Transmission Mechanism of Monetary Policy in Nigeria: Investigating the Role of Private Sector Credit

Musa U.[1], Ndagwakwa D.W.[2], Musa Y.[3], Ita E.U.[4]

[1,2,3,4] Central Bank of Nigeria

Abstract: *This study examines the interest rate channel of monetary policy rates through private sector credits to prices. It applies an approach that is not common in monetary policy transmission mechanism in literature as many studies on transmission mechanism of monetary policy only examine statistical relationship between policy variables and target variables which may not be able to explain the pathway through which the monetary policies are transmitted. This paper uses mediation approach to assess the significance of causal path of interest rate through the bank lending channel. This paper dwelt on the transmission paths- from maximum interest rate, inter-bank call rate, treasury bill rate to prices through the private sector credits. The findings of this study lay credence to effective and significant transmission effects of interest rates (maximum lending rate, interbank lending rate and treasury bill rate) through private sector credit to prices. The paper concludes that maximum lending rate path has the highest significant transmission effect to prices. This is followed by the treasury bill rate and the inter-bank call rate respectively. The findings in this study is new in the case of Nigeria as no previous studies have applied mediation approach to the study of transmission mechanism of bank lending channel in Nigeria. Central banks should explore ways to effectively make policy towards effectively directing the monetary policy through maximum lending rate and treasury bill rates as they have the most significant paths through which the monetary policy rate is transmitted to prices.*

Keywords: mediation, bank lending channel, monetary policy, interest rate, maximum lending rate, credit, CPI.

INTRODUCTION

Monetary policy is any conscious action of the central bank to control the availability, quantity or/and cost of money in an economy in order to meet set goals and in consonance with expected level of economic activity (CBN-RSD, 2016). Eduardo & Sturzenegger (2010) see monetary policy as the policy adopted by a monetary authority to control the supply of money or interest rate on short-term borrowing with the goal of maintaining low inflation, stable exchange rates and economic stability. Maintaining price stability has emerged as the most prominent goal and core mandate of monetary authorities in recent time, Nigeria inclusive (CBN-RSD, 2016). The monetary policy transmission mechanism is the process by which prices and general economic conditions are influenced by monetary policy decisions. The monetary policy decisions are expected to influence interest rates, aggregate demand and money supply for improved economic performance. Okaro (2011) argues that the principal channel of monetary policy is through banks' lending to firms, which stimulate economic growth and employment through investment and posits that credit is an important part of the transmission process of Nigerian Monetary Policy. This occurs through interest rate channels, which affect interest rates, costs and level of borrowing and aggregate demand (Mishkin, 2012) as Kuttner & Mosser (2002) posit that interest rate channel is the primary mechanism at work in conventional macroeconomic models.

Price level has been one of the major policy targets of the central bank. Price level targeting strategy seeks to keep the general price level stable at determined level. The consumer price index (CPI) or other measures of cost of inputs are usually the variables for price level targets. Central bank's policy rates are transmitted through among other things, the short-term money market rates. The policy rate is the rate at which deposit money banks borrow money from the central bank. Consequently, raising the monetary policy rate

Transmission Mechanism of Monetary Policy in Nigeria: Investigating the Role of Private Sector Credit

(MPR), increases short term and other interest rates and vise-visa. Changes in MPR also affect other long-term rates (CBN-RSD, 2016). Hence a rise in nominal interest rate brings about reduction in borrowing especially the private sector borrowing which are channeled into the real sector. This brings about reduced aggregate demand and domestic production. To determine the efficacy and efficiency of monetary policies for any target objective, central banks must be able to accurately assess the effect of their policies on the economic activity through the various channels. Also, the significance of these transmission channels should be ascertained.

Many studies on monetary policy transmission mechanisms used various versions of regression and time series models to directly regress output and prices on monetary policies variables like interest rates, reserves, etc. These only examine statistical relationship between policy variables and target variables. For instance, the vector auto regression (VAR) widely used in literature does not only seek direct causal effects but also found to disentangles causes and effects by imposing coefficient and or error covariance restrictions on the parameters of the model (Okaro, 2011).

