

**EFFECT OF CONSTRUCTS OF INTRA-AFRICAN FOREIGN DIRECT
INVESTMENT ON ECONOMIC GROWTH IN EAST AFRICAN COUNTRIES**

BY

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**A RESEARCH DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE IN
COMMERCE (FINANCE AND ACCOUNTING) DEGREE IN THE SCHOOL OF
BUSINESS AT KCA UNIVERSITY**

OCTOBER, 2023

DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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ABSTRACT

The growth of the economy is the process of expanding the economies of nations, the macroeconomic parameters, particularly the gross domestic product computed periodically mostly annual basis to reflect changes in economic growth across time. The economic growth of a nation is linked to macroeconomic indicators like foreign direct investment growth, gross capital formation, labour force, technology, and institutional quality. This study sought to determine the influence of intra-African foreign direct investments on economic growth in East African countries. The specific objectives of the study were to determine the effect of Intra-African foreign direct investments on the economic growth of selected East African countries. Secondly, to determine the effect of gross capital formation on the economic growth of selected East African countries. Thirdly, to determine the effect of institutional quality on the economic growth of selected East African countries. The fourth objective was to analyze the effect of labor force on the economic growth of selected East African countries. Finally, the study sought to determine the effect of technology on the economic growth of selected East African countries. The study relied on a causal research design. The study population involved 5 East African countries for a period from 2000 to 2020. Further, the study utilized secondary data and the data was analyzed using Stata. The correlation results indicated that the correlation between FDI and economic growth was positive and moderately strong and positive whereas it was strong and statistically significant with gross capital formation. Furthermore, the correlation between labour force and economic growth was positive, significant, and moderately strong while that of institutional quality and economic growth was strong, positive, and statistically significant. Finally, technology had a strong, positive, and significant correlation with economic growth. The regression results for the variables FDI, GCF, labour, institutional quality and technology portrayed a positive and statistically significant linear relationship with economic growth. The study concludes that all these variables are significant determinants of economic growth of the selected countries in East Africa. The study recommends that the countries within East Africa should cooperate and open its borders to allow easy movement of technology and labour within and across the borders to boost foreign inflows to either of the selected East African countries. The countries should create a favorable environment for business and investments.

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DEFINITION OF TERMS

Foreign Direct Investment refers to investments conducted across country borders whereby an investor in a particular country develops an economic investment in another country and gains a substantial and lasting influence over that investment (OECD, 2022).

Gross Capital Formation includes the net changes in inventory added to the outlays on additions to the fixed assets of the economy (World Bank, 2022).

Economic growth (GDP) entails the total market value of services and goods that produced with a specified time interval, usually one year within a country (Leamer, 2009).

Institutional quality encompasses the high-quality government services and regulations as well as the law and individual rights (Kunčič, 2014).

Labour Participation refers to the section of the population of a country that is engaged actively in the labour market by working or looking for employment (Kapsos, 2007).

Technology Advancement is the use of technological innovation in the process of producing goods and service and doing business which lowers the cost of production and increases the productivity as well as boosting competitiveness among the various economies (Younus, 2021).

ABBREVIATIONS AND ACRONYMS

GDP	Gross Domestic Product
IMF	International Monetary Fund
FDI	Foreign Direct Investments
GCF	Gross Capital Formation
IDP	Investment Development Path
RBV	Resource Based Views
NOI	Net Outwards Investments
VIF	Variance inflation factors

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Creation of wealth in various countries is dependent on growth of the economy. Growth of the economy is the process of expanding the economies of nations, the macroeconomic parameters, particularly the gross domestic product (GDP) computed periodically mostly annual basis to reflect change in economic growth across time (Alina, 2012). The global economic growth was 2.9 percent in 2019 before plunging to -3.3 percent in 2020 a phenomenon that was attributed to Covid-19 pandemic (World Bank, 2021). In 2021, the global economic growth was 5.8 percent, and this is expected to slightly shrink to 3.6 percent in 2023 (IMF, 2022). Global GDP was USD 84.71 trillion (World Bank, 2021) and is expected to double to USD165 trillion by 2050 (Wood Mackenzie, 2022). The economic growth of a nation is linked to macroeconomic indicators like Foreign Direct Investment (FDI), labor force, gross capital formation (GCF), institutional quality and technology.

It is argued that FDI is a critical catalyzer to grow the economy of a country as it brings technology, capital, know-how skills, job opportunities and creation of new markets for country's products (OECD, 2018; Liebrand, 2018). Through FDI, technology is transferred across economic sectors, supporting the growth of development of human capacity and uplifting the competitiveness of the local market. In addition, the profits generated through FDI are source of corporate tax revenues for the host country triggering economic takeoff (Gudaro *et al.*, 2012). As per the FDI-led growth hypothesis, FDI triggers economic growth of the host nations by expanding their capital stock, facilitating technology transfer and creation of job opportunities as well as boosting the efficiency and volume of trade in the host country (Yalta, 2013). Under the Solow growth model, FDI allows host nations to grow their domestic savings

through local investments that enhance capital formation (Sukar, *et al.*, 2007). FDI raises domestic investment, that is critical for the development and the growth of the economy overtime. (Olokoyo, 2012). It is through boosting the efficiency of the use of resources and the factor productivity, that FDI affects the growth of the economy. This is achieved through spillovers, foreign inflows and finally externalities considering the business sector in the respective country (OECD, 2002)

FDI is significant to the economic transformation of a nation. Through FDI, technology is transferred across economic sectors, supporting the growth of human capacity development and growing domestic market competitiveness (Makki & Somwaru, 2004). Technology confers economic superiority on other countries. The use of innovative technologies enables the production of goods that are market competitive and affordable. In addition, the accumulation of gross capital, and for the enhancing global competitiveness of the respective countries and the quality improvement of the organizations of scientific research. Technology additionally contributes to the socio-cultural and political growth of the recipient countries. Fast innovations in technology often cause uncertainty in terms of the projection of the future economic growth of the economies. Technology increases the efficiency of doing business by both the individuals and the businesses by lowering the costs, increasing efficiency and thus productivity (Younus, 2021).

Moreover, the profits generated through FDI are a source of corporate tax revenues for the host country that trigger economic growth. Moreover, economic growth of a country is linked to macroeconomic indicators like gross capital formation. Gross capital formation entails a situation where the country expands its fixed assets and outlays for economic

transformation. The expansion of fixed assets and outlay forms the basis for the efficient production of goods and services (Saleh, 1997). The total demand in the economy is catalyzed by new and additional investment increases. Growth in investment opportunities creates more employment opportunities (Meyer & Sanusi, 2019). GCF encompasses fixed assets and outlays required in the production of goods and services in the economy. Capital inflows may affect the host country's productive capacity and ultimately productivity. Inflows of FDI of Kenya have been low even though Kenya was ranked as the best destination in East Africa. It was found that government expenditure, trade openness and human capital development impacts the growth of the economy. In addition to this, the quality of infrastructure and GDP are the enablers of economic growth. The formation of East African community and the individual role of the respective governments has further cemented the significance of the FDI in contributing towards growing the economies of the respective countries (Daniel, 2014).

Institutional quality has also been recognized as a catalyzer of economic growth. It stimulates investment and consumption, improves efficiency in resource allocation and protects property rights. Institutional quality advocates for openness in trade by championing the economies of scale in trade. This majorly serves as an added advantage to the developed economies at the expense of the developing economies (Nguyen et al., 2018). The influence of institutions on economic growth changes with respect to the stages of the development of the economy. In the long-run, efficient institutions stimulate economic transformation of the country. The quality of institutions in these countries differ depending on the level of economic development and their quality of labour (Nawaz, et al., 2014).

Labour force refers to all the persons who are qualified to work or to be employed whether they have work to do or not. Labour force comprises the skilled and the semi-skilled persons required in the production of services and goods. The employed labour force entails the actively engaged people in work either for pay or to gain profit. They may also include

those that are temporarily out of work for some reason including sickness, leave or are engaged in industrial action. The unemployed include the people may include skilled workforce looking for job opportunities (OECD 2022). Skilled labour force enhances economic growth. Labour force engages actively in the activity of producing goods and services in an economy and hence are a vital component in the economic growth of a particular country (Shahid, 2014). Foreign Direct Investments influences the local investments of a country by improving human capital in the host countries (Meyer & Sanusi, 2019). In Bangladesh, Haque et al., (2019) noted that in the short run, the total labor force participation rate and female labour force participation affect the growth of the economy. An active and efficient labour force augments the growth of the economy. Labour force actively participates in producing goods and services in an economy and hence actively participating in growing the respective economy.

Labour force is the greatest asset of the different economies, which entail innovation, knowledge, and skills that people accumulate. Further, human capital explains the income disparities across global populations and regions, hence skillful workforce is essential to the economy (World Bank, 2017). Human capital is a crucial stock component that can affect economic growth. Human capital is critical to the production of goods and services because a well-trained workforce can easily learn to use new technology, innovate and increase productivity. The endowments in human capital including the capacities and skills of the people engaged in production contributes to the long-term economic development. Therefore, equitable income distribution enhances the contribution of human capital as an engine of economic growth Urgaia, (2018).

Technological advancement occurs when technologies become more accurate, precise, efficient, or more powerful or capable. Development in technology is an important factor that boosts economic productivity. Technological transformation causes an increase in the capita per person and motivates savings and investments, which in turn causes an increase to real

GDP (Çalışkan, 2015). Technological advancements enable economies to engage in activities that they had not done before. This in turn will lead to more capital formation and increased economic growth. Development in Technology fosters economic growth in terms of profits and at the macro levels and market shares at the micro level. Through technology, the production of goods and services can be realized with less input. Furthermore, it can be sold, purchased, or understood easily. In addition, its transfer from one firm to another or from one nation to the other is cheap and easy (Çalışkan, 2015). Technological innovation is a factor of Total Factor Productivity which plays a key role in the observance of the inter country changes in income per worker and further the growth in the economy. Therefore, for the realization of sustained economic growth, technological innovation is essential. Innovation in technology is an engine of human progress in addition to economic growth. Technology is an essential ingredient in economic growth as it ensures the discovery of new ideas and becomes productive (Broughel & Thierer, 2019).

Technological adoption plays a critical role on enhancing the standards of living in a particular economy as well as an enable in the achievement of long term growth of the economy of a particular country. Technological innovation requires interconnection of the various institutions in the market to enable the achievement of the gains of technological innovation in an economy. In Asia, Singapore and Hong Kong have proved to faster absorb technology (Sachs & McArthur, 2002).

Global FDI contribution to GDP in 2021 was \$1.6 trillion, up from \$859 billion in 2020 (UNCTAD, 2022) and \$1.5 trillion in 2019. The developed countries received the biggest rebound in FDI with an estimated \$777 billion in inflows in 2021 (UNCTAD, 2022). The developing Asia received 40% of global FDI equivalent to \$619 billion (UNCTAD, 2022) while FDI to Latin America and the Caribbean was \$134 billion (UNCTAD, 2022). In 2021, largest FDI inflows included the US (\$367 billion), China (\$181 billion), Hong Kong (USD

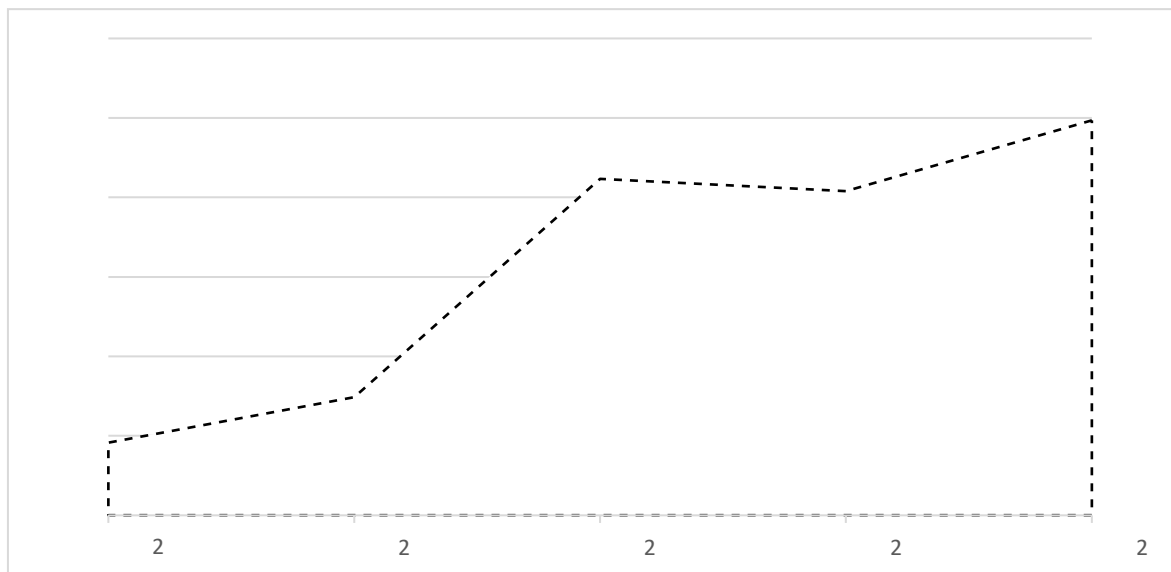
141 billion), Singapore (\$99 billion), Canada (\$60 billion), Brazil (\$50 billion), India (\$45 billion) and South Africa (\$41 billion) (Statista, 2022). In 2020, top FDI inflows by country was US (\$151 billion), China (\$149 billion), Hong Kong (\$135 billion), Singapore (\$75 billion), India (\$64 billion), Canada (\$23 billion), Brazil (\$28 billion) and South Africa (\$3 billion).

Based on the global FDI statistics, FDI significantly contributes to the global economy. FDI stimulates growth of capital formation, transfer and improvement of technology, efficiency, and economic productivity. Despite FDI being a critical component of an open and effective global economic transformation, a significant trigger of economic growth and development, the FDI benefits do not grow automatically across sectors, communities, and countries (OECD, 2002). The contribution of FDI to the global economy is intertwined to other macroeconomic factors like labour force, gross capital formation, technology and institutional quality. The decline in FDI inflows in 2020 across the countries however was attributed to economic effects of Covid-19 pandemic that distorted global economic productions. Global FDI inflows in the year 2022 is likely to be affected by political instability in Eastern Europe occasioned by Ukraine Russia wars (The Economic Times, 2022).

FDI is very important to the growth of the economy particularly for developing nations like the Sub Saharan Africa. The FDI in Africa has been growing boosted by rising growth in Intra Africa FDI. Intra Africa FDI refers to FDI inflows to within African countries. The Intra-African FDI is growing rapidly compared to FDI growth in other regions across the globe and it has grown over 30% from 2007 (Rolfe, *et al.*, 2015). Intra-African FDI in 2002 was 9% and has grown to 13% in 2017 (Qiang, *et al.*, 2021). Figure 1 shows growth in intra African FDI from 2003-2017.

FIGURE 1

Intra-Africa Investment, Million USD, 2003-2016



Source: Author's computations as per the FDI (2017) market database

Figure 1 shows that intra African FDI has been steadily rising over the past 19 years impacting the economy of Africa. Despite the growth in intra African FDI, the growth margins are relatively small. The share of FDI in Africa remains small. The FDI inflows to Africa from 2010 to 2016 was only 6% of the developing countries (WDI, 2017). The growth in intra-African FDI has been linked to rising investment activities in other African countries from South African multinational companies (African Development Bank, 2020). As indicated by FDI markets database (2017), from 2003-2017, 587 African multinational companies from 37 of the 54 African nations are investing in African countries. In addition, the intra-African FD investment was only \$92.8 billion.

The Intra-African FDI is critical to the Africa's economic transformation. Despite Intra-African FDI being crucial to growth of Africa's economy, often the figures are not known, often ignored and lumped in with the intra-African trade investments figures making it problematic to empirically determine its impact on economic growth (African Investor, 2012).

In addition, the intra African FDIs are not reported separately by the World Bank data listing but often reported as combined FDI inflows in SSA. The comprehension of certain critical elements that drive intra-African FDI has fundamental economic policy implications helping understand the factors that enhance or hinder intra-African investment, develop a policy framework that will boost FDI investments in the SSA.

In Africa, Kenya is one of significant destination of FDI inflows. However, FDI inflows have been declining (UNCTAD, 2020). In 2019, Kenya's FDI as % of GDP was 1.4 % a decline from 1.9 % in 2018. As per the UNCTAD's (2020), FDI inflows to Kenya in 2019 shrank by 18% to \$1.3 billion in 2019 down from \$1.7 billion in 2018. In 2020, inflows in FDI to Kenya (\$717) was lower than Ethiopia (\$2,395), Tanzania (\$1,013) and Uganda (\$8235) yet Kenya boost largest economy in the East African region. In terms of intra FDI to other African countries, Kenya contributed 6% (AfDB, 2020).

