Determinants of South Africa's fruit export performance to West Africa: A panel regression analysis

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DECLARATION

I, Lucius Tshwene Phaleng hereby confirm that the work confined in this research dissertation is my unique work for a Degree of Masters of Science in Agricultural Economics working under supervision of Professor Abayomi Oyekale. This work has not been previously submitted for any purpose at the North-West University or any other university.

Student ……..

Signed …….. Date ……

Supervisor …….

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ABSTRACT

Exports are important drivers of economic growth and development in any country. It is therefore important to analyze the factors influencing export between trading countries. West Africa has been ranked as one of the largest importers of fruits from South Africa. This study investigates the factors influencing South Africa's fruit export to West African trading partners. The study used secondary panel data sourced from statistics South Africa and other relevant sources such as quantec easy data, global trade atlas, World Bank. The gravity model was used for data analysis. South Africa's fruit exports to West Africa region has been increasing over the past ten (10) and Nigeria, Benin, Ghana, Senegal and Cote d'Ivoire were the main importers. Fresh fruits such as apples, table grapes and pears exports from South Africa enjoyed market access in West African markets

Importers' GDP, importers population, and South Africa's production capacity positively influenced South Africa's fruit export while importer's Foreign Direct Investment (FDI), Ad-Valorem Equivalent (AVE), and inflation rate had negative impact. The results from this piece of study can assist policy-makers to make informed decisions to improve the fruits export of the South Africa in the African continent. And also allow South Africa exporters and producers to position their products to relevant export markets dictated by the terms of the determinants influencing fruits exports. The study is in line witht Millennium Development Growth (MDG) goals and South African fruits exporters need to assess the barriers. In terms of trade policies, it is vital for South Africa to consider importers GDP, importers population and domestic production capacity when negotiating for trade agreements.

South Africa need to re-direct local agricultural investment towards fruit industry to ensure expansion in production capacity. Land reform policy need to be channelled in a way that it improves the utilization of land for production of agricultural products such as fruits. Farmers Support Programme (FSP) are critical for the expansion of the fruits production and exports in the Africa market. Additionally, Africa Continental Free Trade Agreement (AfCFTA) is at the finalization stages for implementation and policy makers need to pay attention on the findings to direct the fruits exports to the reliable and sustainable markets.

Keywords: *Export, Fruits, Gravity model, West Africa, South Africa*

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LIST OF ABBREVIATIONS

AfCFTA	Africa Continental Free Trade Agreement
AVE	Ad-Valorem Equivalent
BRIC	Brazil Russia India China
CEPII	French research Centre for international economics
COMTRADE	United Nations Commodity Trade Statistics Database
DAFF	Department of Agriculture, Forestry and Fisheries
DDP	Domestic Demand Pressure
DIRCO	Department of Internal Relations and Cooperation
DTI	Department of Trade and Industry
ECOWAS	Economic Community of Western African States
EU	European Union
FDI	Foreign Direct Investment
FGP	Farm Gate Prices
FTA	Free Trade Agreements
FSA	Fruit South Africa
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GVCs	Global Value Chains
HS	Harmonized System
ITC	International Trade Centre
NTB	Non-Tariff Barriers
SADC	Southern African Development Community
SSA	Sub-Saharan Africa
UNCTAD	United Nations Conference on Trade and Development
UNSD	United Nations Statistical Division
VIF	Variance Inflation Factor
WTO	World Trade Organization

Chapter 1 : Introduction

1.1 The Background

The development and improvement of export requires an important understanding by the government and industry. The value of agricultural export plays an significant part in South Africa's economy, impacting the dimension of monetary development, occupation and the balance of payment (Chemeda, 2001). The total of primary agricultural production in 2016 for South Africa was about R263.2 billion contributing R72.2 billion to the Gross Domestic Product (GDP) in 2015 (Statistics South Africa, 2016). Throughout the years, different parts of the South African economy have grown quicker than the agricultural sector. The agricultural sector shares on the GDP has declined from over 6 percent in the 1970s to 2.0 percent by 2015. In spite of its small contribution to the total GDP, it plays a critical part of the South Africa's economy. The agricultural sector remains a huge supplier of work (employment), particularly in the rustic regions and noteworthy foreign trade earnings (DAFF, 2016).

