

The Shock Transmission Mechanism Between Monetary Policy Variables and Industrial Output in West African Countries

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Abstract

The study investigated the shock transmission mechanism between monetary policy variable and industrial output in West African Countries between 1980 and 2019. In this study, West African Countries are grouped into two; Anglophone and Francophone. The monetary policy variables employed in the study are real prices exchange rate money supply, monetary policy rate and interbank rate. The study made use of Panel VAR as an estimation technique in order to examine the shock transmission mechanism. The findings showed that, industrial out negatively responded to the shock from monetary policy variables among English speaking in West African Countries while industrial output sector responded positively to shock from the monetary policy variables in French speaking countries within West Africa. In line with the finding of this study, it is therefore recommended that, monetary authorities in West African nations should formulate appropriate monetary policies in order to increase industrial output growth in West African countries.

Keywords: Shock Transmission Mechanism, Monetary Policy Variables, Industrial Sector, Panel VAR and West Africa

1.1 Introduction

Industrial sector has been noted to be the engine room of economic development of any nation. This means that it will be difficult for any nation to attain economic growth and development without proper development of her industrial sector. The industrial sector offers better trade prospects which also act as a significant center for innovation and competitiveness and this significantly increases exports and productivity growth of the country. The roles of monetary policy variables such as interest rate, inflation and exchange rate to achieve economic growth and development through industrialization cannot be overemphasized. The sudden changes of these monetary policy variables by monetary authority through the use of monetary policy instruments to control economic disturbances constitute monetary policy shocks (Mountford and Uhlig 2009). According to Falade and Folorunso (2015), monetary policy is the deliberate action the monetary

authority takes to regulate the availability of credit and the money supply to advance broad economic goals that might compete. To put it another way, monetary policy refers to the steps taken by the Central Bank or other monetary authorities to control the quantity, cost, and accessibility of money in the economy. The objectives of monetary authorities worldwide include external balance, rapid industrial growth, full employment, and price stability. Changes to monetary policy that are meant to impact the policy's goals are disseminated using the "monetary policy transmission mechanism. There are various viewpoints on how this mechanism functions. The premise of the mainstream Keynesian theory that the transmission mechanism happens through interest rates is supported by a large body of empirical research (Smets&Wouters, 2002; Angolani et al., 2003; Loayza & Schmidt-Hebbel, 2002; Boivin, et al., 2010).

The African continent is the finest region to drive the development of any nation, area, or continent since it is economically sensible to use labour-intensive production methods for export-focused industries. There is no denying the close connections between a nation's economic performance, the expansion of industrial output, exportation levels, human capital, and other factors (Obioma and Anyanwu, 2015). They both maintained that industry is more resilient and sustainable than other sectors. In this sense, it is impossible to overstate the importance of the industrial sector to any economy. The sector dramatically increases economic output and offers work chances to the vast majority of unemployed young people. Despite accounting for only 10% of the nation's GDP in 2018, this sector saw a 24% increase from 2017 to 2018 in Nigeria (Central Bank of Nigeria, CBN, 2019).

Since the global economic crises of the 1980s, 1990s, 2008, and most recently in 2014, discussions on international monetary policy have centered on the cross-border spillover effects, where there is no unanimity. According to literature (Kim, (2001); Miniane and Rogers, (2003); Janssen and Klein, (2011)), monetary policy shocks in industrialized nations have a favourable impact on, among other things, production performance. The policy shocks in developing countries have a significant negative influence on the emerging market economy simultaneously. Brazil, Russia, China, South Africa, and Turkey are emerging economies collectively known as BRICS_T. Both local and international monetary policy shocks were looked at by Mackowiak (2007) and Ivrendi and Yildirim (2013) to see how they affected these countries' macroeconomic indicators. Using the SVAR econometric model, they found that the exchange rate is the primary transmission mechanism. They also asserted that a tight monetary policy leads to an increase in the value of the domestic currency, an increase in interest rates, a fall in output, and the control of inflation. According to Hung and Viana (1995), the US trade surplus in services was significantly impacted by the US dollar's depreciation in the late 1980s and early 1990s". Freund and Weinhold (2002) assess the effects of internet use on trade in services using data from the late 1990s and the exchange rate as a control variable. Although this effect is not particularly large, they discover that US service imports typically rise when the US dollar strengthens. Similar studies demonstrate that while currency depreciation in the exporting country promotes exports, currency depreciation in the importing country lowers exports.