Majority, if not all, of these monetary policy transmission mechanisms studies used approaches that examine statistical relationship between policy variables and target variables. These regression and time series models may not be capable of explaining the pathway through which the monetary policies are transmitted and how monetary policy especially the interest rates affect final prices and output. Hence the need for path analysis approaches that analyses the path through which these policy effects are transmitted.

Mediation Analysis is a path model that hypothetical analyzes causal sequence of relationship between a dependent and independent variable through a third variable known as the mediator. A mediation model is a path model that seeks to identify and explain the mechanism or process that underlies a relationship between two or more variables through a third explanatory variable, known as a mediator variable (Fairchild & MacKinnon, 2009). Hence, statistical mediation refers to a causal path in which the effect of one or more independent variables is transmitted to one or more dependent variables through third variable known as mediator. Statistical mediation indicates that the effect a variable X is transmitted to another variable Y through a mediator variable M. consequently mediation is a causal path such as $X \rightarrow M \rightarrow Y$ (MacKinnon, 2000). Fairchild & MacKinnon (2009) posit that a mediator variable is useful in understanding the mechanism through which a cause produces an effect.

Most of these regression and time series models may not be capable of explaining the pathway through which the monetary policies are transmitted. How monetary policy affects final prices and output can only be explained by chain and sequence of events -path analysis. This paper tries to use mediation approach to assess the causal path of monetary policy variables through the interest rate channels. The current study dwels on the path: interest rates-> private_sector_credit->CPI. At the end of this study the significance of the causal path of interest rates through the maximum lending rate, inter-bank call rate and treasury bill rate would have been ascertained.

LITERATURE REVIEW

The basic idea of interest rate channel is that given some level of stickiness in price, a decrease in nominal interest rate translates to a decrease in the real interest rate and cost of capital. These in turn lead to delay in consumption and reduced investment spending. This is the mechanism in conventional Investment-Savings (IS) curve—both of "Old Keynesian" or the forward-looking equations of the "New Keynesian" macro models (Kuttner & Mosser). This notwithstanding, it has also been argued in Real Business Theory, that the money-output correlation may stem from other components of money supply that are affected by actions of banks, depositors, and borrowers, and more likely to affect business cycles. In period of expansion, interest rates are low and borrowing to invest becomes easy. This increases productivity and output. Consequently, banks are willing to grant loans as expansion allows increase in cash flows and thus, easy pay back of loans becomes possible (Deng, 2009). The ability to consider different factors in a general equilibrium approach to the aggregate economic activity has enabled real business cycle-based models to become widely used in macroeconomic analysis especially in policy analysis and optimal monetary and fiscal monetary policies. This is the thrust of monetary policy analysis. Several studies on monetary policy transmission mechanisms are abound in literature, with diverse methods and findings usually using interest rates, credit, money supply, exchange rates, asset prices as channels of transmission.

Okaro (2011) explored the empirical importance of credit by analyzing both endogenous and exogenous instruments of monetary mechanism using information on the country's main economic objectives as a proxy for bank credit availability; and by using bank's prices to disentangle loan supply from loan demand shift in the 'credit channel' literature. The study provides evidence on the role of banks in the monetary transmission process. The study concludes that credit is an important part of the transmission process of Nigerian Monetary Policy.

Transmission Mechanism of Monetary Policy in Nigeria: Investigating the Role of Private Sector Credit

Uma, Ogbonna, & Paul (2015) in their empirical review showed that interest rate, credit channels and exchange rate are among the channels of monetary policy transmission to the economy; and some of the problems hindering effective transmission of monetary policy in Nigeria. The study found that the low patronage of banking services is a stumbling block in effective control of money supply. The study also found that transmission of monetary policy is yet to be effective as there is much interference by the government in the recent past. The study suggested constant review of credit channel in the financial market and interest rate in order to accelerate aggregate economic activity.

Obafemi and Ifere (2015) compared the Factor-augmented vector–auto regression (FAVAR) framework with the traditional VAR model to ascertain the exact channel of transmission. The results from the models reveals that both approaches generate related results The FAVAR model was however found to be superior over VAR as monetary policy shocks are better identified using the FAVAR model. The FAVAR model was also found not to exhibit the prize puzzle problem found in the VAR model but allows for the computation of impulse responses of variables. The results show that interest rate and credit channels are main channels of monetary policy transmission in Nigeria.