Despite the importance of intra FDI, its impact on economic growth remains not well studied. Empirical studies establish mixed result findings regarding the effects of FDI from multinational firms to the host countries. Lack of consensus exists pertaining to the effects of FDI on economic growth. Advocators for FDI say that FDI is good for investment development, and thus the growth of FDI results in economic growth of the country (Susilo, 2018; Kulu, et al., 2021). According to proponents, FDI brings capital, technology, management know-how skills and new markets boosting a country's economic growth. However, critics argue that FDI has insignificant effect on economic growth (Ayenew, 2022). Critics argue that FDI can result to increased poverty, neglect, and isolation of local investments as FDI is selective in terms of skill premium limiting economic growth.

1.2 Statement of the Problem

It is argued that FDI is a significant catalyzer of economic growth as it brings technology, capital, the know-how skills, job opportunities and creation of new markets for country's products. Through FDI, the technology is transferred across economic sectors, support the growth of human capacity development and uplifting the competitiveness of the local market. In addition, the profits generated through FDI are source of corporate tax revenues for the host country triggering economic growth (Gudaro *et al.*, 2012). As per the FDI-led growth hypothesis, FDI triggers economic growth in the host nations by expanding the capital-stock, facilitating technology transfer and creation of job opportunities in the host country (Yalta, 2013). Under the Solow growth model, FDI allows host nations to grow their domestic savings through local investments that enhance capital formation (Sukar, *et al.*, 2007).

Furthermore, Gross capital formation has an impact on the economic transformation of a country. Aggregate demand in the economy is stimulated by both the existing and the emerging investments. Increasing investments in a country significantly increases the job opportunities available in the different economies (Meyer & Sanusi, 2019). GCF comprises fixed assets and outlays necessary for the economic production of goods and services. Labour comprising of the employed and the unemployed persons also affects economic growth. Skilled labour force enhances economic growth. Labour force engages actively in the activity of producing goods and services in an economy and hence are a vital component in the economic growth of a particular country (Shahid, 2014). Development in technology enhances the efficient production of services and goods in any economic setup. Furthermore, the innovation in technology is necessary for the improvement of the per capita income as well as motivating both investments and savings which ultimately leads to a growth the economic productivity of a country (Çalışkan, 2015).

It is often argued that FDI is significant to the economic transformation of a nation. Through FDI, the technology is transferred across economic sectors, support the growth of human capacity development and growing domestic market competitiveness. Moreover, the profits generated through FDI are a source of corporate tax revenues for the host country that trigger economic growth. Moreover, economic growth of a country is linked to macroeconomic indicators like gross capital formation, labour force, technology, and institutional quality. However, despite the growth in intra African FDI, the growth margins are relatively small. The share of FDI in Africa remains small. The FDI inflows to Africa from 2010 to 2016 was only 6% of the developing countries (WDI, 2017). In Africa, Kenya is one of significant destination of FDI inflows. However, FDI inflows have been declining (UNCTAD, 2020). In Uganda, it is argued that FDI is an opportunity for economic recovery for economic growth in Uganda yet is untapped (Qasim & Heher, U2022). In 2020, Rwanda recorded \$1.3 billion new investments, which however was 48 percent drop in 2019 and 89 percent drop in 2018 (Rwanda Development Board, 2022). In 2018, FDI inflows to Tanzania was USD 1.1 billion, a significant increase from USD 938 million in 2017 (State Department (2021). It would be interesting to study what are the drivers for this heterogeneous behavior between Intra African FDI and the growth of the economies of the EAC countries. Does intra African FDI inflows vary across East Africa countries due to differences in institutional quality, gross capital formation, currency stability and inflation rates. Based on these empirical arguments, the study sought to determine the influence of intra-African foreign direct investments on economic growth in East African countries.

1.3 Objectives

The main objective was to determine the influence of intra-African foreign direct investments on economic growth in East African countries.

The specific objectives of the study were to:

- i. To determine the effect of Intra-African Foreign Direct Investments on economic growth of selected East African countries.
- ii. To determine the effect of Gross Capital Formation on economic growth of selected East African countries.
- iii. To determine the effect of institutional quality on economic growth of selected East African countries.
- iv. To analyze the effect of labour force on the economic growth of selected East African countries.
- v. To determine the effect of technology on the economic growth of selected East African countries.

1.4 Research Hypothesis

To test for the effect of Intra-African FDI, gross capital formation, institutional quality, labour force and technology on economic growth of the East Africa economies. These null hypotheses (H₀) were tested.

- i. H₀₁: Intra-African FDI has no significant effect on the economic growth of selected East African countries.
- ii. H₀₂: Gross capital formation has no significant effect on the economic growth of selected East African countries.
- iii. H₀₃: Institutional quality has no significant effect on the economic growth of selected East African countries.

- iv. H₀₄: Labour force has no significant effect on the economic growth of selected East African countries.
- v. H₀₅: Technology has no significant effect on the economic growth of selected East African countries.

1.5 Significance of the Study

1.5.1 Significance to Scholars

The study's significance was related to the perceived contributions of FDI to the economy. The study findings elaborated the significance of FDI to the economy and suggest policy implication, which may be referral to other academicians and scholars. The study added to the various literature reviews on FDI and economic growth. Within the selected EAC economies, the government through the relevant agencies has provided mechanisms and policy to channel direct investments for the benefit of the economy.

1.5.2 Significance to Policy Makers

This study contributed to the FDI-economic growth debate by extending the discourse to critical inquiry in the linkage between intra-African FDI and economic growth. The research aided policy formulation by the Ministry of Finance and Central Banks of the selected East African Countries and in the formulation of policy intervention that helped reap from the FDI-induced economic growth.

1.5.3 Significance to Practice

The study was also significant to future research on intra African FDI in boosting the growth of the economy growth. The Intra-African FDI is essential to the transformation of Africa's economy. Despite Intra-African FDI being crucial to the continent's economic growth, there are limited studies owing to unreported data by World Bank data. Data on FDI in Africa

are often reported as combined FDI inflows in SSA without separation. The results thus acted as references for future studies on intra African FDI and economic growth.

1.6 Scope of the Study

This study's scope is confined to determining the impact of Intra-African FDI on the economic growth within five EAC countries namely Kenya, Tanzania, Uganda, Rwanda, and Burundi. The FDI, gross capital formation and the labour force and institutional quality were employed as the study's control variables. The study period covered 21 years, from 2000 to 2020. The period from the year 2000 has been chosen because the official treaty of the formation of the East African community came into being in the year 2000. The study is expected to take two months because of the nature of the data to be collected across a panel of countries. The study is longitudinal; data was acquired from the selected East African countries over several time periods.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

An assessment of the works on the nexus between intra-African FDI and economic growth is covered in this chapter. Specifically, the chapter covers the theoretical review, empirical literature review, research gaps, conceptual framework, and operationalization.

2.2 Theoretical Review of Literature

Theories provide a guide for research that consists of constructing theoretical principles, concepts, and tenets of a theory (Grant & Onsanloo, 2014). A theory lays a foundation that guides the study in terms of the selection and measurement of study concepts (Adom et al., 2018). The theories included in the study entail the internalization theory, Heckscher Ohlin Model, and the Investment Development Path (IDP) model.

2.2.1 Heckscher Ohlin Model

The Heckscher Ohlin Model (H-O model) was advanced by Heckscher and Ohlin in 1933. The H-O model interrogates trade patterns in the ideology of comparative advantage (Morrow, 2008). The H-O model postulated that the international trade pattern is impacted by differences in resource and factor endowment across countries and that with free trade, the welfare of a country will be raised relative to the welfare of another country perceive to be more economically endowed. Further, the H-O model argues that a country ought to specialize in producing and exporting by employing factors available and cheaper to them (Bajona & Kehoe, 2010; Bond, Iwasa & Nishimura, 2012).

However, the Heckscher-Ohlin theory has been criticized as being anchored on unmeasurable assumptions (Bajona & Kehoe, 2010). The H-O model cannot provide a complete and satisfactory explanation of trade in such cases. Moreover, Bergh (2010) noted that the H-O model results to two major expectations that are not empirically measurable; that immense trade activities ought to occur between rich and low-income nations and the trade ought to raise inequality in rich countries while lowering it in low-income nations. The H-O model further assumes that all countries access the same technology, which is not the case.

The H-O model is critical in understanding the factor endowment differences and how it impacts Intra-African Foreign Direct Investments. The comparative advantage concept is useful in the production of goods and provision of services at relatively high efficiency and lower costs. Economic productivity is high in a country that is endowed with human resources and technological capability and thus is able to produce and sale more to the international improving its current account balance. The theory is significant to the objectives of the study because the theory is based on the free transfer of resources including labor, technology, and capital within and between countries.

2.2.2 The Internalization Theory

Burley and Casson (1976) proposed the internalization theory. The theory explains the genesis of FDI by looking at market imperfections, especially the knowledge flows to production, flow of intermediate inputs and technology across countries. The imperfections emanate from discriminatory pricing of goods, transfer pricing, bargaining position and time lags in the coordination of resources. Because of these imperfections, firms resort to protecting their knowledge through secrecy and not via patents and trademarks as often is done. In doing so, these firms internalize new technologies they use to attain competitive advantage before

releasing it to the market. Knowledge transfer however happens if firms and local industries are convinced that the positives of international transactions are greater than the negative impacts (Burley & Casson, 1976). However, when the costs are higher, these firms opt to outsource production or locally and export.

Further developments on the theory stated that firms aspire to advance their own internal market whenever transactions can be made at relatively low costs within the firm. Thus, internalization involves a kind of vertical integration bringing new operations and activities, formerly conducted by intermediate markets, under the ownership and governance of the firm (Buckley, 1982, 1988; Buckley & Casson, 1985). A ‘‘purist and stripped-down’’ version of the theory is utilized in contrast, starkly, with the Resource Based Views (RBV’s) emphasis on ‘‘competitive advantages and ownership advantages’’ (Dunning, 2000) or ‘‘dynamic capabilities’’ (Pitelis & Teece, 2010; Teece, 2003, 2012). This version relies on two explanatory factors including externalization or internalization decisions and locational determinants. The interaction of these two variable sets determines the location and mode of operation of the firm; recognizing that the combination of the two is not necessarily automatic (Hennart, 2009).

The theory is applicable in the study in understanding the market imperfections in the intermediate inputs and technological growth in individual African countries may lead to the rise of Intra-African FDI. African MNCs resort to protecting their knowledge through secrecy and not via patents and trademarks as often is done before releasing the knowledge to the market. The Internalization Theory views FDI as a firm-level strategic decision rather than a capital-market financial decision. Firms providing superior products and services can expand into new markets, this enables intra-African FDI.

2.2.3 The Investment Development Path Model

The Investment Development Path (IDP) model was put forward by Dunning (1981), it was advanced along Rostow's growth stages where economies in different stages of growth exhibit different advantages, that include location, ownership, and political advantages. According to theory, economies in the first stage of economic growth experience negative Net Outwards Investments (NOI) as they are deficient of ownership and location advantages. More often, these economies are disadvantaged in terms of capital accumulation (Miguel, 2007). In the second stage of economic growth, inward FDI starts to flow as the country exploits the locational advantages resulting from capital accumulation, infrastructure development and industrialization (Dunning,1981). In the third stage, the emerging economies exhibit increasing NOI as inward FDI slows while outward FDI grows. In the fourth stage, local companies develop ownership advantage like those enjoyed by foreign companies though they still lack intensive technological know-how (Miguel, 2007; Kyrkilis & Moudatsu, 2011)

Economies in different stages of growth exhibit different advantages, that include location, ownership, and political advantages. This would lead to a rise in FDI inflows from countries in the later stages to countries in the initial stages. However, low-income countries with many located in SSA will benefit from inward FDI. This implies that most East African countries are the initial stages of economic development; thus, there is no different configurations of advantages. This implies that intra-African trade might be curtailed because of this fact.

2.3 Empirical Literature Review

This part laid out the empirical works that entails the effect of intra-African FDI on economic growth. It specifically covered the effect of intra African FDI, labour force, GCF, institutional quality and technology on economic growth.

2.3.1 Intra-African Foreign Direct Investments on Economic Growth

Intra-African FDI refers to FDI inflows to and within African countries. Employing longitudinal study, Asafo-Agyei and Kodongo (2022) studied FDI and economic growth in SSA. It was established that FDI is an essential, though not sufficient, condition for the growth of the economy. This was a panel study focusing East African countries from 2000-2020 presenting methodology gap.

Using data for the period 2008 to 2014, Jugurnath et al. (2016) investigated the link between FDI and economic growth in SSA. This research involved a panel investigation of 32 SSA nations. The study established that aggregated FDI has a positive and significant effect on growth of the economy. However, the results are inconsistent with other scholars who established that FDI is insignificantly associated with the growth of the economy (Agbloyor et al., 2016). This in an indication of lack of consistency among authors regarding the linkage between FDI and economic transformation of a country.

Similarly, Gui-Diby (2014) determined the effect of FDI on the growth of the African economy. This was a panel study spanning the year 1980 to 2009. During the period of interest, it was found that FDI significantly affects economic transformation of the economies within Africa. However, FDI negatively affected economic growth in the regime 1980-1994 but positive in the time 1995 to 2009. This is an indication of lack of consistency among authors pertaining to the association between FDI and economic growth.

Employing OLS, Susilo (2018) sought to find out the relation between FDI and economic growth in the US. Data were from period 2000 to 2017 across 10 sectors of the economy. Susilo (2018) suggested that FDI is not always beneficial to host nations and that FDI can have negative or positive effect on economy. This is an indication of lack of consistency among authors concerning the link between FDI and economic growth. Moreover, Susilo (2018) employed an OLS model which may give incorrect parameter estimates instead of advanced panel model like random and fixed effect models presenting methodological gap.

A study by Milutinović and Stanišić (2016) on the impact of FDI on economic growth of the EU. The study found that FDI negatively affects the economic growth of EU nations from 2005 to 2015. Nonetheless, in a study by Burlea-Schiopoiu et al. (2021) on the link between FDI and economic growth of developing nations in the EU, FDI has positive impact on GDP, in Slovenia, Bulgaria and Lithuania; while Romania, Poland and Latvia revealed positive impact on GDP per capita. In Hungary, FDI had positive effect on both GDP per capital and GP growth.

In a study by Alfaro (2003) on FDI and growth and whether the sector matters, the research indicated that foreign direct investment significantly affects the growth of the economy. Through FDI, improvement in the management skills, transfer of technology labour training happens. The study further points out that the inflows of FDI into the primary sector of the economy have a negative effect on the growth of the economy. Nonetheless, the inflows of FDI to the manufacturing sector portray a positive effect on the growth of the economy.

Research was conducted by Makki and Somwaru (2004) on the impact of FDI and trade on economic growth with a focus on developing countries. The study used cross sectional data from 66 developing nations across three decades. The findings of the research argue that FDI is an important component in economic growth. It determines the movement of technology within the countries from the developed countries to the less developed countries. The study

concludes that FDI is far much more beneficial provided that the quality of labour of the host country is better. Furthermore, the research advocated for the stability of the institutions including low rates of inflation and lower tax burden that would boost economic growth.

Daniel (2014) conducted a study did a study on FDI and economic growth in Kenya and indicated that there has been low FDI inflows to Kenya. This was the case even though Kenya was ranked as the best destination in East Africa. It was found that government expenditure, human capital, and openness of the economy. In addition to this, the quality of infrastructure and GDP are the enablers of economic growth. The formation of East African community and the individual role of the respective governments has further cemented the role of the FDI in contributing towards growing the economies of the respective countries.

2.3.2 Gross Capital Formation and Economic Growth

Gross capital formation entails a situation where the country expands its fixed assets and outlays for economic transformation. The expansion of fixed assets and outlay forms the basis for the efficient production of goods and services (Saleh, 1997). Assets that can be used in the process of production for more than one year are fixed assets (Eurostat, 2013).

Research was conducted by Iftikhar et al., (2016) focusing on Gross Capital Formation and Economic Growth in Pakistan. The methodology that was applied in this study was the Johnson's co-integration. The study indicated that gross capital formation has a positive and significant relationship with economic growth in Pakistan. The increase in total productivity of an economy increases the overall capital accumulation. Increasing capital accumulation increases net exports, which in turn will ultimately lead to economic growth of that economy. The productive capacity should be to boost economic growth. This study was conducted in Pakistan whereas the current study is focused on the economies within East Africa.

In the European Union, a study was conducted by Pavelescu (2008) on Gross capital formation and economic growth focusing on early 2000's in EU-member candidates. Gross capital accumulation results in economic growth in several ways and processes. The process of capital accumulation leads to increased productivity, hence increased production of goods and services within an economy thus leading to improved economic growth. The process of the accumulation of Gross capital is aided by the factors of production including the raw materials, labour market and the capital market. This study acknowledges that capital formation has a positive and significant relationship with the growth of various economies.

A study was conducted by Eberechukwu (2013) on the association between capital formation and economic growth. The main focus of this study was sub-Saharan African countries. The study found out that high economic growth causes a higher accumulation of gross capital. Furthermore, high gross capital formation leads to increased economic growth. Therefore, the study concluded that gross capital formation and economic growth have a sort of causal relationship. The study concluded that gross capital formation and economic growth have a positive relationship.

