflation occurs more precisely when the whole quantity of goods demanded at a particular price level increases more quickly than the total quantity of goods supplied at that price level.

However, why does demand exceed supply? The three pillars of macroeconomics that David Moss outlines in his book A Concise Guide to Macroeconomics: What Managers, Executives, and Students Need to Know might be helpful in understanding the various reasons why that might occur. Moss organizes the book according to three factors: money (the amount of money individuals owns or can readily obtain), output (the amount of an economy produces), and expectations (what people believe will happen next). Each of the three contributes to inflation.

Supply shocks: Significant interruptions to a vital economic input, such as energy, are frequently the source of inflation. For instance, the price of energy rises if a battle causes many oil fields to cease producing oil. Prices of

other goods also increase since energy is a necessary component of nearly every other commodity. This is frequently referred to as "cost-push inflation."

Unemployment and inflation

Remember that excessive demand compared to supply is the primary cause of inflation. Asking how much "slack" the economy has at any one time is another approach to think about the same concept. An economy uses natural resources, machinery, other infrastructure, and the time and creativity of its citizens to produce goods. However, economies occasionally fall short of their potential output for a variety of reasons, such as a large number of unemployed workers, idle factories, etc. Many nations had substantial unemployment following the 2008 financial crisis. The economy had a great deal of "slack," which means that many financial resources were not being utilized.

Wage-Push Inflation: It has been proposed that the rise of strong trade unions is to blame for the inflationary trend, particularly in developed nations. There is a cost-push impact when labor unions demand wages that are not justified by the cost of living or a previous increase in productivity. Because they intend to pass on these cost increases to customers in the form of price increases, companies are more willing to give in to these pay demands when demand and employment are strong. We have cost-push inflation if this occurs. We have cost-push inflation if this occurs. It should be mentioned that the cost-push impact of higher wages causes the output's aggregate supply curve to move to the left, which raises the output's price given the output's collective demand curve.

Profit-Push Inflation: In addition to labor wages rising without corresponding increases in productivity, cost-push inflation is also caused by other factors. This is when businesses operating in oligopolistic or monopolistic environments raise their profit margins and raise prices for customers. It is referred to as wage-push inflation in the first scenario, where pay increases are the cause of cost-push inflation, and profit-push inflation in the later scenario, when profit margin increases are the reason of cost-push inflation. The aggregate supply curve shifts to the left as a result of the cost-push effect caused by the rise in profit margins.

Price increases for raw materials or oil: In addition to the increase in labor wages and profit margins, additional supply shocks that raised the marginal cost of production also played a larger role in producing cost-push inflation in the 1970s. prices of raw materials, particularly energy inputs (OPEC's increase in the price of crude oil, which raised the price of petroleum products) throughout the 1970s. Significant supply shocks brought on by the dramatic increase in global oil prices in 1973–1975 and 1979–1980 led to cost-push inflation.

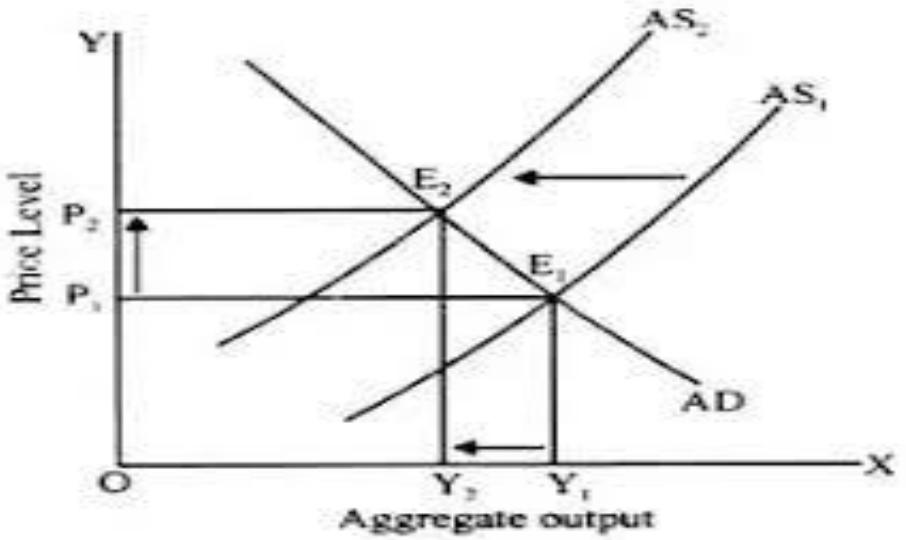

Figure 1. Cost-Push Infaltion

RESULT AND DISCUSSION

Types of Monetary Theories

In the U.S., it is the job of the FRB to control the money supply. The Federal Reserve (Fed) has three main levers:

- Reserve ratio: The proportion of reserves that a bank must maintain in order to cover depositors. Banks are able to lend more as the ratio declines, which expands the money supply.
- Discount rate: The interest rate that commercial banks must pay the Fed when they need to borrow more reserves. Banks will be encouraged to borrow more from the Fed and, consequently, lend more to its clients if the discount rate declines.
- Buying and selling government securities is known as open market operations, or OMO. Purchasing assets from major banks expands the economy's money supply, whilst selling securities reduces it.

