Bi-Annual Research Journal "BALOCHISTAN REVIEW" ISSN 1810-2174 Balochistan Study Centre, University of Balochistan, Quetta (Pakistan) VOL. XLIX, NO.1, 2022

Financial Inclusion and Monetary Policy In Pakistan

Commerce

Iqra Bano[1] & Dr. Uzma Mukhtar[2]

ABSTRACT

This paper examines the impact of financial inclusion on monetary policy in Pakistan, as financial inclusion is thought to influence aggregate demand and interest rates, contributing to monetary policy success. Financial inclusion leads to effectiveness of monetary policy. Monetary policy has the lag effect, the relationship of financial inclusion and monetary policy is endogenous. Therefore, Approach of generalized method of moments is applied. Comparative analysis is done for all the years based on the empirical examination. Past researches have mainly concentrated on analyzing the financial inclusion effect on other factors, so there arises a gap that need to be filled by conducting research to check the impact of financial inclusion on monetary policy. This study employs the Autoregressive Distributed Lag cointegration technique and bound test. The purpose of this test is to look at the long-term relationship between financial inclusion and monetary policy. Coefficient of error-correction (ECM) term can also be used to confirm long-run and short-run correlations. Study concludes thatevery year monetary policy converges towards equilibrium by 66.9% due to the changes in independent variables.

KEYWORDS: Autoregressive Distributed Lag Model (ARDL), inflation, Pakistan.Financial inclusion, financial exclusion, monetary policy,

Introduction

Financial inclusion is important to identify and analyze the factors that are affected by progress in the level of financial inclusion. Bruhn et al. (2014) studied the effect of restricted approach to credit on the economy as a whole and its impact on the human development. The study concluded that limited

[1] M.Phil Scholar, Department of Commerce, University of Balochistan, Quetta
[2] Associate Professor, Department of Commerce, University of Balochistan, Quetta

access to credit facility not only hinders economic growth but also hampers poverty alleviation processes. Segment of the population that is not financially excluded is able to finance their educational expenses and invest in ventures that contribute to poverty reduction and economic growth (Beck et al., 2006, Bruhn et al., 2014).

Seeing the financial inclusion impact on these factors in different regions of the world, it is vital to analyze the financial inclusion impact on monetary policy considering essential role of monetary policy in managing money supply, consumption patterns and economic development.

Financial inclusion for having its ability of playing vital role in financial stability, poverty alleviation, and economic and human development. Financial inclusion affects the aggregate demand to interest rate thereby contributing to success of monetary policy (Mbutor et al. 2013). Studying more, level of financial inclusion may not get affected by financial education, but it can have positive impact on utilization of formal financial services resulting in human development and poverty alleviation.

Today the reliance of financially excepted individuals is mainly on cash transactions and they make their decisions independently by monetary policy of Central Banks. Financial inclusion brings those individuals into the mainstream and electively makes the apparatus of transmission in financial policy.

In the modern world Central banks have 10 or 15 years over policy of maintaining short-term interest rates with targeting inflation as an aim. Whereas the other objective remains but having a lower place on the agenda. The role of survival is cited as supporting the empirical finding that rates of interest are moving gradually with respect to change in response to macroeconomic conditions. Arguments show that by keeping the rate of interest smaller and predicted, there will be a reduction in volatility of central banks and that will decrease the risk of bank insolvencies as well as among the business parties who are their borrowers. As the time passes the growth of financial markets and the financial instruments ranges are available for risk of trading, other players like banks in these markets have become incredibly well able to stand against the risks of short-term variable rates posed with respect to their profits and balance sheets.

