

**EFFECT OF BILATERAL RELATIONS ON ECONOMIC GROWTH: A
CASE STUDY OF THE KENYA-CHINA BILATERAL RELATIONS
BETWEEN 1990 AND 2021**

BY

PATRICK MURIMI NTHIGA

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DECLARATION

Declaration by the Candidate

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Sign..... Date.....

Patrick Murimi Nthiga

SBE/PGE/2006/15

Declaration by Supervisors

This Thesis has been submitted with our approval as university supervisors.

Sign..... Date.....

Dr. Elvis Kimani Kiano

Department of Economics

Moi University, Kenya

Sign..... Date.

Dr. Richard Kiplangat Siele

Department of Economics

Moi University, Kenya

DEDICATION

I am dedicating this thesis to three beloved people who have meant and continue to mean so much to me. First and foremost, I dedicate the thesis to my parent John Nthiga and Esther Gakubu for their bottomless financial support and encouragement. They surely believed in me, and invested. I will always be grateful.

I also dedicate this to my wife Hellen Kinya, whose love for me knows no bounds and, who taught me the value of hard work. Thank you so much hun, I will never forget you. I will always hold your hand.

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Lastly, I would like to express my deep gratitude to Dr. Elvis K. Kiano and Dr. Richard K. Siele my research supervisors, for their patient guidance, enthusiastic encouragement and useful critiques of this research work.

ABSTRACT

The essence of bilateral relations is to provide partnering countries with access to resources that are not locally available on more favorable terms than they would otherwise obtain in the free market. One such agreement is the Kenya-China agreement which has existed for a few decades. China has emerged as a major global power marking an unparalleled presence in the international arena with significant influence in Africa. In Kenya, Chinese imports, Foreign Direct Investments, and debts have grown tremendously over the years. Whereas Kenya has experienced some economic growth in those years, it is not yet clear whether the bilateral relationship with China is the cause of this growth. There have been mixed results on the studies done on the implication of Kenya - China bilateral relations on Kenya's Economic Growth. The study will provide insights on the changing relations between China and Kenya, which may help policy makers, make informed decisions amid China's growing influence. The general objective of the study was to determine the impact of the bilateral relations between Kenya and China on Kenya's Economic Growth, while the specific objectives were to determine the effect of the Chinese imports from Kenya, Kenya's exports to China, Kenya's debt from China and foreign direct investment inflows from China on the Kenya's Economic Growth. This was made possible through the analysis of 32 years' data ranging from 1990 to 2021 on an annual time series secondary data collected from Kenya National Bureau of Statistics. The study employed the Neo-classical model of Solow-Swan Theory, supplemented by the Dependency Theory. The study utilized an explanatory research design. The study employed an explanatory research design using time series econometrics. For the study, secondary data sources from were used. An ARDL model was applied for short-run and long-run analysis. The study findings showed that Kenya's import from China significantly and positively influence economic growth ($\beta = 0.0069$ $p < 0.05$) while Chinese FDI inflow had a significant negative effect on Economic growth ($\beta = -2.960$ $p < 0.05$). Kenya's exports to China had a negative insignificant effect on the economic growth ($\beta = -0.0144$ $p > 0.05$) and Kenya's total debt from China had an insignificant positive effect on economic growth ($\beta = -0.034$ $p > 0.05$). The study concluded that Kenya's import from China and Chinese FDI inflow to Kenya significantly influence economic growth while Kenya's exports to China and Kenya's total debt from China insignificant influences economic growth. The results suggest that Kenya is an import-led growth economy. Therefore, imports from China, especially for capital goods that are used in critical sectors such as industries, infrastructure, and agriculture should be encouraged. By importing from China, a technologically developed country, Kenya benefits by transfer of technology, knowledge and innovations. It is also recommended that the foreign direct investment from China to Kenya need to be monitored and limited. New policies need to be put in place to protect "dumping" and "crowding out effect" as well as protect local industries and artisans working in the informal sector. The study recommends that future studies explore the moderating role of institutional quality in Kenya on the relationship between Kenya-China bilateral relations on Kenya's economic growth.

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OPERATIONAL DEFINATION OF TERMS

China's FDI inflows into Kenya: This pertains to the direct investment of equity from China into Kenya. The World Bank Group (2018) defines FDI inflows as the total of equity capital, reinvestment of profits, and other capital. FDI was originally defined as foreign investment when Chinese residents had control or a major impact on the management of enterprises located in Kenya.

Kenya's Debt from China: This word pertains to the total amount of certain government fixed-term contractual obligations owed to Chinese entities on a specific day. The report included both domestic and international financial obligations, including cash and money deposits, securities other than shares, and loans. Debt was assessed on the final day of each year studied since it is considered a stock rather than a flow.

Kenya's Exports to China: This is the total value of all commodities and market services that Kenya provides to China. It encompasses the worth of goods, shipping, insurance, transportation, travel, royalties, licensing fees, and many services including communication, construction, financial, information, commercial, personal, and government services. They do not include employee remuneration, investment income, or transfer payments.

Kenya's Imports from China: This is the total value of products and market services that Kenya has received from China. The items include the worth of goods, shipping, insurance, transportation, trips, royalties,

licensing fees, and many services including communication, construction, finance, information, commercial, personal, and government services. Similar to exports, they do not include remuneration of workers, investment income, and transfer payments.

Real GDP: This is the total gross value contributed by all resident producers in the economy, including product taxes and excluding subsidies not accounted for in the product value. It is estimated without accounting for the depreciation of manufactured assets or the depletion and deterioration of natural resources.

ABBREVIATIONS AND ACRONYM

ADB	Asian Development Bank
ADF	Augmented Dickey Fuller
AfDB/AfDF	African Development Bank/African Development Fund
AGOA	African Growth and Opportunity Act
AIIB	Asian Infrastructure Investment Bank
AMISON	African Union Mission in Sudan
APEC	Asia-Pacific Economic Cooperation
ARDL	Autoregressive Distributed Lag
ASEAN	Association of Southeast Asian Nations
AU	African Union
BITS	Bilateral Investment Treaties
BRI	Belt and Road Initiative
BRICs	Brazil, Russia, India, China and South Africa
CARI	China-Africa Research Initiative
CBK	Central Bank of Kenya
CCTV	Central China Television
CGTV	Chinese Global Television Network
CNC	China Xinhua News Network Corporation
CNOOC	China National Offshore Oil Corporation
COMESA	Common Market for Eastern and Southern Africa
COMTRADE	United Nations Commodity Trade Statistics Database
CRBC	China Road and Bridges Corporation
CSR	Corporate Social Responsibility
CUSUM	Cumulative sum
CUSUMSQ	Cumulative sum squares
DAC	Development Assistance Committee
DIA	Defense Intelligence Agency
DRC	Democratic Republic of Congo
EAC	East Africa Community
EPC	Export Promotion Centre
EU	European Union
FAO	Food and Agriculture Organization

FDI	Foreign Direct Investments
FOCAC	Forum on China-Africa Cooperation
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
HIPC	Highly Indebted Poor Countries
ICT	Information and communication technology
IDPs	Internally Displaced Persons
IEC	Institute of Economic Affairs
IMF	International Monetary Fund
JEM	Justice and Equality Movement
KANU	Kenya African National Unity
KeBS	Kenya Bureau of Standards
KNBS	Kenya National Bureau of Statistics
KERP	Kenya External Resources Policy
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
KSHS/KES	Kenya Shillings
LAPSSET	Lamu Port-South Sudan-Ethiopia Transport Corridor
LM	Lagrange Multiplier
MDAs	Ministries, Departments and Agencies
MDGs	Millennium Development Goals
MFA	Ministry of Foreign Affairs
MNCs	Multinational Corporations
MPLA	Movimento Popular de Libertação de Angola
NARC	National Rainbow Coalition
OBOR	One belt one Road
ODA	Official Development Assistance
ODM	Orange Democratic Movement
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares regression (OLS) is a common technique for estimating
PNU	Party of National Unity
PRC	People's Republic of China
PSCU	Presidential Strategic Communications Unit

R2P	Responsibility to Protect
ROC	Republic of China
RWP	Responsibility while Protecting
SDGs	Sustainable Development Goals
SEZs	Special Economic Zones
SGR	Standard Gauge Railway
SOEs	State-Owned Enterprises
TICAD	Tokyo International Conference of Africa's Development
TPP	Trans-Pacific Partnership
UECM	Unconstrained error correction model
UK	United Kingdom
UN	United Nations
UNGA	United Nations General Assembly
USA	United States of America
USAID	United States Agency for International Development
UNCTAD	United Nations Conference on trade and Development
USD	United States Dollars
WB	World Bank
WTO	World Trade Organization

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter provides an overview of the study's history and background, problem statement, purpose, goals, research questions, rationale, and importance. The study's assumptions, scope, constraints, and theoretical and conceptual framework are all addressed in this chapter.

1.1 Background of the Study

Globalization is the interconnectedness of nations in many facets of social and economic life. Both established and developing nations have chances and problems in leveraging growing possibilities. Bilateral contracts, particularly between developed and developing countries, have become more significant. China has emerged as a major global power with one of the biggest economies, marking an unparalleled presence in the international arena. The West is keenly monitoring the growth of this new authority as it expands inside Western nations and in the global South, particularly Africa (Alden, 2007). After the Cold War, most Western powers pulled out of the African continent and focused on their own domestic economic development while China remained behind developing a strong interest in Africa (Brautigam, 2009).

Today, few subjects in contemporary international relations cause as much excitement and controversy as the current rise of economic initiatives by the People's Republic of China in Africa (Chege, 2010). Political and economic ties between China in African countries have grown at alarming rates in the past two decades. Ombaba *et. al.* (2012) noted that even the economic super powers of the west such as the United States and European countries have been alarmed by the rate of growth in Chinese influence on the African continent. Most of these countries and indeed some quarters within the

African continent have purported that China could be colonizing Africa. In 2009, China pledged US\$ 10 billion in low-cost loans for Africa over a ten-year period. Further, debt-forgiveness for many of Africa's poorest states, have only added to Western suspicions about China's activities in Africa (Ombaba *et. al.* 2012).

This milestone by China dates back to pre-colonial times when China traded with African communities along the coasts of East Africa. It is believed that by 1414 during the famous Ming Era in China, communities living along the coastal parts of East Africa traded with Chinese traders.

These pre-colonial economic ties between East Africa and China, continued even during colonization of East Africa that led to the creation of Kenya. In fact, China was the fourth country to open an embassy in Nairobi immediately after independence. This was only after Germany, Russia, and Ethiopia (Onjala, 2008). From that date, Kenya-China economic relationships have grown tremendously. Onjala recorded that during the initial times, the relations between the two countries developed fairly but after 1965, the relation of the two countries was lowered to be at the chargé d'affaires level. It was only until the beginning of 1970's that saw the relations gradually return to the normal. After 1978, the relation of the two countries gained a fast development. By the end of 2002, the presence of Chinese in the country started being evidently visible. Subsequently, after 2013, growth in the association between the two countries has been explosive.

In 2012, over 44 Chinese companies were involved in several large-scale projects in the nation. (Ombaba *et al.*, 2012) mentioned many companies, such as Jiangsu International Economic and Technological Cooperation Company, Sichuan International Economic and Technological Cooperation, China Road Bridge

Construction, and China Import and Export Corporation. The Kenyan counterparts have complained that they were being excluded from the market. The government remains faith in Chinese contractors despite the loud criticisms, pointing to the quality of work they have completed and are now doing in comparison to other contractors. The Chinese government employs tactics to enhance the competitiveness of its firms.

One of the approaches is providing operational money to their firms to enhance their competitive advantage. Sometimes, the Chinese government negotiates on behalf of its enterprises for contracts at the government-to-government level. Competing companies are publicly outraged since this goes against the transparent procurement procedure. Ombaba *et al.* (2012) noted that the increase in inexpensive Chinese goods might impact local enterprises, leading them to reduce workers to keep operational expenses low because of declining earnings from losing market share to Chinese items.

As to the Institute of Economic Affairs (2016), several African nations consider China a competitor that hinders the continent's economy by displacing African goods from the market. Some believe that China aims to replace Western influence and establish its geostrategic dominance, leading to comparisons with a new colonizer. Furthermore, the paper highlights that China's actions are seen as mostly extractive and reminiscent of European conquerors' practices. The institution suggests that Kenyan enterprises' manufacturing technologies do not match the advanced Chinese technology. Kenyan enterprises incur greater manufacturing expenses compared to Chinese ones. Nevertheless, Kenya still has hope in her relationship with China. Initially, several corporations have profited by engaging in trade with Chinese enterprises and purchasing inexpensive items from China. Kenya has expanded its export market due to the access to the Chinese market for certain of its products. Significant technological diffusion has occurred to benefit Kenya.

1.1.1 Bilateral relationship between Kenya and China

The bilateral ties have been progressing well, with the historic friendship deepening continually and friendly collaboration expanding in all fields. According to the Embassy of China's website in 2019, China has provided aid and assistance to Kenya since the establishment of diplomatic relations. Some of the projects include the Moi International Sports Center, methane-generating pit, the expansion project of Eldoret Hospital, and the Gambogi-Serem Highway. The bilateral trade value has significantly expanded in recent years. Chinese exports to Kenya consist of domestic electric appliances, industrial and agricultural instruments, textile items, everyday necessities, construction materials, and pharmaceuticals. Goods imported from Kenya mostly include black tea, coffee, and leather products.

The two countries have made significant advancements in their economic and trade relations, particularly in electric power, communications, investment, and project contracts. Progress has also been seen in humanities exchanges, and both sides have maintained close cooperation and consultations in international affairs (Onjala, 2008). China and Kenya have signed bilateral economic and trade agreements: "Agreement on Economic and Technological Cooperation between the People's Republic of China and the Republic of Kenya", "Agreement on Trade between the People's Republic of China and the Republic of Kenya" (1978) and the agreement on promotion and protection of investments in 2001.

The height of Kenya-China economic relationship was realized when China agreed to finance and execute the standard gauge railway project. This has been the largest single infrastructure project in post-independence Kenya. On completion, the project was expected to contribute immensely to the economic fortunes of not only Kenya but the

entire East Africa region (Kithinji, 2016). Phase one of the project is complete with the railway operations from Mombasa to Nairobi having kicked off in June 2017.

The SGR has significantly improved freight volume, enhanced passenger transportation capacity, bolstered the domestic economy and East African Community (EAC) infrastructure, generated job opportunities, stimulated the regional economy, and improved living standards in the area (Oluochi, 2018). The study by Oluochi (2018) further suggests that the initiative marks the beginning of a new era for Africa's regional growth and is a significant factor in enhancing EAC international competitiveness. However, Critics of the project have continued to question its viability and associated the project with China's attempt to colonize the country. There has also been significant debate on the huge capital tied up in the project, huge debts accumulated from the project and allegations of graft (Oluochi, 2018).

1.1.2 Kenya China Trade

Kenya's trade relationship with China has grown exponentially over the past decade. China has emerged as Kenya's largest source of imports and its second largest export destination (KNBS, 2018). This significant growth in trade between the two countries can be attributed to a few key factors. Firstly, China's growing need for natural resources and emerging middle-class market is creating sustained demand for the commodities and agricultural products that Kenya exports such as tea, coffee, fish and seafood (Omolo *et al.*, 2016). By tapping into China's vast consumer base, Kenyan exporters have been able to significantly increase their earnings from trade. As per COMTRADE data, Kenya's exports to China have grown more than five-fold from KES 4.2 billion in 2008 to KES 10 billion in 2018 (KNBS, 2018). The main exports remain traditional commodities however the variety and volumes have diversified over time.

Moreover, China has become one of the largest investors in Kenya's infrastructure development sector through funding of large projects via loans and lines of credit. Some examples include the standard gauge railway from Mombasa to Nairobi, the recently launched Nairobi-Naivasha SGR segment, various road construction and improvement initiatives as well as several energy and ICT related investments (KNBS, 2018). These major infrastructure upgrades have helped boost Kenya's long-term productive capacities and addressed some of its infrastructure deficits. However, the growing infrastructure investment inflows have also contributed significantly to the rising imports from China. Kenya relies heavily on China as a source for various equipment, materials, machinery and intermediate goods required for infrastructure development (KNBS, 2018).

The Kenya-China trade relationship is also fostered through various institutional frameworks. In 2018, Kenya and China upgraded their cooperation to a comprehensive strategic partnership which expanded coordination across many sectors including trade (KNBS, 2018). Additionally, China opened its first ever overseas assistance center in Nairobi in 2014 to streamline development cooperation projects in East Africa (Omolo *et al.*, 2016).

While trade between Kenya and China has delivered opportunities, there are also concerns emerging from the growing imbalance and domination of imports (Omolo *et al.*, 2016). Moreover, Kenya's heavy reliance on infrastructure-related imports from China exposes its balance of payments and external position to exchange rate and supply chain risks from China (Omolo *et al.*, 2016). Going forward, Kenya needs to explore ways to promote light manufacturing, value addition of exports and import substitution in order to better its trade dynamics with China and reduce vulnerabilities from the lopsided flows (Omolo *et al.*, 2016). Overall, prudent management of trade,

debt and strategic partnerships will be critical for Kenya to maintain a mutually beneficial cooperation with China amid the rising scale of commercial engagement (Omolo *et al.*, 2016).

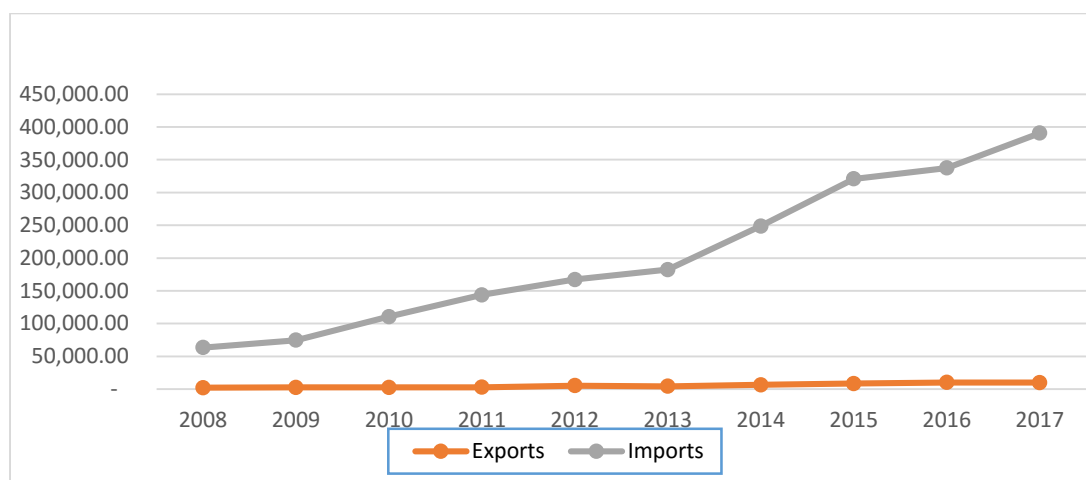


Figure 1.1: Kenya-China trade, 2008-2017

Source: KNBS (2018)

In terms of share of total trade, KNBS data (figure 1.2) indicates Kenya-China trade as a share of total trade amongst the country's major trading partners was leading at 36 percent way ahead of the country's traditional partners like the United Kingdom, United states and Uganda whose shares were only 7 percent, 10 percent and 11 percent respectively. These statistics are not only limited to 2018 but are representative of a trend over the past two decades where Kenya-China trade as a share of Kenya's total trade has been on persistent upward trend indicating the likelihood of a significantly growing influence of China on Kenya's economy.

