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ABSTRACT

International Trade and Foreign Direct Investment openness are crucial for economic growth and development. These are equally significant for developed and under-developed countries. The study’s major goal was to look at how foreign direct investment, inflation, GDP and trade openness affected the poverty alleviation in Sub-Saharan African Countries. A country where half of the population lives below the poverty. Annual data for the period 1990 to 2021 gathered from World Development Indicators database to investigate the long run & short run effects of the independent variables for the Sub-Saharan African countries by using Auto-regressive and Lag distributive (Co-integration) model. The findings revealed negative long run influence of foreign direct investment and GDP to poverty head count ratio. The shreds of Evidence also showed that FDI has not shown any distinctive effect on poverty in a shorter period. Moreover, GDP, trade openness and inflation are also effective in reducing poverty in short run. While inflation urges the investors to do more investment in production sector that reduces unemployment and poverty in the end. The study suggested the government officials, policymakers, and investors, to invest more in the poor countries. As FDI is crucial in creating jobs for the unemployed population that lead to the rise in income and living standard of the people. Moreover, the study suggested questioning some other factors causing poverty.

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1. Introduction

In recent years, countries all over the world have focused their attention on reducing poverty, as the main objective of development strategy. The number of individuals surviving in extreme poverty — on less than $1.90 per person per day — has been continuously decreasing for almost 25 years (Lakner, Mahler, Negre, & Prydz, 2022). The COVID-19 problem, in addition to the effects of conflict and climate change, which had already been slowing poverty reduction, created a disturbance to the trend in 2020, which led to an increase in poverty. According to World Bank Poverty and Inequality Platform (2022), one of the Sub-Saharan poorest countries is Burundi. In 2013, over 65% of people considered poor, and half of those who were not poor were on the verge of becoming so. Even Burundi's political upheaval in 2015 had little impact on the poverty line but the household survey conducted in 2017, it increases the poverty up to 4% along with a rise in unemployment from 14.2% to 23.2% in 2017 in Bujumbura, the capital city of Burundi. With 22.4% of Burundi’s population living below the poverty line in 2017, 72% of the country's population was undoubtedly living in extreme poverty, which was a worrying condition.
Additionally, COVID-19 had a negative impact on Sub-Saharan countries due to border shutting and supply disruptions. Only a few Sub-Saharan African countries could compete with Cabo Veda’s development over the past few decades. The GNI (Growth National Income) per capita increased up to six times and poverty reduced to two-thirds during 2001-2015. The poverty alleviation boosts up due to the rapid economic growth and expansion in commerce and manufacturing activities in 2016 and 2017. However, covid-19 caused an increase in the poverty ratio. It raised from 2.3% points to 33.8 % points in 2020 due to the reduction in services and foreign direct investment.

In the above context, alleviation of poverty is the evergreen problem of the Sub-Saharan African countries. However, the significance of poverty has prompted young scholars to launch studies on addressing its underlying causes, such e.g., (Bendavid, Martin, & Takikawa, 2000; Winters, 2000). These are mostly theoretical studies but some of them done on an empirical basis. However, it was considered by the experts that economic growth helps to reduce poverty rapidly. Proficient allocation of resources and trade openness are the preconditions for sustainable economic growth.

Foreign direct investment is currently a key factor in helping both rich and underdeveloped nations in reducing poverty. As science and technology generate more jobs that boost people's standards of living (Ogunniyi & Igberi, 2014). Hence, most of the developing countries are concentrating on the development of FDI to attain sustainable economic growth (Soumaré, 2015). The emphasis on FDI is mostly due to its involvement in achieving economic goals such as economic growth while simultaneously reducing poverty (Anigbogu, Edoko, & Okoli, 2016). Foreign direct investment has become increasingly significant in the pursuit of economic growth, which is currently helping to reduce poverty, given the extent of poverty in African countries, increasing capital stock, formation of jobs, and promotions of skills and technology (Asajile, 2014). On the other hand, globalization made FDI of great importance among different nations. WTO (World Trade Organization), NAFTA (North American Free Trade Agreement), GATT (General Agreement on Tariffs and Trade), and ASEAN (Association of South-East Asian Nations) have been directed toward improving international markets and trade by reducing market range through foreign investment (Muhammad & Ijirshar, 2015; Shamim, Azeem, & Naqvi, 2014). Moreover, FDI contributed to reduce technical gap and investment (Chindengwike, 2022a).

