

# Moderating Effect of Political Stability on Gross Fixed Capital Formation and Economic Growth of East African Community Member States

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## Abstract

**Goal:** This study sought to ascertain how political stability affected the member states of the East African Community's link between GFCF and EG.

**Design and Techniques:** Panel longitudinal, cross sectional, and correlational study designs were utilized throughout the 2000–2022 study period. In the study, pooled OLS estimation was used to panel data from six (6) EAC member states.

**Results:** The study discovered that the rate of gross fixed capital creation affected the rate of economic growth. Additionally, the study discovered that the link between gross fixed capital creation and the economic development of the EAC member nations was significantly moderated by political stability.

**Originality/value:** This study adds to our understanding of the optimal strategies for fostering regional economic growth while taking into account the states' political stability and capital assets.

**Implication to Policy:** The study implications are that management of political landscape in the region should be prioritized to achieve progressive economic growth alongside investments towards accumulation of capital assets.

**Keywords:** Gross Fixed Capital Formation, Political Stability, Economic Growth, Pooled OLS and East African Community Member States.

## 1. INTRODUCTION

### 1.1 Background of the Study

Economic discourse at the local, regional, and international levels has focused a great deal of emphasis on the relationship between gross fixed capital formation (GFCF) and economic growth (EG). There have been conflicting results from numerous investigations. According to research conducted by (Widjaja, 2024; Dumo, Ico & Magpantay, 2023; Chibuzor & Ele, 2023; Kesar, Bandi, Jena & Yadav, 2022; Solo's, 1957; Barro, 1990; and Romer, 1990), GFCF significantly and favorably affects economic growth. In contrast (Fetai et al., 2017) showed impact of GFCF on economic development was negative while (Onyinye, Idenyi & Ifeyinwa, 2017) discovered insignificant relationship. (Ay, Kursunal & Baoua, 2017) discovered GFCF and economic growth to have a two-way relationship. (Ntamwiza & Masengesho, 2022) analyzed the correlation between GFCF and economic progress and came to the conclusion that there exists both the short- and long-term positive and significant relationship.

One of the macroeconomic factor that is to affect the link between the GFCF and EG is political stability. (Umar, Dauda & Sadiq, 2024; Agu, 2024; Basha, 2023; Hoque, Akhter & Yakob 2018; Alesina et al., 1996) found no causal link between adverse political stability and economic development, just a negative impact on it while (Baliamoune-Lutz & Ndikumana, 2008) reported no significant association. (Ahmed & Pulok, 2013) concluded adverse political environment to have negative effect on EG. Zhang & Li (2005) came to the conclusion that positive political stability favorably affects economic expansion. The study employs two key theories: Jensen & Meckling's Principal-agency theory (1976), which demonstrates the relationship between political stability and economic growth, and Neoclassical Economic Growth Theory (GFCF), which emphasizes the role GFCF plays in economic growth by describing how a steady rate of growth is achieved by the interplay of the three forces of labor, capital, and technology.

Originally known as the East African Community (EAC), it was founded in 1967 and consists of seven nations: Burundi, Tanzania, Kenya, South Sudan, Uganda, Rwanda, and the Democratic Republic of the Congo (DRC). The East African Community (2017) reports that the EAC members, which have a combined land area of over 2.5 million square kilometers, have an annual gross domestic product of around US\$ 193 billion and an estimated population of 177 million, with 22 percent living in metropolitan areas. With a goal of achieving growth, competition, safety, stability, and a politically united community, the EAC member nations treaty was signed in 1999 and put into effect in 2000 (East African Community, 2017). In contrast to its Vision 2050 average projections of 5.8% by 2014, 10% by 2030, and 9.9% by 2050 for East African Community (EAC) member states, the GDP growth rate in EAC member states has stayed at an average of 4.2% over the previous 20 years (The East Africa Community Vision for 2050 and East Africa Community, 2022). Over the past 20 years, the region has lost authority over the political stability in terms of country governance (World Bank, 2015). These observations have brought forth challenges of underperforming economic growth, low GFCF and adverse political stability in some cases in EAC member state's which needs to be addressed. This study seeks to answer the question: does political stability impact the way in which economic development and gross fixed capital creation are related in EAC member states?

### *1.2 Gross Fixed Capital Formation*

The process of progressively acquiring assets such as land improvements, schools, hospitals, airports, trains, roads, equipment, and machinery via the use of society's resources to generate capital goods that increase the efficacy of productive effort is known as gross fixed capital formation (World Bank, 2014). Since it comprises assets meant for more than a year's worth of production of goods and services, the World Bank's (2017) GFCF as percentage of GDP is used to calculate the gross fixed capital formation rate in this study.

### *1.3 Political Stability*

Alesina, Roubini, Ozler, and Swagel (1996) define political stability as a peaceful, stable nation with robust institutional frameworks, administration, and widespread political legitimacy. (Huang and Muchapondwa, 2012) and (Shin, 2015) identified institutional stability and absence of political violence as prerequisites for stability, using a composite index for assessing stability. According to (World Bank, 2018), "Political stability index is the measure produced using a standard normal distribution with units for each nation, ranging from -2.5 (weak) to 2.5 (strong)." Because data for every country under consideration is available, the political stability index (World Bank, 2018) is employed in this study as a gauge of political stability.

### *1.4 Economic Growth*

Gale & Samwick (2016) state that increasing the economy's supply side and potential GDP are necessary for economic growth, while (Baumol & Blinder, 1988) define it as the production of goods and services for every consumer. Kuznets (1973) defined GDP growth to be the gradual expansion of a country's ability to produce a variety of economic commodities, driven by advanced technology and institutional and ideological adjustments. Todaro (1977) defined growth in GDP as a country's ability to produce more commodities and services that raise the standard of living for its citizens. (Landerfeld, Seskin & Fraumeni, 2008) "The Real Gross Domestic Product (RGDP) rate of growth is the percentage increase in the total market rate of domestic services and finished goods over a specific time period". Previous research has used GNP, GDP, and per capita income as indicators of economic growth (Romer, 2018; World Bank, 2019; Aslam & Awan, 2018). This study uses real GDP growth to measure economic growth, as it adjusts numbers by fixing currency value, eliminating inflation or deflation distortions.

### *1.5 East Africa Community Member States*

Consisting of seven nations (the Democratic Republic of the Congo, Burundi, Tanzania, Kenya, South Sudan, Uganda, and Rwanda) with a combined population of 177 million and a GDP of around \$193 billion, the East African Community (EAC) was founded in 1967 (East African Community, 2017). The EAC member nations treaty, signed in 1999 and put into effect in 2000, aimed to promote growth, competition, safety, stability, and political unity among its member nations (East African Community, 2017).

