sciendo
STUDIA UNIVERSITATIS ECONOMICS SERIES
"Vasile Goldiș" Western University of Arad
SUES
2022 - 32(1)
DOI: 10.2478/sues-2022-0002

IMPACT OF MONETARY POLICY TRANSMISSION MECHANISM IN WEST AFRICAN COUNTRIES

Jonathan Olusegun Famoroti *
University of Kwazulu-Natal, South Africa
E-mail: 218000043@stu.ukzn.ac.za

Omolade Adeleke
University of Kwazulu-Natal, South Africa
E-mail: lekeomolade@gmail.com

(Received: June 2021; Accepted: September 2021; Published: January 2022)

Abstract
The study analyzed the impact of monetary policy shocks on economic growth in 12 countries of the Economic Community of West African States (ECOWAS), using quarterly data from 1980(1) to 2017(4). We employed a Panel Structural Vector Autoregressive (Panel SVAR) for the modeling of monetary policy transmission shock in the segregated sub-regions of WAMZ and WAEMU. The key results suggest that fluctuations of the monetary policy do not have significant effects on the economic growth but significantly impact the general price level. Moreover, the study finds that the exchange rate is persistently a vital mechanism that significantly influences the variables of the real economy. Our estimates further suggest that there is idiosyncratic evidence found in the results, which is the anomaly of the Price puzzle.

Keywords: Economic growth, ECOWAS, Monetary policy shocks, and Panel SVAR.

JEL Classification: C01, E52, E58.

1. Introduction and Background

In the course of time, several debates have emerged in the economic literature concerning the relationship between monetary policy and economic growth. This includes, among others: Does monetary policy explains the fluctuations in the economic growth and general price level? If any, to what extent does it influence the key macroeconomic variables? Through what mechanism does the monetary

* Corresponding author: Jonathan Olusegun Famoroti. *E-mail:* 218000043@stu.ukzn.ac.za

policy influence the variations in the macro-economic variables? An attempt to proffer solutions to these issues is a function of policy implementation. The efficacy of monetary policy implementation entails proper assessment of the channels at which the policy changes proliferate to other economic variables and the magnitude of these effects. This in effect requires adequate knowledge of the mechanism (the process of propagating monetary policy into the economy) by which monetary policy impacts economic activity. Otherwise referred to as the transmission mechanism (Muric 2010, Tahir 2012).

The economy is stimulated by the monetary authorities of different countries through the money supply, interest rate, reserve requirements and exchange rate management. The implication is that, by encouraging individual businesses to borrow and spend, monetary policy thus encourages economic activity. When an economy is overheated, future growth is prone to a high rate of inflation as it is driven by costs-push and demand-pull inflation. Consequently, the economic crisis is therefore imminent. Hence, the application of a constricted monetary policy would act as a brake to inflation and other issues associated with an economy that is overheated (Wang and Zhang, 2009; Vale, 2014).

According to Nkwatoh (2018), no ECOWAS member nation has been able to achieve all the required convergence criteria for their monetary union since the agreement in 2001. Their level of macro-economic convergence does not suffice to attain the set goal. Only the Monetary Policy in the West African Economic and Monetary Union (WAEMU) sub-region have struggled to achieve the debt to GDP ratio, deficit, and inflation rate criteria, due to their monetary union and shared stabilization policy. The primary criteria include a budget deficit of ≤ 3% of GDP, public debt ≤ 70% of GDP inflation at ≤ 5% and exchange rate stability. Similarly, the convergence criteria of the West African Monetary Zone (WAMZ), including among others the monetary policy of (i) achieving and sustaining the inflation rate at a single inflation rate by 2003 and to 5% by 2004, (ii) to maintain a stable real exchange rate and (iii) maintaining a positive real interest rate. However, member states have not been able to achieve the criteria, except the Gambia, since the formation of the Zone (Harvey and Cushing, 2014). For instance, in Sierra Leone the inflation rate between 2016 and 2018 was 10.9%, 18.2%, and 16.0%, respectively.; in Nigeria between 2016 and 2018, it was 12.7%, 16.5% and 12.1%, respectively; while in Ghana the inflation records were 11.7%,15.5%,17.1% and 12.4% for the year 2013 to 2017, respectively.

This implies that the economic growth and stability in many developing countries have been majorly threatened by double-digit inflation, whereas their monetary anchors have been tailored towards a pro-growth policy stance. More so, the economic growth rate of these countries is still below the potential level of output (Malick and Sousa, 2012). Thus, shocks are created through the discretionary

action of monetary authorities in these countries, in their bids to leverage the gap between the supply and demand growth Monetary policy instruments could aid the enhancement of investment, leading to output growth and economic stability.

Even though this has been studied widely in various groups of economies such as Organisation for Economic Co-operation and Development (OECD) countries (Assenmacher and Gerlach 2008; Ahrend 2010; Ugur et al., 2016), Emerging market economies (Kutu and Ngalawa 2016; Tipoy et al., 2018), European countries (Angeloni and Ehrmann, 2003; Peersman 2004; East Africa (Buigut 2009; Davoodi et al., 2014, Simionescu 2018) and G7 countries (Kim and Roubini 2000; Smets 1995; Maku et al. 2020), without much concern about the developing economies. Hence, as a contribution to the extant literature, this study extends this investigation to the West African region, being a developing economy, where there is a dearth of literature to aid in policy decisions. Specifically, the objective of this study is to investigate the monetary policy transmission mechanism and its impact on the economic growth of ECOWAS member states.

This study has been segmented as follows: The first Section is on introduction and background, the second section deals with the review of literature, the methodology and the analysis of results are the last two sessions.

2. Theoretical and Literature review

Theories on economic growth and monetary policy have evolved over time, which have been characterized by obscurities, divergences, and inconclusiveness. The nexus between economic growth and monetary policy could be predated to the quantity theory of Money (QTM), which was preceded by other theories including Keynesian Liquidity Preference and New Consensus Model (NCM). Other theories have focused on the Neutrality of money in the long run (Twinoburyo and Odhiambo, 2018).

Monetarism, is a monetary theory, as developed by Friedman (1995), relating to the quantity theory of money, which asserts that the availability of the quantity of money determines the price level. Therefore, the monetarist believed that inflation is a monetary phenomenon. This positivist school of thought emphasizes the velocity at which money income relates to the quantity of money. This implies that money and price are directly related. An increase in the money supply will bring about an increase in the price level. Therefore, in order to avoid inflation, the monetarist said that money supply, in the long run, should not be above the output growth rate. Mishkin (1996) earlier stressed that this model of monetary theory denotes the transmission process of money, which can only be effective only at the neglect of interest level, real income, etc. It was further criticized on the velocity of money that is made constant, whereas the velocity of money is predominantly motivated by consumer behavior. Thus, the non-accountability of other factors

makes the quantity theory of money to reflect a partial description of monetary policy and growth. However, the economic content of the theory is relevant for economic modeling.

In another dimension, the Keynesian Theorists rejected the assumption of the monetarists that real output and the velocity of money are constant. The Keynesians do not believe in the direct relationship of money supply and prices but emphasize the multiplier effects, interest rate, investment and total income. Keynesians are skeptical of the effectiveness of the monetary policy as regards the control of the economy, since the banking system may not loan out their excess reserves to the firm. Also, the firms and households may not be sensitive to the reduced interest rate. In view of this, Keynesian places more emphasis on fiscal policy than monetary policy for the control of the economy (Keynes, 1936).

