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# Economic Growth-Financial Deepening- Poverty Nexus in Rwanda

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**Abstract:** The study examined the relationship between economic growth, financial deepening, income distribution, financial efficiency and poverty level in Rwanda an East African Community country. The specific objectives of the study included establishing the direct effect of economic growth on poverty level in Rwanda; determining the indirect effect of financial deepening, income distribution, financial efficiency on poverty level in Rwanda. The study adopted descriptive research designs. Annual data for 30 years beginning 1989 to 2018 was gathered for the study purpose. Secondary data, which consisted of annual data, was utilized in the study. The study employed normality, heteroscedasticity, multicollinearity, serial correlation, optimal lag test, unit root diagnostic tests, cointegration test. The data was analyzed using inferential statistics with the help of excel and STATA version 14. Inferential statistics analysis was performed based on Autoregressive Distributed lags (ARDL) model to ascertain the causal effect link between various variables relating to economic growth, financial deepening, income distribution, financial efficiency and poverty levels in Rwanda. The study results revealed that economic growth had a significant direct effect on poverty level in Rwanda. The study also revealed that financial deepening and income distribution had a significant indirect effect on poverty in Rwanda. The study recommends that the government should put down concrete plans aimed at improving economic growth rates. In addition, the governments of Rwanda countries to work towards encourage financial deepening within their respective countries.

**Keywords:** Economic growth, financial deepening, income distribution, financial efficiency and poverty

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## 1. Introduction

Generally, the economies in financial and general sectors in particular in the member states of the East African Community (EAC) that Rwanda is a member, have been growing with the exception of 2012 that was severely affected by the effects of global financial crisis (Rousseau and Wachtel, 2017, Obuya and Olweny, 2017). The financial sector's average growth rate has been at about seven percent. However, the poverty status has remained quite high at the ranges of 46%. The poverty status report by World Bank (2017) indicates that poverty has reduced slightly. Few studies such as Jalilian and Kirkpatrick (2002) and Odhiambo (2015) investigated this relationship. However, growth, finance and poverty studies have not attracted much research in this area; hence, the link between financial development and poverty reduction has not been adequately addressed by research (Ncube, Anyanwu and Hausken, 2014). Even though Africa has experienced economic growth since 2003, the continent still has high levels of poverty because almost half of the population earns below \$1.25 per day. This challenge is even more prevalent in Rwanda because effort geared towards reducing income disparity is minimal (World Bank, 2019). Over the last three decades, worldwide poverty levels have fallen greatly from 40% to under 20 %, but the poverty levels in African countries have almost remained the same in the same period under review. Over 40% of the people who live in the Sub-Saharan Africa live in abject poverty (Anyanwu, 2013). Various policies to combat poverty have been introduced in Rwanda.

This study, therefore, attempted to address a number of knowledge gaps. Firstly, most studies that examine effect of

economic growth on reducing poverty in have been carried outside Rwanda hence have limited application in the context of Rwanda (Pérez-Moreno and Weinhold, 2012; Waiyaki, 2013 Kakwani and Son, 2016; Keho, 2017; Williams, Adegoke and Dare, 2017). Secondly, the majority of studies have ignored indirect effect of financial deepening, income distribution and financial efficiency on the association between economic growth and poverty which is contrary to the growth-finance-poverty nexus literature (Singh and Huang, 2015; Gries, Kraft and Meierrieks, 2009; Nzotta and Okereke, 2009). In this respect, this study examined the link between economic growth, financial deepening, income distribution, financial efficiency and poverty levels in Rwanda.

### **1.1 Objective of the Study**

1. To examine the direct effect of economic growth on poverty level in Rwanda.
2. To establish the indirect effect of financial deepening, financial efficiency and income distribution on poverty level in Rwanda.

