

**DETERMINANTS OF KENYA'S TRADE IN GOODS: A GRAVITY MODEL
APPROACH**

BY

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DECLARATION

I hereby declare that this is my original and legitimate work and that to the best of my knowledge, it has not been presented for examination in any other University.

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DEDICATION

I dedicate this research work to my parents who have given me an enduring moral and emotional support during the entire epoch of my research work. They have always looked forward with optimism to its completion. May God bless them richly.

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LIST OF ACRONYMS/ABBREVIATIONS

AGOA	African Growth Opportunity Act
AfCFTA	African Continental Free Trade Area
BEC	Broad Economic Category
BoPs	Balance of Payments
CIA	Central Intelligence Agency
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
ECI	Economic Complexity Index
EPAs	Economic Partnership Agreements
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
IGAD	Intergovernmental Authority on Development
IGADD	Intergovernmental Authority on Drought and Development
IMF	International Monetary Fund
KNBS	Kenya National Bureau of Statistics
MoT	Ministry of Trade
OEC	Observatory Economic Complexity
PTA	Preferential Trade Area
RCA	Revealed Comparative Advantage
ROK	Republic of Kenya
RTA	Regional Trade Agreement
SADC	Southern African Development Community
SSA	Sub-Saharan Africa
USMCA	US-Mexico-Canada Agreement
VAT	Value Added Tax
WTO	World Trade Organization

ABSTRACT

This study applied PPML estimation technique to analyze Kenya's determinants of bilateral trade flows in goods. It used panel data covering 166 Kenya's trading partner countries for the period 2005-2020. The empirical results reveal that economic size, population, relative factor endowment, per capita GDP differential, trade openness, bilateral real effective exchange rate, regional trade agreement (RTA) and WTO membership, similarity in legal systems, and religious beliefs positively influence Kenya's bilateral trade flows. Conversely, distance, contiguity and common language negatively impact Kenya's trade flows in goods. The outcome also illustrates that Kenya's trade patterns are anchored on the Heckscher-Ohlin theory which states that nations with similar factor endowments witness higher trade transactions than those with contrary factor endowment proportions. The study also found that institutional quality and institutional distance (homogeneity) are not significant in influencing Kenya's trade flows in goods. Given that the results showed that Kenya trade more with distant countries compared to its neighbors, there is need for Kenya (through relevant authorities) to develop appropriate trade policies to raise its trade potentials with its neighbors.

CHAPTER ONE INTRODUCTION

1.0 Background

Trade enhances efficient production of goods and services through efficient resource allocation among countries that have comparative advantage in their production. Similarly, trade links the economy's vast sectors by enhancing access to both domestic and foreign markets for goods and services. Thus, trade acts as a driver and an instrument of economic growth and development (Frankel & Romer, 1999; Didier & Pinat, 2012). In addition, trade plays a significant role in eradicating poverty through backward and forward linkages. These linkages enhance direct and indirect employment opportunities, which ensure equitable income distribution.

In light of this, developing countries have continued to formulate trade policies and strategies to boost their export volume (Ngepah & Udeagha, 2018). Nevertheless, they have continued to experience substantial trade deficits (Moussa, 2016; Mwangi, 2021). The trade deficits have in turn, adversely affected their balance of payments (BoPs), thus, rendering them unable to compete favorably in the international trade. Data from UN-Comtrade shows that in 2021, Kenya recorded estimated total exports of US\$ 6,751,366,221 and total imports of US\$ 19,594,117,729. The statistics show that the net exports stood at US\$ 12,842,751,508, a huge trade deficit in the balance of payments accounts.

Nonetheless, if developing countries can enact appropriate trade policies, such as anti-dumping policies (anti-dumping duty/protectionist tariffs), they can significantly tap into the benefits that come along with international trade. Developing countries can harness these benefits by expanding export and import volume. These benefits will be derived from exploiting the economies of scale

for small open economies through market access to the outside world (Helpman & Krugman, 1985) and competition that increases efficiency and productivity (Balassa, 1978). In addition, enhanced educative and learning effects will create avenues for spill-overs, thereby creating job opportunities in the economy (Todaro & Smith, 2014).

For developing countries whose economies are primarily agriculture-based, increased exports in agricultural goods to international markets will increase foreign reserves. In turn, these reserves would ease the importation of both capital and intermediate goods into these economies (Bussière et al., 2015; McKinnon, 1964; Korinek & Servén, 2016).

In this era of globalization and trade liberalization, Kenya is working hard to strategically position itself and assert its authority over the world's social-economic and political affairs. As globalization accelerates since the 18th Century due to technological innovations, it poses various challenges to global economies. Economic crises such as the world financial crisis of 2008/09 and the COVID-19 pandemic continue to pose serious challenges to economies globally. Thus, there is an accelerated tendency towards regional integration of world economies into RTAs such as EAC, USMCA (formerly, NAFTA), and ASEAN.

Regional integration provides various countries with mutual vested economic gains and eventually protect their nested individual and collective interests. Despite the advances in world integration, developing countries have not reaped the full benefits of trade liberalization so far. The WTO fourth Ministerial Conference held in Doha in November 2001 focused on this challenge, the objective being to promote a global free trade system. Top on the agenda was the problems developing countries encounter in implementing the 2001 WTO agreements to expand the market access (Dash, Cronin, & Goddard, 2003). Thus, it is projected that economic integration will raise

Kenya's trade potentials with other countries. The South-South trade cooperation for example, offers vital trading opportunities that can boost Kenya's export potentials.

1.1 Overview of Kenya's Economic Prospects

In 2020, Kenya became a lower-middle-income country and among the fastest expanding economies in SSA region, with a growth rate GDP of 5.7% (CIA, 2020). The World Bank (2019) ranked Kenya's economy among the largest and most prosperous economies in Central and East Africa. Equally, Kenya's population continues to show an upward trajectory of 47.56 million (KNBS, 2019). The population is vital as it plays a critical role both as a market base and a source of the labor force.

Having an estimated \$99.246 billion GDP and a \$2,010 GDP per capita, Kenya's economy is classified as the 62nd worldwide (IMF, 2019). Likewise, Economic Complexity Index (ECI) in 2019 rated Kenya's economy in terms of GDP at position 63 as well as positions 107 and 80 concerning total exports and imports, respectively. Equally, Kenya's economy ranked at positions 146 in per capita GDP and 87 as the most complex economy.

1.2 Kenya's Trade Policy and Reforms

Kenya's trade policies and reforms can be classified into three phases: pre-colonial era (before 1895), colonial era (between 1895-1962), and post-colonial era (after 1963-date).

1.2.0 Pre-colonial Era

This is the period before colonization of African countries. This era was characterized by mainly long-distance and barter trade among the pre-colonial Kenyan communities. Various communities utilized their different diversities in agricultural commodities and natural resources (such as salt and iron tools) in exchange for other goods among themselves and the coastal Arabian and Asian

traders. Pre-colonial era had no formal trade policy due to limited civilization and lack of a central sovereign authority. Therefore, different communities existed and traded mutually and coherently and accepted barter trade as a medium of exchange.

1.2.1 Colonial Era

During colonization, African colonial territories were classified into three main regions depending on their colonial structures. The regions included: (i) Africa of the concession-owing companies i.e., French Equatorial Africa and Belgian Congo; (ii) Africa of the labor reserves i.e., Southern and Eastern Africa; and (iii) Africa of the colonial economy i.e., French and British West Africa. Kenya was grouped under the second category.

Trade during the colonial era was mainly dominated by exports in primary commodities from the European settler farmers (referred as white highlands) and minerals from the European-owned ore companies. The British colonial power had amassed enormous human and capital resources and accumulated much political powers that gave them advantage in trade. Therefore, as the colonial government powers grew, so did Kenyan trade. The development of the railway network which eased the movement of agricultural produce and other natural resources to the coastal port for export can also be attributed to the growth of Kenya's trade. Similarly, the central direct rule by colonial Britain can be attributed to the growth of a more formal trade system in Kenya.

As Kenya's trade transited from barter to formal international trade, where domestically produced agricultural commodities and natural resources would be exported, African traders were weakened by the shift in trade. Through the established railway line, Indian traders reaped heavily by setting up shops along the sprouting towns of Kibwezi, Machakos, and Voi. In the 1930s, the colonial administration restricted trade activities through licenses to regulate the rising number of traders and reduce competition. This kept Africans at bay. By the 1950s, Africans agitated for their space

in trade which forced the government to give support to African traders. The entry of Africans into trade attracted many participants because it was deemed profitable.

1.2.2 Post-colonial Era

This is the period in which Kenya became a sovereign state and a republic. Within this epoch, Kenya has gone through five main and significant trade policy regimes. These policy regimes include: import substitution of 1963-79; SAPs of 1980-92; export-oriented policies of 1993-2002; strategy in economic recovery for employment and wealth creation of 2003-07; and lastly, vision 2030 and national trade policies of 2009 and 2017.

1.2.2.0 Import Substitution Policy (1963-79)

At post-independence, Kenya adopted the Import substitution policy in respect to the Sessional Paper No. 10 of 1965. The policy entailed promoting African Socialism through application to Economic Planning in Kenya, and it emphasized the promotion and protection of the local infant industries. This was to be achieved through reducing imports into the country, primarily, in the sector of manufacturing, through imposition of trade tariffs and quotas. At this period, Kenya had signed trade agreements, namely, EAC in 1967 and General Agreement on Tariffs and Trade (GATT) in 1964.

This trade policy regime was extremely protectionist as it protected domestic infant industries from foreign competition with a view of enhancing them to attain international standards. This policy was motivated by the principle of economic independence as the country had just come out of the colonial power. However, this policy failed to give the intended outcome as it encouraged inefficiencies in domestic production and consumer exploitation through monopolistic behaviors of firms.

1.2.2.1 Structural Adjustment Policies (SAPs) (1980-92)

As import substitution policies failed to achieve favorable economic outcome, the country shifted to the SAPs. The SAPs were induced in the mid-1980s through Sessional Paper No. 1 of 1986 that centered on the management of the economy for renewed growth. The key objective of the paper was to spearhead a systemic shift from dependence on import substitution and trade protectionism to policy that encouraged export manufacturing and economic liberalization.