There are divergent views in the various empirical findings on the significant level of the monetary policy shocks to economic stabilization. There are a lot of studies, upholding the view that the effects of the monetary policy shocks on economic growth are positive and greatly significant, this includes the investigation of Aragon and Portugal, (2009) on the impact of monetary policy shocks in Kenya, using VAR and MS-VAR and found that they are significantly effective on the macroeconomic variables of the economy. Hammed and Ume, (2011), applied a regression technique to investigate the impact of monetary policy on the GDP in Pakistan for the period 1980 to 2009. Their results show that GDP is highly affected by monetary policy. Specifically, among other factors affecting GDP, money supply stands out as a major policy that greatly affected GDP. Supporting this investigation, Ayub et al., (2015), also examined the impact of monetary policy on GDP in Pakistan. Using 10-year data between 2005 and 2014, the study revealed that the GDP had been greatly affected by money supply, interest rate and inflation. Also, in a related empirical study carried out by Vinayagathasan (2013) on the macroeconomic variables in Sri Lanka, using the SVAR model with data by employing a data set between 1978m1 and 2011m12. The findings of the author suggest that the shock of interest rate had a significant effect on output growth, while the shock of money supply produced a significant but negative impact on the output.

Furthermore, Chaitip et al. (2015), used ARDL of Pooled Mean Group Estimator (PMGE) to study the influence of money supply on economic growth in 8 countries studied and found that the is a positive long correlation exist between money supply and economic growth. The study conducted by Cambazoglu (2012), using the VAR model on time series data for the period 2005(1) to 2010(7) to examine the monetary policy shocks on macroeconomic variables including industrial production and broad money (M2), shows that M2 had a positive impact on output and employment. Furthermore, the investigation carried out by Fiado (2016) in

three sub-Saharan African countries (Ghana, Gambia and Nigeria) on monetary policy and economic performance, for the period 1975 to 2011, shows that the real GDP growth is positive and significant with improved risk-taking. Milani and Treadwell (2012) utilized DSGE econometric model to disentangle anticipated and unanticipated monetary policy shocks and their impacts on the US economy, between 1960q1 and 2009q1.The authors estimated with Bayesian techniques with macroeconomic variables of output, inflation and federal funds rate. The results show that unanticipated monetary policy shocks had small, but momentary effects on output, whereas the anticipated monetary policy shock produces a large and persistent impact.

Conversely, there is another school of thought showing that the effects of monetary policy on output growth are weak and statistically insignificant. By empirical studies, a policy change of 1.0 percent leads to a price and output change between 0.5 and 1.0 percent in the United States of America. (Sims 1992 and Bernanke 1990). Kim (1999) studied whether monetary policy shocks matter in the G-7 countries. The study revealed that in the short run, the monetary policy shocks affected the output growth on a minor level. This implies that changes in the output of the G-7 countries were not significantly determined by the monetary policy. Similarly, Chen Kevin, (2006) used VAR to analyze Kenya's monetary policy Transmission Mechanism. The report shows that a short-term increase in prices leads to a reduction in interest rate but has insignificant effects on output growth. Kapuscinski et al. (2015) attempted the investigation on the importance of monetary policy channels of transmission in Poland, using the SVAR model and monthly data from 2001q1 to 2015q3. The authors' findings suggest that the impact of the shock of the exchange rate channel on other economic sectors declined sharply during the period. The weakness in the effectiveness of the channel was adduced to the massive influx of international enterprises. They further claimed that the principal driver of inflation was the interest rate, which was the strongest channel.

Recently, the existent literatures reviewed by Sedegah and Odhiambo (2021) on the effects of external shock on monetary policy in non-WAEMU revealed that the transmission of shocks to the domestic economy is a function of many factors including exchange rate flexibility, economic integration, foreign aids, among others.

In summary, despite deferred opinions on the effectiveness of the monetary policy on economic growth and which of the transmission channels is most important, nevertheless, there is consensus in the empirical literature about the neutrality of monetary policy in the long run (Chen 2007; Bae et al. 2005; Noqueira 2009). From the above, the reason for the weakness of the monetary policy may, however, be adduced to a few data observations covered by some studies, which might have

led to few degrees of freedom e.g. Buigut (2009) and Bagzibagli (2014). It could also be inferred that most of these empirical studies were carried out in developed countries and emerging markets, at the neglect of the sub-region of West Africa. The few West African countries included in the studies were either country-specific or too few countries or univariate, which are not fit for generalization. These are the gaps this study intends to fill.

3. Methodology

3.1 Model specification

The Panel SVAR employed in this study is preferred to VAR because it captures the dynamic behavior of all the variables in the model. Also, the estimation of the parameters is more efficient in SVAR and the rationale for the imposition of restrictions to identify the monetary policy shocks are equally provided, making it a more powerful instrument for analyzing macroeconomic policy. Apart from the restrictions, the main assumption in panel SVAR is that all the variables are endogenous, and more variables can be accommodated without the risk of the degree of freedom. Various studies have employed this technique including Omolade (2014), Kutu and Ngalawa, (2016); Akande and Kwenda (2017), *among others.*

3.2 A Recursive Structural VAR Model

The Panel SVAR is derived from the conventional panel Var model. Therefore, following Kutu and Ngalawa (2016), the structure of the economic model is expressed is in the form:

Let ECOWAS member countries be in the notation as stated as follows

$$HY_{it} = N_{i0} + A_1 Y_{it-1} + A_1 Y_{it-1} + \cdots A_p Y_{it-p} + B\varepsilon_{it} \quad \ldots\ldots (1)$$

Where H denotes invertible (NxN) matrix; Y_{it} is (Nx1) vector of the endogenous variables, which is further specified that $Y_{it} = Y_{1t}, Y_{2t}, \ldots Y_{nt}$; N_{i0} is (Nx1) vector for the constant values, which represents the country-specific intercepts; A_j is (NxN) matrix of the coefficients of the lagged value (p) of the endogenous variables and j=1, … p; H is in the form (NxN) matrix with non-zero elements that are off-diagonal; ε_{it} denotes the vector error of the error terms.

To ease the problem of estimating the model in equation (1), as a result of the interactions of the current values with their lag values, we reinstate the model into a reduced form by multiplying $(Y_{it})\ by\ (H^{-1})$.

Therefore

$$Y_{it} = H^{-1}N_{i0} + H^{-1}A_1 Y_{it-1} + H^{-1}A_1 Y_{it-1} + \cdots H^{-1}A_p Y_{it-p} + H^{-1}B\varepsilon_{it} \quad \ldots\ldots (2)$$

Let $H^{-1}N_{i0} = C_i$, $H^{-1}A_1, \ldots ,\ H^{-1}A_p = D_p$, and $H^{-1}B\varepsilon_{it} = \mu_{it}$ …………………. (3)

Hence, in a reduced form

$$Y_{it} = C_i + D_1Y_{it-1} + D_2Y_{it-2} + \cdots + D_pY_{it-p} + \mu_{it} \quad \ldots\ldots (4)$$

In line with Ender (2004), equation (4) is the standard panel SVAR with no contemporaneous
relationship among the variable and error terms (μ_{it}) is a composite of (Y_{it}) shocks.
In another form, the equation could also be written as:

$Y_{it} = C_i + H(L)Y_{it} + \mu_{it}$ ……..……...…… (5)

Where Y_{it} denotes the vector-matrix of the ECOWAS the selected variables for this study.
Specifically:

$Y_{it} = (RGDP, inf, ms, intr, exc)$ ……..……..…….. (6)