According to UNCTAD (Economic Development Report Africa, 2021a) Sub-Saharan Africa is a cluster of 49 countries, one of these countries in Burundi with 12.26 million population in

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2 Sub Saharan Africa
3 Web: [unctad.org/press](http://unctad.org/press)
2021. Which is also a free-trade region in the world with many opportunities for investors. America is making more trade investments in these underdeveloped parts of Africa. America and the FCS (Foreign Commercial Services) have already contributed to nine Sub-Saharan African regions including Burundi. The trade between America and SS Africa is dual dimensional that exceeds $38 billion in 2019. Exports in 2019 were $15 billion. That is the opportunity for the locals to improve their standard of living while boosting their revenue through trade. The main source of income for these Sub-Saharan African Countries like Burundi is the use of natural resources like forestry, raw materials, crude oil, etc. This wealth of natural resources is being used by the government to better up the living standard of the people leading to economic stability and growth (Chinedu, Ogbonna, & Nkechi, 2015). The bond between trade and poverty alleviation has always been a new area of study concerning about the new challenges of survival (Kafle, Songsermsawas, & Winters, 2022; Pant & Dhamija, 2021).

Various economies of the world often have to cope with the problem of economic growth, unemployment, high poverty rate, and drastic inflation rate (V. V. Cardoso et al., 2021; Van Niekerk, 2021). According to Philip (1958), economic growth upgrades the quality of life of the population by the creation of employment and inflation control. Ultimately, the result of this economic growth is poverty reduction (Libman, 2020; Muzaffar & Chowdhury, 2014). Contrary facts showed that the low purchasing power of the people is the root cause of poverty (Labonté, 2016). Numerous studies undertaken on the relationship of poverty, unemployment, inflation and economic growth. But there is no consensus on the specification of the results. Macroeconomic indicators of a stable economy such as GDP, unemployment, and poverty reduction are the factors that help to achieve economic stability (Quévat & Vignolles, 2018). Inflation, the other hand, is vital for the stability of the economy. The lower the inflation rate, the higher are the job opportunities created by the healthy and stable economy (Mansi, Hysa, Panait, & Voica, 2020; Mohaddes & Raissi, 2014).

1.1. Problem Statement

Sub-Saharan African Countries just like Burundi are the most adversely influenced region in terms of poor income and poverty headcount. The population growth rate in Africa was 26% until the end of 2018, with an expectation to double. With the double-figure, it will reach 2.5 billion by the end of 2050. It is the largest expected population growth in the region. According to an estimate, almost 300 million people are living under the lower-middle-class category. While 478 million people were living under the poverty line in 2019 with $1.90 power of purchasing per day. Which is raised to 490 million in 2021 (Economic Development Report Africa, 2021b)\(^3\).

In the above context, it is clear that increasing population along the reduction in purchasing power is a drastic problem of the Sub-Saharan African Countries. The question here is to estimate the factors that may help the Burundi to increase the purchasing power of poor, reducing poverty. The study focuses on FDI, inflation, GDP, and trade in this regard. Furthermore, the main goal of the study is to examine which factors effectively contributed to reduce the poverty in Burundi a Sub-Saharan African Country.