The EAC Vision 2050 focuses on three themes: Transformation, Value Addition, and Economic Growth. "An Upper-Middle Income Region that Competes Globally and Has a High Quality of Life for Its People Based on the Principles of Inclusiveness and Accountability" with an expected 5.8% growth by 2014, 10% by 2030, and 9.9% by

2050. Despite significant obstacles such as a high unemployment rate, inadequate infrastructure, and low levels of industrialization, the EAC member nations have averaged 4.6% GDP growth annually for the past 22 years (East African Community, 2022). Researchers have been motivated to conduct additional research on how economic growth can be improved and sustained in EAC member states by the reasons behind the EAC member states' low, underperforming, and erratic economic growth when compared to its Vision 2050 EG targets.

### *1.6 Research Problem*

Studies on the impact of gross fixed capital formation on economic growth in various countries have produced opposing viewpoints. Some scholars argue it enhances growth (Achar, Luther, Ochieng & Odhiambo, 2024; Dumo, Iko & Magpantag, 2023; Chibuzor & Ele, 2023; Kesar, Bandi, Jena & Yadav, 2022) while (Fetai et al., 2017) argue it doesn't enhance economic growth. (Onyinye, Idenyi & Ifeyinwa, 2017) argue that it's insignificant while (Ay, Kursunal & Baoua, 2017) posit that gross fixed capital formation and Economic growth have a bidirectional interaction towards each other.

The EAC's Vision 2050 aims at EAC member states to become an upper-middle income region, with economies developing at a pace of 5.8% by 2014, 10% by 2030, and 9.9% by 2050, based on inclusivity and accountability values. The EAC Development and Growth Strategy (2016) emphasizes macroeconomic stability among member states, acknowledging that economic growth objectives, such as GDP growth rate, GFCF rate, and national savings rates, have not been met. The World average for GFCF rate between 2000-2022 was 25%, while EAC member states' average was 20%. EAC's GDP growth rate over the past 22 years was 4.6%, falling short of their vision 2050 leading to concerns being raised by researchers.

This study modifies the association between GFCF and EG using political stability, despite previous contradicting results suggesting adverse political environments to negatively impact the relationship, with no causal relationship found (Umar, Dauda & Sadiq, 2024; Agu, 2024; Basha, 2023; Hoque, Akhter & Yakob 2018; Alesina et al., 1996). According to the second viewpoint, conducive political environment significantly and favorably affects the relationship between GFCF and EG (Yao & Wei, 2007; Zhang & Li, 2005; Asiedu, 2002). All these divergent and incompatible viewpoints on the ideas of GFCF, political stability and EG result in conceptual, contextual, methodological and theoretical gaps.

The studies mentioned above reveal gaps in research in the EAC member states context, including conceptualization, methodology, theoretical, and periodic gaps due to the use of different methodologies, theories, and study periods. The goal of this research is therefore to fill the conceptual, contextual, methodological and theoretical

gaps mentioned in the foregoing discussion in order to ascertain how Political Stability moderates the relationship between GFCF and economic growth in EAC member states. What is the moderating effect of political stability on GFCF and economic growth of EAC member states? is the main research question driving this study.

### *1.7 Research Objectives*

The general objective of this study is to establish the moderating effect of political stability on the nexus between GFCF and economic growth of EAC member states. The specific objectives are:

- i. To examine the effect of GFCF on economic growth of East African Community member states.
- ii. To determine the effect of political stability on the relationship between GFCF and EG of East African Community member states.

## **2. LITERATURE REVIEW**

### *2.1 Neoclassical Economic Growth Theory*

Solow & Swan (1956) exogenous growth concept, based on neoclassical economics, suggests that long-term economic growth is achieved through labor, capital, and technology forces, with technology potentially contributing infinitely despite limited resources. The theory suggests that economic development is influenced by individuals' financial use and capital accumulation. Technology enhances labor productivity and output capacity, while capital investments in infrastructure, education, and healthcare boost private sector efficiency (Romer, 1990).

Some of the proponents for this theory are (Barro, Mankiw & Sala, 1992), suggests that countries with higher investment rates and human capital tend to grow faster. Lucas (1988) in his study explains how technological progress can lead to economic growth and (Mankiw, Romer & Weil, 1992) who in their study shows how significant variables of EG include investments in people and physical resources, population expansion, and technology advancement. On the contrary several scholars have criticized the theory; for neglecting institutions, politics, and social norms in EG, assuming perfect competition and markets, and ignoring R&D's role in EG (Acemoglu, 2009; Romer, 1994). The theory is pertinent to this research proposal since it hypothesizes how variations in gross fixed capital formation are reflected in changes in total factor productivity, which affects economic growth (Maingi, 2010). The EG in EAC member states is predicted to increase if enough funds are allocated to gross fixed capital accumulation initiatives.

## *2.2 Agency Theory*

Jensen & Meckling (1976) explains the relationship between principals and agents in business, addressing conflicts of interest caused by separate control and ownership. It addresses divergent risk aversions between principals and agents (Eisenhardt, 1989). This theory helps in comprehending the effect of political stability on the connections between GFCF and EG in this study. In EAC member states, the governments represent the agent and the electorate (citizenry) represents the principal in this theory. Agency-Principal relationship can result from bad governance brought on by knowledge asymmetry, which includes abusing public office to further one's own interests (Forrester, 2002). This concept is therefore viewed in this analysis as an anchor for political stability on its relationship between GFCF and EG. The following are some of the criticisms of this theory: Holmstrom & Milgrom (1990) claim that the theory's skewed premise that agents are exclusively driven by financial incentives is unfounded. Donaldson (1990) critiqued the theory's focus on how to resolve conflict among stakeholders in the firm for being too narrow.

## *2.3 Empirical Literature Review*

### *2.3.1 Gross Fixed Capital Formation, Political Stability and Economic Growth*

Huang & Quibria (2013) in their study "The global partnership for sustainable development: Is China helping or hindering?" investigates the impact of political stability as a moderating factor in the link between GFCF and economic development in a sample of nations, including China, using panel data analysis. According to the findings, conducive political environment strengthens the beneficial impact of GFCF on EG. Since China's economy is more developed than that of the EAC member nations, the research used specialized data from China that is not applicable to other countries.

Molonko (2017) examines the relationship between capital investment and sectoral economic development in Kenya and the moderating effect of political risk using the panel stationarity test, the Hausman test (ARDL model), and the heterogeneity test. The study found that capital expenditures, both short- and long-term, had an effect on the pace of economic growth. The study demonstrated the significant short- and long-term effects of capital investment on sectoral economic growth. Additionally, the study found that political risk significantly alters the long-term relationship between capital spending and sectoral economic growth at the significance level of 0.05. The study concluded that capital expenditures had an immediate and long-term impact on Kenya's sectoral economic growth. Political risk also lessens the impact of capital expenditure over the long run. The analysis cannot be applicable to the context of the EAC member states because it relied on specific economic statistics from Kenya.