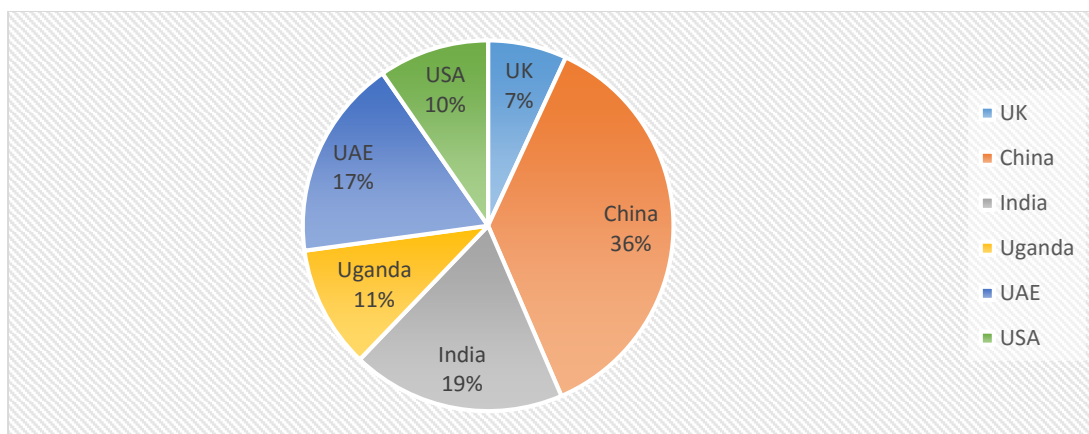


Figure 1.2: Share of total Trade between Kenya and its main trading partners, 2018

Source; (KNBS, 2019)

According to Omolo *et. al.* (2016), Chinese exports to Kenya constitute about 35 percent of Kenya's total imports revealing Chinese producers and exporters have recognized and effectively exploited opportunities in the Kenyan market. This statistic has been collaborated by various KNBS statistics as shown in figures 1.3 below. Figure 1.3 reveals that China is the leading source of Kenya's imports having overtaken India in 2014. This indicates a dramatic growth in Chinese influence on Kenya's foreign trade. China is therefore the leading source of Kenya's imports.

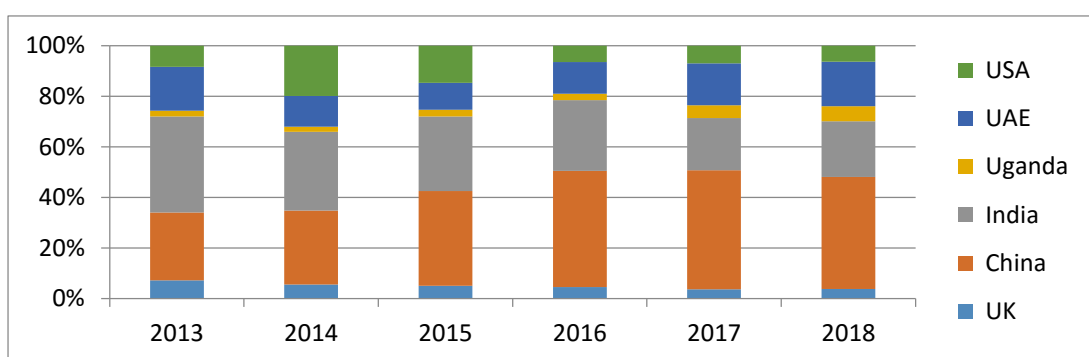


Figure 1.3: Kenya's imports by origin, 2013-2018

Source: KNBS Economic Survey Reports

According to Sanghi and Johnson (2016), Kenya produces and exports only a few intermediate goods to China. Figure 1.3 below indicates that in terms of export destination, China only accounted for about 5% of Kenya's exports for the period from 2013 and 2018. These statistics indicate that trade between the two countries is skewed in favor of China. However, it is worth noting that the effect of imports on the economy can be mixed. Imports can be considered as a withdrawal from the countries flow of income and therefore negatively affect GDP growth. However, if a country imports capital goods and intermediate goods which increase the countries production capacity, then imports can be considered as a source of growth.

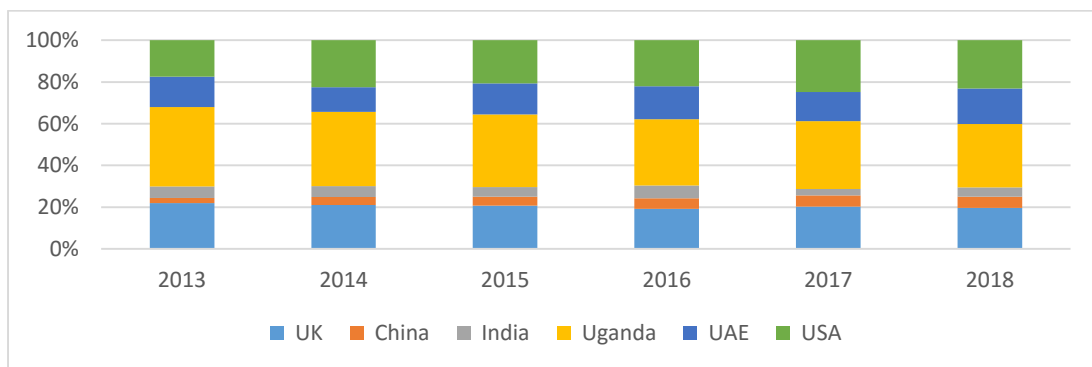


Figure 1.4: Kenya's exports by destination, 2013-2018

Source: KNBS Economic Survey Reports

1.1.3 Chinese Foreign Direct Investment (FDI) in Kenya

Currently, China is the main source of FDI flows to Kenya. This has been demonstrated by Omolo *et. al.*, who indicates that, currently, the correlation between Kenya's GDP and FDI inflows and stocks from China supersedes that of EU and US who were the traditional sources of FDI inflow into the country. Kenya was in the top 5 African locations for Chinese Foreign Direct Investment (FDI) in 2014. Algeria, Zambia, Republic of Congo, and Nigeria were also included in the study (Wanjiku *et. al.*, 2018).

The increase in Chinese Foreign Direct Investment (FDI) in Kenya is credited to the country's open economy and positive political ties with China during the last twenty years. They also suggest that China's Foreign Direct Investment (FDI) in the early 2000s was little due to Kenya's focus on attracting investments from Western countries. According to data from the United Nations Conference on Trade and Development (UNCTAD), Kenya received \$1.3 billion in Foreign Direct Investment (FDI) from China between 2003 and 2015. Figure 1.2 illustrates a sharp upward trend in China's Foreign Direct Investment (FDI) in Kenya.

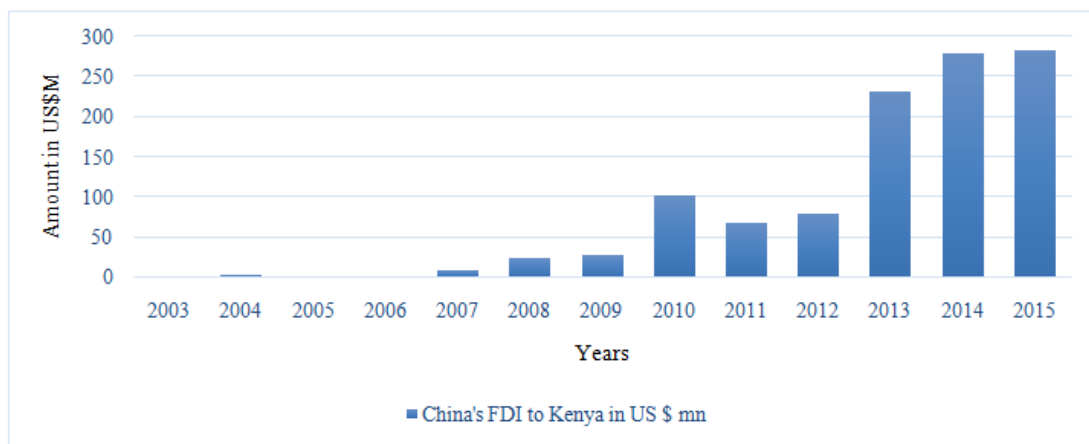


Figure 1.5: China's FDI into Kenya, 2003-2015

Source: Wanjiku et. al. (2018)

In 2023, Kajilwa (2023) reported that Kenya was targeting an additional KSh5 billion (US\$40 million) in investment from China through an upcoming industrial expo slated to host 200 Chinese businesses. Kenya Investment Authority Managing Director June Chepkemei stated that Chinese FDI currently stands at \$348 million and the goal is to increase this by 10% through converting exhibitors to actual investors at the expo (Kajilwa, 2023). A railway case study provides insights into on-the-ground dynamics. Lesutis and Huang (2021) examined China Road and Bridge Corporation's involvement in constructing Kenya's standard gauge railway. Through interviews with Chinese

managers and public officials, they found the company adapted strategies in response to local circumstances rather than imposing priorities. This counters narrative of top-down Chinese control and highlights African government agency in shaping large projects (Lesutis & Huang, 2021).

Mwanza (2021) analyzed the relationship between Chinese FDI and human rights in Kenya. While noting potential risks, Mwanza argued a "mutually affirming relationship" is possible if proper accountability frameworks exist. However, weaknesses in international corporate accountability, limited jurisdiction in investment arbitration, and host state capacity challenges threaten rights protection (Mwanza, 2021).

Newcomb (2020) also assessed FDI impacts on Kenya's economy. Both opportunities and challenges were identified, including unfair competition concerns if not regulated properly by the Kenyan government. Policies were needed to create synergies yielding economic growth while respecting citizens' rights (Newcomb, 2020). Additionally, Sanghi and Johnson (2016) similarly questioned whether China-Kenya deals were "strictly business." They argued balanced, win-win cooperation requires attention to political dynamics and implications on local stakeholders not just economic returns.

1.1.4 Chinese debt

China's economic dominance over Kenya is perhaps most evident in the realm of bilateral lending and debt obligations. As of 2018, China accounted for approximately 70% of Kenya's bilateral debt, making it by far the largest single-country creditor (Siringi, 2018; Owino & Mutua, 2019). This represents a massive increase over the past decade, with borrowing from China rising at an unsustainable average annual rate of 54% from 2010 to 2014 (National Treasury of Kenya, 2015). The scale of Kenya's

growing indebtedness to China became clearly apparent in 2015 figures from the Central Bank of Kenya. By June 2015, debt owed to China had ballooned to KES 262 billion (approximately \$2.6 billion USD), up significantly from KES 82.9 billion in 2014 and a mere KES 14.7 billion in 2010 (Central Bank of Kenya, 2015). Behind these alarming aggregate statistics lie several major infrastructure loan deals that underpin China's financial clout in Kenya.

Notable Chinese-funded projects to which large portions of Kenyan debt can be traced include the Mombasa-Nairobi Standard Gauge Railway, development of the Dongo Kundu Special Economic Zone near Mombasa, expansion of the Athi River electric power station, and the landmark Lamu Port-South Sudan-Ethiopia Transport Corridor (LAPSSET) infrastructure project (Kinyanjui, 2019; Ochieng, 2019; Obala, 2018).

Many critics argue such deals lack sufficient transparency and impose unsustainable debt repayment terms on Kenya. However, proponents counter that the investments have considerable economic impacts through job creation, skills building and long-term productive capacity improvements. The rising liability to China also introduces credit risk challenges. Inability to adequately service Chinese loans in a timely manner could expose Kenya to negative diplomatic and commercial consequences. For example, default may trigger punitive actions like seizure of strategic assets or suspension of future infrastructure financing (Abeny & Geta, 2020; Lumwamu & Odera, 2019). Moreover, over-reliance on Chinese bilateral loans risks crowding out other development partners and pushing up the country's overall public debt distress levels (Ramachandran *et al.*, 2019; Fitch Solutions, 2019).

To address these concerns, Kenyan authorities have begun pursuing parallel financing from new sources like Eurobonds, development banks and operational budget

allocations to diversify debt structures (Okello, 2020; Ngugi, 2019). However, balancing large-scale infrastructure needs against prudent debt levels remains an ongoing challenge. Alternative approaches involving public-private partnerships, social impact bonds or output-based aid models could help spread associated financial risks.

Greater debt transparency and capacity development initiatives are also required from China. Tools like publishing all contract details, loan collateral terms and conducting mandatory ecological-social impact assessments would boost accountability and foster shared prosperity from projects (Mwega & Ndung'u, 2019; Otieno, 2017). The Chinese government seems more cognizant of risks to its global image from unsustainable lending and recent debt relief efforts signal a commitment to responsible financing (Brautigam & Tang, 2014; Erwin & Johnson, 2019).

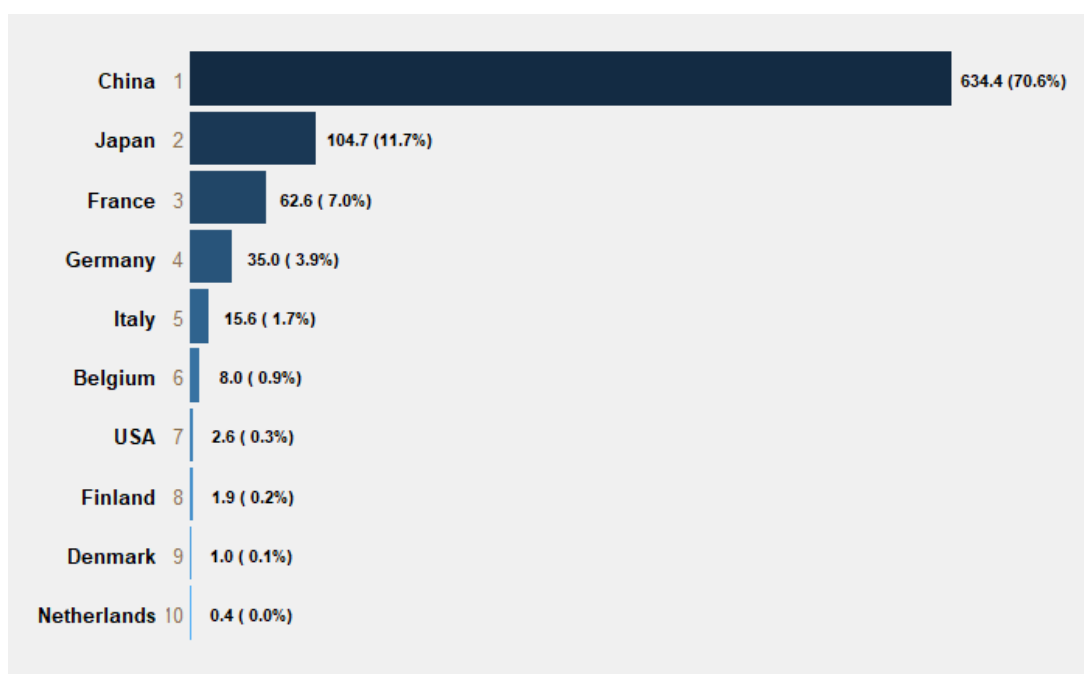


Figure 1.6: Composition of Kenya's bilateral debt as of 2018

Source: Owino and Mutua (2019).

In recent years, the Kenyan government has justified its borrowing by stating that it is aimed at enhancing infrastructure, expanding energy resources and distribution, and

improving transportation systems. The increasing availability of Chinese finance indicates the advancement of Sino-Kenyan ties, as the government seeks to secure uncomplicated loans. Warui (2013), states that China also invests a significant amount on the development of hospitals and schools in underdeveloped regions in Kenya. Chinese loans are linked to the use of Chinese products and services. The sole requirement is adherence to the "One China" policy, rather than the "good governance" conditionality imposed by conventional Western lenders.

While mega-projects funded by China have led to debt concerns (Lesutis & Huang, 2021; Newcomb, 2020), their impacts are complex. A case study of Kenya's standard gauge railway found Chinese firms adapted strategies in response to local dynamics rather than imposing priorities, highlighting African government agency (Lesutis & Huang, 2021). There are opportunities but also challenges if not regulated properly by the Kenyan government (Newcomb, 2020). Mwanza (2021) analyzed the relationship between Chinese FDI and human rights in Kenya, arguing proper accountability frameworks could yield a "mutually affirming relationship" but weaknesses currently threaten rights protection.

Sanghi and Johnson (2016) questioned whether deals served Chinese or Kenyan interests strictly, advocating balanced cooperation focus on political implications for local stakeholders alongside returns. Overall, the literature portrays a nuanced dynamic requiring policy from all sides to maximize development effects of the growing FDI relationship. Close cooperation but also oversight is important to safeguard national priorities.

1.1.5 Kenya's Economic performance

Kenya aims to transition from a lower middle-income nation to an upper middle-income one by 2030. The country's economy has continued to grow steadily since the country gained independence in 1963 (Wanjiku *et al.*, 2018). Using GDP as a measure of economic performance, at independence, the country reported 926.6 million United States (US) dollars only. As at the year 2000, the country's GDP stood at 12.7 billion US dollars. Thereafter, the GDP has grown at much faster rates to hit 80 billion US dollars as of 2017 (World Bank Group, 2018).

Kenya has pursued economic growth and integration into the global economy. According to USAID (n.d.), prior to the Covid-19 pandemic Kenya experienced strong growth, averaging 5.9% annually from 2010-2018 which lifted it to lower-middle income status. However, challenges persist including poverty, inequality, and corruption (USAID, n.d.; Lesutis & Huang, 2021; Newcomb, 2020). Foreign direct investment (FDI) plays a key role in Kenya's development. China is currently the largest FDI source (Kajilwa, 2023). Through an upcoming industrial expo, Kenya aims to attract an additional KSh5 billion from China (Kajilwa, 2023). However, the impacts of Chinese investment are complex, with opportunities and risks that require balanced policymaking (Mwanza, 2021; Newcomb, 2020; Sanghi & Johnson, 2016).

A case study of Kenya's standard gauge railway found the Chinese contractor China Road and Bridge Corporation adapted strategies in response to local dynamics rather than imposing priorities, highlighting Kenyan government agency in shaping large projects (Lesutis & Huang, 2021). While mega-projects funded by China have led to debt concerns and belief they might only benefit China and a few local elites' short term, the literature portrays a nuanced dynamic (Lesutis & Huang, 2021; Newcomb, 2020; Sanghi & Johnson, 2016).

Regional differences also influence Kenya's growth. According to Mose (2021), factors like rainfall, fertilizer usage, infrastructure and FDI affected county-level GDP per capita from 2009-2015. Counties with higher investment in roads, electricity, and water and sewer systems experienced stronger growth. To maximize development from FDI, the literature argues close cooperation but also oversight is needed. Proper accountability frameworks and balancing Chinese and Kenyan interests could yield mutually affirming outcomes from FDI, but weaknesses currently threaten human rights and sustainability if debt levels continue rapidly escalating (Mwanza, 2021; Newcomb, 2020; Sanghi & Johnson, 2016). Overall, nuanced multi-stakeholder partnerships providing balanced opportunities appear most likely to optimize FDI's contribution to equitable growth.

As indicated in the foregoing discussion, China has been greatly involved in Kenya's economy. China dominates Kenya's foreign trade-especially imports, Kenya's bilateral debt and FDI inflows. It is however not clear if the country is benefiting or losing out on this economic association.

1.2 Statement of the Problem

Bilateral economic relationships often exist between economies. Research has demonstrated that the effect of such bilateral relationships on economic growth varies across countries. For instance, while Chami, *et al.*, (2005), argued that there was statistically significant link between GDP growth and increased bilateral agreement among countries. Chami *et al.* (2008) demonstrated that there was little evidence of a significant influence of bilateral relations on growth, especially in developing countries.

