Effect of Gross Capital Formation on the Economic Growth in Tanzania: A Vector Error Correction Model Analysis

James Daniel Chindengwike[1]

[1]chindengwikejames@gmail.com (+255752515509)

[1]https://orcid.org/0000-0002-1717-8759

[1]St. John's University of Tanzania

https://doi.org/10.51867/ajernet.6.1.7

ABSTRACT

The goal of this research was to investigate the influence of gross capital formation on economic growth in Tanzania. Neoclassical Growth Model was used in this study. The quantitative research approach was used in this study. This study adopted a longitudinal research design, while a documentary review was employed to get secondary data from specific sites. The analysis relied on secondary data on private and public investment. Following the determination of the model's assumptions, a Vector Error Correction Model (VECM) was used. Because the data were presented in the form of a time series, stationarity was investigated. This was followed by a unit root test, then a cointegration test. Consideration is given to validity, reliability, and ethical considerations. The study revealed that there is positive association between gross capital formation and economic growth in Tanzania, also the study revealed that there is positive association between government consumption expenditure and economic growth in Tanzania. The study concluded that the economic growth is significantly impacted by gross capital formation. The study recommends that the government should focus more on the implementation and development of policies and strategies pertaining to the fees and charges paid to the government at all administrative levels. It also suggests that penalties be imposed in order to increase capital formation for private and public companies.

Keywords: Economic Growth, Gross Capital Formation, Tanzania

I. INTRODUCTION

Capital formation is very crucial to stimulating the economic growth of any country. Economic growth in developing countries still has problems that lead the national to depend on developed nations (Ocolisanu et al., 2022). Capital formation can be from private or public nations. The nations attract different investors inside and outside of nations by simplifying the trade policy and making a good environment for investments. Tanzania makes a good environment for investors by establishing the organ that connects the government and investors known as the Tanzania Investment Centre (TIC); this organ is responsible for reviewing the existing investment policy if it is fitted for investors. This organ is collaborated with the Ministry of Trade and Finance to ensure all plans are achieved (Mumuni & Njong, 2023). The previous studies done by Europe and Asia revealed that there is a positive association between capital formation and economic growth. The study recommends that the government should formulate the friendly laws that can help to attract investors. Empirical evidence revealed that the capital formation of manufacturing companies is very important to support the economic growth that helps to achieve the sustainable development goals (SDGs).

Capital formation is very crucial to support economic growth. The empirical evidence revealed that there is a positive association between capital formation and economic growth in America (Ocolisanu et al., 2022). Capital formation helps to boost the economic indicators and help the nations to finance their own budgets. Most developing countries use the strategy of investing in capital markets so as to boost the capital formation for financial and non-financial companies and hence can increase the economic growth.

The feasibility of any occupation depends much more on the appropriate gross inventory turnover management than on interacting capital due to the attention associated with net inventory turnover, which is too narrow (Fazaalloh, 2024). The result of inventory turnover cannot be abandoned during company funding due to its influence on company liquidity and profitability (Fazaalloh, 2024).

The achievement of a corporate trust depends mostly on the aptitude of the financial bosses to manage receivables, stocks, cash, and payables successfully, as observed as the life plasma of the occupational since its mechanisms are used to support the daily doings of the business associated with non-current assets, which are long-term speculation and henceforth not used in short-term funding choices (Mumuni & Njong, 2023). Inventory turnover management is imperative to all companies, including listed companies with several investors, including the public, such as manufacturing, which is highly characterised by majority inventory movements, cash, debtors, and creditors,

which are key components of working capital. Listed companies need to uphold an appropriate level of inventory turnover to ensure maximisation of shareholder wealth through maintaining profitability and solvency of the company (Hickey et al., 2020; Ocolisanu et al., 2022).

The primary drivers of the contemporary economy and financial system are public and private investment, which generate extra value and utilise it for the good of civilisation (Ocolisanu et al., 2022). This point of view holds that the primary goal of investment is the concentration and accumulation of capital, which is subsequently transformed into justifiable public speculation goods and high-quality organic capital. Economic theory states that public funds intended for investment in developing economies should be directed primarily toward filling important infrastructure gaps (Hickey et al., 2020; Ocolisanu et al., 2022). Similarly, both public and private investments play a major role in the production functions by providing the funds required for development. Due to increased demand, government spending on defence, infrastructure, and education crowds out private investment, but public investment provides extra support for private investment (Fazaalloh, 2024). On the other hand, public investment might push out private investment. But in this case, it is important to link economic growth and public investment.

Mose and Kipchirchir (2024) define economic growth as an increase in the per capita national income. This analysis, which is especially quantitative in nature, focuses on the functional relationships between the endogenous variables Gross Domestic Product (GDP), Gross National Products (GNP), and National Income (NI) (Mumuni & Njong, 2023). This includes the structural changes to the economy and the increase in the nation's wealth, including its production capacity, both in absolute and relative terms, per person. Therefore, the estimation of economic growth refers to the process of growing national economies, macroeconomic indicators, and especially GDP per capita not always in a linear fashion. In this context, it is essential to observe how both public and private investment affect economic growth.