Over the past few year, the sector has shown resilience and remains the backbone of the South Africa's economy. According to Statistics South Africa, mining and agriculture were the two main sectors that experienced positive development, consequently contributed decidedly to the nation's GDP in the third quarter of 2017. The agricultural economy developed by over 22 percent and contributed 0.4 percent to the nation's GDP, in the third quarter of 2017 South African economy grew by 2.0 percent, down from a revised 2.8 percent in the second quarter. The positive contribution of the agricultural sector on GDP infers that local consumers spend less on foreign products than domestic producers sell to foreign consumers. Agriculture, mining and manufacturing were the fundamental drivers of the expansion, with the agricultural industry continuing to dominate the growth by 44.2 percent in the second from last quarter (contributing 0.9 percent of the South African GDP) (StatsSA, 2017).

According to the Oxford dictionary, export refers to a movement of products to another nation for marketing. Exports give an indication of how competitive a nation is globally. In the same way, a strong export base ensures a nation is safeguarded against deteriorating

current account balance. Generally, exports encourage the exploitation of economies of scale; permit asset distribution according to comparative advantage; improve foreign exchange reserves and certification of simple financing of imports; increase effectiveness and efficiency through competition; improve work and take into account information overflows to energize domestic advancement (Malik, Ghani, & Din, 2017). Countries consider exports under diverse circumstances such as when their cost of production in the international countries is high, the bulk of sales is not enough to break even, the international market is not a long term market, the product might not have enough life to legitimize enormous direct investments and the political elements are not favorable (Cherunilam, 2005).

Within South Africa, agricultural exports to international markets were the main elements influencing the agricultural economic growth (contribution to the GDP) in 2017 (StatsSA, 2017). Export of agricultural goods or any other goods is considered as the most important source of earning foreign currency. Figure 1.1 illustrates the relationship between agricultural exports and their contribution to the agricultural economy. The figure demonstrates that there is significant correlation between agricultural exports and agricultural GDP. Therefore, an increase in agricultural exports drives an increase in agricultural GDP. In order to improve agricultural export, policy-makers should become familiar with the factors influencing exports. As a result, they can improve and reinforce it when needed (Gharache *et al*., 2011).

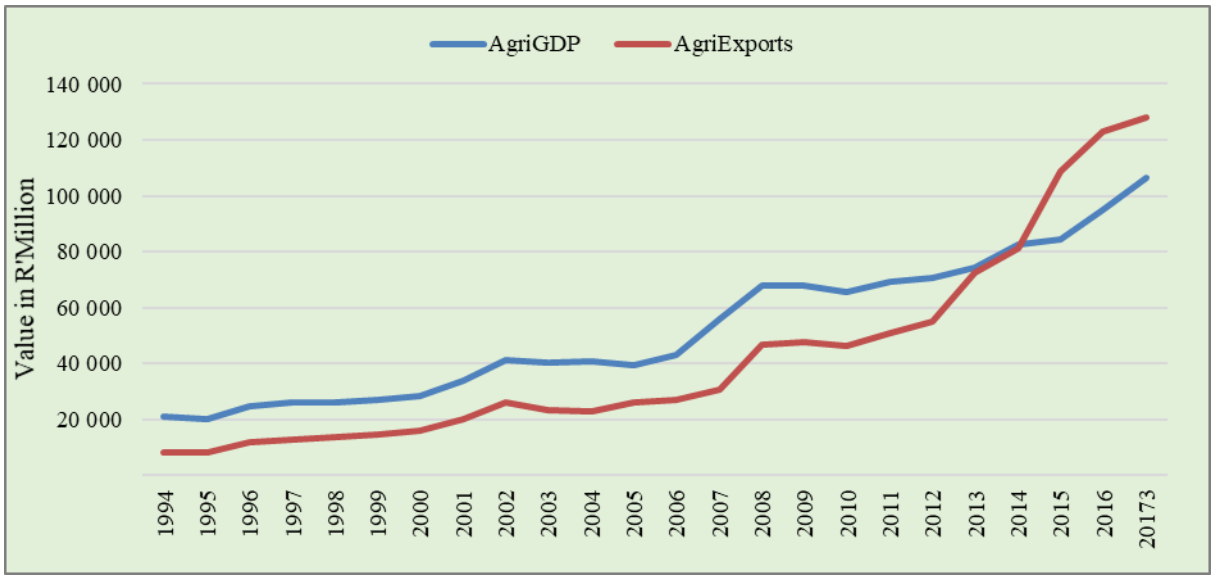

Figure 1.1: Correlation between agricultural GDP and exports

Source: ITC (2018) & own calculation

South Africa's agricultural exports have been increasing since 1994, and these increases have revived economic growth and export earnings (Plessis & Smit, 1994). Exports have remained impressive with more markets being liberalized or opened. In South Africa, agricultural exports are important due to their positive influence on economic development. The expansion of products to the international markets creates an opportunity to generate or earn more foreign currency, which will, in turn, enable domestic industries to create employment and generate income (DAFF, 2016).