C_i represents the constant values for the country's intercept, $H(L)$ indicates the matrix of the polynomial lags, which encompasses the interactions between the endogenous variables and the lag values, μ_{it} equals $H^{-1}B\varepsilon_{it}$ representing the vector of the disturbance random effects. Therefore H$\mu_{it} = B\varepsilon_{it}$.
In a structural form, we, therefore, impose certain restrictions on the matrices H and B

3.3 Shocks identification and ECOWAS modeling

Several authors (including Christiano, et al, 1999, 2005), have identified shocks of the monetary policy to an economy using Cholesky decomposition. Similarly, in this study, we apply recursive restrictions to the ECOWAS economy. The recursive VAR involves structural rigidity of the underlying relationships between the variables, which therefore leads to the questioning of its ability to appropriately describe the dependencies between the variables of a model. Hence, in order to eliminate these weaknesses, it is essential to use the SVAR identification method.
The Ecowas monetary policy equation can be specified in the order: Y= [Real GDP, inflation rate, money supply, domestic interest rate, and exchange rate,]. The basis of this ordering centers on the implicit assumption of the monetary authority that some variables may or may not contemporaneously vary with the policy decisions. For instance, Output growth and prices do not respond simultaneously to the monetary policy changes. Similarly, the interest rate does not respond simultaneously to the changes in output growth and the exchange rate. However, the exchange rate has a contemporaneous relationship with the various shocks of all the variables. These shocks are identified through the imposition of zero restrictions to the matrix coefficients of A and B. Following Allen and Robinson (2015); Amisano and Giannini (2012); Coric, et al. (2015); and Nazamani et al. (2017), the Panel SVAR requires a maximum of n(n+1)/2 or 15 restrictions to matrices A and B altogether (n= no of variables).

$$\mathbf{A}=\begin{bmatrix} U^{RGDP} \\ U^{Inf} \\ U^{M2} \\ U^{Int} \\ U^{Exh} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & a_{34} & 0 \\ a_{41} & 0 & 0 & 1 & a_{45} \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 \end{bmatrix} \begin{bmatrix} V^{RGDP} \\ V^{Inf} \\ V^{M2} \\ V^{Int} \\ V^{Exh} \end{bmatrix} \quad \mathrm{B} = \begin{bmatrix} b_{11} & 0 & 0 & 0 & 0 \\ 0 & b_{22} & 0 & 0 & 0 \\ 0 & 0 & b_{33} & 0 & 0 \\ 0 & 0 & 0 & b_{44} & 0 \\ 0 & 0 & 0 & 0 & b_{55} \end{bmatrix}$$

3.4 Definition of variables and Sources of data

Various empirical and theoretical literature has identified different domestic monetary policy variables as sources of economic fluctuations including stock of money supply, interest rate, inflation exchange rate, among others. This study, therefore, employed common variables similar to some of these authors like Chen and MacDonald, (2012); Popescu, 2012; Coric et al. (2015) and Hur (2017). These variables are defined as follows:

Real GDP rate (RGDP). This is the deflated value of goods and services produced in each country. It is the product of the nominal GDP and the GDP deflator. The RGDP is used in the study as the proxy for economic growth, which measures the economic effects of the policy shocks in ECOWAS. It is also a variable for further assessment of the validity of the opinion, (Mishkin, 1995) that economic stabilization (both output growth and inflation), is a function of monetary policy for the achievement of Pareto optimality. *Domestic Interest Rate (IR)*-This represents the bank lending rate. It denotes the policy indicator, which is brought into the model as a monetary policy tool (Ngalawa and Viegi, 2011). An instrument used by the monetary authority to regulate the effects of inflation and growth by acting as an incentive or disincentive for commercial banks of the respective countries to borrow from their central banks. *Exchange rate (ER)*- This is the value of the national currency per US Dollar. The use of the US Dollar as the yardstick is based on its general acceptability and most traded currency in the exchange market (Ibrahim and Amin, 2005). An increase in the exchange rate implies a depreciation of the country's currency, which implies that the variable has effects on inflation. It is introduced into the model being an open economy. In an open economy, the importance of the exchange rate channel in the monetary transmission mechanism cannot be undermined (Goeltom 2008). *Money supply (M2)* –This is the monetary base growth rate. It is the aggregate money supply rate, representing the total money in circulation plus demand deposit plus time deposit (i.e. Broad money) in all the countries under study. This is incorporated into the model as an intermediate monetary policy target. *Inflation Rate (INF)*- This is the general increase in the price level. This is the consumer price index (base year 2000=100) of goods and services consumed for each country. Like the RGDP, is a key macroeconomic variable commonly used to measure economic stability (IMF 2018). According to literature, the inflation rate may be affected through the

flexibility of the exchange rate (Bernanke 1990), hence it serves as a control variable by which macroeconomic targets are achieved.

The data were obtained from the World development indicator and international Financial Statistics (IFS). In this study, in order to obtain the quarterly data for the variable of the RGDP, and the inflation rates, we followed the standard techniques used in the literature including Cheng, 2006; Davoodi et al. 2013; among others, to interpolate the available annual data into quarters, by converting from low frequency to high-frequency rates.

4. Results and discussions

4.1 Selection Optimal lag length

For the criteria used for the selection of the optimal lag lengths, we explored the five conventional optimal lag lengths regression methods. The Sequentially Modified LR test statistics (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hanna-Quinn Information Criterion (HO). The major reasons for the selection of the optimal lag length are to avoid multi-collinearity, serial correlation of the error term in the models and to prevent misspecification errors (Elboure, 2007). The results for the sub-region of WAMZ depict that all the methods (LR, FPE, AIC, SC and HQ) suggest the use of 6 lags, being their lowest values, for example, the lowest value in AIC is 3.792748 at the 6^{th} lag. Hence this study employed a 6-lag length for the WAMZ sub-region. On the other hand, WAEMU sub-region, estimated results depict that FPE and AIC allow 7 optimal lags, while SC and HO permitted the use of a 6-lag length. The odd-one-out is the LR suggesting an 8 optimal lag length. Therefore, we employed a 7-lag length for the WAEMU, as suggested by the AIC with the most negative value of -1.569333.

4.2 Unit Root Test

The stochastic non-stationarity of the series was examined in this study and their integration order was established through the conduction of a battery of the unit root tests. This was considered necessary in order to avoid misleading and spurious results. Therefore, for a consistent and reliable result, three statistical tests had been conducted, viz: Im, Pesaran Shin. (IPS), Dickey-Fuller (ADF), and Phillips Perron (PP). Testing for stationarity of data in the analysis is a precondition for the implementation of VAR and SVAR estimation to avoid a persistent shock that may be infinite, evade a situation whereby the standard assumption of asymptotic analysis from being invalid and a non-stationary time series data may lead to spurious regression. (Afandi, 2005; Dendramis et al., 2014). In this study, we conducted the unit root tests for the variables with individual intercepts and at

intercepts and trends. The summary of the results for WAMZ and WAEMU are as shown in Tables 1a &1b respectively.

