



Research Article

An assessment of central banking on unemployment and poverty: The case of Nigeria

Patrick Omoruyi Eke

Department of Banking & Finance, Lagos State University, Ojo, Nigeria

*Corresponding Author email: patrick.eke@lasu.edu.ng

Submitted: 02 February 2022

Revised: 13 May 2022

Accepted: 22 May 2022

ABSTRACT

This paper assesses the impact of Central Bank monetary policies on living standards in Nigeria from 1980 to 2017, using eclectic regression techniques. The outcome reveals that unemployment growth is positively sensitive to policy rates and money supply. Per capita income is negatively sensitive to policy rate, which suggests that policies do not address structural weaknesses that influence rapid price variations. The study thus fails to reject the hypothesis that Central Banking policies may be accentuating unemployment and poverty in Nigeria. The paper recommends low policy rate possibly at the middle of single digit; an indexed-wage system; and stoppage of money supply through ways and means.

Keywords: *Central Banking; Monetary Policy; Poverty; Unemployment*

1. INTRODUCTION

Since the 2009 global financial crises and the subsequent commodity price decline, many African economies have been facing economic hardship, amidst abundant natural resources. On average, until recent years, Africa's annual growth rate, in the periods following the global financial crises was 5 per cent (World Bank, 2013), which however, subsequently declined in response to fall in global primary commodity prices (Eke, 2017). It may suffice to reveal that the much talked about Africa's accelerated growth in the post-crises period has not generated better development outcome in terms of poverty reduction. The poverty risk in recent time also warrants the need for deeper evaluation of various economic transformation policies, institutional reforms and regulations. By the outcome of this study, what may be required for further poverty reduction in economies, such as Nigeria, may be drastic change in the roles of governments and her institutions on the long-term expansion of the financial system. Stiglitz (1998) cited in KirkPatrick (2000) argues that the financial system remains the 'brain' of the economy, as it helps to direct capital to where it can be most effective. Moreover, KirkPatrick (2000) further argues that whether a given economic growth rate impacts poverty reduction in a particular economy is largely a function of contemporary institutional structure and policy environment.

Institutional failings have overtime been cited as one of the major causes of increasing poverty and persistent underdevelopment in Africa (Fenske, 2010; WEF, 2017), such that despite the general acknowledgement that economic growth is most potent influencer of

poverty reduction (Ames et al., 2001), many African economies missed some basic minimum of the millennium development goals' (MDGs) socio-development targets on poverty, health-care, education, and others. Sadly, UNDP (2018) alleges that sub-Saharan Africa (SSA) currently accommodates the highest concentration of extreme poor people, living on less than \$1.25 a day, as at 2018. The report claims that about 42% of the world 1,334 million poorest live in SSA. As at 2021, the World Bank poverty report reveals that two-third of the world extreme poor resides in Africa, and it projects the failure of the first SDG goal (ending poverty) thereof in the region; that, as the trend persists, the ratio would rise to nine-tenth by 2030. The region also has the highest inequality ratio (Gini coefficient), as inequality and re-distribution constitutes major global incidence of poverty (World Bank, 2016a; World Bank, 2016b), consequently high intra-regional ethnic conflicts and insecurity.

Features of Nigeria's poverty as at 2018, reveals that about 44 % (80 million) Nigerians (180 million) were reported to be extremely poor; rated the poorest country in the world (Brooking Institute, 2018). Moreover, Nigeria is rated behind African peers on poverty reduction efforts (see table 1); the economy is characterized by massive food imports and driven by consumption-led growth (IMF, 2015), weak productivity due to poor infrastructure base. Other typical features of Nigerian poverty incidence include increasing regional disparity between the relatively advanced southern part and the highly improvised North; infrastructure deficits, poor entrepreneurial enabling environment, institutional failings and atrocious corruption, government reliance on primary commodity export for revenue, foreign exchange and income (Ogbeidi, 2012; Eke, 2017); an undeveloped financial system, that is perverted (Ojo, 2010).

The failings of monetary policies are onerous. On financial inclusion, a key poverty reduction enabler and panacea for credit constraint, there is correlation between financial inclusion and extreme poverty in developing countries, including Nigeria (World Bank, 2018). Access to credit has been tough for micro, small, and medium enterprises (MSMEs) that constitutes over 70 per cent of sources of employment, thus actually limiting growth over the years (IMF, 2015). Moreover, the Central Banks (henceforth, CB) may have often hurt the credit system, like in Nigeria, where it raises the deposit money banks' credit reserve ratio (CRR) to balance government's excess spending. The policy limits credit to private enterprise, and thus reduces government's much needed tax revenue. The vicious cycle ends up with government borrowing more to funding its spending; a characteristic and practice that fuels inflation, crowds-out the private sector, instituting culture of lazy banking, and hurting economic growth (Ojo, 2010; Hauner, 2006). On bank account ownership, mobile money services, digital and electronic finance, Nigeria's statistics is far behind peers like Kenya and South-Africa in this global financial inclusion revolution needed to drive the financial system to eliminating cash handling (World Bank, 2018). Suri and Jack (2016) found that in Kenya, women access mobile money services, as it enabled women-household to increase their savings by a fifth, and there-on changed the life of 194,000 from farming to business owners.

Based on consumption-based monetary poverty of \$1.90/day, the poverty phenomenon in some African economies from 1990 to 2018 is presented in table 1. The trend reveals that

Nigeria and next South-Africa constitute case of high poverty economies in sub-Saharan countries, while Egypt and Morocco produced negligible records.

Table 1. Monetary poverty (% on < \$1.90) trend in some African economies.

Years	1990	1992	1996	1999	2002	2005	2008	2011	2013	2015	2018 ^a
SSA	54.700	59.000	58.900	58.300	55.300	50.800	48.000	45.000	42.400	41.000	40.400
Nigeria		57.100	63.500	-	53.500	-	53.500	53.500	-	-	39.800
S.A.		31.700	36.600		35	26.100	16.900	18.900	-	18.900	-
Egypt	7.400	-	-	2.000	-	4.400	3.900	-	-	1.300	3.800
Morocco	2.900	-	-	-	-	-	-	-	1.0	-	-

Source: World Bank Development Research Group (2021).

[www.data.worldbankindicators.org](http://www.data.worldbankindicators.org;);

^astands for the most recent data for respective country.

SSA represents sub-Sahara Africa. –

indicates data not available.

