The Impact Of Financial Inclusion On The Stability Of Monetary Policy Of The South Asian Countries, Panel Ardl Approach

Rabia Kausar[1]* , Dr. Ihtesham Khan[2] , Muhammad Tahir Khan[3] , Anoraga Ilafi Perdana[4] Maria Siddique[5]

[1]*Ph.D. Scholar in the Department of Economics, Islamic International University, Islamabad.

[2]Assistant Professor Institute of business studies and leadership, Abdul Wali Khan University Mardan.

[3]Lecturer Instutue of business studies and leadership Abdul Wali Khan University Mardan.

[4]Department of Economics, University of Padjadjaran.

[5]Lecturer in Economics, Women University of Azad Kashmir, Bagh.

Abstract:

This study has evaluated that how can financial inclusions are important in the stability of monetary policy in South Asian countries. The yearly data has been used in this study from 2001 to 2020. The Panel ARDL technique is used to assess the data. The index of financial inclusion is estimated by Principle Component Analysis with help of three relevant variables; on the contrary, board money, exchange rate, and real interest rate are taken as the control variables. The results of this study illustrated a positive relationship between the financial inclusion and volatility of the monetary policy. This can be happened due to an increment in demand for money due to an increase in financial facilities or because of flaws in institutions. It is the future perspective for further research.

Keywords: Financial Inclusion, Stability, Monetary Policy, South Asian, Panel ARDL

Jel Classification: C18, G24, E52

1. Introduction:

Financial inclusion is not a new word that is used to boost the development process in developing countries. Financial inclusions mean providing financial services at an affordable cost to marginal social groups in any country. These financial services can be transactions, savings, payments, credit, and insurance (World Bank 2020). On the other hand, Sinclair (2001) described the term financial exclusion which means the failure to access essential financial services due to some financial friction, for instance, price, terms, and conditions of credit and loan, or self-excluded due to some religious and cultural reasons.

Financial inclusion affects the economy with many links, for instance, it promotes bank deposits and loans which enhances business activities and investment and, it gives a boost to economic growth which reduces household poverty (Abor, Amidu, & Issahaku, 2018; Bongomin and Munene, 2020; Bandura, 2020; Irankunda and Van Bergeijk, 2020). Therefore, the growth of financial services to facilitate more population will reduce the informal financial sector; consequently, it will stable the channel of monetary policy. (Irankunda and Van Bergeijk, 2020; Lapukeni, 2015).

Monetary policy is used by the central bank of any country to stabilize the price and output volatility through different channels. Exchange rate stability and external balance are other goals that can be achieved by monetary policy (Layi, 1998). The authorities should imply the policy with time management and according to its potential to achieve long-term output growth (Dornbusch, Fisher, and Startz, 2011). The achievement of macroeconomics goals depends on various factors such as central bank accurate analysis, its reliability, and the growth of any country`s financial system.

In the developing countries, financial services are still underdeveloped and, according to empirical analysis transmission mechanism of central bank monetary policy is still weak these countries (Lapukeni, 2015). According to the survey report of the World Bank of one hundred and forty-eight countries, 50% of adults in the world did not have bank accounts in the formal financial sector (Demirgüç-Kunt and Klapper, 2012). Transmission channels can work if countries have a well-developed and organized bond market and, they can be developed with help of financial inclusions in the short run as well as in the long run (Anarfo, Abor, Osei, and Gyeke-Dako, 2019; Ouyang and Rajan, 2019). In this study about financial inclusion in the south Asian countries; therefore, a brief diagram is showing the important figures for financial inclusion in South Asia