In a panel study for 124 countries from 1980-2018, Topcu et al. (2020) revealed that for high-income economies, gross capital formation, energy and urbanization usage impacts positively on economic growth, whereas capital formation negatively impacts low-income economies. The analysis cannot be extended to the context of the EAC member states because it relied on specific economic statistics from 124 countries.

#### *2.4 Hypotheses of the study*

The hypotheses to be investigated emerge from the study's objective and are based on literature and the study conceptualization.

**H<sub>01</sub>:** Political stability has no significant moderating effect on the relationship between gross fixed capital formation and economic growth of EAC member states.

### **3. RESEARCH METHODOLOGY**

#### *3.1 Research Design*

This study employed a Panel longitudinal, cross sectional and correlational design to examine trends in change in the variables over time. The design enabled the study to differentiate between changes in overall data and variations in individual data over time (Rutter, 1988). The target population for the research consisted of seven member states of the East African Community: Burundi, the Democratic Republic of the Congo, Kenya, Rwanda, South Sudan, Uganda, and Tanzania. The study period was for over a 23-year span, from 2000 to 2022. Data for the Political Stability (Gymah-Brempong & Osei, 2013) for the years 2000 to 2022 was drawn from the World Bank's Worldwide Governance Indicators while data for the GFCF and GDP growth was drawn from the World Bank's World Development Indicators. To enable the data to be analyzed, the GFCF was calculated as a percentage of the GDP while political stability was calculated as an index.

The data was tested for key axioms to ensure robust results in panel datasets such as Levin-Lin-Chu Unit-Root Test for stationarity, Wooldridge test for autocorrelation, Breusch-Pagan test for homoskedasticity, Hausman specification test for determining the appropriate model between fixed and random effects and also LM test for determine the method to use between random and pooled OLS regression model. The data was analyzed through Autoregressive Distributed Lag Model (ADL).

**Table 3.2***Summary of Research Objectives, Hypotheses, Analytical Models, Statistical Test and Interpretation*

| Objective                                                                                                                                            | Hypothesis                                                                                                                                                         | Analytical Models                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Interpretation                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. To examine the effect of gross fixed capital formation on economic growth of EAC member states.                                                   | H01: Gross Fixed Capital formation has no significant effect on the economic growth of EAC member states.                                                          | <p><b>Multiple Regression Models:</b></p> $GDP_{it} = \beta_0 + \beta_1 GFCF_{it} + \varepsilon_{it}$ <p>Where, GDP = Economic growth rate, <math>\beta_0</math> = Intercept, GFCF = Gross fixed capital formation rate, <math>\beta_1</math> = coefficient, <math>\varepsilon_{it}</math> = Error term, i = individual country cross-section data and t = time series</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>Relationship exists if <math>\beta_1</math> is significant (p-value: <math>p &lt; 0.05</math>).</p> <p>Test of significance for <math>R^2</math> using the F-statistics. F-Test will be statistically significant if (p-value: <math>p &lt; 0.05</math>)</p>                                                                                                                                                                                    |
| 2. To determine the moderating effect of political stability on the effect of gross fixed capital formation on economic growth of EAC member states. | H02: The relationship between gross fixed capital formation rate and economic growth of EAC member states is not significantly moderated by political environment. | <p><b>Hierarchical Regression Models:</b></p> <p>Baron and Kenny (1986) approach:<br/> Step 1: Relationship between X and Y should be statistically significant.<br/> Step 2: Determine whether or not the moderator Z alters the robustness of the causal association between X and Y.<br/> Step 3: Moderating effect occurs if the relationship between X and Y is significant and the interaction term is statistically significant <math>p &lt; 0.05</math></p> $GDP_{it} = \beta_0 + \beta_1 GFCF_{it} + \beta_2 PSI_{it} + \varepsilon_{it}$ $GDP_{it} = \beta_0 + \beta_1 GFCF_{it} + \beta_2 PSI_{it} + \beta_3 (GFCF * PSI) + \varepsilon_{it}$ <p>Where, GDP = Economic growth rate, GFCF = Gross fixed capital formation rate, PSI = Political stability index, (GFCF * PSI) = Interaction term, <math>\varepsilon_{it}</math> = error term, i = individual country cross-section data, t = time series</p> <p><math>\beta_0</math> = Intercept, <math>\beta_1, \beta_2, \beta_3</math> are coefficients</p> | <p>The F-Test need to have statistical significance. Check to see whether the direction or strength of the connection between GFCF and GDP changes when the interaction term (GFCF*PSI) is included. Identify the interaction term's statistical significance. If the association between GDP and GFCF is substantial and the interaction term is also significant (p-value: <math>p &lt; 0.05</math>), the moderating impact will take place.</p> |

Source: Researcher 2024

## 4. RESULTS

### 4.1 Descriptive Statistics

#### 4.1.1 Economic Growth

Results on economic growth among EAC Countries show that the average growth in economy for the last 23 years between 2000 and 2022 was 5.14%. The data showed that Rwanda had recorded the highest average rate of growth at 7.4% followed by Tanzania which had an average of 5.98%. The countries with the least average rate of economic growth included Burundi at 2.34% and Kenya with an average of 4.27%.

The skewness shows that data on economic growth for Rwanda (Skew = -1.425629), Tanzania (Skewness = -1.230348), Democratic Republic of Congo (skewness = -1.693765), Kenya (Skewness = -0.5450768) and Burundi (Skewness = -0.7602928) were negatively skewed indicating that most of the annual growth rates were more than the average rate for the period. Ugandan data was positively distributed (skewness = 0.5030457) indicating most of the annual growth rates were less than the mean. The kurtosis for the EAC member states was 4.75 indicating that it was highly peaked and therefore signaling presence of some extreme values (outliers).

Countries such as Rwanda, Tanzania, and Congo had very highly peaked distributions indicating that they had some years where the rates of growth had extreme rates.

**Table 4.1***Descriptive Statistics For Economic Growth Among EAC Members States*

| Country          | N   | Mean     | Max   | Min   | Sd       | Skewness  | Kurtosis |
|------------------|-----|----------|-------|-------|----------|-----------|----------|
| Rwanda           | 23  | 7.416522 | 13.19 | -3.38 | 3.348394 | -1.425629 | 6.064615 |
| Tanzania         | 23  | 5.98     | 7.67  | 1.99  | 1.32534  | -1.230348 | 4.577996 |
| Uganda           | 23  | 5.906522 | 10.78 | 2.95  | 2.180754 | .5030457  | 2.428655 |
| Congo, Dem. Rep. | 23  | 4.878261 | 9.47  | -6.91 | 3.652672 | -1.693765 | 6.096252 |
| Kenya            | 23  | 4.271739 | 8.06  | -.27  | 2.263143 | -.5450768 | 2.677175 |
| Burundi          | 23  | 2.397826 | 5.41  | -3.9  | 2.493178 | -.7602928 | 2.808745 |
| Total            | 138 | 5.141812 | 13.19 | -6.91 | 3.049095 | -.7996319 | 4.749398 |

Figure 4.1 shows the trends of economic growth among the EAC member states. The trends seem to have been oscillating around the same place where the countries had some high economic growth rates and in other years it declined. A review of the trends on the economic growth for all the countries shows a decline for all countries in year 2020 due to the effects of COVID19.