1.1. CONCEPTUAL FRAMEWORK

Poverty is a multidimensional concept and a risk factor. Its nexus to finance gap, among the poor is onerous (UNDP, 2015; Agyemang-Badu et al., 2018). Presented in Fig. 1 is the functional transmission that targets poverty reduction, with the feedback loop to growth, such that interest rate that target capital deficiency of the poor for increased entrepreneurial capacity may be poverty reducing, and in a circular relationship, may increase growth. The framework provides that CB policies' effects may have influenced the peoples' living standards overtime. Central to effective monetary policy is the dear need for CB's independent structure that would assist to guarantee monetary and financial stability for better performance of monetary policies (Ojo, 2010).

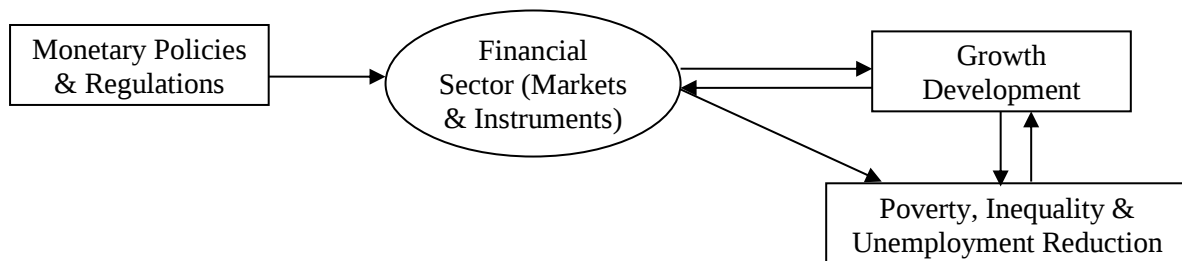


Fig. 1. Monetary Policy, Financial development and Poverty reduction transmissions

Source: Adapted from DFID (2004) with major modification

Presented in table 2 is the trend in lending rate (in %) from 1990 to 2020. The trend reveals that lending rate in Nigeria tops the other top economies in the region. A major consequence is that the investment capacity of Nigerians may have been lowest relative to peers (Obasanjo, 2017).

Table 2. Trend in average lending rates (in %): Nigeria relative to peers in Africa.

Years	1990	1993	1996	1999	2002	2005	2008	2011	2014	2017	2020
Nigeria	20.600	25.500	20.200	18.700	23.200	19.300	16.300	17.500	16.700	17.100	13.400
South Africa	18.700	18.500	17.600	19.900	14.500	12.300	13.200	10.200	8.800	10.200	7.700
Egypt	18.100	19.500	16.200	13.300	13.400	13.400	12.500	11.300	11.900	14.500	11.400
Morocco	9.000	-	10.000	13.600	13.200	11.800	-	-	-	-	-

Source: World Bank Development Indicators (2021),

data.worldbank.org – indicates data not available.

Following this foregoing, this study's research questions are as follows: to what extent do CB's policies promote employment of resources, and secondly, to what extent do CB's policies alleviate poverty in Nigeria. The objective is to establish whether CB's monetary policies promote employment and reduce poverty in Nigeria. The study makes the proposition that: there is no significant relationship between the CB's policies and unemployment growth in Nigeria; secondly, there is no significant relationship between the CB's policy rates and poverty reduction in Nigeria. The study's finding reveals that unemployment growth is positively sensitive to policy rates and money supply. Per capita income is negatively sensitive to policies, which suggest that the policies do not address structural weakness that may have been accentuating domestic prices.

2. THEORETICAL REVIEW OF LITERATURE

The New-institution theorists posit that rising détente of poverty in developing world may be traced to institutional failure (Acemoglu & Robinson, 2008; North, 1990). In general, the World Bank and the World Economic Forum have often theorized and categorized that underdevelopment challenges in developing economies are related to existence of poor institutions, limited infrastructure, and finance constraints in descending order. Many structuralist literatures have also linked nations' economic performance, critical to growth, poverty and unemployment reduction to the rightful macroeconomic policies, and the structure type, given rightful support of its institutions (North, 1990; Ojo, 2010). North (1990) regards institutions as an evolutionary measure of performance or otherwise, and claim that institutions create incentive structure for the economy to strive towards growth or stagnation.

The vicious circle of poverty reveals the interactions of human development variables; due to market imperfections from both the supply and demand side of capital deficiency tends to perpetuate low living patterns in developing countries (Jhingan, 2007). Nurkse (1953) regards poverty-circle as perpetuated with low capital formation, leading to low productivity and low real income. The ingredient of finance in economic development process was perhaps first recognised in the classic article of Gurley and Shaw (1955), following that, the outcome could permeate to reduce poverty (DFID, 2004). Financial development scholars further claim that financial structure may influence growth in different dimensions (Patrick, 1966; Goldsmith, 1969). Similarly, McKinnon (1973), Shaw (1973), and King and Levine (1993) link poor financial risk pricing, otherwise referred to as financial repression to low financial development, leading to poor growth rate and declining standard of living.

The microfinance and community banking model strategies for meeting credit needs of the micro, small, and medium enterprises (MSMEs) and the rural sector to improve rural sector productivity enroot poverty reduction for the marginalized have again been ineffective due to high lending and inflation rates (Taiwo et al., 2016). Following the weak domestic reforms to alleviate increasing poverty in developing countries, the World Bank initiated financial liberalization against the preponderance of financial repressions of the 1980s and 1990s. As part of financial liberalization, among other reforms, the World Bank pressed for foreign banks as potent solution to the very poor credit allocation to SMEs

(Stein, 2010). Foreign banks were to set the pace for competitiveness and attract domestic banks into lending to SMEs.

The theoretical nexus of monetary policy and poverty indicates that target economic activity is a function of policy rate rule (Taylor, 1993), while the rate of growth of financial intermediation and economic growth, enroot poverty reduction are inextricably linked (Zhuang et al., 2009; Greenwood & Jevanovik, 1990).

2.1. EMPIRICAL REVIEW

Macroeconomic policies may have direct link to growth and poverty. Bhorat et al., (2016) examined the poverty reduction power of growth, in their growth-poverty-inequality nexus in Africa. The study pointed out that when evaluating policies on growth and inequality, the initial state of inequality is pivotal to subsequent growth-inequality-poverty reduction. The study reveals that the elasticity is -0.7, meaning that a one percent increase in growth can only generate 0.7 reduction in poverty, compared to 2 per cent for the rest of the world, excluding China (World Bank, 2013).