In Nigeria, Nweke et al. (2017) determined the influence of capital formation on economic growth. In the analysis of data, the study adopted the co integration and vector error correction model. The findings of this research indicated that GCF had a positive but insignificant relationship with the real GDP in both the long runs and the short run. The study further a bi causality association that exists between the gross capital formation and the growth of GDP in the various economies. Therefore, the study concluded that even though the effect of GCF on GDP growth was positive, it was insignificant.

Research was carried out by Lidiana (2020) on gross capital formation effects on the gross domestic product. This study adopted secondary data and ordinary least squares in its analysis. The study in its findings indicated that gross capital formation has a positive and

statistically significant relationship with the gross domestic product of the different states. Therefore, the study concluded that gross capital formation is important in explaining the variations in economic growth of the various economies globally.

2.3.3 Institutional Quality and Economic Growth

The importance of institutions today has gained much attention and is extensively used in growth and cross-country (Kuncic, 2012). Institutional quality mitigates the crowding out effects of FDI by championing the foreign direct investments to the preexisting firms and hence reducing their competition with the domestic industries. This stimulates the growth of these economies and strengthens foreign direct investments (Nguyen et al., 2018). The impact of institutions on economic growth varies based on the stages of economic development. Institutions determine the long-term growth of the economy. This calls for different sets of institutions and policies in the different economies to promote the economic growth in the long run (Nawaz et al., 2014).

A study was conducted by Nguyen et al. (2018) on the quality of institutions and economic growth with reference to the emerging economies. The study adopted the systems generalized method estimators. The study acknowledged that institutional quality plays a critical role in enhancing economic growth. It strengthens the growth of the economy by accelerating trade including economies of scale and trade specializations in the advanced economies. Hence, the quality of institutions plays a critical role in stimulating the growth of the economies.

In Nigeria, Abubakar (2020) conducted a study focusing on the quality of institutions and economic growth. The study adopted the ordinary least squares method and the Johansen co-integration method. The study argued that the quality of institutions provides an enabling

environment for economic growth for the poorer proportions of the Nigerian population. The growth of the Nigerian economy is susceptible to the changes in the quality of institutions in Nigeria. Therefore, quality of institutions positively affects the growth of the economies of the developing nations.

In Latin America, Sawyer (2011) did research on institutional quality and economic growth. The study argued that poor quality of institutions is a recipe for poor economic growth in Latin America. Some of the characteristics of the poor quality of institutions include high inflation rates together with the high rates of unemployment. The presence of these conditions has a negative effect on the economic growth of the various economies. The study concludes that the quality of institutions in Latin America influences the growth of the economies within this region.

Research was done by Radzeviča et al. (2018) on the role of the quality of institutions in economic growth with a focus on the implications for the Baltic States. The study adopted the systems generalized method estimators. The findings of this research show that the quality of institutions is key when analyzing the changes in the GDP per capita. The institutions identified by the study included the regulatory quality and the effectiveness of the government. Therefore, the quality of civil services and public services together with the policies and regulations imposed by the government affects the growth of the economy of the nation. Quality governance has a positive effect on economic growth.

2.3.4 Labour Force and Economic Growth in the East African Economies.

In a study by Urgaia (2018) on the importance of human development in east African economies indicated that human capital is a crucial stock component that can affect the economic growth. Economic growth largely depends on human labour because skilled labour

is can easily learn and adopt new production technologies, innovate, and promote productivity. The endowments in human capital including the capacities and skills of the people in the productive sectors contributes to the long-term economic development. Therefore, a fair and equitable distribution of income enhances the contribution of human capital as an engine of economic growth.

Appleton (1998) did a study on human capital and economic development. From his findings, it was indicated that human capital comprising human knowledge, skills, strengths, and vitality supports the enhanced production and delivery of goods and services in the economy. Further, the study found that Africa has been achieving substantial human capacity development. Nevertheless, there have been low returns to the investment in education and that there has been low growth of incomes. Human capital has a direct impact on the productive capacity of an economy.

In an empirical investigation by Akinlo and Oyeleke (2020) on human capital formation and economic growth in the countries in Sub-Saharan African, the researchers found that human capital is a major determinant of economic growth. This is because labour is a major determinant behind technological advancement and generation of ideas. The integration of new technology and the transfer of new technology between and within countries is facilitated by human capital. Many developing countries have very high levels of illiteracy rates because most of the population cannot afford the costs of education. The level of development of the economy of any particular country hence depends on the availability and the quality of skilled labour force. Skilled labour facilitates the transfer and integration of new technology to increase the efficiency of the production of goods and services and further reduce the costs of production.

In a report by World Bank (2017) on human capital, it was viewed as an important asset to the developing economies. The report postulated that attributes such as knowledge,

innovation and skills are developed over time and are essential in the development of an economy. Further, the report indicates that human capital is a significant economic parameter influencing income global distribution across populations and countries. Prudent investments in human capital will have a significant role in shaping the economic path of the countries in African in future. African is blessed with a very high population that if utilized is important in the development of the economies of these countries. The report recommends Africa to invest more resources in education specifically on areas such as engineering, applied sciences and technology.

Haque et al. (2019) while conducting research in Bangladesh on labor force participation rate and economic growth used longitudinal dataset from 1991 to 2017. The research indicated that total labour force participation as well as the participation of famine labour affect the growth of the economy of Bangladesh in the short run. An active and efficient labour force augments the growth of the economy. Labour force actively participates in the production of goods and services in an economy and hence actively participating in growing the respective economy.

2.3.5 Technology and Economic Growth in the East African Economies.

Younus (2021) conducted a study on technological advancement and economic growth for the business sector. The findings of the study indicated that technology is an essential ingredient in economic development. Countries may have economic superiority over others because of their level of adoption of technology in their economy. Through technological innovation, individuals and businesses can be able to enhance their levels of production because technology guarantees low cost of production as well as increases the efficiency in

production. The increased and efficient production yields increased capital accumulation, which ultimately results in an improvement in economic growth.

Research undertaken by Sachs and McArthur (2002) on technological growth and economic growth in Asia. The findings of the study indicated that technological adoption itself raises the standards of living as well as enabling the achievement of economic growth in the long run. Technological innovations are therefore important to a growing economy. Furthermore, the study indicated that innovation in technology is the key indicator of economic growth in the long-term. The effective process of innovation calls for unity among the non-market and market institutions in order to steer fast economic growth. In Asia, economies such as Singapore and Hong Kong have proved to faster absorb technology.

Kvochko (2013) conducted a study on five ways technology can transform an economy. The study indicated that other than being the fastest growing industry, the technology industry is a key ingredient in innovation and development. Therefore, technologies act as a leverage that boosts the competitiveness of economies. The study identified five economic effects of the technological industry. The effects include the emergence of new services and industries, the transformation of the workforce, business innovation and direct job creation. Therefore, technology is an important catalyst in enhancing economic growth.

Research was conducted by Çalışkan (2015) on technological change and economic growth. The study postulated that the development in Technology fosters the growth of the economy growth in terms of profits and at the macro levels including the market shares of the firms at the micro level. Technological advancements enable people to engage in activities that they have not done before. This in turn will lead to more capital growth and increased economic growth. Through technology, the production of goods and services can be realized with less input. Furthermore, it can be sold, purchased, or understood easily. In addition, its transfer from one firm to another or from one nation to the other is cheap and easy.

Broughel and Thierer (2019) in their study on technological innovation and economic growth indicated that innovation in technology is an engine of human progress in addition to economic growth. Technology is an essential ingredient in economic growth as it ensures the discovery of new ideas and becomes productive. Technological innovation is a factor of Total Factor Productivity which plays a key role in the observance of the inter country changes in income per worker and further the growth in the economy. Therefore, for the realization of sustained economic growth, technological innovation is essential.

2.4 Research Gap

None of the studies reviewed related FDI to economic growth with the inclusion of control variables. This presents a research avenue that this study is intending to capitalize by investigating what effect intra-African FDI has on economic growth in the East Africa region context while incorporating the control variables entailing, gross capital formation, the labour force, institutional quality and the technology. There are also conflicting findings on the effect of FDI on economic growth. For example, Gui-Diby (2014) and Jugurnath et al. (2016) indicated that FDI positively and significantly impacts economic growth. Milutinović and Stanišić (2016) revealed a negative interdependence between FDI and GDP in European Union but not in developing economies. According to Asafo-Agyei and Kodongo (2022) FDI is essential though not the sufficient, condition for the growth of the economy while Agbloyor et al. (2016) indicated that FDI has insignificant effect on the growth of the economy.

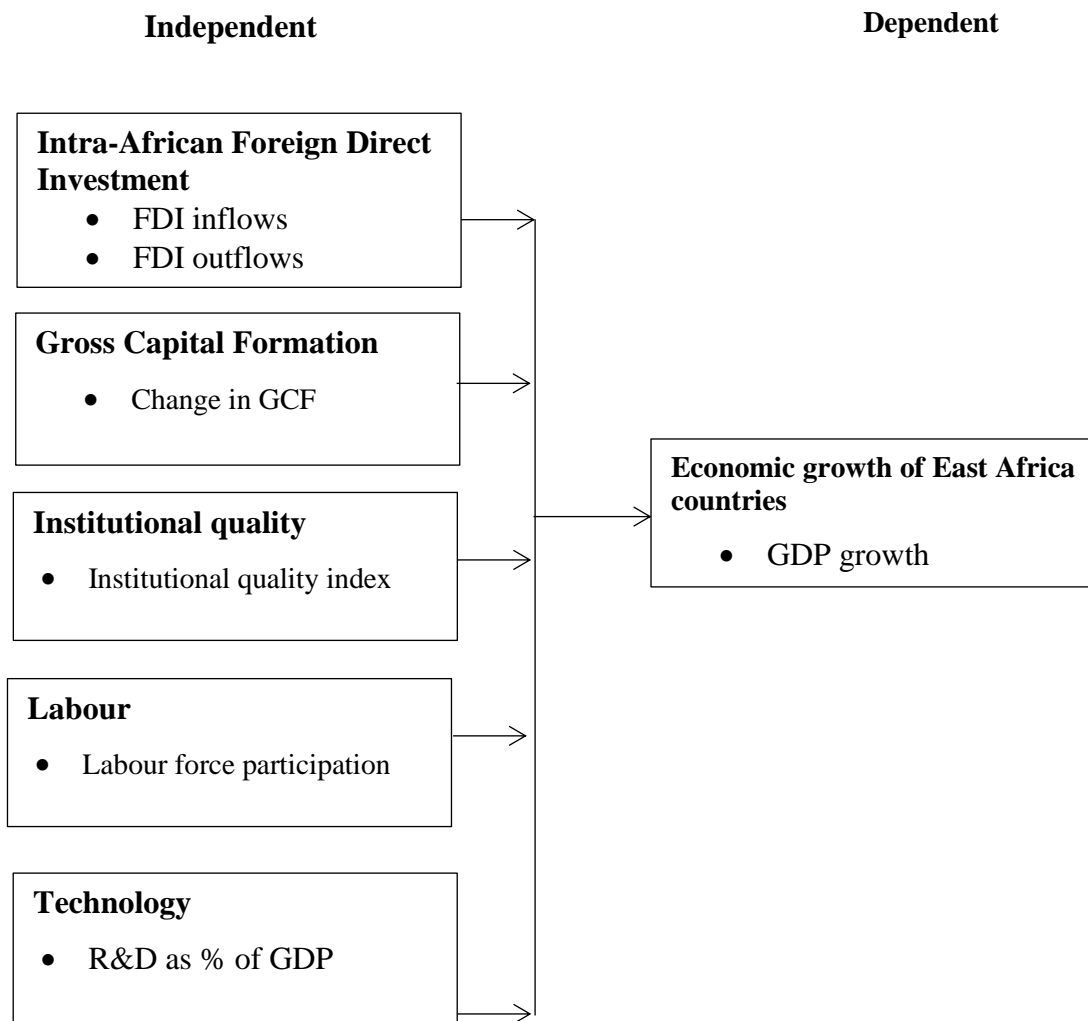
Most studies Gui-Diby (2014), Susilo (2018) and Asafo-Agyei and Kodongo (2022) employed longitudinal approach to establish the linkage between FDI and economic growth contrasting current investigation that employs panel approach. The panel approach considers the both the time and population variance compared to longitudinal approach. This presents a methodological avenue that this research intends to capitalize by utilizing the opportunity

provided by the collected panel data to panel model test to assess the nexus between FDI, GCF, institutional quality, labour force and technology on economic growth.

2.5 Conceptual Framework

A conceptual framework is crucial since it provides the platform for research; research purpose and specific intentions and points the study in the right direction. Intra-African FDI and economic growth are the independent and dependent variables respectively.

FIGURE 2
Conceptual Framework



2.6 Operationalization of Study Variables

This section discusses how the research variables would be operationalized. The dependent variable was economic growth. The independent variables were intra-African FDI, institutional quality, labour force, technology, and gross capital formation. The study assessed how intra-African FDI impacts on economic growth. This is displayed in Table 1.

TABLE 1

Operationalization of Study Variables

Category	Variable	Indicator	Measurement
Independent variable	Intra-African FDI	Net Intra-African inflows	% Intra-African FDI to GDP
	Gross Capital Formation	Change in GCF	% of GCF to GDP
	Institutional quality	Institutional index	quality Composite index to evaluate governance, law enforcement, regulation, social participation and level of corruption
	Labour	Labour participation	force This is the labour force participation rate, a total which is expressed as a percentage of the total population aged 15 and above (Labour force participation rate (% of total population ages 15+))
	Technology	Technological growth	Refers to technological progress in output production. It was measured as the amount spend on research and development as % of GDP
Dependent Variable	Economic Growth	GDP Growth	$(GDP_{t+1} - GDP_t) / GDP_t$

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology that the research intends to follow. It also explains how data was collected, managed, and interpreted throughout the study. These include the procedure of analysis and presentation alike.

3.2 Research Design

Research design is a guide, road map that guides the researcher in answering the outlined research objectives and statement of the problem (Bell, Bryman & Harley, 2018). The causal research design was adopted in this study. Causal research design seeks to determine how one set of variables termed as independent variable affects another set of variables, termed as dependent variable. It can answer what, where, how, when and what questions, though it does not answer the why questions (Erickson, 2017).

Causal research design is appropriate when investigating relationships among variables. Contrasting the experimental research, in this design, the researcher observes and measures study population without undertaking any experimental tests. Causal research design was also employed by Asafo-Agyei and Kodongo (2022) to analyse the nexus between FDI and economic growth of the SSA. Similarly, Jugurnath, et al. (2016) determined the nexus between FDI and economic growth in Sub-Saharan Africa.

3.3 Population of the Study

Study population refers to the aggregate study population where the sample is selected. The population of the study were the 5 East African Countries in Africa invested which have

in African countries (EAC, 2022) over the period 2000 to 2020. Data for the FDI, economic growth, gross capital formation, labour force, technology and institutional quality over the period 2000- 2020 was collected.

3.4 Sample Size

Sample size is the portion of the aggregate study population where study inferences are made from. The sample for this study was the 5 East African Countries over the period 2000 to 2020. This translated to 105 observations.

3.5 Data Sourcing

Data accuracy is vital to the study since it is what the accuracy of the study relies upon. Secondary data, which the researcher used, is important for accuracy. Data for FDI, economic growth, gross capital formation, labour force, technology and institutional quality was collected for the period from 2000 to 2020. The researcher specifically used figures from World Bank data banks, which document annual data on FDI, economic growth, gross capital formation, labour force, technology, and institutional quality. The data was collected for the East African countries, which was a representation of other countries in Africa.

3.6 Data Analysis

The data was first organized, then placed into tables for simplicity. The data then underwent analysis and interpretation. The study relied on data analysis software, particularly STATA Version 13, to perform the required data analysis procedures. Data analyses involved descriptive and inferential statistics. The descriptive tests entailed the mean, minimum, maximum and standard deviation. The inferential statistics included the panel regression model to determine the effect of Intra-African FDI, gross capital formation, labor force, institutional quality, and technology on economic growth of EAC nations.

3.6.1 Model of Analysis

This study adopted dynamic macro panel model to be determined after testing the diagnostic tests. Dynamic panel data entails studying the study population across period (Hsiao, 2007) while lagging the dependent variable. Dynamic macro panel data seeks to determine the change in a phenomenon of entities across the period (Frees, 2004). The dynamic panel model to be estimated was:

$$y_{it} = \sum_{j=1}^p \gamma_j y_{it-j} + \beta_{1i}X_{1it} + \beta_{2i}X_{2it} + \beta_{3i}X_{3it} + \beta_{4i}X_{4it} + \beta_{5i}X_{5it} + e_{it}$$

Where;

β_{1i} - β_{5i} are the beta coefficients of variable X_1 to X_5 which measures the change Y to change in i

y_{it} denotes economic growth of East African countries

y_{it-j} is lag of dependent variable (economic growth)

γ_j is the coefficient of the lag

X_{1it} is intra-African FDI inflows of country i at time t

X_{2it} is gross capital formation

X_{3it} is institutional quality

X_{4it} is labour

X_{5it} is Technology

t is time variance 2000 to 2020

i is the number of observations, East African countries.

e_{it} is the error term.