Nyumuah (2018) carried out econometric analysis of monetary transmission channels in less developed economies using Ghana macroeconomic data. The study employed the Granger causality tests, variance decompositions, and impulse response functions. The study found that money supply channel is the strongest channel in transmitting monetary policy impulses in the long run while the exchange rate channel is strongest in the short run. The study found also that interest rate and the bank credit to private sector emerge as very weak channels of monetary transmission.

The study of Akani & Imegi (2017) examined the effects of monetary policy transmission mechanism on liquidity of Nigerian capital market using data on capital market liquidity as dependent variable and savings rate, treasury bill rate, net domestic credit, prime lending rate, maximum lending rate, monetary policy rate, credit to private sector and exchange rate as the independent variables. The study employed Ordinary Least Square multiple regressions, Granger Causality Test, Co integration test, Vector Error Correction Model and Augmented Dickey Fuller Test to examine the variables. The study found significant monetary policy transmission mechanism on the liquidity of the capital market; and recommends monetary policies aimed at enhancing the liquidity of Nigerian capital market in view of its impact on the capital market and monetary policy transmission channel. The results of this study may lack credence as credit to net domestic credit, credit to private sector and exchange rates are intermediate outcome variables of interest rate.

Robinson & Robinson (1997) using a Vector Autoregressive model examined possible use of a monetary conditions index (MCI), a measure like that used by the Bank of Canada as an intermediate target for monetary policy. The study also found impact of monetary policy to be immediate and pervasive, but short living- between two to eight months. The study concluded that monetary policy can be highly effective, financial system, expectations and other structural variables which impact on the ultimate target influence the process. The implications of a weak financial sector and inefficient production structure cannot also be ignored.

Ezeaku, *et al* (2018) assess the industry effects of monetary policy channels in Nigeria using Johansen cointegration and the error correction model (ECM). The result reveals that interest rate, private sector credit, and exchange rate channels have negative effects on real output growth both in the short-run and long-run. The results also found that the degrees of effects are smaller in the short-run than the long-run. The results of the study reveal also that monetary policy transmission channels jointly have a long-run relationship with real output growth of the industrial sector.

These studies have all studied monetary policy transmission mechanisms as direct causal mechanisms rather than indirect effects, as monetary policy does not have direct link with the targets, rather a causal path relationship to the target. These models of direct causal relationships may not be able to capture the actual indirect effects of monetary policy on target goals, in this case, the interest rates channel affect final prices and output. Hence the need for path analysis approaches that analyses the path through which these policy effects are transmitted. Mediation analysis is one of the path analysis in literature and may be more appropriate in explaining the indirect effects of monetary policy on target goals.

Mediation Analysis is a path model that hypothetical analyzes causal sequence of relationship between a dependent and independent variable through a third variable known as the mediator. A mediation model is a path model that seeks to identify and explain the mechanism or process that underlies a relationship between two or more variables through a third explanatory variable, known as a mediator variable (Fairchild & MacKinnon, 2009). Hence, statistical mediation refers to a causal path in which the effect of one or more independent variables is transmitted to one or more dependent variables through third variable known as mediator. Statistical

mediation indicates that the effect a variable X is transmitted to another variable Y through a mediator variable M. consequently mediation is a causal path such as $X \rightarrow M \rightarrow Y$ (MacKinnon, 2000). Fairchild & MacKinnon (2009) posit that a mediator variable is useful in understanding the mechanism through which a cause produces an effect.

RESEARCH METHOD

This paper studies bank lending channel of monetary policy by studying the causal path: **interest rates-> private_sector_credit->CPI.** The study employed the mediation procedure used in Nwankwo & Igweze (2016). The procedure originates from Baron and Kenny approach to mediation analysis and the Sobel test, which is one of the most widely used test of indirect effect in simple mediation (Baron & Kenny, 1986). The data series used is a monthly data from January 2007 to February 2020 covering 14 years and 158 data points. The data was sourced from the Central bank of Nigeria money market data base. The interest rates used were maximum lending rate (MLR), inter-bank rate (IBR) and treasury bill interest rate (TIR).