The Sessional Paper No. 1 of 1986 centered on propelling the economy towards a policy that encouraged local industries to focus on Export Promotion and Reforms. Export Promotion and Reforms aimed at improving domestic efficiency and stir private investment through increased investor confidence. The reforms would foresee an increment in foreign exchange earnings in the sector. Similarly, the reforms aimed at privatization of public agencies by terminating the dominant responsibility of the public sector's institutions in the management, coordination, and facilitation of trade distribution networks and trade-related activities. It also aimed at liberating trade across borders by eliminating or lowering tariffs and relaxing the restrictions on foreign exchange.

To achieve these reforms, the government provided a conducive environment through a gradual liberalization of agricultural marketing systems. These systems included a comprehensive policy framework covering production, pricing, and marketing for both domestic and export goods. Under the manufacturing sector, the state put incentives like manufacturing under bond schemes in 1988, duty-free, export guarantee and credit schemes, VAT remission schemes, and instituting Export Promotion Council (EPC) in 1992 and export processing zones (EPZ) in 1990. Furthermore, to encourage investment, the Restrictive Trade Policies, Monopolies, and Price Control Act were also put in place by the government to safeguard against exploitation of the smaller firms by larger

enterprises. During this period, Kenya joined the Intergovernmental Authority on Drought and Development (IGADD) in 1986 and Preferential Trade Area (PTA) in 1981.

1.2.2.2 Export-Oriented Policies (1993-2002)

The period between 1993-2002 was the time characterized by high levels of trade openness (free trade). During this regime, trade policies were steered by the Sixth Development Plan policy document of 1989-93. At this time, Kenya endeavored to promote trade liberalization via creation of National Export Credit Guarantee Corporation (NECGC), restructuring and reducing tariffs, introducing export retention schemes, cancelling export duties, and a 100 percent retention of earnings from foreign exchange by exporters in 1993 (Gertz, 2009). After the collapse of EAC in 1977, efforts were put to revive it in 1999, Kenya joined the Indian Ocean RIM Association (IORA) in 1994, and PTA was changed to COMESA in 1997. Similarly, Kenya joined WTO that superseded GATT in 1995 and a year later it joined IGAD that superseded IGADD. Lastly, in 2001, Kenya joined AGOA.

1.2.2.3 Strategy in Economic Recovery for Employment and Wealth Creation (2003-07)

This regime is traced back to the strategy in economic recovery for employment and wealth creation. During this period, Kenya formulated the national export strategy of 2004. In 2005, the EAC member states became signatories to the EAC Customs Unions that benefited Kenya through the common external tariff policy.

1.2.2.4 Vision 2030 and the National Trade Policies of 2009 and 2017 (2008-Date)

From 2008 till date, Kenya has been steered by the National Trade Policies of 2009 and 2017 and Vision 2030. Kenya's economic blueprint plan for development that aims in transforming Kenya's economy into a middle-income level by 2030, is envisioned in the Vision 2030. Kenya through the MoT, developed the National Trade Policy whose vision was to transit Kenya into an efficient

local market with a global competitive export-oriented economy (ROK, 2009). This was in recognition of the various challenges of efficient coordination and lack of harmonious decision-making that witnessed a clash in the rules and regulations in implementing different trade policies.

In this period, Kenya joined various RTAs which include: EPAs in 2016; AfCFTA in 2018; and the Tripartite COMESA-EAC-SADC FTA in 2015 (Socrates & Kimuli, 2020). Similarly, during this regime, Kenya became a signatory to Common Market Protocol of the EAC in 2010. There are also several bilateral trade agreements that Kenya has entered into with its trade partners totaling 36 out of which 10 have been ratified (ROK, 2017).

In a nutshell, in Kenya like in the rest of the world, international trade is an essential agent for economic growth and development. It is for this cause that Kenya has developed and advanced different trade policies and strategies to help maximize gains from trade. Kenya has an open trade policy. This notwithstanding, its trade composition has remained concentrated in and dominated by primary products destined for its traditional markets. This has led to persistent trade deficits due to constant fluctuations in prices of primary exports vis-à-vis the capital goods. To that end, resource constraints due to overreliance on foreign exchange earnings from traditional primary exports have worsened Kenya's trade deficit.

1.3 Kenya's Exports and Imports

1.3.0 The Structure of Kenya's Trade in Goods

Kenya's trade in terms of exports entail a broad classification of agricultural and manufactured components, predominantly agricultural commodities like coffee, tea, and horticultural products. In addition, apparel and clothing goods also characterize the export sector. Thus, agricultural,

manufactured, and apparel components are the highest contributors of foreign exchange earnings for the country.

Kenya National Bureau of Statistics indicates that in January 2022, domestic exports by Broad Economic Category (BEC), the food and beverages which form the main export category, accounted for 46.67% of the domestic exports. On the other hand, the industrial non-food category accounted for 26.52% of the total domestic exports. While coffee has been showing a valuable significant share in total commodity exports, the trend has shifted to tea production. In 2021, tea in total exports accounted for US\$ 1.19 billion, while coffee accounted for US\$ 238.4M. Similarly, the value of coffee rose from US\$ 16.99M in December 2021 to US\$ 23.23M in January 2022. However, the value of tea dropped from US\$ 112.70M to US\$ 111.40M over the same period (KNBS, 2021).

In the 1980s, the manufacturing sector stagnated. As a result, its share in total exports was performing poorly. By 1990s, it had declined to about 13% from 16% in the 1980s through 1970s. Nevertheless, the manufacturing industry has kept an upward trend in growth, recording a significant improvement especially after the enactment of export-oriented policies. World Bank (2021) shows that in 2013, 2016, and 2019, Kenya's manufacturing sector recorded a total export share of 36.3%, 31.5%, and 30.8%, respectively.

Conversely, the value of merchandise imports to Kenya in 2020 was estimated at US\$ 15.41 billion compared to US\$17.21 billion in 2019. The sharp decrease of about 10.48% in merchandise imports between 2019 and 2020 can be attributed to the global supply chain interruption caused by COVID-19 pandemic. As the world experience gradual lifting of COVID-19 restrictions, Kenya's imports continue to show an upward trend. United Nations (2022) shows that Kenya

imported goods worth US\$ 19.59 billion in 2021. Thus, the projection of Kenya's imports will likely take a continuous upward trajectory in the long term.

1.3.1 Export Destinations and Import Sources

Kenya's export destinations continue to be the EAC member states with Uganda being the largest consumer of Kenyan goods. On the other hand, Kenya's main import sources include China (largest exporter) and India. Appendix A shows Kenya's top 20 export destinations and import sources in 2021.

1.3.2 Kenya's Major Export and Import Commodities

Kenya primarily exports agricultural goods classified into three categories including: agricultural, manufactured, and apparel/clothing components. In 2021, Kenya's top exports included: tea, cut flowers, coffee, titanium ore, palm oil, tobacco products, and refined petroleum. Conversely, the top imports included: electronics, iron and steel, machinery and transportation equipment, motor vehicles/automobiles, petroleum products, oil, pharmaceuticals, rice, wheat and meslin, plastics, and resins.

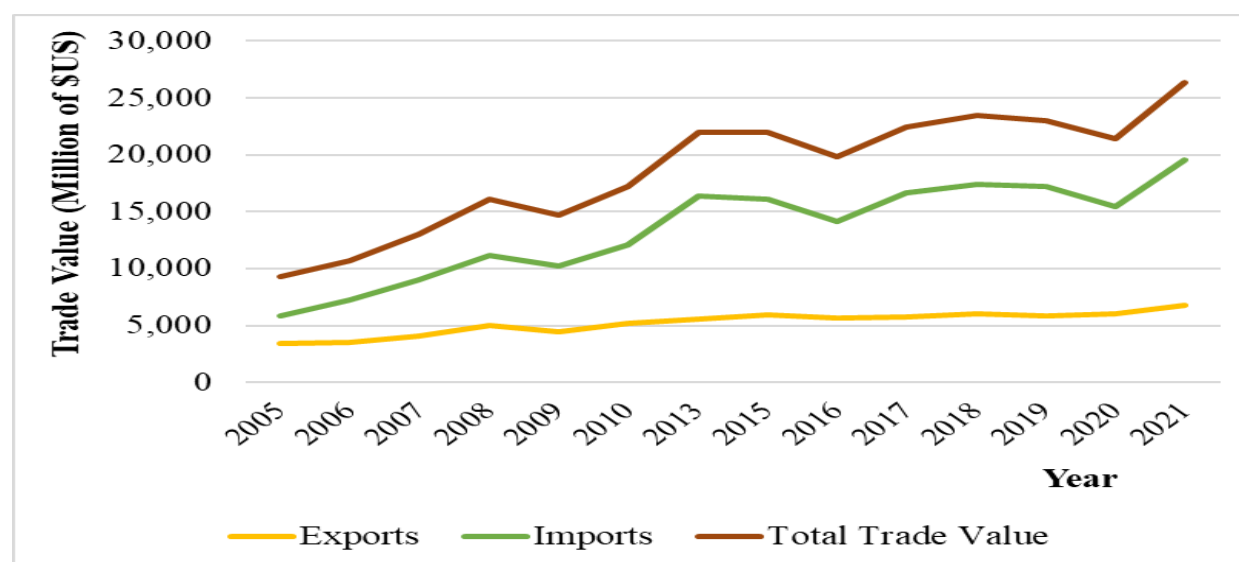
Data from UN-Comtrade shows that merchandise exports in 2021 stood at US\$ 6.75 billion up from US\$ 6.02 billion in 2020, a positive increase of 12.08%. Similarly, the main commodity groups in 2020, predominantly agricultural, accounted for US\$ 3.896 billion (64.41%) in total exports in which the value of tea and coffee had a share of US\$ 1.46 billion (24%). This is also a 6.44% increase in tea and coffee exports as observed from the past ten years. In addition, data shows that SSA accounted for 40.24% of total export destinations for Kenyan goods. Similar patterns are also witnessed from World Bank data in which exports in 2019 tripled and the SSA accounted for 33.02% of total export value (World Bank 2019). In 2021, domestic exports by BEC, food and beverages (main export category) on average was valued at US\$ 2.61 billion

approximately 43.16% of total export share while industrial supplies (non-food) were valued at US\$ 1.42 billion which is a 25.39% share of total domestic exports (KNBS, 2021).