Ames et al., (2001) examined the impact of macroeconomic outcome of investment, inflation, poor term-of-trade, etc, on the poor in Africa and Latin America. Overall, it reveals that stable macroeconomics is a prerequisite to growth and poverty reduction enhancement. In a recent study, the impact of monetary policy on long-term finance of SMEs in the ECOWAS region was examined by Quartey et al., (2017). Quartey et al., (2017) conclude that due to difficulties in accessing formal finance, SMEs in the region are constrained to informal finance, as conditionalities of lack of collateral, among others constitute huge limitation. In a closely related study on financial constraints of small firms in Nigeria and African economies, Ojo (2010), Fowowe (2017), and many others reveal that deposit money banks in Africa invest large percentage of their funds in government securities, rather than credit.

Nissanke (2017) examine the dynamics of pro-poor growth and pro-growth-poverty reduction challenges in sub-Saharan Africa over the last decades. The paper concludes that towards achieving inclusive development ambition would require reformation strategies through socio-economic transformation of African institutions, governance structural changes and new institutional foundation. Explained below are more country and cross-country empirical analysis of macroeconomic variables on poverty reduction.

Nwosa (2016) used ordinary least square to examine the impact of macroeconomic policies on poverty and unemployment in Nigeria from 1980 to 2013. The outcome reveals that fiscal policy and exchange rate impact poverty reduction. However, the paper was short of the monetary policy rate and money supply impact. Furthermore, Hussain and Haque (2017) used the vector error correction analysis technique to examine the nexus between money supply and per capita GDP growth rate in Bangladesh from 1972 to 2014. Broad money was found to have short-term and long-term impact on GDP per capita. Dingela and Khobai (2017) applied ARDL bound test to examine the dynamic impact of money supply on growth in South-Africa from 1980 to 2016. Money supply was found to impact economic growth in the short-term and the long-term. Rewilak (2017) used instrumental variable to

examine financial development impact on poverty across developing countries from 2004 to 2015; the paper reveals that financial access and its deepening are what influence poverty reduction out of the four indicators of financial development.

3. THEORETICAL FRAMEWORK AND METHODOLOGY

3.1. THEORETICAL FRAMEWORK:

Given the conceptual framework, the link between monetary policies and monetary poverty and unemployment may be established via the credit channel. Credit constraints could impede flow of capital to the poor and the investment industry (Beck, Demirgüç-Kunt, and Levine, 2004; Greenwood & Jovanovic, 1990). Taylor (1993) argues that a policy rate rule i_t framework needed to achieving target economic growth rate, enroot poverty reduction could be as follow:

$$i_t = r^* + \pi_t + \alpha(\pi_t - \pi^*) + \beta \left(100X \frac{Y_t - Y_t^*}{Y_t^*} \right) \quad (1)$$

Where i_t stands for policy rate, r^* is the real, natural rate of interest, π^* is target inflation rate of the CB, Y_t^* is potential output. Heffernan (2005) provides a simplified framework of the technical link between money supply (MS) and inflation rate (P) consistent with an output growth rate and target aggregate demand, represented as follows:

$$\hat{P} = MS - \hat{y} \quad (2)$$

y is real GDP growth rate. Similarly, interest rate management is expected to moderate price level towards achieving higher employment of resources and a target real GDP growth rate as represented:

$$\hat{P} = Irt - \hat{y} \quad (3)$$

Where $\hat{p}$ is rate of change in price level. Irt is interest rate. An increase in the policy rate would be passed on through the banking system to producers and consumers in higher lending rate that may weaken the investment capacity and raise unemployment. This implies that interest rate determination has strategic influence on growth and poverty (Ames et al., 2001).

3.2. DATA AND METHODOLOGY:

This study employed annual secondary data obtained from the Central Bank of Nigeria (CBN) statistical bulletin, and the National Bureau of Statistics. The study uses per capita income (Pci) and unemployment rate to measure the impact of CBN's monetary policies, while gross domestic product is control variable. Details of data descriptions, sources, measurement and justification are presented in table 3.

Table 3. Data Description, Sources and Justification

Description	Source/Measurement	Literature justification
Pci= Per capita income	GDP per capita; Central Bank of Nigeria statistical bulletin	Hussain and Haque (2017)
Umr= Unemployment	Nigerian Bureau of Statistics	Nwosa (2016)
Mpr=Monetary policy rate	Central Bank of Nigeria Statistical Bulletin	Goshit and Longduut (2016).
Ms2= Broad money supply	Central Bank of Nigeria Statistical Bulletin	Goshit and Longduut (2016). Hussain and Haque (2017). Dingela and Khobai (2017)
Gdp = Gross domestic product	Central Bank of Nigeria Statistical Bulletin / control variable	Rewilak (2017)

Sources: Compiled by the author (2019)

Been I(1) data series, the study employed granger causality and fully modified ordinary least square (FMOLS) for the long-run regression. Johansen co-integration is adopted to establish long-run relationship, while vector-autoregression is adopted to produce the error correction mechanics (Johansen, 1988; Johansen and Juselius, 1992). Finally, the generalized method of moment (GMM) was also applied for robustness check. In general, theoretical connection exists between the ARDL and ECM. Engle and Granger (1987) argue that if two variables are co-integrated then a dynamic error correction mechanism (ECM) exists. A simplified form is modified from Verbeek (2004) as follows:

$$Y_t = \delta + \phi Y_{t-1} + \gamma_0 X_t + \gamma_1 X_{t-1} + \varepsilon_t \quad (4)$$

From equation 4, the long-run equilibrium relationship between Y and X results by subtracting Y_{t-1} from both side and following transformation process, an ECM model could be formed as follows:

$$\begin{aligned} \Delta Y_t &= \delta - (1-\phi)Y_{t-1} + \gamma_0 \Delta X_t + (\gamma_0 + \gamma_1)X_{t-1} + \varepsilon_t & \text{or} \\ \Delta Y_t &= \phi_0 \Delta X_t - (1-\phi)[Y_{t-1} - \alpha - \beta X_{t-1}] + \varepsilon_t \end{aligned} \quad (5)$$

α and β are the long-run equilibrium multipliers of a unit change in X_t . It connotes that change in Y_t responds to current change in X_t plus an error correction term, and $(1-\phi)$ is the adjustment parameter that determines the speed of adjustment, the current error in achieving long-run equilibrium.