From the Baron & Kenny (1986), procedure, the first step in meditational analysis is to establish that a relationship exists between the independent (X_i) and the dependent variable (CPI) using a regression linear model: as in equation (1). This is known as path c.

$$E(CPI) = c_0 + c*X \text{ (where X=MLR, IBR and TIR respectively)} \quad (1)$$

Next is to fit a regression model with the suspected mediator variable predicting the dependent variable as in equation (2). This is known as path b.

$$E(CPI) = a_0 + a*PSC \quad (2)$$

Thirdly, fit a regression model with the independent and mediator variable predicting the dependent variable as in equation (3)

$$E(CPI) = c_{01} + c_{1*}X + b*PSC \quad \text{(X=MLR, IBR and TIR respectively)} \quad (3)$$

The effect size is then computed as product of coefficient of each of X in equation (2) and coefficient of PSC in equation (3) or difference between the coefficient of X in equation (1) and coefficient of X in equation (3)

$$\widehat{B}_{(indirect)} = a \quad (4a)$$

$$\hat{B}_{(indirect)} = c-c_1 \quad (4b)$$

These two methods in (4a) and (4b) have been found to give the same result (Nwankwo & Igweze). The significance of the mediational effect also known as indirect effect is then tested using the Sobel test which is a ratio of the indirect effect size and the standard error of the indirect effect

The hypothesis is given as:

$$H_0: \quad \hat{B}_{(indirect)} = 0 \quad \text{Versus} \quad H_1: \hat{B}_{(indirect)} \neq 0$$

The Sobel (1982) test statistic for testing significance of indirect effect of the single mediator is:

$$Z_{(Sobel)} = \frac{\hat{B}_{(indirect)}}{S_{(sobel)}}$$

Where: $\hat{B}_{(indirect)}$ is as defined indirect effect (4a and 4b)

$$S_{(Sobel)} = \sqrt{b^2 S_a^2 + a^2 S_b^2 - S_a^2 S_b^2} \quad (11b)$$

The Sobel test follows a standard normal distribution, with parameters as the indirect and standard error of indirect effect).

a is the unstandardized coefficient of each of X in equation (2),

b is the unstandardized coefficient of PSC in equation (3),

S_a is the standard error of the coefficient of X for the mediator in equation (2),

S_b is the standard error of the coefficient of mediator (PSC) in equation (3).

Decision: If p-value is less than α=0.05, reject H_0 and conclude significance of indirect effect.

In ascertaining the type of mediation that exist, whether full or partial, the significance of coefficient of each independent variable, X in equation (3) is compared with the significance of X in equation (1). It is partial mediation if the coefficient of X in equation (3) is reduced and remain significant. A full mediation occurs when the coefficient of X in equation (3) is drastically reduce and becomes insignificant. In this case it is believed that the effect of independent variable, X in equation (1) has been fully transmitted to the mediator variable, PSC in equation (3), thereby becoming insignificant. The excel Real Statistics Macro function was used in running the various mediation analysis.