## **2. Literature Review**

### **2.1 Theoretical Foundations**

Liberal theory revolves around the idea that poverty in an economy is caused by both market distortions and underdevelopment in various areas. This theory was formulated by Keynes (1936) who believed that market forces were capable of promoting economic growth and in turn was able to eradicate poverty. Based on this belief, Keynes justified government's interventions at macroeconomic level especially in handling involuntary unemployment. From a liberal perspective, poverty is defined as the misfortune of a small group of people who cannot work even if they wished to work. As a consequence, governments should regulate as opposed to impose its rule on poverty reduction (Bradshaw et. al., 2000). The liberal theory argues that poverty can be used to reflect the extent to which market forces fail to justify redistributive taxation in kind and cash. While economic growth may be critical in reducing absolute poverty by simply raising income levels, the relative benefits of relative poverty especially those relating to expansion in economic activities are only applicable so long as increases in income levels is accompanied by reduction in inequalities in income distribution (Granville and Mallick, 2006). In this respect, wage growths that are accompanied by GDP growth may force relative poverty to surge (Dickens and Ellwood, 2001). The effects on absolute poverty though may not necessarily be clear so long as the average wages increase as well. This hypothesis is in line with the argument that poverty levels may persist and even grow even when economic growth is recorded so long as deprived people are not included in the growth wagon (Dickens and Ellwood, 2001). Liberal theory was be of great importance to the proposed study because it presumes that economic growth leads to development that in turn leads to poverty eradication. Economic growth has the tendency to improve per capita income of the population that results in reduced poverty levels. An expanding economy through economic growth also leads to reduced unemployment that enables households to afford basic goods needed to support life. Economic growth thus is very critical in poverty reduction at the microscopic and macroeconomic level.

The financial intermediation theory as advanced by Akerlof (1970) postulates that the financial intermediation process includes economic units with surplus funds deposited with financial institutions who in turn lend the same funds to economic units with deficit funds. Leland and Pyle (1977) together with Bisignano (1998) noted that institutions and individuals providing financial intermediation services could be differentiated while employing four criteria that includes: their major categories of liabilities and deposits by surplus economic units are specified for a fixed sum of money not in any way associated with performance of their portfolio, the kind of financial intermediaries whose deposits (liabilities) are typically short-term in nature compared to their assets and those having most of their liabilities dominated by checking deposits hence depositors can access their funds on demand. Finally, those intermediaries whose liabilities and assets are normally not transferable easily (Obuya & Olweny, 2017). Generally, financial intermediaries exist in the financial markets because of the very nature of market imperfections concerning surplus units and deficit units. In a 'perfect' financial market condition where there are no information and transaction costs, financial intermediaries would not exist since they would be serving no purpose. In reality, most financial markets are characterized by information asymmetry hence there exist differences in access to market information between buyers and sellers of financial products. Financial markets have pronounced and elevated levels of information asymmetries that make it crucial that intermediaries should exist to bridge the gap in information and make flow of finances within an economic system practicable (Leland and Pyle, 1977).

The major proponent of the Neo-Classical Utility theory was Bentham (1994). The idea behind cash transfer programs in promoting consumption and encouraging accumulation of human capital may be explained by this theory (Akresh et al., 2013). The Neo-Classical Utility theory presumes that people maximize their utility on the basis of income constraints, which are linked to high poverty levels (Akresh et al., 2013). The theory, therefore, argues that households are faced with a variety of

consumption bundles to the extent that they have to choose between educating their children and meeting other obligations. This may include the income generating activities that children may offer to supplement income in their respective families. Despite the factuality and objectivity claims set out by microeconomic studies, consumer behavior model is justified on rationality grounds. If the Neo-Classical Utility theory is correct, then it should be supported by observations made from consumer behaviors. However, there is no such evidence to support it because it. Sen (1977) argues that rational behaviors may be foolish according to economic axioms. The Neo-Classical Utility Theory underpinned the current study on the association among economic growth, financial deepening, income distribution, financial efficiency and poverty levels. The theory explains the relationship existing between income distribution and poverty levels. The theory presumes that people maximize their utility based on income constraints, which are linked to high poverty levels. The theory is the reason behind cash transfer programs in promoting consumption and encouraging accumulation of human capital. The theory argues that households are faced with a variety of consumption bundles to the extent that they have to choose between educating their children and meeting other obligations. This may include the income generating activities that children may offer to supplement income in their respective families.