Table 1. Apriori Expectation

VARIABLES	EXPECTATION
Exchange rate	+ve
Money supply	_ve
Interest rate	+ve

Overall Significance of The Model

It is employed to ascertain the explanatory variable's overall importance with respect to the dependent variable. They used the F-test. Decision rule: The null hypothesis is rejected if the F-probability is less than 0.05, indicating that it is significant; if the F-probability is more than 0.05, the null hypothesis is not rejected, indicating that it is not significant.

Stationarity Test (Unit Root)

The purpose of the test was to determine whether or not the variables in the model are stationary and to evaluate the time series' stability. The

Augmented Dickey fuller (ADF) unit root test was utilized for this purpose. It denotes a situation in which the error term's mean and variances remain constant over time. The variable is considered stationary if the Augmented Dickey Fuller (ADF) test statistics exceed the threshold value of 5% in absolute terms. The variable is not stationary if the ADF of test statistics is less than the crucial threshold of 5%.

Auto Correlation Test

This feature of the data is that it is based on related objects to determine the correlation between the values of the same variable. The majority of traditional models are based on the premise of instance independence, which is violated in this case. Rule of decision: using serial correlation with Breach-Godfrey. We infer that there is no autocorrelation if the probability Chi-square is more than 0.05, which indicates that it is significant.

Multicollinearity Test

The colinearity of the variables employed in the model would be tested in this investigation. The main goal is to determine whether or not the variables exhibit strong colinearity. Its purpose is to determine whether two or more variables have an exact or perfect relationship. The presence of multicollinearity will be examined using the pairwise correlation. Rule of decision: A significant degree of multicollinearity is present if the correlation coefficient is greater than 0.8, according to the general rule; otherwise, multicollinearity is absent.

Heteroscedasticity Test

The Breusch-Godfrey test was used to determine whether or not the error term's variance is constant. The estimated model may produce a biased result if the outcome is non-constant. Decision rule: The error variance is constant if the likelihood of F-statistics is higher than the selected level of significance of 0.05, and vice versa.

Normality Test

The Jarque-bera normality test was used to determine if the error term adheres to a normal distribution. Decision rule: We determine that the error term is not normally distributed if the probability of Jarque-bera is less than the selected threshold of significance, which is 0.05. Below is a presentation and interpretation of the results summary:

Table 2. Interpretation of the Results

R-Squared	0.911663
Adjusted R- Square	0.705543
Prob (F- Statistics)	0.038576

Source: Author's Analysis, 2022 (Appendix B)

Coefficient of Multiple Determinations (R2)

According to the aforementioned findings, the independent variables account for 91% of the dependent variable's (INF) variables, as indicated by the R2 value of 0.911663. 71% of the dependent variable (INF) can be explained by the independent variables, according to the adjusted R2 of 0.705543 after degree of freedom modification. The R2 level for the study was deemed adequate.

Overall Significance of the Regression

At the 5% level of significance, the likelihood of F-statistics is employed. Table 4.1.1 displays the outcome.The null hypothesis should be rejected if the probability is less than 0.05. Consequently, we reject the null hypothesis based on the table's probability F-Statisticals, which is 0.038576 less than 0.05, indicating that the model's overall test is significant.

Auto Correlation

The presence of autocorrelation is tested using Breusch-Godfrey serial correlation. The outcome is displayed as follows:

Table 3. Presence of Autocorrelation

Prob. F (2,4)	0.9863
Prob. Chi-Square (2)	0.9302

Source: Author's Analysis, 2024 (Appendix C)

The aforementioned result indicates that there is no autocorrelation because the prob. Chi-square (0.2950) is greater than 0.05.

Stationarity

To determine if the time series in the model are stationary, the Augmented Dickey-Fuller unit root test was used. The findings indicate that while inflation is stationary at first difference, the time series for the exchange rate, interest rate, and broad money supply are stationary at level.