RESULTS AND DISCUSSION OF FINDINGS

In this paper, the interest rates (MLR, IBR, TIB) are used as independent variables respectively. Private sector credit (PSC) is the mediating variable while the consumer price index (CPI) is the dependent variable. The data series used is monthly data from January 2007 to February 2020 covering 158 data points. The data is sourced from central bank of Nigeria and National Bureau of Statistics, Nigeria. The tests are done at 5% level of significance.
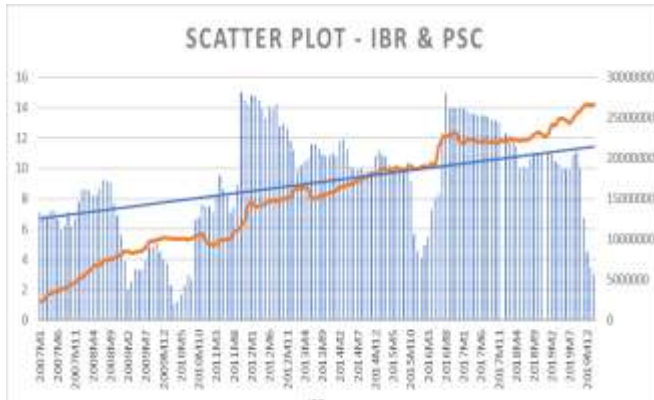
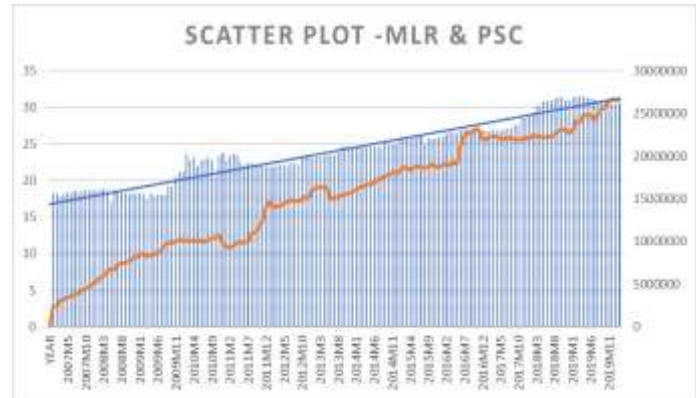Figure 1: Plot of IBR and PSC

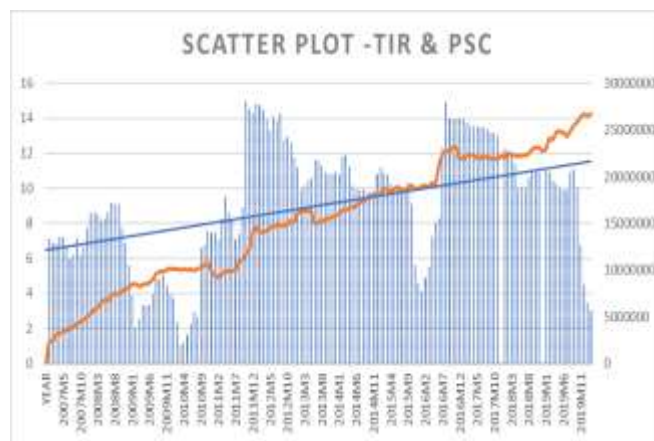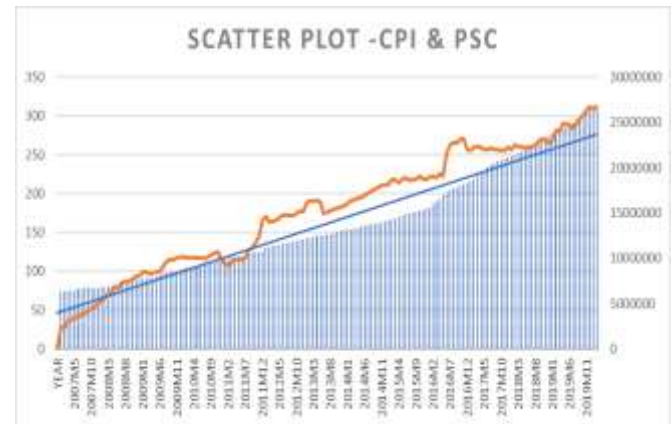Figure 2: Plot of MLR and PSC

Figure 2: Plot of TIR & PSC

Figure 2:Plot of CPI and PSC

The plots of variables are presented in figures 1 to 4 above. Figure 1-4 reveals a consistent upward trend in private sector credit over time. Figure 1 is the plot of private sector credit and on interbank call rate. The plot shows an upward peak and troughs in the inter-bank call rate over time. Figure 2 reveals a slightly increasing upward trend in maximum lending rate over time. The treasury bill interest rate follows similar pattern with the inter-bank call rate in figure 1. The plot of consumer price index in figure 4 has similar patter with maximum lending rate, but with smoother pattern.