## **2.2 Empirical Review**

Research carried out by Pérez-Moreno and Weinhold (2012) analyzed the causal connection between poverty and economic growth in less developed nations between the period 1970 and 1998. The investigation applied Granger causality tests and panel data specification. The examination implied that economic development causes unidirectional decrease in poverty level. Pérez-Moreno and Weinhold (2012) however, used short panels limited to ten years that is associated with the challenge of fewer observations that may make it more difficult to detect any causal linkages between growth and poverty. In addition, the study did not include income inequality as a moderating variable between growth and poverty as a norm in growth poverty studies. Waiyaki (2013) evaluated the connection between economic growth, poverty and development of financial sector in Kenya for the period between 1997 and 2012. The examination utilized OLS technique under the PARCH model. Waiyaki (2013) utilized time series model since the study was carried out in Kenya and may not be readily applicable to other EAC Countries due to each country's inequalities. In addition, the study has not introduced income inequality as a mediating variable as postulated in growth poverty theory which states that economic growth can impact on poverty directly or indirectly through income distribution. A study by Kakwani and Son (2016) analyzed how connection between poverty and growth can vary depending on income inequality and economic development. Utilizing the possibility of poverty elasticity of income, estimating the degree to which economic development diminishes poverty, the examination offers a few suggestions to exhibit that the underlying dimensions of income inequality and economic growth can affect reduction in poverty. Further, the study exhibits that tradeoff between economic growth and income inequality can be clarified as far as initial states of income inequality and development. The study by Kakwani and Son (2016), however, was not based on the East African community countries. In addition, the study utilized income inequality to measure poverty, which may not be a better measure since income is relative and can only measure relative poverty but cannot capture absolute poverty.

An investigation by Keho (2017) analyzed the link between growth of economy, development of financial sector and poverty reduction in nine African nations using the data from 1970 to 2013. The study adopted the Autoregressive Distributed-lagged model. The study established a strong relationship between GDP and financial deepening with GDP positively affecting poverty decrease in five nations including South Africa, Cote d'Ivoire, Benin, Cameroon and Gabon's GDP also affected decrease in poverty positively affecting growth of economy in three nations including Senegal, Nigeria and Ghana. The examination likewise uncovers two-way causation between poverty reduction and financial development in South Africa, Gabon and Cote d'Ivoire and two-way causality between reduction of poverty and development of financial sector in South Africa, Cameroon and Benin. Keho (2017) established mixed findings concerning direction of causation between financial deepening, economic growth and poverty. The study model ignored the role of income distribution on poverty reduction as stated in economic theory that income inequality moderates the relationship between poverty and income growth. Odhiambo (2010) analyzed the link between poverty and financial development in Kenya. The study established that financial development Granger contributed significantly to domestic savings thereby reducing poverty levels within the country. However, the direction of causation between poverty reduction and financial deepening had mixed findings when different proxies of financial deepening are used which may be misleading. The study was limited to Kenya hence findings may not be readily adopted in the five countries of the EAC owing to different economic situations.

Fosu (2010) for example analyzed data spanning from 1980 to 2004 showed that income elasticity of poverty kept on declining. In addition, he found out that poverty income elasticity was less than income inequality's responsiveness. The study ignored economic growth as a variable in the model in addition to using income inequality as an independent variable instead of a mediating variable. Levin and Bigsten (2010) carried out a review of empirical literature connection to income distribution, poverty and economic growth. The Study never, however, established any precise connection between economic development and expanding income disparity. Nations that have been fruitful as far as economic development is concerned are in all

respects effective in decreasing poverty influence. Research by Gakuru and Mathenge (2012) examined the level of income inequality and the role that policies developed toward income inequality played in reducing poverty. The outcomes demonstrated that because of high-income imbalance in Kenya, stimulation of development in rural and manufacturing parts of the country essentially was more advantageous to the urban family unit since they own most of the factors of production. Gakuru and Mathenge (2012) study has limited application to Kenya in addition to using income distribution as independent variable instead of mediating variable. Santos-Paulino (2012) examined the link between poverty, income inequality and trade liberalization. He established that trade liberalization had a significant impact on poverty and income distribution, but the impact was negligible and conveyed unequally. In spite of this, Santos-Paulino (2012) ignored economic growth as a variable in the model and used trade liberalization in place of economic growth. Singh and Huang (2015) analyzed the association between Poverty, property rights and Financial Deepening Sub-Saharan Africa countries. The Data was from 37 countries in Africa from 1992 to 2006. The study used panel data regression model. Study showed that poverty, financial deepening and income inequality were significantly related. It specifically showed that financial deepening was able to increase income inequality thereby increasing poverty that is contrary to finance- poverty nexus. In addition, the study only considered direct effect of financial deepening on poverty thereby ignoring the indirect ones.