3.3. MODEL SPECIFICATION:

In implicit form, a multivariate model is presented in equation 6, of which unemployment (Umr) and per capita income (Pci) may be sensitive to monetary policy- money supply (Ms) and monetary policy rate (Mpr), while economic growth (Gdp) is control variable. National income and per capita income are recursively linked in equations 7 and 8:

$$Umr, Pci = f(Mpr, Ms2, Gdp) \quad (6)$$

$$Y = f(Ms, Mpr) \quad (7)$$

$$Pci = f(Y) \quad (8)$$

From the broad equation 6 two empirical propositions on unemployment (Umr) and poverty (Pci) are presented, with their *a priori* expectations, as follows in equations 9 and 10:

$$Umr_t = f(Mpr_{t-i}, Ms2_{t-i}, Gdp_{t-i}, \varepsilon_t) \quad (9)$$

+ - -

$$Pci_t = f(Mpr_{t-i}, Ms2_{t-i}, Gdp_{t-i}, \varepsilon_t) \quad (10)$$

- +/- +

The model expects policy rate to be negative influencer of unemployment and poverty, while money supply should be negatively linked to unemployment but with either positively or negative link to monetary poverty. The negative linkage is with respect to Milton Friedman's long-run impact of unregulated Ms2 (Pressman, 2006). The specifications are presented more formally in log form, including the short-run ECM term, below:

$$\Delta Pci_t = \alpha_0 + \sum_j^p \gamma_j \Delta Mpr_{t-i} + \sum_j^p \phi_j \Delta Ms2_{t-i} + \sum_j^p \varsigma_j \Delta Gdp_{t-i} + \xi z_{t-1} + \varepsilon_t \quad (11)$$

$$\Delta Umr_t = \alpha_0 + \sum_j^p \gamma_j \Delta Mpr_{t-i} + \sum_j^p \phi_j \Delta Ms2_{t-i} + \sum_j^p \varsigma_j \Delta Gdp_{t-i} + \xi z_{t-1} + \varepsilon_t \quad (12)$$

It is assumed that $\varepsilon_t \sqcup \text{iid } (0, \sigma^2)$, a white noise process, while z_{t-1} is the ECM term.

4. ESTIMATED RESULTS AND POLICY IMPLICATIONS

4.1. CORRELATION ANALYSIS:

Correlation results in table 4 provide associated relationship among the variables. Against the *a-priori* term, monetary income and poverty variable and unemployment measured by the per capita income (Pci) and unemployment (Umr) share positive relationship. It suggests that growth in per capita income is accompanied with increased unemployment in Nigeria. The result may suggest the non-inclusive growth potency of the Nigeria economy overtime, as often stated by global institutions such as International Monetary Fund (IMF), the World Economic Forum (WEF), and the World Bank (2014).

Table 4. Correlation matrix

	Pci	Umt	Ms2	Mpr	Gdp
Pci	1.0000				
Umt	0.907	1.000			
Ms2	0.613	0.516	1.000		
Mpr	0.991	0.892	0.599	1.000	
Gdp	0.990	0.884	0.650	0.996	1.000

Source: Computed by the author (2019)

4.2. LAG LENGTH ORDER:

The maximum lag selection order chosen by majority of the criterion is 1. It informed the extent of restrictions in the conditional vector error correction regression presented

4.3. UNIT ROOT ANALYSIS:

Using three techniques- see table 5, the five variables are first differenced stationary. The uniform stationary properties of the variables suggest applications of the Granger-causality and ordinary least square methodologies for long-run co-integration regression study and, thus determination of the ECM.

Table 5. Unit root tests

Methods	Augmented Dickey-Fuller		DF-GLS Test		Phillips-Perron Test		Remark
Variables	Test stat.	Station. @	Test stat.	Station. @	Test stat.	Station. @	
IPci	-7.386**	I(1)	-6.548**	I(1)	-8.482**	I(1)	differenced
IUmr	-8.230**	I(1)	-3.366*	I(1)	-8.846**	I(1)	differenced
IMpr	-8.320**	I(1)	-8.475**	I(1)	-8.504**	I(1)	differenced
IMs2	-4.541**	I(1)	-4.298**	I(1)	-4.541**	I(1)	differenced
IGdp	-6831**	I(1)	-6.954**	I(1)	-7.137**	I(1)	differenced

Source: Computed by the researcher (2019). * and ** denotes 0.05, and 0.01 levels of significance respectively. I Test statistics is for constant and trend models. Station. indicates stationary.

4.4. GRANGER-CAUSALITY RESULT:

Causality in time series reveal whether one variable has information that helps to forecast future values of another (Sollis, 2012), which may result in four possible outcomes: bidirectional; unidirectional- pairwise; and no-causality (Asteriou and Hall, 2011). Therefore, presented in table 6 are the results of the causal relationships between the variables. In line with *a priori*, the first row reveals that unemployment and poverty significantly predicts one another. An increased in unemployment of economic resources (Umr) directly leads to increase in monetary poverty, that is per capita income (Pci) and vice versa. Very close to this nexus is the second row where money supply and monetary poverty share significant bi-directional relationship. It implies that money supply, a growth variable, could impact monetary poverty in bi-directional order, a theorem arguably with precursor in David Hume's (Pressman, 2006) theory of money. An increased per capita income (Pci) may imply growth of economic activity, that requires increased money supply (Ms2) (Dingela and Khobai, 2017; Nallari and Griffith, 2011).

The money supply and unemployment nexus can be affected through the financial market, given the mechanisms of monetary and credit channels (Sanusi, 2002). Increase in money stock could cause interest rate to fall, thus enabling the banking and the business public to adjust their portfolios, then, as a result, investment and economic activities are enhanced, leading to increased employment. Similarly, the causal relationship between money supply and Gdp growth is analogous to that of Ms2 and unemployment, and likewise Pci. Increased Ms2 may improve purchasing power of consumers and spur business investments and consumption expenditure to increase economic growth.