According to the literature on monetary policy shock and industrial output performance, such as Gonenc and Yilmaz (2008), Aysan and Hacıhasanoglu (2007), and Dogruel and Dogruel (2010), the manufacturing sector reacts to competitiveness pressures brought on by currency movement through several significant channels. "These options include increased productivity, wage moderation, and product differentiation. Gonenc and Yilmaz (2008) assert that the cost of

imported inputs serves as a natural hedge against exchange rate changes that affect competitiveness. This is crucial given how heavily the Sub-Saharan African nations depend on imported raw resources for manufacturing. Obamuyi, Edun, and Kayode (2010) assert that the slow growth rate of Nigeria's manufacturing sector is attributable to a shortage of funding, which may be brought on by an inefficient capital market or the historical preference of Nigerian banks for short-term investments over long-term ones. Because of the banking sector's stringent and onerous credit requirements and high interest rates, long-term finance is not readily available. These elements could have made it harder for Nigeria's manufacturing sector to boost productivity in terms of export growth and import substitution and raise employment and per capita income, which impacts various consumption habits.

According to numerous studies, the management of monetary policy in many developing nations, notably in Africa, contributes to the challenges the manufacturing sector encounters due to fluctuations in oil revenue (Jordi & Mark, 2007; Gali & Monacelli, 2005). According to another study (Degrauwe, 2000; Gregory, 2007), monetary policy in developing African countries can reduce the negative impacts of variations in oil revenue on macroeconomic performance". "They make the point that the current inflation and exchange rate policies can be utilized to absorb risks from changes in income or oil prices, reducing the responsiveness of monetary policy tools to shocks in oil prices.

Unlike Acosta-Ormaechea and Coble (2011), who focused on the exchange rate channel, Bayangos (2010) and Ncube and Ndou (2011) support the credit channel of monetary transmission. However, Elbourne (2008) and Borio and Zhu (2012) demonstrate that asset prices and lending rates serve as a conduit for transmitting monetary policy's effects on the real economy. Kabundi and Ngwenya (2011) also demonstrate how monetary policy is communicated through currency rates and direct channels.

Research has demonstrated that this is also true, just as monetary policy, which can promote economic development and increase employment, may considerably impact changes in output and pricing. "However, the impact of monetary policy on industrial output as a percentage of overall output is still being debated. The monetary authorities' activities are motivated by the notion that the shock response may have short-term effects on growth and long-term implications on inflation (Mihov, 2001).

This study therefore examined the shock transmission mechanism between monetary policy variables and industrial output in West African Countries between 1980 and 2019. The length of the study allows for the determination of both the long- and short-term correlations between specific monetary policy variables and the performance of industrial output in selected West African countries. The West African nations selected in this study are Gambia, Liberia, Senegal, Ghana, Nigeria, Benin, Burkina Faso, Cote d'Ivoire, Mali, and Guinea. These ten (10) nations can serve as a representation of the entire West African region.

1.2 Model Specification

The industrial Output equation is developed variable in this study. Real Interest Rate, Exchange Rate, Money Supply (Broad), Monetary Policy Rate, Interbank Rate, World Oil Price, and United Nations Real Interest Rate are some of the independent variables that are included in the equation for this study. The purpose of implementing these variables is to allow for a

combination of global and local monetary policy factors in order to examine how industrial output in a few African emerging economies responds to these variables.

$$MANUF_{it} = \alpha_{it} + \alpha_2 RINTR_{it} + \alpha_3 EXR_{it} + \alpha_4 MS_{it} + \alpha_5 MPR_{it} + \alpha_6 IBR_{it} + \alpha_7 WOP_{it} + \alpha_8 USRINTR_{it} + \mu_{it} \quad \dots 1.1$$

Where MANUF is Manufacturing Value added (proxy for Industrial Output), SERV is Services Value added, RINR is Real Interest Rate, EXR is Exchange Rate, MS is Money Supply Broad, MPR is Monetary Policy Rate, IBR is Interbank Rate, WOP is World Oil Price, USRINTR is United Nations Real Interest Rate (which captures foreign interest rate), μ is Error Term, α_1 is Intercept, $\alpha_2 - \alpha_8$ are Parameter Estimates and i is Countries and t is year. These selected seven variables represent the domestic macroeconomic variables WOP and USRINTR are the two variables representing the global macroeconomic variables and USRINTR are the two variables representing the global macroeconomic variables”

1.3 Estimation Techniques

The employed Panel VAR to investigate the shock transmission mechanism between monetary policy variables and industrial output growth in West African. The unit root was carried out to determine the time series characteristics of the variables employed in the study. Panel VAR was used to examine the shock transmission mechanism between monetary policy variables and industrial output in West African Countries.