Ewah, et al., (2009) examined the association between capital market efficiency and economic growth in Nigeria for the period beginning 1961 and ending in 2004. The study adopted OLS, which were multiple regressions in nature. The study ascertained that Nigerian economic growth had not been affected much by capital market efficiency. Ewah, et al., (2009), however, used economic growth as the dependent variable instead of independent variable in addition to ignoring poverty in the model. A study by Hasan et al., (2009) evaluated the link between bank efficiency, financial depth and economic growth. It tested the link between quality finance measured by economic growth and financial efficiency for a highly wide-ranging sample comprising over 100 countries covering the study period between 1996 and 2005. The research ascertained that the quality of financial deepening and development had statistically significant effect on economic growth, suggesting that the association between deeper capital market and better banking was indeed most beneficial for economic growth. Hasan et al., (2009), however, used economic growth as dependent variable instead of independent variable in addition to the study being carried out outside East African Community. Hasan et al., (2009) also ignored poverty as a variable in the study. A paper by Ferreira (2012) analyzed the influence of efficiency of banking institutions on growth of an economy. The investigation examined data from 27 EU nations for the period between 1996 and 2008. The investigation examined the impact of bank efficiency on Gross Domestic Product (GDP). The findings demonstrated a positive impact of bank cost effectiveness on development of an economy based on the GDP estimates. Ferreira (2012) utilized bank efficiency as independent variable instead of moderating variable in addition to using economic growth as dependent variable instead of independent variable. Ayadi, et al., (2015) analyzed the link between growth in economy and financial sector development in selected nations found in the northern and southern part of the Mediterranean Sea for the period between 1985 and 2009. The study established that financial deepening is inversely related to growth of the economy and credit to the private segment is adversely related with development. Ayadi et al., (2015) however, ignored poverty as the dependent variable in addition to study being carried out outside East African Community.

### 3. Methodology

#### 3.1 Research Design and Data Sources

The study adopted a descriptive research design. The design enabled the investigation of the link between economic growth, financial development, income distribution and poverty level in Kenya. Secondary data, which consisted of annual data, was utilized in the study. The study collected annual data for 30 years from 1989 to 2018 from Rwanda. The study variables were operationalised as shown in table 1.

Table 1: Definition and Measurement of Variables

Variables	Notation	Proxy	Expected Sign
<b>Dependent Variable</b>			
Poverty	Y	Head Count Ratio	
<b>Explanatory Variable</b>			
Economic growth	X	Real GDP	Negative
Financial Deepening	U	Credit to Private Sector	Negative
Income Distribution	W	Gini coefficient	Positive
Financial efficiency	Z	Operational cost efficiency	Negative

The data relating to annual credit to the private sector, real GDP data was gathered from World Bank's website whereas data on cost efficiency was gathered from the website of Central Banks Rwanda. Data on headcount ratio and Gini coefficient was

acquired from the World Bank and African Development Bank websites. The study collected annual data for 30 years running from 1989 to 2018. All the proxies used in the study were normalised using natural logarithm.

**3.2 Diagnostic Tests**

The study employed normality, heteroscedasticity, multicollinearity, serial correlation, optimal lag test, unit root diagnostic tests and cointegration test test. The Shapiro-Wilk test was adopted to test for normality of estimates’ residuals. The residuals were said to be normal if their p-values are greater than 0.05 level of significance. If the residuals are not normally distributed, the study will transform the data using natural logarithm to obtain log linear relationship. The research employed Breusch-Pagan / Cook-Weisberg test to evaluate for heteroscedasticity. If the calculated p-value is less than 0.05, then it would be concluded that there is no homoscedasticity. If the data is heteroskedastic implying that the standard errors are overestimated or underestimated, the data can still adopt OLS with robust standard errors also referred to as heteroscedasticity consistent standard errors. The Variance Inflation Factor (VIF). Multicollinearity does not exist (Gujarati, 2003) when the VIF value is less than 10. In the presence multicollinearity the problem, either of each variable should be removed from the model. The study adopted Breusch-Godfrey Test for serial correlation to evaluate the presence of autocorrelation in the model where a probability value greater than 0.05 would be taken to imply absence of autocorrelation. In the presence of high autocorrelation, the study would use lagged values of the exogenous variables. To test for the existence of unit roots within the data, the study utilized the Augmented Dickey Fuller (ADF) unit root test. Due to problems of unit roots in long-term time series data, to correct unit roots problem ARDL regression model would be adopted.