With a few notable exceptions, such as Turan et al. (2021) and Nguyen and Trinh (2018), empirical research on the growth effects of investment generally ignores the distinction between public and private components. However, the critical question to ask is this: Could the effects of public and private investment on economic growth differ depending on socioeconomic status? Developed countries have a higher capital stock than emerging countries. Alternatively, one could argue that industrialised countries have the institutional capacity and financial means to direct investment projects to the most needed or productive areas. Furthermore, how does institutional quality affect the growth outcomes of public and private investments?

1.1 Statement of the Problems

The Covid-19 epidemic triggered a recession in various economies. Tanzania's GDP growth rate has declined in recent years, after peaking at 7.9% in 2011 (Fazaalloh, 2024). Following improvements in government priorities announced in April 2021, the World Bank estimates Tanzania's GDP would rise to 5.1% by 2023. Tanzania's GDP is projected to reach USD 75.5 billion in current terms by 2022. In 2022, GDP per capita climbed by 1.4%, while the international poverty rate fell by 0.3%. This is reliable with high-frequency displays like cement output, energy generation, and tourist entrances, all of which rose strongly in 2022 (Fazaalloh, 2024).

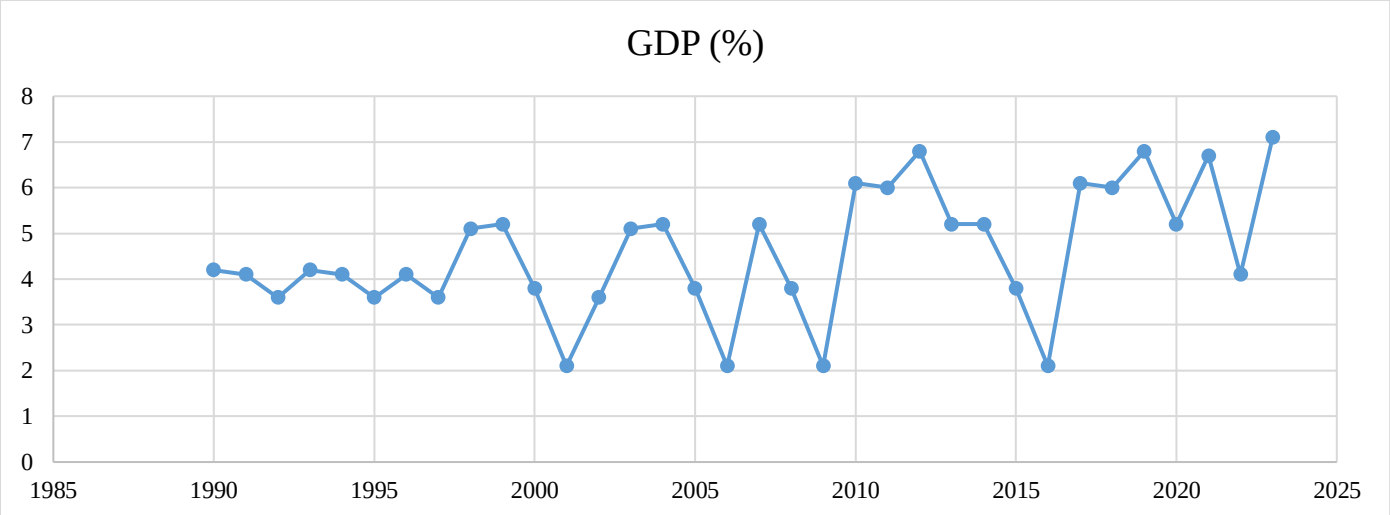

Figure 1
The Tanzanian GDP growth (%) for the Period of 1990 to 2023
Source: URT Data 1990-2023

The graph shows that GDP peaked at 7% before declining to 0.6% in 1992. It gradually recovered, reaching 7.5% in 2005 and peaking at 7.7% in 2013, before declining to 2.0% in 2022. This graph shows how economic growth

varies so dramatically that it has become unpredictable. Public and private investments are key drivers of economic growth. This is because public financing increases investor profits. Tanzania's total investment as a percentage of GDP fell from 33.24% to 29.16% between 2010 and 2023 (Turan et al., 2021). This illustrates that public and corporate investments had little impact throughout this time period and instead exhibited a steady decline. Similarly, GDP appeared to fluctuate dramatically throughout the same time span. For example, GDP climbed by 7.0% in 1990 and 0.6% in 1992; similarly, GDP increased to 7.5% in 2006 but decreased to 2% in 2022. Although private and public investments are not the only factors driving GDP fluctuations, this condition suggests an unclear trajectory, piquing interest in how public and private investment affect economic growth in Tanzania.

To address this difficulty, Tanzania implemented coordinated steps in 1986, including strategic adjustment programs such as economic liberalisation, to supplement the efforts of the public sector, albeit with limited success. Furthermore, past experiments produced contradictory results. For example, some studies identified a negative association between private and public investment and economic growth (Nounou et al., 2023; Amukule and Badji, 2023; Atlam et al., 2017), while others found a positive relationship (Mose & Kipchirchir, 2024; Mumuni & Njong, 2023 & Akinlo, 2022). Furthermore, Ndanshau and Mdadila (2023) in Tanzania only examined one aspect of public expenditure rather than include others, which is consistent with the current study. As a result, these findings are mixed in nature, rendering it impossible. The study's findings are critical for boosting the country's investment policies, both public and private. The study's findings provide policy suggestions and methods for increasing public and private investment in economic growth. Similarly, the study's findings served as a reference for other academics exploring the same or a comparable topic.

