Determinants of Inclusive Growth in Zambia

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Abstract
Policymakers, scholars and development practitioners agree that economic growth is necessary but insufficient to achieve inclusive growth. Zambia witnessed improved GDP growth in recent decades. However, the country ranks among the poorest and wealth unequal in the world. This paper investigates the long run and short run determinants of inclusive growth in Zambia using the auto-regressive distributed lag (ARDL) and error correction model (ECM) from 1980 to 2022. The findings show that initial income, inflation, foreign direct investment and trade openness improve inclusive growth in the long run. On the contrary, gross fixed capital formation and general government education expenditure have long run negative impact on inclusive growth. However, in the short run gross fixed capital formation and government education expenditure increase inclusive growth while inflation, foreign direct investment and trade openness dampens inclusive growth in the short run. From the findings, the study recommends that policymakers promote the inflow of foreign direct investment through a conducive economic environment, stable inflation rate, and complete openness of the economy to international trade while improving the levels of gross fixed capital formation and education expenditure to achieve higher inclusive growth in the long run.

Keywords: Inclusive growth; poverty; income inequality; ARDL; Zambia.
JEL Classification Codes: D60; I30; O40; O55

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1. Introduction

Policymakers, scholars, and development practitioners concede that more than economic growth is needed to address many developing economies' diverse challenges. In the 1990s, 2000s, and 2010s, developing countries witnessed increased economic growth. Yet poverty, income inequality, and unemployment rose to confront higher economic growth in these countries (Adams, 2003; Anand, Mishra and Peiris, 2013; UNDP, 2017). The limited effect of economic growth on poverty, inequality, and unemployment heightened the debate on how economic growth benefits the poor (Adams, 2003). Stuart (2011) observed that the benefits of economic growth in many developing countries could not be maximized because equality issues were ignored.

Zambia is no exception to the challenges facing many developing countries. In perspective, Zambia's economy has been growing above 4 percent for fourteen consecutive years from 2001 to 2014. In spite of notable growth, poverty levels and inequality have remained high over the same period. Poverty headcount ratio marginally reduced from 62.8 percent to 60.05 percent between 2006 and 2010 (Mphuka, Kaonga and Tembo, 2021). In 2015, this figure continued to stagger at 60.8 percent. On the other hand, income inequality has not been reduced with increased economic growth over the years. Zambia is ranked number four among the top 10 wealth-unequal countries in the world with a score of 57.1% (World Population Review, 2023).

Income inequality increased by 8.33 percent from 1980 to 2022 with an average of 56.21 percent. Nonetheless, the country has managed to see a decline in unemployment between 1980 and 2022 although it is above 5 percent. Also, unemployment is still very high among the youths (Mphuka, Kaonga and Tembo, 2021). Notwithstanding, before the 1980s, Zambia's GDP per capita was on par with the largest economies (China, Vietnam) in Asia that reduced poverty with increased economic growth (Anand, Mishra and Peiris, 2013; Broadberry and Gardner, 2022; UNDP, 2011). Zambia recorded stable economic growth in the past two decades. However, this growth did not lead to meaningful inclusive growth as reflected in higher poverty, inequality and unemployment levels. This contradicts economic growth theories and empirical evidence.

Hence, economic growth failed to address levels of inequality and poverty in Zambia over the years. Actually, inequality was worse in 2015 than in 1996 such that it rose from 0.70 to 0.735 (Bhorat et al., 2017). Despite this, economic growth averaged about 6 percent between 1996 and 2015. Therefore, it is justifiable to state that economic growth has not ended poverty and inequality as can be seen in figure 1. This is contrary to growth's poverty and inequality reduction power observed in Asian countries such as China and Vietnam (UNDP, 2017). To end poverty and inequality, scholars and policy makers are continuously calling for growth to be inclusive.

This paper as a result aims to investigate factors that determine inclusive growth in Zambia. Consequently, the research question investigated is: What are the determinants of inclusive growth in Zambia? To answer this question, the author uses an empirical investigation into the problem using autoregressive distributed lags (ARDL) and error correction model (ECM) between 1980 and 2022. Pesaran, Shin and Smith's (1998) ARDL estimates is used when series are integrated of different order and a long run relationship exist among them. As shown in table 3 and 5, some series are stationary at levels whereas others at first difference while having a long run relationship. In this case, other time series estimators such as vector autoregression (VAR) cannot produce efficient estimates. In addition, the ARDL model is superior because it generates sufficient lags for the variable. It also provides the means to ascertain residual

correlation as well as providing results for the short run and long run at the same time (Adekoya and Abdul-Razak, 2018b).

Studies have found factors such as inflation, trade openness, education expenditure, general final government consumption expenditure, and initial income, among others, to have mixed effect on inclusive growth. Zambia's 8th National Development Plan has policy directions aimed at ensuring sustainable development through economic transformation. Among issues of concern are poverty, inequality and unemployment. This study found initial income, inflation, foreign direct investment, and trade openness to have positive and significant long run effect on inclusive growth while gross fixed capital formation and general government education expenditure have negative and significant long run effect, and vice versa in the short run.