**3.3 Analytical model**

The study adopted multiple regression based on VEC model. The regression equation is shown in equation (1).

$$Y_t = \beta_0 + \beta_1 X_t + \beta_2 U_t + \beta_3 W_t + \beta_4 Z_t + \varepsilon_t \dots\dots\dots (1)$$

Where;

Y<sub>t</sub> = Poverty Level, X<sub>t</sub> = Economic Growth, U<sub>t</sub> = Financial Deepening.

W = Income Distribution and Z<sub>t</sub> = Financial Efficiency, β<sub>0</sub>= Constant.

β<sub>1</sub>, β<sub>2</sub>, β<sub>3</sub> and β<sub>4</sub> = coefficients of explanatory variables (X,U,W and Z respectively), ε = error term t= current period.

**4. Results**

**4.1 Diagnostic Tests**

The diagnostics tests were carried out to establish whether or not to use OLS, VAR or VEC or ARDL models in estimating the effect of explanatory variables on poverty. The test included Normality, Multicollinearity, heteroscedasticity, serial correlation and Unit root test.

Table 2: Shapiro Wilk Test for Normality

Variable	Obs	W	V	z	Prob>z
Y	30	0.963	1.179	0.341	0.367
X	30	0.961	1.254	0.468	0.320
U	30	0.897	3.263	2.445	0.007
W	29	0.901	3.074	2.317	0.010
Z	30	0.946	1.731	1.135	0.128

Y= Poverty, X = Economic growth, U = financial deepening, W= income distribution and Z= financial efficiency.

From Table 2, the data shows that financial efficiency, poverty and economic growth data were normally distributed since the p-values were greater than 0.05 level of significance with income distribution and financial deepening not showing signs of normality. The p value for Poverty was (0.367), income distribution was (0.010), financial efficiency (0.128), financial deepening (0.007) and economic growth had a p-value of (0.320). Based on the ‘W’ statistics, the values of ‘W’ should have a value of one for perfectly normal distribution. All the variables used in the study had W statistics value closure to one hence; the deviation of the data from normality is not extreme. OLS assumption of normality of observed explanatory variables is

violated hence the study did not use OLS since the coefficients and error terms may be misleading and other models like VAR and VEC models may be preferred. Data analysis later used VEC model due to presence of unit roots and long term cointegration among the variables.

Table 3: VIF test for Multicollinearity

Variable	VIF	1/VIF
lnx	1.61	0.621118012
lnu	3.91	0.255754476
lnw	1.57	0.636942675
lnz	3.50	0.285714286
Mean VIF	2.64	0.449882362

lnY= natural logarithm of poverty, lnX = natural logarithm of economic growth, lnU = natural logarithm of financial deepening, lnW= natural logarithm of income distribution and lnZ= natural logarithm of financial efficiency.

Table 3 shows that all variables had a VIF value less than 10. Cooper and Schindler (2006) assert that multicollinearity results to inflated coefficients of the regressors making the significance values invalid tests. With all variables showing no signs of multicollinearity, the OLS model may be appropriate for the analysis. However, the study to explore the suitability of other models after testing for heteroscedasticity and unit roots in the model.

Table 4: Breusch-Pagan test Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity		
Ho: Constant variance		
Variables: fitted values of D.lny		
chi2(1)	=	0.75
Prob > chi2	=	0.3859

Table 4 established that the p-value (0.3859) was higher than the level of significance (0.05), hence it is concluded that the data for Rwanda does exhibit presence of heteroscedasticity. Serious violations of homoscedasticity may result in overestimation of goodness of fit (R<sup>2</sup>) of a data (McCulloch, 1985). The study established constant variance, OLS assumption of homoscedasticity is was thus not violated hence OLS model could be adopted, however, to be able to adopt OLS, the variables should not have unit roots otherwise OLS may not be used. The study therefore explored other models including VAR and ARDL models. Data analysis later used ARDL model due to presence of unit roots in levels. The stability of the poverty model was tested based on graphical plot of the cusum of squares presented in Figure 1. The cusum of squares ought not to cross the 5% significance level. The graphs showed that the parameters in the poverty model was stable. The cusum plot was within the 95% confidence band around the null.