1.2 Research Objectives

i. To determine the effect of gross capital formation on the economic growth in Tanzania.
ii. To determine the effect of government consumption expenditure on the economic growth in Tanzania.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Neoclassical Growth Model

Neoclassical Growth Model: Solow presented this notion in 1956. According to neoclassical growth theories, production factors such as land, labour, capital accumulation, and technology variables all have an impact on long-run productivity and economic growth. This suggests that for the country's economy to develop, adequate land, labour, money, and modern technology must be accumulated in order to improve production efficiency and generate surpluses that can be profitably exported. Capital accumulation and technical investment are significant issues for emerging economies (Akinlo, 2022). Limited resource availability can only be addressed by technical innovation that takes into account capital and worker productivity. The primary driver of economic growth varies with a country's level of development. This idea is relevant because of the following fact:

In the current situation, the theory appears to be correct because the country requires ample land, labour, capital accumulation, and superior technology to increase production efficiency and generate a surplus. Tanzania is attempting to provide an enabling environment for lucrative investments by constructing hydroelectric power facilities, standard gauge railways (SGR), and other forms of technology. The literature on the impact of gross capital formation on economic growth is valuable for research (Akinlo, 2022).

2.2 Empirical Review

2.2.1 The effect of gross capital formation on the economic growth

Ahamed (2023) of the United States researched the impact of public and private investments on emerging country economic growth. The study's goal is to examine the impact of public and private investments on economic growth in 39 developing countries between 1990 and 2019. According to the study, public investment in terms of gross capital formation has a significantly greater beneficial influence on economic growth than private investment. According to Fraga and Ferreira-Filho (2023) from Brazil assessed the impact of infrastructure and governmental investment on the elasticity of private investment: an empirical study for Brazil. The purpose of this study was to evaluate the factors of the elasticities of private and total investment for the Brazilian economy between 1960 and 2013. The study used Bayesian model averaging and weighted-average least-squares methods. It was highlighted that public investment in terms of gross capital formation had an impact on the Brazilian economy.

2.2.2 The Effect of Government Consumption Expenditure on the Economic Growth

According to Nguyen (2023) from Vietnam assessed the relationship between public spending and private investment in industrialised and emerging countries. The two-step difference GMM Arellano-Bond estimator will be used in this study to investigate the impact of public spending and private investment on a group of 36 industrialised

countries between 2002 and 2019. It was noted that there was both government and private investment. However, this analysis found no link between governmental and private investment and economic growth. The goal of this research was to investigate the impact of public sector spending and governance on economic growth in Sub-Saharan Africa (SSA). The study examined data from 31 sub-Saharan African nations obtained between 2002 and 2020. The study found that public investment had a favourable link with economic growth.

Similarly, Atlam et al. (2017) explored how national private investment affects manufacturing in Egypt. Based on annual data from 1990 to 2015, this study employed the augmented Dickey-Fuller test and Johansen co-integration to show the stages of national private investment development and their contribution to Egypt's manufacturing sector. The study's findings showed that national private investment makes a major contribution to the manufacturing sector; however, the empirical research found that gross capital formation had a negative impact on the manufacturing sector in both the short and long term. However, this study was not undertaken in Tanzania and centred only on the manufacturing industry. Do other industries provide equivalent results? This question has to be answered.

Furthermore, Ennin and Wiafe (2023) in Ghana investigated the effect of mining foreign direct investment on economic growth. The goal of this research is to investigate the influence of mining foreign direct investment on Ghana's economic growth using quarterly time series data from 1996 to 2015. The Autoregressive Distributed Lag Bounds testing approach was utilised in this study to evaluate cointegration and the error correction model. The study revealed that foreign direct investment in the mining sector slows economic growth but is helpful in the short term. Furthermore, the analysis found a statistically significant positive correlation between private ownership and long-term economic growth. Mose and Kipchirchir (2024) also did a thorough investigation on foreign direct investment and economic growth in Kenya. The study's purpose was to examine the impact of foreign direct investment on economic growth using an Autoregressive Distributed Lag (ARDL) regression technique and causality tests with time series data from 1990 to 2021. The findings suggest that increasing FDI inflows contribute to economic growth. Notably, the data show that short- to long-term foreign direct investment promotes economic growth. Furthermore, Tanzanian researchers Ndanshau and Mdadila (2023) used Autoregressive Distributed Lag (ARDL) to study the relationship between government spending and economic development from 1967 to 2020. The study discovered that in the near run, public and private investment in gross capital formation had a negative and minor impact on economic growth. However, private investment had a favourable but statistically insignificant effect on economic growth. The study produced the opposite results as Mose and Kipchirchir (2024) in Kenya.

III. METHODOLOGY

3.1 Research Design

The quantitative research approach employed and time series (longitudinal research design) was applied in this study since this approaches is suitable for testing the long run relationship of variables.