Table 1a Unit Root test-WAMZ

Variable		IPS		ADF		PP	
		t* stat.	Order of Interg.	t* stat.	Order of Interg.	t* stat.	Order of Interg.
RGDP	Ind. Intercept	-4.30813***	1(1)	44.3221***	1(1)	65.8231***	1(1)
	Ind. Intercept & Trends	-4.70862***	1(1)	41.3327***	1(1)	65.1612***	1(1)
INF	Ind. Intercept	-3.49366***	1(0)	28.2224***	1(0)	23.5781***	1(0)
	Ind. Intercept & Trends	-3.85198***	1(0)	29.0382***	1(0)	25.6396***	1(0)
MS	Ind. Intercept	-3.61178***	1(0)	29.5015***	1(0)	32.4071***	1(0)
	Ind. Intercept & Trends	-4.78585***	1(0)	38.1049***	1(0)	26.8495***	1(0)
INTR	Ind. Intercept	-1.89004**	1(0)	70.0725***	1(1)	149.592***	1(1)
	Ind. Intercept & Trends	-6.44719***	1(1)	55.5823***	1(1)	130.223***	1(1)
EXCH	Ind. Intercept	- 0.18729**	(1)	9.28065**	1(1)	36.4219***	1(1)
	Ind. Intercept & Trends	-1.55490**	(1)	14.1684**	1(1)	39.0878***	1(1)

Significance level: *** (1%) and ** (5%). Source: Author's computation from results.

Table 1b Unit Root test-WAEMU

Variable		IPS		ADF		PP	
		t* stat.	Order of Interg.	t* stat.	Order of Interg.	t* stat.	Order of Interg.
RGDP	Ind. Intercept	-4.16424***	1(1)	60.6740***	1(1)	208.319***	1(1)
	Ind. Intercept & Trends	-10.1784***	1(1)	136.353***	1(1)	212.972***	1(1)
INF	Ind. Intercept	-1.73067***	1(0)	181.171***	1(1)	196.335***	1(1)
	Ind. Intercept & Trends	-10.9883***	1(1)	147.712***	1(1)	159.476***	1(1)
MS	Ind. Intercept	-7.67438***	1(0)	97.2583***	1(0)	72.6092***	1(0)
	Ind. Intercept & Trends	-9.92159***	1(1)	126.179***	1(1)	47.4036***	1(0)
INTR	Ind. Intercept	-7.29206***	1(0)	84.7536***	1(0)	47.4036***	1(0)
	Ind. Intercept & Trends	-3.77032***	1(0)	39.5732***	1(0)	284.694***	1(1)
EXCH	Ind. Intercept	-11.1918***	1(1)	166.989***	1(1)	218.434***	1(1)
	Ind. Intercept & Trends	-10.3151***	1(1)	137.787***	1(1)	179.742***	1(1)

Significance level: *** (1%) and ** (5%). Source: Author's computation from results.

4.3 Analysis of the impulse responses

In this sub-section, having estimated the model, we analyze the shock effects, through the impulse response functions. The analysis of the impacts of monetary policy innovations in the economic literature is prevalent, as it gives room for distinguishing between contending theoretical models in an economy (Christiano et al., 1999). Therefore, in this study, having estimated the model, we discuss the panel SVAR results in this section. Specifically, we employed the impulse response functions (IRF) to analyze the dynamic responses of the respective exogenous variables, to one standard deviation of the monetary policy over a period of 38 quarters in the panel SVAR model for the two sub-regions in ECOWAS. For simplicity, the period is allocated to a compact of 12 quarters for both sub-regions (see Figures 1 to 5). In this study, we used the IRFs to illustrate the dynamic responses of the RGDP and inflation to one standard deviation of monetary policy shocks in the two sub-regions (WAMZ and WAEMU) in ECOWAS.

4.3.1 Impulse Responses of economic growth to the shock of monetary policy instruments

Figure 1 shows the IRFs of the real GDP to a standard deviation in inflation and variables of monetary policy (Money supply, interest rate, and exchange rate). In WAMZ (row one of column one), the response of the growth rate to one standard deviation of the inflation rate is persistently negative and significant. Whereas the results obtained for WAEMU (row one of column two) defers a little from the WAMZ sub-region, where the shock produces an insignificantly mixed effect. The growth rate was initially positive to the 6^{th} quarter and thereafter remains negative. The preliminary rise in growth rate arising from the inflation rate could be attributed to asymmetric information in the economy. When the stakeholders, specifically, the producing firms are only restricted to the information relating to their products relative to the general price level, then the output may initially be increased to augment the relative price increases due to delay in information. Eventually, when they have access to full information regarding the increase in the general price level, the output will decline and subsequently to the equilibrium level (Romer, 2012). In sum, inflation exerts a negative impact on real output growth. The inverse relationship is typically re-affirming the theoretical literature of the non-linear relationship between the growth rate and inflation, similar to Vinayagathasan (2013) on 32 Asian countries.

The one standard deviation of the aggregate money supply in ECOWAS shown in row two from both sub-regions depicts an insignificant effect on the growth rate. The theoretical expectation of an expansionary monetary policy is to trigger growth

as affirmed in the economic literatures like Aragon and Portugal, (2009); Fiado, (2016) and Noqueira, (2009). However, in the case of ECOWAS, the shock has a marginal impact on growth. Even though it is positive in WAEMU, but statistically not distinguishable from zero in the WAMZ sub-region over the whole forecast horizon. This indicates that shocks of monetary policy do not impact real output growth. This is similar to Patnaik et al.'s (2011) on monetary policy shocks in Emerging markets economies. It is also in alignment with the results of Cheng (2006), whose estimations on Kenya's economy suggest that monetary policy has little effect on real output growth because of structural weaknesses of the financial sector, thereby hindering the monetary policy transmission mechanism. In another dimension, the magnitude of these effects might have been absorbed by the hike in the inflation rate or may be attributed to the monetary policy framework in each country (Mallick and Sousa, (2012).

Also included in this analysis is the response of growth rate to a positive shock of the interest rate in the two sub-regions Evidence from both sub-regions (row three) reveals that growth rate has a negative response to the shock of the interest rate and is statistically insignificant. This is in accord with the findings of Kim (1999); Cheng (2006), and Kevin (2006), that changes in interest rate are not a stimulus to economic performance and do not have a significant impact on output. The effects fade off in WAEMU at the 10^{th} quarter. In Keynesian theorists' view, the interest rate is the standard channel of monetary transmission. The multiplier effects of an increase in interest rate will reduce the cost of capital, resulting in a high cost of investment. This further leads to an upsurge in aggregate demand and output is enhanced. Thus, contrary to monetarists, investment decisions and consumer behaviors are influenced by the real interest rate and not the nominal interest rate (Mishkin, 1996).

The last row of figure 1 shows the responsiveness of the growth rate to one standard deviation in the exchange rate of the monetary transmission mechanism in ECOWAS. As documented in the literature that an overvalued domestic currency may initially lead to an increase in output, but with the risk of the financial crisis, which may eventually result in the depreciation of the rate exchange and decline in output (Berument and Pasaogullari, 2003**).** In WAMZ (column one) the response of the growth rate is persistently negative to the shock and significantly affects the real economy. Conversely, in WAEMU (column two), the response of the growth rate is mixed. It was initially negative and becomes positive after the 7^{th} quarters, but the effect fades off at the 12^{th} quarters of the horizon. The negative effects of the exchange rate shock demonstrated in this result are parallel to Kamin and Roggers' (2000).