This study's findings are important as they inform Zambia's policymakers on factors that could contribute to achieving inclusive growth thereby reducing poverty and inequality. In addition, many empirical literatures on the determinants of inclusive growth are panel studies and a handful of time series. In Zambia, there is not any empirical study investigating the determinants of inclusive growth. Therefore, this study fills this gap. Moreover, the findings of this study are robust having subjected the model to postestimation tests. In addition, the findings imply that policies that support the inflow of foreign direct investment, stable inflation, and increased international trade on one hand as well as improving gross fixed capital formation and general government education expenditure are eminent for inclusive growth.

The rest of the paper is organized as follows: Section 2 is the literature review while section 3 is the methodology. Section 4, and 5 are the results and discussion, and conclusion in that order.

2. Literature Review

2.1. Causes of Poverty, Inequality and Unemployment in Zambia

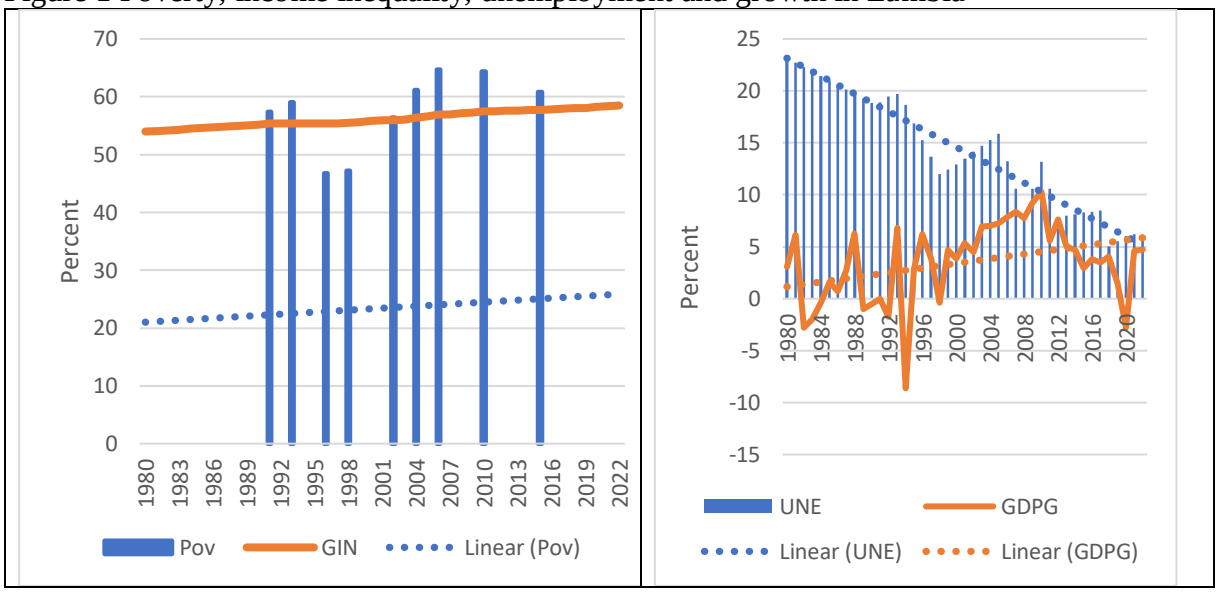
A number of factors underlie high levels of poverty and inequality in Zambia. Between 1980 and 2022 several economic developments took place. For instance, in the 1990s the structural adjustment programme (SAP) came with its costs. Job losses due to the privatization of state-owned enterprises and removal of subsidies, and high commodity prices brought about currency devaluation amidst wage freeze. The resulting effect was high poverty levels which increased to 81 percent in 1996 from 75 percent in 1991 (Mphuka, Kaonga and Tembo, 2021). Other factors that continue to hunt Zambia's development is high fuel prices, fluctuations in water and power supply. Zambia's largest population depend on rain-fed agriculture which accounts for over 75 percent of the population. Also, inflation has remained high in Zambia which has continued to affect the general populace of which majority only have income at specific periods of the year especially small-scale farmers. The ultimate impact of inflation is the reduction in relative income of the people especially the poor which further sinks them into deeper poverty. Higher inflation makes it difficult for the poor to pay for essential commodities such as food, housing and utilities (Mphuka, Kaonga and Tembo, 2021).

Zambia's economy largely depends on mining for stable exchange rate and government revenue (Chipili, 2015). Agriculture is another important sector for Zambia's economy (IMF, 2023). In 2015, Zambia's economic growth plummeted to 3 percent following a reduction in mining production when copper prices hit a record six-year low. While transitioning to the industrial sector has been a policy priority for Zambia, the sector's contribution has continued to dwindle. The industrial sector's share of the economy fell from 36 percent in 1990 to 8.2 percent in 2014 (Mphuka, Kaonga and Tembo, 2021). Therefore, there is reduced prospects for

value addition, employment creation, and income. The ultimate end is higher poverty levels, income inequality, and unemployment when other sectors fail to absorb the labour force.