3.2 Study Location

This study was done in Tanzania because Tanzania is one of developing countries that is attracting investment in order to achieve the Sustainable Development Goals (SDGs) while the economic growth of the nation is growing slowly.

3.3 Data Collection Instrument

A documentary review was used to gather secondary data from specific sites. The data was taken from the World Bank and the International Monetary Fund. The analysis relied on secondary data on private and state investment. Because the data were presented in the form of a time series, stationarity was investigated. This was followed by a unit root test and finally a cointegration test.

3.4 Econometric Model Specification

A Vector Error Correction Model (VECM) is used after the assumptions of the model have been established. The decision was made because "continuous data in nature" (GDP %) is the dependent variable in this study. The VECM is therefore appropriate for this research (Ennin & Wiafe, 2023). The function is extracted as follows;

$$GDPTt = (GCF, GCE) \dots\dots\dots\dots\dots\dots\dots\dots (i)$$

Where;

GDPTt =Economic Growth, *GCE=Government Consumption Expenditure, GCF = Gross Capital Formation*

The model was transformed to

$$GDPTt = \alpha + \beta 1GCFt + \beta 2GCEt + \varepsilon t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (ii)$$

GCF = Gross Capital Formation, GDPTt =Economic Growth, *GCE=Government Consumption Expenditure*
α = Constant term, ε_t = Error Term

Table 1
Measurement of Variables

S/n	**Variables**	**Definition**	**Unit of Measurement**	**Expected signs of the coefficients**	**Source**
1	Economic Growth	Income gained by government through taxation	GDP (%)	Dependent variable	BOT
3	Gross Capital Formation	Net capital accumulation during an accounting period	Capital Goods	+	IMF
4	Government Consumption Expenditure	All government current expenditures for purchases of goods and services	Recurrent Expenditure	+	World Bank

IV. FINDINGS & DISCUSSION

4.1 Trend Analysis of Variables

The study examined the analysis of variable trends from 1990 to 2024. The trend analysis shows how the variable's data behaved from 1990 to 2023. The findings of the trend analysis are shown in Figure 2. As seen in Figure 2, the GDP trend increased in the early 1990s but then slowed down in 1999 before hitting the ground running and accelerating further until 2024. Between 1990 and 2023, it continued to rise after reaching its lowest point of about 40. Tanzania's GDP ratio has not exceeded 100 for the past 34 years.

A. Effect of Government Consumption Expenditures on the Economic Growth in Tanzania

Additionally, Figure 2 demonstrates that government consumption expenditures for the 1990–2023 period increased from roughly 938.713 billion in 1990 to 605.53 billion in 1995 following a decline. According to the trend analysis Figure 2, it rose dramatically to 1010 billion in 1998 before gradually increasing to roughly 6410 billion in 2023. According to the data, during the study period, the government's consumption expenditure to GDP ratio (as a percentage of GDP) did not exceed 40%. This result are similar to a study conducted by Ennin and Wiafe (2023) who said that gross capital formation influence economic growth.

B. Effect of Gross Capital Formation on the Economic Growth in Tanzania

Furthermore, Figure 2 illustrates how gross capital formation (as a percentage of GDP) increased and decreased between 1990 and 2023. According to the data, during the study period, the gross capital formation to GDP ratio (as a percentage of GDP) has not increased above 70%. On the other hand, the analysis shows that gross capital formation peaked at 1040 billion in 1995. GDP growth (as an annual percentage) has been rising and falling between 1990 and 2023, as seen in Figure 2. According to the data, during the study period, the GDP growth ratio, when expressed as an annual percentage, has not exceeded 10%. This result contradicted by Mumuni & Njong (2023) who said that there is association between government consumption spending and economic growth in Ghana