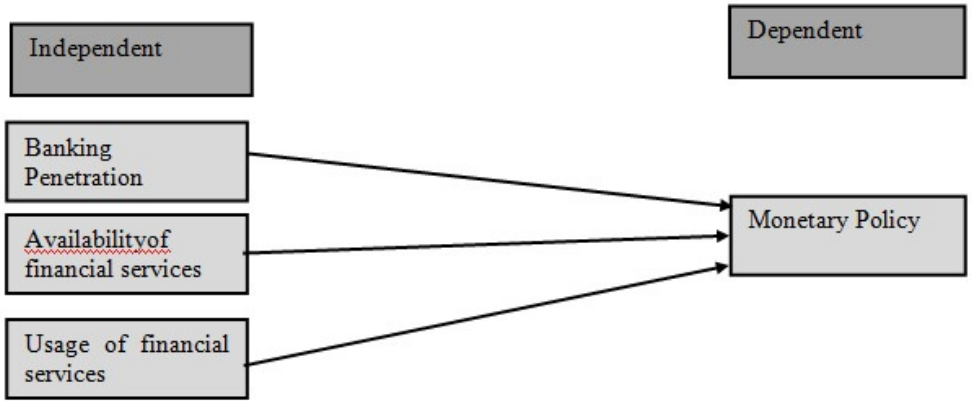
Financial inclusion has become pivotal with respect to competition and in maintaining economy's sustainable growth. Financial services are becoming more accessible to people from all walks of life predominantly to the poor section shall result in decrease of the income inequalities and chances of earning between the different groups of the society. It may not only play a vital role in the poverty relief but also has contribution in economic development of the country which may results as increase in economic activity (Bruhn et al., 2014).

Financial access can provide facilities according to day-to-day living and by helping families and businesses plan as expecting a long-term goal to unexpected emergencies. As accountholders people prefer using financial services like insurance and credit, moreover for starting and expanding business, investment in health or education, risk management can bring improvement to their lives.

World Bank Group initiated a program called Universal Financial Access 2020 which is actually working on parameters to make sure that the unbanked community must have basic rights to traditional platforms like account checking by 2020. With respect to basic transaction People who possess these accounts are termed as underbanked referring mainly to the adults securing the traditional tools such as a bank account for conducting transactions, as well as to those who are unaware of these transactions of digital incorporation such as digital payments.

Theoretical framework.

Research framework of the study based on previous research and the hypothesis generated is as follow:



Theoretical Framework

Where:

(Money Supply/Interest Rate) will be used as dependent variable representing monetary policy.

The independent variables in the study are

- Banking Penetration (Number of deposit bank accounts per 1000 adults population)
- Availability of financial services (Number of bank outlets per 1000 population or number of ATM per 1000 individuals).
- Usage of financial services (total volumes of deposits, credit and mobile money transaction as percentage of GDP)

Foreign exchange rate, Commercial Bank Average lending rate, inflation and Gross Domestic Product are control variables.

Hypothesis

H1:Banking penetration affects the monetary policy of Pakistan.

H2: Availability of banking services affects the monetary policy of Pakistan.

H3: Usage affects the monetary policy of Pakistan.

Data

The maximum available data from 1960 to 2017 has been utilized in this study to examine the impact of financial inclusion on monetary policy. An effort has been made to study the most suitable proxies for the given analysis. The data has been extracted from World Bank Development Indicators.

Model:

$$Yt = \alpha + \beta 1X1t + \beta 2\, X2t + \gamma 1\, Z1t + \gamma 2Z2t + \varepsilon$$

Y = Dependent Variable

X = Vector of Independent Variables

Z = Vector of Control Variables

Empirical model:

Log(inf)= α+ β1t (Deposits outstanding to GDP)+β2t (Loans outstanding to GDP)+γ1t (Official Exchange Rate)+ γ2t (Log Liquid Liabliliteis)+ ε

WHERE

Dependent variable:

Y = Log (inflation) is the dependent variable and it is measured through the percentage change on annual basis in consumer price index. It captures the cost that a general consumer incurs while obtaining a basket of services and goods. Inflation is considered as the most accurate proxy for the monetary policy for any economy since targeting the inflation has proved as a successful tool by offering transparency in monetary policymaking and reducing the inflation rate.

Independent Variables:

Deposits outstanding to GDP:

This proxy reflects the size of the banking sector and an increase in bank deposits would be considered as an increase in financial inclusion. Time, demand and saving deposits in the banks as a percentage of GDP, it is calculated using Following deflation method is used to determine time, demand and bank saving deposits as a proportion of GDP : {(0.5)*[Ft/P_et + Ft-1/P_et-1]}/[GDPt/P_at] where F stands for demand, time, and saving deposits, P_estands for end-of- period CPI, and P_astands for average annual CPI.