Table 5: Breusch-Godfrey Test for Serial Correlation

Poverty Model			
F-statistic	1.227	Prob.	0.5413

In Table 5, the p-value (0.5413) was greater than the significance level (0.05) hence the test fails to reject the null hypothesis of no autocorrelation implying that the data did not show significant serial correlation. The OLS model assumption of no autocorrelation is not violated. However, ARDL model is preferred when there is unit roots in the data. Data analysis later used ARDL model due to presence of unit roots among some study variables.

Table 6: Optimal Lag Test for Variables

Variable	Lags	FPE	AIC	HQIC	SBIC
lnx	2	.000115*	-6.23382*	-6.19202*	-6.08865*
lnw	2	0.000041*	-7.25547*	-7.2149*	-7.04761*
lnu	2	.038036*	-.432366*	-.390563	-.287201
lnz	2	.021711*	-.993094*	-.951292*	-.847929*
lny	4	.001274*	-3.83286*	-3.76319*	-3.59092*

Note: Income distribution (w), Economic growth (x), financial deepening (u), financial efficiency (z), poverty (y), Ln is the natural logarithm.

The results presented in Table 6 shows that the variables had different optimal lags. Income distribution, Economic growth,

financial deepening and financial efficiency had optimal lag of two. Poverty had an optimal lag of four. The value of p was significant as shown by stared values of Fixed Prediction Error (FPE), Akaike Information Criteria (AIC), Hannan and Quinn Information Criteria (HQIC) and Schwarz'Bayesian Information Criteria (SBIC). The optimal Lag length was used in DF unit root test.

Table 7: Dickey Fuller unit root test

Variables	MacKinnon approximate p-value	Conclusion
LnY	0.1868	unit roots
lnX	0.0014	no unit roots
lnU	0.0593	unit roots
lnW	0.1064	unit roots
lnZ	0.7752	unit roots

Income distribution (w), Economic growth (x), financial deepening (u), financial efficiency (z), poverty (y), Ln is the natural logarithm.

Table 7 and Table 4.30 presents the findings on roots test. Since all the MacKinnon P-values for Poverty, financial deepening, income distribution and financial efficiency were greater than 0.05 level of significance hence presence of unit roots. However, MacKinnon P-value for economic growth was lower than 0.05 hence no unit roots. The results showed that some variables had unit roots at levels. The study therefore settled on Autoregressive Distributed Lag Model (ARDL). ARDL is suitable where variables are either 1(0), that is, stationary at level or 1(1), integrated of order 1 or a combination of both.

Table 8: ARDL bounds test for Cointegration

	F-statistic	bounds critical value at 10%	bounds critical value at 5%		bounds critical value at 1%
		I (0)	I (1)	I (0)	I (1)
Model 1 (Poverty)	3.582	3.519	5.206	3.15	4.43

The results in Table 8 revealed that there was no cointegrating equations given that the f-statistic was greater than bounds critical values at 5% level of significance. The f-statistic was less than bounds critical values for 1(1) integrations bounds. The study thus concluded that there was no cointegrating equations hence no long-run relationship.

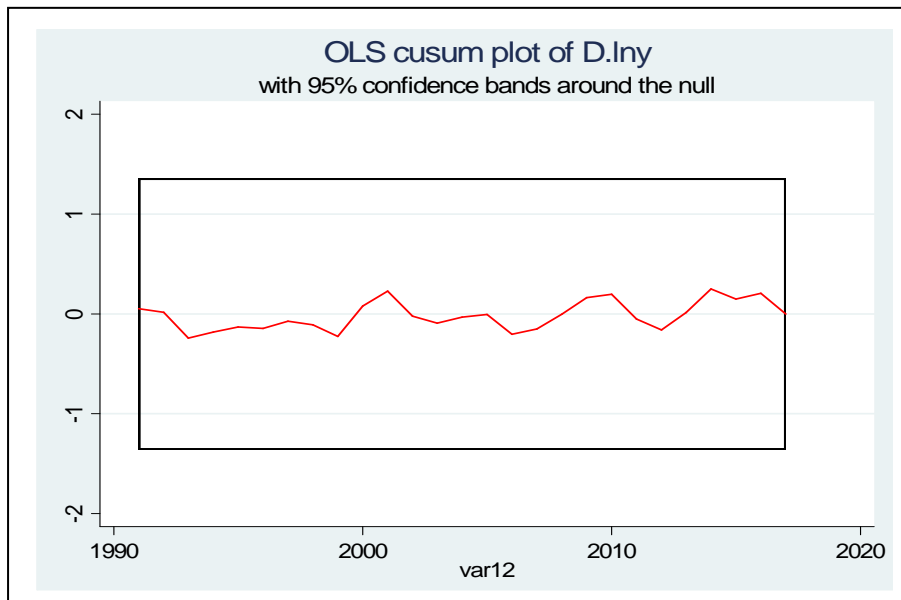


Figure 1: the cusum of squares

4.2 ARDL Model

Given that the ARDL model did not suffer from the problem of heteroscedasticity, serial correlation and the models stable, this implied that the study could continue with the ARDL model in estimating parameters (Table 9).