Wage income and self-employment in non-agriculture sector contribute to income inequality in Zambia (Bhorat *et al.*, 2017). Wage income contributes about 51 percent of household income. Over the last two decades, poorest households experienced highest proportional growth in incomes. However, the gap between middle- and high-income households has widened. About 59 percent of inequality measured by the Gini coefficient is accounted by wage income. Hence, increased income inequality undermined economic growth's poverty reduction potential. To address the higher levels of inequality, Bhorat *et al.* (2017) recommend policy focus on the creation of broader wage employment, ending inequality among wage earners, promoting agricultural productivity as well as implementing policies to reduce poverty and inequality.

Figure 1 Poverty, income inequality, unemployment and growth in Zambia



Source: Author, 2023.

2.2 Conceptual and Measurement Issues for Inclusive Growth

Inclusive growth has been used interchangeably with terms such as 'pro-poor growth', broad-based growth', and 'shared growth'. However, inclusive growth is more holistic than these concepts (Oluseye and Gabriel, 2017, p. 98). Kakwani and Pernia (2000) first introduced the concept of inclusive growth while writing on pro-poor growth (Ranieri and Ramos, 2013). There are many definitions that scholars and development institutions have given to inclusive growth resulting in not having any universally accepted definition (UNDP, 2015).

The definitions of inclusive growth touch on major issues such as socioeconomic and political participation including benefit sharing (International Policy Centre for Inclusive Growth, 2008), availability and equality of access to opportunities (Ali and Son, 2007; Ali and Zhuang, 2007a). It must ensure the falling of inequality, poverty and unemployment (Rauniyar and Kanbur, 2010; Raheem, Isah and Adedeji, 2016) therefore non-discriminatory and disadvantage-reducing (Klasen, 2010). From these definitions, inclusive growth is the process that ensures equal access to socioeconomic and political opportunities, and benefit-sharing in all segments of society—rural and urban, for all social classes—poor, middle and rich of any gender, race, ethnicity, among others, in all sectors—agriculture, mining, manufacturing etc.

Measuring inclusive growth can be said to be straightforward (Ali and Son, 2007; Rauniyar and Kanbur, 2010), difficulty and technically difficult (Ali and Zhuang 2007b; UNDP 2011; World Bank, 2008), and unclear (ADB, 2008). It can be a daunting task, however, various approaches for measuring inclusive growth have emanated. Ali and Son (2007) measured inclusive growth using the social opportunity curve, which reflects the average opportunities available and how they are shared among the population. Anand, Mishra and Peiris (2013) used the same approach, while Ayinde and Yinusa (2016), and Oluseye and Gabriel (2017) modified the social opportunity function and used GDP per person employed to capture the participation component of inclusive growth. Others have proxied inclusive growth on income inequality, poverty and unemployment (see Ghandour, 2020).

Ali and Son (2007) defined inclusive growth as growth that increases the social opportunity function which is predicated on two factors—average opportunities available to the population, and how opportunities are shared among the population. Ali and Zhuang (2007a
) contend that high and sustainable growth to create productive and decent employment opportunities, and social inclusion to ensure equal access to opportunities must anchor any inclusive growth strategy. Gross domestic product per person employed is used to proxy inclusive growth as a dependent variable. It reflects productive and decent employment. This indicator was used to measure inclusive growth by Tella and Alimi (2016), and Oluseye and Gabriel (2017) in analysing the determinants of inclusive growth in Africa, and Nigeria.

2.3 Review of the Empirical Literature

Anand, Mishra and Peiris (2013) conducted a study to establish inclusive growth measures and determinants using 5-year panel data for 143 developing countries from 1970 to 2010. They employed a standard panel growth regression. The study revealed that human capital, macroeconomic stability and structural changes are the basis for inclusive growth. Also, the study found foreign direct investment and trade openness as significant drivers of inclusive growth, while financial deepening and technological change had no effect.

Balakrishnan, Steinberg and Syed (2013) employed an instrumental variable approach to investigate the drivers of inclusive growth in Asia. Their findings showed that financial reforms, industry employment, labour share, education spending, and years of schooling significantly increase inclusive growth. On this basis, they recommended fiscal policies aimed at increasing health, education and social safety-nets expenditure, among others.

Anand, Tulin and Kumar (2014) documented the drivers of inclusive growth in Indian ocean states from 2004 to 2009. They examined the role of economic policies and macro-financial conditions in explaining inclusive growth and its components. Their study revealed that robust economic growth drives inclusive growth. In addition, they contended that social and educational expenditure and educational attainment rates are essential for ensuring inclusive growth.

Ghandour (2020) studied the role of institutions and macroeconomic policies on inclusive growth in 16 Economic and Social Commission of Western Asia from 2000 to 2016 using GMM. The findings showed that government effectiveness, years of schooling, financial deepening, government health expenditure and inflation positively impact inclusive growth. In Africa, Tella and Alimi (2016) found that population growth dampened inclusive growth, while initial income, government health expenditure, and real net official development assistance enhanced it.