Loans Outstanding to GDP

This proxy reflects the mobilization of savings from lenders to borrowers in an effective way therefore in this study, a proxy for financial inclusion is included. It is the efficiency measure of banking sector that how effectively banks are channeling saving from the savers to potential businesses that contributes to the increased GDP growth rates. It is calculated by the following deflation method: {(0.5)*[Ft/P_et + Ft-1/P_et-1]}/[GDPt/P_at] where F is credit to the private sector, P_e is end-of period CPI, and P_a is average annual CPI.

Control Variables

Official Exchange Rates

Since exchange rate has a strong impact on the monetary policy of the economy, therefore its impact couldn't be ignored while observing role of financial inclusion in monetary policy. It's based on monthly averages and

calculated as an annual average (local currency units relative to the U.S. dollar).

Exchange rates effect domestic inflation by effecting on the price of tradable goods .The ultimate effect of exchange rate changes on the broader price level depends on the other hand, is highly dependent on the characteristics of the domestic inflation process, particularly transmission of the initial impact via "second-round" effects.To anchor inflation expectations in the face of destabilizing domestic currency depreciations, central banks tend to tighten their monetary policy stance, usually by adjusting a short-term reference interest rate.

Liquid Liabilities to GDP

The sum of currency and deposits in the central bank, plus transferable deposits and electronic currency, plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements, plus travelers checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents, are referred to as liquid liabilities.

Methodology

Stationary and Non-Stationary Series

A non-stationary time series is a stochastic process that includes unit roots or structural breakdowns. On the other hand, unit roots are a major source of non-stationary data. A non-stationary time series has a unit root, whereas a stationary time series does not. This demonstrates that unit root is one of the causes of non-stationary.

The most frequent procedures for measuring the stationarity property of a single time series are the Dickey Fuller or Augmented Dickey Fuller tests. The proper tests are chosen based on the set up of the problem that the practitioner is interested in. The unit roots test is used to determine how many times a variable or series must be differenced in order to achieve stationary. The term "integration" is derived from this. A variable Y, is said to be integrated of order d, I(d)] if it attained stationarity after differencing d times (Engle and Granger, 1987).

Unit Root Test Results

The probability of spurious regressions is investigated by looking at the stationarity of variables. To check the stationarity of the variables that enter the ARDL model, the Augmented Dickey Fuller (ADF) method is used. Table 1 shows the variables that appeared with mixed integrated orders, for example. At the first difference, log inflation and Loans Outstanding to GDP are stationary, whereas Deposits Outstanding to GDP, Exchange Rate, and Liquid Liabilities are stationary. The Autoregressive Distributed Lags Model (ARDL), which represents the long run relationship between dependent and independent variables, is the most appropriate methodology here because the variables are integrated in mixed order.

Table: 1

Variable	Integration Order
Log Inflation	I (0)
Deposits outstanding to GDP	I (1)
Loans Outstanding to GDP	I (0)
Exchange Rate	I (1)
Liquid Liabilities	I (1)

Cointegration Test

Co-integration is a method for modelling time series while preserving their long run-information. Granger (1981), Engle and Granger(1987) and others were the first to formalize the idea of co-integration, providing estimationalgorithms and tests for examining the existence of a long-run link between a set of variables inside a dynamic specification framework. The co-integration test examines how non stationary time series that drift far from equilibrium can be joined so that equilibrium force mechanisms prevent them from drifting too far apart. Co-integration is the term used to describe a stationary linear combination of variables that are individually non-stationary but integrated to an order (d). Co-integration is an econometric term that refers to a long-run equilibrium between underlying economic time series that converges with time. As a result, co-integration for the empirical error correction model, which mixes short and long-run information in modeling variables. Co-integration testing is a critical stage in establishing whether a model exhibits s important long-run interactions in the lab. The

Autoregressive Distributed Lag co-integration approach and the bound test are used in this work to assess the long-run link between financial inclusion and monetary policy.

Autoregressive Distributed Lag Model (ARDL)

When dealing with variables that are integrated in different orders, the ARDL cointegration technique is better and more durable when there is a single long runrelationship (I(0), I(1), or a combination of the two) between the underlying variables in a sample.To find long-term correlation between underlyingvariables, the F-statistic is used.In this strategy the long run relationship of the series is deemed when the F-statistic exceeds the critical value band. The key advantage of this method is that it can identify numerous cointegrating vectors.

