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THE EFFECT OF MONETARY POLICY SHOCKS ON INDUSTRIAL OUTPUT IN AFGHANISTAN

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ABSTRACT

Purpose- This study examines the impact of monetary policy shocks on industrial output in Afghanistan. Quarterly secondary data were collected for the period from 2003 to 2021 from various official sources such as the Statistical Bulletin of the Central Bank of Afghanistan, the International Monetary Fund, and the World Bank.
Methodology- This study used a three-stage procedure. The first stage involved testing the stability of the variables to be included in the model. The second stage involves selecting the optimal lag length using various lag length criteria. Finally, the Vector Error Correction (VECM) model was used to determine if there were any short-run correlations or dynamics among the variables. The study also conducted some post-tests to confirm the validity and robustness of the regression model.
Findings- The results of the long-run vector error correction model show that there is a long-run causality running from monetary policy rate, broad money supply, inflation, exchange rate, and a commercial bank loan to the industrial sector. So, there was a speed of adjustment from the short-run to the long-run equilibrium. However, the Wald test confirmed that the short-run causality runs from the explanatory variables to the dependent variable. Commercial bank credit to the industrial sector was found to cause a change in industrial production in all six lag periods. The results were further supported by the Granger causality test. Shocks in commercial bank lending to the industrial sector were found to have no significant effect on industrial output. However, the performance of the industrial sector was the main cause of the flow of commercial banks' credit to the industrial sector.
Conclusion- The study recommends that monetary policy should proceed with extreme caution in managing the exchange rate. The study also recommends that the Central Bank of Afghanistan should encourage commercial banks to offer credit to the industrial sector at low-interest rates.

Keywords: Monetary policy shocks, industrial output, Vector Error Correction Model (VECM), Granger Causality Test, Afghanistan.
JEL Codes: E52, E32, L60

1. INTRODUCTION

We begin our discussion with the question, what is monetary policy? The policy pursued by a country's central bank to control and manipulate the supply of money and credit is called monetary policy. According to Prof. Spencer, *"Monetary policy is the deliberate exercise of the monetary authority's power to induce expansion or contraction in the money supply"*. The objectives of monetary policy vary from country to country and depend on economic conditions. The basic objectives of monetary policy are to promote a high level of employment, steady economic growth, a stable price level as a goal, interest rate stability, and a more stable financial market. Monetary policy is used to achieve these goals.

Another debate is whether monetary policy has an impact on the actual economy or economic activity in general. If so, what is the transmission mechanism that causes these effects? These are two of the most important and controversial questions in macroeconomics (Bernanke and Blinder 1992). Empirical estimation of the effects of monetary policy is another area of controversy among economists. Monetary economics has generated several controversies. Although there is now a consensus among economists that only prices are affected in the long run, the effects of monetary policy stimulus on real variables in the short run are still controversial (Walsh 2003).

An efficient monetary policy requires a thorough investigation of the short-run interaction between real and monetary variables. A frequently discussed issue is the divergence between the sticky price Keynesian models and flexible-price models of the real business cycle. Both monetarists and New Keynesians accept that monetary policy affects output in the short run, while New Classical economists argue that prices are fully flexible and adjust quickly to clear the market; real variables are not affected by monetary policy (Mankiw and Romer 1991). The central bank policymaker asks about the impact of a one percentage point (basis point) change in the monetary policy instrument (interest rate) on output, prices, and other macroeconomic variables. The influence of monetary policy on real economic activity is a contentious area of macroeconomic debate. In recent decades, numerous studies have been conducted to determine the importance of money and monetary policy in the economy. Some of them are: Friedman and Schwartz, 1963; Romer and Romer, 1989; Sims, 1972, 1980a, 1980b; Stock and Watson, 1989; Masih and Masih, 1996; Ibrahim, 1998; Tan and Baharumshah, 1999; Ramachadran, 2004; Gamber and Hakes, 2005. According to Friedman (1968), *"Monetary Policy was a string. You could pull it to stop inflation but you push it to halt recession"*.

Da Afghanistan Bank (Central Bank of Afghanistan) is responsible for implementing monetary policy. This responsibility is explicitly stated in the 2003 Law on the Central Bank of Afghanistan. Article 62 of the Da Afghanistan Bank Law states: *"Da Afghanistan Bank shall be responsible for the formulation, adoption, and execution of the monetary policy".* The monetary policy encompasses the policy pursued by Da Afghanistan Bank (DAB) with regard to the use of monetary policy tools under its authority in order to achieve the objectives specified in the law.

In Afghanistan, monetary policy employs a variety of mechanisms to control the money supply in the economy in order to maintain general prices and financial system stability. Low and consistent inflation promotes long-term growth and job creation. It decreases uncertainty about the future pricing of goods and services and enables people and companies to make more confident economic decisions like consumption, saving, and investing. This, in turn, promotes higher growth and job creation in the medium term, contributing to the overall economic success of the country. So far, there have been no such studies on the impact of monetary policy shocks on industrial output in Afghanistan. Thus, this is initiative research.

The basic objective of this study is to examine the influence of monetary policy shocks on industrial output in Afghanistan. Quarterly secondary data were collected for the period from 2003 to 2021 from various official sources such as the Statistical Bulletin of the Central Bank of Afghanistan, the International Monetary Fund, and the World Bank. The paper contributes by filling the knowledge gap in the literature and providing policymakers with an evidence-based policy alternative to promote industrial expansion. To achieve the aforementioned research objective, the following research question was answered; Do monetary policy shocks affect industrial output?

This study is organized into the following five sections. Following the introduction, section 2 deals with the related literature review, section 3 explains the research methodology and dataset, section 4 focuses on research findings, section 5 explores discussion, and the last section presents the main conclusions and policy implications.

2. LITERATURE REVIEW

"Monetary policy was a string. You could pull on it to stop inflation but you could not push on it to halt the recession. You could lead a horse to water but you could not make him drink." (Friedman, 1968, pg. 1).

Central bank authorities influence real and nominal variables in the economy and initiate monetary policy actions by changing either short-term interest rates or the money supply. There is still much controversy in macroeconomics about the role of money in the short and long run. Although there is now a consensus among economists that the long-run effects of money are confined solely to prices, i.e., the long-run supernaturality of money, the effects of monetary stimulus on real variables in the short run are still controversial (Walsh 2010). A frequently discussed issue is the divergence between the sticky price Keynesian models and flexible-price models of the real business cycle. Both monetarists and New Keynesians accept that monetary policy affects output in the short run, while New Classical economists argue that prices are flexible and adjust quickly to clear the market (Mankiw and Romer, 1991).

From the debate among the four most influential schools of thought in macroeconomics, i.e., the Keynesians, the monetarists, the New Classical, and the real business cycle school, different opinions and views have emerged on the effectiveness of monetary policy in both the short and long run. Monetary policy is concerned with the discretionary regulation and control of the money supply by the monetary authority or central bank to achieve intended or desired economic goals (Nuhu, 2015). Monetary policy is known as an effective "economic stabilizer" that is usually used to determine, regulate, control, cost availability, and influence the direction of money and lending within an economy in order to achieve a specific macroeconomic policy goal such as increased employment, the balance of payments equilibrium, and long-term economic growth.