Causal Path Analysis of maximum Lending Rate to Prices

The path analysis of the transmission mechanism of interest rate channel is presented below. Table 1a presents the result of transmission of maximum lending rate. The transmission path from maximum lending rate to private sector credit was found to be significant at 5% level of significance, as the p-value of the path, MLR => PSC is less than 0.05. This means that the private sector credit has the ability of being transmitted the effect of maximum lending rate. The transmission path: from the private sector credit to consumer price (PSC =>CPI) in equation (2) was also found to be significant at 5% level of significant. The coefficients of MLR and PSC in partial effect model, equation (3) were also found to be significant at 5% level of significant respectively. The reduction of the coefficient of the independent, MLR in equation (3) suggests possible transmission of its effect to the mediator, PSC. The significance of this transmission will be confirmed in the test of significance in table 1b.

Transmission Mechanism of Monetary Policy in Nigeria: Investigating the Role of Private Sector Credit

Table 1a: Mediation results of MLR, PSC and CPI

		coeff	std err	t-stat	p-value	corr
	MLR => PSC	1518627	35730.94	42.50174	1.12E-87	0.95943
Equn. (2)	PSC =>CPI	9.86E-06	2.56E-07	38.56325	1.17E-81	0.951346
Equn. (1)	MLR => CPI	15.57651	0.414159	37.60996	3.98E-80	0.949036
Equn. (3)	MLR	7.491935	1.309028	5.723279	5.2E-08	
	PSC	5.32E-06	8.27E-07	6.437172	1.43E-09	

Level of significance is 5%

Table 1b presents the result for indirect effect of PSC on the relationship between MPR and CPI. The result of the indirect effect MLR=>PSC=>CPI of 0.9127 and a p-value of approximately 0.000, shows that private sector credit (PSC) is a mediator in the transmission channel of MLR. This confirms a significant transmission mechanism of MLR to CPI through PSC. A partial mediation was found to exist between MLR and CPI, as the coefficient of MLR remains significant in equation (3) row of table 1a.

Table 1b: Indirect effect and test of significance of MLR & PSC

	Coeff	std err	t-stat	p-value
MLR => PSC	0.95943	0.022574	42.50174	
PSC =>CPI	0.951346	0.02467	38.56325	
MLR=>PSC=>CPI	0.912749	0.031955	28.5638	1.23E-63

Causal Path Analysis of Inter-Bank Call Rate to Prices

The path analysis of the transmission mechanism of inter-bank call rate channel is presented in table 2a. The transmission path from inter-bank call rate to private sector credit was found to be significant at 5% level of significance, as the p-value of the path, IBR => PSC is less than 0.05. This means that the private sector credit has the ability of receiving the effect of inter-bank call rate. The transmission path: from the private sector credit to consumer price (PSC =>CPI) in equation (2) was also found to be significant at 5% level of significant. The coefficients of MLR and PSC in partial effect model, equation (3) were also found to be significant at 5% level of significant respectively. The reduction of the coefficient of the independent, IBR in equation (3) suggests possible transmission of its effect to the mediator, PSC. The significance of this transmission will be confirmed in the test of significance in table 2b.

Table 2a: Mediation results of IBR, PSC and CPI

		Coeff	std err	t-stat	p-value	Corr
	IBR => PSC	184925.9	61831.57	2.990801	0.003235	0.232872
Equn. (2)	PSC => CPI	9.86E-06	2.56E-07	38.56325	1.17E-81	0.951346
Equn. (1)	IBR => CPI	1.343835	0.650437	2.06605	0.040477	0.163199
Equn. (3)	IBR	-0.50797	0.205544	-2.47133	0.014536	
	PSC	1E-05	2.59E-07	38.68753	7.41E-82	

Level of significance is 5%

Table 2b presents the result for indirect effect of PSC on the relationship between Inter-bank call rate (IBR) and CPI. The result of the indirect effect IBR=>PSC=>CPI of 0.2215 and a p-value of 0.003318, shows that private sector credit (PSC) is a mediator in the transmission channel of IBR to CPI. This confirms a significant transmission mechanism of MLR to CPI through PSC. A partial mediation was found to exist between MLR and CPI, as the coefficient of IBR remains significant in equation (3) row of table 2a.