When only one co integrating vector is present, the co-integration approach of Johansen and Juselius(1990) cannot be used. It's crucial to investigate Pesaran and Shin's (1995) and Pesaranet al's (1996b) proposed Autoregressive Distributed Lag (ARDL) approach to co-integration bound process for a long run connection, regardless of whether the underlying variables are I(0), I(1), or a combination of both. In such a case, the ARDL approach to co-integrationwill provide reasonable and efficient estimates. Unlike the co-integrationtechnique proposed by Johansen and Juselius (1990), the Autoregressive Distributed Lag (ARDL) approach to co-integrationaids in the identification of the cointegrating vector (s).

First, ARDL was utilized to explore the relationship between monetary policy and financial inclusion using automatic selection criteria foroptimal lag length , i.e. four lags.The Akaike Info Criterion was used to select the models in order to precisely measure the impacts. Table 2 shows the results of the Short run causality experiment. The impact of independent variables such as outstanding bank deposits to GDP and outstanding private credit/ loans to GDP is considerable at 5% and 10% respectively.

Table 2

Dependent Variable: LOGINF				
Method: ARDL				
Sample (adjusted): 5 58				
Included observations: 54 after adjustments				
Maximum dependents lags: 4 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (4 lags, automatic): BDGDP PCDMGDP LXR LLL				
Fixed regressors: C				
Number of models evaluated: 2500				
Selected Model: ARDL (1,4,4,0,0)				
Note: final equation sample is larger than selection sample				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOGINF (-1)	0.330844	0.14471	2.286250	0.0276
BDGDP	-0.275370	0.13339	-2.064569	0.0455
BDGDP(-1)	0.485051	0.20584	2.356175	0.0235
BDGDP(-2)	-0.424658	0.22412	-1.894514	0.0654
BDGDP(-)	0.289461	0.19625	1.474770	0.1481
BDGDP(-4)	-0.130054	0.11016	-1.180529	0.2448
PCDMGDP	0.315842	0.16006	1.973819	0.0553
PCDMGDP(-1)	-0.716328	0.28789	-2.488380	0.0171
PCDMGDP(-2)	0.788946	0.32051	2.460914	0.0183
PCDMGDP(-3)	-0.609424	0.28915	-2.107679	0.0414
PCDMGDP(-4)	0.327012	0.15365	2.128501	0.0395
LXR	0.159178	0.21656	0.734940	0.4667
LLL	-0.179879	0.53307	-0.337454	0.7375
C	2.064457	4.73533	0.435971	0.6652
R-squared	0.413960	Mean Dependent var		1.929658
Adjusted R- squared	0.223498	S.D. Dependent Var		0.742793
S.E.of	0.654544	Akaikeinfo		2.208659
Regression		Criterion		
Sum Squared resid	17.13712	Schwarz Criterion		2.724321
Loglikelihood	-45.63378	Hannan-Quinn criter		2.407529
F-Statistic	2.173444	Durbin-Watson Stat		1.829047
Prob(F-Statistic)	0.030203			
*Note: p-values and any subsequent tests do not account for model				
Selection.				

TABLE 3

ARDL Bounds Test				
Sample: 5 58				
Included Observations: 54				
Null Hypothesis: No long-run relationship exist				
Test Statistic	Value	K		
F-Statistic	5.211079	4		
Critical Value Bounds				
Significance	I0 Bound	I1 Bound		
10%	2.45	3.52		
5%	2.86	4.01		
2.5%	3.25	4.49		
1%	3.74	5.06		
Test Equation:				
Dependent Variable: D(LOGINF)				
Method: Least Squares				
Sample: 5 58				
Included observation: 54				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BDGDP)	-0.266702	0.123366	-2.161876	0.0367
D(BDGDP)(-1))	0.273155	0.127675	2.139459	0.0386
D(BDGDP) (-2))	-0.166382	0.122176	-1.361816	0.1809
D(BDGDP) (-3))	0.144116	0.107281	1.343350	0.1867
D(PCDMGDP)	0.321481	0.150398	2.137538	0.0387
D(PCDMGDP (-1))	-0.523381	0.175666	-2.979410	0.0049
D(PCDMGDP (-2))	0.277106	0.167213	1.657206	0.1053
D(PCDMGDP (-3))	-0.336859	0.146774	-2.295089	0.0271
C	4.284242	4.859931	0.881544	0.3833
BDGDP(-1)	-0.033704	0.072788	-0.463050	0.6458
PCDMGDP(-1)	0.104633	0.059526	1.757771	0.0864
LXR (-1)	0.189439	0.210873	0.898358	0.3744
LLL(-1)	-0.449136	0.565552	-0.794155	0.4318
LOGINF (-1)	-0.671289	0.143540	-4.676666	0.0000
R-squared	0.491767	Mean Dependent Var		0.019100
Adjusted R-squared	0.326591	S.D Dependent Var		0.792480
S.E.of regression	0.650321	Akaike info criterion		2.195713
Sum Squared resid	16.91670	Schwarz criterion		2.711376
Log likelihood	-45.28425	Hannan-Quinn Criter		2.394584
F-statistic	2.977230	Durbin-Watson stat		1.784748
Prob(F-statistic)	0.004009			