Figure 1.2 highlights South Africa's total products and agricultural products exported between 2001 and 2016. South Africa witnessed a further increase in exports despite the increasing non-tariff barriers (NTB) and factors that discourage the movement of products between countries. It is critical to take note that total products and agricultural exports expanded through the period, in any case, there have been some considerable changes over time. There was a strong growth rate of 485 percent for agricultural exports between 2001 and 2016 and total exports experienced a growth of 392 percent. It can be observed that South Africa's total exports and agricultural exports achieved a high value of R1,086 billion and R165 billion respectively, irrespective of severe drought effect that occurred on the continent. Total agricultural exports represent 15.2 percent of total South African exports to the world.

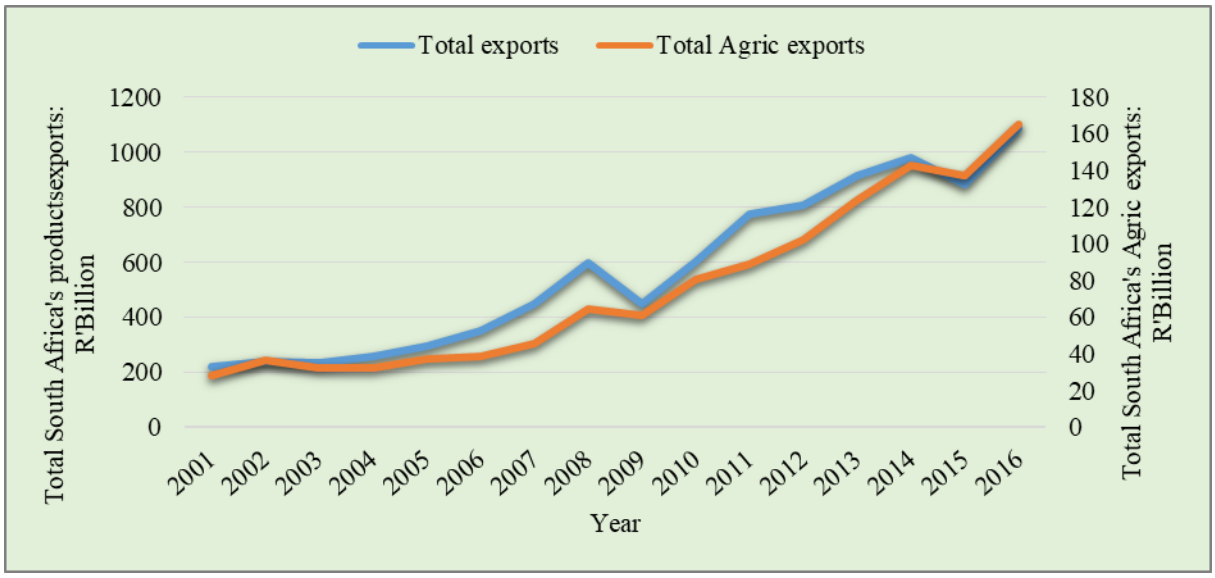

Figure 1.2: South Africa's exports, 2001 - 2016

Source: ITC (2017)

South Africa has been involved in international trade since the mid-1600s when a provisioning station for shipping cargo was built. For a couple of hundreds of years onwards, South Africa exported farm products and imported basically everything that could not be produced using local resources (NPI, nd). Today, the country is positioned among the main forty trading countries in the world. In 2016, Germany was the greatest contributor to South Africa's exports with 8.2 percent offers, USA was in the second place with 8 percent, China was third with 7.4 percent, Botswana was fourth with 5.4 percent and Japan took the fifth spot with 4.9 percent (TradeMap, 2017).

Figure 1.3 shows the composition (or distribution) of South Africa's significant trade in regions in the world market measured in share value (%). The composition of major importing markets has taken into account the 2016 values. During 2016, SADC region was eminent as the major importing market, constituting 33 percent share. The EU (28) stood in the second main importer with 29 percent share, followed by BRIC (19 percent), USA (10 percent) and Middle East (5 percent) respectively. The list of items exported by South Africa to the world was dominated by metals, vehicles and ores. Fruits were ranked seventh in South Africa's main products exported in 2016. Globally, South Africa was the 36th main export country. These indicates the demand of South African products in the global market.