2. Literature Review

The literature on the variables of our interest in various contexts reviewed briefly in this section. Because poverty has many facets, researchers have used a variety of methods to gauge it. That includes GDP per capita (Tahir et al., 2014), foreign private investment (Tahir et al., 2014), development expenditures (Joe, Rajaram, & Subramanian, 2016), the GINI index as a measure of poverty (Wodon, 1999), rural per capita income (Malik, 1996), and the poverty head count (Alkire, Oldiges, & Kanagaratnam, 2021). In the views of Haughton and Khandker (2009), poverty is deprivation of the wellbeing of the people. People with inadequate income, who are unable to meet their minimal living standards, called the poor. According to the World Bank Report 2018, about one-fourth of the total population of the world was living under $3.2 per day in 2015. On the same note, half of the population was still living under $5.5 per day. Therefore, it is the mandatory responsibility of the rich and developed countries to invest more in developing countries to reduce poverty, especially in African countries, where 59% of the population of Africa was living under $3.2 per day in 2019 according to the

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\(^3\) Economic Development in Africa Report 2021

Web: unctad.org/press

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Previous research suggested a connection between FDI and poverty reduction in developing nations with weak economies. As far as FDI tends to increase, poverty tends to be slender (Asajile, 2014). Kedir (2012) stated an indirect causation relationship between poverty and FDI inflows by employing the Co-integrated VAR approach. On the other hand, Fauzel, Seetanah, and Sannassee (2015) adopted dynamic Panel vector error correction model that discovered a significant negative association between the factors. On the contrary, FDI inflow helped in poverty reduction in Nepal and Sri Lanka while increasing poverty in Pakistan and Bangladesh (Chindengwike, 2022a; Mahmood & Chaudhary, 2012). Lazreg and Zouari (2018) have also proved through unit root test of co-integration, the model error correction of FMOLS and Granger causality that FDI and poverty have negative correlation to each other in Pakistan. (Chindengwike, 2022a) disclosed that FDI was in a positive relation to the poverty alleviation among the developing and underdeveloped countries using time series data analysis from 1987-2017 for Tanzania. On the other hand, the GINI index revealed that FDI tends to increase poverty. While Chindengwike (2022a) stated a negative connectivity between GDP and FDI inflow, not reducing poverty to the minimum. Evidence of poverty reduction in African nations is directly related to FDI. It is found that foreign direct investment helped to reduce the poverty in poor countries, especially in Central and East African countries (Mahmood & Chaudhary, 2012). The analysis reveals that while FDI has a direct relationship with reducing poverty, the relationship is not as strong as thought. As a result, the study is undertaken to examine the impact of FDI on the reduction of poverty in SS Africa using the Autoregressive Distributed Lags technique.

One of the scourging reasons of the rise in poverty is; the rise in the price of food and other edibles which is called inflation. This rise in the price of the items increases the profitability of the producers while on the other hand reducing the purchasing power of the people. If the household income of a person remains the same, the rise in the price tends to decline the purchasing power of the people ultimately surging poverty. Sijabat (2022) scrutinized the effect of change in price of food items that affect the living standard of farmers in Indonesia through Vector error model. The study followed the demand function to check the impact of increase in the prices. The results showed that upswing in the income caused a rise in the price in Indonesia due to the cross elasticity of the products. Prior to this, (Fujii, 2013) used non-parametric regression to estimate, the impact of the price hike on inflation, finding that more people from the non-agricultural sector are living in poverty than from the agricultural sector in Philippine. The gap in poverty level is witnessed due to the poor agricultural setup.

Alem, Köhlin, and Stage (2014) used probit-regression analysis to examine the relationship between Ethiopia’s food prices and its level of poverty. The results identified a negative but significant result in inflation and the living standard in the urban region. Additionally, the study discovered indications of an improvement in the household’s standard of life that was receiving foreign aid. Yolanda (2017) researched inflation; results declared that inflation affects the economic stability of the Indonesian economy adversely. Moreover, the low purchasing power of money was seen from 1997 to 2016. Additionally, a country’s economic growth is influenced by inflation. The higher the inflation, the lesser the economic growth leading to poverty hike. Most of the researches showed a negative but significant influence of inflation on poverty alleviation(Awotunde & Bamidele, 2022). However, it is still unknown how much inflation impacted the poverty line and which approach is the most accurate for doing so. Despite a vast literature on poverty, there is a still dearth of study in the context of Burundi.

