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# INTEREST RATE TRANSMISSION MECHANISMS IN THE NIGERIAN ECONOMY

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**Abstract:** Interest rate pass-through, the responsiveness of retail bank lending and deposit rates to changes in the policy rate, plays a critical role in assessing the effectiveness of monetary policy. This study investigates interest rate pass-through in the context of Nigeria's evolving monetary policy framework, with a focus on the period following the introduction of the monetary policy rate (MPR) in December 2006. By exploring the relationship between the policy rate, interbank rate, and retail bank lending and deposit rates, we aim to provide insights into the extent and effectiveness of interest rate pass-through in Nigeria.

Existing literature presents a varied landscape regarding interest rate pass-through, with some studies indicating incomplete pass-through and others suggesting complete pass-through. Factors contributing to this variation include demand elasticity of deposits and loans, alternative financing sources, asymmetries, switching costs, and the banking system's concentration.

Our research contributes to the understanding of interest rate pass-through in Nigeria by employing a comprehensive analysis over an extended time frame. Unlike previous studies that focused on shorter periods or used annual data, we employ a more granular approach to assess the dynamics of interest rate pass-through in Nigeria's evolving monetary policy landscape.

**Keywords:** Interest rate pass-through, monetary policy, Nigeria, policy rate, interbank rate.
**JEL Classification: E40, E50, E52**

## 1. Introduction

Interest rate pass-through is a description of how the retail bank lending and deposit rates respond to changes in the policy rate. Monetary policy is therefore completely effective if the retail and deposit rates respond and adjust completely to changes in the policy rate within the short term (Ahmad, Aziz, and Rummun, 2013). In December 2006, the Central bank of Nigeria introduced a new monetary policy framework by replacing the minimum rediscount rate with the monetary policy rate. This policy introduced an asymmetric corridor around the policy rate and there was a shift in policy focus to targeting the overnight rate (Mordi and Adebiyi, 2014). According to Ewerhart, Cassol, Ejerskov, and Valla (2004), there is a close link between the interbank rate and the policy rate. This is because the standing deposit and lending facilities of the central bank provide an alternative source of banking sector liquidity compared to the interbank market. Therefore, the interbank rate is expected to move in tandem with the policy rate.

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Several studies in the literature have examined the potential effectiveness of interest rate pass-through. Some of these studies have found an incomplete pass-through (Binning, Bjornland and Maih, 2017, 2019; Mahmood, 2018; Sanusi, 2010), while some have found a complete pass-through (Grigoli and Mota, 2017; Mbowe, 2015), and the rest had mixed results (Ahmad, Aziz, and Rummun, 2013; Belke, Beckmann and Verheyen, 2012). The reasons for an incomplete pass-through according to the literature (that is, the demand elasticity of deposits and loans being less than one) can be linked to alternative sources of financing and investments such as investment in government securities (treasury bills and bonds) of similar maturities or equity financing (Bangura, 2011; Lerskullawat, 2014). Other reasons may include the role of asymmetries, a high cost of changing banks (switching costs), and a highly concentrated banking system (De Bondt, 2002, 2005). The monetary authorities in Nigeria have been using interest rates as its main policy anchor in line with an inflationtargeting framework, but the few studies to consider the extent and effectiveness of interest rate pass-through in Nigeria have focused on shorter periods (Sanusi, 2010), or using annual data in computing the pass-through (Ogundipe and Alege, 2013), or a comparative analysis (Fomum, 2011).

However, a recent study to consider interest rate pass-through in Nigeria focused on the pass-through from the policy to the retail rates using a structural break approach (Mordi, Adebiyi, and Omotosho, 2019). In light of the above, this study extends the literature in four main areas. First, the study examined the effectiveness of the policy rate on the interbank (money market) and retail lending and deposit rates, and the effectiveness of the interbank rate on the retail lending and deposit rates since the adoption of the monetary policy rate as the policy anchor. Second, the study considered the role of asymmetries in computing the time taken for a change in a central bank's interest rate to fully reflect on the interbank, retail deposit, and lending rates. Third, the study considered the short and long-run dynamic adjustment of two interbank rates and seven retail rates, extending the number of rates covered in previous studies. Finally, the study using monthly data, adopted an up-to-date time frame compared to previous studies (Sanusi, 2010; Fomum, 2011; Ogundipe and Alege, 2013) to capture recent events in the economy, such as the 2007 capital market splurge, the 2008 financial crises, the periods of fallen crude oil prices and the periods of recession and post-recession. The aim was to examine the effectiveness of interest rate pass-through in Nigeria since the monetary policy rate was introduced.

An important reason for observing the effectiveness of interest rate pass-through is because if retail and money market rates are perfectly responsive to the policy rate, the economy may be able to achieve its full potential. However, an incomplete pass-through may lead to failure on the part of the monetary authorities to stabilize shocks within an economy (Tai, Sek, and Har, 2012). Therefore, the magnitude and speed of these adjustments will determine whether the monetary authorities' interest rate policies have been effective or not since an effective pass-through is required for effective economic stabilization and inflation control under an inflation targeting strategy.

## 2. Literature Review

This paper briefly discussed what previous authors have done regarding the topic. The review starts with Liu (2019) whose study examined interest rate pass-through in China and the major determinants of lending rates in China. The study found some evidence of interest rate pass-through in China from money market rates to lending

rates; however, this pass-through was negatively affected by shadow banking activities, commercial banks' asset quality as well as macroeconomic activities. Mueller-Spahn (2008) empirically examined interest rate passthrough from the capital and money market to retail bank rates in Germany. The study found an incomplete passthrough from the capital and money market rates to retail banking rates in Germany. Frisancho-Mariscal and Howells (2011) examined interest rate pass-through and risk in the UK since the period of the global financial crises. The study found that the aftermath of the crises affected deposit rates compared to lending rates, leading to higher interest rate spreads in the UK. Ahmad, Aziz, and Rummun (2013) in a similar study on the UK found an incomplete pass-through from the Libor rate to four different retail rates in the short run and a fairly complete pass-through in the long run.