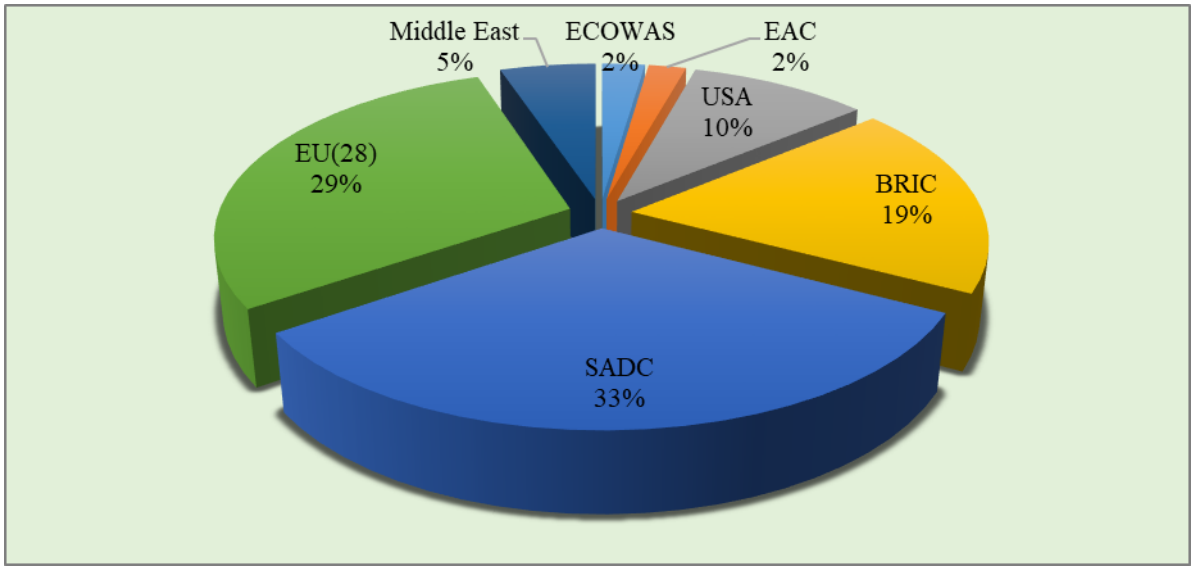

Figure 1.3: Composition of South Africa's exports destination, 2017

Source: ITC (2017)

The concept “export” is a significant indicator of a country’s success and the literature has evidence to show its existence (Carneiro, Rocha, & da Silva, 2011). This concept of the determinants of export performance featured in areas of international business and international marketing. Katsikeas, Leonidou, & Morgan (2000) explained export as the most generally researched however it is found to be the least known in the area of international trade. This reality is due to the growing leaning towards monetary globalization, the monetary and money related association. , In light of the fact that an extraordinary number of countries (for example South Africa) depend on their export to accomplish the growth of economy (Cavusgil & Zou, 1994). Furthermore, export performance depends intensely on various determinants (on importers or exporters’ side) that directs the movement of the exported products. In their review, Sousa, Martinex-Lopez, & Coelho (2008), considered two approaches for the determinants of export: the *resource-based paradigm*, take into consideration the internal determinants of the country, and the *contingency paradigm*, consider the external determinants. The study will be focusing on both resource-based paradigm (i.e. South Africa) and contingency paradigm (i.e. West Africa countries).

According to the World Trade Organisation (2017), world trade has encountered a substantial increase in the most recent decades. Feenstra (1998) proposed few factors that clarify this growth, to be specific; (a) deteriorating transport charges, (b) trade liberalization, (c) economic merging of countries and (d) the expansion of goods trade. In a same line, Baier and Bergstrand (2001) studied the variables that represented the development of trade. They concluded that revenue growth, tariff rate decrease and lower transport charges have added to the growth of world trade. As indicated by these authors, income growth explained 67 percent of the growth of trade, tariff reductions explained 25 percent while transport cost explained 8 percent of trade growth. Ogunkola (1998) highlighted that external and international inspiration have been the central point in the advancement and improvement of territorial bodies in the developing countries, particularly countries or regions that are committed to regional integration. After obtainememnt freedom, African countries identified the importance for working together. This originated from the removal of specific impediments in order to realise economic development.