1.4 Results and Discussions

The objective of the study was to determine how changes in monetary policy impacted the performance of industrial output in West African countries. In this chapter, the analyses' findings are given. In the chapter, the findings are described, including the correlation findings, the estimation findings for each study model, and the findings displaying the descriptive statistics of all employed variables. The results of the impulse response, variance decomposition analysis, panel unit root test, and correlation analysis were especially covered in this chapter. The main conclusions are understood and discussed when the results are tabulated?

1.4.1 Descriptive Analysis

Table 1.1: Descriptive Statistics of Variables

Variables	Obs	Mean	Std. Dev.	Min	Max
MANUF	400	10.3417	5.44099	1.68645	21.4919
SERV	400	44.6708	9.80828	17.8637	67.5935
RINTR	400	4.39719	9.12244	-65.8572	33.4668
EXR	400	74.5278	237.068	0	3520.37
MS	400	20.7949	7.76650	5.21006	43.2952
MPR	400	7.29548	7.93431	0	45
IBR	400	10.5857	8.239	0	36.5
WOP	400	41.3994	30.7554	12.76	111.63
USINTR	400	7.38438	3.60362	3.25	18.87

Source: Author's Computation, 2021

Note: MANUF=Manufacturing sector output (% of GDP), SERV= service sector output (% of GDP), RINTR= Real interest rate (%), EXR= exchange rate (index), MS= Money Supply (% of GDP), MPR= Monetary policy rate (%), IBR=interbank rate (%), WOP= World oil price (WOP); USINTR=United States' interest rate (%)”

The study's variables are listed and described in Table .1. The findings revealed that the output of the manufacturing and service sectors was 10.3417% and 44.6707%, respectively, with standard deviations of 5.440988 and 9.808281, minimum and maximum values of 1.686488% and 17.86371, respectively. Additionally, the findings revealed that the averages for the US interest rate, real interest rate, money supply, monetary policy rate, interbank rate, and world oil price were, in that order, 7.384375, 10.58565, 41.39941, and 4.397188% of GDP. Standard deviations were 9.122436%, 237.0678%, 7.766502% of GDP, 7.934311%, 8.239%, 30.75542%, and 3.603624% for actual interest rates, exchange rates, money supply, monetary policy rate, and US interest rates, respectively. The exchange rate was 0, the money supply ranged between 5.210061% of GDP and 43.29521% of GDP, the monetary policy rate ranged between 0% and 45%, the world oil price ranged between 12.76 and 111.63%, and the US interest rate ranged between 3.25% and 18.87%. The real interest rate ranged between -65.85715% and 33.46679%.”

1.4.2 Correlation Analysis

Table 1.2: Correlation Statistics

	MANUF	SERV	RINTR	EXR	MS	MPR	IBR	WOP	USINTR
MANUF	1.0000								
SERV	0.3078	1.0000							
RINTR	-0.3426	0.0250	1.0000						
EXR	-0.0399	-0.0029	-0.0773	1.0000					
MS	0.1293	0.3603	0.0137	-0.0571	1.0000				
MPR	-0.0833	0.1003	-0.0297	0.2821	0.1437	1.0000			
IBR	-0.3608	0.1854	0.4415	-0.0517	-0.2740	0.0954	1.0000		
WOP	-0.0894	0.1096	0.1261	-0.1143	0.4846	-0.0989	-0.0230	1.0000	
USINTR	0.0667	-0.0293	-0.2128	0.2192	-0.4168	0.0216	-0.0326	-0.6205	1.0000

Source: Author’s Computation, 2021

Table 1.2 provides information on correlations for the variable pair combinations employed in the study. The correlation values were 0.3078, -0.3426, -0.0399, 0.1293, -0.0833, -0.3608, -0.0894 and 0.0667 between MANUF and SRV, MANUF and RINT, MANUF and EXR, MANUF and MS, MANUF and MPR, MANUF and IBR, MANUF and WOP, and MANUF and USINTR, respectively. This shows that the production of the industrial sector is negatively correlated with the real interest rate, exchange rate, monetary policy rate, interbank rate, and global oil price and favorably correlated with the output of the service sector, the money supply, and the US interest rate. In contrast to the money supply, the US interest rate, and the output of the service sector, which all move in the same way, the real interest rate, exchange rate, monetary policy rate, interbank rate, and the price of oil globally all move in the other direction.