3.6.2 Tests of Significance

The study adopted a confidence interval of 95%. The expected results should be statistically significant at alpha level 0.05, implying that the significant values had a level below 0.05. To make conclusions, the study relied on a statistical inference for model accuracy in predicting the market capitalization. The significance of the model was tested using the 95% CI significance values. The association among all independent variables was also determined by these values. Standard error was also determined, showing by what margin the sample deviates from the tested value.

3.7 Diagnostic Tests

While performing linear regression, certain assumptions are held. They include zero multi collinearity, zero conditional mean, the assumption that the model is also “linear in parameters”, there is no autocorrelation, there is homoscedasticity and the assumption that error terms have normal distribution (Grewal *et al.*, 2004). These assumptions are crucial and violation of any may give unreliable results finally.

Diagnostic tests are essential in ensuring statistical assumption tests are not violated with the aim of ensuring correct parameter estimates of the model are generated. The diagnostic tests help ensure that data is fit for model estimation. The study performed the normality, Heteroscedasticity, Unit Root Test, multicollinearity, autocorrelation, and Hausman Test to inform the study whether the data fits the desired linear regression model.

3.7.1 Unit Root Test

Fisher-type test was employed to check unit root in the data. Fisher's test states that under null hypothesis, data is non-stationary while alternative hypothesis says that at least the data is stationary (Hanck, 2013). An alternative of this method was data differencing if unit root was present in data,

3.7.2 Normality Test

Bera and Jarque (1981) tests were employed to check for the normality of dataset. Under the null hypothesis, the error term is not normally distributed. We reject the null hypothesis if the P value is greater than 0.05 at 95% confidence interval. On the other hand, if the p-value estimated is >0.05 the error variance is normally distributed.

3.7.3 Hausman Test for Random and Fixed

This test was employed to ascertain whether the random or fixed model is appropriate for this study. If we fail to reject the null hypothesis, then a fixed effect model is adopted in the study. If hausman test rejects the null hypothesis, fixed effect model is discarded, otherwise random model is used.

3.7.4 Multicollinearity Test

Variance inflation factors (VIF) were applied to assess the level of correlation between the study variables, and whether the correlation is severe or acceptable. A variance inflation factor of less than 5 means an acceptable level of multicollinearity while a value greater than 5 gives an implication of the presence of severe multicollinearity.

3.7.5 Serial Correlation Test

Wooldridge test was employed in checking for serial correlation in data. The null hypothesis is that data has no serial correlation. In the event serial correlation is found, the

FGLS model was estimated. A calculated p value of > 0.05 signifies the absence of serial correlation (Wooldridge, 2002).

3.7.6 Heteroscedasticity Test

Breusch-Pagan/Godfrey test was adopted to check for heteroscedasticity. The error variance is homoscedastic under null hypothesis. If the null hypothesis is rejected, heteroscedasticity is present in the panel data, and this was cured by estimating FGLS. Breusch & Pagan, (1980) postulated that when the P value is less than 0.05 it implies the presence of heteroscedasticity; when p-value is greater than 0.05, there is no heteroscedasticity.

3.7.7 Breusch and Pagan Lagrangian Multiplier Test for Random and Pooled Effects

The test was used to check the appropriate model for the study the options been pooled OLS model and the random OLS model. The choice of the model to be adopted depends on the P value result of the test. A value greater than 0.05 means that Pooled OLS is the appropriate model to be used whereas a value of less than 0.05 gives the meaning that the random effects model should be adopted in the study.

3.7.8 Instrument Validity Test

Before estimating the dynamic panel, instrument validity was conducted using *Sargan test* (Kiviet & Kripfganz, 2021) and Hansen (1982) over identification test based on the one-stage estimates does not provide evidence for misclassification. Sargan p-value must not be less $< 5\%$ and $> 10\%$. The higher the p-value of the sargan statistic the better (Sargan, 1958). However according to Roodman (2006), it is recommended that sargan p-value should be greater than 0.25.

3.7.9 Second Order Autocorrelation ar (2)

Second order autocorrelation was tested using Arellano-Bond test. According to (Piper, 2023), for the AR (1) the autocorrelation is present in the dynamic model while in the higher autocorrelation. The Arellano and Bond (1991) specification test for absence of second-order serial correlation in the first-differenced residuals is easily passed by both estimators. It is important to test for second order autocorrelation ar (2) prior estimating dynamic panel model.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This part presents the results and discussion of results including the diagnostic tests, descriptive results, and panel models. The findings are presented in line with the objectives of the study.

4.2 Descriptive Statistics

The descriptive results for intra-African FDI, economic growth, institutional quality, gross capital formation, labour and technology in the East African countries are tabulated below. They are presented in the form of mean, standard deviation, maximum and minimum values together with the number of observations. The descriptive results is shown in Table 2.

TABLE 2**Descriptive Statistics**

Variable		Mean	Std. Dev.	Min	Max	Observations
GDP	overall	5.1819	2.96012	-3.9	13.1921	N = 105
	between		1.64108	0.33316	7.68606	n = 21
	within		2.48451	-2.9727	11.5717	T = 5
Intra African FDI	overall	1.99976	1.66047	-0.0013	6.6566	N = 105
	between		0.64954	1.02612	3.58517	n = 21
	within		1.53346	-0.9644	6.50874	T = 5
GCF	overall	21.1176	9.43791	1.1429	45.6246	N = 105
	between		4.1886	11.4871	27.4342	n = 21
	within		8.49732	1.61761	48.1401	T = 5
Labour Force	overall	77.6197	9.48624	28.951	88.35	N = 105
	between		3.3369	68.1438	79.7592	n = 21
	within		8.90405	38.4269	93.4329	T = 5
Institutional Quality	overall	53.5034	7.62221	18	68.1	N = 105
	between		2.11032	48.86	56.48	n = 21
	within		7.33594	22.6434	71.0834	T = 5
Technology	overall	0.27397	0.13729	0.013	0.63291	N = 105
	between		0.0329	0.22153	0.34092	n = 21
	within		0.13344	0.01209	0.59632	T = 5

It can be observed from the results presented that economic growth (GDP) had a mean of 5.181903. The overall standard deviation was 2.960123 and it ranged between 1.641076 and within 2.484507. The maximum and the minimum values are 13.19208 and -3.9 respectively. The variations in standard deviation imply that the GDP of the East African countries varied throughout the selected period of study. A report by IMF, (2022) indicated that in 2021, the global economic growth was 5.8 percent, which is expected to slightly shrink to 3.6 percent in 2023, confirms these variations. Furthermore, Kenya has been experiencing some steady

economic growth with GDP growth averaging 5.6 percent during the period 2014 to 2018 (World Bank, 2022).

Furthermore, it can be noted that the mean of Intra African Foreign Direct Investments (FDI) was 1.999764. The overall standard deviation was 1.66047 and its range was between 0.649541 and within 1533455. The minimum value was 1.026122 and the maximum value was 3.585168. The variations in standard deviation imply that the Intra African FDI varied throughout the selected period of study. These results are in tandem with the findings of Rolfe, et al., (2015) who indicated that the Intra-African FDI is growing rapidly compared to FDI growth in other regions across the globe and it has grown over 30% from 2007. Furthermore, Qiang, et al., (2021) found out that Intra-African FDI in 2002 was 9% and has grown to 13% in 2017. In addition, Yalta, (2013) argues that FDI triggers economic growth of the host nations by expanding their capital stock, facilitating technology transfer and creation of job opportunities in the host country.

It was also established that Gross Capital Formation (GCF) had a mean of 21.11764. The overall standard deviation was 9.437905 with a range within 8.497323 and between 4.188595. The minimum and maximum the values are 1.142898 and 45.62456 respectively. The variations in standard deviation imply that the GCF of the East African countries varied throughout the selected period of study. Meyer and Sanusi, (2019) argue that economic growth is stimulated by new and additional investment increases the aggregate demand in the economy. This means that increasing investments is likely to provide more jobs or increase the employment level.

From the results that the mean of labour force was 77.61969. The overall S D was 9.486238 and it ranged between 3.336895 and within 8.90405. The maximum and the minimum values are 88.35 and 28.951 respectively. The variations in standard deviation imply that the labour force of the East African countries varied throughout the selected period of

study. Appleton, (1998) in a study on human capital and economic development. From his findings, it was indicated that human capital identifies human characteristics which can be acquired, and which increase income including human knowledge, skills, strengths, and vitality. Further, the study argued that there has been an increasing improvement in the quality of human capital formation. This is because Africa has improved access to education by its citizens.

The results indicate that the institutional quality had a mean of 53.50362. The overall standard deviation was 7.622133 and it ranged between 2.110506 and within 7.335802. The maximum and the minimum values are 68.1 and 18 respectively. The variations in standard deviation imply that the institutional quality of the East African countries varied throughout the selected period of study. The impact of institutions on economic growth varies depending on the stages of economic development. Institutions determine the economic growth over time. Each economy requires a set of institutions and policies that are different to promote long run economic growth (Nawaz, et al., 2014).

It can be noted from the results that the technology had a mean of 0.274762. The overall standard deviation was 0.137198 and it ranged between 0.032885 and within 0.133355. The maximum and the minimum values are 0.63 and 0.01 respectively. The variations in standard deviation imply that the technology of the East African countries varied throughout the selected period of study. Technology supports the growth of human capacity development and uplifting the competitiveness of the local market (Liebrand, 2018).

4.3 Trend Analysis

Trend analyses using trend line was conducted to examine the growth trend of GDP growth, Intra-African FDI, gross capital formation, labour force participation, institutional quality index and technological growth over the study period. The trend lines entailed average growth

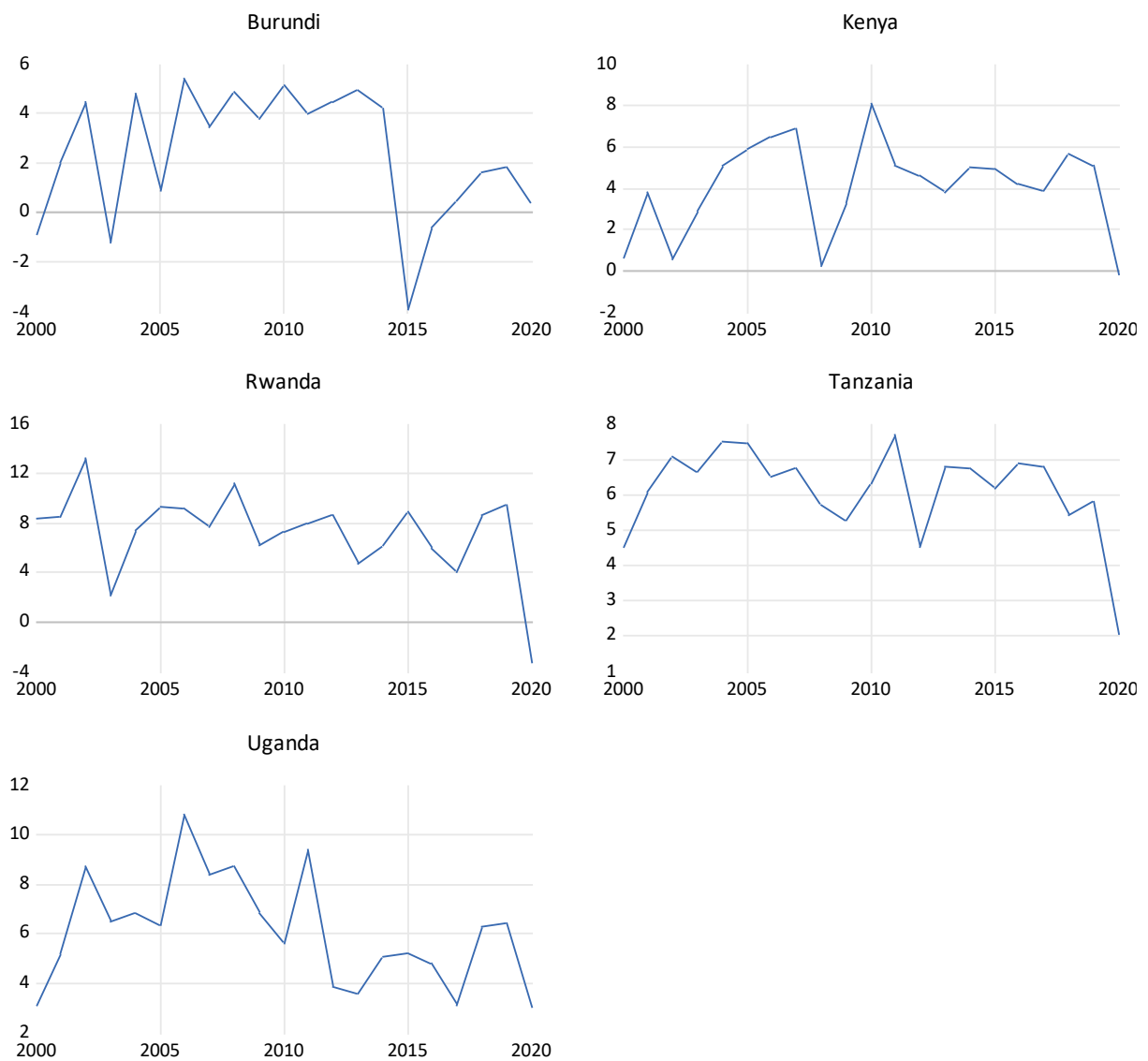
of GDP growth, Intra-African FDI, gross capital formation, labour force participation, institutional quality index and technological growth from 2000 to 2020.

4.3.1 GDP Growth

A trend line of average GDP growth for the East African countries comprising of Kenya, Tanzania, Uganda, Rwanda and Burundi was drawn. The trend line for GDP growth from 2000-2020 is shown in figure 3.

FIGURE 3

GDP Growth 2000-2020



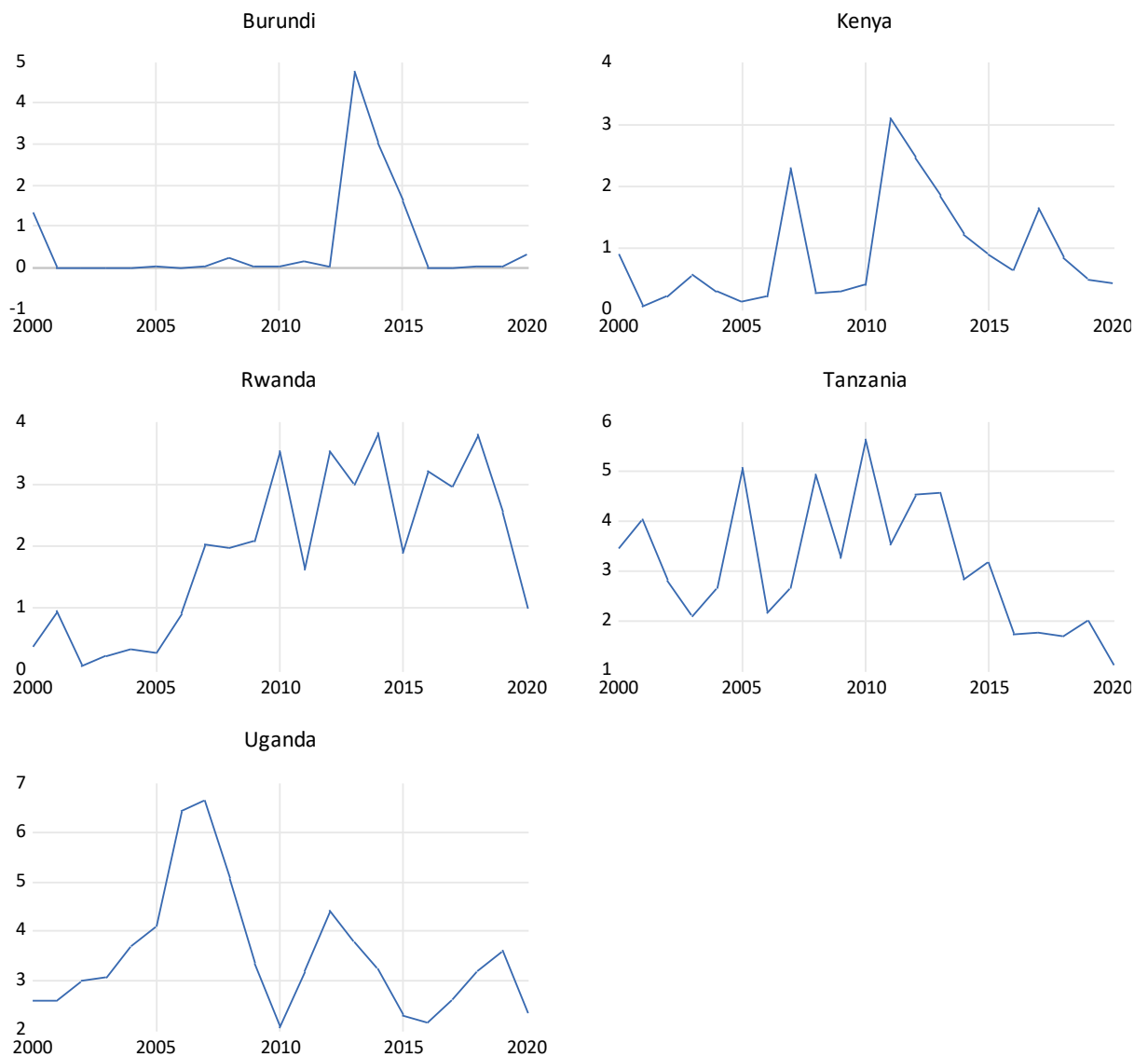
The growth of GDP from 2000 to 2020 was highest in Rwanda, followed by Tanzania and Uganda. Burundi has been recording the lowest GDP growth over the study period. Kenya compared to Tanzania, Uganda and Rwanda, recorded low GDP growth over the period 2000-2020 yet Kenya boasts large GDP in terms of nominal GDP. This is an indication that Kenya GDP has been slowing down. The slow down has been linked to shrinking desire of Kenya as preferred investment destination by foreign and African investors and falling ease of doing business because of high cost of doing business featured by high taxes, cost of energy and minimal accountability. Rwanda on the other hand has attracted rising investments owing to favorable investment environment characterized by rising accountability and ease of doing business.