Table 9: ARDL Estimates of Poverty Model

lny	Coef.	Std.Err.	t	P>t	[95%Conf.	Interval]
lnY(-1)	0.541	0.181	2.990	0.009	0.158	0.924
lnX	-0.421	0.589	-0.720	0.485	-1.669	0.827
lnX(-1)	0.019	0.808	0.020	0.982	-1.694	1.731
lnX(-2)	-0.753	0.322	-2.338	0.013	-0.140	1.647
lnU	-0.015	0.002	-7.500	0.000	-0.083	0.052
lnU (-1)	-0.037	0.034	-1.110	0.284	-0.109	0.034
lnz	0.018	0.043	0.420	0.678	-0.074	0.110
lnW	-1.046	1.181	-0.890	0.389	-3.548	1.457
lnW(-1)	2.584	1.518	1.700	0.108	-0.633	5.802
lnW(-2)	3.010	0.966	3.120	0.007	-5.058	3.962
_cons	-6.548	5.448	-1.200	0.247	-18.097	5.000

Income distribution (W), Economic growth (X), financial deepening (U), financial efficiency (Z), poverty (Y), ln is the natural logarithm.

Lagged one poverty figures measured by HCR had a positive and statistically significant effect on current poverty in Rwanda. This implies that previous year's poverty leads to even more future poverty as explained by vicious circle of poverty theory. Further, the effects of lagged two economic growth figures on poverty was negative and significant. The finding implies economic growth is only felt in terms of poverty reduction some years after the economic growth has been exercised in the country. The effect of financial deepening on poverty in Rwanda was significant and negative implying that increasing financial deepening in terms of increased credit to private sector leads to poverty reduction as people can easily access financial products like credit to start income generating activities. Finally, lagged two income distribution measured by Gini coefficient had a positive and significant effect on poverty in Rwanda. The finding implies that increasing income inequality leads to increasing poverty in Rwanda.

## 5. Discussion

Lagged one poverty figures measured by HCR had a positive and statistically significant effect on current poverty in Rwanda. This implies that previous year's poverty leads to even more future poverty as explained by vicious circle of poverty theory. Further, the effects of lagged two economic growth figures on poverty was negative and significant. The finding implies economic growth is only felt in terms of poverty reduction some years after the economic growth has been exercised in the country. Pérez-Moreno and Weinhold (2012) noted that economic development causes unidirectional decrease in poverty level. The effect of financial deepening on poverty in Rwanda was significant and negative implying that increasing financial deepening in terms of increased credit to private sector leads to poverty reduction as people can easily access financial products like credit to start income generating activities. Keho (2017) established same results noting that a strong relationship between GDP and financial deepening with GDP positively affecting poverty decrease in five nations including South Africa, Cote d'Ivoire, Benin, Cameroon and Gabon's GDP. The examination likewise uncovers two-way causation between poverty reduction and financial development in South Africa. Further, Odhiambo (2010) established that financial development Granger contributed significantly to domestic savings thereby reducing poverty levels within the country. Finally, lagged two income distribution measured by Gini coefficient had a positive and significant effect on poverty in Rwanda. The finding implies that increasing income inequality leads to increasing poverty in Rwanda. The finding agrees with Kakwani and Son (2016) that exhibited that the underlying dimensions of income inequality and economic growth can affect reduction in poverty.

## 6. Conclusions

The study examined the effect of economic growth, financial deepening, income distribution and financial efficiency on poverty of Rwanda. Study established that economic growth does not have a significant direct effect on poverty in Rwanda. The study also established that lagged poverty figures, financial deepening and income distribution had a significant effect on poverty in Rwanda. The study therefore concluded that previous poverty figures, economic growth, financial deepening and income distribution explained the level of poverty in Rwanda. However, the effect of financial efficiency was not significant.

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