Brunnermeier and Koby (2019) examined the impact of reversal interest rates in Europe using a DSGE framework. The study found out that quantitative easing raised the reversal interest rates and therefore, quantitative easing measures should only be employed if interest rate cuts have been exhausted. Binning, Bjornland, and Maih (2017) also examined interest rate pass-through using a DSGE framework. The study found that there was no short-run pass-through, however, pass-through tended to be incomplete in the long run. Similarly, Binning, Bjornland, and Maih (2019) also found the same results in their recent study on interest rate pass-through via a DSGE framework. However, Gregor, Melecký, and Melecký (2019) carried out a meta-analysis of the literature on interest rate pass-through. They found a lower pass-through in countries that focused on longterm lending rates, while they showed that pass-throughs are more effective in countries that have a welldeveloped financial market and deeper capital markets. Gigineishvili (2011) examined the importance of macroeconomic and financial market conditions on the interest rate pass-through process in low-income, advanced, and emerging countries. The study showed that GDP per capita and inflation were major determinants of interest rate pass-through, while banking competition, credit quality, and overhead costs strengthened the interest rate pass-through in all the examined countries.

Von Borstel, Eickmeier, and Krippner (2015) examined interest rate pass-through in the Euro area during the periods of sovereign debt crises. The study found that unconventional monetary policies were useful in reducing lending rates in Europe, while conventional monetary policies were unable to lower banks' marks up. Similarly, Darracq-Paries, Moccero, Krylova, and Marchini (2014) found out that a well-developed financial market devoid of fragmentations is necessary for an effective pass-through. Furthermore, Van Leuvensteijn, Sørensen, Bikker, and Van Rixtel (2008) found more competition in the bank loan market compared to her deposit market and they also found a stronger pass-through in more competitive economies in the Euro area.

Also, De Bondt (2002) found interest rate pass-through to be more effective in the long term compared to the short term, with the lending rate adjusting faster to the money market rate compared to the deposit rate in the Euro area. While Belke, Beckmann, and Verheyen (2012) examined interest rate pass-through in EMU countries with mixed results. And most of the European monetary union countries had an incomplete passthrough. Siakoulis, Petropoulos, Lazaris, and Lialiouti (2018) also found a lower pass-through during periods of financial crises, and also found interest rate pass-through to be determined by sovereign risk and the financial system of individual country members.

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In the emerging world, Siklar, Dogan, and Dinc (2016) empirically examined interest rate pass-through in Turkey and the resulting pass-through on output and prices. The study although found an incomplete passthrough on retail rates, also had values larger than the pass-through from policy rate to output and prices, which were generally low on the series. Amatyakul, Taerat, Visudtiko, and Wongwachara (2019) examined the passthrough using the new loan rate and minimum loan rate as the policy rate in Thailand. The study found a more effective pass-through from the new loan rate compared to the minimum loan rate. Furthermore, the results showed that firms with large assets and stronger banking relationships had a stronger pass-through, while banks with relatively liquid balance sheets had a weaker pass-through. Finally, the study showed that the agricultural sector loans barely responded to an induced policy rate change; however, loan rates attached to the manufacturing sector changed in line with the induced policy rate change. Bogoev and Petrevski (2012) under a fixed exchange rate system checked the interest rate pass-through in Macedonia. The study found that the monetary authorities may witness a limited impact in the short-run, with a slow speed of adjustment. In the long run, however, interest rate pass-through was found to be almost complete.

Yilmaz, Yergin, and Oğrak (2018) examined interest rate pass-through in Turkey and found a stronger and higher pass-through on the retail interest rates in all cases. Miletic and Tasic (2015) focused on corporate and household loans in Serbia and they found an incomplete pass-through to corporate and household loans in the long run in Serbia. Grigoli and Mota (2017) found a complete pass-through from the policy rate to the lending and deposit rate in the Dominican Republic. However, Sweiden (2011) found a faster pass-through on deposit rates compared to lending rates in Jordan. Jiri and Martin (2018) for the Czech Republic found a complete passthrough to SME lending but did not find a pass-through for consumer lending. Antao (2009) showed that interest rate pass-through to loans was complete in the long run for Portugal, while it had an incomplete pass-through with a considerably higher degree to deposits. Finally, the study showed that deposit interest rates adjusted faster to equilibrium compared to the lending rates for Portugal.

Ansari (2013) empirically investigated India's interest rate pass-through with regulatory requirements. The study found out that there could be a trade-off between regulations and the effectiveness of money transmission and that banks can subsidize loans rather than invest in government securities. Hsu (2017) also studied the interest rate pass-through in seven Asian economies. The study found the lending rates to be stickier, that is, less responsive to the policy rate compared to the deposit rates. While the study found that the pass-through is stronger in more developed economies. Furthermore, Mahmood (2018) found an incomplete pass-through for Pakistan. The study also found out that interest rates were sticky towards a downward adjustment compared to an upward adjustment. Mangwengwende, Chinzara, and Nel (2011) investigated the link between bank concentration and interest rate pass-through in four Sub-Saharan African countries. The study evidenced some relationships between the concentration of banks and the pass-through in these four countries. The study also showed that bank concentration influenced the magnitude, rather than the speed of adjustment. The study finally supported the structure conduct performance hypothesis and the efficient structure hypothesis.

In Sub-Saharan Africa, Mbowe (2015) examined the pass-through in Tanzania, with a major focus on the pass-through from the policy rate to lending rates. The study found a complete pass-through to the interbank rate, while

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it found a weak and incomplete pass-through from the policy rate to the deposit rate. However, Aziakpono and Wilson (2013) found a considerably higher degree of pass-through in the retail rates in South Africa. Ogundipe and Alege (2013) examined interest rate pass-through on retail rates and the macroeconomy at large in Nigeria. The study found out that there was a slow and incomplete pass-through; however, the pass-through was slower and weaker on output and prices compared to retail interest rates. Sanusi (2010) on Nigeria found interest rate pass-through to be characterized by an incomplete degree of pass-through from the policy rate to the interbank and retail lending and deposit rates, however, with a higher degree from the policy rate to the interbank rate compared to the retail lending and deposit rates. The study also showed a higher pass-through to the interbank rates post-consolidation, but the pass-through to retail rates was weaker pre-consolidation. This outcome of an incomplete interest rate pass-through to the lending and deposit rates was reinforced by similar studies such as Okello (2014) in Uganda, Fomum (2011) on Nigeria and Cameroon, and Mordi, Adebiyi, and Omotosho (2019) using a structural break approach in Nigeria.