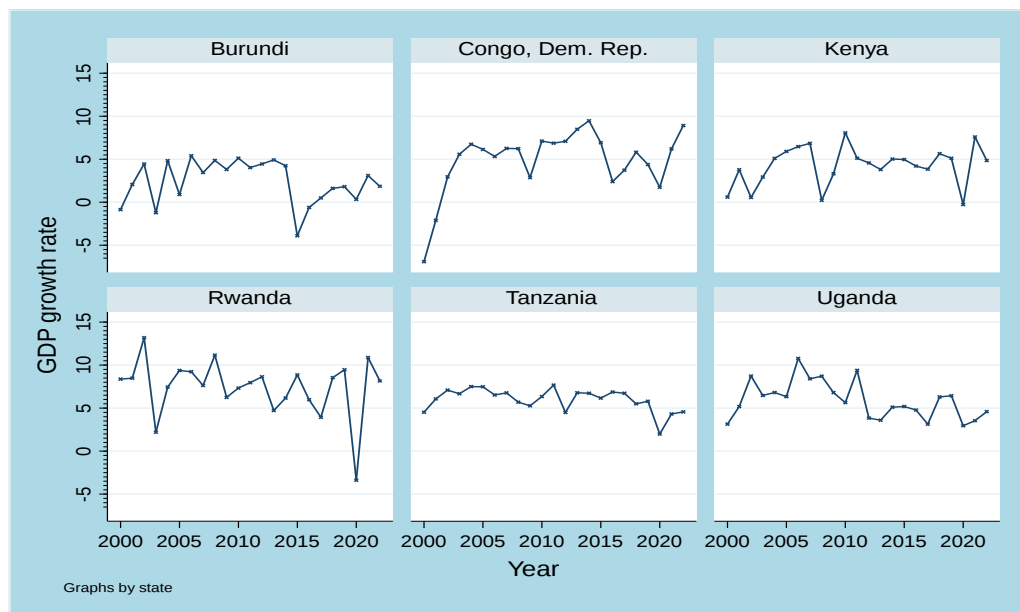


Figure 4.1. Trends in Economic Growth among EAC Members States.

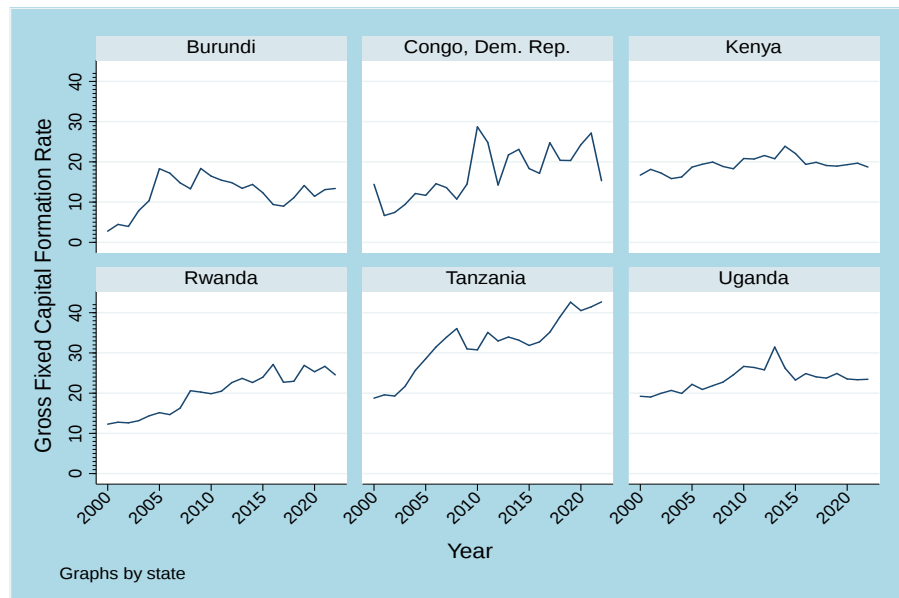
#### 4.1.2 Gross Fixed Capital Formation

Table 4.2 shows the descriptive statistics for the GFCF for EAC member states from the year 2000 to 2022. The data showed that the average rate of GFCF was 20.7% for the EAC member states represented between 2000 and 2022. The country with the highest rate of GFCF was Tanzania with an average of 32.1%, Uganda at 23.4% and Rwanda at 20.1%. The country with the least rate of GFCF was Burundi with 12.2%. A review of the dispersion shows that the distribution of the data on GFCF for Tanzania (skew = -0.4508147), Rwanda (skew = 0-.2692402) and Burundi (skew = 0.6840024) were negatively skewed indicating that most of the annual rates of GFCF were more than the mean for the period under review. Other states such as Uganda, Kenya and Congo republic had positively skewed distribution indicating that most of the annual GFCF were less than the mean GFCF for the period under review. A review of the kurtosis shows that Uganda (kurt = 3.8) and Kenya (kurt = 3.2) had leptokurtic distribution of GFCF. This implies that these countries had some years where the GFCF were extremes and therefore had some outliers.

**Table 4.2**
*Gross Fixed Capital Formation*

| State           | N   | Mean     | Max   | Min   | Sd       | Skewness  | Kurtosis |
|-----------------|-----|----------|-------|-------|----------|-----------|----------|
| Tanzania        | 23  | 32.09043 | 42.69 | 18.76 | 7.190904 | -.4508147 | 2.435109 |
| Uganda          | 23  | 23.42652 | 31.47 | 19.05 | 2.879673 | .6587973  | 3.833293 |
| Rwanda          | 23  | 20.07609 | 27.14 | 12.29 | 5.056075 | -.2692402 | 1.666477 |
| Kenya           | 23  | 19.32261 | 23.88 | 15.84 | 1.872374 | .2565946  | 3.226173 |
| Congo Dem. Rep. | 23  | 17.19913 | 28.72 | 6.66  | 6.346422 | .1521466  | 1.971939 |
| Burundi         | 23  | 12.16826 | 18.37 | 2.78  | 4.343327 | -.6840024 | 2.737125 |
| Total           | 138 | 20.71384 | 42.69 | 2.78  | 7.841665 | .5087326  | 3.459005 |

A review of the trend of the GFCF for the EAC member states shows that some countries such as Rwanda and Tanzania have had progressive trends which are upward moving. The Kenyan and Ugandan trends on GFCF had an undulating pattern over the last 22 years.