At country level, Agu and Evoh (2015) examined the constraints to inclusive growth in Nigeria using the Business Enabling Environment Approach (BEEA) and Employability Analysis Approach (EMPA). They found two categories of constraints to inclusive growth in Nigeria: constraints to the business-enabling environment and the unemployability of Nigerian graduates. They opined that these are closely associated with poor infrastructure, poor human capital formation, and the failure to convert output growth into job creation. Oluseye and Gabriel (2017) employed ARDL and ECM methods to investigate Nigeria's short run and long run determinants of inclusive growth from 1981 to 2014. They found that government consumption and education expenditure negatively affect inclusive growth in the short run and long run. At the same time, inflation and population had positive and negative effects in the short run and long run, respectively. They also found investment and foreign direct investment to have a negative effect in the short run but a positive and significant effect in the long run.

In Zambia, Ianchovichina and Lundstrom (2008) argued that improved quality and access to secondary and tertiary education are essential for the poor to benefit from future growth. They identified weak governance and poor government effectiveness as responsible for the market and identified government failures, which constitute significant obstacles to inclusive growth. Mphuka, Kaonga and Tembo (2021) found poverty prevalent among households whose livelihoods depended on agriculture. Their findings showed that growth is the primary driver of poverty reduction and recommended redistribution policies favouring the poor.
De la Fuente, Rosales and Jellema (2017) used fiscal incidence analysis to estimate the distributional effect of fiscal policy in Zambia. They found that in-kind public service expenditure on education vastly reduced inequality in Zambia in 2015. However, they also proved that fiscal policy increases poverty due to low-level targeted—direct transfer spending, large expenditure on energy subsidies which do not reach the poor, and the tax system that creates an imbalance between individuals receiving net income subtractions and those receiving net additions. Therefore, they recommended subsidy elimination and direct compensation of the poor to reduce poverty and inequality.

Theory holds that economic growth is critical in reducing poverty, inequality and unemployment. However, empirical literature has shown mixed effect of growth on these indicators. Hence the need for growth to be inclusive. The empirical literature reviewed is mainly for panel studies with a handful focusing on individual countries. For Zambia, the sizeable empirical literature is dedicated to poverty and income inequality, and no attention to inclusive growth either measured using the methods of Ali and Son (2007) or proxied on GDP per person employed as in Tella and Alimi (2016), and Oluseye and Gabriel (2017). Therefore, this raises the need for a study investigating Zambia's determinants of inclusive growth.

3. Methodology

3.1 Estimation Method and Technique

Human capital, expenditure on education, health expenditure, financial deepening, inflation, government effectiveness, government per person expenditure on transfers and subsidies, and population are identified as determinants of inclusive growth (Anand, Mishra and Peiris, 2013; Anand, Tulin and Kumar, 2014; Balakrishnan, Steinberg and Syed, 2013; Ghandour, 2020; Lustig, Jellema and Pabon, 2021; Oluseye and Gabriel 2017). Also, a tax system that does not benefit the poor, poor business environment, lack of effective income redistribution policies, weak governance system and inability to transform output growth into job growth hinders the possibility of attaining inclusive growth in many countries (Agu and Eyoh 2015; De la Fuente, Rosales and Jellema, 2017; Mphuka, Kaonga and Tembo, 2021). To determine factors

influencing inclusive growth, the study adopted the inclusive growth model by Anand, Mishra and Peiris (2013), which Agu and Eyoh (2015) and Oluseye and Gabriel (2017) also used.

$$y_t = \alpha + \beta_1 \bar{Y}_t + \beta_2 X_t' + \varepsilon_t \quad (1)$$

In equation 1, y_t is inclusive growth proxied on gross domestic product per person employed. $\bar{Y}_t$ is the initial income level measured as GDP per capita, X_t' is the vector of control variables, and ε_t is the error term. In this study, inflation (INFL), foreign direct investment (FDI), gross fixed capital formation (GFCF), general government education expenditure (GOVED), and trade openness (TRAD) were introduced as explanatory variables through the specification of X_t'. Equation 1 is then reformulated as equation 2.

$$LnGDPPE_t = \alpha + \beta_1 LnGDPPC_t + \beta_2 INFL_t + \beta_3 FDI_t + \beta_4 GFCF_t + \beta_5 GOVED_t + \beta_6 TRAD_t + \varepsilon_t \quad (2)$$

Where $LnGDPPE_t$ is inclusive growth, $LnGDPPC_t$ is the initial income, $INFL_t$ is inflation, FDI_t is foreign direct investment, $GFCF_t$ is gross fixed capital formation, $GOVED_t$ is government education expenditure, and $TRAD_t$ is trade openness.

Pesaran and Shin (1998) proposed an ARDL method to determine the long-run relationship among variables irrespective of their cointegration order. ARDL is argued to produce consistent estimates under mixed order of integration and cointegration in the model. It also allows the use of several lag length for the variable, and enable the determination of residual correlation. In addition, it provides estimates for the short run and long run model simultaneously. Hence, it is superior to other time series estimators (Adekoya and Abdul-Razak, 2018b).