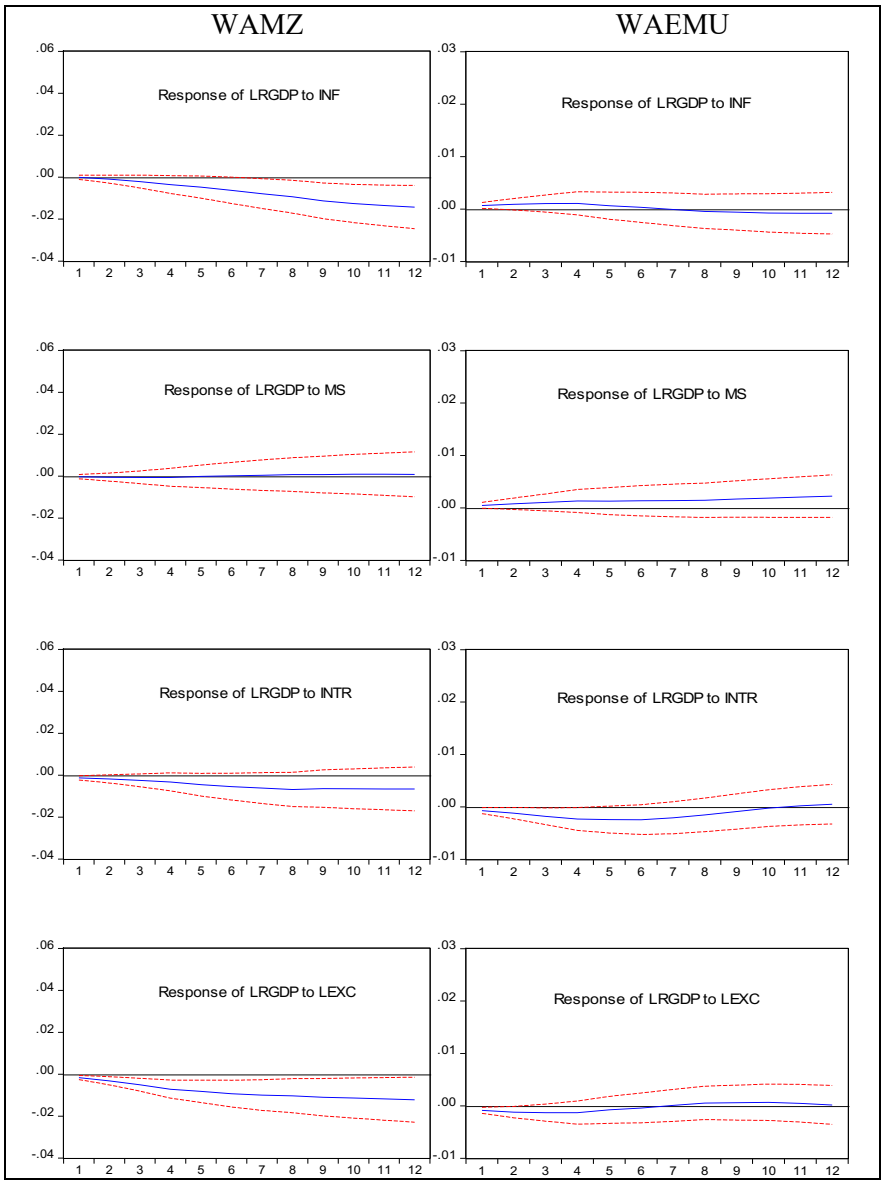

Figure 1 Responses of RGDP
Source: Author's computation from results.

Studia Universitatis "Vasile Goldis" Arad. Economics Series Vol 32 Issue 1/2022
ISSN: 1584-2339; (online) ISSN: 2285 - 3065
Web: publicatii.uvvg.ro/index.php/studiaeconomia. Pages 20 – 42

4.3.2 Impulse Responses of inflation rate to shock of monetary policy Instruments

Figure 2 shows the IRFs of the rate of inflation to a standard deviation in real GDP and variables of the monetary policy transmission mechanism in both sub-regions of WAMZ and WAEMU. In row one, the response of inflation to a shock of growth rate in both sub-regions exhibits a negative and insignificant impact, except between the 1st and 4th quarters in WAEMU. Theoretically, the relationship between economic growth and inflation has been a controversial issue for a long time between structuralists and monetarists. The monetarist argued that inflation has a retarding effect on economic growth, whereas the structuralists opined that inflation is not counterproductive to the achievement of economic growth (Idris, 2017, Than, 2015). The outcome of our estimates, therefore, suggests a nonlinear relationship among the duo, which evidently supports the monetarists.

In WAMZ (row two, column one), the inflation rate demonstrates a positive and significant response to the shock of broad money supply, as against Kim and Roubini (2000). In a hump shape, the rising general price level attains the maximum level of 10 percent at the 7th quarter and subsequently declines. This further re-affirms the quantity theory of money that under the assumption of a constant velocity of transaction and output, the change in the stock of money supply will have a direct relationship with the general price level. However, in this case of the WAEMU (row two column two), the response of inflation to expansionary monetary policy is insignificantly positive up to the 6th quarter and subsequently falls to near zero after the 6th quarter. The increase in the growth rate might have absorbed a further increase in the inflation rate.

The shock of interest rate (row three) leads to an increasing rate of inflation at a statistically significant level. In the WAMZ sub-region, a sharp response is noticed from inception to the 4th quarter by 0.5 percent and declines thereafter, while in WAEMU it was initially negative and leads to persistent positive and significant effects after the 4th quarter. In both sub-sub-regions, this is an indication of idiosyncratic evidence**,** as it appears there is the presence of a price puzzle within the forecast horizon. This is because the contractionary monetary policy through positive innovation in interest rate leads to increase (instead of decrease) in the inflation rate period (See Bernanke and Blinder, 1992; Cheng, 2006; and Boivin and Giannoni, 2006)

In both sub-regions (row four), one standard deviation in the exchange rate impacts positive and significant effects on the inflation rate. In WAMZ, the inflation rate has a sharp and increasing response to the shock, subsequently declined from 0.4 to 0.02 percent with insignificant effects at the 8th quarter to the end of the horizon. The inflation rate in WAEMU rises to the peak of about 1.0 percent at the 4th quarter and thereafter maintains a stable state.