Table 2b: Indirect effect and test of significance of IBR

	coeff	std err	t-stat	p-value
IBR => PSC	0.232872	0.077863	2.990801	
PSC => CPI	0.951346	0.02467	38.56325	
IBR=>PSC=>CPI	0.221542	0.074272	2.982843	0.003318

Causal Path Analysis of Treasury Bill Interest Rates to Prices

The path analysis of the transmission mechanism of treasury bill interest rate channel is presented in table 3a. The transmission path from treasury bill interest rate to private sector credit was found to be significant at 5% level of significance, as the p-value of the path, TIR => PSC is less than 0.05. This means that the private sector credit has the ability of receiving the effect of TIR. The transmission path: from the private sector credit to consumer price (PSC =>CPI) in equation (2) was also found to be significant at 5% level of significant. The coefficients of TIR and PSC in partial effect model, equation (3) of table 3a were also found to be significant at 5% level of significant respectively. The reduction of the coefficient of the independent, IBR in equation (3) when compared to equation (1) suggests possible transmission of its effect to the mediator, PSC. The significance of this transmission will be confirmed in the test of significance in table 3b.

Table 3a: Mediation results of TIR, PSC and CPI

		coeff	std err	t-stat	p-value	Corr	semi-part
	TIR =>PSC	754834.3	131825.3	5.726019	5.13E-08	0.416741	
Equn. (2)	PSC => CPI	9.86E-06	2.56E-07	38.56325	1.17E-81	0.951346	0.901957
Equn. (1)	TIR =>CPI	5.923943	1.426981	4.151381	5.42E-05	0.31541	-0.08917
Equn. (3)	TIR	-1.8423	0.489473	-3.76384	0.000236		
	PSC	1.03E-05	2.7E-07	38.07288	7.11E-81		

Level of significance is 5%

Table 3b presents the result for indirect effect of PSC on the relationship between treasury bill interest rate (TIR) and CPI. The result of the indirect effect of PSC is shown in path TIR=>PSC=>CPI of 0.3965 and a p-value of approximately 0.00, shows that private sector credit (PSC) is a mediator in the transmission channel of TIR to CPI. This confirms a significant transmission mechanism of TIR to CPI through PSC. A partial mediation was found to exist between TIR and CPI, as the coefficient of TIR remains significant in equation (3) of table 3a.

Table 3b: Indirect effect and test of significance of TIR

	coeff	std err	t-stat	p-value
TIR =>PSC	0.416741	0.07278	5.726019	
PSC => CPI	0.951346	0.02467	38.56325	
TIR=>PSC=>CPI	0.396465	0.069975	5.665786	6.94E-08

On interest rate channel mechanism, private sector credit was found to effectively transmit the effect of monetary policy rate (MPR) to the prices through maximum lending rate, inter-bank call rate and treasury bill interest rate.

The summary result of the credit mechanism of monetary policy rate is presented in table 4

Table 4: summary result of path analysis of interest rates

Channel	Effect	T-Stat	p-value.
MLR=>PSC=>CPI	0.91275	28.5638	1.23E-63
IBR=>PSC=>CPI	0.22154	2.98284	0.00332
TIR=>PSC=>CPI	0.39647	5.66579	6.94E-08

Level of significance is 5%

Transmission Mechanism of Monetary Policy in Nigeria: Investigating the Role of Private Sector Credit

A comparison of the results for each path in table 4, reveals that the maximum lending rate path has the highest indirect effect (0.91275) of private sector credit with the least p-value. This is followed by the treasury bill interest rate path with indirect effect size of 0.394 and corresponding p-value of 6.94E-08. The inter-bank call rate path has the least, though significant effect on consumer prices.

CONCLUSION AND RECOMMENDATIONS

The findings of this study have been presented. The results lay credence to effective and significant transmission of effects of interest rates (maximum lending rate, interbank lending rate and treasury bill interest rate) through private sector credit to prices. The paper concludes that maximum lending rate path has the highest significant transmission effect on prices. This is followed by the treasury bill rate path and the inter-bank call rate path respectively. The findings in this study is new in the case of Nigeria as little or no studies have applied mediation approach to the study of bank lending channel of monetary policy in Nigeria. Central banks should explore ways to make policy towards effectively directing the monetary policy through maximum lending rate and treasury bill rates as they have the most significant paths through which the monetary policy rate is transmitted to prices.