Pesaran, Shin and Smith (2001) developed a bounds cointegration test to deal with variables of mixed order of cointegration. The bounds test was applied in this paper to establish a more substantial statistical and economic basis for an empirical error correction model in the presence of a meaningful long-run relationship (Nkoro and Uko, 2016). The Pesaran, Shin and Smith (2001) critical values are argued not to be appropriate for bounds tests based on small sample sizes (Narayan, 2005). For small sample sizes of observations between 30 and 80, Narayan (2005) provides a set of critical values. To determine the existence of cointegration, the study employed both Pesaran, Shin and Smith (2001) and Narayan (2005) critical values.

Even though the knowledge of the order of integration is not a prerequisite for the bounds test, variables were tested for unit root using the Dickey-Fuller and the Phillips-Perron unit root tests. When variables are cointegrated, equation 2 is transformed to the error correction ARDL model as shown below:

$$LnGDPPE_t = \alpha + \sum_{i=1}^{n} \beta_1 \Delta LnGDPPE_{t-i} + \sum_{i=1}^{n} \beta_2 \Delta LnGDPPC_{t-i} + \sum_{i=1}^{n} \beta_3 \Delta INFL_{t-i} + \sum_{i=1}^{n} \beta_4 \Delta FDI_{t-i} + \sum_{i=1}^{n} \beta_5 \Delta GFCF_{t-i} + \sum_{i=1}^{n} \beta_6 \Delta GOVED_{t-i} + \sum_{i=1}^{n} \beta_7 \Delta TRAD_{t-i} + \eta_1 LnGDPPE_{t-1} + \eta_2 LnGDPPC_{t-1} + \eta_3 INFL_{t-1} + \eta_4 FDI_{t-1} + \eta_5 GFCF_{t-1} + \eta_6 GOVED_{t-1} + \eta_7 TRAD_{t-1} + \varepsilon_t \quad (3)$$

Where, $\boldsymbol{\Delta}$ is the first difference operator, Ln is the natural logarithm, and α is the drift component. Short run dynamics of the model are indicated in the expressions with summation. The short run coefficients are β_1 to β_7, while η_1 to η_7 are the coefficients for the long-run

relationship of the model, and ε_t is the error term whose properties include a zero mean and constant variance.

The short run component of equation 3 is estimated to establish short run effect of independent variables on inclusive growth including the speed of adjustment (λ). The speed of adjustment is expected to be less than zero and significant. The last part of the equation is used to establish the long-run effect. To establish the validity and relevance of the model, postestimation tests of normality, serial correlation, heteroscedasticity, and endogeneity were conducted. The optimal structure of ARDL lag order is chosen using the Akaike Information Criteria (AIC) to facilitate its specification. The AIC is argued as the most appropriate to determine the optimal lag length for the variable when the sample size is small (Liew, 2004). Separating the short run and long run effects give rise to equations 4 and 5, in that order.

$$\Delta LnGDPPE_t = \alpha + \sum_{i=1}^{n} \beta_1 \Delta LnGDPPE_{t-i} + \sum_{i=1}^{n} \beta_2 \Delta LnGDPPC_{t-i} + \sum_{i=1}^{n} \beta_3 \Delta INFL_{t-i} + \sum_{i=1}^{n} \beta_4 \Delta FDI_{t-i} + \sum_{i=1}^{n} \beta_5 \Delta GFCF_{t-i} + \sum_{i=1}^{n} \beta_6 \Delta GOVED_{t-i} + \sum_{i=1}^{n} \beta_7 \Delta TRAD_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad (4)$$

$$LnGDPPE_t = \eta_1 LnGDPPE_{t-1} + \eta_2 LnGDPPC_{t-1} + \eta_3 INFL_{t-1} + \eta_4 FDI_{t-1} + \eta_5 GFCF_{t-1} + \eta_6 GOVED_{t-1} + \eta_7 TRAD_{t-1} + \varepsilon_t \quad (5)$$

3.2 Data

The study used time series to analyse the determinants of inclusive growth in Zambia. Yearly observations from 1980 to 2022 were collected from various data sources. Inclusive growth is proxied on gross domestic product per person employed.

Gross domestic product per person employed is defined as gross domestic product divided by the total employment in the economy. Gross domestic product per capita is gross domestic product divided by population for which data is in constant 2015 U.S dollars. Inflation is measured by the consumer price index which reflects the annual percentage change in the cost of acquiring a basket of goods and services to the average consumer yearly. Foreign direct investment is operationalized as the net inflows of investment to acquire a lasting management interest of 10% or more of voting stock by an investor in an enterprise operating in an economy other than the investor's (World Development Indicators, 2023).

Gross fixed capital formation includes land improvements, plant, machinery, and equipment purchases, the construction of roads, railways, schools, offices, hospitals as well as commercial and industrial buildings. General government expenditure on education is expressed as a percent of GDP which includes expenditure funded by transfers from international sources to government. General government education expenditure is measured as a percent of gross domestic product. Trade openness is defined as the sum of exports and imports of goods and services measured as a share of gross domestic product. Data on gross fixed capital formation was obtained from the World Economic Outlook whereas data on the rest of indicators was collected from the World Development Indicators (2023).