Kenya's leading import commodities which included petroleum oils and products had the largest share of US\$ 3.07 billion; Cars, Packed Medicaments, Wheat, and Rolled iron stood at US\$ 522M, US\$ 471M, US\$ 439M, and US\$ 413M respectively (OEC, 2019). However, total import performance from these commodities reduced drastically in 2020. Petroleum oils and products, for example, accounted for US\$ 1.88 billion, which is a 38.76% decline, with only medicaments and wheat showing an increase of 13.8% and 4.33%, respectively.

In 2021, the main import category by BEC, industrial supplies (non-food), accounted for US\$ 7.57 billion while food and beverages, fuel and lubricants, machinery and other capital goods, transport equipment, and consumer goods and other goods (not elsewhere specified) were valued at US\$ 1.92, US\$ 3.31, US\$ 3.07, US\$ 1.83, US\$ 1.75, and US\$ 0.039 (all in billions) respectively (KNBS, 2021). Fig. 1.1 shows Kenya's export and import patterns from 2005-2021 while Appendix B shows the major export and import commodities in 2021.

Figure 1.1: Kenya's Exports and Imports Patterns from 2005-2021



Source: Author's compilation from UN-Comtrade (2022)

1.3.3 Kenya's Comparative Advantage Viz-a-vis Its Top Exports

Countries produce and exchange commodities in which they possess a comparative advantage over their competitors. Similarly, Kenya exports goods in which it produces using the minimum possible opportunity costs while importing those that it has less comparative advantage. In this regard, statistics shows that Kenya exports more of agricultural goods (labor intensive goods) while imports capital goods (capital intensive goods). Appendix C, shows Kenya's Comparative advantage in comparison to its top exports (coffee and tea). The statistics indicate that Kenya exports coffee and tea approximately 88 times its fair share in global trade. Hence, Kenya has a RCA in coffee and tea.

1.4 Problem Statement

Kenya has entered into several bilateral and multilateral trade agreements and made significant progress in policy formulation that promote its trade performance. Nevertheless, Kenya's performance in export volume and value over the years has remained poor. The export value has stagnated despite the open trade policies and different structural and institutional reforms in the trade sector.

The quality of institutions in the domestic economy remains vital as it either deepens or shrinks incentives for trade. The institutional framework has not been accorded a critical significance in analyzing Kenya's bilateral trade flows. In addition, the import demand has continued increasing drastically compared to exports leading to persistent negative trade balances. Many studies have concentrated on Kenya's exports but neglected the import demand. The studies fail to appreciate imports' critical role in determining a country's trade balance by overlooking the import demand component. This study investigates Kenya's determinants of bilateral trade flows with its trade partners by incorporating the institutional framework and the import demand.

1.5 Research Objectives

The objective of this study is to identify factors that determine Kenya's trade in goods. The specific objectives include:

- i. To assess the influence of trade policies on Kenya's trade in goods.
- ii. To investigate the impact of governance quality on Kenya's bilateral trade flows in goods.
- iii. Use findings of (i) and (ii) above to make policy suggestions

1.6 Research Questions

- i. What influence do the trade policies have on Kenya's trade in goods?
- ii. What is the role of institutional/governance quality on Kenya's bilateral trade flows in goods?

1.7 Justification of the Study

Of great concern and importance to macroeconomic researchers and policymakers concerning international trade are the factors determining or hindering trade flows among countries. Accordingly, the advocates of international trade have put forward many models to explain why nations engage in cross-border trade.

On a theoretical and empirical level, one of the study's outcomes is to determine the effect of governance quality on Kenya's trade in goods. Literature reveals relatively limited evidence on country-specific research studies on governance quality on Kenya's bilateral trade flows (Adewuyi & Olubiyi, 2020; Ngugi, 2016; Dankumo et al., 2020; Letete & Sarr, 2017). The study's novelty is to enrich the literature through bridging this gap by contributing to the pragmatic research efforts in this area.

On a practical and application level, a second significance of the study findings is that they will be instrumental in policy formulation for Kenya's trade policy frameworks to strengthen Kenya's trade.

1.8 Organization of the Study

The study examines determinants of Kenya's trade flows in goods for the period 2005 to 2020. The first chapter covers the background to the study, while chapters two and three covers the literature review and the methodology, including data and data sources, theoretical framework, model specification, and econometric methods, respectively. Finally, chapter four includes regression estimates, while chapter five summarizes and draws conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

There is no single theory that holistically explains the determinants of trade flows. Instead, the theoretical literature is intertwined with many hypotheses drawing from many of the demand and supply theories. These theories explain the demand and supply of goods and services from country 'i' to country 'j' (Anderson, 2011; Shahriar & Qian, 2019; Shepherd, Doytchinova, & Kravchenko, 2019).

Goldstein & Mohsin (1978) observed that empirical studies on international trade have primarily concentrated on formulating and finding out demand relationships for exports and imports. Nevertheless, the new trade theories are applied widely to illustrate trade flows among countries globally. The gravity model describes the trading partner country's trade composition, thus considering the traditional economic purpose of international trade (Thursby & Thursby, 1987).

2.1 Theoretical Literature Review

In this section, theories of international trade are discussed. Trade provides countries worldwide with various goods and services, enhances division of labor and production efficiency. Thus, it creates linkages such as employment opportunities that act as sources of income for people's livelihoods. Theories discussed include the theory of absolute advantage, comparative advantage theory, Heckscher-Ohlin (H-O), Linder hypothesis theory, and lastly, Increasing Returns to Scale (IRS). The section will also cover the justification of the Heckscher-Ohlin theory that best describes Kenya's international trade.

2.1.0 Theory of Absolute Advantage

Smith (1776) in the book, "The Wealth of Nations," postulated the theory of absolute advantage after Mercantilist policies failed to realize any meaningful economic progress. The Mercantilists advocated for the creation of powerful states as a sign of national strength and prosperity. They emphasized the accumulation of precious metals (gold and silver) as wealth par excellence to a nation. Thus, the Mercantilists considered foreign trade as an avenue for acquiring precious metals. They argued that exports were good and desirable while all imports were evil and damnable. Therefore, a nation's primary obligation was to minimize imports while maximizing exports.

Smith criticized the Mercantilist policies as crude and inflationary, which lowered the living standards. He supported free trade through the theory of absolute advantage, in which he reckoned that all economies had limited resources. Therefore, to produce one good, a country had to relinquish producing other goods. Smith reasoned that country 'X' had an absolute advantage over country 'Y' in producing a good if it made such a good using the minimal factor units of production (labor). Thus, geographical and climatic factors, knowledge and skills, technological differences, and economic environment bring an absolute advantage in producing different goods and services between countries.

The shortcoming of Smith's theory is that the theory can only explain very minimal economic situations on trade in the world. As a result, it cannot explain why countries with an absolute advantage in producing all traded commodities still transact with countries with the absolute disadvantage in producing the traded commodities (Carbaugh, 2006). Due to this shortcoming, David Ricardo developed the theory of comparative advantage.

2.1.1 Theory of Comparative Advantage

Ricardo (1817), in the book entitled "On the Principles of Political Economy and Taxation," extended the work of Adam Smith by incorporating the aspect of comparative advantage. Ricardo showed that comparative advantage is the basis for countries to engage in trade and why trade benefits the countries involved. Comparative advantage measures efficiency in relative magnitudes (opportunity cost) connected to producing one good compared to another. Therefore, since nations have scarce resources and limited technology, they produce goods or services having a comparative advantage.

Ricardo postulated that a country with low productivity in two goods can still benefit from trade by transacting the good with a comparative advantage. This is because its price before trade is lower than the price abroad. On the other hand, a country with an absolute advantage in both goods gains through specializing in producing the good with a relatively significant advantage. Also, a country gains by importing the good whose relative advantage is lesser given its lower forgone benefit of making it.

Thus, the Ricardian model points out that differences in technological progress between countries bring about the comparative advantage in producing certain goods compared to others. The comparative advantage also motivates beneficial trade among countries (Anderson, 2004; Suranovic, 2006; Fole, 2012). Nevertheless, studies have pointed out that Ricardo's assumption of the comparative advantage is anchored on differences in labor/workforce productivity (Balassa B., 1963). Default of its unrealistic assumptions, the Ricardian model has been incapable of explaining the differences in workforce productivity across countries and the influence of trade on factor earnings (Salvatore, 1998).

2.1.2 The Heckscher-Ohlin (H-O) Theory

So far, both the absolute and comparative advantage models have assumed that labor is the only factor input of production. However, the Heckscher-Ohlin model incorporates one more input (capital) in analyzing international trade. The H-O theory extended the idea of comparative advantage by incorporating the principle of cost and factor endowment of the factors of production. Thus, the H-O theory explains why countries with large labor force concentrate on labor-intensive manufactured goods. Conversely, it explains why nations with greater capital than labor specialize in manufacturing capital-intensive goods.

Heckscher (1919) and Ohlin (1933) developed the H-O model as an extension to the Ricardian theory. The H-O model asserts that comparative advantage originates from disparities in resources or resource endowments. If a factor of production is more abundant in a country, it will cost less. Thus, a nation will produce a good in which the relatively abundant factor is used intensively. In the H-O model, it affirms that a nation will mainly export goods that use abundant resources and few scarce factors in production in exchange for commodities that require contrary factors in correspondences. Therefore, in a nutshell, abundant factors in supply are exported, whereas, factors in scarcity are imported (Ohlin, 1933).

In light of this, countries that are capital-abundant like the USA and other industrialized economies, will export capital-intensive goods. Conversely, the capital-abundant countries will trade in exchange for labor-intensive goods from labor-abundant economies like China, India, and other developing nations. The converse will also hold for the exports and imports in labor abundant countries.

Leontief (1953) tested the Heckscher-Ohlin theory using the US economy (abundant in capital) relative to the world. He estimated the ratios of capital stocks to the number of workers in the US import and export-competing industries in 1947. Using the input-output analysis, he multiplied the input-output matrix by input vectors of capital and labor and values of exports and imports. Leontief established a paradox that perplexed him from the ratio estimates of capital to labor in the export and import-competing industries. The estimates showed the USA was exporting labor-intensive goods in exchange for capital-intensive goods.

Leontief paradox and other indecisive findings from other studies that have evaluated the prognoses of the H-O theory in other countries have led to alternative theories. The alternative theories explain the unexplained part of the H-O theory.