4.3.2 Intra-African FDI

A trend line of average Intra-African FDI growth for the East African countries over the period 2000 to 2020 was drawn. The Intra-African FDI growth is shown in figure 4.

FIGURE 4

Intra-African FDI Growth 2000-2020



The intra African FDI to Rwanda and Tanzania was highest. The intra-African FDI to Burundi and Kenya was lowest. It is evident that instar African FDI have been targeting Tanzania and Rwanda owing to ease of doing business. Tanzania and Rwanda have also been experiencing political stability compared to Burundi, Uganda and Kenya. Jugurnath, et al. (2016) established that aggregated FDI has a positive and significant effect on growth of the

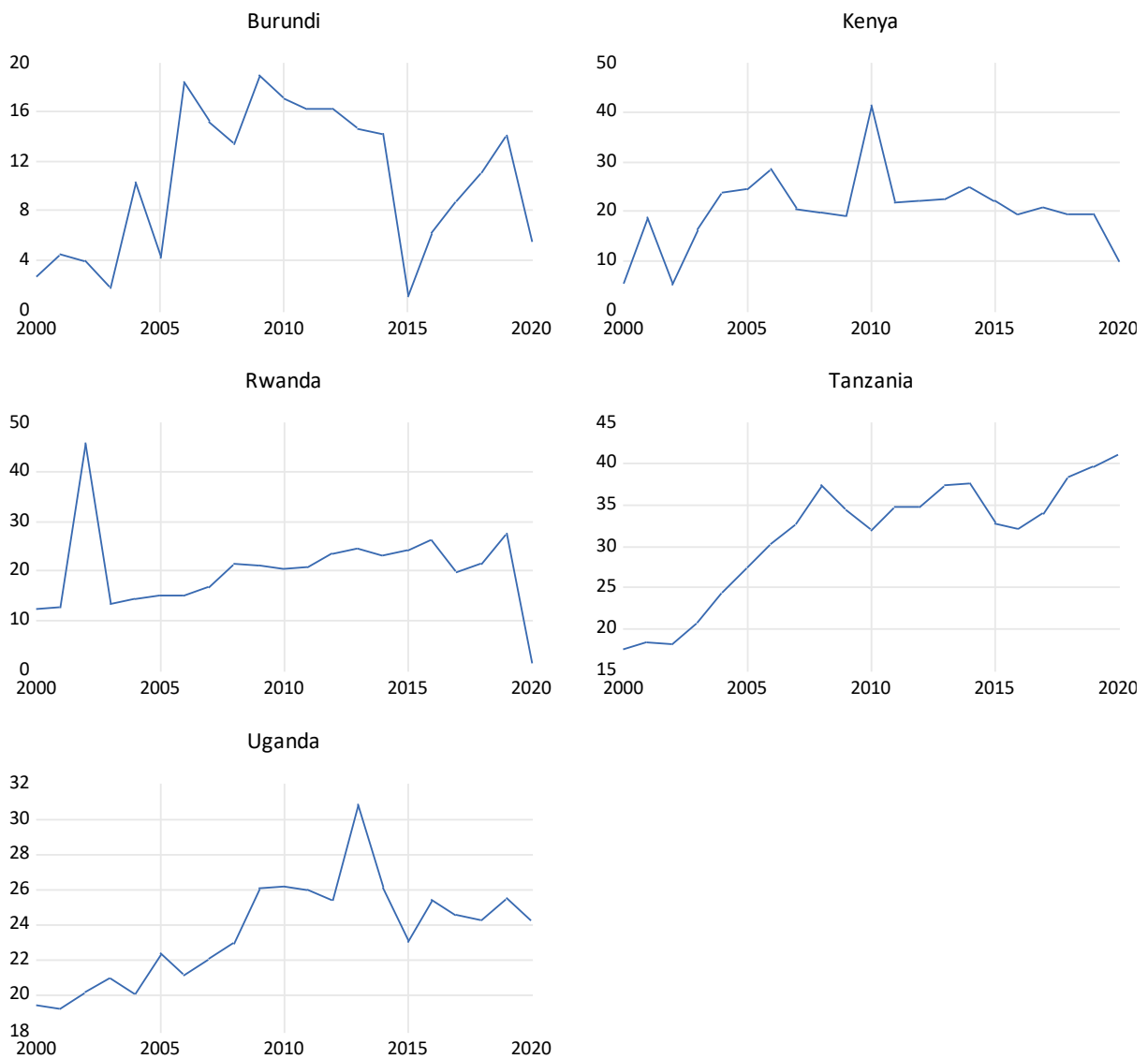
economy. However, the results are inconsistent with Gui-Diby (2014) and Agbloyor et al. (2016) who established that FDI is insignificantly associated with the growth of the economy.

4.3.3 Gross Capital Formation

A trend line of average Gross Capital Formation growth for the East African countries over the period 2000 to 2020 was drawn. The Gross Capital Formation growth is shown in figure 5.

FIGURE 5

Gross Capital Formation 2000-2020



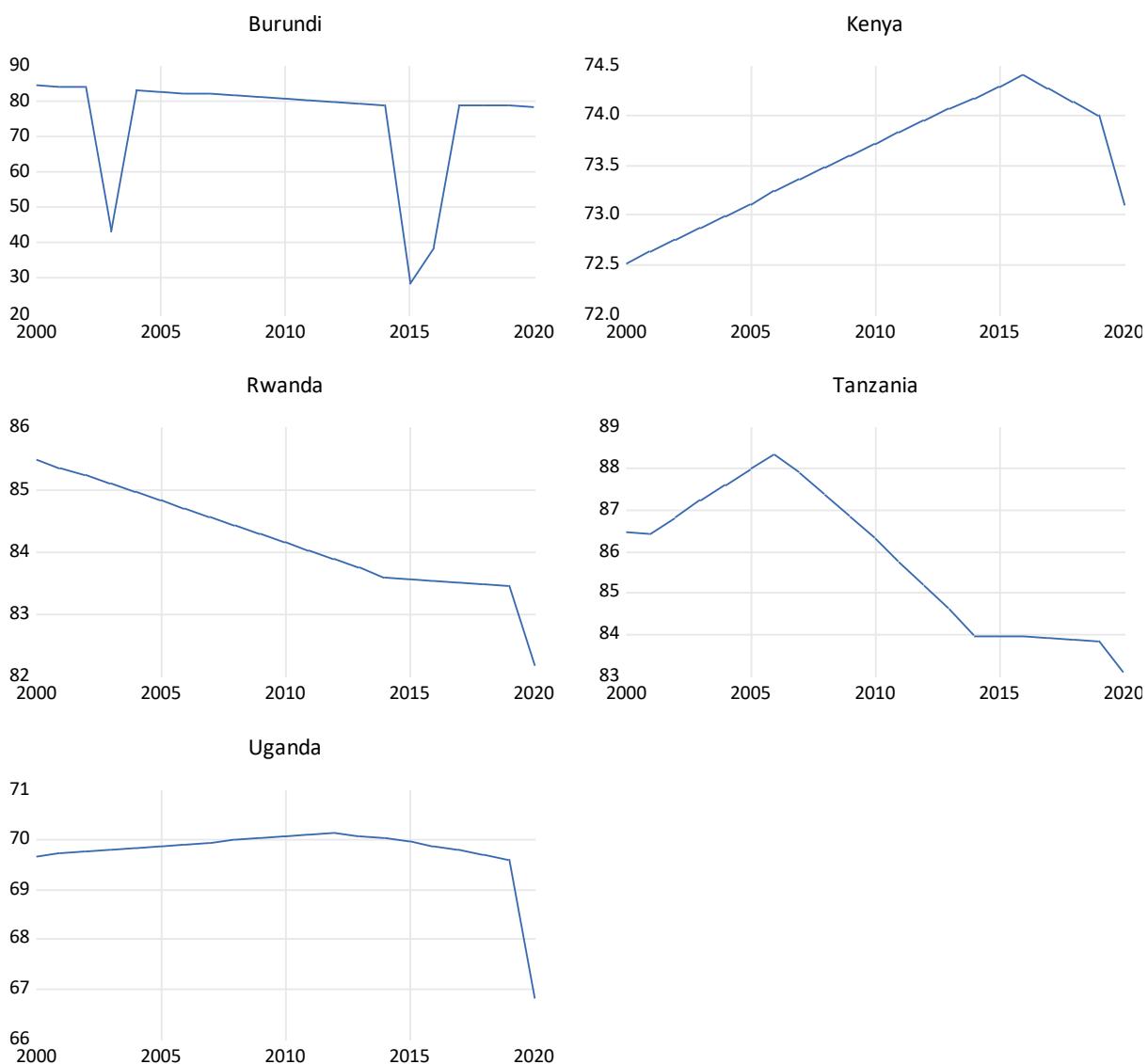
Gross Capital Formation growth was highest in Tanzania followed by Uganda. Kenya and Rwanda recorded almost similar percentage average Gross Capital Formation growth over the study period. Gross capital formation occurs when a country expands its fixed assets and outlays for economic transformation. According to Iftikhar et al., (2016) gross capital formation has a positive and significant relationship with economic growth in Pakistan.

4.3.4 Labour Force Participation

A trend line of average labour force participation for the East African countries over the period 2000 to 2020 was drawn. The labour force participation is shown in figure 6.

FIGURE 6

Labour Force Participation 2000-2020



Labour force participation in Tanzania has been going down. In Kenya, labour force participation rose from early 2000 to 2015 but was followed by decline afterwards. Rwanda and Burundi labour force participation has been fluctuating over the study period featured by sharp rises and declines. The endowments in human capital including the capacities and skills of the people in the productive sectors contributes to the long-term economic development.

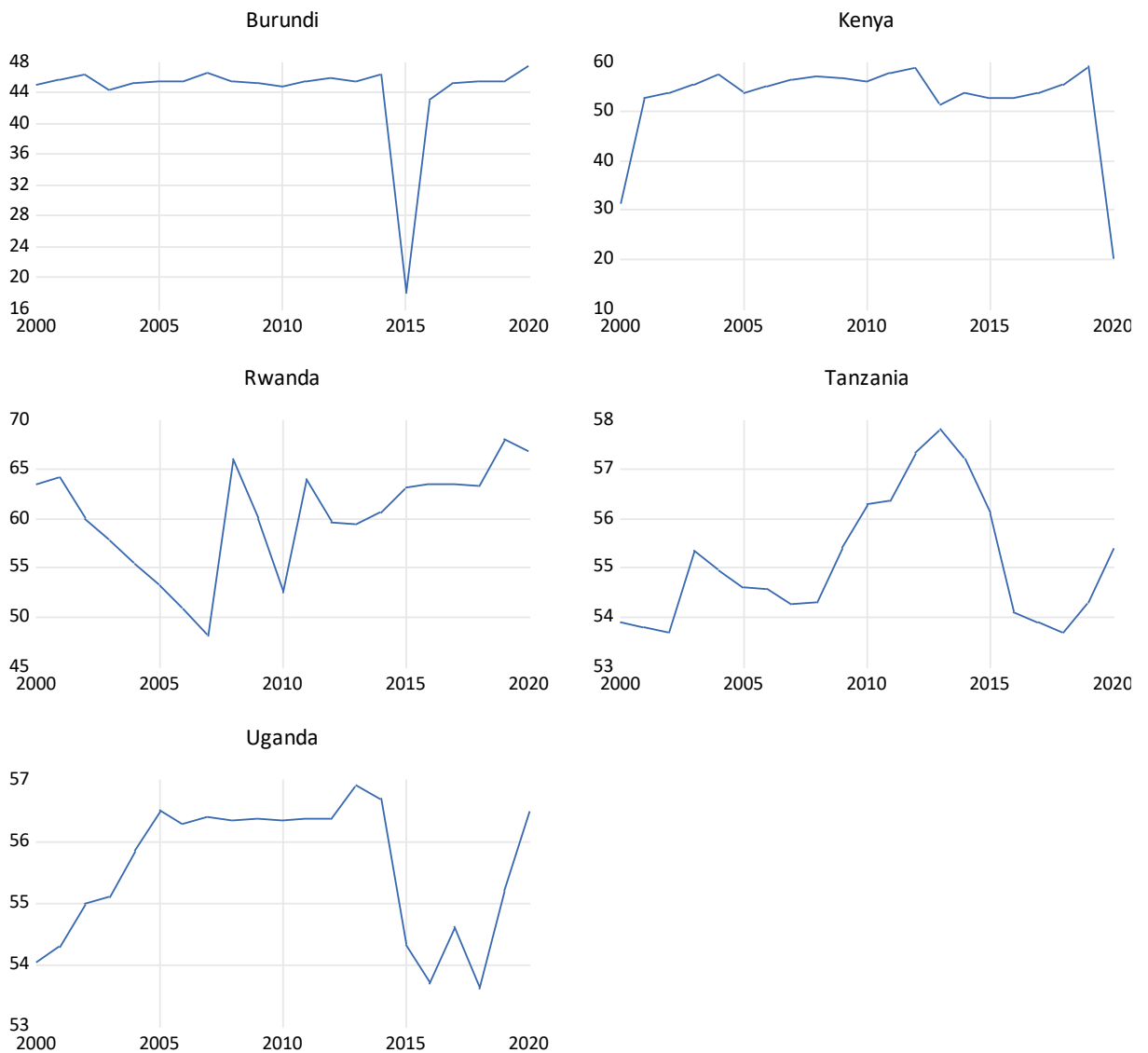
Urgaia, (2018) indicated that human capital is a crucial stock component that can affect economic growth.

4.3.5 Institutional Quality Index

A trend line of average Institutional quality index for the East African countries over the period 2000 to 2020 was drawn. The Institutional quality index is shown in figure 7.