The result also revealed a correlation coefficient of 0.0250 for SERV and RINTR, -0.0029 for SERV and EXR, 0.3603 for SERV and MS, 0.1003 for SEV and MPR, 0.1854 for SERV and

IBR, 0.1096 for SERV and WOP, -0.0293 for SERV and USINTR which indicated that service sector output has a positive relationship with the real interest rate, money supply, monetary policy rate, interbank rate and world oil price but negative relationship with the exchange rate and US interest rate. This showed that, despite the fact that the exchange rate and the US interest rate move in the opposite direction from the actual interest rate, money supply, monetary policy rate, interbank rate, and global oil price, the production of the service sector moves simultaneously with all of these factors.

The result, in addition, showed a correlation coefficient of -0.0773 for RINTR and EXR, 0.0137 for RINTR and MS, -0.0297 for RINTR and MPR, 0.4415 for RINTR and IBR, 0.1261 for RINTR and WOP, -0.2128 for RINTR and USINTR which indicated that real interest rate has a negative relationship with the exchange rate, monetary policy rate and US interest rate but positive relationship with money supply, interbank rate and world oil price. This implies that while the money supply, the interbank rate, and the price of oil globally move in the same direction, the real interest rate moves in the opposite direction from the exchange rate, the rate of monetary policy, and the interest rate in the US.

With correlation coefficients of 0.0571 for EXR and MS, 0.2821 for EXR and MPR, 0.0517 for EXR and IBR, -0.1143 for EXR and WOP, and 0.2192 for EXR and USINTR, the results also demonstrated that the exchange rate has a positive relationship with the US interest rate and monetary policy rate but a negative relationship with the money supply and the interbank rate. This illustrates how the money supply, interbank rate, and the price of oil globally move in opposite ways while the exchange rate moves in the same direction as the US interest rate and the monetary policy rate. There was a positive correlation between the money supply and the monetary policy rate and the price of crude oil, but a negative correlation between the money supply and the interbank rate and the US interest rate, as indicated by correlation values of 0.1437 for the MS and MPR, -0.2740 for the MS and IBR, 0.4846 for the MS and WOP, and -0.4168 for the MS and USINTR. This demonstrates that the money supply follows the rate of global monetary policy and the price of oil but swings in the opposite direction to the interbank rate and the US interest rate.

The monetary policy rate, the interbank rate, and the US interest rate are all positively correlated, while the MPR and the world oil price are negatively correlated, with correlation values of 0.0954 for the MPR and the IBR, -0.0989 for the MPR and the WOP, and 0.0216 for the MPR and the USINTR. As a result, the monetary policy rate follows the direction of the US and interbank interest rates while moving in the opposite direction of the global oil prices. The correlation values of -0.0230 and -0.0326 for IBR and WOP, respectively, indicate that there is a weak association between IBR and WOP, IBR and USINTR, and IBR and IBR. In other words, the interbank rate swings in many ways depending on the price of crude oil throughout the world and the federal funds rate in the US. In other words, the interbank rate swings in many ways depending on the price of crude oil throughout the world and the federal funds rate in the US. The correlation coefficient between the world oil price and the US interest rate, which was -0.6205, suggested a negative link because they move in the opposing directions.”

1.4.3 Panel Unit root Analysis

Table 1.3: Panel Unit Root Test Result

Variables	TEST AT LEVEL		TEST AT FIRST DIFFERENCE		Order of Integration
	LLC	IPS	LLC	IPS	
MANUF	-0.92050	-1.30924	-11.0048*	-11.7325*	I(1)
SERV	-0.15788	-0.39077	-11.8910*	-11.4566*	I(1)
RINTR	-4.69047*	-5.56416*	—	—	I(0)
EXR	-1.43389	-1.56826	-4.79876	-6.05151	I(1)
MS	1.47537	1.94415	-6.96115*	-10.6108*	I(1)
MPR	-2.62026	-0.85247	-14.4284*	-13.7559*	I(1)
IBR	-4.66045*	-4.83844*	—	—	I(0)
WOP	-0.50747	0.3059	-17.0391*	-13.9103*	I(1)
USINTR	-7.88230	-5.09282	—	—	I(0)

Source: Author's Computation, 2021

(*) connote rejection of unit root hypothesis at (5%) level of significance level

Table 1.3 displays the results of the Levin-Lin-Chu (LLC) and Im-Pesaran-Shin (IPS) panel unit root tests that were conducted in the study, both at the level and at the difference for each of the variables used in the study, based on the pooled observations of the selected West African countries sampled in the study. Real interest rate, interbank rate, and US interest rate are stationary at the level as shown in table 1.3, in contrast to other variables like industrial sector output, service sector output, exchange rate, money supply, monetary policy rate, and world oil price, which are not stationary at level but become stationary after first differencing. As a result, the interest rate, interbank rate, and US interest rate have all been integrated to order zero, or I(0), showing that none of them, on average, retain inventive shock that has been passed on to them beyond the same period. On the other hand, the output of the industrial and service sectors, the exchange rate, the money supply, the monetary policy rate, and the global price of oil are all integrated to order one, or I(1), indicating that on average these variables retained the innovative shock that was applied to them for a brief period beyond the same period. But eventually, they usually relinquish control. Therefore, for the studied developing countries, I(0) and I(1) variables are combined in this study.