2.1.3 The Linder Hypothesis

Linder (1961) tried to illustrate the pattern of international trade based upon the demand theory structure. He presented his "preference similarity theory" (overlapping demands) to explain trade in differentiated manufactured goods using the demand side in lieu of the supply side. Linder asserted that economies having similar living standards (proxied by GDP per capita) are likely to consume similar products.

According to Linder, factor endowments influence living standards. Thus, countries that are capital abundant are more likely to be richer than labor abundant countries. In this regard, countries having common factor endowments will have high trade flows. Likewise, rich (developed and industrialized) countries trade more with rich countries while developing and less industrialized countries trade more with developing countries.

Although the Linder hypothesis contradicts the predictions of the H-O theory, it explains trade flows witnessed among the prosperous economies, which form a significant share of global trade. Further, it provides the rationale for the intra-industry trade, a vital component of international trade that composes export and import of identical types of goods by country.

2.1.4 Increasing Returns to Scale (IRS) Theory

Krugman (1985) developed the trade theory of IRS to expound on why countries with comparable productivity trade intensively, a shortcoming that the classical models failed to address. Krugman's theory of trade asserted that availability of economies of scale in production (increasing returns to scale) was enough to spawn beneficial trade among any two nations. Although comparable factor endowments with insufficient comparative advantage exist between the two countries, they will still have mutually advantageous trade (Suranovic, 2006).

Put forth by Carbaugh (2006), IRS trade theory affirms that a country can set up an industry with economies of scale and produce certain goods in large amounts at a low cost, and in turn, trade these low-cost goods with other countries. Therefore, countries can reap more from international trade if they produce goods having increasing returns by taking advantage of the economies of scale through specialization.

2.2 Overview of the Theoretical Literature

This section discussed theories of trade that have been put forward to explain trade patterns of international trade. These theories included theories of absolute and comparative advantage, H-O theory, Linder hypothesis, and IRS theory. The theory of Heckscher-Ohlin assumes that nations will export commodities that employ the abundant factors of production while importing those goods that exploit domestically scarce factors. Thus, since agricultural goods dominate Kenya's

export composition and imports are capital-intensive goods (machinery), the H-O theory perfectly explains Kenya's trade with its partners.

2.3 Empirical Literature Review

Several empirical studies at regional and global frontiers have examined the factors that determine trade flows between countries. Ngepah & Udeagha (2018) adopted a gravity model approach using the Eicker-White Robust Covariance PPML Technique. The study examined the Effects of RTAs in Africa using 1995-2014 panel data. The results showed that the traditional variables had the expected sign. Distance, a proxy for trade costs, significantly impeded trade; neighboring countries traded more than non-neighboring countries. However, the GDP of the two trading partner countries facilitated trade. Similarly, the variables for population had positive signs which implies that population had a significant effect on African's trade. Finally, the results established that a common language enhances trade.

Irshad & Anwar (2019), using the PPML regression technique to find the determinants of Pakistan's trade flows, used panel data for the period 1992-2016, with 198 trading partners. The results showed that income differentials, exchange rates, market size, religion, contiguity, and trade agreements positively enhanced bilateral trade flows. Conversely, distance and lack of access to the coastal area (landlock) negatively influenced trade flows. The results also illustrated that the Heckscher-Ohlin model best explained Pakistan's trade patterns, i.e., well explained by differences in factor endowments. In contrast, membership in WTO had no effect on its bilateral trade flows.

Braha et al. (2018) used data for the period 2005-2015 to analyze the determinants of export in transition economies of Southeast Europe and the Commonwealth of independent states. They employed a PPML estimator to evaluate the augmented gravity model, including exchange rate,

income differential, trade liberalization, price stability, and institutional distance and infrastructure. The results reveal that importer and exporter GDP increased export flows. However, distance negatively impact trade while common border, linguistic similarities, and exchange rate variability positively affect export flows. Conversely, institutional distance was found to show a diminishing influence on exports.

Further, Erdey & Postenyi (2017) used the simple OLS regression and panel data for the period between 1993-2014 to study Hungary's export determinants. The findings show that economic size, FTAs, and the shared borders had statistically significant positive effects on Hungary's exports. However, distance hampered trade flows. Similarly, the results show that Hungary's exports change as per the Linder hypothesis. That is, Hungary tended to exchange more with economies that have similar characteristics in resource endowments.

Orindi (2011), using the OLS technique and panel data extending for the period 1964-2008, established that distance undermined Kenya's exports. As the geographical distance between Kenya and its export destinations got more expansive, it increased transportation costs leading to a decrease in exports. Brown & Anderson (2002) showed that countries bordering or sharing common borders trade more than countries in distant regions. In separate work, Grossman (1998) and Huang (2007), also provided empirical evidence that transportation cost and lack of familiarity negatively affect bilateral trade flows.

Tamas & Miron (2021) estimated the impact of Romanian institutional quality on trade with the EU countries for the period 2007-2018 by using the Augmented Gravity model. The estimates show that the standard variables (GDP, distance, population, shared border, and language) had the expected signs. Control for corruption and government effectiveness had negative effects while

political stability had positive effects on trade flows. Further, voice and accountability was found to be insignificant for exporter countries' trade flows. Similarly, Romanian governance indicators negatively affected trade flows except for regulatory quality. The estimates show that a 1% increase in governance indicators would lead to a significant increase in the Romanian exports.

Yusuf et al. (2021) examined the effect of governance quality on bilateral trade flow between Malaysia and 25 selected African Organization of Islamic Cooperation (OIC) member countries. The study employed the gravity model of trade and the PPML estimation approach using data for the period 1985-2016. The findings indicate that government effectiveness, regulatory quality, and political stability adversely affect bilateral trade flows amongst the African OIC member states. The study concludes that institutional reforms are critical to African OIC member countries in expediting bilateral trade and economic growth in their respective regions. Further, institutional quality was found to positively influence the Malaysian economy.

Nguyi (2016), assessed the impact of institutional quality on Kenya's bilateral trade flows. The study evaluated Kenya's trade flows with its five partners in the East African Community between 1994 and 2014. The study employed the OLS estimation approach to estimate the augmented gravity model. The results establish that exporter and importer GDP positively and significantly determine Kenya's trade flows, while distance negatively influence trade. Equally, institutional quality has a positive and significant impact on Kenya's bilateral trade with its EAC partners.

Sheikh et al. (2018) examined institutional determinants of bilateral trade flows and homogeneity effect for Pakistan with Economic Cooperation Organization (ECO) countries. They employed OLS estimation technique on panel data for the period 2003-2014. The findings provide evidence that institutions significantly impact bilateral trade flows between Pakistan and ECO partner

countries. Other studies have also provided similar empirical results (De Groot et al., 2003; Jansen & Nordas, 2004; Ranjan & Lee, 2007). The studies have further shown that countries with poor governance characteristics tend to trade more with those with identical governance characteristics.

Martinez-Zarzoso & Marquez-Ramos (2019) used panel data spanning 1996-2013. The study applied the OLS estimation method to analyze the effect of governance on trade for the Middle East and North Africa region. They established that advancement in at least five of the indicators would raise the countries' exports in the region. Therefore, effective governance reduce transaction trade costs primarily between countries categorized as high-income economies (Setyastuti, Adiningsih, & Widodo, 2018).

Mwangi (2021) studied the determinants of agricultural imports in SSA using the augmented gravity model on panel data for 37 countries for the period 1995-2018. The findings reveal that economic size (GDP), agricultural land endowment, RTA, same language, inflation rate, and institutional quality directly influence importation of agricultural goods in the SSA. However, the importing country's distance, landlock, and agricultural productivity negatively impact bilateral agricultural import flows in the SSA. The findings also show that regional integration and a sound institutional framework are essential in promoting agricultural imports. The study recommend institutional reforms towards fostering political stability, democracy, and control for corruption in the agricultural trade development plan.

Adewuyi & Olubiyi (2020) estimated the effects of institutions on trade between SSA and its trade partners. The study endeavored to determine whether governance influenced trade in SSA resource-poor countries than resource-rich countries. The study employed modified PPML estimation methodology (Negative Binomial Pseudo Maximum Likelihood and Zero-inflated

Pseudo Maximum Likelihood) using data for the period 1996-2014. The results reveal that not all governance indicators matter for trade between SSA and its partners but resource endowment does. Moreover, the results show that corruption impact SSA export flows significantly. Similar studies have supported this finding that corruption adversely affect trade flows (Dankumo et al., 2019; Wei, 2001; Mauro, 1998; and Ben Ali & Mdhillat, 2015). On the contrary, political stability impact trade flows positively (WTO, 2013).

Lee & Shin (2006) examined the existing or proposed East Asia trading blocs, their effect on inter and extra-bloc trade, and the overall world trade for the East Asian countries. The study used OLS estimation methodology on panel data for the period 1948-1999. The results indicate that proximity, shared borders, and common language significantly impacted trade creation and trade diversion. Preferential RTAs involving trade partners with a shared border and proximity create more trade while diverting less trade. Thus, the study shows that the East Asia RTAs would open more trading opportunities to the member countries while not diverting trade from non-members.

Glick (2017) assessed the influence of the European Economic and Monetary Union (EMU) and regional trade agreements (EU) on trade. The study adopted a panel approach (Pooled Least Squares) with time-varying country and dyadic fixed effects. The data consisted of more than 200 countries for the period between 1948 and 2013. The findings show a significant positive impact of EMU and EU on exports and that EMU increased European trade by 40% while the European Union RTA increased trade by 70%. The study further indicate that integration stimulate both extra-bloc exports and imports. Similarly, NAFTA, AFTA, and EMU regional dummies show convergent results from trade for the member countries (Jerome, 2010).

Soete & Hove (2017) studied the effects of Economic Integration Agreements (EIAs) on international trade patterns in the European Union (EU). They applied Generalized Least Squares estimation methodology on data extending between 1988 to 2013 and covering 27 EU member countries and the rest of the world. The results show strong evidence of the trade creation effects of EIAs, although the degree of the impact depend on the extent to which the agreement enables the integration. In addition, FTAs and currency unions (CUs) generate more substantial cumulative trade effects compared to PTAs. Therefore, EIAs play a vital role in extending the margin of trade through increasing product differentiation for the exports and imports. The study conclude by showing that the effects of one specific agreement or EU member country cannot be generalized to all other agreements or EU member countries.