China's influence on Kenya is prominent. Kenya has been a strategic entrance point for China into the area, since China provides easily accessible financing to Kenya mostly

for infrastructure projects including Thika Superhighway, Standard Gauge Railway, and Kenyatta International Airport. Trade between Kenya and China has significantly increased over the last twenty years, as seen in figures 1.1-1.4. As of 2018, Kenya-China trade as a share of Kenya's total trade was 36 percent ahead of the countries traditional trading partners like Uganda, United Kingdom, United States of America and India.

However, Chinese imports into Kenya far outweigh Kenya's exports to China. Similarly, Kenya's debt from China as well as FDI inflows from China into Kenya has been on an upward trend (UNCTAD, 2019) and (National Treasury of Kenya, 2015). Currently China is the Kenya's largest bilateral lender and source of FDI inflows into the country. All these statistics indicate an ever-growing Chinese presence in Kenya's economy and give rise to the pertinent question among policy makers, researchers, and indeed ordinary Kenyans-What is the economic effect of the affiliations between Kenya and China?

Indeed, the economic impact of the association between Kenya and China has been a subject of debate especially in the recent past. According to Omolo et. al., (2016), the ever-growing role of China in Kenya's economy as likened to the traditional development allies such as the European Union (EU) and the United States (US) has ended into political statements such as 'looking East'. Some quarters have argued that the relationship is detrimental to Kenya while others have alluded the Kenya has benefited immensely from the relationship. Wanjiku *et. al.* (2018) observed that Chinese loans were detrimental to Kenya while FDI and AID boosted growth in Kenya. On the contrary, Mugendi (2011) citing the example of the Nairobi-Thika highway argued that the existing cordial relationship positively affected the Kenyan economy.

The government has also refuted claims that Chinese loans negatively affect growth and have attributed recent economic growth in Kenya to Chinese loans. The debate on impact of Kenya China economic ties is not only limited to debt and Aid. Trade between Kenya and China has also elicited significant debate among policy makers, scholars and business people. The statistics in figures 1.1-1.3 indicate that trade is imbalanced in favor of China. Similarly, the impact of Chinese FDI on economic growth in Kenya has not been conclusively addressed.

The foregoing debate points at an urgent need to study the effect of such bilateral economic association on Kenya's economy. It is against this backdrop that this study seeks to examines the Kenya-China economic association to shade light on the effect of Kenya-China economic association to inform Kenya's policy and contribute to content and theory development.

1.3 Research Objectives

1.3.1 General objective

The overall objective of the study was to establish the economic effect of Kenya-China bilateral economic relations in Kenya from 1991 to 2021, using GDP to measure Economic Growth.

1.3.2 Specific Objectives

1. To determine the effect of Kenya's exports to China on Kenya's Economic Growth between 1991 to 2021;
2. To establish the effect of Kenya's imports from China on Kenya's Economic Growth between 1991 to 2021;
3. To examine the effect of Chinese debt to Kenya on Kenya's Economic Growth between 1991 to 2021;

4. To investigate the effect of Chinese Foreign Direct Investment on Kenya's Economic Growth between 1991 to 2021;

1.4 Hypotheses

To achieve the above stated objectives, the following hypotheses were tested:

H0₁: Kenya's exports to China do not significantly affect Economic Growth in Kenya;

H0₂: Kenya's imports from China do not significantly affect Economic Growth in Kenya;

H0₃: Kenya's total debt from China do not significantly affect Economic Growth in Kenya;

H0₄: Chinese FDI inflow into Kenya do not significantly affect Economic Growth in Kenya.

1.5 Justification of the Study

While extensive research exists on China's economic influence in Africa, most studies focus on broad continental trends rather than country-specific impacts. For instance, analyses of the Belt and Road Initiative often examine its regional implications but do not assess the unique economic effects on individual nations. In Kenya, existing studies predominantly explore trade patterns or infrastructure projects in isolation, lacking a holistic evaluation of Kenya-China bilateral relations. This study bridges that gap by comprehensively assessing how aspects such as exports, imports, debt, and foreign direct investment collectively impact Kenya's economic growth. Given the growing concerns over debt sustainability, trade imbalances, and economic dependency, a focused analysis on Kenya is crucial for informed policymaking and sustainable development strategies. The time frame between 1990 and 2021 was chosen because it represented the period where the bilateral relations between China and Kenya were at

the peak level. The importance of the Chinese economy at the global stage has significantly heightened during this period.

1.6 Significance of the Study

As China continues to expand its global economic influence, understanding the specific impacts of Kenya-China bilateral relations is essential for informed decision-making. This study provides critical insights for policymakers, business practitioners, and scholars. It will help ensure that Kenya maximizes benefits while addressing potential economic challenges.

For policymakers, this study provides empirical evidence to inform negotiations and policy strategies in future negotiations and agreements. For instance, understanding the impacts of the relations will help mitigate risks such as debt dependency, which has been a major concern recently, while also maximizing economic benefits (Lesutis and Huang, 2021; Kumar, 2018). The study will contribute to ongoing discussions on Kenya's debt sustainability, the trade deficit with China, and the strategic alignment of foreign direct investment with Kenya's economic priorities.

For practitioners, including business leaders and industry stakeholders, this research offers valuable insights into the practical implications of Kenya-China bilateral relations on various economic sectors (Lesutis and Huang, 2021). By understanding the nuances of this relationship, practitioners can make better-informed decisions regarding investments, partnerships, and market expansions. The research highlights opportunities for collaboration, technology transfer, and skills development, which can enhance the competitiveness of Kenyan businesses. Additionally, it sheds light on potential challenges such as market competition and regulatory hurdles that practitioners need to navigate (Mwangi, 2018). Equipping businesses with this

knowledge enables them to strategically position themselves within the broader economic landscape influenced by Kenya-China relations, thereby optimizing their operations and growth prospects (Mwanza, 2021).

For academia, this research contributes significantly to the body of knowledge on international relations, economic development, and African studies. It provides a detailed analysis of the dynamics between a developing country and a major economic power, enriching theoretical and empirical discussions on global economic interactions. Scholars can use the findings to explore various theoretical frameworks and models that explain the impacts of bilateral relations on economic growth. Furthermore, this research can serve as a foundation for future studies, encouraging academic discourse and cross-disciplinary research. It also offers educational institutions a robust resource for teaching and curriculum development, helping students and researchers understand the complexities and implications of international economic partnerships.

1.7 Scope of the Study

The study covered economic effect of Kenya-China bilateral economic relations in Kenya, by using GDP to measure Economic Growth. The study was limited to the Solow-Swan theory and it was conducted in Kenya between the years 1990-2021. The study used secondary data and time-series approach as it involved observations over time.

1.8 Limitation and Delimitation of the Study

The scope of the research is the 30-year period between 1990 and 2021. Due to this extensive timeframe, capturing all policy shifts, economic fluctuations, and geopolitical influences in detail is challenging. Similarly, the nature and quality of available data may pose significant challenges. Some economic records may be incomplete,

inconsistent, or based on estimates, affecting the accuracy of the analysis. Differences in reporting standards between Kenyan and Chinese sources further complicate data interpretation.

As such, this study concentrates on four key economic indicators as primary measures of the effects of the bilateral relation between Kenya and China on the Kenyan economic growth. The four are Kenya's exports to China, imports from China, Chinese debt and Chinese Foreign Direct Investment (FDI) to Kenya. The reason for the delimitation is to ensure a structured analysis while acknowledging that other indirect factors may also influence Kenya's economic growth. The study will also primarily rely on secondary data from credible sources, including government reports, international financial institutions, and peer-reviewed studies, to ensure reliability.

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

This section presents theoretical literature, empirical literature and conceptual framework that underpin the study. It reviews the different theories of economic growth which stress alternative causes of economic growth.

2.1 Concepts of the Study

This section discusses the various concepts that have been employed in this study. This includes the concept of impacts of international cooperation, bilateral relations between Kenya and China, Kenya exports to China, Kenya Imports from China, Chinese debt to Kenya, Chinese Foreign direct investment to Kenya and Economic growth.

2.1.1 Impacts of International Cooperation on GDP

In today's globalized society, international cooperation plays a fundamental role in shaping economic growth. According to Krugman & Obstfeld (2003), international cooperation induces growth by facilitating trade, investment, labor mobility, and technology transfer (Krugman & Obstfeld, 2003). The economic interdependence fostered through cooperative frameworks enhances market efficiency, reduces trade barriers, and promotes capital flows, all of which contribute to GDP expansion. International cooperation is grounded in the principles of Comparative Advantage. By allowing countries to specialize in goods and services where they hold relative efficiency, international trade agreements lower transaction costs and enhance global output (Krugman & Obstfeld, 2003).

There is adequate empirical evidence supporting the assertion that international cooperation influences growth. A good example of such cooperation is the U.S.-China trade partnership.

Beyond trade, international cooperation also enhances Foreign Direct Investment (FDI) inflows. This facilitates capital accumulation, infrastructure development, and technology diffusion. According to Endogenous Growth Theory (Romer, 1990), FDI strengthens innovation and productivity, driving long-term GDP expansion (Borensztein et al., 1998). Countries that foster strong international partnerships experience heightened investor confidence, leading to economic stability and growth. Institutional frameworks established through international cooperation also contribute to economic governance and stability.

Bilateral cooperation is a subset of international relations and plays a similar role in fostering economic growth. Bilateral agreements facilitate targeted trade partnerships, direct investment flows, and sector-specific collaborations.

2.1.2 Kenya exports to China

Historically, Kenya's exports to China have been dominated by raw materials and agricultural products. According to Odongo (2019), the primary commodities exported include tea, coffee, and horticultural products, such as flowers and vegetables. Additionally, Kenya exports minerals and raw materials like titanium ores and concentrates. These commodities are vital to China's manufacturing and agricultural sectors, which demand substantial raw material inputs to support their expansive production capacities.

The last decade saw a notable increase in the volume and diversification of Kenya's exports to China. This growth can be attributed to several factors, including the implementation of favorable trade agreements and enhanced diplomatic relations between the two countries. According to the KNBS (KNBS, 2020), the value of exports from Kenya to China rose from approximately USD 105 million in 2016 to USD 150 million in 2020. This upward trend reflects the increasing integration of Kenya into the global supply chain, driven by China's insatiable demand for raw materials and agricultural produce.

One of the critical developments in this period was the strategic partnership under the Belt and Road Initiative (BRI), which aimed to enhance trade connectivity and economic cooperation between China and participating countries, including Kenya. As noted by Githaiga and Wang (2019), the BRI has facilitated infrastructural development in Kenya, such as the construction of the Standard Gauge Railway (SGR), which has improved logistics and reduced the cost of transporting goods to ports for export. This infrastructural enhancement has positively impacted Kenya's export efficiency, making its goods more competitive in the Chinese market.

Moreover, China's growing middle class and urbanization have increased demand for high-quality agricultural products, benefiting Kenya's tea, coffee, and horticultural sectors. According to a study by Sun and Lei (2018), China's rising consumer base has shown a preference for diverse and premium agricultural products, creating a niche market for Kenyan exports. This trend underscores the importance of maintaining and enhancing the quality standards of Kenyan agricultural exports to meet the expectations of Chinese consumers.

Despite these positive developments, several challenges hinder the optimization of Kenya's export potential to China. Trade imbalances remain a significant concern, with Kenya importing more from China than it exports. According to Mukhwana *et al.* (2020), this imbalance has led to a trade deficit, raising concerns about the sustainability of the trade relationship. Additionally, non-tariff barriers, such as stringent phytosanitary standards and quality requirements imposed by China, have posed challenges for Kenyan exporters. These barriers necessitate stringent compliance measures and can increase the cost of exportation, affecting the competitiveness of Kenyan goods in the Chinese market.

To address these challenges, it is crucial for Kenya to diversify its export portfolio and add value to its raw materials. Value addition can enhance the competitiveness of Kenyan exports and reduce the vulnerability associated with the export of unprocessed raw materials. For instance, processing tea and coffee into finished products can attract higher prices and meet the evolving demands of Chinese consumers (Kimani & Turok, 2018).

2.1.3 Kenya imports from China

The concept of imports refers to the goods and services brought into one country from another. Kenya's imports from China have grown significantly over the past few decades, establishing China as one of Kenya's most prominent trading partners. This trade relationship has had profound impacts on Kenya's economy, both positive and negative, over the years 2016 to 2020.

Kenya imports a wide variety of goods from China, including machinery, electronics, vehicles, textiles, and manufactured goods. According to the Kenya National Bureau of Statistics (KNBS), China was the leading source of imports for Kenya from 2010 to

2020, with the value of imports rising steadily each year. In 2016, the value of imports from China stood at approximately USD 3.8 billion, growing to about USD 4.7 billion by 2020 (KNBS, 2020). This increase can be attributed to several factors, including the affordability of Chinese goods, the diversification of imported products, and the strong bilateral trade agreements between the two countries.

One of the key drivers of Kenya's imports from China is the affordability and variety of Chinese goods. Chinese products are generally cheaper compared to those from other countries, making them attractive to Kenyan consumers and businesses. For example, Chinese electronics and machinery, which dominate the import list, are often priced lower than their counterparts from Europe or the United States, making them more accessible to the Kenyan market (Mutuku & Mutuku, 2017). This affordability has made it easier for Kenyan businesses to procure essential equipment and inputs, fostering industrial growth and consumer access to a broader range of products.

The diversification of imported products from China has played a significant role in meeting the varying needs of the Kenyan market. Chinese imports range from sophisticated machinery and industrial equipment to household goods and consumer electronics. This diversification ensures that different sectors of the Kenyan economy, from manufacturing to retail, can access the necessary tools and products to enhance productivity and meet consumer demands (Odongo & Muli, 2018).

The bilateral trade agreements between Kenya and China have also facilitated the steady flow of imports. These agreements have often included favorable trade terms, reduced tariffs, and investments in infrastructure projects. For instance, the Belt and Road Initiative (BRI) has significantly influenced trade between Kenya and China, with China investing heavily in Kenyan infrastructure projects such as the Standard Gauge

Railway (SGR) (Njenga, 2019). These investments not only improve logistics and transportation but also strengthen economic ties, leading to increased import activities.

However, the growing import volume from China has also led to some economic challenges for Kenya. One of the main issues is the trade imbalance, where Kenya imports much more from China than it exports. This trade deficit can have adverse effects on Kenya's economy, including increasing debt and exerting pressure on the local currency (Githaiga & Wang, 2019). The influx of cheaper Chinese goods can also undermine local industries that struggle to compete with the low prices, potentially leading to job losses and reduced industrial growth within the country.

To address these challenges, it is essential for Kenya to adopt strategies that can balance the benefits of Chinese imports with the growth of local industries. Policies that encourage value addition in local manufacturing, improve the competitiveness of Kenyan products, and diversify export markets can help mitigate the negative impacts of the trade deficit (Kimani & Turok, 2018). Additionally, fostering innovation and quality improvements in local industries can make Kenyan products more competitive on the global stage, including the Chinese market.

2.1.4 Chinese debt to Kenya

Debt, in economic terms, refers to the amount of money borrowed by one party from another under the condition that it will be paid back at a later date, usually with interest. The concept of Chinese debt to Kenya involves the loans and financial aid provided by China to Kenya, primarily for infrastructure development and other economic projects. This relationship has seen significant growth over the years, with profound implications for Kenya's economic landscape.

Kenya's reliance on Chinese debt has been driven largely by its ambitious infrastructure projects aimed at boosting economic growth and development. One of the most prominent projects funded by Chinese loans is the Standard Gauge Railway (SGR), a massive infrastructure endeavor connecting the port city of Mombasa to the capital, Nairobi, and further inland. The SGR project, valued at approximately USD 3.2 billion, was primarily financed by the Export-Import Bank of China (Mwangi, 2017). This project is seen as a critical component in reducing transport costs, enhancing trade efficiency, and fostering regional integration.

However, the increasing levels of Chinese debt have raised concerns about Kenya's financial stability and sovereignty. As of 2020, Kenya's debt to China stood at about USD 6.5 billion, making China one of Kenya's largest bilateral lenders (National Treasury of Kenya, 2020). The terms and conditions of these loans, which often include higher interest rates and shorter repayment periods compared to concessional loans from institutions like the World Bank or the International Monetary Fund (IMF), have sparked debates on the sustainability of such debts.

Critics argue that the substantial Chinese debt poses a risk of debt distress for Kenya. According to a report by the IMF, Kenya was at a high risk of debt distress due to its heavy reliance on non-concessional borrowing, including from China (IMF, 2018). The high debt service obligations could potentially divert resources away from essential public services such as healthcare, education, and social protection. This situation is exacerbated by the fact that the revenue-generating capacity of many Chinese-funded projects, like the SGR, has fallen short of initial projections, making it challenging to meet debt obligations (Ochieng, 2020).

Furthermore, the strategic and economic implications of Chinese debt have been a topic of significant discourse. Some analysts contend that the growing indebtedness to China could lead to a form of economic dependency, where Kenya's policy and economic decisions might be unduly influenced by its creditor. The concept of "debt-trap diplomacy" has been invoked in discussions, suggesting that China could leverage its financial leverage to secure strategic assets or favorable economic concessions (Brautigam, 2019). However, this perspective is contested, with others arguing that the relationship is mutually beneficial, providing Kenya with much-needed infrastructure and economic growth prospects.

On the other hand, supporters of Chinese debt argue that it plays a crucial role in filling the financing gap for Kenya's infrastructural development. Traditional lenders like the World Bank and IMF often impose stringent conditions that can delay project implementation. In contrast, Chinese loans are typically disbursed more quickly and come with fewer policy prescriptions, allowing for faster completion of infrastructure projects (Chege, 2018). This has enabled Kenya to undertake ambitious projects that might otherwise have been delayed or scaled down.

Moreover, the infrastructure developed with Chinese funding has the potential to spur long-term economic benefits. Improved transportation networks, such as the SGR, can reduce the cost of doing business, attract foreign investment, and enhance Kenya's competitiveness in the global market (Were, 2018). The modernization of infrastructure is also expected to create jobs, boost local industries, and contribute to economic diversification

2.1.5 Chinese foreign direct investment to Kenya

Foreign Direct Investment (FDI) refers to investments made by a company or individual from one country into business interests located in another country. In this context, Chinese FDI in Kenya pertains to investments made by Chinese companies and individuals in various sectors within Kenya, aiming to enhance economic cooperation and growth. Chinese FDI in Kenya has grown significantly, reflecting China's strategic interest in expanding its economic influence in Africa through infrastructure development, manufacturing, and trade facilitation.

Chinese FDI in Kenya has primarily targeted infrastructure development, which has been pivotal in enhancing the country's economic landscape. One of the most notable projects is the Standard Gauge Railway (SGR), a key infrastructure initiative connecting Mombasa to Nairobi, and further planned to extend to the Ugandan border. This project, largely funded by Chinese loans and constructed by Chinese firms, represents a substantial portion of Chinese FDI in Kenya. The SGR is anticipated to reduce transportation costs and times, boost trade efficiency, and promote regional integration (Mwangi, 2017). According to a report by the KNBS (2019), the transport and infrastructure sector attracted over 40% of Chinese FDI during this period.