4. Results and Discussion

4.1 Descriptive statistics

Table 1 indicates descriptive statistics for the variables used in the study. Inclusive growth was proxied on gross domestic product per person employed. Between 1980 and 2022 gross domestic product per person employed, and gross domestic product per capita averaged US$

8954.335, and US$ 1026.68. Inflation, foreign direct investment, gross fixed capital formation, government education expenditure, and trade openness averaged about 44%, 4%, 35%, 3%, and 63% respectively. The minimum and maximum values for gross domestic product per person employed were US$6,569, and US$11,489 while those of initial income were US$773, and US$1,331. The lowest inflation rate recorded was 6% with the highest record of 183% between 1980 and 2022. The kurtosis and skewness values show that indicators were normally distributed.

Table 1: Descriptive statistics

Variable	Mean	Std. Dev.	Variance	Skewness	Kurtosis	Min	Max
GDDPE	8954.335	1591.623	2533262	0.2897	1.7547	6569.333	11489.27
GDPPC	1026.68	191.077	36510.42	0.3631	1.6353	773.8478	1331.449
INFL	44.3958	45.2353	2046.235	1.3806	4.1570	6.4294	183.312
FDI	3.8385	2.7016	7.2987	0.2453	2.3871	-1.2256	9.6044
GFCF	34.8981	12.2745	150.6623	2.1473	7.8200	17.95	81.49
GOVED	3.0187	1.1930	1.4232	0.1564	1.9401	1.0997	5.3880
TRAD	63.8862	9.3372	87.1829	0.5888	2.2849	50.8875	85.9922

Source: Author using data from various sources, 2023.

4.2 Multicollinearity test

The correlation matrix indicates the association between variables. Table 2 shows that gross domestic product per person employed is positively associated with initial income, foreign direct investment, government expenditure on education, and trade. Whereas it is negatively associated with inflation, and gross fixed capital formation. The correlation matrix indicates high correlation between gross domestic product per person employed and trade. However, the overall level of correlation tested using vector inflated factor (VIF) showed that variables were not highly correlated. The mean VIF value of 2.33 was obtained from the test.

Table 2. Correlation Matrix

	LnGDPPE	LnGDPPC	INFL	FDI	GFCF	GOVED	TRAD
LnGDPPE	1						
LnGDPPC	0.7598	1					
INFL	-0.5657	-0.4258	1				
FDI	0.3560	-0.0314	-0.2246	1			
GFCF	-0.4669	-0.0939	0.3739	-0.2742	1		
GOVED	0.1593	0.6442	0.0749	-0.3903	0.3178	1	
TRAD	0.8060	0.6171	-0.5895	0.2044	-0.4328	0.0997	1

Source: Author using data from various sources, 2023.

4.3 Stationarity test

Table 3 shows the results of the unit root test. The second column gives results for the Augmented Dickey-Fuller test, while the third column presents the Phillips-Perron results. Using the Phillips-Perron results, gross domestic product per person employed (LnGDPPE), gross domestic product per capita (LnGDPPC), inflation (INFL), government expenditure on education (GOVED), and trade openness (TRAD) are integrated of order one ($I(1)$). On the contrary, foreign direct investment (FDI), and gross fixed capital formation (GFCF) are integrated of order zero ($I(0)$). The conclusion is that variables were integrated of order zero and one at a 5 percent significance level.

Table 3. Stationarity test results

		ADF		PP		Order of Integration
Variable	Lag (AIC)	*I* (0)	*I* (1)	*I* (0)	*I* (1)	
LnGDPPE	1	-1.480	-3.524***	-1.504	-6.000***	*I* (1)
LnGDPPC	1	-0.403	-2.896**	-0.176	-4.697***	*I* (1)
INFL	1	-2.163	-6.871***	-2.147	-6.269***	*I* (1)
FDI	3	-1.338	-4.324***	-3.846***		*I* (0)
GFCF	1	-3.800***		-4.240***		*I* (0)
GOVED	1	-1.770	-5.471***	-1.861	-6.537***	*I* (1)
TRAD	1	-2.061	-6.385***	-2.281	-6.170***	*I* (1)

Source: Author, 2023.

4.4 The Pesaran, Shin and Smith Bounds Cointegration test

Given mixed order of cointegration, the Pesaran, Shin and Smith (1998) ARDL model and the Pesaran, Shin and Smith (2001) bounds tests were performed. To decide on the optimal lag length in the bounds test, the AIC was used for lag selection. Hence the lag order of 4 was selected, as shown in Table 4.

Table 4. Optimal Lag Selection Criterion

Lag	LL	LR	DF	P	FPE	AIC	HQIC	SBIC
0	-529.568				2103.32	27.5163	27.6235	27.8149
1	-349.456	360.22	49	0.000	2.6348	20.7926	21.6497	23.1813
2	-289.878	119.16	49	0.000	1.9678	20.2501	21.8571	24.729
3	-207.75	164.25	49	0.000	0.7652	18.5513	20.9082	25.1202
4	-75.975	263.55*	49	0.000	0.0780*	14.3064*	17.4132*	22.9655*

Source: Author, 2023.