1.4.4 Analysis of Shock Transmission Mechanism between monetary policy variables and industrial output performance in Anglophone Countries within West Africa

1.4.4.1 Impulse Response Analysis of Industrial Sector in Anglophone Countries within West Africa

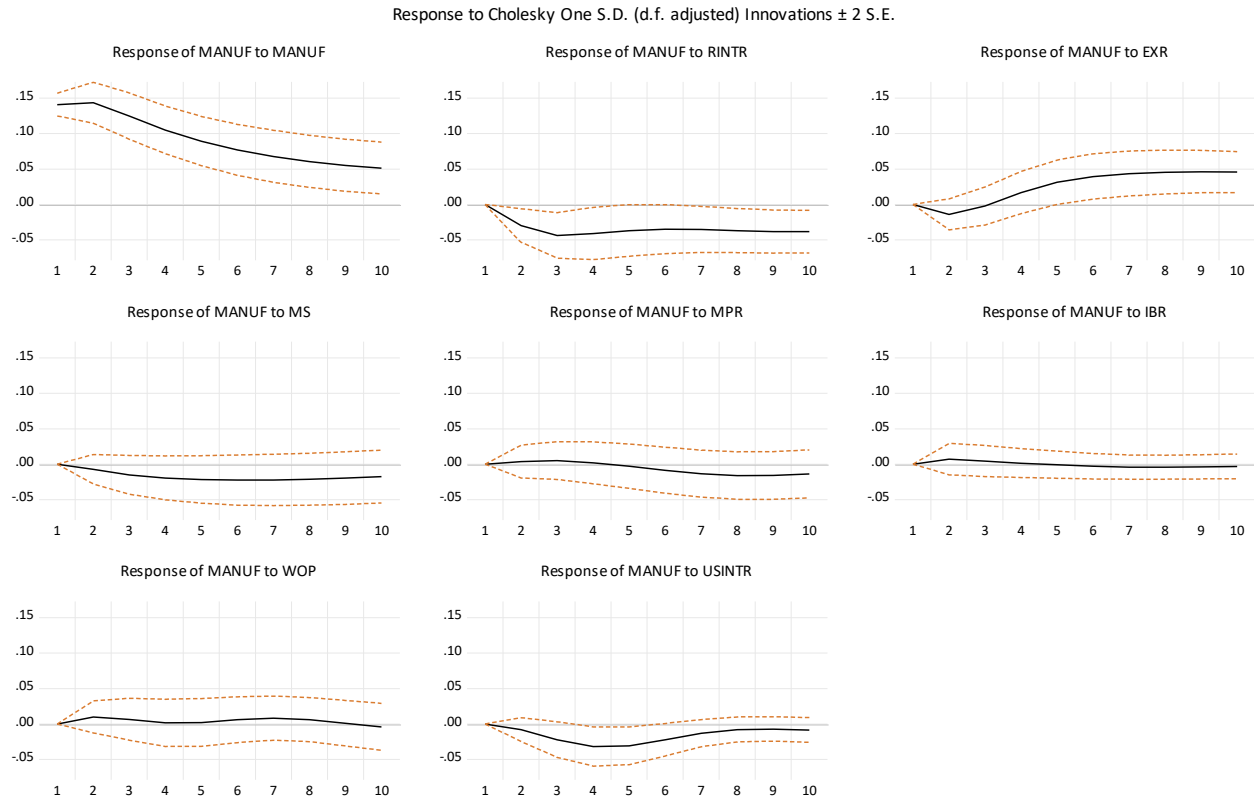


Figure 1.1 shows how manufacturing output in Anglophone West Africa responded to an innovative shock to monetary policy indicators.

The results shown in Figure 1.1 showed how the industrial sector production in Anglophone West African countries responded to innovation shocks in monetary policy variables namely real interest rate, exchange rate, money supply, monetary policy rate, interbank rate, and world oil price. Results specifically showed that the industrial sector's output is negatively impacted by innovative shocks to interest rates, monetary policy rates, money supply, interbank rates, and US interest rates, but favorably impacted by innovative shocks to exchange rates and the price of crude oil in the world.”