Monetary policy is divided into two types: expansionary and contractionary. Expansionary monetary policy is used when monetary authorities decide to expand the supply of money or reduce the cost of money in the economy in order to stimulate economic activity and combat depressions, recessions, and deflationary gaps (Uju and Ugochukwu, 2021). This can be achieved by purchasing securities on the open market, lowering interest and discount rates, reducing reserve requirements, and easing credit regulations, among other measures. In general, an expansionary monetary policy ensures that more money is in the hands of the public. With a contractionary or tight monetary policy, monetary authorities take steps to reduce the money supply or increase the cost of money in the economy to cause a decline in economic activity.

Contractionary policies reduce the general price level and restrain inflation, resulting in lower levels of investment, employment, production, and economic growth. Depending on the economic objectives, regulatory authorities may shift from contractionary to expansionary measures as needed.

Sound monetary policy is essential for the growth and development of the industry. Monetary authority policy should focus on providing private-sector enterprises with access to financial resources. Banks should be encouraged to offer concessions to promote saving. Combined with a positive real interest rate, this will enable the banking sector to mobilize savings that can be transferred to the industrial sector. According to Busari et al. (2002), ''monetary policy stabilizes the economy better in a flexible exchange rate regime than in a fixed exchange rate regime, and it stimulates growth better in a flexible exchange rate regime, but is accompanied by a large depreciation that could destabilize the economy, implying that monetary policy stabilizes the economy better when it directly targets inflation rather than directly stimulating growth''.

Edoumiekumo and Karimo (2013) used the VAR model to examine the response of Nigerian real sector output to monetary policy shocks. The study found that credit and private-sector investment had a larger impact on output. In the long run, real GDP was more responsive to monetary policy shocks (MPR) and CPI, as well as to own innovations. In addition, the study found that while the interest rate or MPR had a direct and immediate impact on the real sector, it did so indirectly through the investment and credit channels. Chuku (2009) examined the ''impact of monetary policy innovations in Nigeria. The study used structural vector autoregression (SVAR) to track the impact of monetary policy shocks on Nigerian output and prices from 1986 to 2008. Monetary policy appears to have a large impact on output at times, but little or no impact at other times''.

It has been argued that changes in the money supply lead to fluctuations in the general price level and consequently in nominal output, but not in real output in the long run (Lucas 1972). An increase in the cost of capital is likely to lead to a decline in investment and, consequently, lower output. Moreover, if the industry is highly unionized, the effect may be amplified to the point of being larger than if the level of unionization is low. From this point of view, it can be argued that the legal structure controlling labor disputes can be an important factor affecting industrial output. Alam and Waheed (2006) used the VAR approach to evaluate the sectoral impact of monetary policy in Pakistan. The results of the study show that different sectors respond differently to monetary policy tightening. In particular, it was observed that the performance of the financial and insurance sectors, retail and wholesale trade, and manufacturing deteriorated as a result of the interest rate shocks. In contrast, the mining and quarrying, and agricultural sectors showed little response to interest rate changes.

Gertler and Gilchrist (1994) found that monetary policy changes have a greater impact on small business variables when the sector as whole moves more slowly. Oliner and Rudebusch (1995) also observe nonlinearity and find that the impact of cash flow on investment is greater during periods of tight money. With respect to the Nigerian economy, a study was conducted by Saibu and Oladeji (2007) to examine the impact of asymmetric monetary policy shocks on fluctuations in real output using the modified GARCH. The study was based on the use of various measures of output such as GDP, and output in agriculture, industry, and service sectors. The analysis showed that monetary policy had a negative and small impact on most of the aggregate output measures studied. In particular, it was found that expansionary monetary policy led to a decline in output.

Ayodeji and Oluwole (2018) used simple regression to examine the impact of monetary policy on economic output in Nigeria. The study found a negative relationship between interest rates and GDP on the one hand and inflation and GDP on the other. The study did not disaggregate the impact of monetary policy on different sectors of the economy such as the industrial sector. According to Abeng (2006), monetary policy is only useful in a strongly monetized economy. If the economy is not highly monetized, the beneficial effect of monetary policy is limited. For example, in an underdeveloped economy where much of the output is produced in a subsistence sector, the availability of money is unimportant.

in other words, the large share of output produced in a subsistence sector of the economy would be independent of the money supply. As a result, monetary policy would not be a stronger tool for managing the economy. Kim (1999) examined the effects of postwar monetary policy shocks in the G-7 countries using the VAR approach. The study found that changes in output were correlated with monetary policy shocks in the short run, but only in an insignificant way. As a result, output fluctuations in the G-7 countries were not found to be significantly affected by monetary policy shocks in the postwar period. According to Olivei and Tenreyro (2007), in the United States of America, a monetary policy shock has a larger impact on output than on prices in the first half of the year, while the opposite is true in the second half. Using the structural vector error correction (SVEC) model with contemporaneous and long-run restrictions, we examined the relationship between monetary policy shocks and some key macroeconomic variables in Thailand from 2000q2 to 2017q2 during the inflation target period (Arwatchanakarn, 2018).

Arintoko and Kadarwati (2022) examine how monetary policy responds to macroeconomic shocks. As a result, the effects of GDP shocks, inflation shocks, and exchange rate shocks on policy rates are examined in the implementation of monetary policy using a vector error correction model (VECM) analysis, as well as the responses of policy rates incorporating long-run relationships. The policy rate is used as the period of policy implementation from 2001Q1 to 2020Q1. The results of the study show that inflation and exchange rate shocks are the most important macroeconomic variables determining Indonesia's monetary policy stance in terms of size and contribution(Arintoko and Kadarwati, 2022).

Kuttner (2001) investigates the effects of monetary policy measures or actions on bills, notes, and debentures, using Federal Reserve futures rates as a measure of the expected component of policy changes to distinguish between expected and unexpected changes in target funds. Kuttner finds that the response of the interest rate market to expected monetary policy adjustments is small, but its response to unexpected surprises is enormous and highly significant. He contends that previous studies have failed to demonstrate the strong relationship between monetary policy actions and market reactions because they were unable to separate the expected component of the monetary policy action from the unanticipated component. Tolulope and Ajilore (2013) used an ARDL model to analyze the effect of monetary policy on prices and output in Nigeria. The analysis found a significant positive relationship between projected or anticipated monetary policy changes and Nigeria's output and prices. Mumtaz and Theodoridis (2020) propose a VAR that estimates the influence of monetary policy shocks on volatility (Mumtaz and Theodoridis, 2020).

In contrast, unexpected changes in monetary policy did not significantly affect the variables (Omini and Ogbeba, 2017). Cambazolu and Karaalp (20 12) used the VAR model to examine the impact of monetary policy shocks on output and employment in Turkey. The study found that shocks in the broad money supply affect employment and output through the stock of credit (Karim and Lee, 2011). Ganley and Salmon (1997) and Hayo and Uhlenbrock (2000) investigated the industry effect and found that the cross-industry distribution of policy effects is similar across countries and that these patterns are systematically related to measures of output durability and industry investment intensity, as well as borrowing capacity, size, and interest burden. In the latter model, more firms find it more difficult to increase their short-term productive capacity when the economy is growing. As a result, inflation becomes more vulnerable to changes in aggregate demand when capacity utilization is higher. Chuku examined the impact of monetary policy shocks in Nigeria using the SVAR technique. Cloyne and Hürtgen (2016) investigate the *''impact of monetary policy shocks on macroeconomic variables in the United Kingdom, while* Champagne and Sekkel (2018) *discover comparable findings in Canada''*(Murgia, 2020).