Table 6. Ganger causality test results

Causal variables	Obser.	F. stat.	Prob. value
Umr → Pci	48	11.649**	0.001
Pci → Umr		7.867**	0.007
Ms2 → Pci	48	4.459**	0.040
Pci → Ms2		26.900**	5.E-06
Gdp → Pci	48	4.003*	0.052
Pci → Gdp		11.877**	0.001
Ms2 → Umr	48	6.409*	0.015
Umr → Ms2		7.326**	0.010
Gdp → Umr	48	7.232**	0.010
Umr → Gdp		38.911**	1.E-07
Gdp → Ms2	48	28.829**	3.E-06
Ms2 → Gdp		0.220	0.641

Source: By the author (2019). * and ** denote 0.05 and 0.01 levels of significance respectively.

4.5. JOHANSEN CO-INTEGRATION TEST: UNEMPLOYMENT AND MONETARY POVERTY EQUATIONS

Co-integration methodology is employed for the long-run regression estimates (Eagle and Granger, 1987), following the I(1) variables. Presented in table 7 are the co-integration test results of the Trace and Eigen-value tests statistics. The two equations and techniques produce test results which suggest existence of co-integrating vectors (Johansen, 1988; Johansen and Juselius, 1992). Next, to established co-integration, is the error-correction test presented in the vector error correction mechanism (VECM) (Eagle and Granger, 1987), contained in the regression result of tables 9 and 10.

Table 7. Unrestricted co-integration rank test

Equation & test	Hypo. no of CE(s)	Eigen value	Trace Stat.	Critical value 0.05	P. value**
Unemployment-trace	(2). At almost 1*	0.586	62.881	47.856	0.001
Unemployment-eigen value	(2). At almost 1*	0.585	41.386	27.584	0.001
Monetary policy- trace	(1). None*	0.502	65.826	55.246	0.004
Monetary policy- eigen value	(2). At almost 1*	0.434	26.207	24.252	0.027

Source: Computed by the author (2019).

* denotes rejection of the hypothesis at the 0.05 level.

**MacKinnon-Haug-Michelis (1999) p-values

4.6. DIAGNOSTICS:

The following diagnostics results in table 8 are the underpinning statistical criteria for the econometric model tested. They are residual serial correlation test; Ramsey (1969) reset model specification (functional) test; model normality test; and residual heteroskedasticity (Breusch-Pagan-Godfrey) test. The study fails to reject the null hypotheses in the four diagnostics.

Table 8. Diagnostics statistics

Test Statistics	LM Version	F Version
A: Serial correlation	54.840*(49) [0.260]	Not applicable
B: Functional form	0.359 (44) [0.720]; 0.41* (1)[0.710]	0.129 (1,44) [0.720]
C. Normality- Umt	1.177** [0.551]	Not applicable

Test Statistics	LM Version	F Version
D. Normality- Pci	3.439** [0.179]	Not applicable
E. Heteroskedasticity	796.5*** (2) [0.124]	1.996 (3,45) [0.128]

Source: Author's computation (2019).

* Edgeworth expansion corrected likelihood ratio statistic.

** is Jacque Bera statistics;

*** indicates χ^2 statistics figure for no cross-term value.

(...) is degree of freedom;

[...] is probability value. The serial correlation is at required P-Lag of 2

4.7. MODEL STABILITY TEST:

The inverse root test was conducted, with the 5 variables AR characteristic points appear within the unit circle. It suggests that the model would be stable in the long-term.

4.8. ANALYSIS OF REGRESSION RESULTS:

Tables 9 and 10 contain the empirical results of the four techniques. In the first hypothesis on the impact of monetary policies on unemployment, the results are mixed. Against *a priori*, the OLS, FMOLS and GMM coefficients reveal negative functional sensitivity on resource unemployed from policy interest rate, while the VECM result reveal positive impact. Given the error correction mechanism, the VECM result seems more plausible as the coefficient agrees with *a priori*, and it is statistically significant. The result indicates that a 1 per cent rise in policy rate proportionately raises the unemployment of resources in Nigeria by about 735 per cent. An increase in policy rate could be discouraging to investments, in a capital scarce economy like Nigeria. Here, investment that reduces unemployment is generally associated with the business sector addition to physical stock of capital, including inventories (Dornbusch, Fischer, and Startz, 2011). It implies that an increase in policy rate may reduce the employment of resources, as physical productivity would reduce, and hence raise the unemployment rate.

On the money supply policy impact on unemployment rate, *a priori* expects negative relationship. The OLS and GMM test produce negative relationship, albeit insignificant, while VECM and FMOLS produce positive link. On the unemployment and GDP nexus, the VECM, reveals that the overall economic growth (that is, GDP) has significant negative impact on unemployment. It indicates that a 1 per cent rise in economic growth can proportionately reduce unemployment by 105 per cent. The result satisfies the short-time business cycle theory, that is, the economy's fluctuation overtime impacts actual investment process, and hence reduction in resource employment. The overall ECM result produced negative annual speed-of-adjustment coefficient of 4 per cent in line with *a priori* and it is significant. This mechanism measures the rate at which the unemployment rate equation adjusts to the disequilibrium $\hat{\varepsilon}_{t-1}$ for the co-integrated variable (Sollis, 2012).

Hypothesis two (2) proposes that monetary policies do not have significant long-term impact on poverty, measured by the per capita income. It has its result provided in table 10. The VECM result satisfies the *a priori* which reveals that policy rate is a significant negative function of per capita income (*Pci*). This result also seems plausible, as it suggests that, a 1 percent increase in policy rate may proportionately induce reduction in per capita income by 313 percent. The results of the Least Squared and FMOLS techniques reveal negative

function, albeit insignificant. On money supply impact on poverty, the results are mixed; while VECM reveals long-term negative influence on poverty, the OLS, FMOLS and GMM techniques results satisfy *a priori* expectation, which suggest that poverty reduction is a significant positive function of money supply, while VECM claims the nexus is negative. The result of the earlier three techniques agree with Hussain and Haque (2017), which find that money supply is a positive function of growth in Bangladesh. Similarly, expectedly the four techniques reveal that the GDP coefficients are of significant positive function of per capita income. The negative error correction adjustment function is significant. The function suggests that 9 per cent is the speed of short-run period adjustment to long-run equilibrium for the poverty reduction equation.