The driver to the choice of fruit is that South Africa's fruit exports are the main agricultural contributors of foreign earnings, and the fruits are in high demand in international countries. South Africa's producers are among the world principal exporters of fruits (ITC, 2017); and this transition from subsistence to commercial fruit production is linked with the development of marketing structure. Fresh fruit possesses potential of earning substantial foreign exchange to the nation. Therefore, it is necessary to create a rational and dynamic relationship with international markets as well as to develop the agricultural sector (through trade) in order to promote economic development and growth (Ghorbani, 2002).

Currently, trade liberalization has been an ongoing process over the last few decades for most countries around different continents in the world. South Africa's access to the world's markets has been paralleled with expanded access for worldwide products to household markets (Fedderke & Vase, 2001). However, the degree of trade advancement in South Africa in the most recent decade remains a territory of discussion due to political instability and protectionism. Understanding the connection between standards, technical guidelines, and trade is essential in the plan of more extensive development programs that can make new opportunities for pro-poor growth. Standards and technical guidelines characterize what can (or cannot) be traded, and lay out the systems under which such trade is or is not allowable (Fedderke & Vase, 2001).

Trade regulatory estimates beyond the regions are critical to improve solid market access for South Africa. Regardless of market access being additionally improved through more liberalization through traditional trade policies for example tariffs and quotas never again significantly affect limiting market access. Tariffs are commonly low on international trade owing to trade arrangements under the support of the General Agreement on Trade and Tariffs (GATT)/ World trade organization (WTO).

In South Africa, fresh fruit still made up the greater part of exports. Notwithstanding, South Africa still depends on specific factors faced in Africa to determine exports volume. Such factors include both external and internal factors which should drive policy-makers to proper implementation. Focusing on the role of trade policy, Santos-Paulino and Thirlwall (2004), insisted that trade advancement improved export trends. Subsequently, the interest of this research study is to carry out an in-depth analysis of South Africa's fruit export to West

Africa so as to distinguish factors impacting exports. Therefore, an appraisal of determinants on fruit export is a noteworthy advancement towards accomplishing sustainable economic growth. More specifically, improving the export of agricultural products is critical for the government. The idea of export has been focal in the international marketing literature for the last four decades from 1978 (Bilkey, 1978). In 2018, Babatunde found that a noteworthy decrease of duties and non-duty boundaries and disposal of exports showcasing boards, among other trade reform measures. While the investigation had the option to affirm the mutilations brought about by trade hindrances on export performance, there is not much proof that the reception of trade arrangement changes since the mid-1980s have created a huge significant on exports.

1.2 Problem Statement

South Africa is positioned as the largest exporter of fresh fruits in the world and is known as a noteworthy exporter of citrus, deciduous and subtropical fruits (FSA, 2019). Market access is a critical determinant of fruit export in the international market. South Africa's fruits export to other continents such as Europe, Asia and Americas compared with the African continent has been somewhat lower (UNCTAD, 2005). Therefore, the study aimed at exploring the determinants of fruit export in Africa especially to West Africa. West Africa has been highlighted as the largest recipient of fresh fruit from South Africa as compared to other African regions (excluding Southern Africa). It is acknowledged that international market potential relates directly to the characteristics of the trading partners, such as the market size and foreign direct investment, infrastructure, macroeconomic factor, and political instability (UNCTAD, 2018).

Given all these potential factors, there is no research effort directed towards distinguishing the determinants of export of fresh fruits in West Africa or other African regions. In addition, most of the research studies accomplished so far on the assessment of the determinants of exports have concentrated on developed nations such as European countries. This study was also conducted after the realization of limited knowledge on the determinants of South Africa's exports of fresh fruit to international markets, especially in Africa. In the perspective of the components affecting export, the issues it presents, and it is frequently significant to the national economy, it is surprising to find that the determinants of export have been understudied particularly in the South African fruit industry.

Thus, this study endeavored to break down to what degree these potential determining factors affect South Africa's export of fresh fruits to West Africa. The investigation additionally went ahead to explore determinants of fruit exports to achieve its maximum capacity. Having profiled that 2.7 percent share of South Africa's fruit exports are destined for West Africa, combined with that fact that Trade Law Centre (2010) posits that the economic impact of factors influencing export is unclear, this study accordingly focus on filling this information and knowledge gap.

1.3 The Aim of the Study

The aim of the study was to analyse the factors influencing South African fruit export to West African countries for the period 1994 to 2016 using the gravity model. Achievement of this objective is through determining the fundamental factors explaining the recent exports in South Africa's fruit to West African countries.