In addition to infrastructure, Chinese FDI has increasingly ventured into the manufacturing sector in Kenya. The establishment of industrial parks and special economic zones (SEZs) has been a significant trend, with the aim of bolstering Kenya's industrial capacity and creating employment opportunities. For instance, the establishment of the Athi River SEZ, supported by Chinese investment, is expected to enhance manufacturing output, foster technology transfer, and generate thousands of jobs (Ochieng, 2018). These investments are part of China's broader strategy to

diversify its investment portfolio in Kenya, moving beyond infrastructure to more sustainable economic sectors.

The real estate sector has also seen a surge in Chinese FDI. Chinese developers have been involved in various real estate projects, including residential, commercial, and mixed-use developments. These projects not only contribute to addressing Kenya's housing deficit but also stimulate the construction industry and ancillary services. According to a report by the African Development Bank (2018), Chinese investments in real estate have been instrumental in modernizing urban infrastructure and enhancing living standards in urban areas.

Moreover, Chinese FDI has had a notable impact on Kenya's telecommunications sector. Companies like Huawei and ZTE have made significant investments in Kenya's ICT infrastructure, improving connectivity and fostering the digital economy. The deployment of fiber optic networks and mobile broadband services has been crucial in enhancing Kenya's digital landscape, promoting e-commerce, and enabling technological innovation (Wambui, 2019). These investments align with Kenya's Vision 2030, which aims to transform the country into a newly industrializing, middle-income economy.

Despite the benefits, Chinese FDI in Kenya has also faced criticism and challenges. Concerns about the sustainability of debt-financed projects, potential dependency on Chinese technology and expertise, and the environmental impact of large-scale infrastructure projects have been raised. Critics argue that while Chinese FDI brings immediate economic benefits, it may also lead to long-term dependency and environmental degradation (Omolo, 2020). Additionally, there have been concerns

about labor practices and the extent to which Chinese investments contribute to local capacity building and technology transfer.

2.1.6 Economic growth

Economic growth refers to the increase in the production of goods and services in an economy over a period of time, typically measured as the percentage increase in real gross domestic product (GDP). Economic growth is crucial as it reflects the health of an economy and its ability to improve the living standards of its population. In the context of Kenya, economic growth from 2016 to 2020 has been influenced by various sectors, policies, and external factors, each contributing to the country's overall economic performance.

Kenya's economy experienced steady growth driven primarily by robust performances in the agriculture, manufacturing, and service sectors. According to the KNBS (2019), the economy grew at an average rate of 5.5% per year during this period. The agricultural sector, which is the backbone of the Kenyan economy, contributing about 34% to the GDP, saw significant improvements due to favorable weather conditions and government initiatives aimed at enhancing productivity (KNBS, 2019). Investments in irrigation, improved seed varieties, and agricultural mechanization played a crucial role in boosting crop yields and agricultural exports.

The manufacturing sector also played a significant role in Kenya's economic growth. The government's emphasis on the "Big Four Agenda," which includes manufacturing as a key pillar, aimed at increasing the sector's contribution to GDP from 9.2% in 2016 to 15% by 2022 (Republic of Kenya, 2017). This agenda led to increased investment in industrial parks, special economic zones, and the promotion of value addition in key sectors such as agro-processing, textiles, and leather. These efforts not only boosted

production capacities but also created employment opportunities, thus contributing to economic growth.

Kenya's service sector, particularly finance, tourism, and ICT, also saw significant growth during this period. The financial sector's expansion was driven by innovations in mobile banking and digital financial services, making financial services more accessible to a larger population (Ndung'u, 2018). Tourism, which had suffered setbacks due to security concerns in previous years, rebounded due to improved security measures and aggressive marketing strategies, attracting a record number of international visitors (Kenya Tourism Board, 2019). Furthermore, the ICT sector continued to grow, supported by investments in infrastructure, such as the expansion of fiber optic networks and the rollout of 4G services, enhancing connectivity and fostering a digital economy (Wambui, 2019).

However, Kenya's economic growth during this period was not without challenges. Despite the positive growth rates, the economy faced significant headwinds, including political instability, corruption, and external debt. The 2017 general elections, marked by contentious campaigns and legal battles, created a climate of uncertainty that affected investor confidence and economic activities (Chege, 2018). Corruption remained a pervasive issue, undermining efforts to improve governance and economic efficiency. The high levels of public debt, particularly from external sources such as China, raised concerns about debt sustainability and the long-term economic implications (Mutua, 2020).

Furthermore, the COVID-19 pandemic, which emerged in late 2019, posed a severe threat to Kenya's economic growth. The pandemic led to disruptions in global supply chains, reduced tourism, and lower remittances, which are crucial sources of foreign

exchange for the country. The World Bank (2020) projected that Kenya's GDP growth would slow down significantly in 2020 due to the pandemic's adverse effects on key economic sectors.

2.2 Theoretical Literature

Theoretical review involves studying theories that have been advanced by researches regarding areas of study pertaining to specific fields. Bilateral relation between nations has its origin in needs and wants for the different nations. To achieve this, trade was the initial foundation of the relations. However, due to different resource endowment by nations, relations developed beyond trade (export/imports) to include among others aid, loans and foreign direct investment. As such, developing countries continue to receive significant aid inflow. The largest beneficiary being Africa, Kenya included.

Different theories of economic growth stress alternative causes of economic growth. The oldest known theory of economic growth is the mercantilism theory according to which the wealth or growth of a nation is determined by the accumulation of specie through running a trade surplus. The classical theory on the other hand postulates that a nation can grow its product by specialization and division of labor to achieve economies of scale (Smith, 1776). According to this theory, the role of increasing returns to scale is paramount in the growth of an economy.

2.2.1 The Neo-Classical Model of Solow-Swan Theory

The neo-classical model of Solow-Swan bases growth of an economy on supply-side factors such as labour productivity, size of the workforce, factor inputs. The theory holds that increasing capital or labour leads to diminishing returns. Therefore, increasing capital has only a temporary and limited impact on increasing the economic growth. As capital increases, the economy maintains its steady-state rate of economic

growth. The theory suggests that for an economy to grow there should be an increase in proportion of GDP that is re-invested. However, this is limited as higher proportion of investment leads to diminishing returns and convergence to a steady-state of growth. There is also need to technological progress within the economy in order to increase the productivity of capital/labour.

The Solow-Swan's perspective on economic growth is also supported by other economic studies and models. For instance, Harod-Domar growth model propounds that the growth rate of an economy is a function of the level of savings (higher savings enable higher investment) and Capital-Output Ratio (Easterly, 1997). A lower capital-output ratio means investment is more efficient and the growth rate will be higher. Therefore, emphasis is on the rate of savings in the economy. On the other hand, the endogenous growth by Paul Romer and Robert Lucas, argues that the rate of economic growth is strongly influenced by human capital and rate of technological innovation. It implies that citizens and residents with greater knowledge, education and training can help to increase rates of technological advancement and hence spur economic growth. Therefore, the role of the government is to actively encourage technological innovation.

The Solow-Swan model best is best placed to explore how the bilateral relation between Kenya and China has influenced capital accumulation and technology and hence contributed to Kenya's growth. Granted, Kenya has received substantial Chinese investments, especially in infrastructure projects such as roads, railways, and energy from China. According to the model, these investments can temporarily boost Kenya's economic growth by increasing capital stock. However, the long-term impact on growth depends on Kenya's ability to enhance productivity through technological advancements and human capital development due to diminishing returns to capital. In this case, it is expected that an adoption of Chinese know-how and technology in

infrastructure development would sustain growth in the long-term. If Kenya effectively absorbs technology and skills from Chinese partnerships, it would have the opportunity to sustain growth beyond the initial capital injection.

2.2.2 Dependency Theory

Dependency theory, developed in the late 1960s by economists like Raúl Prebisch and sociologists such as Andre Gunder Frank, posits that the economic development of less developed countries (LDCs) is significantly shaped by their relationships with more developed countries (DCs). Prebisch and Frank argued that these relationships often create a dependency, where the growth of LDCs is stunted because they are primarily exporters of raw materials and importers of finished goods, leading to a cycle of economic dependency and underdevelopment (Prebisch, 1950; Frank, 1967).

Dependency theory explains global economic disparities through the core-periphery model, where developed countries (the core) exploit the resources and labor of developing countries (the periphery). This relationship perpetuates economic imbalances, as the core benefits disproportionately from the economic activities of the periphery. In the context of Kenya-China relations, China represents the core, while Kenya is part of the periphery. China's investments and trade relations with Kenya can be seen through this lens, where China benefits from Kenya's raw materials and market for its manufactured goods, potentially leading to an imbalanced economic relationship (Ferraro, 2008).

One of the key aspects of dependency theory is the trade imbalance between developed and developing countries. Kenya exports raw materials like tea, coffee, and minerals to China, while importing manufactured goods and technology. This trade pattern can lead to a dependency on Chinese goods and markets, which might inhibit Kenya's ability to

develop its own manufacturing and technological sectors. Studies have shown that such dependency can result in unfavorable terms of trade for Kenya, making it difficult for the country to achieve sustainable economic growth (Ndungu & Otieno, 2017).

China's significant investments in Kenya, particularly in infrastructure projects like the Standard Gauge Railway (SGR), have been touted as drivers of economic growth. While these investments provide much-needed infrastructure, they also come with risks associated with dependency. Dependency theory suggests that reliance on Chinese financing and technology can lead to a form of neocolonialism, where Kenya's economic policies and priorities are influenced by Chinese interests. This can result in debt dependency, where the repayment of loans and interest becomes a burden on Kenya's economy (Chege, 2020).

Proponents of dependency theory argue that true economic development requires the transfer of technology and industrialization. In the case of Kenya-China relations, the extent to which Chinese investments lead to technology transfer and the development of local industries is crucial. If Chinese companies dominate key sectors without facilitating substantial technology transfer, Kenya may remain dependent on Chinese technology and expertise. Studies have highlighted mixed results in this area, with some indicating limited technology transfer and local capacity building, which reinforces dependency (Kamau, 2018).

Dependency theory also examines how economic dependencies can influence national sovereignty. The influence of Chinese investments and loans on Kenya's economic policies and decisions can be significant. For instance, conditions attached to Chinese loans might compel Kenya to prioritize projects that align with Chinese interests, potentially at the expense of local needs and priorities. This can undermine Kenya's

economic sovereignty and its ability to implement policies that foster long-term, self-sustaining growth (Mureithi, 2019).

Beyond economic dimensions, dependency theory also considers the social and environmental impacts of dependent relationships. Chinese projects in Kenya, while boosting infrastructure, have raised concerns about social and environmental sustainability. Issues such as labor rights, environmental degradation, and displacement of communities have been reported in various projects. These concerns highlight the broader impacts of dependency, where the pursuit of economic growth through foreign investment can lead to social and environmental costs that are often borne by the local population (Omondi, 2017).

2.3 Empirical Literature

2.3.1 To determine the effect of Kenya's exports to China on Economic Growth

Kenya's exports to China have played an important role in contributing to the country's economic growth over the past decade. As China's economy has continued to expand rapidly, demand has grown significantly for the key agricultural and commodity products that Kenya exports. By tapping into China's large and emerging consumer market, Kenyan businesses have been able to substantially increase their export earnings. Several studies have explored the economic impacts of rising exports to China.

Mugendi (2011) found positive impacts resulting from improved transportation infrastructure developed through Kenya-China partnerships. One example examined was the Thika Superhighway project, where Chinese contractors were awarded the tender to upgrade the highway. This enhanced road connectivity brought about significant benefits by reducing travel costs, improving access to opportunities, and

encouraging private sector involvement in infrastructure maintenance. More efficient domestic transportation networks help unlock economic activity and productivity gains across different regions. By extension, improved infrastructure also supports increased exports by making industries and ports more accessible and logistics more affordable.

George (2014) conducted a wider analysis of how foreign direct investment influences economic indicators such as GDP, balance of payments and trade. Using time series data from 2002-2011, the study found a direct correlation between overall FDI inflows into Kenya and GDP growth levels. While not focusing specifically on China, this indicates how external investment capital can stimulate domestic output, incomes and development. Export-oriented FDI in particular may contribute new skills and technology transfers that raise national production capacities over time. The resultant export earnings then translate directly into higher GDP through the expenditure approach.

One of the most comprehensive analyses of Kenya's ties with major economic partners was done by Omolo *et al.* (2016). Their comparative study revealed that the growth correlation between FDI from China and Kenya's GDP has actually been stronger than with partners like the US or EU. As China increasingly invests in export-oriented sectors and special economic zones in Kenya, this is actively driving more and more Chinese demand for the country's commodities and goods. The flipside observed was a rising trade deficit, as Kenyan imports from China have also increased rapidly to meet infrastructure material needs.

However, on balance the research suggests that burgeoning exports to China continue making sizable contributions to Kenya's economic advancement. Alongside promoting technology and skills diffusion, these exports act as an important source of foreign

exchange that supports macroeconomic stability. They also facilitate employment across various export industries and agriculture. Going forward, targeting more value-added production and alternative new markets can help strengthen resilience against volatility. But the China export market remains fundamentally important for Kenya's economy, growth prospects and efforts to develop a robust manufacturing base through trade and investment linkages. With prudent policy measures, the trade relationship stands to generate even greater returns towards sustainable development over the long run.

2.3.2 To establish the impact of Kenya's imports from China on Economic Growth

Since Kenya has had bilateral economic relations with various economies of the world, the subject of the role of bilateral relations in economic growth and development has attracted immense research. Similarly, research concerning this subject has been done in many other economies of the world and the results have been mixed.

One of the earlier studies in this area focused on Kenya's relations with China. Mugendi (2011) conducted research to assess the economic effects of the commercial partnership between Kenya and China in the building of Thika Super Highway by Chinese firms. The study's results show that the strong connection between the governments of Kenya and China led to Chinese contractors being awarded the tender to enhance Thika Super Highway. As per the Chinese embassy in Kenya website, China has been involved in several major infrastructure projects in Kenya undertaken by Chinese state-owned construction firms.

More recently, Newcomb (2020) analyzed the impact of Chinese investments on the Kenyan economy. The study examined both the positive and negative impacts of Chinese development projects and investigated the role of the Kenyan government in

facilitating these investments. It highlighted the need for policies to ensure benefits are shared more widely. On similar lines, the Chinese embassy website outlines some of the major investment projects supported by China in Kenya across sectors like rail, ports and energy.

Wanjiku *et al.* (2018) studied the impact of Chinese loans, FDI, and aid on Kenya's economic development from 2000 to 2015. The research utilized time series data and revealed that loans had a small adverse impact on development whereas FDI and assistance provided notable benefits. The Chinese embassy website provides recent statistics on growing Chinese FDI commitments and aid to Kenya.

Overall, past empirical studies have explored different aspects of Sino-Kenyan economic relations with mixed findings. More research is still needed to fully understand the dynamics of their bilateral cooperation as outlined on the Chinese embassy in Kenya's website. This would provide deeper insights for policymaking on both sides.

2.3.3 To examine the effect of Chinese debt to Kenya on Economic Growth

Were (2001) found that Kenya's increasing foreign debt levels had a detrimental impact on the country's economic development, suggesting a potential 'debt overhang' issue. The study utilized time series data from 1970-1995 and established cointegration among variables to develop an error correction model. It revealed that external debt levels were growing steadily with debt indicators rising sharply in the early 1990s. Rising foreign obligations, if not well-managed, can constrain sustainable economic activity in the long-run (Were, 2001).

More recent analyses provide further insights into how burgeoning Chinese debt stocks impact Kenya's growth trajectory. Newcomb (2020) conducted a case study of Chinese

investments in Kenya, including major debt-financed infrastructure projects. While acknowledging positive contributions to infrastructure development, the study also pointed to debt sustainability concerns arising from China's dominant financing role. Wanjiku *et al.* (2018) specifically assessed impacts of Chinese loans, FDI and aid between 2000-2015 through time series modeling. Their findings suggested loans had a small adverse impact on Kenya's economic progress.

Statistics from the Central Bank of Kenya corroborate the increasing scale of Chinese debt exposure. By June 2015, debt owed to China amounted to Ksh.262 billion (approx. \$2.6 billion USD), up drastically from Ksh.82.9 billion in 2014 and only Ksh.14.7 billion in 2010 (KNBS, 2018). A large portion of this growing liability was owed to China's Export-Import Bank, which financed flagship projects like the Mombasa-Nairobi Standard Gauge Railway (SGR) through concessional loans.

Various concerns emerge from rising Chinese debt levels. First, high debt-service obligations constrain fiscal spending aimed at furthering growth and welfare. Second, dependency on one bilateral creditor for critical infrastructure exposes Kenya's public finances to vulnerabilities from supply disruptions or unfavorable loan renegotiations. Third, opaque contract terms surrounding debt-tied investments may compromise policy autonomy in the long-run if left unaddressed.

However, some argue infrastructure build-out supported by Chinese loans provides an important prerequisite for achieving structural transformation and economic growth over the coming decades. As the Chinese embassy website highlights, projects such as the SGR aim to accelerate regional trade efficiency by connecting maritime ports to East Africa's hinterland. If properly leveraged, improved connectivity could boost productivity across multiple sectors.

Studies also indicate Chinese state-owned firms try balancing economic priorities with political and reputational concerns that influence investment decisions on the ground. For instance, Lesutis & Huang (2021) found the main SGR contractor constantly adapted strategies due to changing dynamics in both Kenya and East Africa to mitigate delays, rather than rigidly imposing predetermined plans.

Going forward, prudent management of contractual terms and debt levels will determine whether Chinese loans fulfill their potential developmental impact or impose unsustainable burdens. The onus lies on both Kenya and China to ensure cooperation instills mutual responsibilities through open dialogue and safeguarding national policy space amid deepening economic ties. Closer scrutiny of debt metrics alongside social impact assessments of funded projects would also provide much-needed transparency.

2.3.4 To investigate the impact of Chinese Foreign Direct Investment on Economic Growth

A growing body of empirical studies has investigated the impact of Chinese foreign direct investment (FDI) on Kenya's economic growth. Given expanding bilateral commercial linkages in recent decades, this research strand provides valuable insight into how FDI relations influence development outcomes. Earlier analyses by scholars such as George (2014) and Wanjiku (2016) examined aggregate FDI trends and their correlation with key macroeconomic indicators. George (2014) employed a descriptive approach analyzing 2002-2011 data, finding a direct relationship between overall FDI inflows and Kenya's GDP. Meanwhile, Wanjiku's (2016) time series regression from 1980-2015 attributed over 70% of GDP variability to factors including FDI, infrastructure, trade openness and their interactions.

More specifically focused investigations probed the distinctive character of Chinese FDI and its developmental footprint. Omolo *et al.*'s (2016) comparative study is instructive here. Using basic correlation analysis, it discovered FDI inflows from China correlated more strongly with GDP growth than ties with traditional partners like the U.S. or EU. Infrastructure projects funded by Chinese investments are highlighted on the Chinese embassy website as driving broad-based productivity gains.

Still, some caveats remain. Newcomb (2020) conducted qualitative fieldwork examining impacts on the ground. While acknowledging growth contributions, the study also raised concerns around weak local linkages from import-dependent projects and potential debt vulnerabilities from disproportionate reliance on one investor nation. More data is still required to comprehensively map socioeconomic spillovers beyond macroeconomic statistics.

Recent secondary data affirms the ever-expanding scale of Sino-Kenyan commercial engagement. As per the Kenyan National Bureau of Statistics and UNCTAD, China ranked among Kenya's top three trading partners and largest sources of FDI for consecutive years. Statistics available on the UNCTAD's platform indicate Chinese annual FDI commitments exceeded \$200 million in several years since 2015.