Table 9. Unemployment (Umr) equation

Dependent variable: LUmr	OLS	VECM	FMOLS	GMM
LMpr(-1)	-0.145 (0.137)	7.353** (1.960)	-0.009 (0.319)	-0.144 (0.197)
LMs2(-1)	-0.019 (0.049)	9.239** (2.598)	0.369 (0.411)	-0.042 (0.065)
LGDP(-1)	0.283** (0.054)	-10.57** (2.771)	-0.121 (0.437)	0.321** (0.063)
ECM(-1)	-	-0.041* (0.025)	-	-
R ²	0.777	0.195	0.786	0.748
Adj. R ²	0.767	0.097	0.771	0.736
Std. error of regression	0.431	0.362	0.427	0.448
S.D. of dep. Var./ Instr. Variable	0.893	-	-	7
Long-run variance	-	-	0.407	-
F Stat./ J-stat.	-	1.991	-	1.561
Prob. (J. stat)	-	-	-	0.816

Source: Computed by the author (2019).

* and ** are significant at 0.05 and 0.01 respectively.

Table 10. Monetary poverty (Pci) equation

Dependent variable: LPci	LS	VECM	FMOLS	GMM
LMpr(-1)	-0.072 (0.127)	-3.138** (0.935)	-0.035 (0.176)	0.151 (0.135)
LMs2(-1)	0.565** (0.04)	-5.879** (1.454)	0.552** (0.065)	0.465** (0.043)
LGDP(-1)	0.324** (0.050)	3.962** (1.156)	0.355** (0.072)	0.443** (0.047)
ECM(-1)	-	-0.094* (0.052)	-	-
R ²	0.981	0.14	0.984	0.982
Adj R ²	0.980	0.008	0.983	0.981
Std. error of regression	0.398	0.316	0.371	0.375
Std. dev. of Dep. Var. / Inst. Var.	-	-	-	7
Long-run variance	-	-	0.305	-
F. stat./ J.stat.	-	1.068	-	2.958
Prob. (J. stat)	-	-	-	0.565

Source: Computed by the author (2019).

* and ** are significant at 0.05 and 0.01 respectively

4.9. POLICY IMPLICATIONS OF FINDINGS:

The first hypothesis (see result in table 9) finds that interest rate is a positive function of unemployment in Nigeria. In other words, high interest rate could reduce employment capacity of firms. Empirical evidences have long discovered this nexus, by previous studies, that lending rate has been a negative function of loans and advances (Knoop, 2013; Ojo, 2010; Olokoyo, 2006). The higher the real interest rate the lower the incentive to borrow and invest and vice versa (CBN, 2016). This experience may be responsible for the increasing rate of unemployment in Nigeria, as many non-finance and finance firms are winding up on account of accumulated debt and non-performing loan. Actual and effective lending rate in Nigeria hovers around 30 per cent or more as at 2018 (CBN, 2018), a serious disincentive for the business and investment environment.

Investment expenditure remains the most unstable in the macroeconomic structure of aggregate demand in many developing economies, perhaps due to higher lending rates, as interest rate is directly linked to investment, productivity and employment of resources (Pindyck and Salimano, 1993). A further implication is the likelihood that higher interest rate may render the productive investments to be unviable and hence increase the quantum of non-performing loans (Ojo, 2010).

The finding that money supply policy has positive impact on unemployment, may be reasoned that, increased money supply ought to reduce cost of capital, however given the experience of higher interest rates and other restrictions to private investors, there is no impact on unemployment reduction. Government remains the major investor in the Nigerian economy, and has been borrowing to invest and consume (Eke, 2017). As at 2018 the Central Bank of Nigeria has lent the Government excess of 7 trillion Naira (19.44 billion USD), which may have constituted the bulk of money supply sources. A consequence of inefficient investment process is inflation growth, that has remained in second digit in Nigeria.

Furthermore, it is found that economic growth (GDP) is a negative function of unemployment. It may imply that as control variable, other than private investment, the other explanatory variable of aggregate demand, such as steady growth in private consumption and government expenditures and net-export would have impacted to reduce unemployment rate. Private investment has been low and unstable in Nigeria (Adeboye and Alimi, 2017).

The second hypothesis (see result in table 10), reveals that income poverty (P_{ci}) is a negative function of the monetary policy rate (M_{pr}). Income poverty can be reduced if the peoples' borrowing power is enhanced, by cheap and accessible credit, through low interest rate, such that potential entrepreneurial skill can be exploited. Normally, CB's policy rates are fixed to hold back inflation, however the impact of higher inflation rates on labour wage rate and the return on investment are onerous and matters. Inflation pressure has its root in structural problems that limit productivity such that there is always supply gap. Thus, inflation in Nigeria has been in the second digit, often beyond the limits of the CB planned targets. Consequently, inflation in Nigeria would have been of negative effects on the economy and growth (Nallari and Griffith, 2011).

The LS, FMOLS, and GMM reveal that per capita income is a positive function of money supply. The result suggests that money supply remain a strong poverty reduction instrument when applied steadily in Nigeria. The result finds evidence in theoretical postulations, such as the Taylor rule, and the results find semblance in Hussain and Haque (2017) finding in Bangladesh, and Dingela and Khobai (2017) finding in South Africa.

Finally, gross domestic product is found to be positive function of poverty reduction. Policies that focus on increasing the economic growth need to be encouraged, particularly investment policies that are endogenous and improve domestic production

5. SUMMARY AND CONCLUSION

Given that the root causes of unemployment and poverty remain inconclusive, this paper assesses the monetary policies' long-term impact on unemployment and poverty reduction, with Nigeria as case study. The paper adopted eclectic regression techniques. The outcome reveals that unemployment rate is positively sensitive to both monetary policies (policy rate and money supply); while Per capita income is negatively sensitive to both variables. The results suggest that poorly conceived monetary policies and weak regulations may be have declined the peoples' living standards, measured by income per capita and unemployment rate. The study therefore concludes that, holding fiscal policy impact constant, it fails to reject the hypothesis that CB's policies accentuate unemployment and long-term income poverty in Nigeria.

6. RECOMMENDATIONS

This study recommends as follows: First, CB in developing countries should employ low policy rate regime, perhaps at the middle of single digit towards a medium-term to long-term economic growth objectives rather than a short-term myopic view of the economy. This should target unemployment reduction, by accelerating the level of economic activities, and hence a higher economic growth rate as their major policy pills, rather than the orthodox inflation targeting policy. Secondly, the money supply negative impact on monetary poverty would require managed money supply process, and the CB's encouraging indexed-wage system for the economy at both the private and public sector. Policy would require fiscal compliment, to address structural problems on rising poverty in Nigeria. Finally, being an economic and social institution, the CB has a social/public responsibility for understanding that 'ways and means' financing of the government ultimately transfers inflation to the public, hence its stoppage.