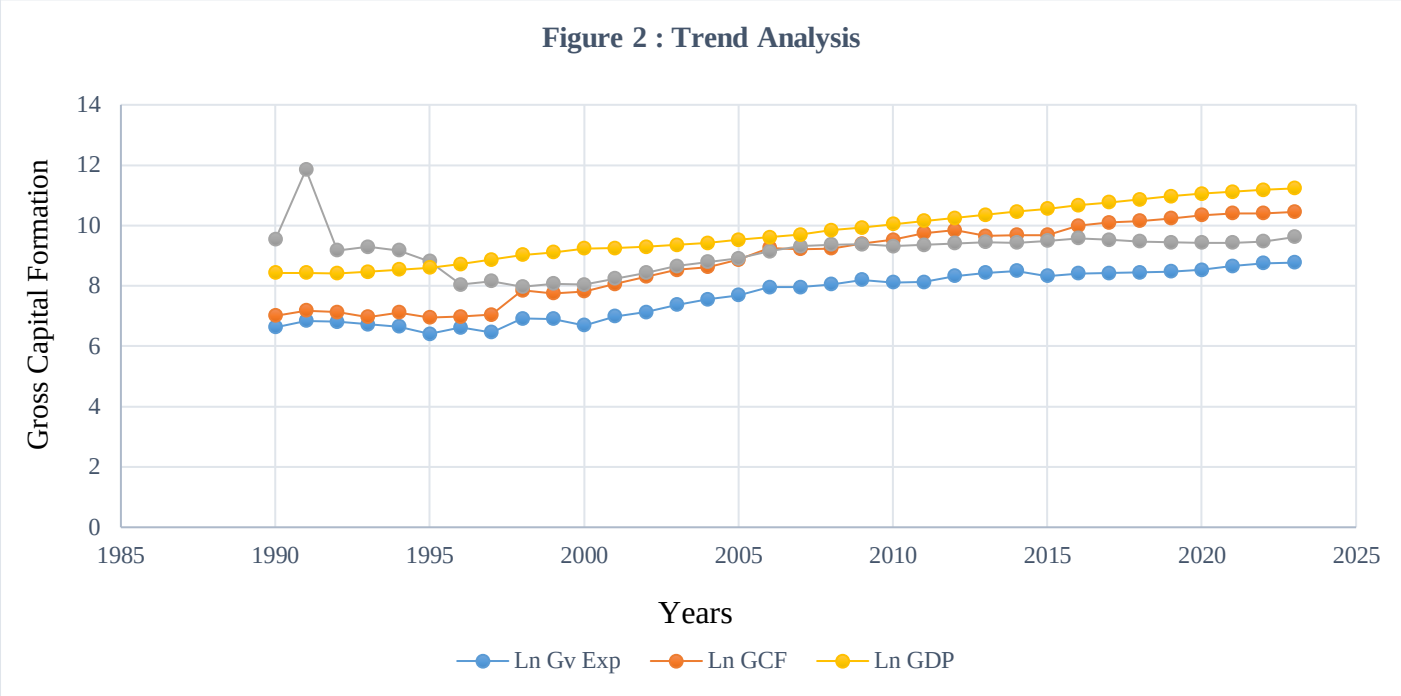

Figure 2
Trend Analysis of Variables
Source: *Researcher Construct* (2024)

4.1.1 Descriptive Statistics of Variables

The study examined the analysis of variable trends from 1990 to 2023. The trend analysis shows how the variable's data behaved from 1990 to 2023. The findings of the trend analysis are shown in Figure 2. As seen in Figure 2, the GDP trend increased in the early 1990s but then slowed down in 1999 before hitting the ground running and accelerating further until 2023. Between 1990 and 2023, it continued to rise after reaching its lowest point of about 40. Tanzania's GDP ratio has not exceeded 100 for the past 34 years.

Additionally, Figure 2 demonstrates that government consumption expenditures for the 1990–2024 period increased from roughly 938.713 billion in 1990 to 605.53 billion in 1995 following a decline. According to the trend analysis figure, it rose dramatically to 1010 billion in 1998 before gradually increasing to roughly 6410 billion in 2023. According to the data, during the study period, the government's consumption expenditure to GDP ratio (as a percentage of GDP) did not exceed 40%.

Descriptive statistics were used in the study to analyse the variables' data. Table 2 displays the descriptive statistics for the variables under investigation, including their mean, standard deviation, minimum value, and maximum value. According to Table 2, the GDP (as a percentage of GDP) has a minimum value of 8.41%, a maximum value of 11.23%, a mean score of 9.74714%, and a standard deviation of %.

Given the extremely low standard deviation between 1990 and 2024, it can be inferred that GDP (as a percentage of GDP) has been growing at a respectable average rate. This suggests that in order to boost economic prosperity, Tanzania needs to work harder to increase GDP (as a percentage of GDP).

Table 2
Descriptive Statistics of Variables

Variable	Obs	Mean	Std. Dev	Min	Max
lngvexp	34	7.670882	0.800161	6.41	8.77
lngcf	34	8.808971	1.248296	6.95	10.45
ln gdp	34	9.747147	0.921161	8.41	11.23

With a mean score of 7.671% and a standard deviation of 0.80%, Table 2 illustrates that the government's consumption expenditures as a percentage of GDP range from 6.41% at the lowest to 8.77% at the highest. This implies that government consumption spending as a proportion of GDP rose between 1990 and 2023. This implies that in order to increase economic growth and reduce wasteful spending, Tanzania should put in more effort to lower government consumption spending as a percentage of GDP. This result contradicted by Mumuni & Njong (2023) who said that there is association between government consumption spending and economic growth in Ghana.

Similarly, Table 2 indicates that the gross capital formation (as a percentage of GDP) ranges from a minimum of 6.95% to a maximum of 10.45%, with a mean score of 8.8089% and a standard deviation of 1.24822%. This suggests that between 1990 and 2023, gross capital formation (as a percentage of GDP) increased. This suggests that in order to boost economic prosperity, Tanzania needs to work harder to increase gross capital formation (as a percentage of GDP). This result similar to the study conducted by Ennin and Wiafe (2023) who said that gross capital formation influence economic growth.

4.1.2 Unit Root Test

The unit root test for the variables under investigation was examined in the study because the information was in the form of a time series. Unit root tests were used to address the issue of spurious regression analysis. The Augmented Dickey-Fuller Test (ADF) was used in the study to determine the stationarity status of the variables. The stationarity status of the variables under investigation is displayed in Table 3.