Figure:1 Growth of Financial Inclusion
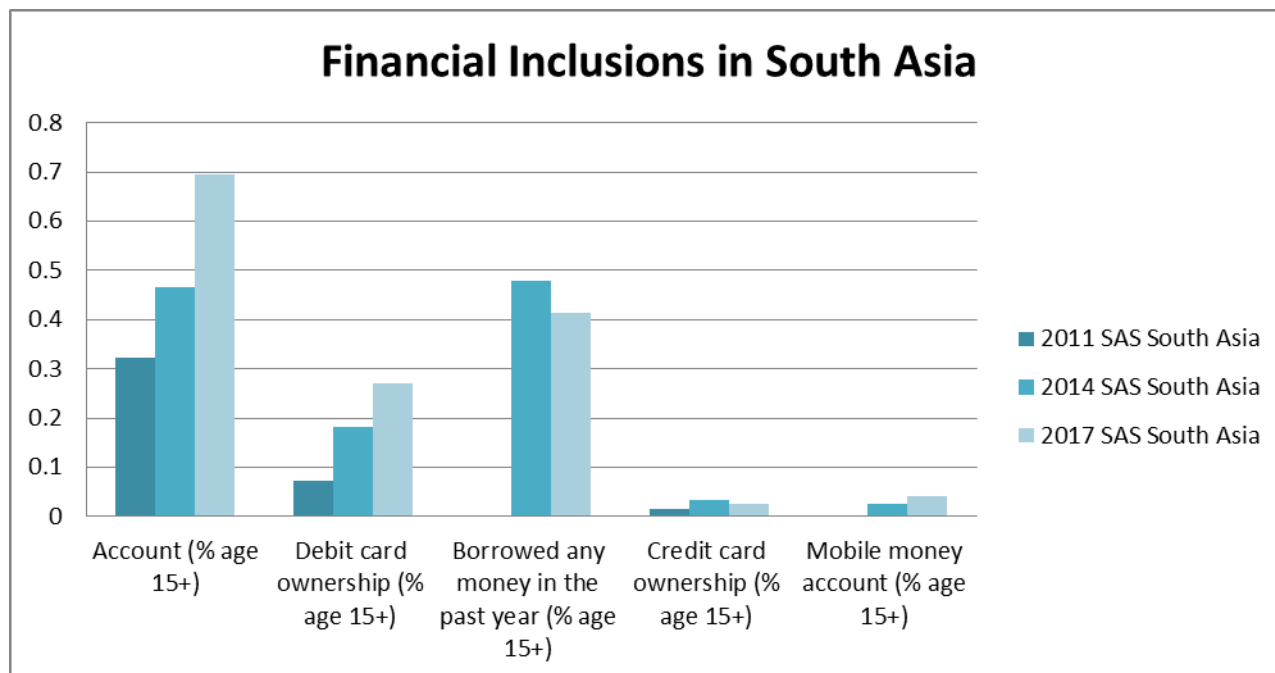
Source; Global Findex Database

According to the graph overall accounts have increased and reached near 70 percent in the South Asian countries whereas Debit card ownership has also enhanced significantly. On the other hand, mobile money accounts and credit cards are not still showing significant growth.

Several pieces of research have confirmed the positive link between output and financial inclusion; on the other hand, there is less research regarding the relationship between financial inclusion and monetary policy. The results of these studies are not giving us a clear answer that either financial inclusion enhances the monetary policy stability or reduces it. Monetary policy stability is measured by price stability and, if financial inclusion has a positive link with economic growth then it will enhance inflation due to growth in aggregate demand but it should not be too high.

This study tries to find out the answer to the question "how can financial inclusion affect the stability of monetary policy in a region of South Asian countries with a statistical technique of panel ARDL.

Significance of study

This study will answer how financial inclusion can be beneficial to analyzing the monetary policy and make it stable to achieve the macroeconomics goals.

Section 2 describes the brief literature review whereas sections 3 and 4 are showing data, methodology, and results respectively. The last section 5 is demonstrating the results and conclusion.

2. Literature Review

The question is, how can monetary policy be affected by financial inclusion, the answer to this question is the transmission mechanism of monetary aggregates and interest rates. The main purpose of monetary policy is to stabilize the aggregate output and growth in the economy; however, it cannot possible without the financial inclusions (De Bandt 1999). Monetary policy can be effective and fruitful with the introduction of various financial inclusions. For instance, it smooth's consumption, saving, and borrowing for poor households (Mehrotra and Yetman 2015 Mbutor and Uba 2013) had also proved positive movement of financial inclusion and efficiency of monetary policy with Nigerian data from the time 1980 to 2012.