The Pesaran, Shin and Smith *(*2001) bounds test was run given the selected lag length and results are in table 5. Given a small sample size, the Narayan (2005) critical values for samples between 30 and 80 are indicated in parentheses. The bounds test of the long-run relationship produced the F-statistic value of 22.114 which is greater than the critical values for the upper bound for Peseran *et al.* (2001), and the Narayan (2005). Therefore, there exist a long run relationship among variables.

Table 5. Pesaran, Shin and Smith Bounds Cointegration Test Results

	Critical Values		
Level of Significance	Lower Bound	Upper Bound	Wald Test (F-Value)
10%	2.12(2.496)	3.23(3.346)	
5%	2.45(2.962)	3.61(3.910)	**22.114**
2.50%	2.75	3.99	
1%	3.15(4.068)	4.43(5.250)	

Source: Author, 2023.

4.5 Empirical results

The optimal lag length was chosen using the AIC and HQIC to run the ARDL (1 0 3 4 4 2 4) model. Table 6 indicates the long run ARDL regression results as well as short run results. The study findings show that initial income (LnGDPPC), inflation (INFL), foreign direct investment, gross fixed capital formation, general government education expenditure (GOVED), and trade openness (TRAD) are determinants of inclusive growth in Zambia. However, initial income, inflation, foreign direct investment, and trade openness do positively affect inclusive growth while gross fixed capital formation, and education expenditure dampen inclusive growth in the long run.

In particular, a percentage increase in initial income (LnGDPPC) increases inclusive growth by 65.75 percent in the long run whereas inflation (INFL) increases it by 0.0011 percent. For the effect of initial income on inclusive growth, this study's findings are similar to that of Oluseye and Gabriel (2017), and Tella and Alimi (2016). The effect of inflation on inclusive growth was found to be positive and significant in the long run for Zambia which conforms to the findings of Ghandour (2020) at the same time contradicting those of Oluseye and Gabriel (2017). With respect to foreign direct investment (FDI), a percentage increase in FDI increases inclusive growth by 0.021 percent. Trade openness positively and significantly increases inclusive growth by 0.0048 percent in the long run. The results for the effect of FDI and trade openness on inclusive growth are similar to those of Anand, Mishra, et al. (2013). This is however contrary to Oluseye and Gabriel (2017) who found no discernible effect of trade openness on inclusive growth in Nigeria.

General government education expenditure was found to have negative long run effect on inclusive growth in Zambia similar to the findings of Oluseye and Gabriel (2017). But contrary to those of Anand, Tulin, et al. (2014), and Balakrishna et al. (2013) who found that education expenditure improves inclusive growth in developed and developing countries as well as in Asia accordingly. In Zambia, gross fixed capital formation undermines inclusive growth such that a percentage increase in the former reduces the latter by 0.0031 percent which is contrary to Oluseye and Gabriel (2017).

As opposed to its long run effect, inflation reduces inclusive growth in the short run such that a percentage increase in inflation will reduce inclusive growth by 0.0004 percent. This opposes the findings by Oluseye and Gabriel (2017) who found inflation to increase inclusive growth in the short run in Nigeria. Similar to the findings of Oluseye and Gabriel (2017) foreign direct investment dampens inclusive growth in the short run in Zambia by 0.0231 percent. On the contrary, this study's findings on the short run effect of gross fixed capital formation, and general government education expenditure on inclusive growth contradicts the findings by Oluseye and Gabriel (2017).

In the short run, gross fixed capital formation, and government education expenditure increase inclusive growth by 0.0036 percent, and 0.0392 percent respectively. Trade openness was found to have a negative and significant effect of 0.0035 percent on inclusive growth. This disapproves the findings of Oluseye and Gabriel (2017) who found insignificant short run effect of trade openness on inclusive growth. The coefficient of the error correction term is estimated at -1.2085. As indicated, it is negative and significant at all levels, implying a high speed of adjustment to equilibrium and confirming the existence of a stable long run relationship.

Table 6. Long-run and short run ARDL regression results.

	Variable	Beta	Std. err	t-statistic
Adj				
	ECT	-1.2085***	0.1314	-9.20
Long Run				
	LnGDPPC	0.6575***	0.0390	16.85
	INFL	0.0011***	0.0001	9.71
	FDI	0.0210***	0.0025	8.43
	GFCF	-0.0031***	0.0010	-3.07
	GOVED	-0.0262***	0.0071	-3.68
	TRAD	0.0048***	0.0011	4.39
Short Run				
	D(INFL)	-0.0004**	0.0002	-2.22
	D(INFL(-1))	-0.0006**	0.0002	-2.92
	D(INFL(-2))	0.0003*	0.0002	1.93
	D(FDI)	-0.0231****	0.0035	-6.51
	D(FDI(-1))	-0.0120***	0.0035	-5.71
	D(FDI(-2))	-0.0205***	0.0035	-5.76
	D(FDI(-3))	-0.0106***	0.0023	-4.58
	D(GFCF)	0.0036***	0.0009	4.00
	D(GFCF(-1))	0.0037***	0.0007	5.57
	D(GFCF(-2))	0.0034***	0.0006	5.61
	D(GFCF(-3))	0.0013**	0.0005	2.74
	D(GOVED)	0.0392***	0.0099	3.95
	D(GOVED(-1))	0.0392***	0.0118	3.31
	D(TRAD)	-0.0035***	0.0011	-3.10
	D(TRAD(-1))	-0.0033**	0.0014	-2.39
	D(TRAD(-2))	-0.0002	0.0008	-0.28
	D(TRAD(-3))	-0.0034**	0.0014	-2.38
	Constant	5.2074***	0.6198	8.40
	Number of Obs	39		
	R-Squared	0.9531		
	Adj R-Squared	0.8726		

***, ** and * indicate significance at 1%, 5% and 10%, respectively. Standard errors in parentheses.
Source: Author, 2023.