Table 3

Result of Unit Root Test

Variables	I (0)		I (1)	
	ADF Test Statistic	ADF Critical Value	ADF Test Statistic	ADF Critical Value
Ln GDP	-0.866344	-2.667287	-3.4765686	-2.275435
Ln GovConExp	-1.778873	-3.233134	-4.6433218	-3.098755
Ln GCForm	-2.6543641	-4.895432	-3.1174876	-2.277832

With the ADF test statistics value for GDP, government consumption expenditure, and gross capital formation at zero degree of integration being less than the ADF critical value, Table 3 shows that none of the variables were stable. Since the variables were not stationary at the zero level of integration, regression analysis was inappropriate to avoid erroneous regression analysis. The study employed the first differential technique to assess the stationarity of natural log gross capital creation, log GDP, and log government consumption spending. Since the ADF test statistics value for Log GDP, Log FINE, and Log FEES was greater than the ADF critical value, the first differential results show that all variables were stationary at the first differential. Consequently, the variables in the model can be inferred to be integrated of order one. This calls for additional analysis of the co-integration equations (Ennin & Wiafe, 2023). During this procedure, estimates of the eigenvalue and likelihood ratios (trace statistic) are made. This result contradicted by Mumuni & Njong (2023) who said that there is association between government consumption spending and economic growth in Ghana.

4.1.3 Correlation Analysis

In order to determine the relationship between the independent variables government consumption spending (as a percentage of GDP), gross capital creation (as a percentage of GDP), and domestic private credit (as a percentage of GDP) and the dependent variable, gross domestic product, the study looked into correlation analysis. The degree of multicollinearity of the variables chosen for this investigation is gauged by the correlation coefficient. According to Mose and Kipchirchir (2024) the correlation matrix is also utilised to identify the most important factors among the independent variables that have been theorized and chosen.

Table 4

Result of Correlation Analysis

	Lngvexp	Lngcf	Lngdp
Lngvexp	1.0000		
Lngcf	0.9839	1.0000	
Lngdp	0.9514	0.9722	1.0000

The GDP and government consumption expenditure (as a percentage of GDP) have a 0.9514 correlation coefficient at p = 0.000, as shown in Table 4. This implies that there is a positive and substantial correlation between Tanzania's GDP and government consumption spending (as a percentage of GDP). The research results are in line with those of Fraga and Ferreira-Filho (2023), who noted that the GDP of the economy was dictated by government consumption spending. This study discovered, among other things, that government spending on consumption affects the country's GDP, a gauge of economic growth. This result similar to the study conducted by Ennin and Wiafe (2023) who said that gross capital formation influence economic growth.

In a similar vein, Ahamed (2023) thought that government consumption spending, among other factors, determined economic growth. Thus, these results are consistent with Ahamed's (2023) findings.

Similarly, Table 4 demonstrates that the correlation coefficient between GDP and gross capital formation to government (as a percentage of GDP) is 0.9772 at p = 0.000. This suggests that Tanzania's gross domestic product and gross capital creation to government (as a percentage of GDP) have a positive and significant relationship. The conclusions of this study are in line with those of Makuyana & Odhiambo (2019) in Malawi, who found that the economic variables of gross capital creation, domestic private credit, and government consumer expenditure have an impact on the Indian service sector between 2011 and 2015. As a result, GDP was positively correlated with domestic private credit, gross capital formation, and government consumption spending. Thus, the positive correlation coefficient between the variables in question indicates that non-tax revenues have a positive and important influence on GDP. This result contradicted by Mumuni & Njong (2023) who said that there is association between government consumption spending and economic growth in Ghana.

4.1.4 Long Run Regression Results

The study examined how government fines and fees, expressed as a percentage of GDP, relate over time to the dependent variable, gross domestic product, which serves as a barometer of economic expansion. The study employed the findings of the Johansen Co-integration Test and Parsimonious ECM Regression Analysis to examine the long-term relationship between variables. Table 5 and 6 presents the findings.

Table 5

Johansen Co-integration Test Result

Johansen Tests for Cointegration

Trend: Constant **Number of obs** = 34

Sample: 1990 - 2024 **Lags=** 2

maximum rank	*parms*	*LL*	*eigenvalue*	*trace statistic*	*critical value (5%)*
0	20	75.86251		100.163	47.21
1	27	114.6181	0.91128	22.6519*	29.68
2	32	123.8186	0.43732	4.2508	15.41
3	35	125.4856	0.09894	0.9168	3.76
4	36	125.944	0.02824		

Maximam rank	*Parms*	*LL*	*eigenvalue*	*Max statistic*	*critical value (5%)*
0	20	75.86251		77.5111	27.07
1	27	114.6181	0.91128	18.4011	20.97
2	32	123.8186	0.43732	3.3339	14.07
3	35	125.4856	0.09894	0.9168	3.76
4	36	125.944	0.02824		

Two of the trace statistics values (likelihood ratios) are higher than the 5 percent critical values, as seen in Table 5. A foundation for a long-term relationship between the variables is established by this outcome. This suggests that the dependent variable, gross domestic product, and the independent variables, gross capital creation (as a percentage of GDP) and domestic private credit (as a percentage of GDP), have a long-term relationship. The study used parsimonious ECM regression analysis to determine the long-term relationship between the dependent variable, gross domestic product, and the independent variables, government consumption spending (as a percentage of GDP), gross capital formation (as a percentage of GDP), and domestic private credit (as a percentage of GDP). The findings are shown in Table 5. This result similar to the study conducted by Ennin and Wiafe (2023) who said that gross capital formation influence economic growth.