Presence of a long-run association is confirmed by the F-stat (5.211079 greater than 5.06) and Bounds test at 1% percent level of significance as shown in table 3.

TABLE 4

ARDL Cointegrating And Long Run Form				
Dependent Variable: LOGINF				
Selected Model: ARDL(1, 4, 4, 0, 0)				
Sample: 1 60				
Included observations: 54				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BDGDP)	-0.275370	0.133379	-2.064569	0.0455
D(BDGDP(-1))	0.42468	0.224152	1.894514	0.0654
D(BDGDP(-2))	-0.28941	0.196275	-1.474770	0.1481
D(BDGDP(-3))	0.13004	0.110166	1.180529	0.2448
D(PCDMGDP)	0.31582	0.160016	1.973819	0.0553
D(PCDMGDP(-1))	-0.78896	0.320591	-2.460914	0.0183
D(PCDMGDP(-2))	0.60944	0.289145	2.107679	0.0414
D(PCDMGDP(-3))	-0.32702	0.153635	-2.128501	0.0395
D(LXR)	0.15918	0.216586	0.734940	0.4667
D(LLL)	-0.17989	0.533047	-0.337454	0.7375
CointEq(-1)	-0.66916	0.144711	-4.624098	0.0000
Cointeq = LOGINF - (-0.0830*BDGDP + 0.1585*PCDMGDP + 0.2379*LXR				
-0.2688*LLL + 3.0852)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BDGDP	-0.08304	0.107577	-0.771947	0.4447
PCDMGDP	0.15849	0.099687	1.589766	0.1198
LXR	0.23789	0.313262	0.759362	0.4521
LLL	-0.26885	0.795424	-0.337952	0.7372
C	3.08518	7.026541	0.439073	0.6630

Coefficient of error-correction (ECM) term can also be used to confirm long-run and short-run correlations. The predicted value of this coefficient is -0.669156,according to Table 4.

Since the coefficient is negative so dependent variable is converging towards equilibrium and the equilibrium is correcting. This means every year monetary policy converges towards equilibrium by 66.9% due to the changes in independent variables.

Results

Presence of a long-run association is confirmed by the F-stat (5.211079 greater than 5.06) and Bounds test at 1% percent level of significance as shown in Table 3. Coefficient of error-correction (ECM) term can also be used to confirm long-run and short-run correlations.The predicted value of this coefficient is -0.669156,according to Table 4.Since the coefficient is negative so dependent variable is converging towards equilibrium and the equilibrium is correcting. This means every year monetary policy converges towards equilibrium by 66.9% due to the changes in independent variables.

Conclusion

Financial inclusion is a hot topic these days gaining attention of many researchers around the globe due to its role in poverty alleviation, financial stability and economic and human development. Past researches have mainly concentrated on analyzing the financial inclusion effect on other factors, so there arises a gap that need to be filled by conducting research to check the impact of financial inclusion on monetary policy.Furthermore ,no research has been done in Pakistan on the impact of financial inclusion on monetary policy.

Because the variables are integrated in mixed order The Autoregressive Distributed Lags Model (ARDL), which describes the long run relationship between dependent and independent variables, is the most suited methodology.The Autoregressive Distributed Lag co-integration approach and the bound test are used in this work to assess long-run link between financial inclusion and monetary policy.