Rose, Lockwood, & Quah (2000) assessed the impact of common currencies on trade using panel data for 186 countries using the same currency from 1970-1990. The results show a significant positive impact of a currency union on international trade and little negative effect on the volatility of the exchange rate. The significant effect of currency unions shows that countries sharing a common currency trade three times more than those with different currencies.

Nguyen (2019) assessed the international trade system's export effects for eighteen worldwide plurilateral regional trade agreements using panel data extending between 1960 and 2014 for 160 nations. The study examined the impact of RTAs on intra-bloc trade and the trade behaviors of member countries to the rest of the world. Nguyen employed the Poisson Pseudo-Maximum Likelihood (PPML) methodology technique. The findings show trade enhancing effects of RTAs with ambiguous effects on extra-bloc trade. Equally, there is strong empirical evidence of trade diversion predominantly in American and African trade agreements and contrasting trade creation in European and Asian RTAs.

Lastly, Sotja, Abdi-Khalil, Alexander, & Micah (2016) applied the OLS estimation techniques on data spanning 2001-2013 to study Swaziland's sugar exports. They observed that COMESA and EU trading blocs significantly impact Swaziland's sugar exports. The findings give more reasons as to why economic integrations should be encouraged. Similarly, the study show that GDP and distance have the expected sign as predicted in the theoretical gravity model. Furthermore, the sign on the coefficient on common language, i.e., English, was found to be positive, suggesting that common language promote Swaziland's sugar export.

2.4 Overview of the Empirical Literature

In the literature reviewed, most of the studies have adopted traditional variables of the gravity model. Similarly, the studies have included other dummy parameters to capture variations in trade flows that the former variables cannot explain. However, the empirical literature reveal that the results wholly depend on the methodology and the time period used.

Most studies have concentrated on estimating determinants of trade flows by factoring in variables: GDP, trade openness, population, distance, and exchange rates (Khayat, 2019; Irshad & Anwar, 2019; Erdey & Postenyi, 2017; Ngepah & Udeagha, 2018; Akhter & Ghani, 2010; Orindi, 2011; and others). However, some studies have endeavored to study the influence of institutional quality on trade flows (Mwangi, 2021; Nguyi, 2016; Dankumo et al., 2020; Tamas & Miron, 2021; Sheikh et al., 2018; Braha et al., 2018; and Yusuf et al., 2021). This study will incorporate institutional quality, trade policy, and the traditional variables to find the determinants of Kenya's bilateral trade flows. The study will also broaden the scope of the study by incorporating Kenya's trade partners far and beyond the EAC.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Theoretical Framework

The "Law of Universal Gravitation"¹ that Newton (1687) proposed holds that the attractive force between two objects 'i' and 'j' can be expressed as shown in equation (1):

$$F_{ij} = G \frac{M_i M_j}{D_{ij}^2} \quad (1)$$

Where; F_{ij} is the attractive force, G is the gravitational or the model constant, M_i and M_j are the objects' masses, and D_{ij} is the distance between the centers of the objects.

The fundamental theoretical gravity model takes a resemblance of equation (1) and follows the one first formulated by Tinbergen (1962) for trade between country 'i' and country 'j' given in equation (2):

$$TR_{ij} = C \times \frac{Y_i^{\beta_1} Y_j^{\beta_2}}{D_{ij}^{\beta_3}} \quad (2)$$

Note that if $\beta_1 = \beta_2 = 1$ and $\beta_3 = 2$, we return to Newton's Law in equation (1). TR_{ij} represents trade flows between country 'i' and country 'j' which mainly represents imports, exports, or total trade volume as dependent variables in the model. C is the constant term, Y_i and Y_j are the economic sizes (GDP) of country 'i' and 'j' respectively while D_{ij} is the geographical distance (proximity) between the two countries.

¹ It states that every object of matter attracts every other object in the universe with a force that is directly proportional to the product of their weights and inversely proportional to the square of the distance between their respective centers (Newton, 1687).

3.1 Econometric Specification

The basic gravity model of trade that is in resemblance to Newton's law of gravity takes the form:

$$TR_{ijt} = \alpha \left(\frac{GDP_{it}^{\beta_1} \times GDP_{jt}^{\beta_2}}{D_{ij}^{\beta_3}} \right) \quad (3)$$

Taking natural logarithms for equation (3) gives the following basic gravity model:

$$\ln TR_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} - \beta_3 \ln D_{ij} + \mu_{ijt} \quad (4)$$

Where TR_{ijt} is the total value of bilateral trade flows between country ' i ' and country ' j ' at time t , GDP is the economic size, D_{ij} is the distance between the capital centres of the two countries, β_0 ($\ln \alpha$) is the gravitational constant, and β_1 , β_2 , and β_3 are model coefficients to be estimated. $\ln$ and μ_{ijt} denotes the natural logarithm operator and the stochastic term, respectively.

This study estimates the augmented gravity model version of the basic model shown in equation (4) by incorporating other variables that affect bilateral trade flows between partner countries. The model includes the traditional variables; GDP, distance, and traditional dummies² for a common official or primary language (English), common colonizer, religion, and similar legal system. Other variables include trade openness ($OPENESS_{ijt}$), population ($N_i N_j$), real effective exchange rate ($REER$), relative country size (RCS_{ijt}), difference in per capita GDP ($Diff_PCGDP_{ijt}$), and trade policy which captures FTA/RTA dummies for EAC and COMESA, WTO, and EU. A weighted average governance index (INST_QTY) and institutional similarity index (INST_DIST)

² The dummy variables take only a value of 0 or 1; 1 where it's true to the country (in this context, a dummy for contiguity, common official or primary language, colonizer, religion, and legal system with Kenya take the value 1 while the dummies for RTA, WTO, and EU take 1 if the country belong to that RTA, WTO or EU) and 0 otherwise.

are created to factor the effect of governance quality and institutional homogeneity on bilateral trade flows. In line with gravity theory, it is recommended to include the directional time-varying (exporter and importer) fixed effects (Anderson & Wincoop, 2004). Country paired fixed effects have also been factored into the model to be estimated.

The augmented gravity model considered for estimating Kenya's determinants of trade in goods with its trading partners takes the following specifications:

$$\begin{aligned} \ln TR_{ijt} = & \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln DIST_{ijt} + \beta_4 \ln N_i N_j + \beta_5 \ln OPENESS_{ijt} + \\ & \beta_6 \ln RCS_{ijt} + \beta_7 \ln Diff_PCGDP_{ijt} + \beta_8 \ln REER_{ijt} + \theta_1 INST_QTY_{it} + \theta_2 INST_QTY_{jt} + \\ & \theta_3 INST_DIST_{ijt} + \gamma_1 comlang_off_{ijt} + \gamma_2 comcol_{ijt} + \gamma_3 religion_{ijt} + \gamma_4 legal_syt_{ijt} + \\ & \gamma_5 RTA_{ijt} + \gamma_6 WTO_{ijt} + \gamma_7 EU_{ijt} + \mu_{ijt} \end{aligned} \quad (5)$$

Whereby β_0 is the constant, β_i ; where $i = 1, 2, \dots, 8$, θ_i ; where $i = 1, \dots, 3$, and γ_i ; where $i = 1, 2, \dots, 7$ are model coefficients to be determined, while μ_{ijt} is the error term. Description of model variables, their expected signs and data sources are illustrated in the Appendix D while the correlation matrix is shown in Appendix E.

3.2 Data

Selection criterion for Kenya's trade partners solely rests on their trading relationship with Kenya and data availability. The data set on the bilateral trade flows from each partner country to Kenya is valued in US dollars (US\$). The study employed longitudinal data³ from 166 supplying countries for the period 2005-2020.

³ Longitudinal data constitutes a group of cross-sectional units i.e., $n = 166$ and time period i.e., $t = 16$ (based on this study) for countries or households who are followed and analyzed over time providing

3.3 Econometric Methodology

3.3.0 Selection of the Gravity Model Estimator

Traditionally, the OLS method has been the widely applied approach among the numerous techniques used to estimate the gravity model over the centuries. Nevertheless, it falls short in addressing several econometric and modeling issues arising from trade data. Therefore, this study adopts the Poisson Pseudo Maximum Likelihood (PPML) estimator to address these challenges as widely endorsed in the literature (Santos Silva & Tenreyro, 2006; Lateef et al., 2017; Irshad & Anwar, 2019; Burger et al., 2009; Tenreyro & Santos Silva, 2011).

While the standard empirical estimators used in measuring the gravity models suffer from biased and inconsistent estimates, the PPML estimator gives consistent results. Santos Silva & Tenreyro (2006) advocated the use of PPML estimator in order to address the problem of zero trade flows. This is achieved by estimating the gravity model in multiplicative rather than in logarithmic form. Later, Tenreyro & Santos Silva (2011) provided supportive proof that PPML estimator gives consistent estimates in presence of zero trade flows.

Santos Silva & Tenreyro (2006) proposed in the presence of heteroskedasticity the use of the PPML estimator. One of the challenge in obtaining robust estimates of the effects of trade policy within the gravity model is that of endogeneity of trade policy. For example, a country can liberate its trade with another country that is already a significant trade partner leading to a reverse causality. Yotov et al. (2016) proposed using pair-fixed effects to account for the unobserved linkages between the endogenous trade policy and the stochastic term in the gravity analysis. However, the pair-fixed effects will absorb all the time-invariant variables used in standard gravity

multiple observations on each individual in the sample. Such units are referred to as ‘individuals’ (Griffiths, Hill, & Lim, 2018).

model although it will not prevent the estimation of the effects of bilateral trade policy (time variant). The pair-fixed effects are a better measure of bilateral trade costs in comparison to the standard gravity variables traditionally employed.

In order to control for the unobserved multilateral resistance terms and for any other unaccounted for, observed and unobserved time variant variables, this study will use the exporter-time and importer-time fixed effects. This will help avoid committing the “Gold medal mistake” as coined by Baldwin & Taglioni (2006).