The inter-relationship of trade openness and poverty alleviation has gained the attention of the modern researchers. Ahmed et al. (2020) have directed a study to look into the impact of trade on poverty alleviation in a post-globalization period between 1990 and 2012. The model was assessed by using OLS and GMM (Generalized method of moments). The empirical study verified a positive significant link between poverty alleviation and country’s exports. Hence, the study suggested that trade openness may reduce the poverty in India in long run. Likewise, the relationship between poverty alleviation, and trade was investigated by Fauzel (2020) from 1990 to 2017 on a small island named Mauritius. This study, specifically studied the effect of trade
openness, the value of exports, and imports of goods. The study adopted the method of Error Correction. The results showed the fact that not only GDP but education also help to reduce the poverty to the minimum. Onakoya, Johnson, and Ogundajo (2019) conducted a study for the period of 9 years in 21 African countries ranging 2005 to 2014. The purpose of the study was to examine the effects of trade openness on poverty. The researcher has deployed the technique of Ordinary Least Square, variance inflator, Panel unit root test, and co-integration test. The results of the study revealed that trade negatively affected poverty in African countries. While inflation and foreign direct investment had a positive impact on human development. Thus, the study suggested an urgent policy development to measure poverty, and define the measures to reduce the poverty in South African Countries.

3. Methodological Framework
The Ex-Post –facto research design assists in measuring the link between GDP dependent variable and explanatory variables (FDI, Inflation, and Trade Openness) using time series data collected from WDI. It is a style of research methodology in which the investigation is carried out after the fact without the researcher’s involvement. The impact of FDI, inflation, and trade openness on the decline of poverty in Sub-Saharan Africa like Burundi has been studied using the quantitative method. For this purpose, time-series data of 32 years has been taken to analyze, how foreign direct investment, inflation, GDP and trade help to reduce the poverty in Burundi. The secondary information was gathered from WDI 2022 between 1991 and 2021 (Annual Data). The reason for taking Burundi was its low-income level and the higher level of poverty. The data was poised from World Development Indicators, World Bank Group, Poverty and Equity.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
<th>Measuring Unit</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>POV</td>
<td>Poverty head count ration</td>
<td>at $5.20 a day (2011 PPP %of population)</td>
<td>WDI</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign direct investment</td>
<td>Net Inflow (annual %)</td>
<td>WDI</td>
</tr>
<tr>
<td>INF</td>
<td>Inflation</td>
<td>GDP deflator (annual %)</td>
<td>WDI</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
<td>GDP per capita growth (annual %)</td>
<td>WDI</td>
</tr>
<tr>
<td>TRD</td>
<td>Trade</td>
<td>Trade (% of GDP annual)</td>
<td>WDI</td>
</tr>
</tbody>
</table>

3.1. Econometric Model Development
Mostly, time-series data found non-stationary, though it may be continuous. Hence, the ordinary least square method may not be the perfect fit for the assessment of the model. Before using the technique of the simple or multiple linear regression the ADF (Augmented Dickey–Fuller, 1981) and PPT (Phillips–Peron tests, 1988) has to be applied. Therefore, the ARDL model employed to investigate the association between poverty alleviation and its determinants. The general form of our ARDL mode is as follows;

\[
POVERTY = f (FDI, INF, GDP, TRD) \tag{i}
\]

\[
POVERTY = \beta_0 + \beta_1FDIt + \beta_2INFt + \beta_3 GDP + \beta_4TRD + \epsilon \tag{ii}
\]

Where FDI represents the inflow of foreign direct investment, INF is the symbol of inflation, GDP stands for growth domestic product. Moreover, TRD represents trade openness in the model.