In summary, the reviewed studies showed that interest rate pass-through in the examined countries has mixed outcomes, with some studies exhibiting an incomplete, complete, or overshooting pass-through. Hence, this paper will examine interest rate pass-through from the period of the implementation of the Monetary Policy Rate (MPR) as the policy anchor in Nigeria. This is to determine the effectiveness of the policy rate on the money market and retail rates. The rest of the paper is designed as follows. Section three discusses the approaches to arrive at the objectives. Section four analyses and discusses the results, while the final section concludes the paper with some recommendations.

## 3. Methodology

Our conceptual framework starts from the Monte-Klein model for bank profit maximization. This model has been previously used by Mbowe (2015) and Roseline, Nyamongo, and Kamau (2011). According to the framework, commercial banks have a direct relationship with the central banks and therefore, maximize profit visa-vis their balance sheet. From the balance sheet, assets and liabilities must be equal. Loans and reserves are on the asset side, while deposits and settlements with the central bank are on the liability side of the balance sheet. Computing this gives our first equation below.

$$R \square L \square D \square S \qquad 1$$

Assume commercial banks grant loans at rate $iL$ , pays for its deposits at rate $iD$ , incurs cost of deposit and loans at $mL$and these banks perform clearing activities with the central bank, the banks with a negative settlement balance will therefore pay a fine $iP$ equivalent to the policy rate. The profit maximization function now becomes:

$$\square(D,L) \square i_L L \square i_D(R \square L \square S) \square i_p \square(S \square R) \square mL \qquad 2$$

From the above, two options are being faced by commercial banks, which is the quantity of loans they give and the amount they choose to have as reserves. Therefore, differentiating equation 2 with respect to loans and reserves gives:

$$i_L \square i_D \square m \qquad 3 \; i_D \square \square i_p \qquad 4$$

Combining equations 3 and 4 gives a linear relationship between the lending and policy rate.

$$i_L \square m \square \square i_p \qquad 5$$

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Hence, the first stage of interest rate pass-through, known as the monetary approach, will see a passthrough from the policy rate to the money market rate (interbank rate and other money market instruments), while the final stage, simply known as the cost of fund approach, will see a pass-through from the interbank rate to the retail interest rates (lending and deposit rates). Re-specifying equation 5 into the pass-through from policy rate to money market rate and from the money market rate to retail rate gives:

$r_{it} \square\square_0 \square\square_1 r_{pt} \square\square_t$ 6 $r_{rt} \square\square_1 \square\square_2 r_{it} \square\square_t$ 7 $r_{rt} \square\square_2 \square\square_3 r_{pt} \square\square_t$ 8

where equations 6, 7 and 8 represent the pass-through from the policy rate to the money market rate (interbank rate), the interbank rate to the retail rates (lending and deposit rates) and from the policy rate to the retail rates respectively. $r_{pt}$ represents the policy rate, $r_{it}$ represents the interbank rate and $r_{rt}$ represents the retail interest rate. $\square_t$ is independently and identically distributed with a mean of zero and a constant variance ($\square^2$), $\square_n$'s are the mark-ups and $\square_n$'s measures the degree of interest rate pass-through. In essence, interest rate passthrough simply gives an explanation of the influence of the policy rate on the money market and retail interest rates in order to verify if the pass-through process is incomplete ($0 \square\square_n \square 1$), complete ($\square_n \square 1$) or overshooting ($\square_n \square 1$) (Lerskullawat, 2014). By implication, the interest rate pass-through measures the degree of responsiveness of the retail and money market rates to the policy rate. For a stationary series at level form, the above equations 6 to 8 will be adopted since the model is in its long run form; however, for series that have a unit root, the below short run model will be adopted to model interest rate pass-through.

$$\square rrit \square\square 0 \square\square 1 \square prpt \square\square\square k \square prpt \square k \square\square\square j \square rr\ it \square\ j \square\square t \quad 9$$
$k \square 1 \quad j \square 1$

It must be noted that equation 9 is a hybrid version of equations 6 – 8, depending on which pass-through is being examined - where m and n are the maximum lags chosen and $\square$ represents the difference operator. Assuming cointegration exists among the observed variables in equation 9, then a dynamic adjustment that shows the speed of adjustment, via a short run disequilibrium to the long run equilibrium is then represented. Equation 10 thus depicts the short run and long run version of equation 9.

$$\square rrit \square\square 0 \square\square 1 prt \square\square 1 \square prpt \square\square\square k \square prpt \square k \square\square\square j \square rrit \square\ j \square\square (rrt \square 1 \square\ prt \square 1) \square\square t \quad 10$$
$k \square 1 \quad j \square 1$

Where $\square$ is the speed of adjustment to the long-run equilibrium level and $\square$is the coefficient of the independent variable in the long-run. Therefore, the error correction co-integration test will be used to test whether $\square$ is statistically different from zero, which then implies that cointegration exists between the policy rate and retail rate (or interbank rate if we consider the policy rate and interbank rate). Once the error correction term is confirmed, the next step will be to confirm the number of months it will take for the retail rate to adjust to a change in the policy rate. This can be derived through the Mean Adjustment Lag (MAL). While the error correction term will show the speed of adjustment within a month, the Mean Adjustment Lag will show the number of months required to reach long-run equilibrium (Mangwengwende, Chinzara and Nel, 2011). This implies that the mean adjustment lag will show the number of months it takes for the retail rates to fully adjust to a change in the policy rate. Thus, the mean adjustment lag is calculated as follows:

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1 □□*n*

*MAL*□ 11

_____

□

If the mean adjustment is high, then the adjustment process is slow and otherwise if the mean adjustment is low. The above description of the mean adjustment lag is termed the symmetric mean adjustment lag. However, there are cases when the mean adjustment lag is said to be asymmetric. According to Scholnick (1996), if residuals are above their mean, then they will tend to adjust downwards to the mean in the long run, while if the residuals are below the mean, then they will adjust upwards towards the mean. This concept brought about the asymmetric mean adjustment lag, which tells us how fast the retail rates fully adjust to the policy rate either upwards or downwards (Scholnick, 1996). Consequently, the correction term is divided into two series (positive and negative) and is mathematically represented as follows:

*ECT*□ □*EC*, if *ECT*□□

*ECT*□ □0 If *ECT*□□

And 12

*ECT*□ □*EC* if *ECT*□□

*ECT*□ □0 if *ECT*□□

where□is the mean error correction and is equal to zero since it denotes the residual in the cointegration equation. By implication, a residual above the mean implies that the retail rate is above the equilibrium and must move downwards towards equilibrium, and otherwise, in the case of a residual below the equilibrium. Therefore, dividing the residual into two separate error correction terms gives the asymmetric mean adjustment lag. *n*

*m*

□*rrit* □□0 □□1*prt* □□1□*prpt* □□□*k*□*prpt*□*k* □□□*j*□*rrit*□ *j* □□1*ECT*□ □□2*ECT*□ □□*lt* 13

*k*□1 *j*□1

And the asymmetric mean adjustment lag will further be represented by:

□ □1□□ 1□

*MAL* □ 14

_____

□1

and

□ □1□□ 1□

*MAL* □ 15

_____

□2

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Equations 14 and 15 display the positive and negative mean adjustment lags, that is, the adjustment of the retail rates (or interbank rate) to the policy rate when these rates are above and below their equilibrium level. If the mean lags are seen to be different, then the adjustment process is also seen to be different.