3.3.1 The PPML Augmented Gravity Model

Estimation of the model in equation (5) is only valid in the case where $TR_{ijt} > 0$ and problematic when $TR_{ijt} = 0$ given that $\log(0)$ is undefined. Data used in this study shows many cases of missing data (i.e. $TR_{ijt} = 0$) which indicates that Kenya and the partner country have zero trade flows for a specific period (i.e., 2011, 2012, and 2014). Therefore, the model to be estimated using the PPML estimator is specified as follows:

$$TR_{ijt} = \exp \{ \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln DIST_{ijt} + \beta_4 \ln N_i N_j + \beta_5 \ln OPENESS_{ijt} + \beta_6 \ln RCS_{ijt} + \beta_7 \ln Diff_PCGDP_{ijt} + \beta_8 \ln REER_{ijt} + \theta_1 INST_QTY_{it} + \theta_2 INST_QTY_{jt} + \theta_3 INS_DIST_{ijt} + \gamma_1 comlang_off_{ijt} + \gamma_2 comcol_{ijt} + \gamma_3 religion_{ijt} + \gamma_4 legal_syt_{ijt} + \gamma_5 RTA_{ijt} + \gamma_6 WTO_{ijt} + \gamma_7 EU_{ijt} + \eta_{it} + \pi_{jt} + \chi_{ij} + \mu_{ijt} \} \quad (6)$$

Where β_i , θ_i , and γ_i are defined as before, whereas, η_{it} are exporter-time fixed effects, π_{jt} are importer-time fixed effects, χ_{ij} are country-pair fixed effects, and μ_{ijt} is the stochastic term.

CHAPTER FOUR

DATA ANALYSIS, RESULTS, AND INTERPRETATIONS

4.0 Descriptive Statistics

This section provides measures of central tendency, i.e., mean, standard deviation, Kurtosis and Skewness.

Table 4.1: Descriptive Summary Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt.
TRijt	2656	87600000	289000000	0	3875000000	6.97	68.74
lnGDPit	2656	24.71	.48	23.65	25.34	-.55	2.42
lnGDPjt	2608	24.59	2.14	19.71	30.70	.17	2.59
lnDISTij	2656	8.60	.67	6.23	9.72	-.91	4.17
lnNiNj	2656	33.58	1.90	28.22	38.87	-.44	3.52
lnOPENESSijt	2484	8.14	.59	6.06	10.21	.17	3.22
Gijt	2608	25.77	1.22	23.67	30.70	1.16	4.43
lnRCSijt	2608	-1.55	.91	-5.86	-.69	-1.38	4.47
lnPCGDP_Diffijt	2608	1.80	1.25	.01	5.06	.46	2.11
lnREERijt	2278	3.56	3.25	-9.58	21.24	1.33	8.41
comlang off	2656	.31	.46	0	1	.84	1.70
comcol	2634	.28	.45	0	1	.96	1.93
contig	2656	.03	.17	0	1	5.50	31.23
Legal_syt	2656	.32	.47	0	1	.76	1.57
religion	2656	.62	.49	0	1	-.50	1.25
RTA	2656	.12	.33	0	1	2.33	6.44
WTO	2656	.83	.38	0	1	-1.76	4.09
EU	2656	.17	.38	0	1	1.77	4.13
INST_QTYit	2656	-.64	.07	-.77	-.54	-.23	1.62
INST_QTYjt	2639	-.05	.95	-2.45	1.89	.21	2.24
INST_DISTijt	2639	2.58	1.47	.29	6.43	.77	2.56

Source: Author's compilation using STATA 15.1

It is important to note that normal skewness equal to zero while mesokurtic has a kurtosis of 3.

The descriptive statistics in Table 4.1 show that majority of the data parameters are not normally distributed. For example, considering the variable for trade flows (TR_{ijt}), skewness is greater than zero (6.97) while kurtosis is leptokurtic since its value is greater than three (68.74). This implies that TR_{ijt} has more higher data distribution values i.e. long right-tailed and a more peaked curve.

Conversely, $\ln GDP_{it}$ has a moderate distribution with skewness of 0.17 indicating a right-tailed and kurtosis of 2.59 that is almost near 3 indicating that it is mesokurtic. Therefore, $\ln GDP_{it}$ indicates a normal distribution with well behaved tails. It is important to note that the dummy for *contig* has skewness of 5.50 with a kurtosis of 31.23. This would be explained by the fact that Kenya has five countries (Ethiopia, Somalia, South Sudan, Tanzania, and Uganda) in which it shares a common border from the 166 countries in the sample size.

The OLS tests depends on normality assumptions and a significant skewness and kurtosis indicate that the data set is not normally distributed. Therefore, if the data shows significant skewness or kurtosis, the data is transformed to try to normalize the data set by taking logs or square roots of the data variables. This will moderately reduce the skewness or kurtosis. In this study, the variables have been transformed by taking natural logs.

4.1 PPML Regression Results

Table 4.1.1 shows the PPML regression estimates using the gravity model in Equation (6). Data processing and empirical regressions were carried out using STATA 15.1.

Table 4:1.1: PPML Gravity Regression Results

TRijt Independent Variables	(1) Basic Model	(2) Factor Endowment	(3) Institutional Quality/Distance	(4) Cultural Familiarity	(5) Trade Policy (RTA and WTO)	(6) Augmented Model
lnGDPit	0.176* (0.098)	0.141 (0.118)	0.784 (0.713)	0.624*** (0.206)	0.542** (0.240)	1.201** (0.597)
lnGDPjt	0.679*** (0.230)	0.692*** (0.201)	0.932*** (0.273)	0.423** (0.201)	0.654*** (0.222)	0.420*** (0.137)
lnDISTij	-1.332*** (0.470)	-2.400*** (0.182)	-1.863*** (0.262)	-1.587*** (0.197)	-1.722*** (0.277)	-1.755*** (0.291)
lnRCSijt		0.376* (0.209)			0.040 (0.195)	
lnPCGDP_Diffijt		0.327* (0.198)	-0.441*** (0.140)	0.577** (0.255)	0.350 (0.234)	0.393** (0.187)
lnREERijt			0.104*** (0.032)	0.046 (0.034)	0.067* (0.038)	0.048* (0.028)
lnOPENESSijt			0.410 (0.452)	0.449 (0.278)	0.647* (0.379)	0.348 (0.236)
Gijt			0.298 (0.344)			
INST_QUALITYit			-8.143 (10.809)			-9.106 (8.296)
INST_QUALITYjt			-0.064 (0.261)			0.195 (0.346)
INST_DISTijt			0.101 (0.177)			0.110 (0.208)
lnNiNj				0.748*** (0.222)	0.588** (0.260)	0.760*** (0.159)
comlang_off				-0.087 (0.373)		-0.362 (0.315)
comcol				0.069 (0.376)		

contig						-0.816* (0.493)
legal_sytem				0.584** (0.286)		0.678*** (0.260)
religion				0.567*** (0.213)		0.713*** (0.227)
RTA					0.047 (0.548)	0.705* (0.410)
WTO					1.351*** (0.299)	0.971*** (0.360)
EU					-0.772** (0.331)	
cons	8.067*** (1.557)	15.393*** (3.784)	-25.660 (22.034)	-26.128*** (10.111)	-25.091*** (8.432)	-45.316** (19.994)
Exporter_time_FE	Yes	Yes	Yes	Yes	Yes	Yes
Importer_time_FE	Yes	Yes	No	No	No	No
Pair_FE	Yes	Yes	No	No	No	No
N	2057	2057	1843	1843	1843	1843
R2	0.943	0.946	0.732	0.806	0.789	0.811

Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$

MODEL 1: Represents results of the basic gravity model.

MODEL 2: The gravity estimates: Benchmark gravity model extended with factor endowment variables.

MODEL 3: The gravity estimates: Benchmark gravity model extended with institutional quality and institutional distance.

MODEL 4: The gravity estimates: Benchmark gravity model with cultural familiarity (religion; <50% of population practice other forms of religion).

MODEL 5: The gravity estimates: Benchmark gravity model extended with trade policies which include RTA, EU, and WTO dummies.

MODEL 6: Regression results of the augmented gravity model.

4.2 Discussion

The estimates of this study are consistent with findings from the previous studies. Traditional gravity model variables show a significant impact on Kenya's trade flows in goods. The results from the gravity model 1, 4, 5, and 6 show that reporter's (exporter) and partner's (importer) economic sizes (GDP) are positive and statistically significant. The finding implies that in the exporter economy, there is a higher domestic production potential while in the importer economies, there is higher demand potentials.

From the basic model (model 1), the results show that exporter GDP is significant at 10% while importer GDP is significant at 1%. It is also true that exporter and importer incomes (GDP) have positive relationship with bilateral trade flows. Therefore, if all other factors remain constant, countries with higher income potentials will import more from Kenya. From the results, a 1% increase in the exporter GDP will lead to an increase in Kenya's imports by between 1.2% ($e^{.176}$) to 3.3% ($e^{1.201}$) while a 1% increase in importer GDP, will lead to an increase in Kenya's exports by between 1.5% ($e^{.423}$) to 2% ($e^{.692}$).

On the other hand, distance between trade partners is a trade cost and negatively affects trade flows between countries. The results further show that distance has a negative impact on trade and is statistically significant at 1% for model 1-6. This shows that Kenya trades more with countries with lower transportation costs relative to those with higher transportation costs. Thus, if distance between Kenya and its partner increase by 1%, trade flows will decrease by between 3.8% to 11% implying that distance is an obstacle to trade.

Population is an important factor that influence Kenya's trade flows. A large population can strengthen markets thus increasing consumption which will in turn decrease exports while

increasing imports into the country. Conversely, population of a country can enhance production (factor of production) which will in turn spur export growth. It is therefore expected that the coefficient on population may show different signs given different cases. For this study, population exhibit a positive sign with a statistical significance level of 1% and 5%. A 1% increase in exporter and importer population will lead to an increase in trade flows between Kenya and partner country by between 1.8% to 2.1%.

Similarly, factor endowment indicates a significant positive influence on trade flows. The coefficient for the absolute difference in per capita GDP shows a mixed sign for model 2 and 3. Turning the focus to model 2 and 6, the factor endowment variable is statistically significant at 10% level of significance. This implies that if per capita GDP differentials between Kenya and its trading partners increase by 1%, bilateral trade flows will increase by between 1.4% to 1.5%. Hence, this results support the Heckscher-Ohlin model implying that if the difference in factor endowment between two countries rises, the trade between them will increase i.e., the more similar the countries are in factor endowment, the more they will trade among each other.