The stability of price is also a sign of effective monetary policy as Lenka and Bairwa (2016) investigated SAARC countries' data from 2005 to 2013, the influence of financial inclusion on monetary policy showed that the increment of instruments of financial inclusion reduces the inflation. Iyer (2016) described the significance of financial services in the context of monetary policy. He said that inflation targeting becomes successful where financial inclusions are high, on the contrary in the developing countries where financial inclusions are at a low level, these countries should focus on the volatility of output instead of inflation.

On the other hand, the interest rate channel also becomes ineffective because it cannot affect those people who are financially excluded (Mehrora and Yatman, 2014). The effectiveness of monetary policy can be increased if the relationship between aggregate demand and interest rate will be strong enough and, it can be strong with a huge drop in financially excluded persons (Bibliie 2008; Anarfo et al., 2019 Koomson et al., 2020). Financial inclusion enhances the monetary policy transmission mechanism as presented in many research studies (Elsherif, 2019; Hung, 2016; Lenka et al., 2016; Mbutor and Uba, 2013).

Financial inclusion can increase the inflation rate as inflation is directly related to the consumption decision of households; therefore whenever financial inclusion gives a positive boost to the economic growth, it increases the aggregate demand which increases the inflation; however inflation must not be too high (Bandura, 2020). Safdar and Khan (2013) checked the Pakistan quarterly data from the period 1981 to 2014 with the OLS statistical technique and, concluded that financial innovation dulled the efficiency of monetary policy through the interest rate channel.

Some researches show that financial inclusion does not affect the monetary policy. Evan (2016) used the panel data of African countries. He concluded that the relationship between financial inclusion and monetary is significant in long run but not in the short run. Other studies, which explain the negative relation between financial inclusion and stability of monetary policy,

demonstrate that monetary policy does not affect the real variables in the short-run (Gomez et al. 2015).

Galí et al (2004) pointed out such consumers who do not need to borrow or save as they spend all their labor income on consumption. Therefore, according to the author central bank should adopt different policies in presence of such consumers. If a policy rule is decided by the current value of output and inflation, then a unique equilibrium value can be achieved with a great response of policy rule in the existence of financially excluded persons. As financially excluded people are less affected by interest rates; therefore, monetary policy becomes ineffective.

Jungo Madaleno and Botelho (2021) stated the comparative analysis between the Sub-Saharan African countries and Latin American Countries concluded that in both countries with help of financial inclusion monetary becomes effective in both countries; therefore, the government should adopt such policy to enhance the financial inclusion. On the other hand, Thi Truc Nguyen (2018) described the importance of expectation about monetary that cause a significant negative relationship between financial inclusion and monetary policy.

Some other studies also showed the hurdles in the stability of monetary policy in the presence of financial inclusions. Cecchetti, 1999; Djankov et al., 2007, 2008 described the legal rules and institution flaws regarding the financial innovations which make ineffective transmission mechanism of monetary policy. As literature tells some positive and some negative relationships between financial inclusion and monetary policy some results are showing no impact. This study has tried to explore the empirical relationship between monetary policy and financial inclusion in the context of South Asian economies and, explore the transmission channel between these two variables. Some main facts are described below according to the theoretical framework of the literature.

3. Data and Methodology

3.1 Variable Selection:

Three variables are selected to make the financial inclusion index which is given below in the table. The financial inclusion index is made by using the statistical technique of PCA. The financial Inclusion definition is described by IMF, but due to the availability of data; this paper has used these three variables. Inflation is taken as a proxy of monetary policy stability. In most countries, price stability is the main target of central banks. On the other hand, exchange rate, monetary aggregate growth rate, and real interest rate are taken as control variables. The annual data has been taken from 2001 to 2020.