Finally, the Wald test will be used to test whether equations 14 and 15 are equal. If they are equal to zero, then the test series is said to be symmetric. However, the test series will become asymmetric if the two equations are not equal to zero. - that is, retail rates will adjust differently to a change in the policy rate.

**4. Analysis and Presentation of Results**

Several techniques were adopted to determine the effectiveness of interest rate pass-through in Nigeria. Some of these techniques include unit root tests, co-integration tests, error correction technique, autoregressive distributed lag model and symmetric and asymmetric mean adjustment lags. The essence was to ensure that the results generated are robust for relevant policy recommendations. Monthly data spanning December 2006 through December 2020 were sourced from Central Bank of Nigeria's Statistical Bulletin (2021). The observed data include monetary policy rate, interbank call rate, open buy-back rate, prime lending rate, maximum lending rate, savings deposit rate, one-month deposit rate, three months deposit rate, six months deposit rate and twelve months deposit rates. From the descriptive statistics, the mean and median values showed a good level of consistency, while the skewness statistics showed that the policy rate, savings rate, three months and six months deposit rates were negatively skewed, while the rest were positively skewed. Furthermore, the kurtosis showed that interbank call rate, open buy-back rate, one-month deposit rate and prime lending rate were leptokurtic, while the other variables were platykurtic. The Jarque-Bera statistic showed that the one month, three months, six months and twelve months deposit rates and the maximum lending rate followed a normal series. The essence of examining the data presented in table one is because it depicts interest rates at every segment of the market, such that the money market is duly represented with the interbank call interest rate and open buy-back rate and the retail rate is represented by the deposit and lending rates.

**Table 1: Descriptive Statistics**

| | MPR | ITBC | OBBR | SDR | 1MDR1 | 3MDR | 6MDR | 12MDR | PLR | MLR |
|---|---|---|---|---|---|---|---|---|---|---|
| Mean | 10.92 | 12.22 | 11.29 | 2.96 | 8.55 | 9.09 | 9.04 | 8.41 | 16.91 | 24.50 |
| Median | 12.00 | 10.63 | 10.20 | 3.24 | 8.52 | 9.33 | 9.63 | 8.28 | 16.82 | 24.54 |
| Max | 14.00 | 64.58 | 51.04 | 4.30 | 15.01 | 14.65 | 15.84 | 16.47 | 19.66 | 31.56 |
| Min | 6.00 | 0.77 | 0.89 | 1.40 | 3.49 | 4.13 | 3.50 | 3.53 | 14.58 | 17.17 |
| SD | 2.63 | 8.44 | 7.50 | 0.93 | 2.36 | 2.21 | 2.56 | 2.88 | 1.02 | 3.94 |
| Skew | -0.60 | 2.51 | 2.31 | -0.36 | 0.02 | -0.09 | -0.20 | 0.15 | 0.58 | 0.09 |
| Kurt | 2.18 | 13.65 | 10.79 | 1.81 | 3.27 | 2.81 | 2.43 | 2.13 | 3.63 | 2.27 |
| J-Bera | 12.87 | 837.72 | 495.83 | 11.73 | 0.46 | 0.41 | 2.92 | 5.15 | 10.59 | 3.39 |
| Pvalue | 0.0016 | 0.0000 | 0.0000 | 0.0028 | 0.7958 | 0.8142 | 0.2318 | 0.0760 | 0.0050 | 0.1840 |
| Sum | 1582.75 | 1771.63 | 1636.52 | 428.90 | 1240.04 | 1317.39 | 1310.74 | 1219.25 | 2452.26 | 3552.63 |
| SSD | 995.03 | 10264.86 | 8101.89 | 125.69 | 801.59 | 706.26 | 945.81 | 1190.77 | 150.62 | 2233.39 |

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| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Obs | 145.00 | 145.00 | 145.00 | 145.00 | 145.00 | 145.00 | 145.00 | 145.00 | 145.00 | 145.00 |

*Source: Author's Compilation from Eviews*

Note: MPR represents Monetary Policy Rate, ITBC represents the Interbank Call Rate, OBBR represents the Open Buy-Back Rate, SDR represents the Savings Deposit Rate, 1MDR represents the One Month Deposit Rate, 3MDR represents Three Months Deposit Rate, 6MDR represents Six Months Deposit Rate, 12MDR represents Twelve Months Deposit Rate, PLR represents Prime Lending Rate, while MLR represents Maximum Lending Rate.

Table 2 displayed the extent of correlation among the variables. While there are mild correlations between the policy rate, interbank rates (interbank and open buy back rates) and savings rate, there are weak positive correlations between the policy rate and one, three, six and twelve-month deposit rates. However, the maximum lending rate has a mildly strong positive correlation with the policy rate. Table 3 confirmed that the policy rate and retail lending and deposit rates had a unit root, while the interbank call rate and open buy-back rate were stationary in their level form.

**Table 2: Correlation Matrix**

| | ITBC | OBBR | SDR | 1MDR | 3MDR | 6MDR | 12MDR | PLR | MLR |
|---|---|---|---|---|---|---|---|---|---|
| MPR | 0.4321 | 0.5607 | 0.5095 | 0.0016 | 0.036 | 0.1559 | 0.1443 | 0.1684 | 0.7135 |

*Source: Author's Compilation from Eviews, 2020*

Note: MPR represents Monetary Policy Rate, ITBC represents the Interbank Call Rate, OBBR represents the Open Buy-Back Rate, SDR represents the Savings Deposit Rate, 1MDR represents the One Month Deposit Rate, 3MDR represents Three Months Deposit Rate, 6MDR represents Six Months Deposit Rate, 12MDR represents Twelve Months Deposit Rate, PLR represents Prime Lending Rate, while MLR represents Maximum Lending Rate.