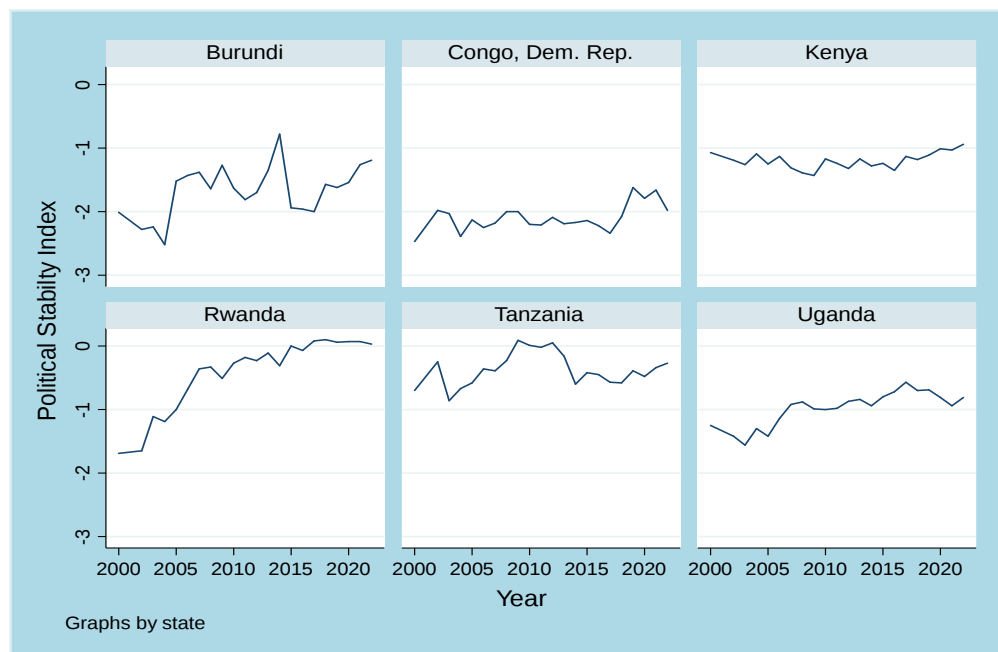

**Figure 4.2. A Trend Gross Fixed Capital Formation**

#### 4.1.3 Political Stability

The political stability was assessed through political stability index Political stability Index (PSI). This index ranges from -2.5 weak which represents weak political stability and +2.5 which represents a strong political stability (Gymah-Brempong & Osei, 2013). The average political stability index for the EAC member states in the period under review was -1.12 implying that the region has not enjoyed stable political stability. However, Tanzania (-0.37) and Rwanda (-0.42) had more politically stable environment compared to the rest of the states. Congo was the country with the weakest political stability at -2.10.

**Table 4.3***Descriptive Statistics on Political Stability Among EAC Member States*

| State            | N   | Mean      | Max   | Min   | Sd       | Skewness  | Kurtosis |
|------------------|-----|-----------|-------|-------|----------|-----------|----------|
| Tanzania         | 22  | -.3713636 | .09   | -.86  | .2568916 | .1964823  | 2.300484 |
| Rwanda           | 22  | -.4218182 | .1    | -1.69 | .5595631 | -1.111668 | 3.034176 |
| Uganda           | 22  | -.9795455 | -.57  | -1.56 | .2638448 | -.7167782 | 2.619729 |
| Kenya            | 22  | -1.195    | -.94  | -1.43 | .1262933 | .0698293  | 2.387352 |
| Burundi          | 22  | -1.665455 | -.78  | -2.52 | .4065034 | -.1229539 | 2.855184 |
| Congo, Dem. Rep. | 22  | -2.096364 | -1.62 | -2.47 | .2108384 | .6407636  | 3.251609 |
| Total            | 132 | -1.121591 | .1    | -2.52 | .7059776 | -.0477801 | 2.061773 |

*Figure 4.3. Trends in Political Stability.*

## 4.2 Diagnostic Tests

### 4.2.1 Stationarity Test

Levin-Lin-Chu Unit-Root Test was run to check for stationarity of the data distribution and ascertain if the model variables exhibited time series properties. The null hypothesis was that the distribution contains a unit root and the alternative hypothesis was that the distribution was stationary. If the p-value was  $p > 0.05$ , the null hypothesis would not be rejected and if the p-value was  $P < 0.05$ , the null hypothesis would be rejected and the alternative hypothesis adopted implying that the dataset would be stationary (Levin-Lin-Chu, 2002).

**Table 4.4***Levin-Lin-Chu unit-Root test for Stationarity*

| Variable | Adjusted t* | P value | Decision   |
|----------|-------------|---------|------------|
| GDP      | -7.5063     | 0.0000  | Stationary |
| GF       | -3.2026     | 0.0007  | Stationary |
| PSI      | -2.9496     | 0.0016  | Stationary |

Table 4.4 shows that all the p values of the variable in the study were stationary as the p values were less than 0.05. According Levin–Lin–Chu, the variables were stationary and exhibited time series characteristics. Therefore, the null hypothesis was rejected and the alternative hypothesis adopted that the data distribution of the variables was stationary.

#### 4.2.2 Autocorrelation Test

Wooldridge test for autocorrelation in panel data was used to detect serial correlation. Serial correlation causes the standard errors of the coefficients to be smaller than they are and higher R-squared. The null hypothesis was that there was no serial correlation in the residual while the alternative hypothesis was that there was serial correlation in the residual. If the p-value was  $p > 0.05$ , the null hypothesis would be rejected and conclude that the dataset has no serial correlation in the residual. If the p-value was  $P < 0.05$ , we reject the null hypothesis and accept the alternative hypothesis implying that the data set has a serial correlation in the residual. The resulting results for Wooldridge test was as shown.

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

$$F(1,5) = 1.018$$

$$\text{Prob} > F = 0.3594$$

From the results, the p-value was insignificant ( $P > 0.05$ ) implying that there was no problem of autocorrelation in the dataset and therefore suitable to undertake further regression analysis.

#### 4.2.3 Heteroscedasticity Test

A robust test is achieved when the distribution of a data set is homoscedastic or the variance of residuals is constant and does not vary with increase in the estimated variable. The data for the variables was tested for homoscedasticity using Breusch-Pagan test. The null hypothesis was that there was homoscedasticity (constant variance of residuals) while the alternative hypothesis was that there was heteroscedasticity (variance of the residuals was not constant). According to Tabachnick and Fidell (2013), the decision criteria was that if p-value was  $p > 0.05$ , the null hypothesis would not be rejected and the decision would be that the dataset is homoscedastic. If the p-value was  $P < 0.05$ , the null hypothesis would be rejected and accept the alternative hypothesis implying that the dataset would be heteroscedastic. The Breusch-Pagan test results are shown.

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Ho: Constant variance  
Variables: fitted values of gdp2  
chi2(1) = 20.21  
Prob > chi2 = 0.0000

The results shown indicates that a p value of 0.000 ( $p < 0.05$ ) implying that the variance of the residuals was not constant and therefore the dataset exhibited heteroscedasticity. To overcome this challenge, the Variance Covariance Estimates (VCE) robust option for standardizing errors was used.