According to the results, broad monetary shocks had little impact on output and prices at a fast adjustment rate. Monetary policy and real exchange rate shocks, on the other hand, had a neutral and short-run impact on output. It was concluded that the broad money supply is the strongest monetary policy instrument in Nigeria. Olorunfemi and Dotun (2008) used simple regression to investigate the effect of monetary policy on Nigeria's economic performance. The study discovered a negative relationship between interest rates and GDP on the one hand and inflation and GDP on the other. The study did not break down the impact of monetary policy on other sectors of the economy, such as the industrial sector.

Using a vector error correction model and an impulse response function, Peter and Okotori (2022) examined the impact of monetary policy innovations on exchange rate volatility in Nigeria. The results show that in the long run, all monetary policy variables show a significant correlation with exchange rate volatility; however, while money supply and the exchange rate appear to have a significant short-run impact on exchange rate volatility, other variables such as the liquidity ratio or the monetary policy interest rate did not show a significant short-run relationship with exchange rate volatility. Further results on the impulse response function to volatility and on the variance decomposition of the prediction error suggest a significant relationship between the volatility of the exchange rate and the volatility of the money supply, but the correlation was much stronger (Peter and Okotori, 2022).

CSÁPAI (2020) develops a structural vector autoregressive model of the Hungarian economy and shows the responses of selected macroeconomic variables to an exogenous monetary policy shock. As a result of a one-standard deviation monetary policy shock, interest rates rise and the exchange rate appreciates. Industrial production, on the other hand, rises one month before the predicted decline. Although the price problem exists, the effects of the shocks are statistically small. We also show the variance decompositions of the forecast errors and test the robustness of our results by modifying the identification technique (CSÁPAI, 2020)

Da Afghanistan Bank has responsibility for implementing monetary policy. The responsibility is stated explicitly in the Da Afghanistan Bank Law of 2003. According to Article 62 of the Da Afghanistan Bank Law: *"Da Afghanistan Bank shall be responsible for the formulation, adoption, and execution of the monetary policy of Afghanistan.* Monetary policy refers to the policy of Da Afghanistan Bank (DAB), the central bank of Afghanistan, with respect to the use of monetary policy instruments under its authority to achieve the objectives stated in the law. Monetary policy in Afghanistan means that Da Afghanistan Bank uses instruments to influence the money supply in the economy with the aim of maintaining general prices and the stability of the financial system low and steady inflation fosters long-term growth and job creation. It eliminates uncertainty about future pricing of products and services, allowing people and companies to make more confident economic decisions including consuming, saving, and investing''. In turn, this supports longer-term growth and job creation, incorporating to the country's overall prosperity. How does monetary policy work? Fluctuations in the money supply signal DAB's monetary policy position to the market. Money supply changes have an impact on economic demand (DAB, 2023).

To preserve its primary goal of stability of domestic price, Afghanistan's central bank has devised a structure known as the Monetary Aggregate Targeting framework. Managing and controlling liquidity is critical in the economy; hence, variations in liquidity rates have a direct impact on the country's total economic activity. The DAB's aims are defined in Article 2 of the Preamble to the Da Afghanistan Bank Law: Da Afghanistan Bank's major goal is to achieve while preserving domestic price stability. Afghanistan Bank's supplementary objectives are to enhance the liquidity, solvency, and effective operation of a secure and stable market-based financial system, as well as to promote a safe, sound, and efficient national payments system. Regardless of its primary goals, Afghanistan Bank will assist the state's overall economic policies and promote long-term economic success. DAB seeks monetary stability by concentrating on the monetary aggregate - the reserve currency. Simultaneously, DAB strives to promote financial stability, including the efficient operation of Afghanistan's banking industry and financial system (DAB LAW, 2010). Since 1389, DAB has utilized the monetary reserve (MR) as the primary liquidity indicator within its monetary policy framework, with the precise amount expected based on the anticipated growth rate, average annual inflation rate, and changes in aggregate demand for Afghani over the year. DAB primarily employs open market operations (OMOs) to control liquidity in the money market to meet its operating goal. DAB conducts twice-weekly foreign exchange auctions to sell foreign exchange to approved money service providers (MSPs) and once-weekly auctions of capital notes (CNs) to sell CNs to commercial banks, often with a commitment to repurchase them on the maturity date of the transaction. In the event of a liquidity crisis, DAB injects Afghani into the system through OMOs (DAB, 2023). The Afghani industrial sector is based on small-scale production of textiles, woven carpets, and fertilizers. This sector employs about 10% of the country's labor force. The industrial sector generates 26% of the country's total GDP. Value-added processing of minerals and agricultural goods employs a significant portion of the Afghan population. Dried fruits, wood, leather, natural gas, coal, copper, cement, semi-precious stones, soap, furniture, footwear, granite, and marble are among the other products that contribute significantly to the country's industrial sector.

To alleviate unemployment, Afghanistan is trying to build a low-cost, labor-intensive manufacturing industry along the lines of India and China. There has been no such study on this subject in Afghanistan. Consequently, this is the first time such a study has been conducted (MOCI, 2023).

3. DATA AND METHODOLOGY

3.1. Data Collection

The study design was basically qualitative in nature. A set of quarterly time series data covering the period from 2003 to 2021 was used for the empirical analysis. The data were obtained from different official sources such as the World Development Indicators (WDI), the International Monetary Fund (IMF), the Central Statistics Office (CSO) of Afghanistan, the Ministry of Economy of Afghanistan, the Ministry of Commerce and Industry (MOIC) of Afghanistan, Da Afghanistan Bank (DAB), and the Statistical Bulletin of the Central Bank of Afghanistan. To achieve the research objective, the following variables were used: the industrial index (proxied by manufacturing output) as the dependent variable and the exchange rate, inflation, interest rate (monetary policy rate), broad money supply, and credit to the industrial sector as independent variables.

3.2. Econometrics Models

This study examines the short-run and long-run effects of monetary policy shocks on industrial output in Afghanistan using a restricted VAR (VECM) model. The Granger causality test is also used to test the causal relationship between the selected variables. The general functional model for the study is specified as follows:

$$COMS = f(MPR, M2\ , INF, EXC, BLTS) \quad (1)$$

Variables that are used in the model above are listed as follows:
COMS = Contribution of Manufacturing Sector to GDP.
MPR = Monetary Policy Rate or Interest Rate.
M_2 = Broad Money Supply.
INF = Inflation.
EXC = Exchange Rate.
BLTS = Bank Loan to Industrial Sector.

Since the values for the majority of the explanatory variables in the model had a large magnitude, to overcome this problem, all variables except the monetary policy rate/interest rate and inflation were converted to logarithmic form before being included in the model. This study used a three-stage procedure. The first stage tested the stability of the variables to be included in the model. This required a preliminary test for stationarity because of spurious regression, high R2, and low Durbin-Watson statistics when using nonstationary data. The Augmented-Dickey Fuller (ADF) test is used to test for unit roots. The Johansen cointegration test is used to examine cointegration between variables.