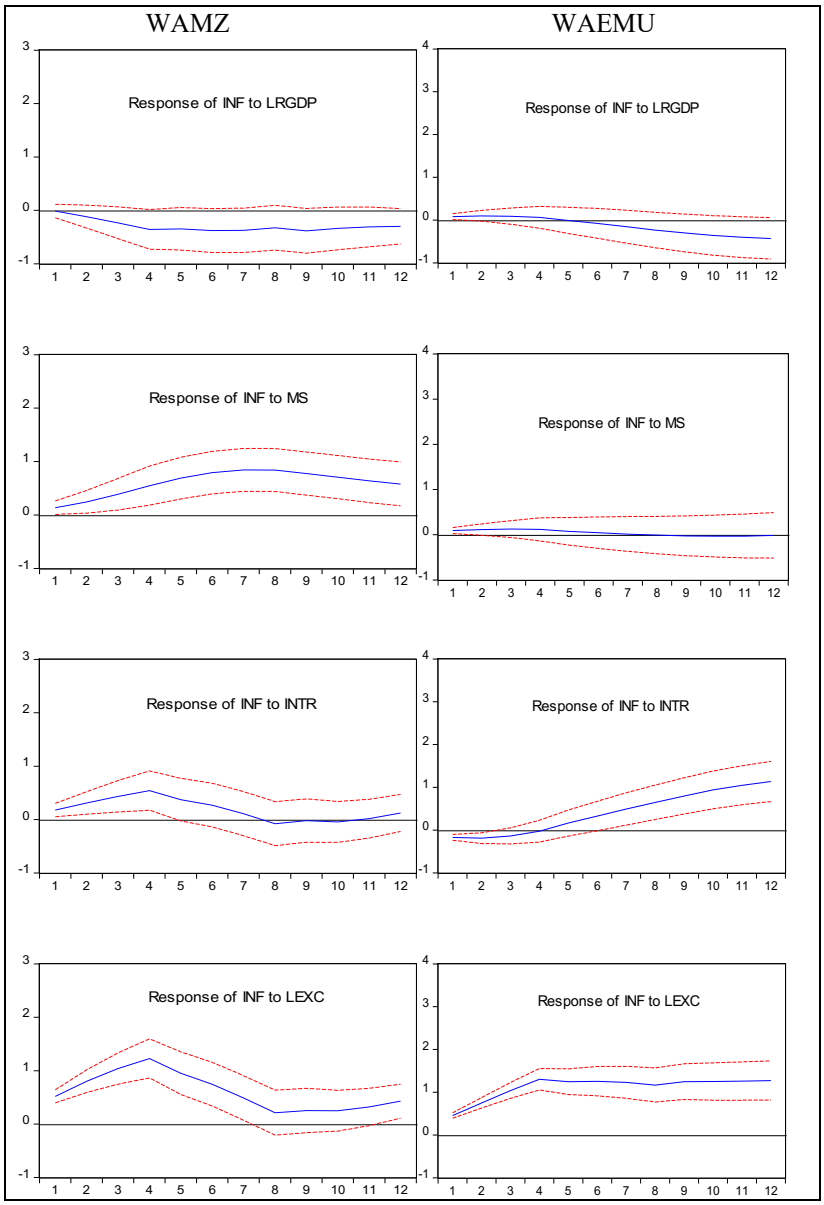

Figure 2 Responses of Inflation rate
Source: Author's computation from results.

Boivin et al (2010) and Mishra et al., (2011) suggested that certain factors are accredited to the operations of the exchange rate channel, including openness, size of the economy, degree of capital mobility, interest rate sensitivity, and level of disbursements between domestic and imported goods. In the case of ECOWAS, the exchange rate policy may be another major driver to be considered, as the exchange rate is dominated by both fixed and flexible exchange rate systems. Our results suggest that the inflation rate is relatively higher in WAEMU, which operates fixed exchange rate and this further corroborates (Aghevli et al. 1991 and Gosh et al. 1995) that countries with fixed (pegged) exchange rates usually experience higher inflation rates. While countries with adopting flexible exchange rates, experienced a relatively lower rate of interest, as the monetary authority has the power to control the exchange through discretional policy.

In sum, evidence from the impulse responses suggests that the two sub-regions share certain common traits in respect of the monetary policy mechanism, which affects the ECOWAS economy. However, in some instances, there are mixed results.

4.4. Variance decomposition

The Variance decomposition is an estimation of a percentage shock on a specific variable in relation to the variable's innovations itself and other dependent variables at a forecast period (Raghavan and Silvapulle, 2008). In this study, the horizon has been allocated into 3, 6, 9, and 12 as shown in tables 2 and 3. The first two columns contain the period, and the Standard error (S.E) of the respective variable, while other columns show the variance (in percentage) accruing to each shock, which sums up the total row to 100.

4.4.1 Variance Decomposition of the RGDP

Table 2 indicates the proportional shock of real growth rate to itself and innovations to other monetary policy instruments in both WAMZ and WAEMU. In WAMZ it suggests that through the period in the horizon, the exchange rate takes dominance of the shock effect to output growth, apart from the variable's own shock. The rate of contribution of the exchange rate was also at an increasing rate through the periods, ranging from 0.005 percent as in the 3rd period to 0.021 percent in the 12th period. Generally, there is an inverse relationship between the real growth rate and inflation and interest rate.

Similarly, the proportional contributions of the variables in WAEMU to innovation in real growth rate show that aside from the variables' contribution, it is dominated by the exchange rate with contributions ranging from 0.42 percent to 0.81 percent in the 3rd and 12th period, respectively. In the two sub-regions, contributions of

money supply and interest rate to the fluctuations of the growth rate remain trivial throughout the period.

Table 2 Variance Decomposition of RGDP

WAMZ						
Period	S.E	RGDP	INF	M2	INTR	EXCH
3	0.300537	99.99506	4.70E-06	5.12E-05	6.92E-05	0.004811
6	0.617370	99.98052	2.06E-05	0.000214	0.000171	0.019077
9	0.85753	99.97841	2.01E-05	0.000249	0.000158	0.021159
12	1.055666	99.97875	5.34E-05	0.000253	0.000154	0.020788
WAEMU						
Period	S.E	RGDP	INF	M2	INTR	EXCH
3	0.287308	99.95678	0.000450	0.000415	0.000586	0.041766
6	0.508082	99.79209	0.002172	0.001990	0.003041	0.200711
9	0.621434	99.44214	0.005799	0.005359	0.005471	0.541234
12	0.747908	99.17106	0.008620	0.007986	0.005081	0.807249

Source: Author's computation from results.

4.4.2 Variance Decomposition of the General Price level

The decomposition of the general price level (inflation) in the sub-regions of ECOWAS is shown in Table 3. In both sub-regions, a greater fluctuation in inflation, after the first quarter, is been accounted for by economic output. This is followed by the exchange rate. For instance, in WAMZ in the 3rd period, the percentage contribution of the growth rate is about 90 percent and 94 percent in the 12th period. The results further suggest the existence of an indirect relationship between the growth rate and the general price level. The contributions of the money supply range between 0.03 and 0.07 percent in WAMZ, while in WAEMU its contribution is between 0.22 and 0.44 percent within the period. The relationship between the growth rate and the inflation in this sub-region is inverse, while that of the aggregate money supply and interest rate is direct with effect from the 6th quarter.

Table 3 Variance Decomposition of INF

WAMZ						
Period	S.E	RGDP	INF	M2	INTR	EXCH
3	1.704603	90.09823	1.275728	0.073300	0.042329	8.510410
6	4.583603	87.72228	0.216485	0.092057	0.070777	11.89840
9	6.618146	92.92063	0.111274	0.049376	0.045183	6.873538
12	7.856347	94.76826	0.079623	0.035691	0.034459	5.081972
WAEMU						
Period	S.E	RGDP	INF	M2	INTR	EXCH
3	0.911821	47.84640	6.622777	0.448614	0.867536	44.21467
6	3.506018	70.22115	1.083081	0.272388	1.672828	26.75055
9	7.312533	76.53022	0.287760	0.217988	1.487361	21.47667
12	11.59817	76.42148	0.114744	0.221198	1.355462	21.88711

Source: Author's computation from results.

In brief, the shocks of the inflation and exchange rate take dominance effect to the economic growth and stability. This implies that the exchange rate plays a significant role in the monetary policy transmission mechanism in ECOWAS countries.

5. Summary and Conclusions

This study employs the Panel Structural VAR (PSVAR) model to examine the monetary policy shocks effect on economic growth in the sub-region of ECOWAS economies. Due to the availability of data, this study covers 12 out of 15 countries in the region, covering the period 1980(1) to 2017(4). The model of the region is divided into two separate sub-regions according to their monetary union viz: WAMZ with 4 countries and WAEMU with 8 countries. This sample period was chosen after 5 years of the existence of economic integration. We conducted the preliminary diagnosis of the data to affirm the suitability of the data, which includes the unit root test to confirm the stationarity of the monetary variables. Hence, the PSVAR provides significant results for the ECOWAS economy.

As revealed by the results of the estimates the shocks of the monetary policy instrument of interest rate and the exchange rate do have a significant effect on the economic growth and economic stability of ECOWAS. Similarly, the inflation rate and exchange rate statistically affect the real growth rate. The results also show that the price stability is significantly being influenced by the monetary policy of interest rate and both anticipated and unanticipated exchange rate shocks. Finally, the result further suggests the presence of price puzzles and no linear relationship exists between growth rate and inflation, which is also corroborated by the variance decomposition**.** These estimates further substantiate the dynamic roles played by the monetary policy in the economic growth and stability in the ECOWAS region.