#### 4.2.4 Hausman Specification Test

The Hausman test was used to choose the most appropriate model between fixed or random effects. The null hypothesis was that the appropriate model was random effects while the alternative hypothesis was the appropriate model was the fixed effects. In this test, if the p-value would be  $p > 0.05$ , the null hypothesis would not be rejected and therefore the appropriate model would be the Random effect. If the p-value was  $P < 0.05$ , the null hypothesis would be rejected and the alternative hypothesis adopted implying that the most appropriate model would be the Fixed effect. Figure 4.4 shows the results of the Hausman test.

| . hausman fixed random, sigmamore                                                                                                                                                                                                                                                          |                    |               |                     |                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|---------------------|-----------------------------|
|                                                                                                                                                                                                                                                                                            | —— Coefficients —— |               |                     |                             |
|                                                                                                                                                                                                                                                                                            | (b)<br>fixed       | (B)<br>random | (b-B)<br>Difference | sqrt(diag(V_b-V_B))<br>S.E. |
| gf2                                                                                                                                                                                                                                                                                        | .5364675           | .6059808      | -.0695133           | .1236641                    |
| psi2                                                                                                                                                                                                                                                                                       | -.395171           | -.0742041     | -.3209669           | .2499251                    |
| b = consistent under Ho and Ha; obtained from xtreg<br>B = inconsistent under Ha, efficient under Ho; obtained from xtreg<br><br>Test: Ho: difference in coefficients not systematic<br><br>$\text{chi2}(2) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$ $= 2.72$ $\text{Prob} > \text{chi2} = 0.2568$ |                    |               |                     |                             |

Figure 4.4. Hausman Specification Test.

From the findings, the P value ( $<0.2568$ ) was more than 0.05 implying that difference in coefficients was uneven and thus asymmetrical. Therefore, the null hypothesis was adopted that there were differences in coefficients and the appropriate model would be random effects.

#### 4.2.5 LM Test

A LM test was done to establish the best model between Random effects model and Pooled OLS model. The null hypothesis was that the appropriate model was random effect model while the alternative was that it was a pooled OLS regression model. If the  $p > 0.05$ , then the study would reject the null hypothesis and adopt the alternative hypothesis that there was no significant heterogeneity among the data for the EAC member States and therefore pooled OLS could be used.

Breusch and Pagan Lagrangian multiplier test for random effects

$$\text{gdp2} [\text{state1}, t] = Xb + u [\text{state1}] + e [\text{state1}, t]$$

Estimated results:

|             | Var      | sd = sqrt(Var) |
|-------------|----------|----------------|
| -----+----- |          |                |
| gdp2        | .6281291 | .7925459       |
| e           | .5171353 | .7191212       |
| u           | .0523894 | .2288874       |

Test:  $\text{Var}(u) = 0$

$$\text{chibar2}(01) = 1.80$$

$$\text{Prob} > \text{chibar2} = 0.0899$$

From the results, the p value was 0.0899 ( $p > 0.05$ ) indicating that there was no significant heterogeneity of the variables among the EAC members and therefore Pooled OLS regression model was the most appropriate model for testing the effect of the GFCF on the GDP.

#### 4.3 Pooled OLS Regression

The 1st pooled OLS regression test was done with economic growth as the dependent variable and the predictor variables as the GFCF and the Political Stability Index (PSI). The F Statistic  $F(1,130)=6.587$ ,  $p=0.002$  was statically significant indicating that both GFCF and PSI were significant predictors of the economic growth. The R square ( $R^2$ ) value was 0.132 implying that GFCF and Political stability jointly influenced variations on economic growth by 13.2%. The resulting regression equation was given as shown.

$$GDP_{it} = -0.384 + 0.691GFCF_{it} + 0.077PSI_{it} \dots\dots\dots (i)$$

Where,  $GDP$  = Economic growth rate,  $GFCF$  = Gross fixed capital formation rate,  $PSI$   
= Political stability index,  
 $i$  = individual country cross – section data,  $t$  = time series

A review of the regression coefficients shows that GFCF (denoted by  $gf2$ ) had a significant influence on the economic growth. According to the study, an increase in the rate of GFCF by one percent holding political stability index constant increases the economic growth by 0.691 percent ( $\beta_1 = 2.807$ ,  $p=0.004$ ) the t statistics value also shows that the effect was statistically significant at 95% confidence level. The influence of the political stability was insignificant at 95% confidence level ( $\beta_2 = 2.807$ ,  $p=0.004$ ) as shown in table 4.5.

**Table 4.5**

Model 1: Pooled OLS with Standard Errors- Dependent Variable Economic Growth, Independent Variables GFCF and Political Stability Index

| gdp2               | Coef. | St.Err. | t-value          | p-value | [95% Conf | Interval] | Sig |
|--------------------|-------|---------|------------------|---------|-----------|-----------|-----|
| gf2                | .691  | .237    | 2.92             | .004    | .223      | 1.159     | *** |
| psi2               | .077  | .275    | 0.28             | .780    | -.467     | .62       |     |
| Constant           | -.384 | .859    | -0.45            | .655    | -2.083    | 1.315     |     |
| Mean dependent var | 1.654 |         | SD dependent var | 0.793   |           |           |     |
| R-squared          | 0.132 |         | Number of obs    | 132.000 |           |           |     |
| F-test             | 6.587 |         | Prob > F         | 0.002   |           |           |     |

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Table 4.6 shows the second model after introduction of the interaction term between GFCF and Political stability ( $GFCF * PSI$ ), the F statistics  $F(1,130) = 4.774$ ,  $p = 0.003$  ( $p < 0.05$ ) was statistically significant. This implies that GFCF and Political stability jointly significantly influenced the economic growth rate. The R squared ( $R^2$ ) for the model was 0.163 indicating that both predictors (GFCF) and PSI accounted for 16.3% of the variation in economic growth. The resulting equation was given as.

$$GDP_{it} = 3.057 - 0.36GFCF_{it} + 3.808PSI_{it} - 1.158(GFCF * PSI) \dots\dots\dots (ii)$$

Where,  $GDP$  = Economic growth rate,  $GFCF$  = Gross fixed capital formation rate,  $PSI$  = Political stability index,  $(GFCF * PSI)$  = Interaction term,  $\varepsilon_{it}$  = error term,  $i$  = individual country cross – section data,  $t$  = time series

The coefficient of the model shows that introduction of the interaction term made GFCF insignificant ( $\beta_1 = -0.36$ ,  $p = 0.391$ ). The influence of political stability on the economic growth became significant at 95% confidence level ( $\beta_2 = 3.808$ ,  $p = 0.041$ ). This means that increasing the stability of the political landscape in the bloc has a significant effect on economic growth alongside accumulation of capital assets. The interaction term was statistically significant at ( $\beta_3 = -1.158$ ,  $p = 0.040$ ). The results show that the introduction of the interaction term made the GFCF insignificant and made political influence significant.