The second step involves selecting the optimal lag length among the variables in the system using various lag length criteria such as the Akaike information criterion (AIC), the Schwarz information criterion (SC), the final prediction error (FPE), and the Hannan-Quinn (HQ) information criterion before performing the Johansen long-run cointegration test using the maximum eigenvalue and trace statistics to determine the number of cointegration vectors in the model. Finally, the Vector Error Correction (VECM) Model was employed to determine if there were any short-run correlations or dynamics between the variables, as shown in Equation 2:

$$\Delta lnCOMS_i = \alpha_0 + \beta_1 lnCOMS_{t-1} + \sum_{i=1}^{p}\beta_2 \Delta MPR_{t-i} + \sum_{i=1}^{p}\beta_3 \Delta lnM2_t + \sum_{i=1}^{p}\beta_4 \Delta INF_{t-i} + \sum_{i=1}^{p}\beta_5 \Delta lnEXR_{t-i} + \sum_{i=1}^{p}\beta_6 \Delta lnBLTS_{t-i} + \alpha ECM_{t-1} + \varepsilon_t \quad (2)$$

In equation 2 Δ is the first difference, α_0, β_1, β_2, β_3, β_4, β_5, β_6 are the coefficients to be estimated. The ECM mechanism tells us how much the variance is corrected in the long term. The Granger Causality test is also used to investigate the existence of causal relationships among the variables involved. The study also conducted some post-testing to confirm the validity and robustness of the regression model. The tests that were performed include the Breusch-Godfrey serial correlation LM test, the Breusch-Pegan-Godfrey heteroskedasticity test, and the Jarque-Bera normality test.

4. EMPIRICAL RESULTS

4.1. Unit Root Tests

A unit root test in statistics examines if a time series variable is non-stationary and has a unit root. Depending on the test, the null hypothesis is commonly defined as the presence of a unit root, and the alternative hypothesis is either stationarity, trend stationarity, or explosive root.

4.1.1. Augmented DICKEY-Fuller Test

An augmented Dickey-Fuller (ADF) test the ''null hypothesis that a time series sample has a unit root''. The alternative hypothesis varies based on the version of the test employed, although it is frequently stationarity or trend stationarity. This is an upgraded version of the Dickey-Fuller test for a larger and more complicated set of time series models. The augmented Dickey-Fuller (ADF) statistic employed in this test is a negative value. The more negative it is, the more confidently the theory of a unit root is rejected. To avoid false regression, the study employed time series data and needed a preliminary stationarity test for all variables used in the model. In this study, the ADF unit root test was performed, and the results are shown in Table 1. The results of the ADF test show that all variables are nonstationary at their levels, but stationary at their first differences, since they are integrated with order one, I(1).

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test

	At Levels			At First Difference		
Variable	**Intercept**	**Trends & Constan**	**None**	**Intercept**	**Trends &Constan**	**None**
lnCOMS	-0.30	-2.45	-0.51	-7.47***	-7. 37***	-6.23***
MRP	-0.33	-4.69	-3.23	-8.87**	-8.62***	-8.17*
LnM₂	-0.26	-3.39	-2.12	-3,63***	-5.43***	-4.31**
INF	-0.96	-3,28	-0.71	-4.95***	-6.75***	-6.41**
lnExc	-0.46	-2.81	-1.23	-9.76**	-9.61**	-8.74***
lnBLTS	-0.97	-1.87	-0.60	-6.72*	-1.06**	-4.56***

Note: ***/**/* indicates that the null hypothesis (H_0) is rejected at 1%, 5%, and 10% significant level.

4.1.2. Lag Order Seclectıon Crıterıa

This is the second stage, where we select the optimal length among the variables of the model. For this purpose, we used different lag length criteria such as the likelihood ratio (LR), the Akaike information criterion (AIC), the Schwarz information criterion (SC), the final prediction error (FPE), and the Hannan-Quinn information criterion (HQ).

Table: 2 Lag Length Selection

LAG	LL	LR	FPE	AIC	SC	HQ
1	-1743.993	23.89251	6.2e-62	91.0764	91.5532	91.5545
2	-1423.838	2647.656*	1.2e+15	78.3162	77.8744	77.6432
3	- 1164.544	3210.921	3.4e+35	78.2531	78.1421*	76.0231*
4	- 1198.273	64.52602	4.6e+62	58.4761	59.2603	57.1025
5	-1196.8 77	38.31659	7.2e+94	58.2571	55.3375	52.1264
6	-1546.567	61.52013	4.6e+62*	54.4417*	62.9738	54.6301

Note: * Represents lag order selection by criterion.

İn Table 2, the results of the Schwarz information criterion and the Hannan-Quinn information criterion show a lag order length of three (3), while the Akaike information criterion and the Final prediction error show a lag order length of six (6) for the selected model. Thus, the model for which we selected the optimal lag length using the AIC was six (6).

4.2. Co-Integration Test

The Johansen cointegration test was used to determine whether or not there is a long-trun relationship between the variables in the industrial output models. The reason for this test lies in the result of the unit root test presented in Table 1; all variables in the model are integrated into order one, which influences the choice of a Johansen cointegration test.

Table 3: Long Run Johansen Co-Integration Test

Null Hypothesis(H_0)	Alternative Hypothesis (H_1)	Eigenvalue	Trace Statistic	Critical Value (5%=0.05)	Decision Criteria
r=0	r>0		58.5905	47.21	Reject the H_0
r≤1	r>1	0.78286	26.5194*	29.68	Fail to reject the H_0
r≤2	r>2	0.55617	9.4606	15.41	Fail to reject the H_0
r≤3	r>3	0.28783	2.3325	3.76	Fail to reject the H_0
r≤4	r>4	0.10512	4.4562	5.56	Fail to reject the H_0
r≤5	r>5	0.62717	10.891	12.53	Fail to reject the H_0
r≤6	r>6	0.02574			

Null Hypothesis(H_0)	Alternative Hypothesis (H_1)	Eigenvalue	Max Statistic	Critical Value (5%=0.05)	Decision Criteria
r=0	r=1		48.3252	21.52	Reject the H_0
r=1	r=2	0.78286	26.8068	35.09	Fail to reject the H_0
r=2	r=3	0.55617	17.9175	18.17	Fail to reject the H_0
r=3	r=4	0.28783	33.1734	23.06	Fail to reject the H_0
r=4	r=5	0.10512	13.1631	9.93	Fail to reject the H_0
r=5	r=6	0.62717	8.6921	10.76	Fail to reject the H_0
r=6	r=7	0.02574			

H_0: There is the existence of cointegration.
H_1: There is no cointegration.

The results of the Johansen cointegration test, as presented in Table 3, show that the independent variables correlate in the long run with the dependent variable based on the fulfillment of the decision criteria. The trace test criterion confirmed the presence of one cointegrating equation (r≤ 1) in the model (P < 0.05%), but the Maximum Eigen value criterion showed the presence of at most one cointegrating equation (P < 0.05%).