FIGURE 7

Institutional Quality Index 2000-2020



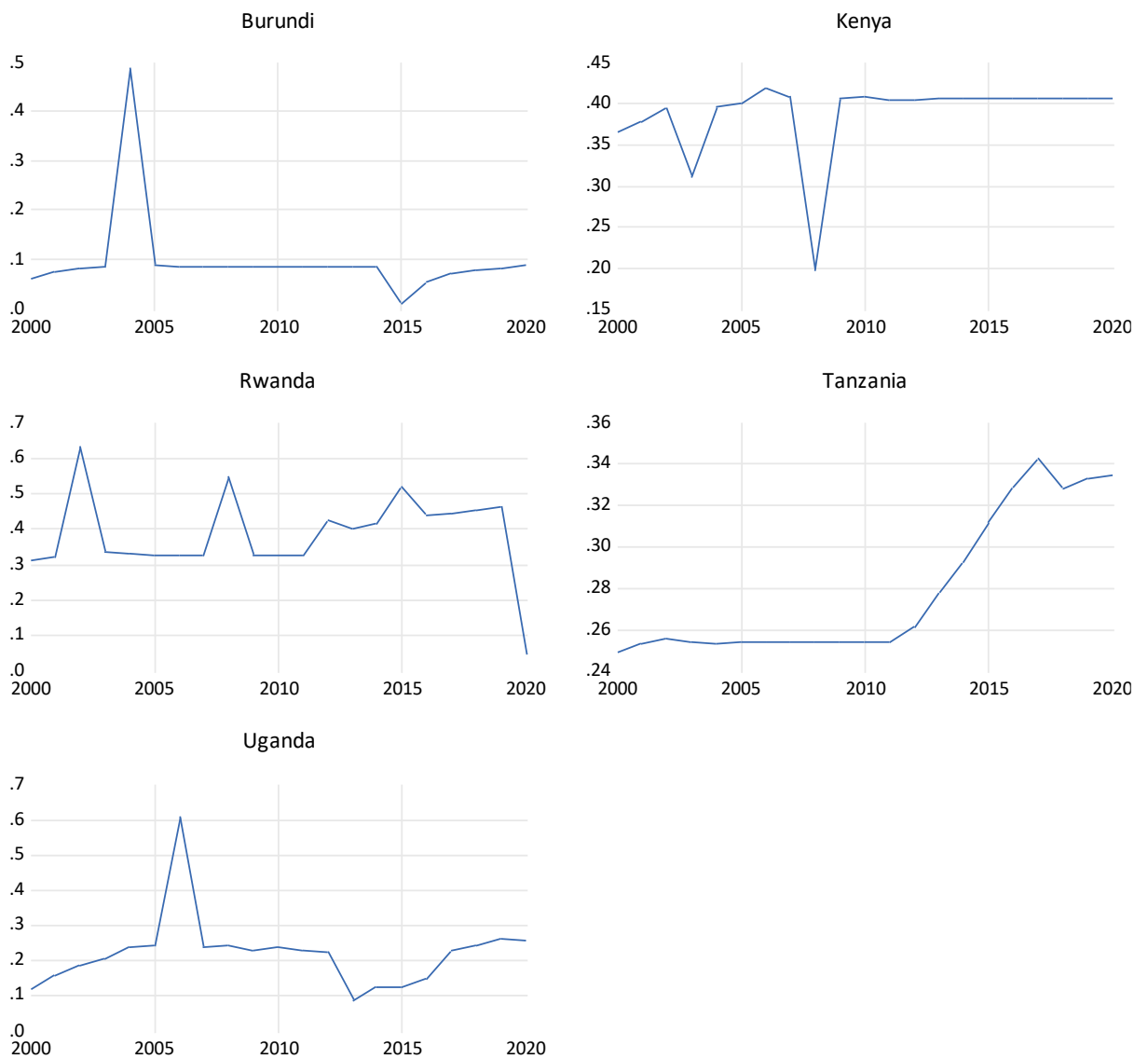
Rwanda institutional quality index has been rising. The institutional quality in Tanzania and Uganda has been fluctuating. In Kenya, the institutional quality from 2001 to 2019 was above 50 percent. However, in 2021, the institutional quality sharply declined. Burundi records lowest institutional quality index among the East African countries. The institutional quality defines the nature of governance, law enforcement, regulation, social participation, and level of corruption. The high institutional quality is favorable for economic growth. Institutional quality mitigates the crowding out effects of FDI by championing the foreign direct investments to the preexisting firms and hence reducing their competition with the domestic industries. This stimulates the growth of these economies and strengthens foreign direct investments. Nguyen et al., (2018) acknowledged that institutional quality plays a critical role in enhancing economic growth as it strengthens the growth of the economy by accelerating trade including economies of scale and trade specializations in the advanced economies.

4.3.6 Technological Growth

A trend line of average technological growth for the East African countries over the study period was drawn. Technological growth is shown in figure 8.

FIGURE 8

Technological Growth 2000-2020



The investment to research and development as percentage of GDP is lowest in all the East African Countries. Through technological innovation, individuals and businesses can be able to enhance their levels of production because technology guarantees low cost of production as well as increases efficiency in production. The increased and efficient production yields increased capital accumulation, which ultimately results in an improvement in economic growth. Younus, (2021) indicated that technology is an essential ingredient in economic

development. Countries may have economic superiority over others because of their level of adoption of technology in their economy.

4.4 Correlation Analysis

This analysis was conducted to have an overview of the magnitude and direction of the relationship between the independent variables that is Intra African FDI, labour force, GCF, institutional quality and technology over the dependent variable that is Economic growth. The range of the correlation values lies from +1 to -1. A value of +1 means a perfect positive correlation, -1 perfect negative correlation and 0.000 no correlation. The range of values from 0.001 to 0.250 meant the presence of weak correlation, 0.251 to 0.500 moderately strong correlation, 0.501 to 0.750 strong correlation and 0.751 to 1.000 very strong correlation.

TABLE 3

Correlation Analysis

	GDP	Intra African FDI	GCF	Labour Force	Institutional Quality	Technology
GDP	1.000					
Intra African FDI	0.3993 0.000	1.000				
GCF	0.5647 0.000	0.432 0.000	1.000			
Labour Force	0.4141 0.000	0.0634 0.5203	0.2871 0.003	1.000		
Institutional quality	0.5601 0.000	0.335 0.0005	0.4809 0.000	0.3826 0.0001	1.000	
Technology	0.5309 0.000	0.1108 0.2606	0.4027 0.000	0.2351 0.0158	0.4538 0.000	1.000

The correlation results of the study indicated that there is a moderately strong relationship between Intra African FDI and economic growth. This relationship is statistically significant ($r= 0.399$, $p= 0.000<0.05$). It can be observed that the correlation between gross capital formation and economic growth is positive, strong, and statistically significant ($r= 0.565$, $p= 0.000<0.05$). In addition, labour force had a positive, statistically significant, and moderately strong relationship with the economic growth of the selected East African countries ($r= 0.414$, $p= 0.000<0.05$). The findings for institutional quality show that the correlation between institutional quality and economic growth is strong, positive, and statistically significant ($r=0.560$, $p= 0.000<0.05$). The correlation results between technology and economic growth indicate that technology and economic growth have a positive, strong, and statistically significant relationship with economic growth ($r= 0.529$, $p= 0.000<0.05$).

4.5 Diagnostic Tests

This section presents the diagnostic tests that were carried out in the study. The diagnostic tests include the unit root test, hausman test, multicollinearity test, autocorrelation, heteroscedasticity, and normality tests.

4.5.1 Normality Test

To carry out any hypothesis tests, the normality assumption ($ut \sim N(0, \sigma^2)$) is required (Brooks, 2008). Table 4 shows the normality results using Skewness and Kurtosis test for study. For the results, if the P value is >0.05 , we reject the null hypothesis that data is not normally distributed and fail to reject the alternative hypothesis that the data is normally distributed.

TABLE 4**Normality Test Results**

	Obs	Pr(Skewness)	Pr(Kurtosis) adj	chi2(2)	Prob>chi2
FDI	105	0.000	0.338	1.060	0.589
GCF	105	0.004	0.706	0.450	0.799
Labour force	105	0.000	0.000	39.660	0.205
Institutional Quality	105	0.072	0.001	11.920	0.093
Technology	105	0.012	0.005	22.125	0.072

The results of this particular study indicate that the calculated p values for all the study variables are significant ($P= 0.589 > 0.05$, $P= 0.799 > 0.05$, $P= 0.205 > 0.05$, $P= 0.093 > 0.05$, $P= 0.072 > 0.05$). These findings point out that the data is normally distributed and thus a panel model can be estimated.

4.5.2 Autocorrelation Test

A serial correlation test was conducted to check for correlation of error terms across time periods. The Wooldridge test was applied to check for serial correlation in data. Serial autocorrelation is a common problem experienced in panel data analysis. To test autocorrelation, hypothesis tests were carried out. The results are presented in Table 5

TABLE 5**Autocorrelation Test Results**

Wooldridge test for autocorrelation in panel data
H ₀ : no first-order autocorrelation
F(5,104) = 0.714
Prob > F = 0.2706

The null hypothesis of this test was that there is no first order autocorrelation. When Serial Correlation tests were conducted, the test statistic from the results was F-test of 0.714 and a $p= 0.2706 > 0.05$. Therefore, we fail to reject the null hypothesis that no first autocorrelation exists. Based on the results, there is absence of serial autocorrelation in the data. Thus, the data is fit for panel model estimation.

4.5.3 Multicollinearity Test

Multicollinearity is the presence of correlations between the study variables (William *et al.* 2013). It exaggerates the confidence intervals together with the standard errors which may result in the estimates of the coefficients that are not stable (Belsley *et al.*, 1980). To test multicollinearity of this study, the study employed variance inflation factors (VIF). VIF values >10 indicates the presence of Multicollinearity whereas VIF values <10 indicates that there is no multicollinearity in the data set.

TABLE 6

Multicollinearity Test Results

Variable	VIF	1/VIF
Institutional Quality	1.64	0.60886
GCF	1.6	0.62313
Technology	1.36	0.73487
FDI	1.31	0.76625
Labour Force	1.21	0.82615
Mean VIF	1.42	

The results presented in Table 6 show that there is no multicollinearity within the study variables. The variance inflation factor figures are <10 ($1.64 < 10$, $1.6 < 10$, $1.36 < 10$, $1.31 < 10$,

1.21<10). This implies the absence of multicollinearity in the data set and hence the data is fit to estimate panel model.

4.5.4 Heteroscedasticity Test

Heteroscedasticity refers to the tests to ascertain whether the variance of the regression errors is dependent on the values of the independent variables. Breusch-Pagan / Cook-Weisberg test for heteroscedasticity was used in this study. Large values of Chi square indicate the presence of heteroscedasticity (Islam, 2019). Table 7 shows the heteroscedasticity results.

TABLE 7

Heteroscedasticity Test Results

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of GDP	
chi2(1)	= 0.07
Prob > chi2	= 0.7934

From the results presented in Table 7, with a Chi square of 0.07, then the results imply that heteroscedasticity is not present.

4.5.5 Unit Root Test

Unit root test was used to test for the time series data stationarity. This is because the estimation of the times series assumes that the variables are stationary. Carrying out the stationarity tests enhances the authenticity of the study results (Gujarati & Porter, 2009). In testing stationarity of the time series, the study employed Fisher-type test. The test results are tabulated in the subsequent section. The hypotheses to be tested were.

H₀: All panels contain unit roots

H_a: At least one panel is stationary

TABLE 8

Fisher-Type Test of Unit Root

Variable		Inverse chi-squared (114) P	Inverse normal Z	Inverse logit t (289) L*	Modified inv. chi-squared Pm
GDP	test statistic	48.7906	-5.2638	-6.0912	8.6738
	p-value	0.000	0.000	0.000	0.000
Intra African FDI	test statistic	22.0239	-2.5781	-2.5339	2.6886
	p-value	0.0150	0.0050	0.0085	0.0036
GCF	test statistic	39.8472	-3.7631	-4.6909	6.6740
	p-value	0.000	0.0001	0.0000	0.0000
Labour Force	test statistic	31.4252	-2.4650	-4.9696	0.0745
	p-value	0.0051	0.0003	0.0000	0.0007
Institutional Quality	test statistic	32.5124	-3.3340	-3.8062	5.0339
	p-value	0.0003	0.0004	0.0003	0.0000
Technology	test statistic	53.3577	-4.4289	-5.8192	9.6951
	p-value	0.0000	0.0000	0.0000	0.0000

The stationarity results test for unit root revealed that, GDP, Intra African FDI, GCF, labour force, institutional quality and technology were stationary. This is because their P values were less than 0.05. Gujarati, (2009) indicated that if the unit root test results are stationary, then the data is fit for regression analysis.

4.5.6 Hausman Test for Random and Fixed

Hausman tests are carried out to determine the type of model to be used in the study. The model to be used could be the random effects model or the fixed effects model (Baltagi, 2005). The null and the alternative hypotheses of the Hausman tests are,

H₀: Random effect is the preferred model in the study.

H₁: Fixed effect is the preferred model in the study.

Table 9 presents the Hausman test results.

TABLE 9

Hausman Test Results

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	re	fe	Difference	S.E.
Intra African FDI	0.17523	0.3583	-0.1831	0.07358
GCF	0.09954	0.0677	0.03185	0.01521
Labour Force	0.08907	0.06309	0.02598	0.01416
Institutional quality	0.02899	0.06932	-0.0403	0.01436
Technology	10.7247	6.32223	4.40249	1.62929
chi2(4)	1.53			
Prob>chi2	0.0658			

The Hausman test was conducted using the Hausman's approach (1978). The null hypothesis was that random is preferred to fixed model. The findings of this test indicated a chi-square of 1.53 and p-value 0.0658>0.05. Therefore, we fail to reject the null hypothesis that the random effect model is appropriate. Random effect model was therefore used in the study. The study further sought to determine the suitable model between the random effects model and the pooled OLS model. The Breusch and Pagan Lagrangian multiplier test for random effects was used and the results are shown in Table 10.

TABLE 10**Breusch and Pagan Lagrangian Multiplier Test Results**

	Var	sd = sqrt(Var)
GDP	8.76233	2.96012
E	3.41701	1.84852
U	0.000	0.000
chibar2(01) = 0.000		
Prob > chibar2 = 0.9999		

From the results should in Table 10, the p value $0.9999 > 0.05$. The study concludes that the pooled OLS model is the appropriate model for the study. However, the dynamic panel-data estimation was estimated since the dependent variable (GDP) depends on its own past realizations. Although the coefficients on lagged dependent variables might be far from our interest, the introduction of these lags becomes crucial to control for the dynamics of the process.

4.5.7 Instrument Validity Test

Before estimating the dynamic panel, instrument validity was conducted using *Sargan test* (Kiviet & Kripfganz, 2021) and Hansen (1982) overidentification test based on the one-stage estimates does not provide evidence for misclassification. The Stata command *xtabond2*, was employed for the empirical analysis, to check the validity of the models that result from this choice. Sargan p-value must not be less $< 5\%$ and $> 10\%$. The higher the p-value of the sargan statistic the better (Sargan, 1958). However according to Roodman (2006), it is

recommended that sargan p-value should be greater than 0.25. The results are shown in Table 11.

TABLE 11

Instrument Validity Test

Sagan test of overid. restriction: $\chi^2(2) = 7.09$ Prob > Chi2 = 0.038

Hansen test of overid. restriction: $\chi^2(92) = 5.64$ Prob > Chi2 = 0.059

Based on the results above, we cannot reject the null hypothesis of joint validity of all instruments. Thus, the instrument was valid according to Sagan test (p-value > 0.05). Similarly, as per the Hansen test, the (p-value 0.059 > 0.05). Thus, the instrument is valid in estimating the dynamic panel model.

4.5.8 Second Order Autocorrelation ar(2)

Second order autocorrelation was tested using Arellano-Bond test. According to (Piper, 2023), for the AR (1) the autocorrelation is present in the dynamic model while in the higher autocorrelation. The Arellano and Bond (1991) specification test for absence of second-order serial correlation in the first-differenced residuals is easily passed by both estimators.

H₀₁: There is no autocorrelation in the model.

H₀₂: There is autocorrelation in the model.

TABLE 12

Second Order Autocorrelation

Arellano-Bond test for AR (1) in first deference: $z=-8.67$ $pr > z =0.037$

Arellano-Bond test for AR (2) in first deference: $z=-1.65$ $pr > z =0.619$

Based on the results in Table 12, the AR (1) p value <0.05 . For Arellano-Bond p-value >0.619 . As per the results, second order autocorrelation ar(2) for prior estimating dynamic panel model is satisfied.

4.6 Dynamic Panel-Data Estimation

Dynamic panel-data estimation was employed when different samples are selected for a specified period. For this data, the panel data analysis is done for the samples drawn for the years 2015-2020 in the respective listed banks. Table 13 presents the results of the dynamic panel-data estimation model.

TABLE 13**Dynamic Panel-Data Estimation**

GDP	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
GDP						
L1.	0.0387	0.0767	0.5000	0.6140	-0.1117 0.1890	
Intra African FDI	0.1635	0.0330	4.9545	0.0000	-0.0970 0.4243	
GCF	0.1097	0.0278	3.9500	0.0000	0.0553 0.1642	
Labour Force participation	0.0932	0.0232	4.0200	0.0000	0.0478 0.1387	
Institutional quality	0.1156	0.0322	3.5900	0.0013	-0.0476 0.0788	
Technology	10.9518	1.9669	5.5700	0.0000	7.0968 14.8068	
_cons	-8.7197	1.9860	-4.3900	0.0000	-12.6123 -4.8271	
Wald chi2(6)	121.8					
Prob > chi2	0.000					
Instruments for differenced equation						
GMM-type: L(2/).GDP						
Standard: D.FDI D.GCF D.LabourForce D.Institutionalquality D.Technology						
Instruments for level equation						
Standard: _cons						

From the results presented in Table 13, the variables GDP, Intra African FDI, GCF, labour force, institutional quality and technology are statistically significant. The dynamic panel is statistically significant (Wald chi2(6)= 121.8, p=0.000<0.05) in explain the economic growth of the East African countries. The results are statistically significant with a p value of 0.000<0.05. Therefore, the study variables are important in explaining the variations in firm performance.

From the results presented in Table 13, Intra African FDI has a positive and statistically significant linear relationship with economic growth of the selected East African countries ($\beta=$

0.1635, $p= 0.0000<0.05$). These results imply that a unit increase in the foreign direct investments will yield 0.1635 units' improvement in the economic growth of the East African countries. FDI is a significant factor necessary to grow the economy of a country as it brings capital, technological innovation, provides opportunities to the labour force, how skills, and creation of new markets for the products of a country.

Gross capital formation had a positive and statistically significant linear relationship with the economic growth ($\beta= 0.1097$, $p= 0.0000<0.05$). A unit increase in the gross capital formation yields 0.1097 units' improvement in the economic growth of the East African countries. Increased capital accumulation in a particular economy leads to a corresponding rise in the exports of the economy, which in return will translate to an improved growth in the economy of a country.