The results for the impact of independent variables i.e. bank deposits outstanding to GDP and private credit/ loans outstanding to GDP are significant at 5% and 10% accordingly. Presence of a long-run association is confirmed by the F-stat (5.211079 greater than 5.06) and Bounds test at 1% percent level of significance as shown in table 3.Coefficient of error-

correction (ECM) term can also be used to confirm long-run and short-run correlationsSince the coefficient is negative so dependent variable is converging towards equilibrium and the equilibrium is correcting. This means every year monetary policy converges towards equilibrium by 66.9% due to the changes in independent variables.

References

Athukorala, P. C., & Tsai, P. L. (2003). Determinants of household saving in Taiwan: growth, demography and public policy. The Journal of Development Studies, 39(5), 65-88.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank concentration, competition, and crises: First results. Journal of Banking & Finance, 30(5), 1581-1603.

Bruhn, M., & Love, I. (2014). The real impact of improved access to finance: Evidence from Mexico. The Journal of Finance, 69(3), 1347-1376.

Chakravarty, S. R., & Pal, R. (2013). Financial inclusion in India: An axiomatic approach. Journal of Policy Modeling, 35(5), 813-837.

Cheung, D., & Padieu, Y. (2015). Heterogeneity of the effects of health insurance on household savings: Evidence from rural China. World Development, 66, 84-103.

Dev, S. M. (2006). Financial inclusion: Issues and challenges. Economic and political weekly, 4310-4313.

De Koker, L., & Jentzsch, N. (2013). Financial inclusion and financial integrity: Aligned incentives?. World development, 44, 267-280.

Diniz, E., Birochi, R., & Pozzebon, M. (2012). Triggers and barriers to financial inclusion: The use of ICT-based branchless banking in an Amazon county. Electronic Commerce Research and Applications,11(5),484-494.

Han, R., & Melecky, M. (2013). Financial inclusion for financial stability: access to bank deposits and the growth of deposits in the global financial crisis. World Bank policy research working paper, (6577).

Kostov, P., Arun, T., & Annim, S. (2015). Access to financial services: The case ofAthukorala, P. C., & Tsai, P. L. (2003). Determinants of household saving in Taiwan: growth, demography and public policy. The Journal of Development Studies, 39(5), 65-88.

B eck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank concentration, competition, and crises: First results. Journal of Banking & Finance, 30(5), 1581-1603.

Bruhn, M., & Love, I. (2014). The real impact of improved access to finance: Evidence from Mexico. The Journal of Finance, 69(3), 1347-1376.

Chakravarty, S. R., & Pal, R. (2013). Financial inclusion in India: An axiomatic approach. Journal of Policy Modeling, 35(5), 813-837.

Cheung, D., & Padieu, Y. (2015). Heterogeneity of the effects of health insurance on household savings: Evidence from rural China. World Development, 66, 84-103.

Dev, S. M. (2006). Financial inclusion: Issues and challenges. Economic and political weekly, 4310-4313.

De Koker, L., & Jentzsch, N. (2013). Financial inclusion and financial integrity: Aligned incentives?. World development, 44, 267-280.

Diniz, E., Birochi, R., & Pozzebon, M. (2012). Triggers and barriers to financial inclusion: The use of ICT-based branchless banking in an Amazon county. Electronic Commerce Research and Applications, 11(5), 484-494.

Han, R., & Melecky, M. (2013). Financial inclusion for financial stability: access to bank deposits and the growth of deposits in the global financial crisis. World Bank policy research working paper, (6577).

Kostov, P., Arun, T., & Annim, S. (2015). Access to financial services: The case of the 'Mzansi'account in South Africa. Review of Development Finance, 5(1), 34-42.

Mbutor, M.O. and Uba, I.A., 2013. The impact of financial inclusion on monetary policy in Nigeria. Journal of Economics and International Finance, 5(8), p.318.

Miled, K. B. H., & Rejeb, J. E. B. (2015). Microfinance and Poverty Reduction: A Review and Synthesis of Empirical Evidence. Procedia-Social and Behavioral Sciences, 195, 705-712.

Sarma, M., & Pais, J. (2011). Financial inclusion and development. Journal of International Development, 23(5), 613-628.