Table 2, shows the descriptive data analysis. According to Hair, Ringle, and Sarstedt (2013) and Bryne (2010), the value of skew-ness must lie between -2 & +2 paired with the kurtosis range of -7 to +7, if the data is normally distributed.

<table>
<thead>
<tr>
<th>Variables</th>
<th>POV</th>
<th>FDI</th>
<th>INF</th>
<th>GDP</th>
<th>TRD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>49.927</td>
<td>1.880</td>
<td>6.859</td>
<td>0.609</td>
<td>51.045</td>
</tr>
<tr>
<td>Median</td>
<td>50.500</td>
<td>1.819</td>
<td>6.053</td>
<td>0.636</td>
<td>50.717</td>
</tr>
<tr>
<td>Maximum</td>
<td>60.200</td>
<td>3.854</td>
<td>27.447</td>
<td>3.875</td>
<td>63.290</td>
</tr>
<tr>
<td>Minimum</td>
<td>36.986</td>
<td>0.278</td>
<td>2.776</td>
<td>-4.521</td>
<td>41.021</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>8.010</td>
<td>0.856</td>
<td>4.318</td>
<td>2.165</td>
<td>6.876</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.200</td>
<td>-0.067</td>
<td>3.512</td>
<td>-0.497</td>
<td>0.171</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.491</td>
<td>2.546</td>
<td>17.355</td>
<td>2.735</td>
<td>1.778</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>3.249</td>
<td>0.298</td>
<td>340.571</td>
<td>1.411</td>
<td>2.146</td>
</tr>
<tr>
<td>Probability</td>
<td>0.196</td>
<td>0.861</td>
<td>0.000</td>
<td>0.493</td>
<td>0.341</td>
</tr>
</tbody>
</table>
4. Estimation and Discussions

Before assessing the dynamic connection between FDI, inflation, trade, GDP, and poverty, we tested the stationarity of the variables. ARDL model can be utilized for the variables stationary at level, at first difference or at both. Only assumption for the model is, no variable should be significant at second difference (Kesharwani & Kumar, 2015). Therefore, ADF and PP test for stationarity are applied. The results are displayed in Table 3 verifying the assumptions of the ARDL technique of econometrics. Thus, we proceed with ARDL model for time series analysis. Many studies has followed this specified procedure for estimation (2021).

Table 3 Unit Root Test

<table>
<thead>
<tr>
<th>Tests</th>
<th>POV</th>
<th>FDI</th>
<th>INF</th>
<th>GDP</th>
<th>TRD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I (0)</td>
<td>0.018*</td>
<td>0.212</td>
<td>0.118</td>
<td>0.429</td>
<td>0.551</td>
</tr>
<tr>
<td>I (1)</td>
<td>0.049*</td>
<td>0.039*</td>
<td>0.002*</td>
<td>0.000*</td>
<td>0.006*</td>
</tr>
<tr>
<td>Phillips-Perron</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I (0)</td>
<td>0.991</td>
<td>0.200</td>
<td>0.020*</td>
<td>0.480</td>
<td>0.328</td>
</tr>
<tr>
<td>I (1)</td>
<td>0.026*</td>
<td>0.000*</td>
<td>0.000*</td>
<td>0.000*</td>
<td>0.000*</td>
</tr>
</tbody>
</table>

Note: * rejects the hypothesis that there is no unit root test

Table 3 shows the intercept and trends along intercept both at Level and at first difference. Gdpt and inflation are stationary at level. That means the data is normal and OLS can be applied to these variables. While on the contrary, fdit and trdt are stationary at first difference verified by the ADF test. The intercept values of all the direct and indirect variables justified that the data was not stationary at the level instead it was mixed data. Therefore ARDL was the recommended model as per previous literature.