Therefore, the monetary policy instruments interest rate, exchange rate, and rate of inflation remain vital macroeconomic variables to be considered in the course of the monetary integration of the ECOWAS and other monetary policy decisions. Also, as a result of the significant impact of the exchange rate on inflation, adequate cautions must be taken by the monetary authorities on any policy measures that devalue the domestic currency with a view to enhancing growth, as it may contemporaneously lead to a rise in inflationary rate.

Acknowledgments

The valuable contributions of the anonymous reviewers and editor are highly appreciated.

Funding
This research received no specific grant from any funding agency in the public, commercial, or not–for–profit sectors.

Author Contributions
Dr. O. Adeleke and Mr. J.O. Famoroti conceived this study and were responsible for the design and development of the data analysis. Mr. J.O. Famoroti was responsible for the data collection and literature review. Dr. O. Adeleke was responsible for data analysis**.**

Disclosure Statement
The authors have not any competing financial, professional, or personal interests from other parties.

References
1. Afandi, A. (2005), Monetary policy transmission mechanism and structural breaks in Indonesia, School of Economics and Information System, University of Wollongong.
2. Aghevli, Bijan B., Mohsin S. Kahn and Peter J. Montiel (1991), Exchange Rate Policy in Developing Countries: Some Analytical Issues", IMF Occasional Paper, No. 78.
3. Aragón, E. K. D. S. B., Portugal, M. S. (2009), Asymmetric effects of monetary policy in Brazil. Estudos Econômicos (São Paulo), 39(2), 277-300.
4. Ahrend, R. (2010), Monetary ease: A factor behind financial crises? Some evidence from OECD countries. Economics: The Open-Access, Open-Assessment E-Journal, 4, 12.
5. Allen, N., Robinson, J. (2015), Monetary Policy Effects in a Regime Switching Model. Applied Economics, 46(24), 2936-2951.
6. Akande, J. O., Kwenda, F. (2017), P-SVAR analysis of stability in sub-Saharan Africa commercial banks. SPOUDAI-Journal of Economics and Business, 67(3), 49-78.
7. Amisano, G., & Giannini, C. (2012), Topics in Structural VAR econometrics. Springer Science & Business Media.
8. Angeloni, I, Ehrmann, M. (2003), Monetary policy transmission in the euro area: any changes after EMU?
9. Assenmacher, K., Gerlach, S. (2008), Monetary policy, asset prices and macroeconomic conditions: a panel-VAR study. National Bank of Belgium Working Paper, (149).
10. Ayub, Sidra, Shah F. Maqbool. (2015), Impact of monetary policy on gross domestic product (GDP). Asian Journal of Business and Management (ISSN: 2321-2802) 3, no. 06.
11. Bae, S. K., Jensen, M. J., Murdock, S. G. (2005), Long-run neutrality in a fractionally integrated model. Journal of Macroeconomics, 27(2), 257-274.
12. Bagzibagli, K. (2014), Monetary transmission mechanism and time variation in the Euro area. Empirical Economics, 47(3), 781-823.
13. Baltagi, B. H. (2008), Econometric analysis of panel data. Fourth Edition. West Sussex: John Wiley and Sons, Ltd. UK, s.13.

14. Bernanke, B. (1990), The federal funds rate and the channels of monetary transmission (No. w3487). National Bureau of Economic Research.
15. Bernanke, B., Blinder, A. (1992). The Federal Funds Rate and the Channels of Monetary Transmission. American Economic Review, 82(4), 90-2.
16. Boivin, J., Kiley, M. T., Mishkin, F. S. (2010), How has the monetary transmission mechanism evolved?. In Handbook of monetary economics (Vol. 3, pp. 369-422). Elsevier.
17. Boivin, J., Giannoni, M. P. (2006), Has monetary policy become more effective?. The Review of Economics and Statistics, 88(3), 445-462.
18. Buigut, S., (2009), Monetary Policy Transmission Mechanism: Implications for the Proposed East African Community (EAC) Monetary Union, http://www.csae.ox.ac.uk/ conferences/2009-EdiA/paperlist.html.
19. Bungin, S., Reljic, M., Ivkovic, B. (2015), Estimation of the transmission mechanism of monetary policy in Serbia. Industrija, 43(3), 143-158.
20. Cambazoglu, B., Karaalp, S. H. (2012), The effect of monetary policy shock on employment and output: the case of Turkey. Economics, Management, and Financial Markets, 7(4), 311.
21. Carstensen, K., Hülsewig, O., Wollmershäuser, T. (2009), Monetary policy transmission and house prices: European cross-country evidence.
22. Chaitip, P., Chokethaworn, K., Chaiboonsri, C., & Khounkhalax, M. (2015), Money supply influencing on economic growth-wide phenomena of AEC open region. Procedia Economics and Finance, 24, 108-115.
23. Chen, S. W. (2007), Evidence of the long-run neutrality of money: the case of South Korea and Taiwan. Economics Bulletin, 3(64), 1-18.
24. Chen, X., MacDonald, R. (2012), Realized and Optimal Monetary Policy Rules in an Estimated Markov? Switching DSGE Model of the United Kingdom. Journal of Money, Credit and Banking, 44(6), 1091-1116.
25. Cheng Kevin, C. (2006), A VAR analysis of Kenya's monetary policy transmission mechanism: How does the central bank's REPO rate affect the economy. International Monetary Fund Working Paper WP/06/300.
26. Christiano, L. J., Eichenbaum, M., Evans, C. L. (1999), Monetary policy shocks: What have we learned and to what end?. Handbook of macroeconomics, 1, 65-148.
27. Christiano, L. J., Eichenbaum, M., Evans, C. L. (2005), Nominal rigidities and the dynamic effects of a shock to monetary policy. Journal of Political Economy, 113(1), 1-45.
28. Coric, B., Malesevic Perovic, L., Simic, V. (2015), A Cross-Country Analysis of Monetary Policy Effects on Prices. Czech Journal of Economics and Finance, Vol. 65, Issue 5, pp. 377-390.
29. Corsetti, G., Dedola, L., & Leduc, S. (2006), Productivity, external balance and exchange rates: Evidence on the transmission mechanism among G7 countries (No. w12483). National Bureau of Economic Research.
29. Davoodi, H. R., Dixit, S. H. I. V., Pinter, G. A. B. O. R. (2014), How Strong Is the Monetary Transmission Mechanism in the East African Community?. International Monetary Fund.