Concerning institutional quality and distance, it can be observed from model 3 and 6 that Kenya's institutional quality has a negative influence on trade flows although insignificant. This would be explained by the fact that Kenya trades with countries whose governance indices are generally higher (Australia, EU, Canada, USA, Japan, and some indices for China and UAE). On the other hand, institutional quality for partner countries have positive impact on bilateral trade but also statistically insignificant. It can be equally observed that the difference in governance (institutional distance) between Kenya and partner countries has a positive but statistically insignificant impact on bilateral trade flows. The results support the hypothesis that countries which are institutionally homogenous (or heterogenous) trade more (or less) among each other (De Groot et al., 2003).

However, this raises questions on the common finding of positive effects of institutional distance on trade when the difference is so wide as in the case of Kenya and most of its partners.

In model 4 and 6, cultural familiarity shows mixed signs. The common language dummy shows a negative sign but has a statistically insignificant impact. This can be explained by the fact that Kenya trades more with countries that do not share a common official language (English) with it, such as China, Japan, UAE, Saudi Arabia and the Asian tigers. Equally, the dummies on common colonizer and contiguity have positive impact but are insignificant in model 4. In model 6, contiguity indicates a negative and significant relationship with bilateral trade flows at 10% level of significance. Empirical findings from other studies predict a positive influence of common borders but for the case of Kenya's trade with its partners, the negative sign would be explained by the fact that Kenya trades more with geographically distant countries i.e., Kenya trades 2.3% more with distant countries compared to its neighbors. There is a strong and positive impact of similarity in legal systems. Kenya trades 1.8% to 2.0% more with countries with similar legal systems. Results on religious beliefs show that Kenya trades 1.8% to 2.0% more with countries in which less than 50% of the population practice other forms of religious beliefs compared to Christianity.

Finally, trade policies show a significant influence on bilateral trade flows. Trade openness between exporter and importer countries indicates a significant positive effect on trade at 10% level of significance in model 5. This reveals that an increase in trade openness between exporter and importer countries leads to an increase in trade flows by at least 1.9%. Real effective exchange rate (REER) between reporter and partner countries has a positive and significant influence. A 1% devaluation of domestic currency will lead to an increase in Kenya's exports by at least 1% to 1.1%. Common RTA and WTO membership have significance levels of 10% and 1% and will lead to an increase in Kenya's bilateral trade by at least 2% and 2.6% to 3.9% respectively. The

dummy for EU is significant at 5% level which shows that non-membership to a regional trade agreement (EU) causes trade diversion of 2.2% for non-member countries. These findings are consistent and in agreement with those of previous empirical studies.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter provides a summary of the study findings. In addition, it gives policy recommendations based on the empirical findings.

5.1 Summary

The primary objective of the study was to identify the factors that determine Kenya's bilateral trade flows in goods using the gravity model approach. The factors of interest that were included in the estimated gravity model included the traditional gravity model variables (exporter and importer GDP and distance), trade policy variables (real effective exchange rate, trade openness, and membership dummies for RTA, EU, and WTO), institutional quality and distance, factor endowment variables (relative country size and absolute per capita GDP differential), population and cultural familiarity dummies (common language, border, legal systems, and religion)

The study applied the PPML estimator on panel data for the period 2005-2020. The empirical results showed strong positive and statistically significant relationship between economic sizes (GDP), real effective exchange rate, membership to a regional trade agreement and WTO, per capita GDP differentials, similarity in legal systems and population to Kenya's bilateral trade flows. Conversely, the distance between the capitals of countries, common primary or official language and non-membership to a regional trade agreement had negative influence on Kenya's bilateral trade flows in goods.

5.2 Conclusion

From the findings, it is evident that transportation costs hinder trade flows between countries. Equally, economic size (GDP) for both the exporter and importer countries is a primary variable that influence trade flows among countries in the world. However, it is quite abnormal from the findings that common language and contiguity negatively affects Kenya's trade.

5.3 Policy Recommendations

Kenya is faced with trade imbalances in which it keeps posting trade deficits. Given this observation, strigent and urgent measures need to be adopted in order to help boost Kenya's exports without necessarily reducing imports since most of the imports are capital goods. From the study findings, Kenya's poor institutional quality adversely affects its trade performance with its partners and that forms the basis for improving performance in the governance quality especially on corruption, regulatory quality and government effectiveness. More trade liberalization is also needed to strengthen Kenya's trade performance.

Given that Kenya's export sector is highly dominated by agricultural goods, policies that aim at improving its growth rates are necessary. These can include government subsidies to cushion farmers, adoption of new agro-technologies and machinery that will aid in boosting agricultural production. On regional and international frontier, the government must endeavour to engage its partners through regional trade agreements and partnerships. This will open both regional and international space for trade.

5.4 Recommendations for Further Research

This study made use of the aggregate trade data and no particular analysis for different sectors of production in the economy were examined. Therefore, future studies would examine the factors that determine Kenya's trade flows per sector. Future studies should also take into account the non-informal governance indicators to examine their effects on Kenya's bilateral trade flows. Non-informal governance indicators, such as trust, would otherwise give a different perspective on the risk presumed by exporters in the event of a default that would be most likely prevail in a setup of ineffective formal institutions. Further studies should come up with policies that will effectively improve Kenya's institutional quality so as to spur the growth of export sector. Lastly, future studies could empirically investigate the effects of COVID-19 on both institutional quality and Kenya's trade (exports) flows.

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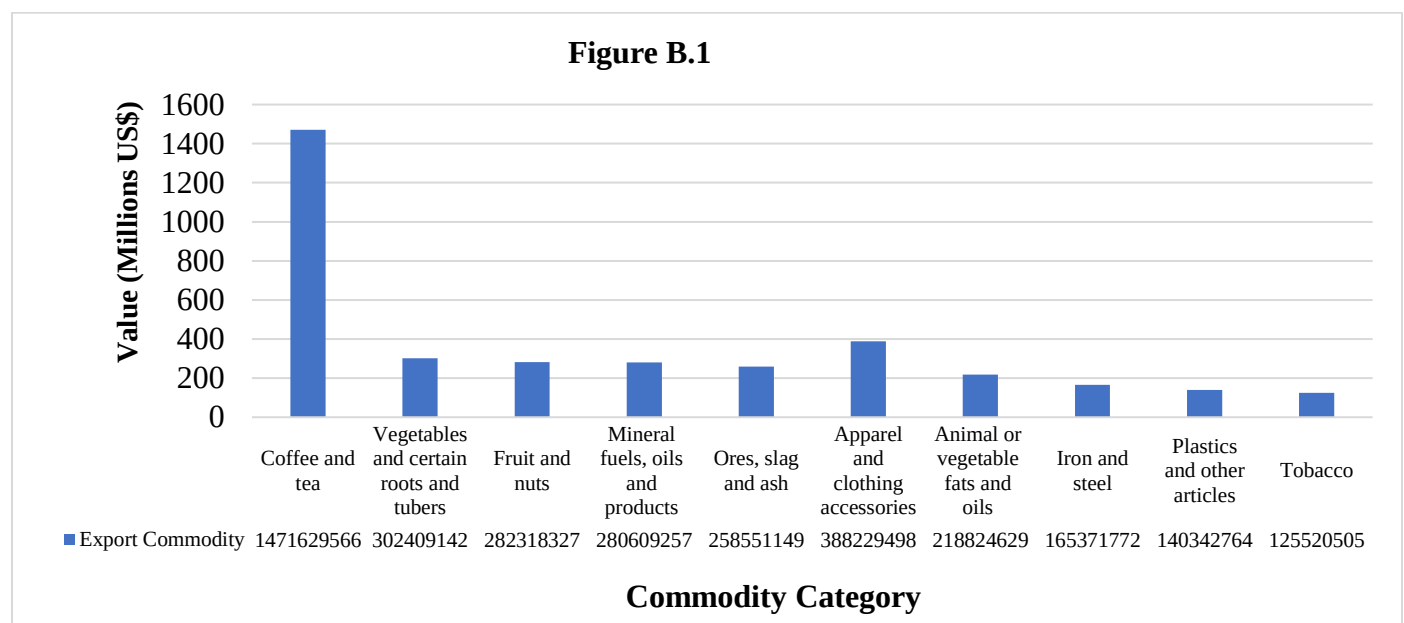
APPENDICES

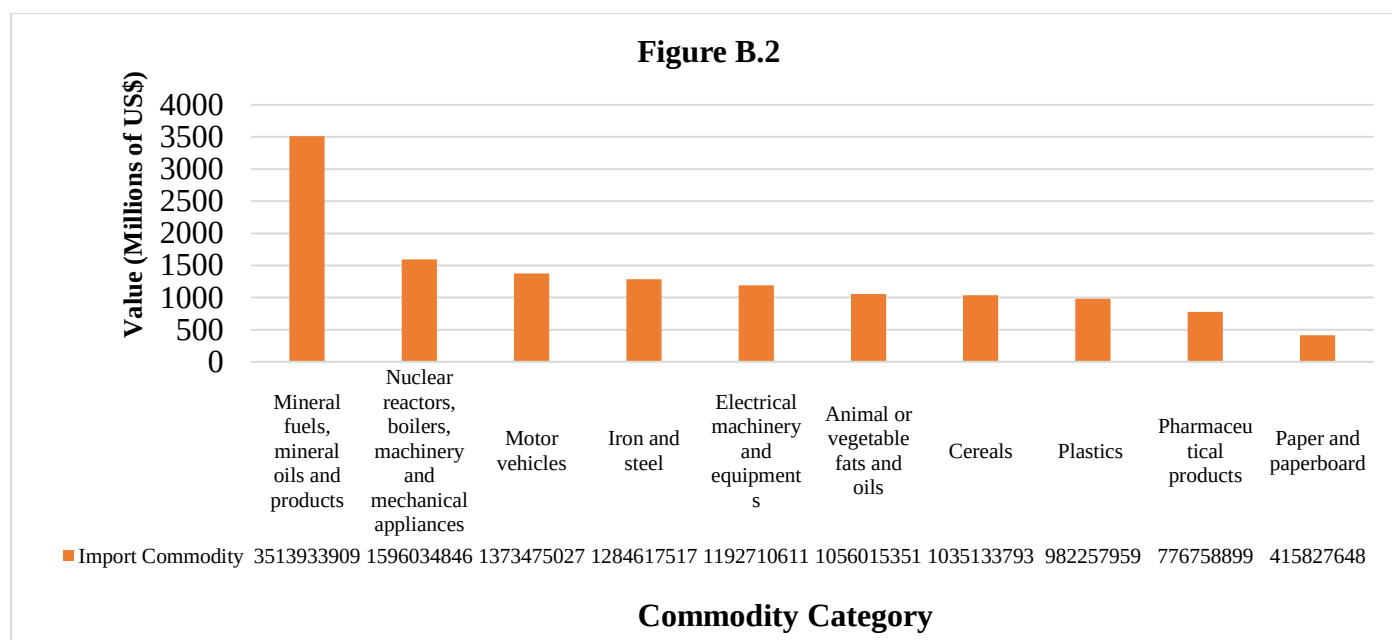
APPENDIX A: Kenya's Top Export and Import Trading Partners in 2021