1.4.5 Analysis of Shock Transmission Mechanism between monetary policy variables and industrial output performance in Francophone Countries within West Africa

1.4.5.1 Impulse Response Analysis of Industrial Sector in Francophone Countries within West Africa

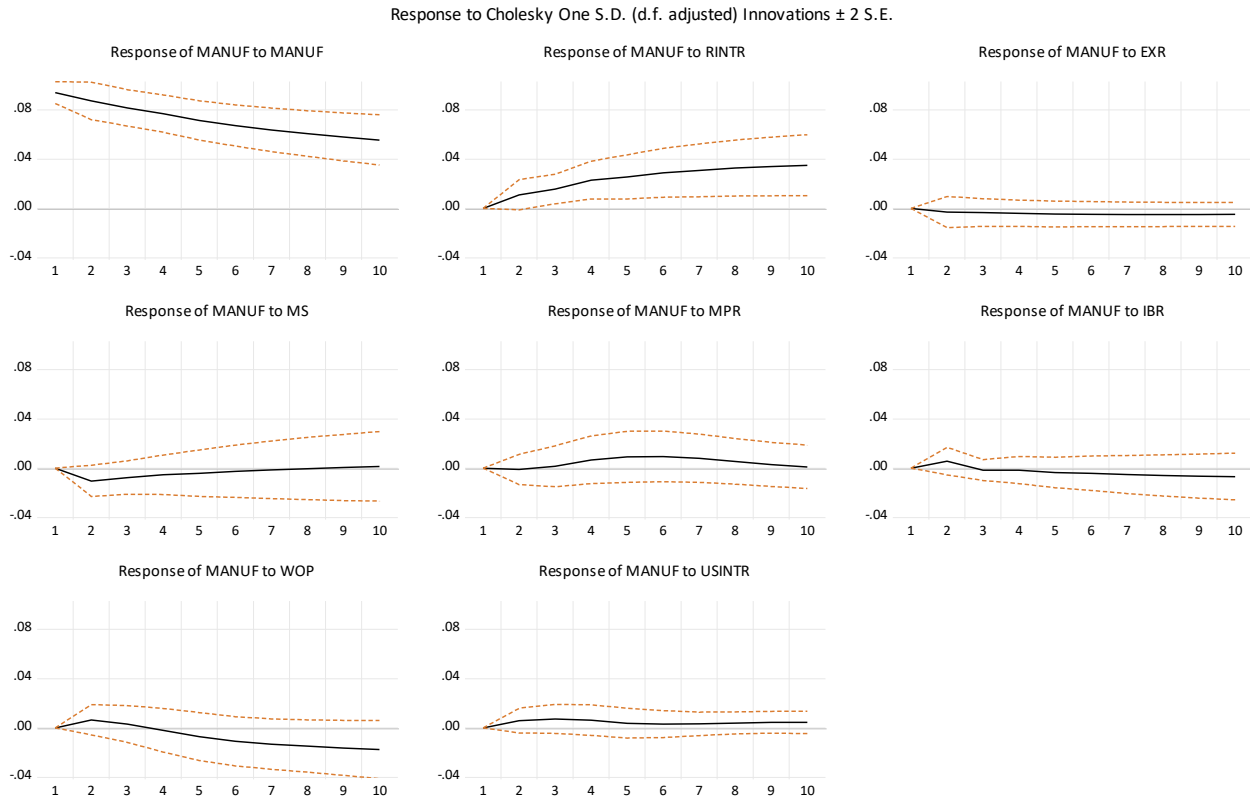


Figure 1.2: Response of Industrial output to innovative shock in monetary policy indicators in Francophone West Africa

Results are shown in Figure 1.2, which shows how industrial sector production in Francophone West African countries responded to innovation shocks in monetary policy variables such as real interest rate, exchange rate, money supply, monetary policy rate, interbank rate, world oil price, and US interest rate. The results specifically showed that the output of the industrial sector responds positively to innovative shocks in the real interest rate, monetary policy rate, and US interest rate but negatively to innovative shocks in the exchange rate, money supply, interbank rate, and world oil price.”

1.4.6 The Forecast Error Decomposition has been analyzed.

In this part, the forecast error variance decomposition for the variable of interest in connection to objective two is summarized. The forecast error decomposition for periods 1 and 10 is summarized in the presentation for clarity, along with the percentage of forecast error variance in output from the industrial sector that can be explained by it and other endogenous variables for the short and intermediate periods. The findings of the variance decomposition of manufacturing sector output and service sector output for the sampled countries under Anglophone West Africa are presented in Tables 4.6 and 4.7, while the results are shown for the sampled countries under Francophone West Africa in Tables 4.8 and 4.9.”