Studies likewise show Chinese actors proactively seek greater integration within Kenyan markets versus pursuing narrow profit motives. For example, following delays building the first SGR phase, China Road and Bridge Corporation took over operations to ensure targets were met - prioritizing reputational gains over financial costs per interviews in Lesutis & Huang (2021). This dynamic balancing of political, reputational and economic drivers merits additional unpacking. A pragmatic approach recognizes mutual risks but also opportunities if managed sustainably. Joint efforts tackling skills

gaps, connectivity challenges alongside initiatives nurturing local enterprise participation can optimize linkages. This aligns with China's emphasis on localized capacity building highlighted in development cooperation reports on the Chinese embassy site. Addressing information asymmetries through open data and impact tracking would also generate mutual accountability.

In summary, while the total impact of Chinese FDI requires ongoing scrutiny, accessible large-scale financing remains indispensable for Kenyan structural transformation - especially in key sectors like infrastructure, power and manufacturing flagged as priority areas in national plans. With good faith efforts from all parties, their partnership stands to yield inclusive, shared prosperity.

2.4 Summary and Research Gaps

The above reviewed literature indicates that the subject of effects of economic relations between countries has received much attention in the recent past from both economists and international relations scholars and policy makers. Most of the studies have used trade, debt, aid and foreign direct investment as the main indicators of economic ties between nations. The outstanding studies are Dinah et. al., (2019), Bouchoucha and Ali (2019), Wanjiku et. al., (2018) and George (2014). Most of the studies relied on secondary time series data with only Albert (2017) who partly relied on primary data. The most common approach of modeling the relationship among variables in the study was the OLS technique. Were (2001) used ECM but only studied Kenya's external debt and its implications on economic growth in the country. As much as Were attains her objective, the study does not give a full perspective on the effect of the bilateral economic relations between Kenya and China since the study only analyses the debt perspective. Bouchoucha and Ali (2019) uses a better estimation method (ARDL) but only accounts for FDI economic growth thereby leaving out the other aspects of

bilateral economic association. Wanjiku et. al., (2018) overcame the limitation of only considering one variable and included all the three: Chinese loans, FDI and Aid. The study only considered annual time series data for 2000-2015. With a sample size of only 16, econometric estimations using OLS would not give robust and reliable findings. It is generally accepted that the minimum sample size should be 30. This study seeks to fill these gaps by incorporating more variables as indicators of bilateral relations. Furthermore, the Wanjiku et. al., did not consider the effect of Kenya China trade on Kenya's economy.

This study addresses these gaps by considering annual time series data from 1990 to 2021. It captures the Kenya-China economic association in four perspectives being Kenya's exports to China, Kenya's Imports from China, Kenya's total debt to China and Kenya's FDI inflows from China.

2.5 Conceptual Framework

This study seeks to establish the effect of bilateral relations between Kenya-China on economic growth in Kenya. Review of literature reveals the main measures and indicators of bilateral relations are trade, debt, and foreign direct investment. This study decomposes trade into imports and export. As such, the study proposed the following conceptual framework.

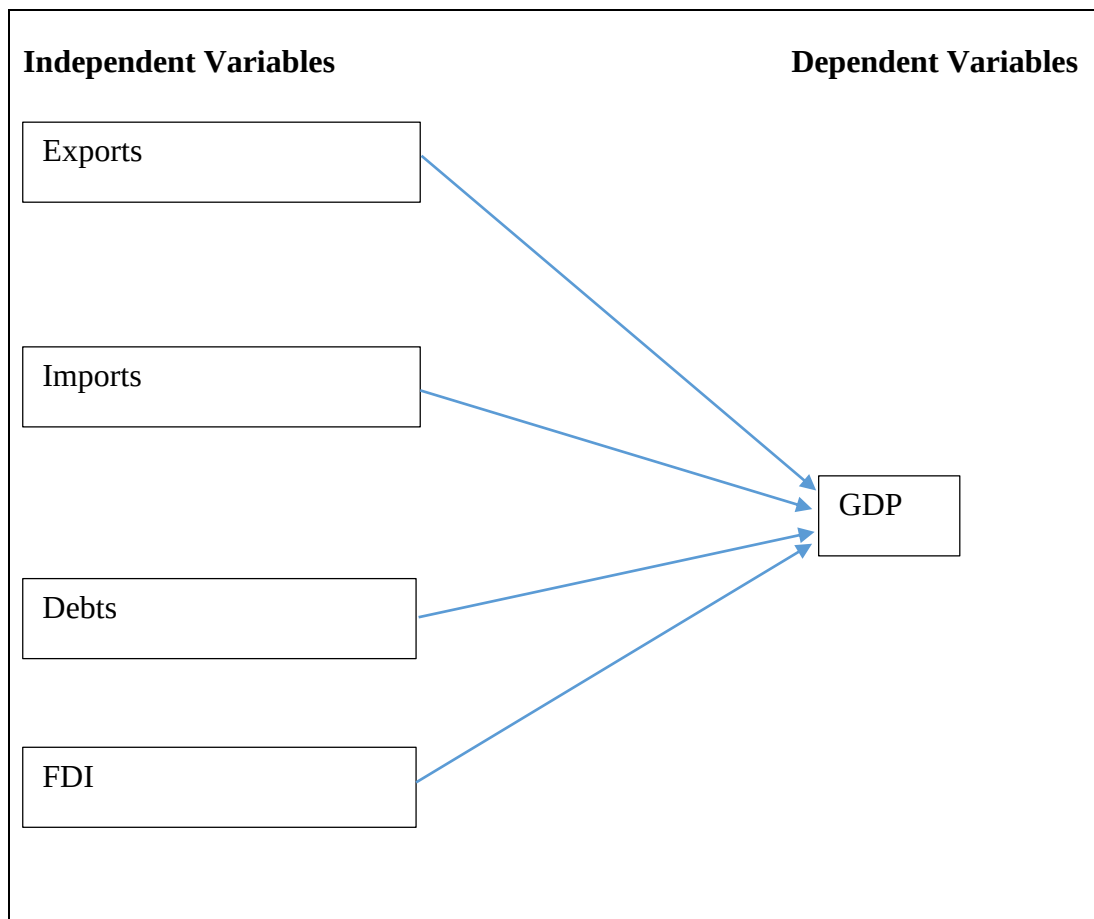


Figure 2.1: Conceptual framework

Source: Author, 2025

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This chapter outlines the technique used to measure, collect, analyze, present, and evaluate the research results. The document includes the study area, research design, target population, and data collecting technique. The chapter provides the theoretical basis, model formulation, and diagnostic tests.

3.2 Research Design

John (2018) defines a research design as a structured plan that details the techniques and processes for collecting and analyzing data to test study hypotheses. The text provides a structure for gathering research data, measuring it, analyzing it, and interpreting it. Kothari (2004) said that an effective study design allows the researcher to be highly efficient by obtaining the most information while minimizing the use of effort, time, and money. He asserts that the research design serves as a blueprint that enables the efficient functioning of all research activities.

John (2018) identified six primary research designs: experimental, longitudinal, case study, cross-sectional, correlation, and explanatory. This study used an explanatory (analytical) research design to help the researcher accomplish the study goals. The design is beneficial for elucidating the researcher's observations in descriptive studies (Cooper & Schindler, 2008). Explanatory research aims to establish causal linkages between elements or variables related to the study topic. The architecture allows for the use of statistical tools and methods to establish and explain correlations between variables (Wyk, 2017).

3.3 Unit of Analysis

The unit of analysis determines the subject or entity being examined in a research study. The unit of study might be a person, a group of people, an organization, a nation, a technology, or any other thing being studied (Kumar, 2018). This research focused on analyzing Kenya. The research analyzed the influence of economic links between Kenya and China on Kenya's economic development using data on Kenya's Gross Domestic Product, total imports from China, total exports to China, Chinese loans to Kenya, and Chinese Foreign Direct Investment inflows into the nation.

3.4 Data Collection Procedure

3.4.1 Data Sources

This research employed annual time series data for the period 1990 to 2021. The data was obtained from secondary sources, that is, the World Bank pool, UNCTAD data, Central Bank of Kenya, the Kenya National Bureau of Statistics (KNBS) and any other useful secondary data sources. The data collected was on the dependent variable (Kenya's GDP at constant prices), and the independent variables (Aggregate Chinese imports to Kenya, Aggregate Kenyan exports to China, total Chinese debt to Kenya, and Foreign Direct Investment from China to Kenya)

3.4.2 Sampling Design and Procedure

The research examined several internet databases such as UNCTAD data, World Bank data, Central Bank of Kenya data, National Treasury, KNBS, State Department for Trade, the Export Promotion Council, and WTO to gather data on the variables being studied. The most comprehensive and reliable source was chosen by easy selection from the available sources. Data from 1990 to 2021 is sufficient for valid inference using time series econometrics due to the 31 yearly data available.

3.4.3 Data Collection Instrument

This is a reference to the research instrument that the investigator uses to gather data for the investigation from the designated sources. This research created a Microsoft Excel spreadsheet for data collecting, which was then used to consolidate the information gathered from the relevant internet databases. Since the data produced from the websites of KNBS, the World Bank, UNCTAD, and CBK was already arranged in excel format, a spreadsheet was acceptable. Manual entry of data from KNBS economic survey reports was done in the spreadsheet.

3.4.4 Measurement of Variables

In order to estimate the economic effect of Kenya-China Economic relations on the Kenya's economy, this study used Kenya's real GDP as the dependent variable while Kenya-China trade, Kenya's debt from China and FDI inflows into Kenya from China was the study's independent variables. Kenya-China trade was disaggregated into exports and imports to effectively capture the specific effect of trade flows between the two countries on Kenya's economy in order to provide specific and robust policy guidelines. Table 3.1 below summarizes these variables, gives their symbols as used in the study and outlines how each of them were measured.

Table 3.1: Study Variables, their Symbols, and Measurements

Variable	Symbol	Measurement	Data Source
Kenya's Economic Growth	GDP	Real GDP (GDP at constant 2010 USD)	World Bank Data
Kenya's Exports to China	EXP	Real Exports to China (Export of goods and services converted to constant 2010 USD)	KNBS
Kenya's Imports from China	IMP	Real Imports (Imports of goods and services converted to constant 2010 USD)	KNBS
Kenya's Debt from China	DEBT	Total Kenya government debt from China (converted to constant 2010 USD)	Compiled from World Bank Data, National Treasury and KNBS
FDI inflows from China	FDI	Foreign direct investment, net inflows from China (converted to 2010 USD)	Compiled from World Bank Data, National Treasury and KNBS

Source: Author, 2025

3.5 Data Analysis and Presentation

The EVIEWS-9 program was used to evaluate the research data. Since the researcher had access to the program, it was deemed suitable for the investigation. The program is also suitable for time series estimation, which forms the foundation of the study's analysis.

Initially, descriptive statistics were used to assess the data. A broad understanding of the distribution, trends, and/or changes in data sets throughout the course of the research is provided by descriptive analysis of the data on all the variables under investigation. The process included calculating the mean and median as central tendency measures, the minimum, maximum, and standard deviation as spread measurements, and a measure of the distribution's skewness and peakedness. While the measures of spread helped to show the degree of data dispersion on the variables under examination, the measures of central tendency summed the data using a single average. The skewness metric made it easier for the researchers to determine how much the data deviated from

symmetry. The research conducted a graphical evaluation of the data subsequent to the descriptive analysis.

3.6 Model Specification

The theoretical model of first approach for the study was considered as follows

$$GDP = f(Exports, Imports, FDI, Debt) \dots\dots\dots (1)$$

This model postulates that debt, imports, and exports all affect GDP growth. While government expenditures and investments may potentially have an impact on GDP growth, these variables are not taken into account in this model since the primary goal of the research was to determine how Kenya's economic development is impacted by China's bilateral relationship with Kenya. Consequently, additional variables are not included in this study's econometric model. This idea has been borrowed from Kahya (2011) and it is underpinned in Keynesian macroeconomic analysis.

In econometric terms, the model was specified as follows

$$GDP_t = \beta_0 + \beta_1 REXP + \beta_2 RIMP + \beta_3 FDI + \beta_4 DEBT + \mu_t \dots\dots\dots (2)$$

3.7 Time Series Estimation procedure

This study used time series estimation techniques to establish the effect of Kenya-China bilateral association on economic growth in the country. The study applied the Bounds test approach to Cointegration of Per saran and Shin (2001). The bounds testing approach tests for presence of cointegration among the variables under study in an Autoregressive Distributed Lag (ARDL) framework.

3.7.1 Autoregressive Distributed Lag (ARDL) model

A model in which the dependent variable is a function of both its own previous lagged values and the present and past values of additional explanatory variables is known as an autoregressive distributed lag model.

A simple ARDL model is given as;

$$Y_t = \delta_0 + \sum_{j=1}^p \delta_{01j} Y_{t-j} + \sum_{j=0}^q \delta_{1j} X_{t-j} + \varepsilon_t \dots \dots \dots (3)$$

When short run and long run dynamics are incorporated into the model, the following model is obtained

$$\Delta Y_t = \beta_0 + \sum_{j=1}^p \beta_{1j} \Delta Y_{t-j} + \sum_{j=0}^q \alpha_{1j} \Delta X_{t-j} + \theta_0 Y_{t-1} + \theta_1 X_{t-1} + \varepsilon_t \dots \dots \dots (4)$$

In this model, Y_t is explained by lagged values of both Y and X as well as the current values of X.

This method's primary benefit is that it works in situations where the regressors are mutually co-integrated, (0), or (1), and it's comparatively more effective with limited or finite sample sizes. Furthermore, after the model's lag order is determined, ARDL enables the co-integration relationship to be estimated using OLS. Finally, a simple linear re-parametrization process may be used to create a dynamic, unconstrained error correction model (UECM) from the ARDL bounds testing model. Since the ARDL and the ECM have the same form and are dynamic single equation models, re-parametrization is feasible. All that the distributed lag model suggests is that the regressors' unlimited lag be included in the regression function. Consequently, the long run equilibrium and short run dynamics are combined by the UECM without any long

run information being lost. But none of the variables being studied should be I (2) for ARDL to function. Last but not least, the ARDL model deals with collinearity by allowing the dependent variable to lag with other independent variables and their delays.

3.7.2 Stationarity test

The starting point to meticulously follow the Bounds procedure is the testing for unit root (Chizonde, 2016). This is because the bounds approach collapses if any of the variables are integrated of order two, I (2). In regression analysis, spurious correlation—which inflates R squared and the t-scores of the non-stationary independent variables—is the main effect of non-stationarity. This may lead to inaccurate model selection, also known as type 1 mistake. It indicates that while the regression may seem well, no econometric interpretation will be possible. The Augmented Dickey Fuller (ADF) test was used in this research to check for stationarity among the variables.

The procedure for unit root test involves estimation of the following model for each of the variables under study.

$$\Delta Y_t = \phi_0 + \beta_t + \pi Y_{t-1} + e_t \dots \dots \dots (5)$$

Where, $\pi = \phi_1 - 1$

The following hypotheses for unit root with drift and trend were tested

$H_0: \pi = 0$ Time series is not stationary

$H_0: \pi < 0$ Time series is stationary

3.7.3 Bounds test procedure

In order to perform the bounds test for cointegration, the ARDL model above was specified as follows;

$$\begin{aligned}
 \Delta \ln GDP_t &= \delta_0 + \sum_{i=1}^n \delta_{1i} \Delta \ln GDP_{t-k} + \sum_{i=0}^n \delta_{2i} \Delta \ln REXP_{t-k} + \sum_{i=0}^n \delta_{3i} \Delta \ln RIMP_{t-k} \\
 &+ \sum_{i=0}^n \delta_{4i} \Delta \ln DEBT_{t-k} + \sum_{i=0}^n \delta_{5i} \Delta \ln FDI_{t-k} + \beta_1 \ln GDP_{t-1} + \beta_2 \ln REXP_{t-1} \\
 &+ \beta_3 \ln RIMP_{t-1} + \beta_4 \ln DEBT_{t-1} + \beta_5 \ln FDI_{t-1} \\
 &+ \mu_t \dots \dots \dots (6)
 \end{aligned}$$

Where, Δ is the difference operator, GDP is Kenya's annual GDP growth rate, $REXP$ is Kenya's real aggregate exports to China, $RIMP$ is Kenya's real aggregate imports from China, $DEBT$ is Kenya's total debt owed to China, FDI is the Chinese Foreign Direct Investment into Kenya while POPN is the total population of Chinese migrants into Kenya. The parameters $\delta_1, \delta_2, \delta_3, \delta_4$ and δ_5 will be the short run dynamic coefficients of the ARDL model while $\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are long run parameters (elasticity's). k is the lag length.

To investigate the presence of a long run relationship, the following hypothesis was tested.

$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$ (coefficients of the long run equation are all equal to zero implying no cointegration)

$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$ (coefficients of the long run equation are not significantly to equal zero implying cointegration exists)

Cointegration was tested using the F-test of the combined significance of the long run coefficients. To determine whether to accept or reject the null hypothesis, Pesaran *et al.*

(2001) provided critical values, upper and lower critical values, which were compared using the F-statistic (Wald test). While all variables are assumed to be I (1) by the higher crucial values, all variables are assumed to be I (0) by the lower critical values.

The null hypothesis is accepted if the F-statistic is below the lower critical limit, suggesting that there is no long-term link between the variables, and it is rejected if the F-statistic exceeds the higher critical bound, showing that co-integration occurs among the variables. On the other hand, if all the variables are I (1), a choice will be made using the higher critical values; if all the variables are I (0), a decision will be made using the lower critical values. If the F-statistic falls inside the band, however, the outcome will be inconclusive.

If the bounds test indicates that the variables are cointegrated, the research will identify both the long run (ECM) and short run (ARDL) models. However, only the short run (ARDL) model has to be stated if it turns out that the variables are not cointegrated.

3.7.4 Stability test

An ARDL-ECM model was established in the research to characterize the connection between the dependent and independent variables under investigation if the bounds test indicates that the variables under investigation are cointegrated of order 0 and/or 1. The cumulative sum (CUSUM) and/or cumulative sum squares (CUSUMSQ) approaches (Borensztein, *et al.*, 1998) may be used to assess a model's structural validity. The research evaluated the structural stability of the calculated model using the cumulative sum of the recursive residuals (CUSUM) plot.

3.7.5 Serial Correlation test

The serial correlation in this research was tested using the Breusch Godfrey test. The test's null hypothesis is that the residuals do not exhibit autocorrelation. After doing an

OLS regression, the estimated residuals' lagged values and explanatory factors will be regressed using the residuals produced, as shown by the equation below.

$$u_t = \alpha_1 + \alpha_2 X_t + \rho_1 \mu_{t-1} + \rho_2 \mu_{t-2} + \dots + \rho_p \mu_{t-p} + \varepsilon_t \dots \dots \dots (7)$$

In a large sample size, $(n - \rho)R^2 \sim X_p^2$, that is, $n - \rho$ times R^2 value obtained from the equation asymptotically follows a chi square distribution with ρ degrees of freedom where ρ is the number of lags. If $(n - \rho)R^2$ is greater than the critical chi square value at a given significance level, the null hypothesis of no serial correlation is rejected.