1.3.1. Objectives of the Study

i. To examine the composition and trends of South Africa's fresh fruits' exportation to some West African countries.
ii. To evaluate the factors explaining South Africa's total fruits' export to West African countries.
iii. To determine the factors explaining South Africa's selected fruits' export to West African countries

1.3.2 Study hypothesis

South Africa's exports of fruits to West African countries is not significantly influenced by identified factor.

1.4 Scope and limitation of the study

Nonavailability of trade information overtime for specific countries in West Africa limited the number of countries included in the analysis. For instance, a country such as Saint Helena did not report any information related to trade and its background or it might because of the fact that it is newly created. The other challenges encountered during the course of the study were that some countries are very strict in providing information, while some sell the information, therefore it was difficult to source facts and figures and this has delimited the analyses of the study.

1.5 Policy relevance and justification of the study

By and large, the South African policy creator's outlook the friuts as a way to collect foreign earnings, growth in work opportunities, upgrade cultural thriving and improve national execution and profitability. Therefore, given that exporting of fruits result in the majority of export earnings, there is need to position our fruit exports through exploring various market opportunities such as West Africa region and determining factors driving fruit export. In South Africa, the finding of these study will play important roles in determining factor afftecting export of fruits, as well as identifying and determining important factors to improve exports in West Africa.

Developing the South African fruits products exports will basically enable all the more South Africans to fruit product exporters to develop and, advantage from becoming all the more globally competitive. Therefore, the overflow impact will add to improving work, efficiency and the way of life in the country. It is significant that the methodologies be created and encouraged by policy producers to improve and better direct fruits export through the dissemination of information on the factors that impact fruit export in the continent. The identification and comprehension of these will help government to create proper strategy that will give important and explicit assets to upgrade regional (i.e. West Africa, East Africa, and North Africa) export. In principle, this study can possibly help government offices see how to all the more likely help fruits exporters and accordingly add to the improved monetary development of South Africa.

1.6 Outline of the chapters

This study covers six main chapters excluding bibliography. Chapter 1 provides an overview of the study, which involves the introduction and foundation of the study. It also highlights the South African economy and export, problem statement, the research objectives, and hypothesis. Chapter 1 also discusses the scope and limitation of the study. Chapter 2 reviews the identified literature related to this study. The development of the theoretical framework and the hypotheses was defined in this chapter. Chapter 3 gives an overview of the South African fruit industry, including the primary importers of South African fruits and largest fruits that have been exported to the international markets. Chapter 4 describes the research technique utilized for this study, while Chapter 5 focuses on the results and discussions. The

study concludes with Chapter 6. The contributions and implications of the study are clarified. The restrictions of the study and recommendations for future work are likewise discussed.

Chapter 2 : South Africa's fruit industry overview

2.1 Introduction

The objective of this chapter is to give an outline of the South Africa's fruit industry and to make the setting for this study. This is done by discussing the fruit industry origins and production areas, export in the world and African markets, export trends looking at different African regions. This chapter included concrete and robust analysis for better understanding of the South Africa's fruit industry and its role in the employment creation, poverty alleviation and development of the economy.

2.2 Background of South Africa's fruit industry

South Africa is among the world's largest contributor in terms of value to the country's agricultural exports (Daya, 2005). According to DAFF (2016), about 90 percent of South Africa's fruit is exported in the global market, the remaining being consumed in the local market either as fresh or processed. The country has comparative advantage of suitable climatic and environmental conditions for favourable fruit production. The produced varieties of fruit in South Africa include deciduous, citrus and subtropical fruits (FSA, 2016). Substantial volumes of fruit grown in South Africa are generally exported to the international markets (Ruben, Van Tilburg, & Trienekens, 2007).

Generally, South Africa's fruit exports are more focused on European markets, with nearly 20 percent going to Netherlands, United Kingdom, China and Russia (FSA, 2016). The smaller share of fruits are exported by means of airship cargo because it is excessively costly for the exporters (FSA, 2016). Almost all the fruit producers and exporters in South Africa are represented by an organization called Fruit South Africa and its role is to represent all its member organizations (such as Hortgro, citrus growers association, South African table grape industry, subtropical growers association).