Equation

$$\text{Inflation} = f(\text{Financial Inclusion}, \text{Real interest rate}, \text{Money Supply}, \text{Exhange rate}) \ldots\ldots 1$$

Variable	Description	Source	Previous Studies to use these variable
ATM	Automated teller machines (ATMs) (per 100,000 adults)	FMI-FAS	Lenka and Bairwa(2016)
CBB	Commercial bank branches (per 100,000 adults)		Lenka and Bairwa(2016)
CTPS	Domestic credit to private sector (% of GDP)		Mbutor and Uba (2013)
Inflation	Inflation Rate	World Bank-WDI	Lenka and Bairwa(2016) Mbutor and Uba (2013)
Real Interest Rate	Real Interest Rate		Lenka and Bairwa(2016
M2	Monetary Expansion Annually		Akanbi et al (2020)
Exchange Rate	Local Exchange rate in terms of Dollar		Mbutor and Uba (2013) Lenka and Bairwa(2016

Source: own elaboration

3.2 Panel Unit root

Panel unit root test is used to check the stability of variables and whether they are integrated of level or order one. Levin, Lin, and Chu (2002) and Im, Persara, and Shin (2003) techniques were used to check the null hypothesis that series have a unit root. The significance of the null hypothesis is tested through the t-statistic with a confidence levels of 5% and 10%.

3.3 Model Specification and ARDL

Panel ARDL model can apply to small data especially more suitable when some variables are stationary at the level and some are at the first difference (Halicioglu 2009). Panel ARDL has three models mean groups, pooled mean group, and two-way fixed effect. Persaran and smith (1995) established the panel data mean group approach in which intercept, slopes, and error terms are different across the countries whereas Persaran et al. (1997, 1999) settled pooled group mean estimator for panel data which has average characteristics. Moreover, PMG is more suitable for the homogenous characteristic of different countries in the group as Mg is used to check the heterogeneity in data which require more longitude data; therefore this data is for 20 years; moreover, South Asian countries approximately have the same characteristics. Hausman test

(1978) is used to check the suitable model between Pooled mean group and Mean group and, the null hypothesis is, there is no significant difference in both models if the null hypothesis gets rejected then we used the MG model otherwise PMG. The same process happens between the DFE and PMG.

Model:

$$\Delta \text{Inflation}_{it} = \left(\emptyset \text{Inflation}_{i,t-1} + \beta_{1i}\text{Financial inclusion}_{it} + \beta_{2i}\text{Real interst rate}_{it} + \beta_{31}\text{Exchange rate}_{it} + \beta_{4i}M2_{it}\right) + \sum_{j=1}^{p-1} \gamma ij\,\Delta \text{Inflation}_{t-j} +$$

$$\sum_{j=0}^{q-1} \alpha_{1ij}\,\Delta \text{Financial inclusion}_{it-j} + \sum_{j=0}^{q-1} \alpha_{2ij}\,\Delta \text{Real Interest Rate}_{it-j} +$$

$$\sum_{j=0}^{q-1} \alpha_{3ij}\,\Delta \text{Exchange Rate}_{it-j} + \sum_{j=0}^{q-1} \alpha_{4ij}\,\Delta M2_{it-j} + \mu_i + \varepsilon_{it}$$

4. Result and Discussion:

The financial inclusion index is made by three variables which are Automated teller machines ATMs (per 100,000 adults), Commercial bank branches (per 100,000 adults), and domestic credit to the private sector, as the data of these three variables were given on the database of the World Bank.

4.1 Descriptive Statistics

Table: 1: Descriptive Statistics

Variables	Mean	S.D	Max	Min
Automated teller machines (ATMs) (per 100,000 adults)	9.783183	9.943546	.0156009	48.09346
Commercial bank branches (per 100,000 adults)	9.894656	5.041677	.37	21.52
Domestic credit to private sector (% of GDP)	33.79708	17.50973	3.126284	87.85271
Inflation	6.289133	4.710649	-18.10863	26.41866
Real Interest Rate	5.177713	5.20773	-27.41666	17.58394
Exchange Rate	69.22039	35.52918	12.24208	185.65
Broad Money	14.89269	9.108989	-1.983859	49.98322

Source: own calculation

The above table is showing the descriptive statistic of all variables. The average inflation and real interest rates remained at 6.2 and 5.1 respectively on the other hand exchange rate in terms of dollar and annual growth of board money remained at 69.22039 and 14.89% in the South Asian region.