In other words: If the trace statistic is greater than the critical value, we can reject H0. If the trace statistic is less than the critical value, H0 cannot be rejected. in our model above, r=0 (no cointegration). İn this case, the trace statistic=58.59 > critical value=47.21. so we can reject H0. İn r=1, the statistical value=26.51 < critical value=29.68. so we cannot reject the H0, but accept it. Consequently, there is one cointegration equation or cointegration. All variables included in the system are cointegrated and have a long-run relationship. When we consider the maximum Eigen value criterion, the same procedure is used. İn r=1, We concluded that all variables are cointegrated and have a long-run relationship. After determining that the long-run relationships exist the study then used the VECM model to capture both the long run and the short run dynamics in the model.

4.2.1. Vector Error Correction Model (VECM)

The vector error correction model (VECM) was estimated after the estimated model showed a long-term relationship; the results are shown in Table 4.

Table 4: Vector Error Correction Model (VECM) Results

Dependent variable: D(lnCOMS)				
Variable	**Coefficient**	**Std. Error**	**t- Statistic**	**Prob.**
ECT(-1)	-0.355155	0.049225	-7.21	0.000
D(lnCOMS(-1))	3.983385	2.288905	1.74	0.082
D(lnCOMS(-2))	2.388587	1.12345	2.13	0.033
D(lnCOMS(-3))	1.116806	0.590561	1.89	0.059

D(lnCOMS(-4))	2.132295	14.38407	0.15	0.882
D(lnCOMS(-5))	4.542783	13.51992	0.34	0.737
D(lnCOMS(-6))	0.0648622	0.0342672	-1.89	0.058
D(MRP(-1))	-0.0512232	0.0046698	-10.97	0.000
D(MRP(-2))	-0.0501563	0.0232211	-2.16	0.031
D(MRP(-3))	-0.2419482	0.0351325	-6.89	0.000
D(MRP(-4))	-0.1465539	0.0693167	-2.11	0.034
D(MRP(-5))	-0.7226421	0.0683759	-10.57	0.000
D(MRP(-6))	-0.0181945	0.0135896	-1.34	0.181
D(lnM$_2$(-1))	0.4754941	0.0926375	5.13	0.000
D(lnM$_2$(-2))	0.2319361	0.0464852	4.99	0.000
D(lnM$_2$(-3))	0.0604867	0.0101573	5.95	0.000
D(lnM$_2$(-4))	0.062569	0.0797558	0.78	0.433
D(lnM$_2$(-5))	2.018727	1.582177	1.28	0.202
D(lnM$_2$(-6))	1.498127	0.7939309	1.89	0.059
D(INF(-1))	0.111421	0.0090884	12.26	0.000
D(INF(-2))	3.123321	0.1802938	17.32	0.000
D(INF(-3))	0.7754851	0.0904708	8.57	0.000
D(INF(-4))	-0.1795064	0.1734789	-1.03	0.301
D(INF(-5))	0.2302592	0.396598	0.58	0.562
D(INF(-6))	1.082274	0.6000362	1.80	0.071
D(lnExc(-1))	0.2740417	0.0451935	6.06	0.000
D(lnExc(-2))	0.095573	0.0197684	4.83	0.000
D(lnExc(-3))	0.080683	0.8279521	0.10	0.922
D(lnExc(-4))	-0.0379117	0.3202604	-0.12	0.906
D(lnExc(-5))	0.1030018	0.2674115	0.39	0.700
D(lnExc(-6))	-0.7226421	0.0683759	-10.57	0.000
D(lnBLTS(-1))	0.4349998	0.0264485	16.45	0.000
D(lnBLTS(-2))	0.6116555	0.0077047	79.39	0.000
D(lnBLTS(-3))	0.1488298	0.0588255	2.53	0.011
D(lnBLTS(-4))	4.966156	1.633555	3.04	0.002
D(lnBLTS(-5))	0.8500856	0.1349062	6.30	0.000
D(lnBLTS(-6))	0.0728073	.0252998	2.88	0.004
C	15.30515	7.503034	2.04	0.041
F-statistic				67.055
Prob(F-statistic)				0.0000
R-squared				0.9137

R^2 From the model estimated above, it can be concluded that there is a strong relationship between the dependent and independent variables. The R-squared value measures the proportion of variance in the dependent variable that is explained by the independent variables. In this case, the R-squared value of about 91% means that about 91% of the changes in the dependent variable are caused by changes in the independent variables. Thus, the overall model explains 91% of the variance in the response variable, which is very good and quite efficient in practice. Moreover, a Prob(F-statistic) of 0.000 indicates that the F-statistic is significant at the one percent level and that the overall model is statistically significant.

The results of the long-run vector error correction model (VECM) are shown in Table 4. The result shows that there is a long-run causality running from the independent variables (MRP, M2, INF,Exc, and BLTS) to the dependent variable (COMS). This is evidenced by the negative coefficient of ECM (-1), which is also statistically significant at the 1% level. This implies there is a speed of adjustment of 35.51%from the short-run to long-run equilibrium. However, to determine if there is a short-term causality from the independent variables to the dependent variable, a Wald test was performed for each of the independent variables. The results of the Wald test are reported in Tables 5, 6 ,7, 8, and 9 respectively and indicates that short-term causality is running from MPR, M2, INF, Exc, and BLTS to COMS.

Table 5: Wald Test for C(8) = C(9) = C(10) = C(11) = C(12) = C(13) = 0

Test Statistic	Value	df	Probability
F-statistic	4.247734	(6,13)	0.0449
Chi-square	4.257309	6	0.0339

Table 6: Wald Test for C(14) = C(15) = C(16) = C(17) = C(18) = C(19) = 0

Test Statistic	Value	df	Probability
F-statistic	89.01805	(6,13)	0.000
Chi-square	178.0361	6	0.000

Table 7: Wald Test for C(20) = C(21) = C(22) = C(23) = C(24) = C(25) = 0

Test Statistic	Value	df	Probability
F-statistic	12.90714	(6,13)	0.000
Chi-square	2581428	6	0.000

Table 8: Wald Test for C(26) = C(27) = C(28) = C(29) = C(30) = C(31) = 0

Test Statistic	Value	df	Probability
F-statistic	25.20496	(6,13)	0.000
Chi-square	5.020454	6	0.000

Table 9: Wald Test for C(23) = C(33) = C(34) = C(35) = C(36) = C(37) = 0

Test Statistic	Value	df	Probability
F-statistic	507.4462	(6,13)	0.000
Chi-square	1522.339	6	0.000

4.3. Diagnostic Tests

The estimated VECM result was subjected to some diagnostic tests, such as the Breusch-Godfrey serial correlation LM test, the Breusch-Pagan-Godfrey heteroskedasticity test, and the Jarque-Bera normality test, as shown in Tables 10, 11, and 12. The results of the first two tests show that the estimated model is free of serial correlation and heteroskedasticity, as the probability of chi-square for both tests are greater than 5% singnificance level, and we therefore do not rejct the null hypothesis. Consequently, the model estimates are statistically reliable. Moreover, the results indicate that the residuals of the model are normally distributed, as the Jarque-Bera test has a p-value of 0.517%, so we could not reject the null hypothesis of normal distribution.