**Table 4.6**

Model 2. Panel Pooled OLS Regression with Standard Errors, Dependent Variable: Economic Growth, Predictors: GFCF, Political Stability Index and Interaction term ( $GFCF * PSI$ )

| gdp2               | Coef.  | St.Err. | t-value          | p-value | [95% Conf | Interval] | Sig |
|--------------------|--------|---------|------------------|---------|-----------|-----------|-----|
| gf2                | -.36   | .419    | -0.86            | .391    | -1.19     | .469      |     |
| psi2               | 3.808  | 1.844   | 2.06             | .041    | .158      | 7.457     | **  |
| c.gf2#c.psi2       | -1.158 | .558    | -2.07            | .040    | -2.263    | -.053     | **  |
| Constant           | 3.057  | 1.448   | 2.11             | .037    | .192      | 5.922     | **  |
| Mean dependent var | 1.654  |         | SD dependent var | 0.793   |           |           |     |
| R-squared          | 0.163  |         | Number of obs    | 132.000 |           |           |     |
| F-test             | 4.774  |         | Prob > F         | 0.003   |           |           |     |

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

According to Baron and Kenny (1986) the moderating effect is determined if the following conditions are met.

Step 1: Relationship between DV and IVs should be statistically significant.

Step 2: Determine whether or not the moderator Z alters the robustness of the causal association between X and Y.

Step 3: Moderating effect occurs if the relationship between DV and IV is significant and the interaction term is statistically significant  $p < 0.05$

From the results, the effect of GFCF had a significant effect (relationship) on the economic growth ( $p = .004$ ). Thus the 1st condition was met. The second condition was also established where the GFCF became insignificant predictor after the introduction of the interaction term. This shows that the moderating effect of the moderator affected the influence of the independent variable on the dependent variable. The value of influenced also changed from 13.2% to 16.3% showing a marginal change on the effect on the variation of the economic growth. Thirdly, the interaction term had a statistically significant effect on the economic growth ( $p = 0.040$ ). The results show that the introduction of the interaction term marginally altered the strength of the causal relationship of the dependent variable (GFCF) as the three conditions by Baron and Kenny (1986) were for detecting moderation. This implies that political instability has a negative moderating effect on the relationship between GFCF and economic growth.

## **5. Discussion**

The results show that GFCF has a significant effect on the economic growth. Also, political stability has a positive effect on the economic growth. This shows that investing in capital assets alongside improvement in political stability increases the growth of the economy. This may be explained by the fact that, having quiet and calm political environment attract investors and even enables optimal utilization of the capital assets which in turn enables other factors of production such as labour and firms to efficiently operate leading to increase in GDP of a country. The introduction of the moderator in the regression showed that the effect of GFCF on economic growth was minimized by moderation of political stability. The interaction term altered the strength of the GFCF on the economic growth and also the robustness of the causal relationship. Therefore, the null hypothesis was rejected and the alternative hypothesis adopted that political stability has a moderating effect on the relationship between Gross fixed capital formation and economic growth among the EAC member states. The results agree with the findings of Molonko (2017) that political risk significantly alters the long-term relationship between capital spending and sectoral economic growth although the study did not consider the EAC bloc. The current study results are in tandem with the results of Bahmani-Oskooee & Harvey (2018) who studied effects of GFCF and the political climate on EG in 28 African countries. They discovered that GFCF itself had a positive impact on economic development but the association between GFCF and EG was negatively impacted by political instability.

## **6. Conclusion**

The study sought to establish whether political stability has moderating effect on the relationship between gross fixed capital formation and economic growth in EAC

member states. The findings revealed that political stability moderates the relationship between gross fixed capital formation and economic growth in EAC Bloc. The results point to the fact that politics play a critical role on economic growth. Although investing in capital assets such as roads, infrastructure, plants, machinery and creation of new businesses influences economic growth positively, the effect of the capital assets may not contribute significantly to the economic growth if political stability of a country/region is not well managed. A policy implication is that all political leadership need to invest in management of the political stability of the member states to realize a progressive economic growth in EAC bloc.

## References

- Acemoglu, D. (2009). Introduction to modern economic growth.
- Achar, P. N., Luther, O. O., Ochieng, O. H., & Odhiambo, O. M. (2024). Gross Fixed Capital Formation and Economic Growth in East Africa Community States. *African Development Finance Journal*, 7(6), 29-49.
- Agu, C. (2024). Moderating effect of state fragility on the globalization: economic growth nexus in Sub-Saharan Africa. *Journal of Academic Research in Economics*, 16(2).
- Ainabor, A. E, Shuaib I. M, Kadiri, A. K. (2014). Impact of Capital formation on the growth of Nigerian economy 1960-2010: Vector Error Correction Model (VECM), *School of Business Studies, Readings in Management and Social Studies*, 1(1), 132-154
- Ahmed, M. U., & Pulok, M. H. (2013). The role of political Stability on economic performance: the case of Bangladesh. *Journal of Economic Cooperation & Development*, 34(3).
- Alesina, A., Ozler, S., Roubini, N., & Swagel, P. (1996). Political instability and economic growth. *Journal of Economic Growth*, 1(2), 189-211.  
<https://doi.org/10.1007/bf00138862>
- Asiedu, E. (2002). The determinants of foreign direct investment to developing countries: Is Africa different? *World Development*, 30(1), 107-119.  
[https://doi.org/10.1016/S305-750X\(01\)00101-0](https://doi.org/10.1016/S305-750X(01)00101-0)
- Aslam, M., & Awan, A. G. (2018). Impact of monetary policy on economic growth: Evidence from Pakistan. *Global journal of management, social sciences and humanities*, 4(1), 89-109.
- Ay, A., Kursunel, F., & Baoua, M. A. (2017). Relationship between trade openness, capital formation and economic growth: A panel data analysis for African countries. In *International Conference on Eurasian Economies*, 43-50.
- Baliamoune-Lutz, M., & Ndikumana, L. (2008). Political Stability and Economic growth in the United States: A historical perspective. *Journal of Policy Modelling*, 30(2).  
<https://doi.org/10.1016/j.jpolmod.2007.08.003>