No.	Partner	Export value (US\$)	Partner	Import value (US\$)
1	Uganda	831,916,748	China	4,025,661,719
2	Netherlands	562,452,313	India	2,106,722,157
3	USA	543,267,740	UAE	1,628,404,334
4	Pakistan	484,986,762	Saudi Arabia	1,045,979,610
5	United Kingdom	450,577,155	Japan	892,273,175
6	Tanzania	409,757,759	Malaysia	855,097,900
7	UAE	315,209,341	USA	801,800,349
8	Rwanda	278,368,538	Korea, Rep.	494,524,852
9	DRC	223,049,753	Tanzania	489,838,268
10	China	199,624,659	Egypt	445,910,544
11	Egypt	193,140,043	Netherlands	427,000,459
12	South Sudan	155,438,709	Indonesia	405,106,541
13	Germany	130,138,487	South Africa	402,034,896
14	Somalia	122,526,044	Germany	392,147,659
15	Ethiopia	106,113,179	Russia	343,495,123
16	Russia	95,455,483	Uganda	305,164,060
17	India	94,930,596	United Kingdom	302,344,973
18	France	90,937,052	Australia	236,207,431
19	Zambia	73,099,414	Italy	225,397,890
20	Belgium	72,260,663	Turkey	223,868,178

Source: Author's own compilation using data from UN-Comtrade (2022)

APPENDIX B: Kenya's Major Export and Imports in Goods in 2021





Source: Author's own computation using data from UN-Comtrade (2022)

APPENDIX C: Kenya's RCA in Coffee and Tea in 2020

Year	Trade Flow	Reporter	Partner	Commodity	Value (In Billion US\$)
2020	Export	Kenya	World	Coffee, tea, mate and spices	1.469
2020	Export	Kenya	World	All Commodities	6.023
% Share of Coffee and Tea in Kenya's Exports					24.39
2020	Exports	World	World	Coffee, tea, mate and spices	49.77
2020	Exports	World	World	All Commodities	17,828
% Share of Coffee and Tea in World's Exports					0.279
Revealed Comparative Advantage (RCA) (i.e., 24.39/0.279)					87.37

Source: Author's own computation using data from UN-Comtrade (2022)

APPENDIX D: Description Summary of Variables and Data Sources

Variable	Description	Unit Measure	Data Source	Sign
TR_{ijt}	Net trade (Exports + imports)	US dollar	UN COMTRADE	-----
GDP	Economic mass/size	US dollar	WDI, WB	Positive
$DIST_{ij}$	Great-Circle distance ⁴ measuring transaction costs.	Kilometers	CEPII, GeoDist Database	Negative

⁴ Overseas and overland transportation costs are comparable and only the capitals can be considered to be the economic centers of countries.

$N_i N_j$	Population for country i and country j calculated as $POP_i \times POP_j$.	Calculated	WDI, WB	Positive
$OPENESS_{ijt}$	Trade openness	Calculated	WDI, WB	Positive
$REER_{ijt}$	Real Effective Exchange rate between Kenya and country " i ".	Calculated	Calculated ⁵	Positive
$Diff_PCGDP_{ijt}$	Absolute differential in per capital GDP a proxy for factor endowment.	Calculated	WDI, WB	Ambiguous
RCS_{ijt}	Relative country size proxying Linder Hypothesis. It is computed using a methodology proposed by Helpman (1987) ⁶ .	Calculated	WDI, WB	Positive
$INST_QUALITY$	A weighted average governance index ⁷ modeled by carrying out a trivial arithmetic average ⁸ .	Estimate	Calculated	Positive
$INST_DIST_{ijt}$	Institutional distance or similarity index for governance computed using a methodology proposed by Kogut & Harbir (1988) and Konara & Mohr (2019) ⁹ .	Estimate	Calculated	Positive
RTA_{ijt}	A dummy for regional trade agreement.	1 or 0	WTO (RTA-IS)	Positive

⁵ $REER_{ijt} = \prod_{i=1}^n [(e/e_i)(P/P_i)]^{w_i}$ where n is number of countries in the basket, i is the i^{th} currency in the basket, e and e_i are exchange rates for Kenyan shilling and foreign currency " i " in indexed form. w_i is the weighted average attached to the foreign currency " i " while P_i is CPI associated with foreign currency and P is Kenya's CPI.

$$^6 RCS_{ijt} = \ln \left\{ 1 - \left[GDP_i / (GDP_i + GDP_j) \right]^2 - \left[GDP_j / (GDP_i + GDP_j) \right]^2 \right\}$$

⁷ It gives the average impact of overall quality of governance on bilateral trade. Governance captures the six broad aspects as categorized by The World Bank (World Bank, 2021): Rule of Law, Voice and Accountability, Regulatory Quality, Control for Corruption, Government Effectiveness and Political Stability and Lack of Violence or Terrorism (Kaufmann et al., 2010).

$$^8 INST_QUALITY_i = \frac{1}{6} \sum_{k=1}^6 INDEX_{ki} \text{ and } INST_QUALITY_j = \frac{1}{6} \sum_{k=1}^6 INDEX_{kj}; \text{ where } k^{th} \text{ is the score.}$$

$$^9 INST_DIST_{ij} = \sqrt{\sum_{k=1}^6 (INDEX_{ki} - INDEX_{kj})^2 / V_k}; \text{ where } V_k \text{ is the variance of the governance index } k.$$

<i>WTO_{ij}</i>	A dummy for WTO.	1 or 0	WTO	Positive
<i>comcol_{ij}</i>	A dummy for the same colonizer.	1 or 0	CEPII Database	Positive
<i>legal_syt_{ij}</i>	A dummy for common legal system after transition.	1 or 0	CEPII Database	Positive
<i>religion</i>	A dummy on religious beliefs.	1 or 0	Pew Research Center ¹⁰	Positive
<i>comlang_off_{ij}</i>	This captures the influence of a common official or primary language ¹¹ on trade flows.	1 or 0	CEPII, GeoDist Database ¹²	Positive

APPENDIX E: Correlation Matrix

Variables	TRijt	lnGDPit	lnGDPjt	lnDISTijt	lnNiNj	lnOPENESSijt	Gijt
TRijt	1						
lnGDPit	.085***	1					
lnGDPjt	.379***	.097***	1				
lnDISTijt	-.071***	.004	.261***	1			
lnNiNj	.380***	.096***	.696***	-.052*	1		
lnOPENESSijt	-.181***	-.372***	-.139***	.099***	-.473***	1	
Gijt	.447***	.274***	.916***	.264***	.631***	-.245***	1
lnRCSijt	-.291***	.024	-.102***	-.109***	-.035	.146***	-.439***
lnPCGDP_Diffijt	.057**	-.126***	.471***	.278***	-.234***	.365***	.440***
lnREERijt	.010	-.036	.091***	.125***	-.320***	.505***	.050*
INST_QTYit	.085***	.745***	.064**	.004	.080***	-.324***	.197***
INST_QTYjt	.056**	.012	.360***	.355***	-.287***	.340***	.370***
INST_DISTijt	.033	-.058**	.306***	.249***	-.309***	.364***	.321***
comlang_off	.072***	.016	-.197***	-.181***	-.177***	-.001	-.093***
comcol	.068**	.015	-.234***	-.190***	-.244***	.094***	-.193***
contig	.124***	-.000	-.047*	-.471***	.133***	-.162***	-.085***
legal_sytem	.146***	.022	-.079***	-.051*	-.091***	-.010	-.023
religion	.126***	-.007	.024	-.062**	.199***	-.014	.017
RTA	.040	-.006	-.231***	-.663***	.025	-.128***	-.209***
WTO	.088***	.072***	.088***	.125***	.044*	-.011	.118***
EU	.002	.001	.315***	.087***	-.064**	.284***	.278***

¹⁰ Data on region is from Pew Research Centre (The Global Religious Landscape):

<https://www.pewforum.org/2012/12/18/global-religious-landscape-exec/>

¹¹ Countries in which English is the official or primary language

¹² Country selection in which English is spoken as the official or primary language is according to the information provided by the CEPII at: http://www.cepii.fr/CEPII/en/bdd_modele/bdd.asp

Variables	lnRCSijt	lnPCGDP_Diff	lnREERij	INST_QTYi	INST_QTYj	INST_DISTijt
lnRCSijt	1					
lnPCGDP_Diffijt	-.169***	1				
lnREERijt	.058**	.473***	1			
INST_QTYit	.018	-.099***	-.047*	1		
INST_QTYjt	-.163***	.813***	.462***	.015	1	
INST_DISTijt	-.193***	.829***	.431***	-.070***	.875***	1
comlang_off	-.206***	-.036	.167***	.014	.134***	.132***
comcol	-.015	-.044*	.291***	.011	.019	.013
contig	.124***	-.149***	-.087***	-.001	-.133***	-.135***
legal_sytem	-.113***	-.004	.215***	.018	.111***	.107***
religion	.007	-.220***	-.096***	-.005	-.311***	-.236***
RTA	.024	-.222***	-.137***	-.004	-.257***	-.167***
WTO	-.077***	.093***	.031	.064**	.263***	.145***
EU	-.018	.524***	.274***	.003	.555***	.525***

Variables	Comlang_off	comcol	contig	legal_syt	religion	RTA	WTO	EU
Comlang_off	1							
comcol	.566***	1						
contig	.152***	.160***	1					
legal_sytem	.644***	.690***	.144***	1				
religion	-.185***	.167***	-.122***	.088***	1			
RTA	.246***	.158***	.396***	.028	-.090***	1		
WTO	.093***	.064**	-.132***	.095***	-0.138***	-.095***	1	
EU	-.141***	-.208***	-.076***	-.196***	-.321***	-.171***	.176***	1
Note: These are levels of significance: * p<0.05, **p<0.01, ***p<0.001								

Source: Author's computation