4.2 Correlation Matrix

Table: 4.2: Correlation Matrix

Variables	Inflation	Financial Inclusion	Real Interest Rate	Board Money	Exchange rate
Inflation	1.0000				
Financial Inclusion	0.0268	1.0000			
Real Interest Rate	-0.1918	-0.3092	1.0000		
Board Money	0.1589	0.1620	0.0434	1.0000	
Exchange rate	0.0841	-0.0946	-0.0450	0.0189	1.0000

Source: own calculation

The correlation matrix is describing the relation of the different variables concerning inflation which is showing the price stability. The interest rate is showing a negative correlation with the inflation rate whereas all other variables are showing a positive correlation with it.

4.3 Unit Root Test

Table:4.3 Unit Root Test

Variables	IPS		LLC	
	Level	**1st Difference**	**Level**	**1st Difference**
Inflation	-2.7741(0.0004)	-5.3973 (0.0000)	-2.4351 (0.0074)	-9.2279 (0.0000)
Financial Inclusion	-0.9110(0.9766)	-3.1133 (0.0000)	-0.9525(0.1704)	-6.4939(0.0283)
Real Interest Rate	-3.4948 (0.0000)	- 5.8100(0.0000)	-6.8017 (0.0226)	-6.6274 (0.0000)
Board Money	-4.2930 (0.0000)	-7.2745 (0.0000)	-0.7694(0.2208)	-2.8278 (0.0023)
Exchange rate	0.5431 (1.0000)	-3.4740 (0.0000)	3.5011(0.9998)	-5.2923 (0.0000)

Source: own calculation

Two techniques are used to check the stationary among the variables one is Levin, Lin, and Chu (2002) and Im, Persara, and Shin (2003). Both are showing that inflation and real interest rate are stationary at the level whereas financial inclusion, board money, and exchange rate are stationary at the first difference. Therefore, it is a suitable situation for the panel ARDL model.

4.4 Hausman Test:

Table 4.4

	Statistics	P-Value
MG and PMG	0.85	0.1301
PMG and DFE	0.70	0.9311

The result of the Hausman test (1978) is showing that PMG and DFE are efficient estimators in the panel ARDL techniques. The null hypothesis of the Hausman Test is that the mean group is a more suitable model for data that is rejected at 1% at a level of significance. On the other hand, another null hypothesis is pool mean group model is suitable for to model as compared to the different model which is also rejected at a 1% level of significance; therefore, the difference model is appropriate for model

4.5 Model Results

Table 4.5

Model Results

Variables	MG		PMG		DFE	
	Long Run	Short Run	Long Run	Short Run	Long Run	Short Run
ECT		-.9694678		-0.7090033		-.8777046
		[0.000]		[0.000]		[0.000]
Financial Inclusion		-1.958176		3.948666		-2.25682
		[0.483]		[0.034]		[0.214]
Real Interest Rate		0.397296		0.2229783		0.236633
		[0.070]		[0.037]		[0.005]
Board Money		-0.0531334		-0.0553076		-.0567867
		[0.236]		[0.125]		[0.166]
Exchange rate		.5074546		0.5206071		0.112394
		[0.270]		[0.270]		[0.207]
Financial Inclusion	5.589684		1.431334		1.48807	
	[0.392]		[0.014]		[0.041]	
Real Interest Rate	-0.4779844		-.6104254		-0.6144752	
	[0.142]		[0.000]		[0.000]	
Board Money	-.0278482		-.053572		0.0413478	
	[0.855]		[0.341]		[0.528]	

Exchange rate	-.0938863		-.138069		-0.0512849	
	[0.596]		[0.000]		[0.092]	
Constant	10.50287		13.31255		10.88269	
	[0.294]		[0.000]		[0.000]	
Hausman	--	0.85[0.9311]	--	0.7[0.1301]		
Observation	160	160	160	160	160	160

Lag length of variables= (Inflation, financial inclusion, real interest rate, board money exchange rate)=(1,0,0,0,0)