Table 3. Unit Root Test Result Using Augumented Dickey – Fuller Procedures

Variable	Level	1st Difference	Order Of Integration
INF	0.0026	0.0031	1(0)
INT	0.3994	0.0031	1(1)
EXR	0.8225	0.0011	1(1)
LNBM	0.3239	0.0021	1(1)

Source: Author's Analysis, 2024 (Appendix D)

Long Run Test

The ARDL bound test was used to ascertain whether there is long run relationship among the variables. The summary of the result is presented below:

Table 4. ARDL Bound Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I (0)	I (1)
			Asymptotic: n=1000	
F-statistic	8.482244	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66
Actual Sample Size	21		Finite Sample: n=35	
		10%	2.618	3.532
		5%	3.164	4.194
		1%	4.428	5.816

			Finite Sample: n=30	
		10%	2.676	3.586
		5%	3.272	4.306
		1%	4.614	5.966

Source: Author's Analysis, 2024 (Appendix E)

We compared the F-statistic value with the values of 1(0) and 1(1) of the 5% threshold of significance for sample size 35 based on the aforementioned result. According to the criterion unit, the null hypothesis should be rejected if the F-statistic is larger than 1(1) of the 5%, but it should not be rejected if it is less than 1(0) of the 5%. We reject the null hypothesis because the F-statistic (8.482244) is more than 1(1) of the sample sizes at the 5% level of significance (3.164) and (4.194), respectively; this indicates that the variables have a long-term association.

Short Run Relationship

Table 5. The Short-Term Association Between the Variables

VARIABLES	PROBABILITY
D(EXR)	0.0031
D(LNBM)	0.0082
CointEq(-1)	0.0002

Source: Author's Analysis, 2024 (Appendix F)

The short-term association between the variables is ascertained using the error correction model. According to the preceding result, the likelihood of ECM is less than 0.05 and the coefficient of ECM (-2.934461) has a negative sign, indicating that there is a short-term association between the variables.

Multicollinerity

The degree of a positive or negative association between each of the variables under examination is displayed in the correlation matrix. Multicollinearity is a problem in the model if there is a significant positive or negative degree of link between the explanatory variables. The outcome is displayed below:

Table 6. Multicollinearity Between INF, INT, EXR and LNBM

	INF	INT	EXR	LNBM
INF	1.000000	0.27599	0.313858	-0.015980
INT	0.027599	1.000000	-0.596866	0.991490
EXR	0.313858	-0.596866	1.000000	-0.609622
LNBM	-0.015980	0.991490	-0.609622	1.000000

Source: Author's Analysis, 2024(Appendix G)

Following the result shown, there is an existence of multicollinearity between INF, INT, EXR and LNBM but we can introduce one of the remedies of this problem which is to do nothing.

Heteroscedasticity

This is used to check if the variance of the error term is constant. The Breusch-Pagan-Godfrey heteroscedasticity test is used to conduct this test. The table below displays the outcome.

Table 7. The Breusch-Pagan-Godfrey Heteroscedasticity Test

Prob. F (14, 6)	0.9990
Prob. Chi-Square (14)	0.9852
Prob. Chi-Square (14)	1.0000

Source: Author's Analysis, 2024 (Appendix H)

The following is the decision rule that governs this test: reject the null hypothesis if the f-prob is less than 0.05, indicating the presence of heteroscedasticity, or a constant variance. We are unable to reject the null hypothesis, indicating that heteroscedasticity is not present, because the f-prob is bigger than 0.05.

Normality Test

The purpose of this test is to determine whether the variables in question have a normal distribution. The Jarque-Bera test of normalcy will be the one employed in this investigation. The outcome is displayed below.

Table 8. The Jarque-Bera Test of Normalcy

Jarque Bera	0.915210
Probability	0.632797

Source: Author's Analysis, 2024 (Appendix I)

The variables were evenly distributed, as indicated by the above result using the Jarque-Bera probability, which is 0.697328 and also greater than the 0.05 level of significance.