4.1. ARDL Co-integration and F-Bounds Test

ARDL model found best among all previous cointegration tests, as it addresses the issues of non-collinearity, heteroscedasticity and outliers providing the short and long run relation between variables. Equation used for ARDL model estimation provided below.

\[ \text{POV} = \beta_0 + \beta_1 \text{FDI}_t + \beta_2 \text{INF}_t + \beta_3 \text{GDP} + \beta_4 \text{TRD} + \epsilon \]  

We have to consider coefficient diagnostics and check their long run co-integration through F-statistics bond test. Table 4 presents F-bound test analysis for the model.

Table 4 F-Bounds Test Null Hypotheses: There is no relationship between the variables

<table>
<thead>
<tr>
<th>Test Statistics</th>
<th>Value</th>
<th>Significance</th>
<th>I(0)</th>
<th>I(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
<td>13.645</td>
<td>10%</td>
<td>2.22</td>
<td>3.09</td>
</tr>
<tr>
<td>K</td>
<td>4</td>
<td>5%</td>
<td>2.56</td>
<td>3.49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.5%</td>
<td>2.88</td>
<td>3.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1%</td>
<td>3.29</td>
<td>4.37</td>
</tr>
</tbody>
</table>

Source: Author’s estimation

The findings investigated that the value of F-statistic is larger than the upper limit which confirmed co-integration between variables. Hence, the null hypothesis was rejected. The F-Statistics value shows that there exists co-integration between the variables. Our results demonstrate that long run co-integration exists between poverty head count ratio and our explanatory variables (FDI, INF, GDP & TRD). Before examining the short- and long-term effects of positive and negative changes FDI and inflation, trade, and GDP on poverty, diagnostic statistics like serial correlation, heteroscedasticity, and normality checked to determine the validity of dynamic specifications for forecasting and decision-making.

4.2. ARDL Short Run Results

Table 5 Sample Size: 1990-2021

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>D (POV (-1))</td>
<td>-0.300</td>
<td>0.110</td>
<td>-2.728</td>
<td>0.072</td>
</tr>
</tbody>
</table>

Source: Author Estimation
The negative value of ECM confirms the significant speed of adjustment of the variables towards the long run. Table 5 illustrates the short run association between poverty and independent variables (FDI, INF, GDP, TRD). A positive and significant relationship is observed between poverty headcount ratio, foreign direct investment and inflation. A 1% change in FDI brings 0.176% change in the level of poverty which means that FDI tends to increase headcount ratio of poverty by 0.176% in sub Saharan Africa see evidence from Klein (2001). It denotes that FDI may not directly reduce the poverty directly but the government policies regarding FDI may help to reduce the poverty in Sub Saharan Africa. On the contrary, inflation is affecting the poverty head count ratio by 0.062%. These results are in line with Mati Moreover, GDP helps the poverty to reduce in SS Africa by 0.048%. And 1 % decrease in trade increases the poverty per head in African Countries by 0.027%. The study reveals that GDP and TRD play vital role in poverty reduction while FDI is not showing any direct and negative influence on poverty.

Table: 6

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI</td>
<td>-23.597</td>
<td>5.483</td>
<td>-4.303</td>
<td>0.023</td>
</tr>
<tr>
<td>INF</td>
<td>-0.458</td>
<td>0.514</td>
<td>-0.890</td>
<td>0.438</td>
</tr>
<tr>
<td>GDP</td>
<td>-7.858</td>
<td>2.032</td>
<td>3.866</td>
<td>0.030</td>
</tr>
<tr>
<td>TRD</td>
<td>0.612</td>
<td>0.584</td>
<td>1.047</td>
<td>0.372</td>
</tr>
<tr>
<td>C</td>
<td>51.680</td>
<td>18.909</td>
<td>2.732</td>
<td>0.007</td>
</tr>
</tbody>
</table>

\[ EC = POV - (-23.597 \times FDI - 0.458 \times INF - 7.858 \times GDP + 0.612 \times TRD + 51.680) \]

The inferences of the long run statistics observes that FDI & GDP and trade helped the SS Africa to reduce poverty in long by 23.597% and 7.858%. The result are supported by different scholars (Chindengwike, 2022b). Moreover, inflation and trade openness show insignificant association to the poverty. Where increase in inflation induces the investors toward foreign direct investment that leads the country to reduce unemployment that ultimately reduces the poverty (E. Cardoso, 1992). Additionally, the study investigated insignificant and positive impact of trade openness on poverty. It means that foreign direct investment and GDP are playing vital role in poverty reduction.