In addition, the linear relationship between labour force and economic growth is positive and statistically significant ($\beta= 0.0932$, $p= 0.0000<0.05$). This implies that a unit increase in labour force will yield 0.0932 units increase in economic growth of the East African countries under study. A country's labour force entails the population that is actively engaged in the production of goods and services. Labour force engages actively in the activity of producing goods and services in an economy and hence is a vital component in the economic growth of a particular country.

Furthermore, institutional quality had a positive and statistically significant linear relationship with economic growth ($\beta=0.1156$, $p=0.0013<0.05$) implying that a unit increase in institutional quality results in 0.1156 units increase in economic growth. Institutional quality mitigates the crowding out effect of FDI by championing foreign direct investment of the preexisting firms and lessening competition with domestic firms, so that the growth effect of FDI is further strengthened.

Technology had a positive and statistically significant relationship with the economic growth of the selected East African countries under study ($\beta=10.9518$, $p=0.000<0.05$). A unit increase in technology in within the selected east African countries will yield 10.9518 units increase in the economic growth of these countries. Technology is an essential ingredient in economic growth as it ensures the discovery of new ideas and becomes productive. Technological innovation is a factor of Total Factor Productivity which plays a key role in the observance of the inter country changes in income per worker and further the growth in the economy.

4.7 Discussion of the Findings

This sub-section gives an outline of the results from the analyzed data linking them with the literature reviewed as described below.

4.7.1 Intra African Foreign Direct Investments

From the analysis of the results, the mean value of the Intra African FDI is 1.9998 and its standard deviation is 1.66047. Its minimum and maximum values are -0.0013 and 6.656597 respectively. The correlation results indicated that there is a moderately strong and statistically significant relationship between foreign direct investment and economic growth ($r=0.399$, $p=0.000<0.05$). The regression results show that Intra African FDI has a positive and statistically significant linear relationship with economic growth with regards to the selected East African countries ($\beta= 0.1635$, $p= 0.0000<0.05$). These results imply that a unit increase in the foreign direct investments will yield 0.1635 units' improvement in the economic growth of the East African countries. Intra African FDI is a significant factor necessary to grow the economy of a country as it brings capital, technological innovation, provides opportunities to the labour force, how skills, and creation of new markets for the products of a country.

The results concur with the findings of Jugurnath, et al. (2016) who indicated that aggregated FDI has a positive and significant effect on economic growth. The findings also agree with the results of Gui-Diby (2014) who argued that it was found that FDI significantly affects economic growth in the African region. Alfaro, (2003) further indicated that through FDI, improvement in the management skills, transfer of technology labour training happen. The study further points out that the inflows of FDI into the primary sector of the economy have a negative effect on the growth of the economy. However, the FDI inflows to the manufacturing sector portray a positive effect on the growth of the economy.

However, the results are inconsistent with other scholars who established that FDI is insignificantly related to the growth of the economy (Agbloyor et al., 2016). The findings of Susilo (2018) who suggested that FDI is not always beneficial to host nations and that FDI can have negative or positive effect on economy. In addition, Gui-Diby (2014) also argued that FDI significantly impacts economic growth in the African. A negative effect of FDI on economic growth, however, was established in the regime 1980-1994 but positive in the time 1995 to 2009. This in an indication of lack of consistency among authors regarding the linkage between FDI and economic growth.

4.7.2 Gross Capital Formation

The findings indicated that the mean value of the gross capital formation is 21.118 and its standard deviation is 9.437905. Its maximum and minimum values are 45.62456 and 1.142898 in that order. The correlation results indicated that there is a strong and statistically significant correlation between gross capital formation and economic growth ($r=0.565$, $p=0.000<0.05$). Gross capital formation had a positive and statistically significant linear relationship with the economic growth ($\beta= 0.1097$, $p= 0.0000<0.05$). A unit increase in the formation of gross capital will result in 0.1097 units' improvement in the economic growth of the East African countries. With gross capital formation, a rise in production of goods and

services will lead to the accumulation of capital and hence exports. This will ultimately boost the economic the economic growth in both short and long run.

Gross capital formation can trigger the creation of employment opportunities, enhance human and capital and production. Moreover, the gross capital formation facilitates the acquisition of production assets in a country required for good and service growth. The assets comprising both tangible and intangible assets are used in the production of goods and services in the economy. The goods and services result in the growth of a country's national income. To accumulate more capital, the country needs to foster more investments and savings that will trigger the accumulation of funds to produce capital goods faster which can be reinvested by the governments resulting in economic growth.

The results are in line with the findings of Iftikhar et al., (2016) who postulated that there was a positive and significant relationship between gross capital formation and economic growth. The study argued that a rise in production of goods and services will lead to the accumulation of capital and hence exports. In addition, Ntamwiza and Masengesho (2022) argued that GCF has indirect effect on economic growth through FDI. However, other scholars were not in agreement with these findings. These scholars include Koskei, et al. (2013) who argued that FDI and gross capital formation did not significantly affect the growth of the economy. It is argued that GCF affects economic growth through FDI. Muse and Mohd (2021) in a study to determine the nexus between FDI and growth of Ethiopian economy who found that gross capital formation negatively and significantly influenced the economy during the interest rate period.

4.7.3 Labor Force Participation

The study results indicated that the mean value of the labour force is 77.62 and its standard deviation is 9.486. Its minimum and maximum values are 28.951 and 88.35 respectively. The correlation results indicated that labour force had a positive, moderately strong, and statistically significant relationship with the economic growth of the selected East African countries ($r=0.414$, $p=0.000<0.05$). The regression results implied that the linear relationship between labour force and economic growth is positive and statistically significant ($\beta= 0.0932$, $p= 0.0000<0.05$). This implies that a unit increase in labour force will yield 0.0932 units increase in economic growth of the East African countries under study. Human capital is the resource of the economies. This resource entails knowledge, skills, and innovation that people accumulate. Further, the quality of labour skills explains the disparities in the levels of labour income across countries. Quality investments in human skills plays are essential in determining the level of development and economic growth of Africa in the near future.

Labour force forms a critical component in the growth of the economy. More importantly, the presence of a skillful labour force is essential to the growth of the economy. The intra-African FDI may trigger the transfer of skillful labour forces across the countries. A skillful labour force is required in the efficient production of goods and services. In the context of the study, the EAC investment policy is geared at allowing the community members to meet their investment targets, particularly in light of the current difficult global economic realities. The EAC investment Framework supports free movement of labour to promote a balanced and competitive industrial development in the region; strengthens relations with other regional and international organizations; provides for Export Processing Zones among other provisions. Thus, the EAC Investment Policy 2019-2024 allows member countries to pursue a coordinated region-wide approach to promotion of investment opportunities seeking to boost intra-African FDI within the region. Thus, capacity building of the labour force through training informed

by market needs, desire for country's economic growth, greatness and competitiveness in the global market is essential. Adequate and skillful labour is required not only during the production of goods and services, but also provides a market for the consumption of those goods and services.

The findings of the research are in tandem with the findings of Haque et al., (2019) on labor force participation rate and economic growth who argued that total labour force participation and female labour force participation affect the growth of the economy of Bangladesh in the short run. An active and efficient labour force augments the growth of the economy. Labour force actively participates in the production of goods and services in an economy and hence actively participating in growing the respective economy. Akinlo and Oyeleke, (2020) on the formation of human capital with respect to growth of the economy in Sub-Saharan African countries further pointed out that found that human capital is a major determinant of economic growth and that it is an engine behind the generation of new ideas that underlie technological progress. Urgaia, (2018) further indicated that human capital is an important stock component that can affect economic growth. Labour is critical to economic growth because the labour force that is skilled can easily adopt the changes in technology, innovate and increase their levels of production. The endowments in human capital including the skills and capacities of the people in the productive sectors contributes to the long-term economic development. Therefore, a more equal distribution of income enhances the contribution of human capital as an engine of economic growth.

4.7.4 Institutional Quality

The study results indicated that the mean value of the institutional quality is 53.504 and its standard deviation is 7.622. Its minimum and maximum values are 18 and 68.1 sequentially. The findings for institutional quality show that the correlation between institutional quality and economic growth is positive, strong, and statistically significant ($r=0.560$, $p=0.000<0.05$). The

regression results implied that institutional quality had a positive and statistically significant linear relationship with growth of economy ($\beta=0.1156$, $p=0.0013<0.05$) implying that a unit increase in institutional quality results in 0.1156 units increase in economic growth. Institutional quality mitigates the crowding out effect of Intra African FDI through championing the foreign direct investment into pioneering firms and reducing the competition with domestic firms, to enable growth in foreign direct investments. The quality of institutions is essential in triggering economic activities as well as boosting the growth of the economy. This is more so when it comes to the new markets whereby emphasis has been put with regards to the improvement of the quality of institutions.

Institutional growth is one of crucial parameters for structural development and long-term welfare creation for a nation. The institutional quality depicts the quality of governance practices exercised by a country or territory. The nature of institutional quality creates favorable investment destinations and favourable environment to do business. Institutional quality is featured by rule of law, protection of human and property rights, governance featured by quality leadership and low corruption cases, justified taxation policies and efficient business regulatory frameworks. Institutional quality tends to enhance trade openness of a country thus triggering economic growth by unlocking its potential. Moreover, institutional quality is argued to be very useful in the adoption of frontier technology and productivity in the economy. High quality institutions in a country inspires confidence of investors into the country enhancing the growth of goods and services. In addition, higher institutional quality and a better atmosphere of governance reduce business costs and promote an efficient business environment, which can improve bilateral trade flow between nations. It is worth a country improving its institutional quality by outlining and upholding policy frameworks and rule of law, enforcing integrity, accountability, and transparency in public and private institutions. Moreover, governments

ought to cultivate the virtue of accountable and effective leadership that will attract intra-African direct investments.

The results of the current study agree with the findings of Nawaz, et al., (2014) who pointed out that the effect of institutional quality on economic growth varies depending on the stages of economic development. Institutions determine economic growth in the long run. Hence, different economies require different sets of institutions and policies to promote long-term growth of the economy. Additionally, Ogbonna et al. (2021) on the institutional quality on the nexus between foreign aid and economic growth in Africa argued that quality of institutions enhances the effect of foreign aid on economic growth in Africa. Trojette (2016) further established that quality of institutions moderates the link between FDI and GDP except in the Americas. In addition, Nguyen, et al. (2018) postulated that FDI positively impacts economic growth. However, institutional quality impedes the positive impacts of trade openness and FDI on economic growth.

4.7.5 Technology

The study results indicated that the mean value of the technology is 0.2748 and its standard deviation is 0.1372. Its minimum and maximum values are 0.01 and 0.63 respectively. The correlation results between technology and economic growth indicate that technology and economic growth have a positive, strong, and statistically significant relationship with economic growth ($r=0.529$, $p=0.000<0.05$). Technology had a positive and statistically significant relationship with the economic growth of the selected East African countries under study ($\beta=10.9518$, $p=0.000<0.05$). A unit increase in technology in within the selected east African countries will yield 10.9518 units increase in the economic growth of these countries.

The growth of intra-African FDI facilitate the transfer of technology as it triggers technology spillovers. The goal of technology is to enable countries, business enterprises and individuals to use technologies more efficiently, cutting production costs while enhancing productivity output. With growth in technology, there is enhanced know-how in the economy where technology enhances total output production in the economy. Know-how is important in the efficient production of goods and services resulting in the growth of the economy. Technology is argued as one of the differentiating factors that brings competitive advantage of certain countries over others resulting to quick economic transformation. Technology targets different sectors of the economy including automotive, manufacturing and processing, agriculture, finance, service industry, energy, and transport. The countries may thus need to invest much in research and development to spur the growth of technological know-how of the EAC countries. The research and development should target the learning institutions, government institutions and private institutions. The support of the research and development can be through national funding support, creation of linkage and coordinated research activities among local government institutions, other neighboring, and foreign organizations.

Advancement in Technology improves economic growth in terms of profits and at the macro levels including the market shares of the firms at the micro level. It enables people to engage in ne activities, which will lead to more capital formation and increased economic growth. This increases the goods and services production and hence economic growth. The transfer of technology is easy and cheap. Innovation in technology is an engine of economic growth in addition to human progress. Technology is an essential ingredient in economic growth as it ensures the discovery of new ideas and becomes productive. Technological innovation is a factor of Total Factor Productivity which plays a key role in the observance of the inter country changes in income per worker and further the growth in the economy.

Therefore, for the realization of sustained economic growth, technological innovation is essential.

The findings of this study are in tandem with the results of Kvochko, (2013) conducted a study on five ways technology can help the economy and indicated that the technology industry is a key ingredient in innovation and development significantly influencing economic growth. Therefore, the competitiveness of economies lies largely in the ability of the economies to adopt new technologies. The study identified five economic effects of the technological industry. The effects include the emergence of new services and industries, the contribution to the GDP growth, the transformation of the workforce, business innovation and direct job creation. Furthermore, Younus, (2021) indicated that through the countries that are endowed in terms of technology, the other countries that are considered inferior in terms of technological advancement gain economic superiority through technological transfer. Technology enables the production of goods efficiently and at low cost, improvement in the levels of capital accumulation and generally improves the competitiveness of a country. The rapid advancement in technology makes it hard to forecast into the future in terms of economic growth. However, technology is key in economic growth because it decreases the cost of production and increases the efficiency of productivity.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

After the analysis and discussion of the study findings, this section gives the summary of the results, the conclusion of the study and finally the recommendations of the study based on the results. The subsequent sections outline the chapter.

5.2 Summary of Findings

The aim of the study was to explore the determinants of intra-African flows to East African economies. The study relied on secondary data sourced from World Bank data banks, which documents annual data on FDI, economic growth, gross capital formation, the exchange rate, inflation, and institutional quality for the period from 2000 to 2020. The data was collected for the East African countries, which was the representation of other countries in Africa.

5.2.1 Foreign Direct Investments

The results of the study indicate that Intra African FDI had a mean of 1.999764. The overall standard deviation was 1.66047. Its maximum and minimum values were 3.585168 and 1.026122 respectively. The correlation results between Intra African FDI and economic growth indicate that the relationship was moderately strong and statistically significant ($r=0.399$, $p=0.000<0.05$). The model regression findings give the indication that Intra African FDI has a linear and statistically significant association with economic growth ($\beta= 0.1635$, $p=0.0000<0.05$). This implies that a unit increase in the foreign direct investments will yield 0.1635 units' improvement in the economic growth of the East African countries. Intra African FDI is a significant factor necessary to grow the economy of a country as it brings capital, technological innovation, provides opportunities to the labour force, how skills, and creation of new markets for the products of a country. Rolfe, et al., (2015) indicated that the Intra-

African FDI is growing rapidly compared to FDI growth in other regions across the globe and it has grown over 30% from 2007. Furthermore, Qiang et al., (2021) found out that Intra-African FDI in 2002 was 9% and has grown to 13% in 2017.

5.2.2 Gross Capital Formation

The findings of this research show that Gross Capital Formation (GCF) had a mean of 21.11764. The overall standard deviation was 9.437905. Its maximum and the minimum values were 45.62456 and 1.142898 respectively. The correlations result between gross capital formation and economic growth indicate that gross capital formation had a positive, strong and statistically significant ($r= 0.565$, $p= 0.000<0.05$). Furthermore, gross capital formation had a positive and statistically significant linear relationship with the economic growth ($\beta= 0.1097$, $p= 0.0000<0.05$). This means that increasing the gross capital formation by a unit will result in 0.1097 units' improvement in the economic growth of the East African countries. With gross capital formation, a rise in production of goods and services will lead to the accumulation of capital and hence exports. This will ultimately boost the economic the economic growth both in the long and short term. Additional investment increases the aggregate demand in the economy. It is expected that any increase in investment increases the levels employment within an economy as well as increasing productivity thus leading to improved growth of the economy (Meyer & Sanusi, 2019).

5.2.3 Labor Force

It can be summarized that the labour force had a mean of 77.61969 and a standard deviation was 9.486238. Its maximum and the minimum values were 88.35 and 28.951 respectively. Furthermore, the correlation between labour force and economic growth indicate that labour force had a relationship that was positive, moderately strong, and statistically significant with the economic growth of the selected East African countries ($r= 0.414$, $p=$

0.000<0.05). In addition, the regression results show that labour force and economic growth are linearly related, and this relationship was positive and statistically significant ($\beta= 0.0932$, $p= 0.0000<0.05$). This implies that a unit increase in labour force will yield 0.0932 units increase in economic growth of the East African countries under study. Human capital is the resource of economies, which include knowledge, skills, and innovation that people accumulate. This gives to a point of two thirds of the explanations in income differences across the world. Timely and smart investments in labour are critical in shaping the trajectory of the nations in Africa in the near future. This is because Africa has a large population set which is growing rapidly. Banking on this population by investing in the development of their skills will help in steering the growth of the economies in Africa.

Appleton, (1998) in a study on human capital and economic development. From his findings, it was indicated that human capital identifies human characteristics which can be acquired, and which increase income including human knowledge, skills, strengths and vitality. Further, the study argued that there has been an improvement in several aspects of human capital especially in the expansion of education in Africa.