Reference:

- Adegboye, A. A. & Alimi, R. S. (2017). Public-Private Investment Nexus in Developing Economies: Does Financial Sector Development Matter for Nigeria? *MPRA*, retrieved from Online at <https://mpa.ub.uni-muenchen.de/80908/>, cited Jan. 02, 2020, 1-16.
- Agyemang-Badu, A. A., Agyei, K., & Duah, K. E. (2018). Financial Inclusion, Poverty and Income Inequality: Evidence from Africa. *Spirit International Journal of Poverty Studies*, 2(2), 1-20
- Ames, B., Brown, W., Devarajan, S., & Izquierdo, A. (2001). *Macroeconomic Policy and Poverty Reduction. Draft for Comments*. April., IMF and The World Bank.

- Acemoglu, D. & Robinson, J. (2008) The Role of Institutions in Growth and Development. *The International Bank for Reconstruction and Development/ The World Bank*, WP.10,1-44
- Asteriou, D. & Hall, G. S. (2011). *Applied Econometrics*, 2nd Edition, Palgrave Macmillan, 319-333
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2004). Financial, Inequality, and Poverty: Cross-Country Evidence. *NBER Working paper 10979*. National Bureau of Economic Research, Cambridge, MA.
- Bhorat, H., Naidoo, K., & Pillay, K. (2016). Growth, Poverty and Inequality Interactions in Africa: An Overview of Key Issues. United Nations Development Programme Regional Bureau for Africa (RBA). Inequality Project. *UNDP-RBA/WPS 1/2016*. Retrieved from <https://ageconsearch.umn.edu › record › files>, cited Oct. 17, 2021.
- Brooking Institute (2018). The start of a new poverty narrative. Retrieved from <https://www.brookings.edu/blog/future-development/2018/06/19/the-start-of-a-new-poverty-narrative/> cited Nov. 10, 2020
- CBN (2018). 2018 Statistical Bulletin- Financial sector. Central Bank of Nigeria (CBN), Abuja, Nigeria. www.cbn.org
- CBN (2016). *Education in Economic Series No 3. Interest rate*. Central Bank of Nigeria, Research Department, 3-4
- DFID (2004). The importance of financial sector development for growth and poverty reduction. Policy Division Working Paper, issued by the Policy Division, Department for International Development, DFID, 1 Palace Street London, UK
- Dingela, S. & Khobai, H. (2017). Dynamic impact of Money Supply on Economic Growth in South Africa. An ARDL Approach. Online at [https://mpira.ub.uni-muenchen.de/82539/MPRA_Paper No. 82539](https://mpira.ub.uni-muenchen.de/82539/MPRA_Paper_No.82539), accessed online Dec. 27, 2019, 1-19
- Dornbusch, R., Fischer, S., & Startz, R. (2011). *Macroeconomics*. Eleventh edition. International edition. McGraw-Hill, 22-50; 219-282
- Eagle, F. R. & Granger, W. J. C. (1987). Co-integration and error correction: representation, estimation and testing. *Econometrica*, 55, 251-276
- Eke, P. O. (2017). *Interest Rate Macrostructure, Corporate Bond Market Development and Industrial Output in selected African Economies*. A Ph.D Thesis. Available <http://eprints.covenantuniversity.edu.ng/12955/1/Binder1.pdf>.
- Fenske, J. (2010). Institutions in African history and development: a review essay. *Munich Personal RePEc Archive*. Cited online at [https://mpira.ub.uni-muenchen.de/23120/MPRA_Paper No. 23120](https://mpira.ub.uni-muenchen.de/23120/MPRA_Paper_No.23120), accessed Jan. 25, 2019
- Fowowe, B. (2017). Access to finance and firm performance: Evidence from African countries. *Review of Development Finance* 7, 6-17
- Goldsmith, W. R. (1969). *Financial structure and development*, CT, Yale University Press, New Haven.
- Goshit, G. G. & Longduut, G. T. (2016). Indirect Monetary Policy Instruments and Poverty Reduction in Nigeria: An Empirical Evidence from Time Series Data. *International Journal of Academic Research in Business and Social Sciences*, 6(4), 86-101
- Greenwood, J. & Jovanovic, B. (1990). Financial development, Growth and the distribution of Income. *The Journal of Political Economy*, 98 (5), part 1, 1076-1107
- Gurley, G. J. & Shaw, S. E. (1955). Financial aspects of economic development. *The American Economic Review* 4 (45), 515-538
- Hauner, D. (2006). Fiscal Policy and Financial Development. *IMF WP 06/26*, 1-26
- Heffernan, S. (2005). *Modern Banking*. John Wiley & Sons, Ltd, 30-32