Source: own calculation

Table:4.5 is shown the results of panel data. The result of the Hausman test (1978) is showing that PMG and DFE are efficient estimators in the panel ARDL techniques. In Pool Mean Grouped model financial inclusion estimator and real interest rate estimators are significant in the short run whereas financial inclusion, real interest rate, and exchange rate estimators are significant in the long run. On the other hand, the difference is showing that interest rate is the only significant variable in the short run whereas in the long run financial inclusion and interest rate are significant variables. The lag length of every variable is selected by Akaike's information criterion (AIC), Schwarz's information criterion (SIC),

In the Pooled Mean Grouped model financial inclusion is positively and significantly related to inflation and, the same happens in the long run. These results are related to the research of, Thi Truc Nguyen (2018), Gomez et al. (2005), and Djankov et al., 2007, 2008. In DFE model financial inclusion is not significant but in the long run, it positively and significantly affected the price volatility of the South Asian Countries. The reason for positive relationships can happen due to economic growth which enhances the aggregate demand and, pushes the prices to inflate whereas the other reason is that it may be due to poor design of financial inclusion which would not suitable for local people's income; therefore, these type of financial inclusions just add up in prices.

 The error terms in all three models are significant and negative which shows that a stable long-run relationship exists in this model whereas interest rate is significant both in the long run and short runs; however, negatively related to inflation in long run it follows the traditional channel and, as affects comes after inertia, therefore, it is positive in the short run.

5   Conclusion and Policy Implication

According to the results, financial inclusion increases the overall price of South Asia countries, it may be caused due to poor institutional factors in these countries. Djankov et al., 2007, 2008 described institutional drawbacks for financial innovation, and Gomez et al (2005) described that in the developing countries, people do not have enough income to save or have an account in the banks and, they consume all their income; therefore, those countries should focus on the output volatility instead of price volatility. On the other hand, it may increase economic growth which

enhances aggregate demand and price. It is a further research question to make the monetary policy more effective with the help of financial inclusion.

This study has some limitations and vision for future studies that if we have institution and political index with the model or we firstly analyze the financial inclusion impact on local development and, check its effectiveness and mechanism, then then we can better predict the monetary policy with financial inclusion.

References

Abor, J. Y., Amidu, M., and Issahaku, H. (2018). Mobile telephony, financial inclusion, and inclusive

Abrigo, M. R. M., & Love, I. (2016). Estimation of Panel Vector Autoregression in Stata. The Stata Journal,16(3), 778–804.

Anarfo, E. B., Abor, J. Y., Osei, K. A., & Gyeke-Dako, A. (2019). Financial inclusion and financial sector development in Sub-Saharan Africa: A panel VAR approach. International Journal of Managerial Finance.

Bandura, W. N. (2020). Inflation and finance-growth nexus in Sub-Saharan Africa. Journal of African Business, 1–13.

Bilbiie, F. O. (2008). Limited asset markets participation, monetary policy, and(inverted) aggregate demand logic. Journal of Economic Theory, 140(1), 162–196.

Bongomin, G. O. C., & Munene, J. C. (2020). Financial inclusion of the poor in developing economies in the twenty-first century: Qualitative evidence from rural Uganda. Journal of African Business, 21(3), 355–374.

Cecchetti, S. G. (1999). Legal structure, financial structure, and the monetary policy transmission mechanism. Economic Policy Review, 5(2).

De Bondt, G. J. (1999). Financial structure and monetary transmission in Europe: A cross-country study (Unpublished Ph.D. Thesis). University of Amsterdam, Netherlands.

Demirgüç-Kunt, A., & Klapper, L. F. (2012). Measuring financial inclusion: The global findex database. World bank policy research working paper, (6025).

Demirguc-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2018). The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution. World Bank Publications.

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.

Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. Journal of Financial Economics, 84(2), 299-329.

Djankov, Simeon. Who are the unbanked?. Vol. 4647. World Bank Publications, 2008.