5.2.4 Institutional Quality

The findings indicate that institutional quality had a standard deviation with a mean of 7.622133 and 53.50362 sequentially. The maximum and the minimum values are 68.1 together with 18 in that order. In addition, there was a strong, positive, and statistically significant correlation regarding the quality of institutions and economic growth ($p= 0.000<0.05$, $r= 0.560$). The regression analysis indicate that institutional quality had a positive and statistically significant linear relationship with economic growth ($\beta=0.1156$, $p=0.0013<0.05$) which means that increasing institutional quality by a unit result in 0.1156 units increase in economic growth.

Institutional quality mitigates the crowding out effect of foreign direct investment through championing for foreign investment into existing firms and reducing the competition with domestic firms, to enable growth in Intra African FDI. Institutional quality contributes immensely to activities in the economy and significantly aids in the process of the growth in the economy particularly in the new markets whereby effort has been applied in the improvement of institutional quality (Nawaz, et al., 2014). The quality of institutions affects the economy of various economies depending on the level of development of the respective economies. Institutions determine the long run economic growth. To ensure growth of the economy in the long run, different sets of policies and institutions should be put in place depending on the respective countries.

5.2.5 Technology

It can be noted that technology had a mean of 0.274762 and a standard deviation of 0.137198. Its maximum and the minimum values were 0.63 and 0.01 respectively. The correlation results between technology and economic growth indicate that technology and economic growth have a positive, strong, and statistically significant association with economic growth ($r=0.529$, $p=0.000<0.05$). Furthermore, from the regression analysis, the findings indicate that technology had a positive and statistically significant relationship with the economic growth of the selected countries in East Africa under study ($\beta=10.9518$, $p=0.000<0.05$). A unit improvement in technology in within the selected east African countries will yield 10.9518 units' improvement in the growth of the economies of these countries. The transfer of technology is easy and cheap. Innovation in technology is an engine of economic growth in addition to human progress. Technology is an essential ingredient in economic growth as it ensures the discovery of new ideas and becomes productive. Advancement in Technology improves economic growth in terms of profits and at the macro levels including the shares of the market of the firms at the micro level. It enables people to engage in ne

activities, which will lead to additional formation of capital and increased economic growth. This increases the goods and services production and hence economic growth. Innovation in technology innovation is a factor of Total Factor Productivity which plays a key role in the observance of the inter country changes in income per worker and further the growth in the economy. Therefore, for the realization of sustained economic growth, technological innovation is essential. Technology supports the growth of human capacity development and uplifting the competitiveness of the local market (Liebrand, 2018).

5.3 Conclusion

The research concludes that Intra African FDI and the growth of the economy have a moderately strong and statistically significant correlation. Furthermore, Intra African FDI have a positive and significant linear relationship with the growth of the economies of the selected East African countries. Intra African FDI influences the growth of the economy by increasing the efficient use of resource and factor productivity, facilitates the technology across economies supports the development of human capacity and its improvement hence its competitiveness.

Institutional quality has a strong and positive correlation with economic growth. In addition, the study concludes that it has a statistically significant and positive relationship with economic growth. Institutional quality has also been recognized as a catalyzer of economic growth. It stimulates investment and consumption, improves efficiency in resource allocation and protects property rights. Institutional quality advocates for openness in trade by championing the economies of scale in trade. This majorly serves as an added advantage to the developed economies at the expense of the developing economies.

The results for Gross Capital Formation further show that there is a statistically significant and strong correlation between gross capital formation and economic growth. Its regression results with the growth of the economy points out that it has a positive and

statistically significant relationship. With gross capital formation, a rise in production of goods and services will lead to the accumulation of capital and hence exports. This will ultimately boost the economic the economic growth in the short term and in the long term.

The conclusion of this research with regards to labour force is that its correlation with economic growth was positive, moderately strong, and statistically significant. The regression statistics between labour force and economic growth portrayed a positive and statistically significant relationship with economic growth. Human capital is the resource of the economies. This resource entails knowledge, skills, and innovation that people accumulate. Further, human capital explains to a level of two thirds the differences in income across the world. Prudent and quality investments in human capital are significant in projecting the future growth of the countries in Africa. This is because Africa is well endowed with labour owing to its large population. Taping on this great population by improving the quality of their skills to merge the emerging market demands is critical.

Concerning Technology, the research concludes that its correlation with economic growth gave significantly strong and positive correlation whereas its regression statistics showed that the technology has a significant and also positive linear relationship with the growth of the economy of the selected countries. Innovation in technology is an engine of economic growth in addition to human progress. Technology is an essential ingredient in economic growth as it ensures the discovery of new ideas and becomes productive. It enables people to engage in ne activities, which will lead to more capital formation and increased economic growth. This increases the goods and services production and hence economic growth. The transfer of technology is easy and cheap. Advancement in Technology improves economic growth in terms of profits and at the macro levels and further at the micro level in terms of market shares. Technology and its innovations contributes to economic growth

because it boosts the income per worker and hence total productivity. Therefore, for the realization of sustained economic growth, technological innovation is essential.

5.4 Recommendations

The study recommends that the countries within East Africa should cooperate and open its borders to allow easy movement of technology and labour within and across the borders. This will allow increased investments in these countries thus boosting economic growth. It will lead to foreign inflows to either of the selected East African countries and hence boosting the economic growths in their respective economies. Furthermore, some countries may be well endowed in terms of technology, others in terms of labour. Sharing these resources across borders boosts economic growth. The study further recommends that countries should create a favourable environment for business and investments. The countries should strive to have strong legal background to protect the innovations. These countries should also put more investments into research and development. In addition, the quality of training offered should be improved to improve the quality of labour. The East African countries should also improve the quality of their governance structures to have favourable taxation as well as friendly business environments.

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[2021#:~:text=Foreign%20direct%20investment%20\(FDI\)%20in,2022%20published%20on%209%20June](https://unctad.org/news/foreign-direct-investment-latin-america-rebounded-56-2021#:~:text=Foreign%20direct%20investment%20(FDI)%20in,2022%20published%20on%209%20June). Accessed on 28th July 2022.

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[uncertainty#:~:text=Developing%20Asia%2C%20which%20receives%2040,India%20shrank%20to%20%2445%20billion](https://unctad.org/press-material/global-foreign-direct-investment-recovered-pre-pandemic-levels-2021-uncertainty#:~:text=Developing%20Asia%2C%20which%20receives%2040,India%20shrank%20to%20%2445%20billion). Accessed on 28th July 2022.

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[transition/#:~:text=Martin%20said%3A%20%E2%80%9CIn%20our%201.5,economic%20output%20over%20the%20period.%E2%80%9D](https://www.woodmac.com/press-releases/the-economic-impact-of-an-accelerated-energy-transition/#:~:text=Martin%20said%3A%20%E2%80%9CIn%20our%201.5,economic%20output%20over%20the%20period.%E2%80%9D). Accessed on 28th July 2022.

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APPENDICES

Appendix I: Data Collection Letter



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SCHOOL OF GRADUATE STUDIES

KCA/SGS/Oct.22/1

28th October 2022

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: MAUREEN KWAMBOKA AIKO REG. NO: 14/00816

It is my distinct pleasure to introduce to you Ms. Maureen Kwamboka who is a student in our institution pursuing a Master of Science in Commerce at the School of Business.

Maureen is conducting a research on a topic titled: *“Effect Of Intra-African Foreign Direct Investment On Economic Growth In East African Countries.”* which is part of the requirements of the program she is pursuing. The research as well as the data procured thereof shall be used for academic purposes only.

Any assistance accorded to her is highly appreciated.

In case of further inquiry, do not hesitate to contact the undersigned.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Nyaribo Misuko', written over a large, faint watermark of the KCA University logo.

Dr. Nyaribo Misuko

Dean, School of Graduate Studies

Appendix II: Secondary Data Collection Sheet

Year	Country	Economic Growth	Intra African FDI				Gross Capital Formation		Labor	Technology	Institution quality
			Intra African FDI Inflows	Intra African FDI Outflows	Net Intra African FDI	Ln Net Intra African FDI	Gross Capital Formation	Δ Gross Capital Formation			
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Appendix III: Data Set

Country	Year	GDP	FDI	GCF	Labour Force	Institutional quality	Technology
Kenya	2000	0.5997	0.8729	5.41409	72.512	31.40	0.37
Kenya	2001	3.77991	0.04083	18.7903	72.633	52.65	0.38
Kenya	2002	0.54686	0.21006	5.13822	72.754	53.61	0.40
Kenya	2003	2.93248	0.54841	16.4821	72.874	55.48	0.31
Kenya	2004	5.1043	0.28619	23.9625	72.994	57.47	0.40
Kenya	2005	5.90667	0.1132	24.6497	73.114	53.90	0.40
Kenya	2006	6.47249	0.19622	28.6336	73.234	55.16	0.42
Kenya	2007	6.85073	2.28124	20.457	73.353	56.45	0.41
Kenya	2008	0.23228	0.26629	19.6127	73.472	57.06	0.20
Kenya	2009	3.30694	0.27453	19.0192	73.59	56.92	0.41
Kenya	2010	8.05847	0.39216	41.264	73.708	56.11	0.41
Kenya	2011	5.12111	3.09471	21.8858	73.826	57.66	0.41
Kenya	2012	4.56868	2.44726	22.1934	73.944	58.78	0.40
Kenya	2013	3.79785	1.81417	22.405	74.061	51.50	0.41
Kenya	2014	5.02011	1.20221	24.9507	74.177	53.60	0.41
Kenya	2015	4.96772	0.8838	22.1034	74.294	52.70	0.41
Kenya	2016	4.21352	0.62759	19.3484	74.41	52.70	0.41
Kenya	2017	3.83796	1.64085	20.6635	74.28	53.80	0.41
Kenya	2018	5.64795	0.83269	19.376	74.145	55.30	0.41
Kenya	2019	5.11416	0.46816	19.3418	74.006	59.20	0.41
Kenya	2020	-0.2502	0.42348	9.6831	73.089	19.90	0.41
Uganda	2000	3.14191	2.59476	19.4838	69.679	54.05	0.12
Uganda	2001	5.18366	2.59389	19.3021	69.717	54.28	0.16
Uganda	2002	8.73269	2.98853	20.2174	69.756	54.98	0.19
Uganda	2003	6.47326	3.06033	20.9841	69.794	55.10	0.21
Uganda	2004	6.80723	3.72085	20.1457	69.833	55.85	0.24
Uganda	2005	6.33257	4.11083	22.3551	69.871	56.50	0.25
Uganda	2006	10.7847	6.45706	21.1304	69.91	56.28	0.61
Uganda	2007	8.41243	6.6566	22.0831	69.948	56.39	0.24
Uganda	2008	8.70875	5.04737	22.9778	69.987	56.34	0.25
Uganda	2009	6.80152	3.34916	26.0919	70.025	56.36	0.23
Uganda	2010	5.63761	2.039	26.1877	70.063	56.35	0.24
Uganda	2011	9.39166	3.20861	25.9783	70.102	56.36	0.23
Uganda	2012	3.83746	4.41439	25.4295	70.14	56.35	0.23
Uganda	2013	3.58691	3.79032	30.8195	70.084	56.90	0.09
Uganda	2014	5.10631	3.2459	26.1073	70.021	56.70	0.12
Uganda	2015	5.18786	2.27761	23.0404	69.954	54.30	0.13
Uganda	2016	4.781	2.14253	25.4154	69.876	53.70	0.15
Uganda	2017	3.13141	2.61089	24.6142	69.788	54.60	0.23
Uganda	2018	6.30392	3.20513	24.3288	69.691	53.60	0.25

Uganda	2019	6.43875	3.60332	25.5296	69.583	55.20	0.26
Uganda	2020	2.95131	2.32389	24.2161	66.81	56.50	0.26
Tanzania	2000	4.52078	3.46443	17.4568	86.446	53.90	0.25
Tanzania	2001	6.07081	4.04421	18.3105	86.44	53.80	0.25
Tanzania	2002	7.09319	2.7971	18.0819	86.842	53.70	0.26
Tanzania	2003	6.67279	2.09141	20.6773	87.234	55.36	0.25
Tanzania	2004	7.50381	2.65376	24.4852	87.616	54.94	0.25
Tanzania	2005	7.47632	5.08461	27.3959	87.988	54.59	0.25
Tanzania	2006	6.53222	2.16111	30.324	88.35	54.58	0.25
Tanzania	2007	6.76854	2.66217	32.6512	87.865	54.28	0.25
Tanzania	2008	5.68642	4.95061	37.4895	87.364	54.29	0.25
Tanzania	2009	5.26911	3.27573	34.3557	86.844	55.43	0.25
Tanzania	2010	6.33652	5.66373	32.0172	86.307	56.29	0.25
Tanzania	2011	7.67216	3.54721	34.736	85.751	56.36	0.25
Tanzania	2012	4.50015	4.53877	34.8444	85.176	57.36	0.26
Tanzania	2013	6.78159	4.56926	37.47	84.583	57.80	0.28
Tanzania	2014	6.73246	2.83417	37.654	83.97	57.20	0.29
Tanzania	2015	6.16063	3.1787	32.7587	83.957	56.10	0.31
Tanzania	2016	6.86712	1.73593	32.1748	83.934	54.10	0.33
Tanzania	2017	6.78568	1.75861	34.0172	83.909	53.90	0.34
Tanzania	2018	5.44497	1.70441	38.3766	83.88	53.70	0.33
Tanzania	2019	5.8	1.991	39.6549	83.847	54.30	0.33
Tanzania	2020	1.99634	1.09741	41.0183	83.05	55.40	0.33
Rwanda	2000	8.37092	0.39176	12.2996	85.475	63.56	0.31
Rwanda	2001	8.48452	0.94124	12.7925	85.347	64.16	0.32
Rwanda	2002	13.1921	0.07634	45.6246	85.218	59.90	0.63
Rwanda	2003	2.2024	0.21992	13.1766	85.087	57.80	0.33
Rwanda	2004	7.44768	0.32416	14.365	84.956	55.42	0.33
Rwanda	2005	9.3779	0.27146	15.1559	84.824	53.13	0.33
Rwanda	2006	9.22705	0.92354	15.0316	84.69	50.90	0.33
Rwanda	2007	7.63331	2.02258	16.7982	84.556	48.09	0.33
Rwanda	2008	11.1612	1.97577	21.354	84.421	66.10	0.55
Rwanda	2009	6.24826	2.09236	21.0244	84.285	59.97	0.33
Rwanda	2010	7.33466	3.53168	20.5419	84.148	52.51	0.33
Rwanda	2011	7.95839	1.62943	20.9107	84.01	64.04	0.33
Rwanda	2012	8.64152	3.52408	23.315	83.871	59.65	0.43
Rwanda	2013	4.71984	2.99085	24.4419	83.731	59.40	0.40
Rwanda	2014	6.16717	3.81307	23.2393	83.59	60.60	0.42
Rwanda	2015	8.85686	1.89806	24.2516	83.563	63.20	0.52
Rwanda	2016	5.97074	3.21886	26.133	83.523	63.50	0.44
Rwanda	2017	3.97629	2.96154	19.835	83.494	63.50	0.44
Rwanda	2018	8.57944	3.79771	21.4061	83.47	63.40	0.45
Rwanda	2019	9.4606	2.54117	27.488	83.438	68.10	0.46
Rwanda	2020	-3.3589	0.98107	1.1429	82.157	66.80	0.05

Burundi	2000	-0.8569	1.34215	2.78114	84.684	45.02	0.06
Burundi	2001	2.05581	-0.0013	4.46826	84.32	45.70	0.08
Burundi	2002	4.44652	0	3.94866	83.949	46.40	0.08
Burundi	2003	-1.2237	0	1.86879	43.572	44.40	0.09
Burundi	2004	4.83366	0.00488	10.3471	83.187	45.20	0.49
Burundi	2005	0.9	0.05234	4.2	82.795	45.60	0.09
Burundi	2006	5.41381	0.00248	18.513	82.396	45.60	0.09
Burundi	2007	3.45195	0.03689	15.1865	81.99	46.58	0.09
Burundi	2008	4.86171	0.23782	13.409	81.576	45.50	0.09
Burundi	2009	3.81275	0.01956	18.9749	81.155	45.40	0.09
Burundi	2010	5.12416	0.03841	17.1604	80.727	44.90	0.09
Burundi	2011	4.0326	0.15006	16.3457	80.291	45.50	0.09
Burundi	2012	4.44671	0.02593	16.3381	79.848	45.93	0.09
Burundi	2013	4.92419	4.76125	14.6326	79.398	45.50	0.09
Burundi	2014	4.24065	3.0212	14.2031	78.94	46.40	0.09
Burundi	2015	-3.9	1.59867	1.16346	28.951	18.00	0.01
Burundi	2016	-0.6	0.0021	6.23741	38.957	43.20	0.06
Burundi	2017	0.5	0.01167	8.80602	78.956	45.20	0.07
Burundi	2018	1.60994	0.03698	11.1035	78.948	45.60	0.08
Burundi	2019	1.81257	0.04048	14.1287	78.934	45.60	0.08
Burundi	2020	0.32716	0.30476	5.44599	78.184	47.50	0.09