- Bantimaroudi, P., Golitsis, P., & Mitreva, M. (2023). An empirical study of the relationship between Foreign Direct Investments, Remittances, Political Stability and Economic Growth in Greece. *Journal of Economics*, 8(1), 1–19. <https://doi.org/10.46763/joe238101b>
- Barro, R. J. (1990). Government spending in simple model of endogenous growth. *Journal of Political Economy*, 98(5), 103-117.
- Barro, R. J., Mankiw, N. G., & Sala-i-Martin, X. (1992). Capital mobility in neoclassical models of growth (No. w4206). National Bureau of Economic Research.
- Basha, M. H. (2023). Assessing the Moderating Effect of Political Stability on the Relationship between FDI and Economic Prosperity: The Case of Jordan. *Global Journal of Economics & Business*, 13(6).
- Baumol, William J. and Alan S. Blinder. 1988. *Economics: Principles and Policy*. 4th edition. San Diego, London, Sydney, Toronto: Harcourt Brace Jovanovich, Academic Press.
- Donaldson, L. (1990). A rational basis for criticisms of organizational economics: A reply to Barney. *Academy of Management Review*, 15(3), 394-401.
- Dua, P., & Kumar, V. (2021). The relationship between gross fixed capital formation and economic growth in the United States. *Journal of Economic Studies*, 48(2). <https://doi.org/10.1108/JES-06-2020-0187>
- Dumo, G. A., Ico, H. D., & Magpantay, E. V. (2023). Applicability of Harrod-Domar Model in Explaining Economic Growth in the Philippines. *Journal of Economics, Finance and Accounting Studies*, 5(3), 22–46. <https://doi.org/10.32996/jefas.2023.5.3.3>
- East Africa Community Annual report. (2017).
- East Africa Community Annual report. (2022).
- East Africa Community Vision 2050.
- Easterly, W., & Rebelo, S. (1993). Fiscal policy and Economic growth. *Journal of Monetary Economics*, 32(3), 1–18.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of management review*, 14(1), 57-74.
- Fetai, B. T., Mustafi, B. F., & Fetai, A. B. (2017). An Empirical Analysis of the Determinants of Economic Growth in the Western Balkans. *Scientific Annals of Economics and Business*, 64(2), 245–254. <https://doi.org/10.1515/saeb-2017-0016>
- Gyimah-Brempong, K. (1999). Political instability, investment and economic growth in Sub-Saharan Africa. *Journal of African Economics*, 8(1), 52–86. <https://doi.org/10.1093/jae/8.1.52>
- Hoque, M. E., Akhter, T., & Yakob, N. A. (2018). Revisiting endogeneity among foreign direct investment, economic growth and stock market development: Moderating role of political instability. *Cogent Economics & Finance*, 6(1), 1492311.
- Holmström, B., & Milgrom, P. (1990). Regulating trade among agents. *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft*, 85-105.

- Huang, Y., & Quibria, M. G. (2013). The global partnership for inclusive growth (No. 2013/059). WIDER Working Paper.
- Kesar, A., Bandi, K., Jena, P. K., & Yadav, M. P. (2022). Dynamics of governance, gross capital formation, and growth: Evidence from Brazil, Russia, India, China, and South Africa. *Journal of Public Affairs*, 23(1). <https://doi.org/10.1002/pa.2831>
- Kuznets, S. (1973). Modern Economic Growth: Findings and Reflections. *The American Economic Review*, 63(3), 247–258. <http://www.jstor.org/stable/1914358>
- Landefeld, J. S., Seskin, E. P., & Fraumeni, B. M. (2008). Taking the pulse of the economy: Measuring GDP. *Journal of Economic Perspectives*, 22(2), 193-216.
- Lucas, R.E. (1988): „On the Mechanics of Economic Growth“, *Journal of Monetary Economics*, Volume 22, PP. 3-42.
- Maingi, J. N. (2010). The Impact of Government Expenditure on Economic Growth in Kenya: 1963-2008. Kenyatta University.
- Mankiw, N.G., Romer, D., Weil, D. (1992) A contribution to the empirics of economic growth. *Quarterly Journal of Economics*, 107: 407- 437.
- Meckling, W. H., & Jensen, M. C. (1976). Theory of the Firm. Managerial Behavior, Agency Costs and Ownership Structure.
- Mitnick, B. M., & Ryan, R. C. 2012. The social construction of proof. Paper presented at the 2012 Annual Meeting of the Society for Business Ethics, Boston, MA (August).
- Molonko, B., N. (2017). Government expenditure and Sectorial economic growth in Kenya. Kenyatta University Repository.
- Retrieved from <http://ir-library.ku.ac.ke/handle/123456789/17943>
- Basha, M. H. (2023). Assessing the Moderating Effect of Political Stability on the Relationship between FDI and Economic Prosperity: The Case of Jordan. *Global Journal of Economics & Business*, 13(6).
- Onyinye, N., Idenyi, O., & Ifeyinwa, A. (2017). Effect of Capital Formation on Economic Growth in Nigeria. *Asian Journal of Economics, Business and Accounting*, 5(1), 1–16. <https://doi.org/10.9734/ajeba/2017/36075>
- Pasara, M. T., & Garidzirai, R. (2020). Causality Effects among Gross Capital Formation, Unemployment and Economic Growth in South Africa. *Economies*, 8(2), 26. <https://doi.org/10.3390/economies8020026>
- Romer, P. M. (1990). Endogenous Technological Change. *Journal of Political Economy*, 98(5, Part 2), S71–S102. <https://doi.org/10.1086/261725>
- Romer, P. M. (1994). The origins of endogenous growth. *Journal of Economic perspectives*, 8(1), 3-22.
- Romer, D. (2018). Macroeconomic theory. University of California, Berkeley.
- Shi, W. (2015). The Political Economy of China's Outward Direct Investments. University of California, San Diego.
- Solow, R.M. and T.W.Swan (1956). "Economic Growth and Capital Accumulation", *Economic Record*, 32, pp. 334–61
- Solow, R. M. (1957). Technical Change and the Aggregate Production Function. *The Review of Economics and Statistics*, 39(3), 312. <https://doi.org/10.2307/1926047>

Todaro, M. P. (1977): *Economic for a Developing World*, Longman, London, UK.

Topcu, E., Altinoz, B., & Aslan, A. (2020). Global evidence from the link between economic growth, natural resources, energy consumption, and gross capital formation. *Resources Policy*, 66(March), 101622.

<https://doi.org/10.1016/j.resourpol.2020.101622>

Umar, H. M., Dauda, S. I., & Sadiq, A. A. (2024). Nexus between Foreign Aid, Political Instability and Economic Growth in West Africa.

Widjaja, G. (2024). Infrastructure investment policy to boost economic growth and increase employment. *International Journal of Financial Economics*, 1(2), 418-426.

Work Bank report (2019); (2023); (2014); (2015); (2017); (2018).

Yao, S., & Wei, K. (2007). Economic growth in the presence of FDI: The perspective of newly industrializing economies. *Journal of Comparative Economics*, 35(1), 211-234.

Zhang, J., & Li, X. (2005). Political instability and stock market development: The case of China. *China Economic Review*, 16(4), 393-413.

<https://doi.org/10.1016/j.chieco.2005.03.005>

Zomchak, L., & Nehrey, M. (2022, February). Economic growth and capital investment: the empirical evidence. In *The International Conference on Artificial Intelligence and Logistics Engineering* (pp. 645-652). Cham: Springer International Publishing.