3.7.6 Heteroscedasticity test

The study used the white's general test for heteroscedasticity. The null hypothesis of the test is that residuals have a constant variance. Considering a basic regression of the form;

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + u_i \dots \dots \dots (8)$$

The above equation is estimated and the squared residuals therefrom are regressed against the independent variables, their squared values and cross products as is shown in the below equation and the R^2 squared is obtained.

$$\mu_i^2 = \alpha_1 + \alpha_2 X_{2i} + \alpha_3 X_{3i} + \alpha_4 X_{2i}^2 + \alpha_5 X_{3i}^2 + \alpha_6 X_{2i} X_{3i} + v_i \dots \dots \dots (9)$$

In a null hypothesis of homoscedasticity, it can be shown that the sample size n multiplied by the resultant R^2 above asymptotically follows a chi square distribution with a degree of freedom equal to the number of explanatory variables excluding the constant term. This is shown as follows;

$$n \cdot R_{asy}^2 \sim X_{df}^2 \dots \dots \dots (10)$$

Heteroscedasticity is present if the chi square obtained at a particular level of significance is greater than the crucial chi square value. Heteroscedasticity is implied when the null hypothesis is rejected.

3.7.7 Multicollinearity test

If the explanatory variables have a high correlation amongst them, statistical inference becomes a challenge. Regression may have a high coefficient of determination, but estimated coefficients may have an incorrect or unexpected sign or become statistically insignificant (Greene, 2003). This work used Gujarati's (2004) postulate, which states that a variance inflation factor of greater than 10 indicates a high degree of collinearity, to measure the degree of multicollinearity.

3.8 Conclusions and Expected Economic Relationships between Kenya and China

Bilateral economic relations between Kenya and China have tightened over the past two decades. While Kenya's exports to China have grown at a sluggish pace, Chinese imports into Kenya have grown tremendously indicating that trade between Kenya and China is skewed in favor of China. At the same time, Chinese lending to Kenya has grown dramatically with China being the largest bilateral lender to Kenya. While the debt has been considered as essential to fuel growth in Kenya's economy especially through infrastructural development, arguments abound on the potential debt burden that they give to Kenya. Furthermore, the growth in Chinese FDI inflows into Kenya over the past decade has been alarming. All these factors point at the growing influence of China on Kenya's economy giving rise to the need to examine how the relationship affects Kenya. This study determined the effect of Kenya's exports to China, Kenya's imports from China, China's total debt to Kenya and Chinese FDI inflows into Kenya on Kenya's GDP.

The set of government policies which the study seeks to address is largely fiscal policies. The fiscal policy variable that the study hypothesizes benefit from the conclusions of the study is Kenya's debt from China. If the relationship between Kenya's GDP and Debt from China is found to be positive and significant, then, the study recommend that Kenya should continue pursuing loans from China. Similarly, if the study findings indicate a positive relationship between FDI inflows from China and GDP in Kenya, the study recommends that the country should encourage FDI inflows from China. Similarly, findings on the relationship between Kenya's exports to China and imports from China and Kenya's GDP will effectively inform Kenya's trade policy with China.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Overview

This chapter presents the data analysis findings and the discussions of the findings. The chapter starts with the descriptive statistics of the variables used in the study. The next section comprises of the evaluation of the proposed model using diagnostic tests. The third section is the main data analysis evaluating the research questions of the study.

4.1 Descriptive Statistics

As mentioned in the preceding section, the data utilized in this research was gathered from a variety of sources. The years 1990–2021 were covered by the data collection. The United Nations Conference on Trade and Development, the KNBS, and the World Bank are some of the data's primary sources. Table 2 below displays the descriptive statistics for each of the variables. For this study, the descriptive statistic measurements include mean, median, maximum, and minimum, Std. Dev, Skewness, Kurtosis, Jarque-Bera, Probability, and Sum

Table 4.1: Descriptive Statistics

	EXP (USD MM)	IMP (USD MM)	GDP (USD MM)	FDI (USD MM)	DEBT (USD MM)
Mean	3919.242	115355.300	50850.220	99.912	297.062
Median	1374.500	26344.000	45212.410	8.408	25.892
Maximum	19924.920	423779.800	90372.800	728.289	3709.942
Minimum	42.288	672.293	30431.940	0.006	0.028
Std. Dev.	5250.197	146371.600	18725.020	185.217	712.806
Skewness	1.578	0.981	0.656	2.191	3.824
Kurtosis	4.543	2.382	2.112	7.026	17.997
Jarque-Bera	16.455	5.640	3.345	47.226	377.850
Probability	0.000	0.060	0.188	0.000	0.000
Sum	125415.800	3691370.000	1627207.000	3197.184	9505.981

Source: Author, 2025

4.1.1 GDP Descriptive Statistics

The results indicate that the mean for GDP over the 32 years considered was \$50850.22 million, with a standard deviation of 18725.02 which was quite high indicating large spread GDP over time. To put this into perspective, the standard deviation is almost 40% of the mean GDP value. This extremely large deviation underscores how greatly individual GDP figures fluctuated from year to year, ranging from far above to far below average. Such high volatility is exactly what we would expect for a macroeconomic indicator like GDP, which is influenced by numerous uncontrollable factors in the external and internal economic environment over time. These include global financial crises, commodity price shocks, changes in government policies, levels of investment and consumption, currency fluctuations and more.

The skewness of the data (0.655) was within recommended threshold of +2 and -2 according to Hair *et al.* (2010) in their seminal book provide guidelines on assessing normality in multivariate data. They recommend that for data to be considered normally distributed, the skewness value should fall between +2 and -2. Skewness indicates the degree of asymmetry of a distribution around its mean. Values beyond +2 or -2 would suggest significant non-normality that could impact inferences from parametric tests which assume normal distributions. Byrne (2010) in his book delves deeper into normality testing in the context of SEM analysis. However, his guidance is also applicable more generally. Byrne notes that within social science research, skewness values exceeding an absolute value of 3 are generally considered to indicate non-normal data issues. Between 2 to 3 may still suggest problems, while below 2 is acceptable to assume normality.

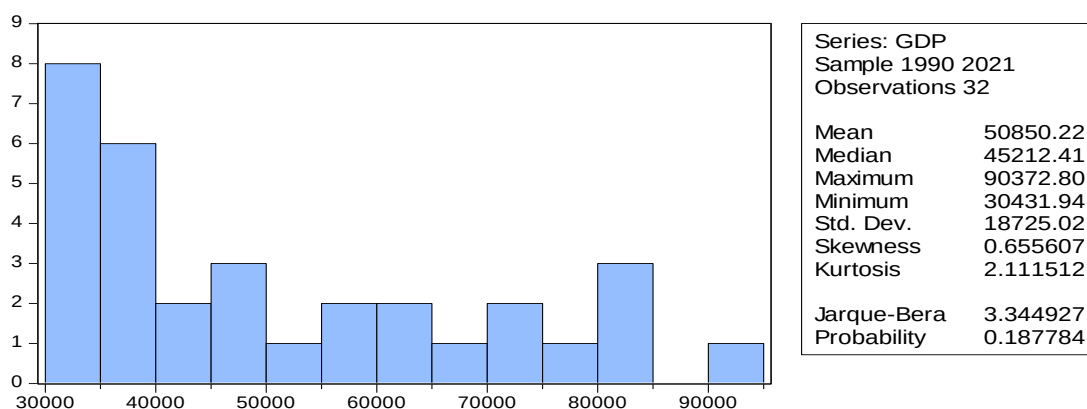


Figure 4.1: GDP Descriptive Statistics

Source: Author, 2025

4.1.2 FDI Descriptive Statistics

The mean FDI inflow over the 32-year period was \$99.9112 million, providing a benchmark average level of foreign investment received annually in Kenya during the analyzed time frame. However, looking more closely at the standard deviation of 185.2174, this indicates that on average, each year's FDI figure varied hugely from the mean by over \$185 million. Similar to GDP, this standard deviation value being so large relative to the mean (over 185% in this case) underscores the tremendous fluctuations seen in FDI flows into the country across different time periods.

The range of minimum to maximum values further illustrates the vast spread. At the low end, there was a year with an extremely small \$0.0058 million of FDI. In contrast, FDI peaked at an unusually high \$728.289 million in a different given year. This massive variability is logical, as FDI depends not just on domestic market conditions but also global investment trends that cannot be controlled. It is prone to uncertain economic and geopolitical events internationally. More notably, the skewness value of 2.19 exceeds the recommended +2 /-2 thresholds from Hair et al (2010) and Bryne (2010). This implies the data had a positive skew and was not truly symmetrically distributed, with a longer tail toward higher FDI values. Combined with the large

standard deviation, it confirms the series substantially deviated from a normal distribution pattern.

Overall, these FDI descriptive metrics all point to exceptionally high volatility and inconsistency in annual foreign investment levels experienced in Kenya over the sampling period. Both booms and droughts were witnessed on the ground.

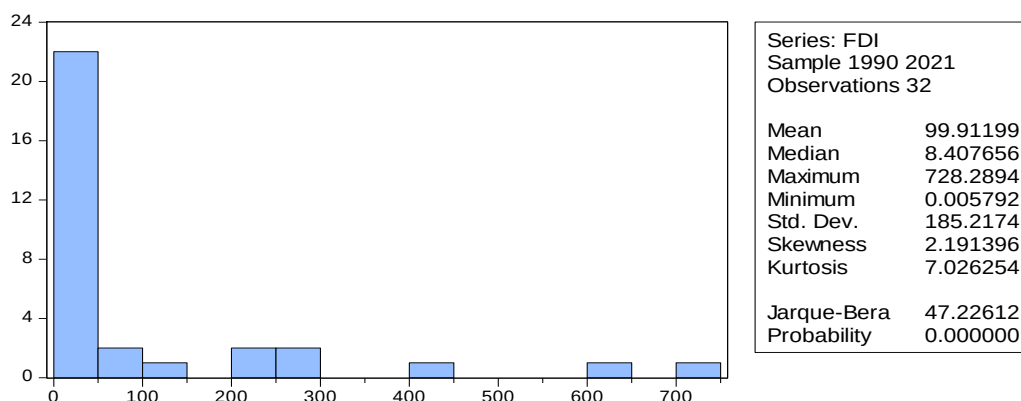


Figure 4.2: FDI Descriptive Statistics

Source: Author, 2025

4.1.3 Descriptive Statistics for Debt

The mean external debt level of Kenya over the 32-year period was \$297.0619 million, providing a benchmark average debt value carried annually. However, evaluating the standard deviation of 712.8061, which was over twice the size of the mean value, signifies that debt levels drastically oscillated from the norm by over \$712 million on average each year. This immense variability is reflected in the huge range between minimum and maximum recorded debts. At the low end was an extremely small \$0.027 million of debt in a given year, yet debt rocketed to an extraordinarily high \$3709.942 million in another year - differing by over 13,000 times between these extremes.

More critically, the skewness of 3.823 overtly exceeds the ± 2 threshold guidelines according to Hair *et al.* (2010) and Bryne (2010) indicating that the series assumption

of normally distribution was questionable. This signals the debt data had a strong positive skewness rather than a normal symmetric distribution. There was an excessively long right tail of higher outlier debt observations relative to most years. When also considering the massive standard deviation exceed over twice the mean value, it's unequivocally clear from these fundamental descriptives that Kenya's annual external debt exposure wildly fluctuated without any semblance of uniformity or predictability across the time span studied. Both droughts and deluges of debt burdens were witnessed on the ground, leaving the economy highly vulnerable to instability depending on the fiscal year. The marked non-normal attributes of this time-series data as a whole bring into question any assumptions of predictable debt levels or patterns.

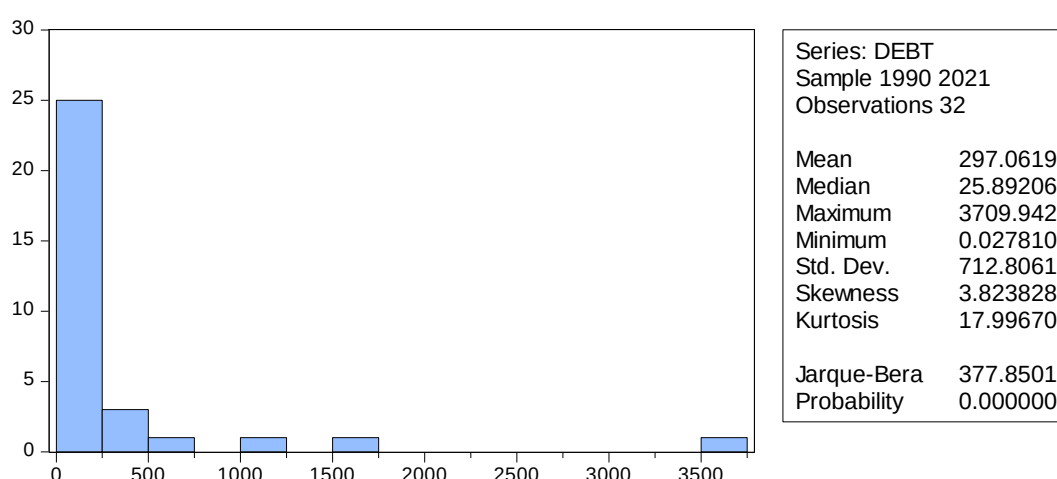


Figure 4.3: Descriptive Statistics for Debt

Source: Author, 2025

4.1.4 Exports Descriptive Statistics

The mean level of Kenyan exports over the 32 years was Ksh3919.242 million, serving as a benchmark average value. However, evaluating the standard deviation of Ksh. 5250 million, which exceeded the size of the mean value considerably, it is evident that annual export earnings widely fluctuated from the norm by over Ksh. 5 billion on average each year. This significant variation was well reflected across the huge range

between minimum and maximum recorded exports. Exports dropped to an extremely low minimum of just Ksh. 42.288 million in one particular year, rising sharply to an extraordinarily high maximum of Ksh 19924.92 million in a different year - a staggering difference of over 470 times between these values. Encouragingly though, the skewness level of 1.57 lies inside the recommended ± 2 threshold interval according to guidelines from Hair *et al.* (2010) and Bryne (2010). This indicates the export data approached a normal symmetrical distribution without skewing heavily to either side. Nonetheless, the impressively huge standard deviation exceeding even the mean value is a clear sign that export earnings wildly oscillated without any consistency or predictability across the time span under investigation. Considerable year-to-year variations from the average norm were the norm for this indicator.

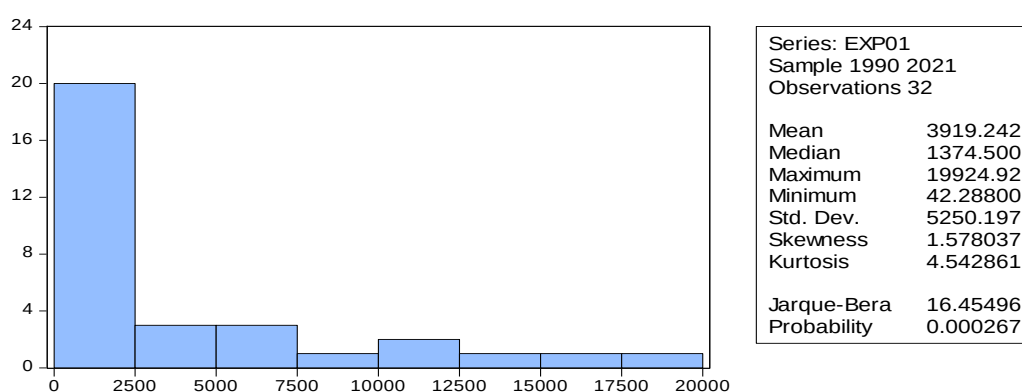


Figure 4.4: Exports Descriptive Statistics

Source: Author, 2025

4.1.5 Imports Descriptive Statistics

The mean level of Kenyan imports over the 32 years was \$1234936.0 thousands, serving as a benchmark average value. However, evaluating the standard deviation of \$1459550.0 thousands, which exceeded the size of the mean value considerably, it is evident that annual import bill amounts wildly fluctuated from the norm by over \$1.45 million on average each year. This immense variability was clearly reflected across the

huge range between minimum and maximum recorded import values. Imports dropped to an extremely low minimum of just \$18743.88 thousands in a particular year, escalating sharply to an extraordinarily high maximum of \$4029224.0 thousands in another year - differing by over 215 times between these extremes. Encouragingly, the skewness of 0.772 lies inside the recommended ± 2 threshold range according to statistical guidelines. This implies the import data approached a normal symmetrical distribution without excessively skewing. Regardless, the outstandingly huge standard deviation exceeding the mean unequivocally shows that Kenya's yearly import bills immensely oscillated without consistency or predictability across the time span reviewed. Substantial fluctuations above and below average prevailed as the norm for this economic indicator over decades. While still having met normality criteria, the country undoubtedly faced immense unpredictability and vulnerability from the massive annual swings witnessed in real import amounts spanning over two centuries at various points in time. Considerable instability characterized Kenya's long-term import performance.

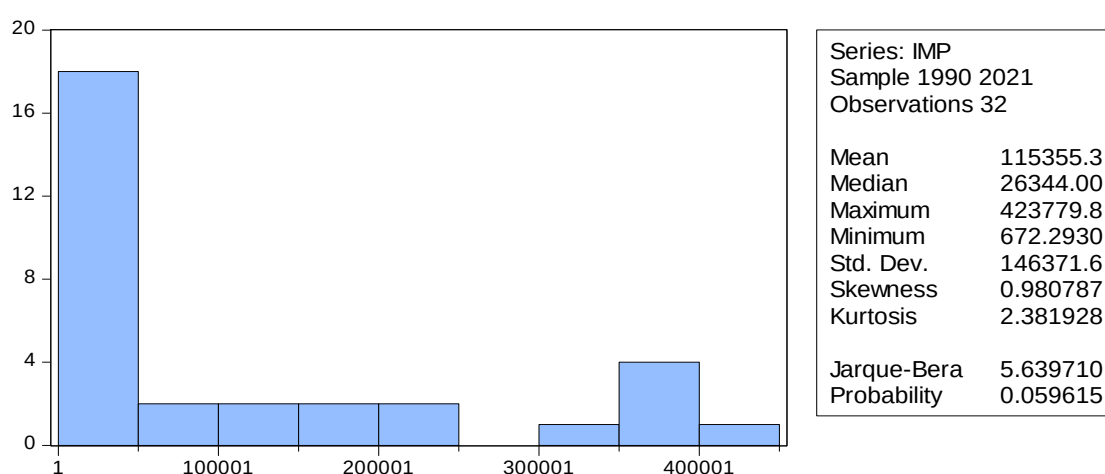


Figure 4.5: Imports Descriptive Statistics

Source: Author, 2025

4.2 Diagnostic Tests of the Model

Before carrying out the actual analysis of the data, it was critical to evaluate the variables and the model through diagnostic tests. The diagnostics tests conducted included normality test, serial correlation test, unit root tests and heteroscedasticity test. The results are presented and discussed in the following sections.

4.2.1 Unit Root Tests

To find out whether the variables had a unit root or not, it was crucial to do the unit root tests. It was used to determine whether or not the variables are stationary. Due to the non-stationary variables, erroneous regression problems might provide misleading results. The Augmented Dickey Fuller Fisher Unit Root Test (ADF-test) with the following hypothesis is used to test for stationarity:

H0: The variable has a unit root

H1: The variable does not have a unit root

The tests were done so that for the series that were not stationary, they could be differenced to make them stationary. GDP exhibited an upward trend over time, indicative of non-stationarity. This was confirmed via the ADF test - the null of a unit root could not be rejected at levels. Economically, a growing trend is expected for GDP as the size of the economy increases annually. Taking the first difference removed this deterministic trend component, making the series stationary around a fixed mean. First differencing essentially measures the year-on-year growth rate, satisfying the stationarity condition required for hypothesis testing and model estimation. In contrast, FDI values did not visually portray any trend up or down. However, the ADF still failed to reject a unit root at levels and first difference. Only after second differencing did it

become stationary, suggesting complex stochastic fluctuations in FDI flows rather than a simple trend.