1.4.6.1 Industrial Sector in Anglophone within West Africa

Table 1.4: Summary of Variance Decomposition

<i>Period</i>	MANUF	RINTR	EXR	MS	MPR	IBR	WOP	USINTR
1	100.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	93.2119	4.6605	0.3361	0.4491	0.0672	0.1176	0.2392	0.9183
5	87.0468	6.7481	1.6968	1.2886	0.0609	0.0853	0.1756	2.8979
10	74.9064	9.9165	8.8570	2.5482	0.7845	0.1101	0.2445	2.6329

Source: Author's Computation, 2021

The manufacturing sector output for Anglophone countries was shown in Table 1.4 to account for 100% of the period 1 forecast error by itself, demonstrating that none of the other variables included could significantly contribute to the period 1 forecast error variance. The findings also demonstrated that in period 3, the industrial sector's output in Anglophone nations only accounts for 93.21% of the forecast error, while real interest rates, exchange rates, money supply, monetary policy rate, interbank rate, world oil price, and US interest rates each account for 4.66%, 0.37%, 0.45%, 0.07%, 0.12%, 0.24%, and 0.92% of the forecast error variance, respectively. The manufacturing sector output of the affected countries was found to be responsible for 85.04% of the period 5 forecast error, with the remaining forecast error being attributed to real interest rates, exchange rates, money supply, monetary policy rates, interbank rates, world oil prices, and US interest rates, with values of 6.74%, 1.69%, 1.29%, 0.06%, 0.08%, 0.17%, and 2.89%, respectively. Moreover, the findings revealed that in period 3, the manufacturing sector output of Anglophone countries only accounts for 74.91% of the forecast error, while real interest rates, exchange rates, money supplies, monetary policy rates, interbank rates, world oil prices, and US interest rates respectively accounted for 9.91%, 8.85%, 2.54%, 0.78%, 0.11%, 0.24%, and 2.63% of the forecast error variance.”

1.4.6.2 Industrial Sector in Francophone within West Africa

Table 1.5: Summary of Variance Decomposition

<i>Period</i>	MANUF	RINTR	EXR	MS	MPR	IBR	WOP	USINTR
1	100.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	96.9028	1.5675	0.0808	0.6822	0.0141	0.1493	0.2248	0.3785
5	93.7856	4.2972	0.1495	0.5685	0.3728	0.1367	0.2919	0.3979
10	85.2189	11.0234	0.2686	0.3507	0.5378	0.3443	1.8960	0.3605

SOURCE: Author's Computation, 2021

Table 1.5 showed that none of the other variables utilized could significantly affect the variance of the period one forecast error because the industrial sector production for Francophone countries accounted for 100% of the period one forecast error by itself. The findings also revealed that only 96.90% of the period 3 forecast inaccuracy was attributable to the manufacturing sector's output in Francophone countries. The forecast error variance was simultaneously affected by actual interest rates, exchange rates, money supply, monetary policy rate, interbank rate, world oil price, and US interest rates, with contributions totaling 1.56%, 0.08%, 0.68%, 0.01%, 0.14%, 0.22%, and 0.37%. The results for period 5 showed that the industrial output in the concerned countries accounted for 93.78% of the forecast error, with the real interest rate, exchange rate, money supply, monetary policy rate, interbank rate, world oil price, and US interest rate accounting for the remaining forecast error, with values of 4.29%, 0.14%, 0.56%, 0.13%, 0.29%, and 0.39%, respectively. The findings also revealed that, in period 3, the output of the industrial sector in Anglophone nations only accounts for 85.21% of the forecast error, while the real interest rate, exchange rate, money supply, monetary policy rate, interbank rate, world oil price, and US interest rate are each responsible for 11.02%, 0.26%, 0.35%, 0.53%, 0.34%, 1.89%, and 0.36% of the forecast error variance, respectively”.

1.7 Discussion of the Results

In the chosen West African countries, real interest rates and monetary policy rates primarily trended in the opposite direction from the output performance of the manufacturing sector over time, whereas the money supply primarily trended in the same direction. This is revealed by an analysis of the trends in monetary indicators and the output of the industrial sector. In contrast, the real interest rate displayed a trajectory that was inconsistent with the effectiveness of production. The trend analysis revealed that the manufacturing sector production in the sample countries of West Africa decreased over time when monetary variables such the real interest rate and the monetary policy rate increased the most frequently throughout the course of the study. But the manufacturing sector's output continued to move generally in the same direction as the money supply. The pattern of movement of the industrial sector's output performance is clearly different, especially with regard to the monetary policy rate, as shown by an analysis of the trajectory of monetary policy indicators alongside industrial output performance.