**Table 3: Unit Root Test**

| Variable | | Augmented Dickey-Fuller | | Phillip-Perron | | |
|---|---|---|---|---|---|---|
| | | Levels | Difference | Levels | Difference | Status |
| MPR | Tstats | -0.7932 | -11.4217 | -1.0061 | -11.5045 | I(1) |
| | Coeff | (0.8177) | (0.0000)*** | (0.7502) | (0.0000)*** | |
| ITBC | Tstats | -5.3064 | | -8.9017 | | I(0) |
| | Coeff | (0.0000)*** | | (0.0000)*** | | |
| OBBR | Tstats | -3.5066 | | -7.2297 | | I(0) |
| | Coeff | (0.0091)*** | | (0.0000)*** | | |
| SDR | Tstats | -1.1635 | -14.0956 | -1.1329 | -13.9412 | I(1) |
| | Coeff | (0.6892) | (0.0000)*** | (0.7018) | (0.0000)*** | |
| 1MDR | Tstats | -2.1948 | -5.3466 | -2.1339 | -13.0838 | I(1) |

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| | | | | | | |
|---|---|---|---|---|---|---|
| | Coeff | (0.2092) | (0.0000)*** | (0.2319) | (0.0000)*** | |
| 3MDR | Tstats | -1.8681 | -7.0518 | -2.1822 | -12.486 | I(1) |
| | Coeff | (0.3466) | (0.0000)*** | (0.2137) | (0.0000)*** | |
| 6MDR | Tstats | -2.0975 | -11.772 | -2.1968 | -11.7704 | I(1) |
| | Coeff | (0.2461) | (0.0000)*** | (0.2084) | (0.0000)*** | |
| 12MDR | Tstats | -2.2293 | -15.9318 | -2.7793 | -15.9652 | I(1) |
| | Coeff | (0.1969) | (0.0000)*** | (0.0638)* | (0.0000)*** | |
| PLR | Tstats | -3.3835 | | -2.7922 | -9.9880 | I(1) |
| | Coeff | (0.0132)** | | (0.0619)* | (0.0000)*** | |
| MLR | Tstats | -0.5625 | -15.4055 | -0.6058 | -15.2306 | I(1) |
| | Coeff | (0.8740) | (0.0000)*** | (0.8646) | (0.0000)*** | |

*Source: Author's Compilation from Eviews*

Note: The ADF critical value with intercept are -3.48(1%), -2.88(5%) and -2.58(10%).

The Phillip-Perron critical value with intercept are-3.48(1%), -2.88(5%) and -2.58(10%). ***, ** and * denote significance at 1%, 5% and 10% levels, respectively.

**4.1 Response from the Policy Rate to the Interbank Rate**

The first aspect of the analysis discusses the pass-through from the policy rate to the inter-bank market (the monetary approach). First, the bound test procedure was carried out to examine the extent of cointegration among the variables. The result from table 4 showed that cointegration exists among the variables, implying that there is a long-run relationship, and the interbank rates adjust to policy rate changes in the long run.

**Table 4: Bound Test Result of Pass-Through from Policy Rate to Interbank Market**

| | ITBC | OBBR |
|---|---|---|
| F-Statistic | 10.77 | 10.67 |
| Lower(1%) | 6.84 | 6.84 |
| Upper(1%) | 7.84 | 7.84 |
| Lower(5%) | 4.94 | 4.94 |
| Upper(5%) | 5.73 | 5.73 |
| Cointegration | Yes | Yes |

*Source: Author's Compilation from Eviews*

In the short run, Table 5 showed that the pass-through from the policy rate to the interbank market is incomplete, albeit to a higher degree at 0.88 for the interbank call rate and 0.71 for the open buy-back rate. Table 5 further suggests that the interbank call rate adjusts at 62% towards equilibrium in each month, while the open buy-back rate adjusts at 44% towards long-run equilibrium. An incomplete pass-through implies that the interbank market responds less than proportionately to a change in the policy rate. This result is in line with the theoretical expectation which states that interest rate can have an incomplete pass through as a result of factors that cause

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interest rate stickiness such as the problem of asymmetric information, costs faced by banks (switching costs and adjustment costs), risk-sharing behavior and credit rationing. The result of an incomplete pass-through aligns with previous developing country studies (Fomum, 2011; Bangura, 2011; Lerskullawat, 2014; Mordi, Adebiyi, and Omotosho, 2019) and previous developed country studies (Bredin, Fitzpatrick and Reilly, 2001; and De Bondt, 2002, 2005).

In the long run, however, the demand elasticity of the pass-through process exceeded one for both the interbank call rate (1.42) and the open buy-back rate (1.62). This implies that interest rate pass-through overshoots. The implication of this is that banks might have been engaged in raising their lending rates at the interbank market to counter the possibilities of a default in loan repayments between banks rather than reducing the supply of loans they create (De Bondt, 2005). The results of the asymmetric version of the error correction term (positive and negative error correction term) showed that banks fully adjust to equilibrium in line with monetary policy changes regardless of whether the policy rate is adjusted downward or upward. However, the null hypothesis that the positive and negative correction terms are equal is rejected, implying asymmetry between the positive and negative correction terms based on the Wald test for both the interbank call rate and open buy-back rate. Finally, the essence of the mean adjustment lag is to know the number of months required for a full adjustment process from the policy rate to the interbank rates (while the error correction term showed the correction speed in each month). Therefore, the computed mean adjustment lag for interbank call rate (0.12) and open buy-back rate (0.29) showed that these interbank rates adjust to policy rate changes within a month, regardless of whether the policy rate is revised upwards or downwards.