Debt also followed an increasing path like GDP. Yet curiously, the ADF null of a unit root was rejected at levels, signifying debt was already stationary in its original form unlike GDP and FDI. No transformation was needed. Aligning with GDP, exports grew over the sample as depicted in its climbing graph shape. However, taking first differences eliminated this trend, achieving stationarity similar to GDP. Imports tracked an ascending manner over time on the graph. Differing from the other variables though, the ADF proved imports were stationary at levels without any preprocessing required.

In conclusion, unit root tests and graphs together illuminated the time-series properties and appropriate transformations necessary to fulfill the stationarity precondition for each economic indicator prior to cointegration and modeling analysis. These results are presented in the Table 3 below. The tests results are also presented in Appendix B.

Table 4.2: Unit Root Tests

Variable	T-statistic	p-value	Level
GDP	-5.618184	0.0004	1st difference
FDI	-8.562354	0.0000	2 nd Difference
Debt	-3.670170	0.0399	At levels
Exports	-5.859045	0.0002	1st difference
Imports	-3.742077	0.0387	At levels

Source: Author, 2025

4.2.2 Serial Correlation Test

To find out if there is serial correlation between the variables under investigation, the serial correlation test was the next one to be performed. The following theory guided the execution of the Breusch-Godfrey Serial Correlation LM Test:

H0: No serial correlation

H1: There is serial correlation

The probability was 0.8527 and the F-statistic was 0.16004. Since the p-value associated with the F-statistic (0.8527) and the Chi-square p-value (0.8135) was greater than 0.05 we fail to reject the null hypothesis, which states that there is no serial correlation, and we concluded that the series contains no evidence of serial correlation.

Table 4 presents a summary of the outcomes, while Appendix C has the full test data.

Table 4.3: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.160444	Prob. F (2,23)	0.8527
Obs*R-squared	0.412791	Prob. Chi-Square (2)	0.8135

Source: Author, 2025

4.2.3 Heteroscedasticity Test

The last test that was conducted was the heteroscedasticity test. To carry out this test, the Breusch Pagan Test was conducted. Breusch Pagan Test is utilized to test for heteroskedasticity in a linear regression model and adopts that the error terms are normally distributed. The following hypothesis was used:

H0: no heteroskedasticity exists (= homoskedasticity exists).

H1: There is heteroscedasticity

The results for the heteroscedasticity tests indicated that the F-statistic was 0.248 and the Chi-square probability was 0.908. Since the Chi-square probability was greater than 0.05 (p-value (0.887) > 0.05) we failed to reject the null hypothesis and concluded that for the model and the data used, there were no heteroscedasticity. In other words, there

were enough evidence to conclude that the error terms were normally distributed. These results are presented in the Table 5 below and the complete results in Appendix C.

Table 4.4: Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.247997	Prob. F(4,25)	0.9081
Obs*R-squared	1.144952	Prob. Chi-Square(4)	0.8871
Scaled explained SS	0.658031	Prob. Chi-Square(4)	0.9564

Source: Author, 2025

4.2.4 Multicollinearity Test

Multicollinearity refers to the phenomenon in regression analysis where predictor variables are highly correlated, leading to unreliable estimates of regression coefficients. Variance Inflation Factor (VIF) is a widely used statistical measure to detect multicollinearity. VIF quantifies how much the variance of a regression coefficient is inflated due to multicollinearity. Generally, a VIF value exceeding 10 is considered a cause for concern, indicating significant multicollinearity (O'Brien, 2007).

Table 4.5: VIF multi-collinearity test

Variable	VIF	1/VIF
DEBT	1.45	0.689655
FDI	1.71	0.584795
IMP	1.64	0.609756
EXPORT	1.99	0.502512
Mean VIF	1.6975	

Source: Author, 2025

The mean VIF value for the variables is 1.6975, which further indicates that multicollinearity is not a significant concern in this dataset. A mean VIF close to 1 suggests that there is minimal multicollinearity among the predictor variables, making the regression estimates more reliable (Kutner, Nachtsheim, & Neter, 2004).

4.3 Correlation Analysis Results

The correlation test results provide insights into the linear relationships between economic growth, exports, imports, foreign direct investment (FDI), and debt. The correlation coefficient ranges from -1 to +1, where values close to +1 indicate a strong positive linear relationship, values close to -1 indicate a strong negative linear relationship, and values around 0 suggest no linear relationship. An asterisk (*) denotes statistical significance, implying that the observed correlation is unlikely to be due to chance.

Table 4.6: Correlation test results

Variable	Economic growth	Exports	Imports	FDI	Debt
Economic growth	1.0000				
Exports	0.9374*	1.0000			
Imports	0.9717*	0.9554*	1.0000		
FDI	0.7624*	0.8048*	0.7746*	1.0000	
Debt	0.3945*	0.2728	0.4043*	0.2918	1.0000

(*) Indicates that the coefficient is statistically significant at 95 percent confident interval.

Source: Author, 2025

The correlation between economic growth and exports is 0.9374*, indicating a very strong and statistically significant positive relationship. This suggests that increases in exports are closely associated with increases in economic growth. Such a strong positive correlation reflects the importance of export activities in driving economic

performance, aligning with literature that highlights exports as a key engine for growth (Harrison & Rodriguez-Clare, 2010).

The correlation between economic growth and imports is 0.9717*, which is even higher than that for exports. This very strong and significant positive relationship suggests that economic growth is also closely tied to the level of imports. This can be interpreted as imports being vital for economic growth, possibly through the importation of capital goods, technology, and intermediate inputs that bolster productivity and economic activities (Frankel & Romer, 1999).

The correlation between economic growth and FDI is 0.7624*, indicating a strong and statistically significant positive relationship. This suggests that higher levels of FDI are associated with higher economic growth, supporting the notion that FDI contributes to economic development by providing capital, technology transfer, and creating jobs (Borensztein, De Gregorio, & Lee, 1998).

The correlation between economic growth and debt is 0.3945*, which is weaker compared to the other variables but still statistically significant. This positive relationship suggests that while debt may play a role in financing growth, it is not as influential as exports, imports, or FDI. The relatively weaker correlation might reflect the complex nature of debt's impact on growth, which can be positive if used for productive investment but potentially negative if it leads to high debt burdens (Reinhart & Rogoff, 2010).

4.4 Empirical Analysis

This section presented the data analysis, which addressed the key objective of the study. The study was geared towards investigating effect of the Kenya-China economic relations on Kenya. This relationship was investigated by analyzing how various

macroeconomic factors (imports, exports, foreign direct investment, and debt) activities between China and Kenya influence the gross domestic product of the country. The outcomes are presented in Table 4.7 and discussed in the following section. The table shows a summary of the empirical results of an ARDL model where GDP is differenced, FDI and export are lagged 2 and debt and imports are at level. The r-squared, which was 0.618, and the corrected r-squared, which is 0.557, are the initial research outcomes to be interpreted. This percentage suggests that the variables in the model accounted for about 55.7% of the variation in Kenya's GDP, with the remaining 44.3% coming from factors outside the model.

Hypothesis 1 (H_{01}) stated that Kenya's exports to China has no significant effect on Economic growth in Kenya. The findings in Table 4.6 indicate that Kenya's exports to China had a negative and insignificant effect on Economic growth in Kenya ($\beta_1 = -0.014444, p > 0.05$): hence H_{01} is accepted and it is concluded that Kenya's export to China has no significant effect on Economic growth in Kenya.

Hypothesis 2 (H_{02}) stated that Kenya's imports from China has no significant effect on Economic growth in Kenya. The findings in Table 4.6 indicate that Kenya's imports from China had a positive and significant effect on Economic growth in Kenya ($\beta_2 = 0.006888, p < 0.05$): hence H_{02} is rejected and it is concluded that Kenya's import from China has significant effect on Economic growth in Kenya. Empirically, a unit increase in Kenya's imports from China led to a 0.006888 unit increase in economic growth. The findings of this study agree with the previous studies done by (Githinji and Thuku, 2017; Mwega, 2016; Wang and Blomström, 2021; Omolo and Muriuki, 2019).

Hypothesis 3 (H_{03}) stated that Kenya's total debt from China has no significant effect on Economic growth in Kenya. The findings in Table 4.6 indicate that Kenya's total

debt from China had a positive and insignificant effect on Economic growth in Kenya ($\beta_3 = 0.034313, p > 0.05$): hence H_{03} is accepted and it is concluded that Kenya's total debt from China has insignificant effect on Economic growth in Kenya.

Hypothesis 4 (H_{04}) stated that Chinese FDI inflows into Kenya has no significant effect on Economic growth in Kenya. The findings in Table 4.6 indicate that Chinese FDI inflows into Kenya had a negative and significant effect on Economic growth in Kenya ($\beta_4 = -2.959999, p < 0.05$): hence H_{04} is rejected and it is concluded that Chinese FDI inflows into Kenya has significant effect on Economic growth in Kenya. Empirically, a unit increase in Chinese FDI inflows into Kenya led to a 2.959999 unit decrease in economic growth.

Table 4.7: Empirical Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1137.159	255.1361	4.457069	0.0002
DEBT	0.034313	0.299325	0.114635	0.9097
FDI	-2.959999	1.210426	-2.445420	0.0219
IMP	0.006888	0.001464	4.705703	0.0001
EXPORT	-0.014444	0.150175	-0.096178	0.9241
R-squared	0.618445			
Adjusted R-squared	0.557396			
Dependent Variable = GDP				

Source: Author, 2025

4.5 Results and Discussions

The first objective was to determine whether Kenya's exports to China has influence on Economic growth in Kenya. The findings indicated that Kenya's exports to China had a negative and insignificant effect on Economic growth in Kenya ($\beta_1 = -0.014444, p > 0.05$): hence H_{01} is accepted and it is concluded that Kenya's export to China has no significant effect on Economic growth in Kenya. The negative and insignificant effect of Kenya's exports to China on economic growth could be attributed

to factors such as the profile of Kenya's export, skewed trade imbalance, and lack of technology transfer. Kenya's exports are primarily low-value raw materials and agricultural products with minimal value addition. This limits the potential for substantial economic benefits compared to high-value manufactured exports (Were, 2018). Additionally, Kenya's trade balance with China remains largely skewed due to high imports of manufactured goods. This leads to a trade deficit that may offset any gains from exports (Mwega, 2016). Furthermore, limited technology transfer and weak linkages between export sectors and the broader economy may reduce the overall impact on economic growth (UNCTAD, 2020).

The second objective was to determine whether Kenya's imports from China has influence on Economic growth in Kenya. The findings indicate that Kenya's imports from China had a positive and significant effect on Economic growth in Kenya ($\beta_2 = 0.006888, p < 0.05$): hence H_{02} is rejected and it is concluded that Kenya's import from China has significant effect on Economic growth in Kenya. Empirically, a unit increase in Kenya's imports from China led to a 0.006888 unit increase in economic growth. The findings of this study agree with the previous studies done by (Githinji and Thuku, 2017; Mwega, 2016; Wang and Blomström, 2021; Omolo and Muriuki, 2019). Imports from China often consist of machinery, electronics, and industrial inputs which are critical for infrastructure development and industrialization in Kenya. According to Githinji and Thuku (2017), such imports facilitate technological advancements and productivity improvements within various sectors of the economy. The influx of affordable and high-quality machinery from China allows Kenyan firms to enhance their production capabilities, leading to increased economic output. The multiplier effect of goods imported for reexport to neighboring countries may also be attributed to the positive impacts of imports from China.

The availability of a wide range of consumer goods from China at competitive prices has helped improve the standard of living in Kenya. Consumer access to affordable products contributes to increased household consumption, which is a significant component of GDP. As noted by Mwega (2016), the importation of low-cost goods from China helps manage inflation and allows consumers to save and spend on other economic activities, thus stimulating economic growth.

Moreover, the relationship between imports and economic growth can be understood through the lens of the endogenous growth theory, which posits that investment in human capital, innovation, and knowledge are key drivers of economic growth. Imports from China bring in new technologies and knowledge that are essential for innovation and development in Kenya. As Wang and Blomström (2021) highlight, the transfer of technology through imports can lead to spillover effects, where local firms adopt and improve upon these technologies, thereby fostering a more dynamic and competitive economic environment.

Empirical studies support these findings. For instance, Njenga (2018) found that increased imports of capital goods from China significantly contribute to Kenya's manufacturing sector's growth. This sector, in turn, plays a crucial role in driving overall economic growth by creating jobs and increasing exports of manufactured goods.

Furthermore, trade with China provides an opportunity for Kenyan businesses to integrate into global value chains, enhancing their competitiveness and ability to access international markets. By importing intermediate goods and components from China, Kenyan firms can engage in value-added production, which boosts economic growth through increased exports. This phenomenon is well-documented in the literature, with

studies such as those by Omolo and Muriuki (2019) demonstrating that participation in global value chains enhances economic resilience and growth.

The third objective was to determine whether Kenya's total debt from China has influence on Economic growth in Kenya. The findings indicated that Kenya's total debt from China had an insignificant effect on Economic growth in Kenya ($\beta_3 = 0.034313, p > 0.05$): hence H_{03} is accepted and it is concluded that Kenya's total debt from China has insignificant effect on Economic growth in Kenya.

The fourth objective was to determine whether Chinese FDI into Kenya has influence on Economic growth in Kenya. The findings indicated that Chinese FDI inflows into Kenya had a negative and significant effect on Economic growth in Kenya ($\beta_4 = -2.959999, p < 0.05$): hence H_{04} is rejected and it is concluded that Chinese FDI inflows into Kenya has significant effect on Economic growth in Kenya. Empirically, a unit increase in Chinese FDI inflows into Kenya led to a 2.959999 unit decrease in economic growth. The findings of this study agree with the previous studies done by (Osano and Koine, 2016; Mwangi, 2018; Chege, 2017; Mohan and Tan-Mullins, 2019). It is important to consider the potential adverse effects of foreign direct investment (FDI) on domestic industries. According to Osano and Koine (2016), large inflows of Chinese FDI can lead to market domination by foreign firms, which often outcompete local businesses due to their superior financial resources and technological capabilities. This market dominance can stifle the growth of domestic enterprises, leading to reduced economic diversity and lower overall economic growth.

Furthermore, Chinese FDI in Kenya has been heavily concentrated in the extractive industries and infrastructure projects, which may not have the same multiplier effects on the economy as investments in manufacturing or technology sectors. As Mwangi

(2018) points out, investments in the extractive sector can lead to an economic phenomenon known as the "resource curse," where reliance on natural resource extraction undermines broader economic development and leads to volatility in economic growth due to fluctuating commodity prices.

Moreover, there are concerns regarding the quality and sustainability of Chinese-funded projects. Several studies, including those by Chege (2017), have highlighted issues such as substandard construction, lack of local capacity building, and environmental degradation associated with some Chinese infrastructure projects. These problems can offset the potential economic benefits of such investments and contribute to negative growth impacts.

Additionally, the nature of Chinese FDI often involves the use of Chinese labor and materials, which limits the employment and economic opportunities for local populations. As noted by Mohan and Tan-Mullins (2019), the limited integration of local workers and suppliers in Chinese projects reduces the positive spillover effects typically associated with FDI, such as knowledge transfer and skill development, thereby diminishing the potential for economic growth.

Empirical studies provide further evidence supporting these concerns. For instance, Ndikumana and Verick (2018) found that while Chinese FDI has increased the infrastructure stock in several African countries, it has also led to increased debt levels and dependency on China, which can strain national budgets and reduce fiscal space for other development initiatives. This debt dependency is particularly relevant for Kenya, where large-scale infrastructure projects have been financed through loans tied to Chinese FDI, exacerbating the debt burden and potentially hampering long-term economic growth. Lastly, the significant negative effect observed in the study could be

attributed to capital flight and profit repatriation. Many foreign firms repatriate profits to their home countries, resulting in a net outflow of capital that can negatively impact the host country's balance of payments and economic growth. As Akinlo (2020) discusses, the repatriation of profits by Chinese firms operating in Africa can negate the initial benefits of FDI inflows, leading to adverse effects on economic growth.

Table 4.8: Summary of hypotheses

Hypothesis	Beta values	P values	Decision
H0 ₁ Kenya's export to China has no significant effect on Economic growth in Kenya.	-0.014444	0.9241	Accept
H0 ₂ Kenya's import from China has no significant effect on Economic growth in Kenya.	0.006888	0.0001	Reject
H0 ₃ Kenya's total debt from China has no significant effect on Economic growth in Kenya.	0.034313	0.9097	Accept
H0 _{5d} Chinese FDI inflows into Kenya have no significant effect on Economic growth in Kenya.	-2.959999	0.0219	Reject

Source: Author, 2025

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Overview

The data findings were summarized, conclusions were derived from the findings that were highlighted, and recommendations were provided in this chapter. The aim of this study was to examine how Kenya's economic progress is impacted by China's economic ties with Kenya.

The study's objectives were addressed in the conclusions and recommendations that followed. These included figuring out how Kenya's exports to China affected Kenya's economic growth, figuring out how Kenya's imports from China affected Kenya's economic growth, examining the impact of China's debt to Kenya on Kenya's economic growth, and looking into the effect of Chinese foreign direct investment on Kenya's economic growth.

Among the four factors, FDI and imports were found to have significant influence on GDP, while debts and exports were found to have insignificant influence. As a result, this discussion is done with major emphasis on the significant factors.

5.1 Summary of Findings

The first interesting finding of this study is the negative and significant effect of foreign direct investment from China on Kenya on Kenya's gross domestic product. The foreign direct investment net inflow from China to Kenya negative effects could have resulted from several aspects. First, this study considered data up to year 2021. In the recent past, Kenya allowed huge FDI inflows from China to Kenya. There has been influx of Chinese products in Kenya. These Chinese products are replacing the local manufactured products made by artisans famously known as "Juakali" in Kenya. The

products made in Kenya local artisans include handmade kitchen products such as utensils. The Chinese products are sold at a lower market price as compared to Kenyan local made products. As a result, the artisans' locally made products are losing their market, negatively affecting the livelihood of the large population of Kenyan artisans because they are losing their earnings.

As quoted from the Kenya National Federation of Jua Kali Association, the foreign investment of Chinese firms has led to influx of cheap Chinese goods, which have devastated the regional market of their traditional handmade products. As a result, it is argued that the industrial sector is affected negatively by FDI inflows from China that in turn negatively affects Kenyan's GDP. Another aspect that could be argued is that due to the close trade relationship between Kenya and China, there is no explicit policy regulating FDI inflow from China. As a result, this would result to what is referred to as "crowding out effect" of the "dumping" effect. There are previous researchers that agree with these findings. For instance, Quazi (2004) whose conducted a study on foreign aid and capital freight in Bangladesh, he found out that FDI results to negative effects on host country economy. Additionally, a study by Schoors *et al.* (2002) indicated that FDI might result to what is referred to as "market stealing" where the domestic firms may be pooled out of the market by the inflows of the FDI firms.

Another interesting research was that the results indicated that imports from China to Kenya results to a positive increase in GDP and vice-versa. This relationship could be explained from several perspectives. First, Kenya imports from China comprises of various capital goods, which are used in sectors such as agriculture, transport and infrastructure, and information technology. These capital goods could be considered and seen as growth oriented and innovation oriented. Most of the machineries used in Kenya transport sector, such as standard gauge railways were imported from China.