REFERENCE

1) Adekunle P. A., Yaaba, B. N., Stephen, S. A., Ogbuehi F., Idris A., and Zivoshiya P. B. (2018). Monetary Policy Transmission in Nigeria: How Important is Asset Prices Channel? Microeconomics and Macroeconomics Vol., 6(3): 55-66

2) Akani, H. W & Imegi, J. C (2017). Monetary Policy Transmission Mechanism and Liquidity Of Capital Market: A Time Series Study From Nigeria: 1981-2016. IOSR Journal of Economics and Finance (IOSR-JEF), Vol. 8 (5)(IV):01-24

3) Baron, R. M., & Kenny, D. A. (1986). The moderator mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. Journal of Personality and Social Psychology, 51, 1173-1182

4) Central Bank of Nigeria-Research Department (CBN-RSD) (2016). Monetary Policy. Education in Economic Series No. 2.

5) Deng, D (2009). Real Business Cycle Theory-A Systematic Review. Munich Personal RePEc Archive (MPRA), Paper No. 17932

6) Eduardo, L. Y. & Sturzenegger, F. (2010). Monetary and Exchange Rate Policies. Handbooks in Economics. Handbook of Development Economics. 5. pp. 4215–4281.

7) Ezeaku, H. C., Ibe, I. G., Ugwuanyi, U. B., Modebe, N. J. & Agbaeze, E. K (2018). Monetary Policy Transmission and Industrial Sector Growth: Empirical Evidence from Nigeria. SAGE Open April-June: 1 –12.

8) Fairchild, A. J and MacKinnon, D. P. (2009) A general model for testing mediation and moderation effects. Prevention Science, 10, 87-99.

9) Kuttner, k. N & Mosser, P. C (2002). The Monetary Transmission Mechanism: Some Answers and Further Questions. FRBNY Economic Policy Review.

10) MacKinnon, D. P. (2000). Contrasts in multiple mediator models. In J. Rose, L. Chassin, C. C. Presson, & S. J. Sherman (Eds.), Multivariate applications in substance use research: New methods for new questions (pp. 141-160). Mahwah, NJ: Erlbaum.

11) Mishkin, F. (2012). The Economics of Money, Banking, and Financial Markets. Prentice Hall. ISBN 9781408200728.

12) Mishra, P., Montie, P & Sengupta, R (2016). A Modern Macroeconomic Perspective. (Eds.) Chetan Ghate and Ken Kletzer. Springer Verlag: India.

13) Ndekwu, E. C (2013). An Analysis of the Monetary Policy Transmission Mechanism and the Real Economy in Nigeria. Central Bank of Nigeria, Occassional Paper No. 43.

14) Nwankwo, C. H & Igweze, A. H (2016). Comparison of Tests of Indirect Effect in Single Mediation Analysis. American Journal of Theoretical and Applied Statistics. Vol. 5 (2):64-69.

15) Nyumuah, F. S (2018). An Empirical Analysis of the Monetary Transmission Mechanism of Developing Economies: Evidence from Ghana. International Journal of Economics and Finance; Vol. 10 (4):72-83.

16) Obafemi, F. N & Ifere, E. O (2015). Monetary Policy Transmission Mechanism in Nigeria: A FAVAR Approach. International Journal of Economics and Finance; Vol. 7(8):229-239.

17) Okaro, C. S (2011). Transmission Mechanism of Monetary Policy In Nigeria. African Banking & Finance Review, Vol. 1 (2):68-85.

18) Opolot, J & Nampewo, D (2014). Bank Lending Channel of the Monetary Policy Transmission Mechanism in Uganda: Evidence from Disaggregated Bank-level Data. Journal of Applied Finance & Banking, vol. 4(1): 47-60.

19) Robinson, W & Robinson, J. W (1997). The Transmission Mechanism of Monetary Policy in the Jamaican Economy. Annual Conference of the Caribbean Centre for Monetary Studies.

20) Uma, K. E., Ogbonna, B. M & Paul, O. C (2015). Monetary Policy Transmission Mechanism in Nigeria: An Overview. International Journal of Economics, Commerce and Management, Vol. III (8):363-377