**Table 5: Summary of Pass-Through from Policy Rate to Interbank Market**

| VAR | | ITBC | OBBR |
|---|---|---|---|
| SHORT-RUN | Coeff | 0.8781 | 0.7101 |
| | Pvalue | (0.0032)*** | (0.0024)*** |
| ECT | Coeff | -0.6203 | -0.4375 |
| | Pvalue | (0.0000)*** | (0.0000)*** |
| | Coeff | 1.4155 | 1.6229 |
| LONG-RUN | | | |
| | Pvalue | (0.0003)*** | (0.0001)*** |
| ECT+ | Coeff | 1.0000 | 1.0000 |
| | Pvalue | (0.0000)*** | (0.0000)*** |
| | Coeff | 1.0000 | 1.0000 |
| ECT | | | |
| | Pvalue | (0.0000)*** | (0.0000)*** |
| MAL | Months | 0.1965 | 0.6626 |
| MAL+ | Months | 0.1219 | 0.2899 |
| MAL | Months | 0.1219 | 0.2899 |

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| | | | |
|---|---|---|---|
| Wald | Pvalue | (0.0000)*** | (0.0000)*** |
| Adj-R2 | | 0.2289 | 0.4508 |
| SC | | 0.0931 | 0.332 |
| Het | | 0.7947 | 0.5025 |

*Source: Author's Compilation from Eviews*

***, ** and * denote significance at 1%, 5% and 10% levels, respectively.

### 4.2 Response from the Interbank Rate to the Retail Lending and Deposit Rates

#### 4.2.1 Response from the Interbank Call Rate to the Retail Rates

The second aspect of the analysis examines the pass-through from the interbank rates (interbank call rate and open buy-back rate) to the retail lending and deposit rate (cost of fund approach).

The deposit rates are represented by the savings deposit rate, one month, three months, six months, and twelve months deposit rates, while the lending rates are represented by the prime lending rate and the maximum lending rate. The analyses in this section will further be divided into two separate analyses to reflect the response of the interbank call rate to the retail lending and deposit rates and the response of the open buy-back rate to the retail lending and deposit rates. The bound test result for Table 6 showed that only the one-month deposit rate had a long-run relationship with the interbank call rate (with an F-stats greater than the lower and upper bound at the 5% level), implying that the rest of the variables are short-run variables.

**Table 6: Bound Test Result of Pass-through from Interbank Call Rate to Retail Rate**

| | SDR | 1MDR | 3MDR | 6MDR | 12MDR | PLR | MLR |
|---|---|---|---|---|---|---|---|
| F-Statistic | 1.91 | 7.6 | 3.28 | 3.99 | 4.97 | 5.08 | 4.54 |
| Lower(1%) | 6.84 | 6.84 | 6.84 | 6.84 | 6.84 | 6.84 | 6.84 |
| Upper(1%) | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 |
| Lower(5%) | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| Upper(5%) | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 |
| Cointegration | No | Yes | No | No | Inconclusive | Inconclusive | No |

*Source: Author's Compilation from Eviews*

Table 7 summarizes the pass-through process from the interbank call rate to the retail lending and deposit rates. The results showed that in the short run, the savings deposit rate, twelve months deposit rate, and the prime lending rates are insignificant at a 5% level, while the one month (0.01), three months (0.01) and six months deposit rate (0.02) had an incomplete pass-through with a lower degree. The maximum lending rate (0.01) also had a lower and incomplete pass-through. These results were in line with the previous outcome, albeit to a considerably lower degree. Furthermore, the speed of adjustments of one-month (5%), three months (5%), six months (7%), twelve (11%) months deposit rate, and the prime lending rate (9%) was characteristically low in line with their short-run outcomes. That is the adjustment speed towards equilibrium is generally very slow for the series. In the long run, the one-month deposit rate also displayed an incomplete pass-through, also in line with

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the short-run outcomes. Furthermore, the positive and negative correction terms would only be computed for the one-month, three months, and six months deposit rates since they were the only results with significant short-run and error correction outcomes. This implies that the savings rate, twelve-month deposit rates, prime lending rate, and maximum lending rates have insignificant correction terms, and therefore, insignificant mean adjustment lags. The positive correction terms for the one-month and three months deposit rates were insignificant, while the sixmonth deposit rate had a significant positive correction term. However, the three variables all had significant negative correction terms. Therefore, the positive mean adjustment lags for one-month and three-month deposit rates were also insignificant and irrelevant (notice that they were very high compared to the negative, which shows the results for the positive terms are spurious). Thus, the six months deposit rate fully adjusts to an upward interbank call rate change within a month, while the one- and three-month deposit rate fully adjust to a downward change in the interbank call rate within eight months; however, the six months deposit rate fully adjusts to a negative change in the interbank rate within a month. Finally, the Wald tests for the one-month, three months, and six months deposit rates support the presence of asymmetries among the positive and negative correction terms. The unresponsive nature of lending rates on the pass-through from the interbank call rate to the lending rate implies that the lending rate is sticky to changes in the interbank call rate.

**Table 7: Summary of Pass-Through from Interbank Call Rate to Retail Rate**

| VAR | | SDR | 1MDR | 3MDR | 6MDR | 12MDR | PLR | MLR |
|---|---|---|---|---|---|---|---|---|
| S-RUN | Coeff | 0.0019 | 0.0138 | 0.0135 | 0.0205 | 0.0056 | 0.0029 | 0.0092 |
| | Pvalue | (0.41) | (0.05)** | (0.05)** | (0.02)** | (0.69) | (0.45) | (0.10)* |
| ECT | Coeff | -0.0262 | -0.0546 | -0.0562 | -0.0711 | -0.1082 | -0.0870 | -0.0182 |
| | Pvalue | (0.20) | (0.02)** | (0.03)** | (0.02)** | (0.01)*** | (0.01)*** | (0.13) |
| L-RUN | Coeff | 0.1775 | 0.4957 | 0.2401 | 0.2885 | 0.3278 | 0.0338 | 1.1113 |
| | Pvalue | (0.24) | (0.06)* | (0.14) | (0.07)* | (0.06)* | (0.47) | (0.11) |
| ECT+ | Coeff | 1.0000 | 0.0033 | -0.0064 | 1.0000 | 1.0000 | 0.0044 | 0.0070 |
| | Pvalue | (0.00)*** | (0.87) | (0.73) | (0.00)*** | (0.00)*** | (0.48) | (0.24) |
| ECT- | Coeff | 1.0000 | 0.1360 | 0.1222 | 1.0000 | 1.0000 | 0.0161 | 0.0112 |
| | Pvalue | (0.00)*** | (0.00)*** | (0.00)*** | (0.00)*** | (0.00)*** | (0.08)* | (0.19) |
| MAL | Months | 38.15 | 18.10 | 17.55 | 13.78 | 9.19 | 11.39 | 54.44 |
| MAL+ | Months | 0.9981 | 298.85 | 154.14 | 0.98 | 0.99 | 226.61 | 141.54 |
| MAL- | Months | 0.9981 | 8.07 | 8.07 | 0.98 | 0.99 | 61.93 | 88.46 |