Causality Test

Table 9. Pairwise Granger Causality Tests

Pairwise Granger Causality Tests			
Date: 07/11/24 Time: 15:42			
Sample: 1999 2022			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
INT does not Granger Cause INF	22	0.58824	0.5662
INF does not Granger Cause INT		3.72812	0.0454
EXR does not Granger Cause INF	22	0.93743	0.4110
INF does not Granger Cause EXR		0.73596	0.4937
LNBM does not Granger Cause INF	22	0.48415	0.6245
INF does not Granger Cause LNBM		2.35521	0.1251
EXR does not Granger Cause INT	22	2.80239	0.0887
INT does not Granger Cause EXR		0.09908	0.9062
LNBM does not Granger Cause INT	22	1.26423	0.3077
INT does not Granger Cause LNBM		1.44366	0.2636
LNBM does not Granger Cause EXR	22	0.12331	0.8848

EXR does not Granger Cause LNBM	3.90369	0.0403

Source: Author's Analysis, 2024 (Appendix J)

Using the probability and 5% level of significance, the above result indicates that if the probability is less than the o.o.5 level of significance, there is a casual relationship, indicating that there is a bi-directional relationship between the variables; if it is greater than that, there is no causal relationship, indicating that there is a uni-directional relationship. The likelihood is greater than 0.05 for the null hypothesis, which states that INT does not granger cause INF, indicating that there is no casual association and that the null hypothesis cannot be rejected.

Answering of Research Question

The coefficients of the independent variables were used to answer the research questions, and the table displays the regression results as follows:

Table 10. The Coefficients of the Independent Variables Were Used to Answer the Research Questions

VARIABLES	COEFFICIENT	PROBABILITY
INT	6.359756	0.3071
EXR	0.073930	0.1570
LNBM	-346.9830	0.2098
INT (-1)	-4.230035	0.3726
EXR (-1)	-0.123003	0.1702
LNBM (-1)	163.3168	0.3775

Source: Author's Analysis, 2024

Research Question 1

1. What is the exact relationship between Inflation and exchange rate?

The findings indicate that there is a long-term association between the variables, as indicated by the f-statistic (8.482244), which is higher than 1(1) of both sample sizes at the 5% level of significance (3.164) and (4.199). Additionally, the calculated f-statistic (8.482244) indicates that there is a short-term link between the variables, surpassing 1(1) of both sample sizes at the 5% level of significance (2.79) and (3.67).

Research Question 2

2. What is the impact of Interest rate in Inflation?

Interest rates have a beneficial impact on inflation, according to the regression results. This indicates a 6.359756 positive coefficient. This indicates that 6.359756 changes in inflation will occur for every unit increase in interest rates.

Research Question 3

3. To what extent has Money supply influence Inflation?

We must qualify the strength and direction of the association between them using the regression result in order to respond to this question.

According to the regression analysis, the money supply has a detrimental impact on inflation. This is demonstrated by a negative coefficient of -346.9830, which indicates that an increase of one unit in the money supply will lead to an

inflation of -346.9830. Given that the coefficient is negative, the direction indicates an inverse relationship. The R2 at 0.911663, which is nearer to 1, is used to measure the degree of association between variables. This demonstrates that the money supply and inflation are closely related.

Testing of Research Hypothesis

The probability of the independent variable was used to test the study hypothesis. if each independent variable's probability is smaller than the significance level of 0.05. As a result, the null hypothesis is rejected. The hypothesis is tested using the regression result.

Research Hypothesis 1

H0: The exchange rate and inflation do not significantly correlate. Since the results of the long-term test indicate that the variables have a long-term relationship, we reject the null hypothesis, indicating the presence of a long-term link.

Research Hypothesis 2

H0: Interest rates have no discernible effect on inflation. INT 0.3071 is more than 0.05, according to the regression result. As a result, the null hypothesis (H0), which states that interest rates have no discernible effect, cannot be rejected.

Research Hypothesis 3

H0: The money supply has no discernible effect on inflation. According to the regression result, LNBM 0.2098 is higher than 0.05. As a result, the null hypothesis (H0), which holds that the broad money supply has no discernible effect on inflation, cannot be rejected.

CONCLUSION AND RECOMMEDATIONS

This study found that there are both short- and long-term relationships between variables, as well as a bi-directional causal link between the variables, and that the exchange rate significantly reduces inflation.Based on the study's findings, I will suggest that the government enact stricter fiscal policies by raising taxes or cutting spending. They should also think about short-term solutions like import tariffs because this lowers demand for products and services, which could indicate inflation. Interest rates are one monetary policy tool that central banks should use to affect inflation and the exchange rate. Higher interest rates tend to draw in foreign capital, which can strengthen the value of the home currency and lessen inflationary pressures from imported commodities. To control expectations and preserve market confidence, the government and central banks should also make their policy goals and actions very clear. Policies that encourage domestic production and competitiveness can help reduce the economy's dependency on imports and make it less vulnerable to changes in exchange rates. Regulation Policy makers should maintain sound macroeconomic policies that promote sustainable growth and low inflation is crucial for a resilient exchange rate.

FURTHER STUDY

This study still has limitations, so further research on this topic is needed "This Study Examines the Impact of Inflation on Exchange Rate".

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