2.3 Origin and production areas of the fruit

South African fruits are found in the wild, but on the other hand are commercially become consumed as primary or secondary. Studies have demonstrated that collecting of fruit from the wild and from the semi-trained trees grown on homesteads can result in a improving rural economy through foreign returns (Department of Government Communication and Information System, 2017/18). Fruits are produced in the most parts of South Africa and the key areas include Western Cape, Limpopo, Eastern Cape, Mpumalanga, Gauteng, and Northern Cape. Citrus fruit is produced in eight of the nine provinces (see figure 2.1 for a map of South Afica indicating major production areas) and Western Cape is the largest fruit producing province (FSA, 2016). As South Africa produces more fruits than can be ingested and devoured by the nearby market, and the fruit of such a high caliber, a huge level of fruits are traded.

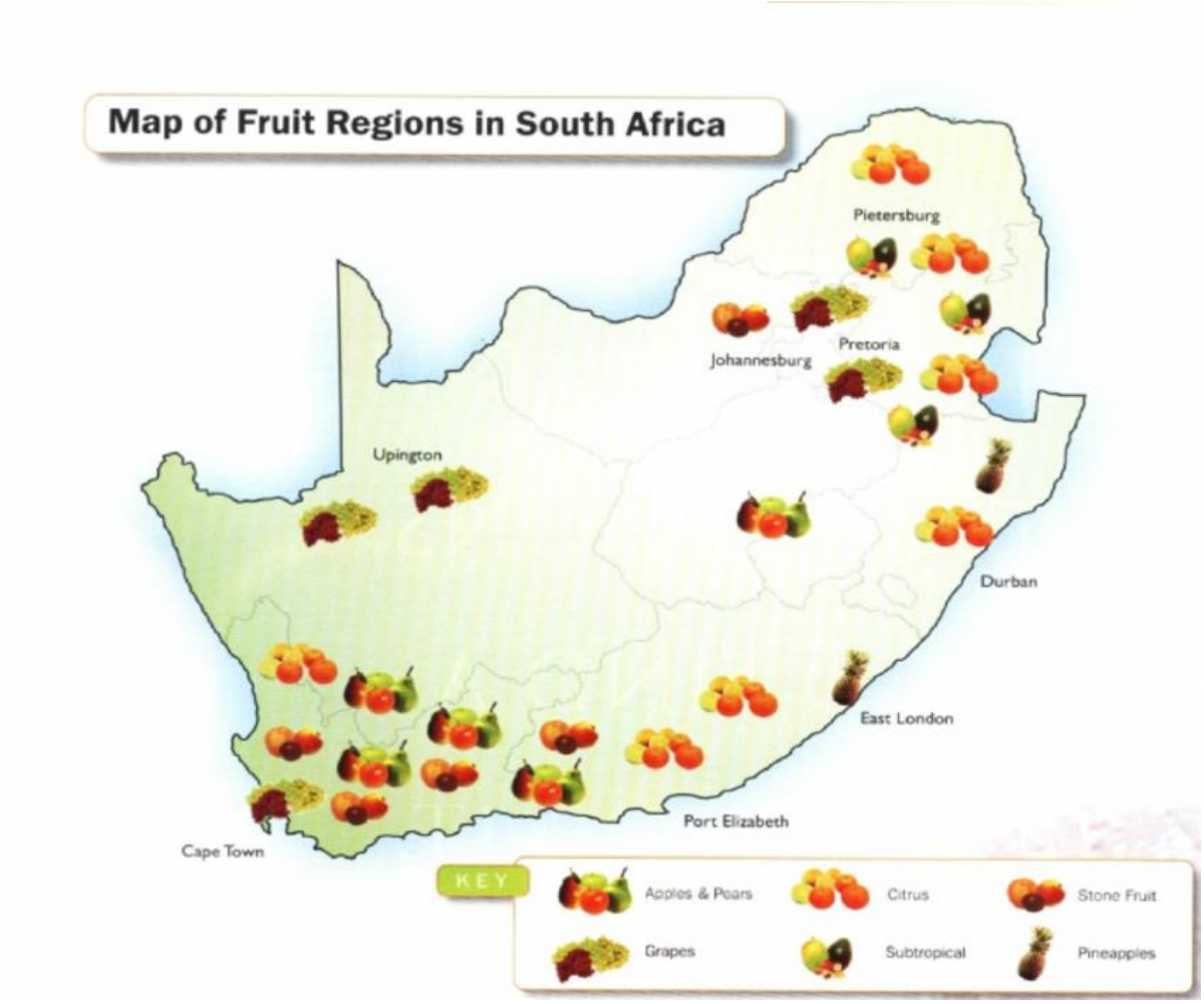

Figure 2.1: Map of fruit regions in South Africa

Source: Fruit South Africa (2016)