- Hussain, M. E. & Haque, M. (2017). Empirical Analysis of the Relationship between Money Supply and Per Capita GDP Growth Rate in Bangladesh. *Journal of Advances in Economics and Finance*, 2(1), February, 53-66
- IMF (2015). Nigeria: Selected Issues. *IMF Country Report* No. 15/85. Retrieved from <https://www.imf.org/external/pubs/ft/scr/2015/cr1585.pdf>, cited Jan. 4, 2020
- Jhingan, M. L. (2007). *The Economics of Development and Planning*, 39th edition. Vrinda Publications (P) Ltd: 292xvii-292xxxi, 31-38
- Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and control*, 12(2-3), 231-254
- Johansen, S. & Juselius, K. (1992). Testing structural hypothesis in a multivariate cointegration analysis of the PPP and the UIP for UK. *Journal of Econometrics*, Elsevier, 53 (1-3), 211-244
- King, G. R. & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 108 (3), 717-737.
- Kirkpatrick, C. (2000). Financial development, economic growth, and poverty reduction. *The Pakistan Development Review*, 39 (4) Part I (winter), 363-388
- Knoop, A. T. (2013). Global Finance in Emerging Market Economies. *Routledge International Studies in Money and Banking*. Taylor and Francis Group. London and New York, 118-135, 165-186
- MacKinnon, J.G., Haug, A.A., & Michelis, L. (1999). Numerical distribution functions of likelihood ratio for cointegration. *Journal of Applied Econometrics* 14, 563-577
- McKinnon, I. R. (1973). *Money and capital in economic development*. Brookings institution, Washington, D.C., United States.
- Nallari, R. & Griffith, B. (2011). *Understanding Growth and Poverty. Theory, Policy, and Empirics. Direction in Development. Poverty*. The World Bank. Washington D.C. www.worldbank.org, 99-111
- Nissanke, M. (2017). Introduction: Tracing Poverty Dynamics in Sub-Saharan Africa: Recent Progress and Future Challenges, in *Poverty Reduction in the course of African Development*, Nissanke Machiko and Ndulo, Muna (eds). From Center for studies on African Economics (CSAE), Oxford University published to Oxford Scholarship Online www.oxfordscholarship.com, April 2017, accessed Jan. 2, 2020.
- North, C. D. (1990). *Institutions, Institutional Change, and Economic Performance*. New York: Cambridge University Press
- Nurkse, R. (1953). *Problems of Capital Formation in Underdeveloped Countries*. Oxford: Oxford University Press.
- Nwosa, P. (2016). Impact of Macroeconomic Policies on Poverty and Unemployment Rates in Nigeria, Implications for Attaining Inclusive Growth. *Acta Universitatis Danubius (AUDCE) (Economica)*, 12(2), 114-126
- Obasanjo, A. O. (2017). Obasanjo reveals what current interest rate will do to Nigeria's economy. *Daily Post*, <http://dailypost.ng/2017/09/29/obasanjo-reveals-current-interest-rate-will-nigerias-economy/>, accessed Nov. 2, 2017.
- Ogbeidi, M. M. (2012). Political Leadership and Corruption in Nigeria since 1960: A Socio-economic Analysis. *Journal of Nigeria Studies*, 1(2), 1-25
- Ojo, T. A. (2010). *The Nigerian Maladapted Financial System: Reforming Tasks and Development Dilemma in Nigeria*. Chartered Institute of Banker Press, Nigeria, 154-174.
- Olokoyo, F. O. (2006). Determinants of Banks' lending Behaviour (A case study of Commercial Banks in Nigeria). M.Sc (Banking and Finance) unpublished dissertation, Covenant University, Ota, Nigeria

- Patrick, T. H. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change* 14, 174-189.
- Pressman, S. (2006). *Fifty Major Economists*, Second Edition. Routledge, Taylor & Francis Group. London and New York, 28-32
- Pindyck, S. R. & Solimano, A. (1993). Economic Instability and Aggregate Investment. *Massachusetts Institute of Technology and the World Bank*, 260-303
- Quartey, P., Turkson, E., Abor, J. Y., & Iddrisu, A. M. (2017). Financing the growth of SMEs in Africa: What are the constraints to SME financing within ECOWAS?. *Review of Development Finance* 7(1), 1-11
- Ramsey, J. B. (1969). Tests for specification errors in classical least squares regression analysis. *Journal of the Royal Statistical Society, Series B* 31, 350-71.
- Rewilak, J. (2017). The role of financial development in poverty reduction. *Review of Development Studies* 7(2), 169-176
- Sanusi, O. J. (2002). Central Bank and the Macroeconomic Environment in Nigeria. Being a lecture delivered to participants of the Senior Executive Course No. 24 of the National Institute for Policy and Strategic Studies (NIPSS), Kuru on 19th August, 1-19
- Shaw, S. E. (1973). *Financial deepening in economic development*, New York. Oxford University Press, 19.
- Sollis, R. (2012). *Empirical Finance for finance and banking*. First Edition. Wiley. A John Wiley & Sons Ltd Publication, 7-48
- Stein, H. (2010). Financial liberalization, institutional transformation and credit allocation in developing countries: the World Bank and the internationalization of banking. *Cambridge Journal of Economics*, 34, 257-273
- Stiglitz, E. J. (1998). Knowledge for Development: Economic Science, Economic Policy and Economic Advice. Address to the World Bank's 10th Annual Conference on Development Economics, April.
- Suri, T. & Jack, W. (2016). The long-run poverty and gender impacts of mobile money. *Science*, 354 (6317), 1288-1292
- Taiwo, N. J., Falohun, T., & Agwu, M. E. (2016). SMEs financing and its Effects on Nigerian economic growth. *European Journal of Business, Economics and Accountancy*, 4(4), 37-54
- Taylor, B. J. (1993). Discretion versus Policy rules in practice. *Carnegie-Rochester Conference Series on Public Policy* 39 North-Holland, 195-214
- UNDP (2015). *Work for Human Development*. 25 Years of Human Development. Human Development Report 2015.
- UNDP (2018). *The 2018 Global Multidimensional Poverty Index (MPI)*. Retrieved from <http://hdr.undp.org/en/2018-MPI>, accessed Jan. 17, 2019
- Verbeek, M. (2004). *A Guide to Modern Econometrics*, 2nd edition. John Wiley & Sons, Ltd, 309-385.
- WEF (2017). The Inclusive Growth and Development Report 2017. *World Economic Forum, Geneva*, 1-75
- World Bank (2013). *Africa's Pulse: An Analysis of Issues Shaping Africa's Economic Future*. World Bank, Washington, D.C, 1-26
- World Bank (2014). Ending poverty requires more than growth, says WBG. The World Bank, retrieved from <https://www.worldbank.org/en/news/press-release/2014/04/10/ending-poverty-requires-more-than-growth-says-wbg> cited Jan. 3, 2020.
- World Bank (2016a). *Taking on Inequality*. The World Bank Group, 1818 H Street, N.W. Washington, DC 20433 USA, www.worldbank.org

- World Bank (2016b). *Poverty and Shared Prosperity: Taking on Inequality*. The World Bank Group, 1818 H Street, N.W. Washington, DC 20433 USA. www.worldbank.org/psp
- World Bank (2018). Measuring Financial Inclusion and the Fintech Revolution: Overview. The Global Findex database, 2017, The World Bank Group
- World Bank Development Indicators (2021), data.worldbank.org. accessed Dec. 20, 2021.
- World Bank Development Research Group (2021). www.data.worldbankindicators.org., accessed Dec. 20, 2021.
- Zhuang, J., Gunatilake, H., Niimi, Y., Khan, M. E., Jiang, Y., Hasan, R., Khor, N., Lagman-Martin, A., Bracey, P., & Huang, B. (2009). Financial Sector Development, Economic Growth, and Poverty Reduction: A Literature Review. *ADB Economics Working Paper Series*, No. 173, Asian Development Bank (ADB), Manila