Table 6

Vector Error Correction Model Regression Results

Vector Autocorrelation Model						
Sample: 1990-2024					No of Obs = 29	
Log likelihoo = 180.3082					AIC = -7.262636	
Dot (Sigma_m1) = 4.67e-11					HQIC=-6.15517	
					SBIC=-3.726526	
Equation	Parms	RMSE	R-sq	chi2	P>chi2	
D_1ngvexp	1B	-158688	0.5771	15.01073	0.6612	
D_1ngcf	1B	-145761	0.844	59.52776	0	
D_1ndpc	1B	-90144	0.9291	144.1652	0	
D_1ngdp	1B	-94094	0.7445	32.04881	0.0217	
	Coof.	Std. Err.	=	P>1=1	[95% Conf.	Interval]
D_1ngvexp						
-col						
L1.	4709964	578115	0.81	0.415	6620882	1.604081
lngvexp						
LD.	6780528	8064055	-0.84	0.4	-2.258579	902473
L2D.	897949	5009542	-0.18	0.858	-1.071647	8920573
L3D.	-0.6625	675822	-0.98	0.327	-1.987087	6620867
L4D.	2939628	3687995	-0.8	0.425	-1.016796	-4288709
1ngcf						
LD.	6022921	4385933	1.37	0.17	-0.257335	1.461919
L2D.	40706	39154	-0.1	0.917	BOB1103	7266984
L3D.	507993	2877711	0.18	0.86	5132218	0.6148204
L4D.	-1651067	19723 -	0.84	0.403	221457	5516704 -
1ndpc						
LD.	-223461	3467321	0.06	0.949	6572363	7019285
L2D.	2823984	4014985	0.7	0.482	5045242	1.069321
L3D.	-409896	1767599	0.23	0.817	0.3054535	3874326
L4D.	468127	1123642	-0.42	0.677	-2670426	1734171
1ngdp						
LD.	2468248	5648586	-0.44	0.662	-1.353927	8602777
L2D.	1.348124	999411	-1.35	0.177	-3.306934	6106857
L3D.	1656324	9597936	-0.17	0.863	-2.046793	1.715528
L4D.	4875193	9939192	-0.49	0.624	-2.435565	1.460526
_cons	1566612	1467191	1.07	0.286	-0.130903	4442254
D_1ngcf						
-col						
L1.	3059215	5310201	-0.58	0.565	-1.346702	7348588
lngvexp						
LD.	4368343	7407135	0.59	0.555	-1.014937	1.888606
L2D.	8025815	4601451	1.74	0.081	992863	1.704449
L3D.	7027147	-6207676	1.13	0.258	5139675	1.919397
L4D.	1220667	338756	0.36	0.719	5418829	7860163
1ngcf						
LD.	-1254316	4028643	0.31	0.756	6641678	9150311
L2D.	1033577	0.3596441	0.29	0.774	6015318	8082471
L3D.	2616685	2643285	-0.99	0.322	7797429	2564058
L4D.	1663761	1811631	-0.92	0.358	5214493	188697
1ndpc						
LD.	1392886	3184863	-0.44	0.662	7635102	4849331
L2D.	4313982	3687913	-1.17	0.242	-1.154216	2914194
L3D.	1178332	1623605	0.73	0.468	2003876	0.436054
L4D.	363434	1032107	0.35	0.725	1659459	2386327
1ngdp						
LD.	2.185747	5188436	4.21	0	1.168832	3.202662
L2D.	7208256	9179962	-0.79	0.432	-2.520065	1.078414
L3D.	63548	0.8816061	0.07	0.943	-1.664368	1.791464
L4D.	9156641	9129517	1	0.316	0.8736884	2.705017
_cons	1105233	0.134767	-0.82	0.412	0.3746617	1536151

Using the Vector Error Correction Model (VECM), the study's findings are presented in Table 6, which examines the long-term relationship between the independent variables of gross capital formation (as a percentage of GDP), domestic private credit, and economic growth (GDP) as the dependent variable.

The null hypothesis is rejected since the trace statistics (77.511) in Table 6 are greater than critical values at both significant levels, i.e., 5% (27.21) and 1% (100.1630). This implies that alternative theories are accepted, and consequently, domestic private credit, gross capital formation, and government consumption spending all have a major influence on the gross domestic product. This illustrates how domestic private credit, gross capital formation, and government consumption spending affect Tanzania's GDP. This result similar to the study conducted by Ennin and Wiafe (2023) who said that gross capital formation influence economic growth.