Table 10: Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.035268	**Prob. F(2,89)**	0.9654
Obs*R-squared	0.079192	**Prob. Chi-Square(2)**	0.9612

Table 11: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.438587	**Prob. F(2,95)**	0.7804
Obs*R-squared	1.813199	**Prob. Chi-Square(4)**	0.7701
Scaled explained SS	6.666435	**Prob. Chi-Square(4)**	0.1546

Table 12: Jarque-Bera Test

Test	Chi-Squared	Prob
Jarque-Bera normality test	1.318	0.517

4.4. Pairwise Granger Causality Test

Granger causality is a method for studying causality between two variables in a time series. The method is a probabilistic representation of causality; it uses empirical data sets to find correlation patterns. The results of the Piarwise-Granger causality test are shown in Table 13.

Table 13: Pairwise Granger Causality Test

Null Hypothesis	Obs	F-Statistic	Prob	Decision Criteria (5%)
MPR does not Granger Cause COMS	67	2.98877	0.0183	Reject H_0
COMS does not Granger Cause MPR		0.49995	0.7750	Fail to Reject H_0
M2 does not Granger Cause COMS	67	0.39148	0.030	Reject H_0
COMS does not Granger Cause M2		1.28993	0,2810	Fail to Reject H_0
INF does not Granger Cause COMS	67	3.12202	0.0106	Reject H_0
COMS does not Granger Cause INF		1.88946	0.0994	Fail to Reject H_0
EXC does not Granger Cause COMS	67	4.08607	0.0031	Reject H_0

COMS does not Granger Cause EXC		1.18347	0.3287	Fail to Reject H_0
BLTS does not Granger Cause COMS	67	1.18629	0.3275	Fail to Reject H_0
COMS does not Granger Cause BLTS		2.59745	0.0348	Reject H_0
M2 does not Granger Cause MPR	67	3.69856	0.0162	Reject H_0
MPR does not Granger Cause M2		3.15847	0.0307	Reject H_0
INF does not Granger Cause MPR	67	0.87991	0.5159	Fail to Reject H_0
MPR does not Granger Cause INF		3.07727	0.0338	Reject H_0
EXC does not Granger Cause MPR	67	2.38977	0.0404	Reject H_0
MPR does not Granger Cause EXC		1.27300	0.2852	Fail to Reject H_0
BLTS does not Granger Cause MPR	67	2.80799	0.0467	Reject H_0
MPR does not Granger Cause BLTS		2.68696	0.0235	Reject H_0
INF does not Granger Cause M2	67	3.09958	0.0152	Reject H_0
M2 does not Granger Cause INF		3.06382	0.0344	Reject H_0
EXC does not Granger Cause M2	67	5.53424	0.0002	Reject H_0
M2 does not Granger Cause EXC		2.74093	0.0275	Reject H_0
BLTS does not Granger Cause M2	67	3.50027	0.0054	Reject H_0
M2 does not Granger Cause BLTS		1.38470	0.2376	Fail to Reject H_0
EXC does not Granger Cause INF	67	5.15208	0.0003	Reject H_0
INF does not Granger Cause EXC		5.89085	0.0002	Reject H_0
BLTS does not Granger Cause INF	67	4.15110	0.0028	Reject H_0
BLTS does not Granger Cause INF		2.52514	0.0392	Reject H_0
BLTS does not Granger Cause EXC	67	2.58863	0.0607	Fail to Reject H_0
EXC does not Granger Cause BLTS		4.65237	0.0012	Reject H_0

5. DISCUSSION

The policy pursued by a country's central bank to control and manipulate the supply of money and credit is called monetary policy. The objectives of monetary policy vary from country to country and depend on economic conditions. The basic objectives of monetary policy are to promote a high level of employment, steady economic growth, a stable price level as a goal, interest rate stability, and a more stable financial market. Edoumiekumo and Karimo (2013) used the VAR model to examine the response of Nigerian real sector output to monetary policy shocks. The study found that credit and private-sector investment had a larger impact on output. In the long run, real GDP was more responsive to monetary policy shocks (MPR) and CPI, as well as to own innovations. In addition, the study found that while the interest rate or MPR had a direct and immediate impact on the real sector, it did so indirectly through the investment and credit channels.

Chuku (2009) examined the impact of monetary policy innovations in Nigeria. The study used structural vector autoregression (SVAR) to track the impact of monetary policy shocks on Nigerian output and prices from 1986 to 2008. Monetary policy appears to have a large impact on output at times, but little or no impact at other times. With respect to the Nigerian economy, a study was conducted by Saibu and Oladeji (2007) to examine the impact of asymmetric monetary policy shocks on fluctuations in real output using the modified GARCH. The study was based on the use of various measures of output such as GDP, and output in agriculture, industry, and service sectors.

According to Busari et al. (2002), monetary policy stabilizes the economy better in a flexible exchange rate regime than in a fixed exchange rate regime, and it stimulates growth better in a flexible exchange rate regime, but is accompanied by a large depreciation that could destabilize the economy, implying that monetary policy stabilizes the economy better when it directly targets inflation rather than directly stimulating growth. Alam and Waheed (2006) used the VAR approach to evaluate the sectoral impact of monetary policy in Pakistan. The results of the study show that different sectors respond differently to monetary policy tightening. In particular, it was observed that the performance of the financial and insurance sectors, retail and wholesale trade, and manufacturing deteriorated as a result of the interest rate shocks. In contrast, the mining and quarrying, and agricultural sectors showed little response to interest rate changes.

Kim (1999) examined the effects of postwar monetary policy shocks in the G-7 countries using the VAR approach. The study found that changes in output were correlated with monetary policy shocks in the short run, but only in an insignificant way. As a result, output fluctuations in the G-7 countries were not found to be significantly affected by monetary policy shocks in the postwar period. According to Olivei and Tenreyro (2007), in the United States of America, a monetary policy shock has a larger impact on output than on prices in the first half of the year, while the opposite is true in the second half. Cambazolu and Karaalp (20 12) used the VAR model to examine the impact of monetary policy shocks on output and employment in Turkey. The study found that shocks in the broad money supply affect employment and output through the stock of credit.

The Central Bank of Afghanistan (Da Afghanistan Bank) has established a framework known as Monetary Aggregate Targeting in order to preserve the primary goal of domestic price stability. Because liquidity management is crucial to the economy, fluctuations in liquidity rates have a direct influence on the country's macroeconomic activities. The DAB's aims are defined in Article 2 of the Preamble to the Da Afghanistan Bank Law: ''The primary goal of Da Afghanistan Bank is to maintain domestic price stability''. Da Afghanistan Bank's additional objectives are to promote the liquidity, solvency, and effective functioning of a stable, market-based financial system and to promote a safe, sound, and efficient national payments system subordinate to this core objective. Da Afghanistan Bank will assist the overall economic policies of the state while achieving long-term economic success, without regard for its primary aims. DAB seeks monetary stability by concentrating on the monetary aggregate - the monetary reserve. Simultaneously, DAB aspires to guarantee financial stability, including the smooth operation of Afghanistan's banking industry and financial system (DAB LAW, 2010). Afghanistan's industrial sector thrives on the small-scale production of textiles, woven carpets, and fertilizers. About 10 % of the country's population is employed in this sector. The industrial sector contributes 26% of the country's GDP revenue. A significant portion of the Afghan population relies on the value-added processing of minerals and agricultural products. Some other products that contribute significantly to the country's manufacturing sector are dried fruits, timber, leather, natural gas, coal, copper, cement, semi-precious minerals, soap, furniture, shoes, granite, and marble. Afghanistan is seeking to build a low-cost, labor-intensive manufacturing sector along the lines of India and China to reduce unemployment. There is no such research on this issue in Afghanistan. So this is the first time such a study has been conducted (MOCI, 2023).