4.3. Serial Correlation and Heteroscedasticity Test

Breusch-Pagan-Godfrey’s serial correlation (1979) test has performed in this section of the analysis. BG test identify the serial correlation between the variables, which is a necessary assumption for ARDL model (Baltagi, 1991), Whereas the Durbin-Watson Test is restricted to detecting first-order auto-regression, the Breusch-Godfrey (BG) Test can detect autocorrelation up to any pre-designated order p.

Table: 7 Null hypothesis: No serial correlation at up to 2 lags

<table>
<thead>
<tr>
<th></th>
<th>F-statistics</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BG serial Correlation</td>
<td>0.297</td>
<td>0.791</td>
</tr>
<tr>
<td>BG Heteroscedasticity</td>
<td>0.581</td>
<td>0.810</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>0.459</td>
<td>0.794</td>
</tr>
<tr>
<td>Cusum Stability Test</td>
<td>Stable</td>
<td></td>
</tr>
</tbody>
</table>

Here, the insignificant value of p in Table 7 shows that there is no problem of serial correlation, heteroscedasticity, stability, and normality of the data. Moreover, BG test of heteroscedasticity & serial correlation found its evidence in many research works(Paterne, 2021; Peter, 2022). Cusum stability test illustrates the stability of data at 5% level of significance, aligned(Asongu, 2019). While p-value for the JB test of normality verifies the normality of the data.
Cusum test signifies the stability of the relation between the variables over the period. On the other hand, cusum of squares test showed a structural break in 2017, which could be the result of 2017-2018 financial crisis. Later on, stagnant value may denote crisis during Cov-19 pandemic.

Figure: 1 CUSUM Stability Graph & Cusum of Square Test

5. Conclusion
Analysis of the model indicated that there is no ARCH in the model, and not even an issue of heteroscedasticity was found. R² value estimation verified that the model is the best fit. The dependent variables explain the model to 99%. R square value interpreted that there would be some other factors affecting poverty. The study set a direction for future researchers to alleviate poverty.

According to Dollar and Kraay (2000), economic growth is critical for poverty reduction. As it increases the wage rate of the poor. Therefore, the economic growth rate of poor economies like Burundi must raise to the international development goal, which will lower the number of people who are living in poverty.

The study has taken careful measurement of the relation of FDI, inflation, and Trade openness to poverty alleviation. Econometric analysis of the study proved a long-run negative impact of foreign direct investment on poverty. While negative effect of the inflation to the poverty reduction. The study has approached the data of the last 32 years (1991-2021) as evidence from the past of Burundi from WDI. Conclusively, FDI and GDP help the poor economy to reduce poverty, while inflation is a slow poison for the people living below the poverty line as an international standard.

5.1. Suggestions and Future Directions
This study contributed to the literature on poverty reduction. Moreover, the study suggested to the government that it should adopt such policies that increase the income level of the people by increasing investment in the production and services sector. Government should also encourage the investment inflow into the country to improve people’s living standards. Similarly, private sector investors and international financial institutions should come forward to reduce poverty in poor countries, particularly in Sub-Saharan Africa, where the majority of the people are living below the poverty line. International financial institutions and markets should encourage financiers and traders to invest in these countries. Inflation must control as it reduces the real income of poor people by reducing their purchasing power. Government should introduce such policies and consumption pattern that reduces their expense on imports. Moreover, awareness is needed for young people, so that they make enough money to reduce their hunger and consistent poverty.

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Additionally, this study has turned a new leaf for future researchers to find out such dependent variables that may interpret the model fully to find the exact measures to reduce poverty to its minimum level.

References