30. Davoodi, M. H. R., Dixit, M. S., Pinter, G. (2013), Monetary transmission mechanism in the East African Community: An empirical investigation (No. 13-39). International Monetary Fund.
31. Dendramis, Y., Spungin, G. E., Tzavalis, E. (2014), Forecasting VaR models under different volatility processes and distributions of return innovations. Journal of Forecasting, 33(7), 515-531. Developing Countries?. A Survey of the Empirical Evidence, CEPR Discussion Paper, (8577).
32. Elbourne, A. (2007), The UK housing market and the monetary policy transmission mechanism: An SVAR approach. Journal of Housing Economics, 17 (8) 65-87.
33. Fiador, V. O. L. (2016), Monetary policy and economic performance-evidence from selected African countries (Doctoral dissertation, University of Cape Town).
34. Friedman, M. (1995), The role of monetary policy. In Essential Readings in Economics (pp. 215-231). Palgrave, London.
35. Goeltom, M. S. (2008, January), The transmission mechanisms of monetary policy in Indonesia. In Participants in the meeting (p. 309).
36. Gosh, Atish R., Anne-Marie Gulde, Jonathan D. Ostry and Holger C. Wolf (1995), Does the Nominal Exchange Rate Regime Matter? IMF Working Paper, No. 95/121.
37. Gujarati, D. (2004), Basic Econometric (Trans. S. Zain). Jakarta: Erlangga Publishers.
38. Hameed, I., Ume, A. (2011), Impact of monetary policy on gross domestic product. Institute of Interdisciplinary Business Research, 2.
39. Head, A. C., Liu, L. Q., Menzio, G., Wright, R. (2010), Equilibrium price dispersion and rigidity: a new monetarist approach.
40. Hur, J. (2017), Monetary Policy and Asset Prices: A Markov Switching DSGE Approach. Journal.
41. Ibrahim, M. H., Amin, R. M. (2005), Exchange Rate, Monetary Policy and Manufacturing Output in Malaysia. Journal of Economic Cooperation Among Islamic Countries, 26(3).
42. Idris, M., Bakar, R. (2017), The relationship between inflation and economic growth in Nigeria: a conceptual approach. Asian Research Journal of Arts Social Sciences, 1-15.
43. IMF. (2018), West African Regional Economic: Domestic Revenue Mobilization and Private Investment.
44. Kapuściński, M., Kocięcki, A., Kowalczyk, H., Łyziak, T., Przystupa, J., Stanisławska, E., Dzwonik-Wrobel, E. (2016), Monetary Policy Transmission Mechanism in Poland: What Do We Know in 2013?. Economic Institute.
45. Keynes, J. M. (1936), The general theory of interest, employment and money.
46. 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(2), 387-412.
47. Kim, S., Roubini, N. (2000), Exchange rate anomalies in industrial countries: A solution with Structural VAR Approach. Journal of Monetary Economics, 45, 561-586
48. Kutu, A. A., Ngalawa, H. (2016), Monetary policy shocks and industrial output in BRICS countries. SPOUDAI-Journal of Economics and Business, 66(3), 3-24.

49. Maku, O. E., Tella, A. T., Fagbohun, A. C. (2020), Alleviating poverty in Nigeria: Keynesian vs monetary theory of poverty. Studia Universitatis Vasile Goldiș Arad, Seria Științe Economice, 30(1), 103–120.
50. Mallick, S. K., Sousa, R. M. (2012), Real effects of monetary policy in large emerging economies. Macroeconomic Dynamics, 16(S2), 190-212.
51. Milani, F. and Treadwell, J. (2012), The effects of monetary policy news and surprises. Journal of Money, credit and banking, Vol. 44, No. 8.
52. Mishkin, F. S. (1996), The channels of monetary transmission: lessons for monetary policy (No. w5464). National Bureau of Economic Research.
53. Mishkin, F. S. (1995), Symposium on the monetary transmission mechanism. Journal of Economic Perspectives, 9(4), 3-10.
54. Mishkin, F. S. (2004), Can central bank transparency go too far? (No. w10829). National Bureau of Economic Research.
55. Mishra, P., Montiel, P., Spilimbergo, A. (2011), How Effective is Monetary Transmission in Developing Countries? A Survey of the Empirical Evidence.
56. Muric, M. (2010), The transmission mechanism of monetary policy and channels of monetary transmission in Serbia. In Global network for social-economic research and development. Conference paper.
57. Ngalawa, H., Viegi, N. (2011), Dynamic effects of monetary policy shocks in Malawi. South African Journal of Economics, 79(3), 224-250.
58. Nkwatoh Louis, S. (2018), Does ECOWAS Macroeconomic Convergence Criteria Satisfy an Optimum Currency Area? Journal of Economics and Management Sciences; Vol. 1, No. 2.
59. Nogueira, R. P. (2009), Is monetary policy really neutral in the long run? Evidence for some emerging and developed economies. Economics Bulletin, 29(3), 2432-2437. of Applied Econometrics, 32(5), 965-982.
60. Nizamani, A. R., Karim, Z. A., Zaidi, M. A. S., Khalid, N. (2017), Trade Balance Response to Shocks in Monetary Policy and Exchange Rate: Evidence from Pakistan Using SVECM Approach. International Journal of Business and Society, 18(3), 579-594.
61. Omolade, A. (2014), Monetary policy and manufacturing sector growth in Africa's oil-exporting countries (Doctoral dissertation).
62. Patnaik, I., Shah, A., Bhattacharya, R. (2011), Monetary policy transmission in an emerging market setting. International Monetary Fund.
63. Peersman, G. (2004), The transmission of monetary policy in the Euro Area: are the effects different across countries?. Oxford Bulletin of Economics and Statistics, 66(3), 285-308.
64. Popescu, I. V. (2012), Effects of Monetary Policy in Romania-a Var Approach. CES Working Papers, 4(3a), 605-624.
65. Raghavan, M., Silvapulle, P. (2008, July). Structural VAR approach to Malaysian monetary policy framework: Evidence from the pre-and post-Asian crisis periods. In New Zealand Association of Economics, NZAE Conference (pp. 1-32).
66. Romer, C. (2012, April), Fiscal policy in the crisis: lessons and policy implications. In IMF Fiscal Forum, April (Vol. 18).

67. Rotimi, M. E., Ngalawa, H. (2017), Oil price shocks and economic performance in Africa's oil-exporting countries. Acta Universitatis Danubius. Œconomica, 13(5).
68. Sedegah, K., Odhiambo, N. M. (2021), A Review of the Impact of External Shocks on Monetary Policy Effectiveness in Non-WAEMU Countries. Studia Universitatis Vasile Goldiș Arad, Seria Științe Economice, 31(3), 37-59.
69. Simionescu, M. (2018), What drives economic growth in some CEE countries?. Studia Universitatis Vasile Goldiş, Arad-Seria Ştiinţe Economice, 28(1), 46-56.
70. Sims, C. A. (1992), Interpreting the macroeconomic time series facts: The effects of monetary policy. European economic review, 36(5), 975-1000.
71. Smets, F. (1995), Central bank macroeconometric models and the monetary policy transmission mechanism. BIS (a cura di), Financial structure and the monetary policy transmission mechanism, Basel, 225-266.
72. Tahir, M. N. (2012), Relative importance of monetary transmission channels: A structural investigation; Case of Brazil, Chile and Korea.
73. Thanh, S. D. (2015), Threshold effects of inflation on growth in the ASEAN-5 countries: A Panel Smooth Transition Regression approach. Journal of Economics, Finance and Administrative Science, 20(38), 41-48.
74. Tipoy, C. K., Breitenbach, M. C., Zerihun, M. F. (2018), Exchange rate misalignment and economic growth: On the possible transmission channels for emerging economies. Cogent Economics Finance, 6(1), 1476016.
75. Twinoburyo, E. N., Odhiambo, N. M. (2018), Can Monetary Policy drive economic growth? Empirical evidence from Tanzania. Contemporary Economics, 12(2), 207-222.
76. Ugur, A., Sancar, C., Akba, Y. E. (2016), Effectiveness of monetary policies in OECD countries. Theoretical Applied Economics, 23(4).
77. Vale, P. H. (2014), Central Bank Challenges after the Financial Crisis. Management and Organizational Studies, 1(2), 67-77.
78. Vinayagathasan, T. (2013), Inflation and economic growth: A dynamic panel threshold analysis for Asian economies. Journal of Asian Economics. Science Direct Elsevier Inc., 26(2): 31-41.
79. Wang, J., Zhang, J. (2009), Thoughts on China's growth of economy and inflation. Asian Social Science, 4(4), 15-26.