Additionally, most of the machineries and vehicles used in road constructions are imports from China, which are utilized in undertaking economic development projects. According to Baark (1988), the importation of machines that are used in the agricultural and industries increases the output and production of the concerned nation. As a result, this research is supported by that of Baark (1988) that imports of capital goods from China increases economic growth of Kenyan economy. Another argument is borrowed from Keller (2000) who argues that when a developing country imports from a developed country, it stands to gain, as compared to importing from another developing country. When a developing country imports from a developed country, it benefits both in terms of developed machinery technology, as well as the associated knowledge and technological advancement. This is the case for Kenya and China.

This research finding concur with that of Wamalwa & Were (2021) whose research asked the question “Is Kenya an export or import driven economic growth?” country. Their research was findings out whether Kenya’s economic growth is driven more by export or imports. Their findings indicated that output growth is influenced by imports. Since the Kenyan imports are diversified, as compared to agricultural concentrated exports, they tend to have higher impact on output growth. The growth was specifically associated with imports of machineries, manufactured commodities, and industrial goods.

Though debt was not found to have a significant effect on GDP, it is important to highlight some aspects, considering its positive relationship with GDP. The evaluation of the debt and GDP statistics revealed increased growth on them over the last few years. There are several aspects that could be argued from these aspects. In the last few years, Kenya has borrowed significantly from China, the money that has been invested in economic projects, such as infrastructure development like standard gauge railway

(SGR) and the Thika Super Highway Improvement projects. These projects have resulted to creation of employment among Kenyans as well as boosted the money circulation in the economy. By lowering the cost of general transportation, enhancing accessibility to public transportation, creating job opportunities, and providing housing and recreational opportunities, they have also improved Nairobi's urban mobility and transportation services. Furthermore, as Mugendi (2011) argues and finds empirically, projects have encouraged private sector involvement in the management and operation of road infrastructure in Kenya. Thus, through higher GDP, these ensuing activities have contributed to positive economic growth and development.

The research also found that exports have insignificant negative effects on GDP. This is an interesting finding which indicated that the exports to China contributed negatively to economic development of Kenya. Historically, it is observed that Kenya and China have had bilateral relationship for a long time. However, the Kenya's exports to China have remained little, with a slight gradual annual increase. Much export has not been realized until the past few years. For instance, according United Nations COMTRADE database, the Kenya's export to China was US\$199.62 Million. It is also noted that Kenya has been eying and making efforts to boost its export to China, especially in the agricultural products sector. For instance, the products which are in high demand in China, including tea, flowers and plants, leather products, coffee, macadamia, pineapples and oil seeds products. The negative relationship could be linked to the many challenges Kenya's exports faces in China. For instance, there is higher tariffs for Kenya's products as compared to other least developed countries which are given preferential treatment. As well, there is limited direct flights to China, to facilitate the export of flowers, and the strict compliance with the phytosanitary controls required in the export of avocados.

5.2 Conclusions

This research was driven by the increasing economic ties being developed among China and African countries, and specifically between China and Kenya. This relationship has ignited great concern for both the concerned nations as well as the economic super powers of the west such as the United States and European countries. The Kenya-China economic relationships have been increasing tremendously over time, which have seen Kenyan government borrow hugely from China. The relationship is facilitated by trade agreements between them such as "Agreement on Economic and Technological Cooperation between the People's Republic of China and the Republic of Kenya". To evaluate this relationship, this study led an analysis of the effects of Kenya's exports, imports, debt, and foreign direct investment on Kenya's GDP. The study adopted a quantitative design with secondary data collected for the period between years 1990 to 2021. The multiple regression analysis was applied to test the data after conducting the necessary diagnostic tests and making sure that the data was appropriate for the study. The diagnostic tests conducted included unit root tests, serial correlation tests, and heteroscedasticity tests. The descriptive statistics was also conducted to have a deeper understanding of the study variables.

The results of the study indicated that foreign direct investment (FDI) inflows from China have a negative and significant effect on the gross domestic product (GDP) in Kenya. This implied that an increase in FDI from China resulted to negative effects in Kenya's economy by declining its GDP. This was considered to be so because FDI could be resulting to huge influx of China's products driving out Kenya's domestic products and small-scale sector from the market, as well as the crowding out effect.

The result also indicated that imports from China has an encouraging effect on GDP hence positive economic growth. These findings meant that Kenya is an import-driven

economy. Kenya is an emerging nation, and imports from China, an established country. This means that it imports products that are advanced than its capability of production. Additionally, Kenya imports are diversified, as compared to agricultural concentrated exports, they tend to have higher impact on output growth. By importing from China, Kenya benefits both in terms of developed machinery technology, as well as the associated knowledge and technological advancement. Its imports include various capital goods, which are used in sectors such as agriculture, transport and infrastructure, and information technology. These capital goods could be considered and seen as growth oriented and innovation oriented that increased the output and production in Kenya, boosting GDP and economic growth.

The outcomes also indicated that debt from China has an encouraging effect on the gross domestic product of Kenya. These findings implied that the loan from China positively influenced Kenyan economy. The monetary loan from China have seen many development projects being implemented in China, majorly in the infrastructure sector. These projects include the Standard Gauge Railway that have eased the transport of people and goods between Mombasa and Nairobi and created employment; the Thika Super Highway that have eased the transport between Nairobi and Thika and the nearby towns and residential areas; the Nairobi Expressway that will unlock traffic jam in the capital city of Nairobi; and other smaller infrastructure projects implemented all over the country. These projects have created employment, boosted money circulation consumption and output.

Exports to China were found to have a negative influence to Kenya's GDP. Though the magnitude of influence is minimal, the negative relationship raises concerns. The research indicates that the Kenya's export has not been much until in the past few years. As well, Kenya's export to China is faced by several challenges including high

standards required in Chinese markets and high tariffs. For Kenya economy to benefit from China's export, favorable terms of trade need to be negotiated and agreements signed.

5.3 Recommendations

Based on the findings of this research, and with reference to the critical analysis of literature, several recommendations could be highlighted. First, Kenya is an import-led growth economy. Therefore, imports from China, especially for capital goods that are used in critical sectors such as industries, infrastructure, and agriculture should be encouraged. By importing from China, a technologically developed country, Kenya benefits by transfer of technology, knowledge and innovations.

Secondly, the borrowing from China could be continued for the benefits of the country. However, the borrowed funds should be channeled to projects and uses that are economically beneficial. These include the projects that would create industrial development and infrastructure development, which have a direct influence on the economic output. Such investment would result to improvement of transport services and urban mobility within the country, hence dropping general transport costs, enhancing accessibility to public transportation. Additionally, the employment opportunities would be created by employing Kenyans in these projects and the later spillover effects of the implemented projects. Further, other economically beneficial activities such as housing and recreation activities would be developed from the borrowed money. Moreso, project has endorsed private sector participation in the management and operation of road infrastructure.

It is also recommended that the foreign direct investment from China to Kenya need to be monitored and limited. New policies need to be put in place to protect "dumping"

and “crowding out effect” as well as protect local industries and artisans working in the informal sector. To boost their exports to China, Kenya should make significant efforts to negotiate favorable trade agreements that would reduce or rather eliminate the trade bottlenecks. These should be geared towards facilitating and supporting the micro, small and medium-sized enterprises in the horticultural sector, tea farming, fruit, and vegetable sector value chain. More importantly, the Kenya’s products should work towards developing and meeting the standards required and appropriate for the Chinese market.

5.4 Suggestions for Future Research

Even though debt was not found to have a significant impact on GDP, this could be because Chinese loans to Kenya are channeled into capital budgeting investments, whose returns may take longer to recover. This is consistent with the findings of Hassan *et al.* (2005), who found that loans have a negligible and negative impact on economic growth. It did not, however, correspond with earlier studies on the impact of total debt on Kenya's economic expansion. According to Mageto (2015), public debt stimulated investment and economic growth. This raises the need for more investigation into the precise terms and circumstances of China's loans to Kenya. Remarkably, FDI had a negative but negligible impact on GDP. I would recommend reevaluating a number of bilateral relations issues to ascertain whether these effects are short- or long-term.

Furthermore, as the study only examined Kenya's bilateral relations with China, it would be possible to evaluate and compare the results of a cross-sectional study on other countries with which Kenya has bilateral relations. Also, the components of bilateral relations encompass more than just exports, imports, debt, and foreign direct investment; as a result, future attention must be paid to additional components.

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APPENDICES

Appendix A

Table A.1 Data Used

Year	exp	imp	FDI	Debt	GDP
1990	42.3	672.3	1.90	0.09	30431.945
1991	78.7	712.8	5.89	0.32	30869.662
1992	283.0	782.3	0.01	0.07	30622.861
1993	678.2	872.3	1.89	4.28	30731.020
1994	127.9	1082.8	0.08	0.68	31540.101
1995	829.9	1283.8	7.09	1.38	32929.826
1996	94.3	5367.7	5.73	2.17	34295.373
1997	627.0	6728.9	3.13	0.89	34458.243
1998	83.3	5732.2	4.80	4.11	35591.993
1999	637.8	7832.2	0.35	4.29	36412.526
2000	239.8	6930.2	0.48	0.89	36630.891
2001	738.8	9283.9	12.92	6.04	38015.504
2002	228.9	10902.2	0.69	6.04	38223.395
2003	837.8	11939.0	7.89	0.09	39344.287
2004	903.0	12795.0	2.68	0.03	41352.537
2005	1278.0	22967.0	2.05	0.03	43795.094
2006	1555.0	29721.0	0.19	45.74	46629.729
2007	1471.0	45672.0	8.92	65.48	49824.205
2008	2030.0	63474.0	23.24	165.14	49939.938
2009	2487.0	74524.0	28.13	249.74	51591.422
2010	2512.0	120648.0	101.23	212.96	55748.903
2011	3803.0	143817.0	68.18	394.40	58603.864
2012	5384.0	167206.0	78.74	456.32	61281.287
2013	4199.0	182356.0	230.55	208.67	63608.657
2014	6597.4	248648.3	278.40	3709.94	66801.882
2015	6597.4	248648.3	281.82	1653.12	70120.413
2016	10061.0	337450.1	29.68	1061.15	73074.949
2017	9997.5	390622.3	410.19	505.74	75879.535
2018	11132.9	370826.4	232.05	169.77	80165.170
2019	15160.3	376725.6	10.38	264.96	84264.945
2020	14794.5	361366.7	629.63	162.46	84054.151
2021	19924.9	423779.8	728.29	148.99	90372.809

Appendix B

Table B.1 Stationarity Test for GDP

Null Hypothesis: D(GDP1) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic - based on AIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.618184	0.0004
Test critical values: 1% level	-4.309824	
5% level	-3.574244	
10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDP1,2)

Method: Least Squares

Date: 09/01/22 Time: 18:18

Sample (adjusted): 1993 2021

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP1(-1))	-1.891877	0.336742	-5.618184	0.0000
D(GDP1(-1),2)	0.520560	0.266200	1.955523	0.0618
C	-220.9016	468.6820	-0.471325	0.6415
@TREND("1990")	231.0907	48.10466	4.803915	0.0001
R-squared	0.676810	Mean dependent var	226.3948	
Adjusted R-squared	0.638027	S.D. dependent var	1807.592	
S.E. of regression	1087.523	Akaike info criterion	16.94863	
Sum squared resid	29567651	Schwarz criterion	17.13723	
Log likelihood	-241.7552	Hannan-Quinn criter.	17.00770	
F-statistic	17.45129	Durbin-Watson stat	1.945264	
Prob(F-statistic)	0.000003			

Table B.2: Stationarity Test for FDI

Null Hypothesis: D(FDI,2) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 5 (Automatic - based on AIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.218360	0.0000
Test critical values: 1% level	-4.394309	
5% level	-3.612199	
10% level	-3.243079	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(FDI,3)

Method: Least Squares

Date: 09/01/22 Time: 18:22

Sample (adjusted): 1998 2021

Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1),2)	-13.94268	1.931557	-7.218360	0.0000
D(FDI(-1),3)	11.69250	1.862099	6.279207	0.0000
D(FDI(-2),3)	10.11384	1.647527	6.138800	0.0000
D(FDI(-3),3)	8.230493	1.270257	6.479392	0.0000
D(FDI(-4),3)	6.112662	0.830568	7.359615	0.0000
D(FDI(-5),3)	4.030156	0.495351	8.135956	0.0000
C	-17.12699	38.75412	-0.441940	0.6644
@TREND("1990")	1.884235	1.924336	0.979161	0.3421

R-squared	0.989133	Mean dependent var	-21.63946
Adjusted R-squared	0.984379	S.D. dependent var	479.1362
S.E. of regression	59.88383	Akaike info criterion	11.28389
Sum squared resid	57377.17	Schwarz criterion	11.67658
Log likelihood	-127.4067	Hannan-Quinn criter.	11.38807
F-statistic	208.0576	Durbin-Watson stat	1.722170
Prob(F-statistic)	0.000000		

Table B.3: Stationarity Test for Debt

Null Hypothesis: DEBT has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on AIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.670198	0.0399
Test critical values: 1% level	-4.284580	
5% level	-3.562882	
10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DEBT)

Method: Least Squares

Date: 09/01/22 Time: 18:22

Sample (adjusted): 1991 2021

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEBT(-1)	-0.665088	0.181213	-3.670198	0.0010
C	-116.5535	242.6001	-0.480435	0.6347
@TREND("1990")	20.13162	14.43124	1.395003	0.1740
R-squared	0.325612	Mean dependent var		4.803272
Adjusted R-squared	0.277442	S.D. dependent var		761.5635
S.E. of regression	647.3551	Akaike info criterion		15.87543
Sum squared resid	11733921	Schwarz criterion		16.01421
Log likelihood	-243.0692	Hannan-Quinn criter.		15.92067
F-statistic	6.759573	Durbin-Watson stat		2.014047
Prob(F-statistic)	0.004025			

Table B.4: Stationarity Tests for Exports

Null Hypothesis: D(EXPORT) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.859045	0.0002
Test critical values: 1% level	-4.296729	
5% level	-3.568379	
10% level	-3.218382	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXPORT,2)

Method: Least Squares

Date: 09/01/22 Time: 13:51

Sample (adjusted): 1992 2021

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXPORT(-1))	-1.444491	0.246540	-5.859045	0.0000
C	-8635.976	3767.216	-2.292403	0.0299
@TREND("1990")	1058.699	237.3813	4.459908	0.0001
R-squared	0.572407	Mean dependent var		1678.867
Adjusted R-squared	0.540733	S.D. dependent var		13613.44
S.E. of regression	9225.723	Akaike info criterion		21.19202
Sum squared resid	2.30E+09	Schwarz criterion		21.33214
Log likelihood	-314.8803	Hannan-Quinn criter.		21.23684
F-statistic	18.07208	Durbin-Watson stat		1.549453
Prob(F-statistic)	0.000010			

Table B.5 Stationarity Tests for Imports

Null Hypothesis: IMPORT has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 7 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.742077	0.0387
Test critical values: 1% level	-4.394309	
5% level	-3.612199	
10% level	-3.243079	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(IMPORT)

Method: Least Squares

Date: 09/01/22 Time: 13:56

Sample (adjusted): 1998 2021

Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IMPORT(-1)	-0.602263	0.160944	-3.742077	0.0022
D(IMPORT(-1))	0.379321	0.192700	1.968458	0.0691
D(IMPORT(-2))	0.385323	0.178490	2.158800	0.0487
D(IMPORT(-3))	0.360504	0.216857	1.662402	0.1186
D(IMPORT(-4))	0.736076	0.366429	2.008781	0.0643
D(IMPORT(-5))	0.634938	0.412418	1.539550	0.1460
D(IMPORT(-6))	0.783317	0.447613	1.749989	0.1020
D(IMPORT(-7))	1.688425	0.378338	4.462742	0.0005
C	-386619.2	192846.6	-2.004802	0.0647
@TREND("1990")	39124.25	14904.97	2.624913	0.0200
R-squared	0.753790	Mean dependent var	165222.0	
Adjusted R-squared	0.595512	S.D. dependent var	240484.6	
S.E. of regression	152946.8	Akaike info criterion	27.00790	
Sum squared resid	3.27E+11	Schwarz criterion	27.49876	
Log likelihood	-314.0949	Hannan-Quinn criter.	27.13813	
F-statistic	4.762439	Durbin-Watson stat	1.851423	
Prob(F-statistic)	0.004788			

Appendix C

Table C.1: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.160444	Prob. F(2,23)	0.8527
Obs*R-squared	0.412791	Prob. Chi-Square(2)	0.8135

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 09/01/22 Time: 19:08

Sample: 1992 2021

Included observations: 30

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.689716	264.3951	0.021520	0.9830
DEBT	-0.032251	0.315881	-0.102098	0.9196
D(FDI,2)	-0.025135	1.282758	-0.019594	0.9845
IMP	3.83E-05	0.001520	0.025164	0.9801
D(EXP01,2)	-0.006303	0.160299	-0.039321	0.9690
RESID(-1)	0.049336	0.216625	0.227748	0.8219
RESID(-2)	0.110249	0.226148	0.487510	0.6305
R-squared	0.013760	Mean dependent var	4.93E-14	
Adjusted R-squared	-0.243520	S.D. dependent var	984.7319	
S.E. of regression	1098.107	Akaike info criterion	17.04153	
Sum squared resid	27734272	Schwarz criterion	17.36847	
Log likelihood	-248.6229	Hannan-Quinn criter.	17.14612	
F-statistic	0.053481	Durbin-Watson stat	1.905631	
Prob(F-statistic)	0.999244			

Table C.2: Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.247997	Prob. F(4,25)	0.9081
Obs*R-squared	1.144952	Prob. Chi-Square(4)	0.8871
Scaled explained SS	0.658031	Prob. Chi-Square(4)	0.9564

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 09/01/22 Time: 19:11

Sample: 1992 2021

Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	972459.5	311676.5	3.120092	0.0045
DEBT	-287.0772	365.6586	-0.785096	0.4398
D(FDI,2)	510.4473	1478.667	0.345208	0.7328
IMP	0.438053	1.788095	0.244983	0.8085
D(EXP01,2)	2.261795	183.4550	0.012329	0.9903
R-squared	0.038165	Mean dependent var	937373.7	
Adjusted R-squared	-0.115729	S.D. dependent var	1226592.	
S.E. of regression	1295625.	Akaike info criterion	31.13790	
Sum squared resid	4.20E+13	Schwarz criterion	31.37143	
Log likelihood	-462.0684	Hannan-Quinn criter.	31.21261	
F-statistic	0.247997	Durbin-Watson stat	2.064767	
Prob(F-statistic)	0.908147			

Appendix D

Table D.1: Regression Analysis

Dependent Variable: D(GDP1)
 Method: Least Squares
 Date: 09/01/22 Time: 19:14
 Sample (adjusted): 1992 2021
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1137.159	255.1361	4.457069	0.0002
DEBT	0.034313	0.299325	0.114635	0.9097
D(FDI,2)	-2.959999	1.210426	-2.445420	0.0219
IMP	0.006888	0.001464	4.705703	0.0001
D(EXP01,2)	-0.014444	0.150175	-0.096178	0.9241
R-squared	0.618445	Mean dependent var	1983.438	
Adjusted R-squared	0.557396	S.D. dependent var	1594.187	
S.E. of regression	1060.589	Akaike info criterion	16.92205	
Sum squared resid	28121212	Schwarz criterion	17.15558	
Log likelihood	-248.8307	Hannan-Quinn criter.	16.99676	
F-statistic	10.13032	Durbin-Watson stat	1.791114	
Prob(F-statistic)	0.000051			