6. CONCLUDING REMARKS

The main objective of this study was to investigate the impact of monetary policy shocks on industrial output in Afghanistan. To achieve this objective, the study used a three-stage procedure. The first stage tested the stability of the variables to be included in the model. This required a preliminary test for stationarity, because spurious regression, high R^2, and low Durbin-Watson statistics can occur when using non-stationary data. The Augmented-Dickey Fuller (ADF) test is used to test for unit roots. The Johansen cointegration test is used to test for cointegration between variables.

The second step involves selecting the optimal lag length among the variables in the system using various lag length criteria such as the Akaike information criterion (AIC), the Schwarz information criterion (SC), the final prediction error (FPE), and the Hannan-Quinn (HQ) information criterion before performing the Johansen long-run cointegration test using the maximum eigenvalue and trace statistics to determine the number of cointegration vectors in the model. Finally, the Vector Error Correction (VECM) model was used to determine if there are any short-run correlations or dynamics among the variables. In addition, the Granger causality test is used to investigate the existence of causal relationships between the variables involved. In the study, some post-tests were also performed to confirm the validity and robustness of the regression model. The tests performed include the Breusch-Godfrey serial correlation LM test, the Breusch-Pegan-Godfrey heteroskedasticity test, and the Jarque-Bera test for normality. A set of quarterly time series data covering the period from 2003 to 2021 was used for the empirical analysis.

The data were obtained from various official sources such as the World Development Indicators (WDI), the International Monetary Fund (IMF), the Central Statistics Office (CSO) of Afghanistan, the Ministry of Economy of Afghanistan, the Ministry of Commerce and Industry (MOIC) of Afghanistan, Da Afghanistan Bank (DAB), and the Statistical Bulletin of the Central Bank of Afghanistan. The empirical results of the long-run vector error correction model (VECM) show that there is a long-run causality running from the independent variables (MRP, M2, INF, Exc, and BLTS) to the dependent variable (COMS). This is evidenced by the negative coefficient of ECM (-1), which is also statistically significant at the 1% level. This implies there is a speed of adjustment of 35.51%from the short-run to long-run equilibrium. However, to determine if there is a short-term causality from the independent variables to the dependent variable, a Wald test was performed for each of the independent variables. The result in the appendix indicates that short-term causality is running from MPR, M2, INF, Exc, and BLTS to COMS.

The results of the study also showed that the monetary policy rate (MPR) or interest rate, broad money supply (M_2), inflation (INF), the exchange rate (EXC), and commercial bank loans to the industrial sector (BLTS) caused significant changes in industrial output (COMS). MPR has a negative and significant impact on industrial production in five lag periods. The coefficients of M2 and inflation have a significant and positive impact on COMS in three lag periods. EXC has a positive and significant impact on COMS in two lag periods, but a negative impact on COMS in six lag periods. Commercial bank loans to the industrial sector (BLTS) were found to exert a change on COMS in all six lag periods. These results were further supported by the Granger Causality test, which showed the existence of causality running from MPR, M2, INF, EXC, and BLTS to the contribution of the Manufacturing Sector to GDP (COMS).

Conversely, shocks in commercial bank lending to the industrial sector were found to have no significant impact on the manufacturing sector's contribution to GDP. The Granger causality test also revealed that the performance of the manufacturing sector was the main cause of the flow of commercial bank loans to the industrial sector. Consequently, there was a one-way causal relationship between COMS and BLTS. In addition, the Granger causality test showed that there were bidirectional causal relationships between M2 and MPR, BLTS and MPR, INF and M2, EXC and M2, EXC and INF, and BLTS and INF. The results of this study are significant. For example, they make it clear that monetary policy and exchange rates are the most effective tools to promote the improvement of manufacturing performance. Any change in exchange rates, such as the devaluation of the AFG, will therefore have a serious impact on the sector.

Based on the results, the study recommends that extreme caution be exercised in managing the exchange rate, which can help the industrial sector overall. In addition, it was found that improvements in the performance of the manufacturing sector are necessary to attract credit from commercial banks to this sector. This is not surprising given the unwillingness of commercial banks in Afghanistan to lend to the manufacturing sector at low-interest rates. This is a widespread problem faced by all large, medium, and small enterprises. The study also recommends that the Afghan government or especially the Central Bank of Afghanistan should reduce interest rates and encourage commercial banks to offer loans to the industrial sector at low interest rates.

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REFERENCES

Abeng, M. O. (2006). Financial Sector Reform Outcomes in Nigeria: A Quantitative Evaluation. CBN Bullion, 30(2), 53-69. https://dc.cbn.gov.ng/bullion/vol30/iss2/6/.

Alam, T., & Waheed, M. (2006). Sectoral effects of monetary policy: evidence from Pakistan. The Pakistan Development Review, 45(4II), 1103–1115. https://doi.org/10.30541/v45i4iipp.1103-1115.

Arintoko, A., & Kadarwati, N. (2022). Does monetary policy respond to macroeconomic shocks? Evidence from Indonesia. Jurnal Ekonomi & Amp, Studi Pembangunan, 23(2), 171–188. https://doi.org/10.18196/jesp.v23i2.14881

Arwatchanakarn, P. (2018). Monetary policy shocks and macroeconomic variables: evidence from Thailand. Studies in Computational Intelligence, 203–219. https://doi.org/10.1007/978-3-030-04263-9_16.

Ayodeji, A., & Oluwole, A. (2018). Impact of monetary policy on economic growth in Nigeria. OALib, 05(02), 1–12. https://doi.org/10.4236/oalib.1104320.

Busari,D., Omoke, P and Adesoye, B. (2002). Monetary policy and macroeconomic stabilization under Alternative exchange rate regime: evidence from Nigeria'. https://www.scirp.org/reference/ReferencesPapers.aspx?ReferenceID=2214849.

Cambazoğlu B, Karaalp HS., (2022). The effect of monetary policy shock on employment and output: The case of Turkey. International Journal of Emerging Sciences, 2(1), 23-29. https://ideas.repec.org/a/shc/jaresh/v3y2011i3p543-550.html.

Chuku CA. (2009). Measuring the effects of monetary policy innovations in Nigeria: A structural vector autoregressive (SVAR) approach. African Journal of Accounting, Economics, Finance and Banking Research, 5(5), 112-129. https://ssrn.com/abstract=1534227.

Csápaı, Á. (2020). Effect of exogenous monetary policy shocks on selected macroeconomic variables in Hungary: a SVAR approach. 12th International Conference of J. Selye University. Economics Section. Conference Proceedings. https://doi.org/10.36007/3754.2020.115.