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|---|---|---|---|---|---|---|---|---|
| Wald | Pvalue | (0.00)*** | (0.03)** | (0.00)*** | (0.00)*** | (0.00)*** | (0.76) | (0.00)*** |
| Adj-R2 | | 0.9472 | 0.9273 | 0.9135 | 0.8837 | 0.7898 | 0.8632 | 0.9827 |
| SC | | 0.6926 | 0.8772 | 0.8369 | 0.6521 | 0.6889 | 0.3768 | 0.9387 |
| Het | | 0.8964 | 0.1519 | 0.2069 | 0.0825 | 0.0551 | 0.2845 | 0.162 |

*Source: Author's Compilation from Eviews*

***, ** and * denote significance at 1%, 5% and 10% levels, respectively.

### 4.2.2 Response from the Open Buy-Back Rate to the Retail Rates

The second aspect of this section measures the response from the open buy-back rate to the retail lending and deposit rates. The bound test result in Table 8 showed that there is no long run relationship among the series.

**Table 8: Bound Test Result from Open Buy Back Rate to Retail Lending and Deposit Rate**

| | SDR | 1MDR | 3MDR | 6MDR | 12MDR | PLR | MLR |
|---|---|---|---|---|---|---|---|
| F-Statistic | 1.4 | 4.08 | 2.9 | 3.67 | 3.85 | 4.37 | 1.87 |
| Lower(1%) | 6.84 | 6.84 | 6.84 | 6.84 | 6.84 | 6.84 | 6.84 |
| Upper(1%) | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 |
| Lower(5%) | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| Upper(5%) | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 |
| Cointegration | No | No | No | No | No | No | No |

*Source: Author's Compilation from Eviews*

In the short run, the one-month and six months deposit rates were significant, while the maximum lending rate was the only lending rate found to be significant. The pass-through for the one month (0.01), six months (0.02), and maximum lending rates (0.01) were also found to be incomplete and very low, in line with the results from the pass-through from the interbank call rate to the retail rates. The adjustment speed for the onemonth (5%), three months (5%), six months (7%), and twelve months (10%) deposit rates and the prime lending rate (9%) were also found to be characteristically low in line with the interbank call rate outcomes. Since the onemonth and six months deposit rates had significant short-run and error correction outcomes, this study computed their positive and negative correction terms and their mean adjustment lags.

The positive and negative correction terms show that the one-month and six months deposit rates fully adjust to a change in the open buy-back rate either upward or downward. Their mean adjustment lags further suggest that they adjust within a month to the upward or downward movements in the open buy-back rate. Finally, the Wald test shows that there are asymmetries in the way the positive and negative correction terms respond to changes in the open buy-back rate.

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The unresponsive nature of lending rates on the pass-through process from the open buy-back rate to the lending rate implies that the lending rate is sticky to changes in the interbank rate. These outcomes corroborate the previous outcomes on interest rate pass-through from the interbank call rate to the retail lending and deposit rates.

**Table 9: Summary of Pass-Through from Open Buy-Back Rate to Retail Rate**

| VAR | | SDR | 1MDR | 3MDR | 6MDR | 12MDR | PLR | MLR |
|---|---|---|---|---|---|---|---|---|
| | S-RUN | Coeff | 0.0035 | 0.0135 | 0.0107 | 0.0185 | 0.0177 | -0.0051 | 0.0137 |
| | | Pvalue | (0.16) | (0.09)* | (0.17) | (0.06)* | (0.24) | (0.32) | (0.04)** |
| | ECT | Coeff | -0.0253 | -0.0496 | -0.0536 | -0.0677 | -0.0965 | -0.0893 | 0.0173 |
| | | Pvalue | (0.21) | (0.05)** | (0.04)** | (0.02)** | (0.02)** | (0.01)*** | (0.17) |
| | L-RUN | Coeff | 0.1394 | 0.2712 | 0.1987 | 0.2737 | 0.1836 | 0.0391 | 0.7946 |
| | | Pvalue | (0.28) | (0.21) | (0.26) | (0.12) | (0.27) | (0.49) | (0.14) |
| | ECT+ | Coeff | 0.0387 | 1.0000 | -0.052 | 1.0000 | 1.0000 | -0.0076 | 0.001 |
| | | Pvalue | (0.12) | (0.00)*** | (0.00)*** | (0.00)*** | (0.00)*** | (0.48) | (0.89) |
| | ECT- | Coeff | 0.0456 | 1.0000 | 0.0045 | 1.0000 | 1.0000 | -0.0131 | 0.0148 |
| | | Pvalue | (0.14) | (0.00)*** | (0.75) | (0.00)*** | (0.00)*** | (0.11) | (0.11) |
| | MAL | Months | 39.39 | 19.89 | 18.46 | 14.5 | 10.18 | 11.14 | 57.01 |
| | MAL+ | Months | 25.75 | 0.9865 | 19.025 | 0.9815 | 0.9823 | 130.91 | 986.3 |
| | MAL- | Months | 21.85 | 0.9865 | 219.84 | 0.9815 | 0.9823 | 75.95 | 66.64 |
| Wald | Pvalue | | (0.18) | (0.00)*** | (0.00)*** | (0.00)*** | (0.00)*** | (0.01)** | (0.00)*** |
| Adj-R2 | | | | 0.9206 | 0.9122 | 0.8821 | 0.7847 | 0.8645 | 0.9823 |
| | 0.9471 | | | | | | | | |
| SC | 0.6236 | 0.2113 | | 0.5231 | | 0.7944 | | 0.7808 | 0.3942 | 0.5645 |
| Het | 0.5399 | 0.1352 | | 0.1014 | | 0.1089 | | 0.089 | 0.0803 | 0.0057 |

*Source: Author's Compilation from Eviews*

***, ** and * denote significance at 1%, 5% and 10% levels, respectively.

**4.3 Response from the Policy Rate to the Retail Lending and Deposit Rates**

The final aspect of these analyses examines the pass-through from the policy rate to the retail lending and deposit rates. First, the bound test results in Table 10 showed that there was no long-run relationship among the observed variables.