4.6 Postestimation tests

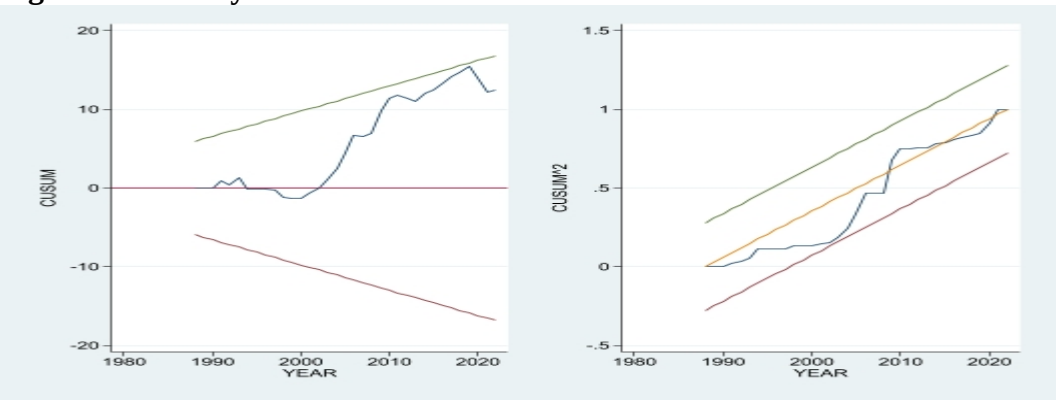
The short run model was subjected to postestimation tests to ensure that the results obtained are robust. On the other hand, the stability of long run and short run coefficients were tested using the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ). The postestimation test results are given in table 7. The study employed the joint skewness and kurtosis tests for normality and found that the residuals were normally distributed. The Durbin-Watson, Durbin alternative, and the Breusch-Godfrey autocorrelation tests revealed that there was no serial autocorrelation. For heteroskedasticity, White's test showed that the model did not suffer from heteroskedasticity while Wu-Hausman test rejected the hypothesis of endogeneity. The regression's independent variables explain about 87 percent of the changes in inclusive growth. Figure 2 indicates the stability tests which shows that the model is correctly specified and stable because the tests of stability are within the limits of the 5 percent level of significance. Therefore, there is stability of the long-run coefficients of regressors that have an effect on Zambia's inclusive growth.

Table 7. Diagnostic tests

	d-statistic	Chi2	F-statistic	prob>Chi2	Adj. Chi2	prob>Chi2	P-value
Durbin-Watson	1.680						
Durbin's Alternative test		0.351		0.5537			
Breusch-Godfrey test		1.025		0.3114			
White's Test		39		0.4246			
Skewness and Kurtosis test for normality (Joint Test)					0.75	0.6877	
Wu-Hausman			0.6749				0.4194

Source: Author, 2023.

Figure 2. Stability tests



Source: Author 2023.

5. Conclusion

Zambia is on the list of countries with high poverty levels, income inequality and unemployment. The prospects of achieving inclusive growth remain unclear given these circumstances. There is, therefore, great concern on how Zambia can achieve inclusive growth. This paper analysed the factors that affect inclusive growth in Zambia using the autoregressive distributed lags (ARDL) and the error correction model (ECM) from 1980 to 2022. The findings show that there is a long run relationship between inclusive growth and independent variables—initial income, inflation, foreign direct investment, gross fixed capital formation,

general government expenditure on education, and trade openness. In addition, a long run relationship existed given that the coefficient of the long run adjustment term was significant. After carefully applying the estimation technique, the results showed that initial income, inflation, foreign direct investment, gross fixed capital formation, government education expenditure, and trade openness are long run and short run determinants of inclusive growth in Zambia. With the exception of gross fixed capital formation, and government education expenditure, the rest of the variables have positive long run impacts on inclusive growth. However, in the short run all variables have negative impacts on inclusive growth except for gross fixed capital formation, and government education expenditure. In addition, initial income level proved to have no discernible impact on inclusive growth in the short run.

The findings of this study have policy implications for the government of Zambia such that policies that ensure a stable economic environment should expeditiously be implemented. Specifically:

- Government should ensure a stable macroeconomic environment to encourage the inflow of foreign direct investment.
- Increase economic opportunities for productivity by eliminating hindrances to productivity thereby increasing national income necessary for inclusive growth.
- Enabling the free flow of trade between Zambia and its partners by eliminating any hindrances to trade.
- Improving gross fixed capital formation and education expenditure to achieve higher inclusive growth in the long run.

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