The findings show that the output of the industrial sector in Anglophone West African countries would gradually and primarily decrease in response to monetary policy variables in terms of interest rate, money supply, interbank rate, and US interest rate but increase in terms of exchange rate and global oil price. It was also anticipated that real interest rates and currency rates will contribute more to the forecast error variance decomposition than other policy variables. However, the results did show that the industrial sector output of Francophone West African countries would increase in response to novel shocks in real interest rates, monetary policy rates, and US interest rates while gradually and primarily declining in response to variables related to exchange rates, money supply, interbank rates, and international oil prices. The production performance of Francophone West African countries is positively impacted by real interest rates, monetary policy rates, international oil prices, and US interest rates; however, this is not the case for Anglophone West African countries, which are positively impacted by exchange rates, the money supply, and international oil prices. Additionally, the price of international oil had a

significant impact on the forecast error variance in the service sector's production performance in both the Anglophone and francophone West African nations. The real interest rate, however, placed in second place in Anglophone West African countries, followed by the monetary policy rate. In contrast, in the countries of Francophone West Africa, the global oil price and the monetary policy rate came in second and third, respectively.

The results revealed that the real interest rates, monetary policy rates, and global oil prices will all have a significant impact on how well the production sector performs in the Anglophone and francophone West African nations. To be more specific, the output performance of the service sector rises in the countries of Francophone West Africa in response to the price of crude oil, the pace of monetary policy, the real interest rate, and the US interest rate, whereas it rises in the countries of Anglophone West Africa primarily and gradually in response to the price of crude oil, the amount of money in circulation, and the exchange rate. While the main causes of a decline in the output performance of the service sector in Anglophone West African countries are real interest rates, monetary policy rates, interbank rates, and US interest, the main causes of a similar decline in Francophone West African countries are money supply, exchange rates, and interbank rates.

All of the African Development Bank Group's (ADB) 2010 submissions, findings, and conclusions, as well as those of Onyeiwu (2012), Chuku (2009), and Mansor (2009) are in agreement with the findings of this study. For instance, Chuku (2009) claimed that although changes in the money supply or monetary policy shocks have little effect on output and price reactions, they are nonetheless quite quick to respond. Despite the fact that the exchange rate situation is only equivalent to that of Anglophone West African countries, Mansor and Ruzita (2005) found that manufacturing production responded more strongly to changes in interest rates and exchange rates than other categories of aggregate output. Discovery concurs with the conclusions of Ibrahim and Amim (2005), Oriji, Oguabor, Okeke and Oriji (2019), Ehinomen and Oladipo (2012), and others who claim that the exchange rate had a significant impact on the manufacturing sector's output, despite the results being somewhat different from those of the Francophone West African countries. However, the discovery refutes the contention in the African Development Bank Group's (ADB) (2010) statement that the nation's structural imbalances and economic instability have rendered its inflation rate and exchange rate policies ineffective in reviving its ailing industrial sector.

1.8 Conclusion

Based on the findings of this study, among other monetary policy indicators, the real interest rate fluctuated over time in a manner that was at odds with both the output of the industrial sector. While it did the opposite for industrial output, the monetary policy rate moved generally in the same direction as the performance of output in the service sector. Although the trend for other monetary policy indicators, like the actual interest rate and money supply, is the same for the industrial there is a noticeable difference in the pattern of movement of output performance in the industrial sector, particularly with regard to the monetary policy rate. The study's concluding finding was that the industrial sector output of Anglophone West African nations would gradually decline and primarily be affected by monetary policy variables such as interest rates, monetary policy rates, money supply, interbank rates, and US interest rates, but rise in terms of exchange

rates and global oil prices, whereas industrial sector output of Francophone West African nations will gradually decline and predominantly be affected by factors such as exchange rates and world oil prices. The real interest rate and monetary policy rate, in addition to other study variables, will have a big impact on how well the service sector performs in the output sectors of Anglophone and Francophone West African nations.

1.9 Recommendations

The following recommendation was made in accordance with the study's findings:

- i. The monetary authorities in West African nations should formulate appropriate monetary policies in order to increase industrial output growth in West African countries.
- ii. The money supply and monetary policy rate should be crafted to increase consumer and business demand for services in order to support the production of the service sector.
- iii. West Africa should consider the United States interest rate and put in place suitable procedures to investigate its benefits and reduce its costs on the industrial sector, notably the service sector.
- iv. To increase the output of the industrial sector, monetary policy should be employed to promote the development of an environment that is favorable for investment through suitable exchange rates, real interest rates, money supplies, and interbank rates.”

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