**Table 10: Bound Test Result from Policy Rate to Retail Lending and Deposit Rate**

| | SDR | 1MDR | 3MDR | 6MDR | 12MDR | PLR | MLR |
|---|---|---|---|---|---|---|---|

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|---|---|---|---|---|---|---|---|
| F-Statistic | 4.28 | 4.01 | 3.44 | 2.85 | 4.31 | 3.94 | 3.01 |
| Lower(1%) | 6.84 | 6.84 | 6.84 | 6.84 | 6.84 | 6.84 | 6.84 |
| Upper(1%) | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 |
| Lower(5%) | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| Upper(5%) | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 | 5.73 |
| Cointegration | No | No | No | No | No | No | No |

*Source: Author's Compilation from Eviews*

The short-run results show that the pass-through from the policy rate to the retail lending and deposit rates is incomplete and characterized by a lower degree of pass-through from the policy rate to the retail rates. This outcome of an incomplete pass-through corroborates the outcome generated from the pass-through from the policy rate to the interbank rate, albeit to a lower degree this time around. The error correction terms also suggest that the savings, one month, three months, and six months deposit rates adjust at a slow speed of 5%, while the twelve months deposit rate and the prime lending rate adjust at a slow speed of 9%. However, the maximum lending rate adjusts at a slow speed of 3%. The positive and negative corrections terms of one month, three months, and six months deposit rates suggest that these rates adjust completely to a change in the policy rate either upwards or downwards, while the six months and twelve months deposit rates adjust strongly to a change in the policy rate either upwards or downwards. However, the lending rates (prime and maximum lending rates) adjust slowly to an upward or downward change in the policy rate.

Furthermore, the mean adjustment lags suggest that the five (5) deposit rates will fully adjust to an upward or downward policy rate change within a month, while it will take around three months for the maximum lending rate to fully adjust to an upward change in the policy rate and it will take around 10 months for the maximum lending rate to fully respond to a downward change in the policy rate. This result is also similar to the outcomes of the prime lending rate even though it had an insignificant short-run result, and its negative mean adjustment lag is around eight months. Finally, the Wald test suggests that there are asymmetries in the way the positive and negative correction terms respond to changes in the policy rate, except for the twelve months deposit rate, which suggests it takes around ten months for a change in the policy rate to fully reflect on the twelve months deposit rate. These outcomes imply that the deposit rates adjust faster to an upward or downward change in the policy rate compared to the lending rates.

**Table 11: Summary of Pass-Through from Policy Rate to Retail Rate**

| VAR | | SDR | 1MDR | 3MDR | 6MDR | 12MDR | PLR | MLR |
|---|---|---|---|---|---|---|---|---|
| S-RUN | Coeff | 0.0229 | 0.0409 | 0.0381 | 0.3586 | 0.0792 | 0.0043 | 0.0546 |
| | Pvalue | (0.00)*** | (0.08)* | (0.08)* | (0.03)** | (0.07)* | (0.73) | (0.02)** |
| ECT | Coeff | -0.0483 | -0.0478 | -0.0518 | -0.0504 | -0.095 | -0.0856 | -0.0321 |
| | Pvalue | (0.03)** | (0.05)** | (0.04)** | (0.09)* | (0.02)** | (0.01)*** | (0.05)** |
| L-RUN | Coeff | 0.4749 | 0.8552 | 0.7357 | 1.0624 | 0.8337 | 0.0501 | 1.6984 |
| | Pvalue | (0.02)** | (0.22) | (0.21) | (0.18) | (0.13) | (0.74) | (0.01)*** |

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|---|---|---|---|---|---|---|---|---|---|
| | ECT+ | Coeff | 0.861 | 1.0000 | 1.0000 | 1.0000 | 0.9133 | 0.3267 | 0.289 |
| | | Pvalue | (0.00)*** | (0.00)*** | (0.00)*** | (0.00)*** | (0.00)*** | (0.00)*** | (0.00)*** |
| | ECT- | Coeff | 0.6128 | 1.0000 | 1.0000 | 1.0000 | 0.9415 | 0.1262 | 0.0969 |
| | | Pvalue | (0.00)*** | (0.00)*** | (0.00)*** | (0.00)*** | (0.00)*** | (0.04)** | (0.08)* |
| | MAL | Months | 20.23 | 20.06 | 18.57 | 12.73 | 9.69 | 11.63 | 29.45 |
| | MAL+ | Months | 1.13 | 0.96 | 0.96 | 0.64 | 1.01 | 3.05 | 3.27 |
| | MAL- | Months | 1.59 | 0.96 | 0.96 | 0.64 | 0.98 | 7.89 | 9.76 |
| Wald | Pvalue | (0.01)*** / 0.9496 | (0.05)** | (0.56) | (0.01)*** / 0.9129 | (0.00)*** / 0.8853 | | (0.02)** | (0.02)** |
| Adj-R2 | | 0.9207 | 0.7878 | 0.8627 | 0.9824 | | | | |
| SC | 0.5134 | 0.4106 | 0.8216 | 0.8928 | 0.7429 | 0.3137 | 0.5337 | | |
| Het | 0.6166 | 0.1147 | 0.0858 | 0.0002 | 0.0514 | 0.051 | 0.0003 | | |

*Source: Author's Compilation from Eviews*

***, ** and * denote significance at 1%, 5% and 10% levels, respectively.

## 5. Conclusion and Policy Recommendations

This paper examines interest rate pass-through in Nigeria, with a focus on the pass-through process from the policy rate to the money market and retail rates and from the money market rates to the retail rates. The results show that there were an incomplete short-run pass-through albeit at a higher degree from the policy rate to the interbank rate, while in the long run, the pass-through process overshoots. However, this pass-through was found to be very low from the policy rate to the retail rates and from the money market rates to the retail rates. The mean adjustment lags were very low, suggesting that it takes a quicker period (in terms of months) for changes in the policy rate to fully reflect in the interbank and retail rates. Finally, compared to the lending rates, the deposit rates were found to respond more significantly, albeit slowly to changes in the policy rate and money market rates, also suggesting that the lending rates are stickier to monetary policy changes.

From these outcomes, it can be argued that the introduction of the policy rate improved the interbank market tremendously and the policy reforms were significantly targeted at reducing distortions within the interbank market. In essence, we recommend that the monetary authorities critically appraise the size of interest rate pass-through to the retail and money market rates in light of the heterogeneous response from the policy rate to the retail and money market rates and the adjustment process toward their long-run equilibrium. Also, the weak pass-through between the money market and the retail lending and deposit rates suggests that other supplementary measures are necessary to remove the distortions in the retail lending and deposit rates to ensure that the retail rates fully adjust in line with the policy rate change and other money market rate changes.

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