Edoumiekumo, S.G., Karimo, T.M., & Amaegberi, M. (2013). Real sector responsiveness to monetary policy shocks in Nigeria. https://www.semanticscholar.org/paper/REAL-SECTOR-RESPONSIVENESS-TO-MONETARY-POLICY-IN-Edoumiekumo-Karimo/1924ff989349658fdf2ce675942065edf6abb07a.

Friedman, M., 1968. The role of monetary policy. American Economic Review 58 (1), 1–17. https://doi.org/10.4324/9780203443965-15.

Friedman M. and Schwartz A. (1963), A Monetary History of United States, Princeton University Press, Princeton, NJ., 1867-1960. https://doi.org/10.1515/9781400829330-020.

Gamber, E. N., & Hakes, D. R. (2005). Is monetary policy important for forecasting real growth and inflation? Journal of Policy Modeling, 27(2), 177–187. https://doi.org/10.1016/j.jpolmod.2004.12.008.

Ganley, J., & Salmon, C. (1998). The Industrial Impact of Monetary Policy Shocks: Some Stylised Facts. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.74661.

Gertler, M., & Gilchrist, S. (1994). Monetary policy, business cycles, and the behavior of small manufacturing firms. The Quarterly Journal of Economics, 109(2), 309–340. https://doi.org/10.2307/2118465.

Ghosh, S. (2009). Industry effects of monetary policy: evidence from India. Indian Economic Review, 44(1), 89-105. https://mpra.ub.uni-muenchen.de/17307/ .

Hjbrahim, M. (1998). A look at the empirical relationship between money, price, interest, and income in Malaysia. The Indian Economic Journal, 46(1), 39–53. https://doi.org/10.1177/0019466219980105.

Hui Boon, T., & Ahmad Zubaidi, B. (1999). Dynamic causal chain of money, output, interest rate and prices in Malaysia: Evidence-based on Vector Error Correction modelling analysis. International Economic Journal, 13(1), 103–120. https://doi.org/10.1080/10168739900000032.

Karim, S., Lee, M., & Gan, C. (2011). Price effects of monetary policy: the case of a small open economy of New Zealand. Economic Analysis and Policy, 41(3), 253–271. https://doi.org/10.1016/s0313-5926(11)50036-0.

Kim S. (1999). Do monetary policy shocks matter in the G-7 countries? Using common identifying assumptions about monetary policy across countries. Journal of International Economics, 48, 387-412. https://doi.org/10.1016/S0022-1996(98)00052-X.

Kuttner, K. N. (2001). Monetary policy surprises and interest rates: Evidence from the Fed funds futures market. Journal of Monetary Economics, 47(3), 523–544. https://doi.org/10.1016/s0304-3932(01)00055-1.

Lucas, R. E. (1972). Expectations and the neutrality of money. Journal of Economic Theory, 4(2), 103–124. https://doi.org/10.1016/0022-0531(72)90142-1.

Mankiw, N. Gregory, and David Romer. 1991. New Keynesian Economics. Cambridge: MIT Press. New Keynesian Economics: Coordination failures and real rigidities - Google Books.

Masih, A. M. M., & Masih, R. (1996). Empirical tests to discern the dynamic causal chain in macroeconomic activity: new evidence from Thailand and Malaysia based on a multivariate cointegration/vector error-correction modeling approach. Journal of Policy Modeling, 18(5), 531–560. https://doi.org/10.1016/0161-8938(95)00133-6.

Mumtaz, H., & Theodoridis, K. (2020). Dynamic effects of monetary policy shocks on macroeconomic volatility. Journal of Monetary Economics, 114, 262–282. https://doi.org/10.1016/j.jmoneco.2019.03.011.

Murgia, L. M. (2020). The effect of monetary policy shocks on macroeconomic variables: Evidence from the Eurozone. Economics Letters, 186, 108803. https://doi.org/10.1016/j.econlet.2019.108803.

Nuhu, K.M. (2015). An analysis of the impacts of monetary policy on Nigerian economy. Journal of Economics and Sustainable Development, 6(20), 129-133.

Oliner, S.D., & Rudebusch, G.D. (1995). Is there a bank lending channel for monetary policy. *Econometric Reviews*, 1-20. https://www.semanticscholar.org/paper/Is-there-a-bank-lending-channel-for-monetary-policy-Oliner-Rudebusch/ed72b27d992de6c1326f76521b94fbcb31714f0d.

Olivei, G., & Tenreyro, S. (2007). The timing of monetary policy shocks. The American Economic Review, 97(3), 636-663. https://www.jstor.org/stable/30035015.

Olorunfemi, S., Dotun, O.F. (2008). Stationarity analysis of the impact of monetary policy on the economic performance in Nigeria. Pakistan Journal of Social Sciences, 5, 562-566. URL: https://medwelljournals.com/abstract/?doi=pjssci.2008.562.566.

Omini, E., Ogbeba, E., & Okoi, O. (2017). Monetary policy shocks and ındustrial output in Nigeria. British Journal of Economics, Management & Amp, Trade, 16(2), 1–13. https://doi.org/10.9734/bjemt/2017/30459.

Peneva EV. (2013). Effects of monetary policy shocks across time and across sectors. Finance and Economics Discussion Series Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board, Washington, D.C. https://www.federalreserve.gov/pubs/feds/2013/201370/index.html.

Peter Eze, G., & Waikumo Okotori, T. (2022). Exchange Rate Volatility and Monetary Policy Shocks. Macroeconomic Analysis for Economic Growth. https://doi.org/10.5772/intechopen.99606.

Uju E.A., Ugochukwu P.O. (2021). Effect of monetary policy on ındustrial growth in Nigeria. International Journal of Entrepreneurship and Business Innovation, 4(1), 47-60. DOI: 10.52589/IJEBI-1Z4IYBYE.

Ramachandran, M. (2004). Do broad money, output, and prices stand for a stable relationship in India? Journal of Policy Modeling, 26(8-9), 983–1001. https://doi.org/10.1016/j.jpolmod.2004.08.008.

Romer, C. D., & Romer, D. H. (1994). Monetary policy matters. Journal of Monetary Economics, 34(1), 75–88. https://doi.org/10.1016/0304-3932(94)01150-8.

Saibu MO, Oladeji SI. (2007). Asymmetric policy shocks and real output fluctuations in Nigeria (1960-2004). The International Journal of Applied Economics and Finance, 1(2), 88–96. https://doi.org/10.3923/ijaef.2007.88.96.

Komura, C. (1982). Money, Income, and Causality: The Japanese Case. Southern Economic Journal, 49(1), 19. https://doi.org/10.2307/1058539

Tolulope, A. O. (2013). A bound test analysis of effects of monetary policy shocks on output and prices in Nigeria 2000-2010. Journal of Economics and Behavioral Studies, 5(3), 136–147. https://doi.org/10.22610/jebs.v5i3.388.

Walsh, C. E. (2003). Labour market search and monetary shocks. Dynamic Macroeconomic Analysis, 451–486. https://doi.org/10.1017/9781139165235.011.

Stock, J. H., & Watson, M. W. (1989). New ındexes of coincident and leading economic ındicators. NBER Macroeconomics Annual, 4, 351-394. https://doi.org/10.1086/654119.

Da Afghanistan Bank (DAB). (2019). DAB, http://dab.gov.af/en Retrieved April 5, 2023.