The null hypothesis is rejected because the trace statistics (77.511) in Table 6 are greater than critical values at both significant levels, namely 5% (27.21) and 1% (100.1630). This implies that alternative theories are accepted, and consequently, domestic private credit, gross capital formation, and government consumption spending all have a major impact on the GDP. This illustrates the relationship between gross capital formation, domestic private credit, and government consumption spending and Tanzania's GDP. The findings of Ahamed (2023) investigation into the variables impacting the EU economy are corroborated by this. The study used panel data analysis to ascertain whether macroeconomic and monetary factors affect the economy. Granger causality tests were also used to investigate the direction of the relationship among member states between domestic private credit, gross capital formation, and government consumption expenditure. The findings showed that government consumption expenditure, gross capital formation, and domestic private credit were correlated in one-third of the cross-sectional variation of determinants. This result similar to the study conducted by Ennin and Wiafe (2023) who said that gross capital formation influence economic growth.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

According to the study, revealed that the economic growth is significantly impacted by gross capital formation. The researchers discovered that gross capital formation had a large impact on economic growth. Therefore, there is association between gross capital formation and economic growth in Tanzania.

5.2 Recommendations

The research suggests that the government should focus more on the implementation and development of policies and strategies pertaining to the fees and charges paid to the government at all administrative levels. It also suggests that penalties be imposed in order to increase capital formation for private and public companies. Furthermore, this study used data analysis, but cointegration analysis requires that a similar study be conducted using different methods of analysis. As a result, this demonstrates a methodological gap that warrants future research with the goal of closing the knowledge gap.

REFERENCES

Ahamed, F. (2023). Impact of public and private investments on economic growth of developing countries. *IOSR Journal of Economics and Finance (IOSR-JEF), 12*(1), 23-39.

Akinlo, A. E. (2022). Impact of public and private investment on economic growth in Nigeria: A Markov regime-switching approach. *Review of Innovation and Competitiveness, 8*(1), 41-61.

Amukule, A. I. O., & Badji, K. G. (2023). Foreign direct investment and economic growth in Kenya. Bachelor's degree project thesis in economics submitted at Kenyatta University, Kenya.

Atlam, B. M., Soltan, A. A., & Mohamed, N. M. (2017). The impact of national private investment on manufacturing in Egypt. *International Journal of Economics and Financial Issues, 7*(1), 192-200.

Ennin, A., & Wiafe, E. A. (2023). The impact of mining foreign direct investment on economic growth in Ghana. *Cogent Economics & Finance, 11*(2), 15-36. https://doi.org/10.1080/23322039.2023.2251800

Fazaalloh, A. (2024). FDI and economic growth in Indonesia: A provincial and sectoral analysis. *Journal of Economic Structures, 13*(3), 2-18. https://doi.org/10.1186/s40008-023-00323-w

Fraga, J. S., & Ferreira-Filho, H. L. (2023). The effects of infrastructure and public investment on the elasticity of private investment: An empirical investigation for Brazil. *Brazilian Journal of Political Economy, 43*(1), 275-298. https://doi.org/10.1590/0101-31572023-3383

Hickey, R., Lozej, M., & Smyth, D. (2020). Financing government investment and its implications for public capital: A small open economy perspective. *Economic Modelling, 93*(5), 620-641.

Makuyana, G., & Odhiambo, M. N. (2019). Public and private investment and economic growth in Malawi: An ARDL-bounds testing approach. *Economic Research-Ekonomska Istraživanja, 32*(1), 673-689. https://doi.org/10.1080/1331677X.2019.1578677

Mose, N., & Kipchirchir, E. (2024). Foreign direct investment and economic growth in Kenya: A comprehensive analysis. *Asian Journal of Economics, Business and Accounting*, *24*(2), 1-13.

Mumuni, S., & Mom Njong, A. (2023). Public sector investment and economic growth in Sub-Saharan Africa. *Journal of Economics & Management*, *45*(5), 147-181. https://doi.org/10.22367/jem.2023.45.08

Ndanshau, M. O. A., & Mdadila, K. (2023). Government expenditure and economic growth nexus in Tanzania. *African Journal of Economic Review, 11*(3), 29-54.

Nguyen, C. T., & Trinh, L. T. (2018). The impacts of public investment on private investment and economic growth: Evidence from Vietnam. *Journal of Asian Business and Economic Studies, 25*(1), 15-32. https://doi.org/10.1108/jabes-04-2018-0003

Nguyen, V. B. (2023). The relationship between public expenditure and private investment in developed and developing economies: Policy implications based on the difference. *Hacienda Pública Española/Review of Public Economics, 24*(1), 37-55.

Nounou, H., Karim, M., Dar, M. M., & Zerrab, F. Z. (2023). Public investment and economic growth in Morocco: An econometric analysis using the ARDL model. *International Journal of Economics and Finance, 15*(9), 126-135. https://doi.org/10.5539/ijef.v15n9p126

Ocolisanu, A., Dobrota, G., & Dobrota, D. (2022). The effects of public investment on sustainable economic growth: Empirical evidence from emerging countries in Central and Eastern Europe. *Sustainability, 14*(1), 8721. https://doi.org/10.3390/su14148721

Turan, T., Yanıkkaya, H., & Özer, H. A. (2021). Economic growth effects of public and private investment: Evidence from dynamic panel estimation for developed and developing countries. *Prague Economic Papers*. https://doi.org/10.18267/j.pep.781