Dornbusch, R., Fisher, S., & Starz, R. (2011). Macroeconomics. Eleventh Edition. Mc Graw-Hill Elsherif, M. (2019). The relationship between financial inclusion and monetary policy transmission: The case of Egypt. May, 63–87. 10.20472/iac.2019.045.014

Evans, O. (2016). The effectiveness of monetary policy in Africa: Modeling the impact of financial inclusion. Iranian Economic Review, 20(3), 323–337.

Galí, J., López-Salido, D., & Vallés, J. (2004). Understanding the effects of government spending on consumption. growth. Journal of African Business, 19(3), 3

Gómez Urquijo, L. (2015). Financial exclusion in the European Union: addressing difficulties in accessing finance within the current integration framework. Journal of Contemporary European Studies, 23(1), 100-117.

Halicioglu, F. (2009). An econometric study of CO_2 emissions, energy consumption, income, and foreign trade in Turkey. Energy Policy, 37(3), 1156-1164.

Hausman, J. A. (1978). Specification tests in econometrics. Econometrica: Journal of the econometric society, 1251-1271.

Im, K. S. Pesaran, M. H. & Shin, Y. (2003). Testing for Unit Roots in Heterogeneous Panels. Journal of Econometrics, 115(1), 53-74.

Irankunda, D., & Van Bergeijk, P. A. (2020). Financial inclusion of urban street vendors in Kigali. Journal of African Business, 21(4), 529-543.

Iyer, T. (2016). Optimal monetary policy in an open emerging market economy.

Jungo, J., Madaleno, M., & Botelho, A. (2021). The Relationship between Financial Inclusion and Monetary Policy: A Comparative Study of Countries' in Sub-Saharan Africa and Latin America and the Caribbean. Journal of African Business, 1-22.

Koomson, I., Villano, R. A., & Hadley, D. (2020). Effect of financial inclusion on poverty and vulnerability to poverty: Evidence using a multidimensional measure of financial inclusion. Social Indicators Research, 149, 613–639.

Lapukeni, A. F. (2015). Financial inclusion and the impact of ICT: An overview. American Journal of Economics, 5(5), 495-500.

Layi, A. (1998). Monetary Economics, Nigeria Perry Barr Ltd, Lagos, Nigeria. Pp 418

Lenka, S. K., & Bairwa, A. K. (2016). Does financial inclusion affect monetary policy in SAARC countries? Cogent Economics & Finance, 4(1). doi:10.1080/23322039.2015.1127011

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. Journal of econometrics, 108(1), 1-24.

Mahendra, S. D. (2006). Financial Inclusion: Issues and Challenges. Econ. Political Weekly, 41 (41), 4310–4313.

Mbutor, M. O., & Uba, I. A. (2013). The impact of financial inclusion on monetary policy in Nigeria. Journal of Economics and International Finance, 5(8), 318–326.

Mehrotra, A. N., & Yetman, J. (2014). Financial Inclusion and optimal monetary policy. BIS Quarterly Review December, BIS Working Papers No 476

Mehrotra, A. N., & Yetman, J. (2015). Financial Inclusion-Issues for central banks. BIS Quarterly Review March 2015.

Nguyen, H. T. T. (2019). The interest rate sensitivity of output and prices with different levels of financial inclusion: Evidence from developing economies. Journal of Economics and Development.

Ouyang, A. Y., & Rajan, R. S. (2019). The impact of financial development on the effectiveness of inflation targeting in developing economies. Japan and the World Economy, 50(April), 25–35.

Pesaran, M. H., & Smith, R. (1995). Estimating long-run relationships from dynamic heterogeneous panels. Journal of econometrics, 68(1), 79-113.

Pesaran, M. H., Shin, Y., & Smith, R. P. (1997). Pooled estimation of long-run relationships in dynamic heterogeneous panels.

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. Journal of the American Statistical Association, 94(446), 621-634.

Safdar, S., & Khan, A. (2013). Financial innovation and monetary policy transmission mechanism in Pakistan. International Journal of Development and Sustainability, 2(1), 390-397.

Sinclair, S. P. (2001). Financial exclusion: An introductory survey. CRISIS, Edinburgh College of Art/Heriot-Watt University.