South Africa's atmosphere and soil qualities bring about perfect conditions for some assortments of fruits to be developed; deciduous, citrus and subtropical fruits are completely developed all through. fruits that are developed for new utilization (not developed for squeezing, canning, pulping or some other explicit handling/esteem including industry). Deciduous fruits incorporates table (grapes developed for eating, not wine generation), pome fruits (apples and pears), and stone fruits (apricots, peaches, nectarines and plums). The class citrus fruits is part into oranges, grapefruit, lemons, limes and delicate citrus (otherwise called simple peelers, for example, naartjies, mandarins, and so on). Subtropicals are mangoes, litchis, melons, avocados and pineapples (while bananas additionally fall into this classification). Citrus fruits are produced in eight of the nine production areas (see Figure 2 for a guide of South Africa demonstrating significant production areas). There are presently 1 073 citrus growers that legitimately absorb approximately 100 000 individuals. It is evaluated that during citrus season more than 1 million metric huge amounts of citrus is exported (that bars all the citrus created for the nearby market!) .

2.4 Global overview of fresh fruits trade

Globally the United State of America (USA) continues to dominate the production of fruit and is ranked as the leading importer and exporter, accounting for approximately 11.5 percent of the R245 billion in world imports and 13.9 percent (R206 billion) in exports, respectively. European countries constitute the largest share, and Germany and Spain were the principal importer and exporter while the Netherlands assumes an essential role in the physical dissemination process. Chile and South Africa have turned out to be significant suppliers in the international trade of fresh fruit commodities (TradeMap, 2016).

Table 2.1 highlights the world top 20 importers of fruit in the 2016 production season, measured in billion rand and percentages. It is evident that a global import of fruit has been increasing annually from R282 billion in 2001 to R1 709 billion in 2016. USA was the world leading importer of fruits with a global share value of 14.3 percent in 2016, followed by Germany, the Netherlands and the UK constituting 20.3 percent share collectively. There were no African countries from the list of principal importers of fruit. The reason for African countries not being part of importers may be due to the fact that African countries are the main fruit producers.

Table 2-1: World leading importers of fruits, 2016

	Imported value in R 'Billion				Growth value (%)		Share value (%)	
Importers	**2001**	**2014**	**2015**	**2016**	**2015/16**	**2014/16**	**2016**	**2015**
World	**282**	**1225**	**1453**	**1709**	**90**	**39**		
USA	40	151	196	245	125	62	14.3	11.5
Germany	36	110	127	150	61	36	8.8	7.5
Netherlands	12	74	84	104	159	41	6.1	4.9
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Poland	4	17	19	21	65	28	1.3	1.1
Switzerland	5	14	16	19	63	42	1.1	1.0

Source: Trade Map (2017)

The top 20 world leading exporters of fruits are highlighted in Table 2.2. The top countries that exported fruit in the world accounted for more than half of the exported fruits in the world. According to the Oxford business group (2016), there is an increased demand from western markets such as the EU and US in recent years. As highlighted from the table, the USA was ranked as the leading exporter of fruits, constituting 13.1 percent share in value in 2016. Spain was the second largest with a share value of 8.4 percent, followed by Netherlands and Chile constituting a share value of 11.8 percent collectively. As noted previously, South Africa was among the main manufacturer and exporter of fruits and ranked 10th as the leading exporter with a growth value of 18 percent between 2015 and 2016.

Table 2-2: World leading exporters of fruits, 2016

	Exported value in R 'Billion				Growth value (%)		Share value (%)	
Exporters	**2001**	**2014**	**2015**	**2016**	**2015/16**	**2014/16**	**2016**	**2015**
World	**246**	**1,141**	**1,317**	**1,572**	**19**	**38**		
USA	34	161	183	206	12	28	13.1	13.9
Spain	29	100	115	133	16	32	8.4	8.7
Netherlands	9	67	76	98	29	47	6.3	5.8
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!	!	!	!	!	!	!	!	!
!	!	!	!	!	!	!	!	!
Thailand	2	14	17	24	40	68	1.5	1.3
India	5	18	19	23	24	32	1.5	1.4

Source: Trade Map (2017)

Figure 2.2 highlights world trend of fruit traded (imports and exports) in 2016, measured in billions Rand. The world trend increased as expected, reaching global exports of R1 572 billion and imports of R1 709 billion in 2016. The value of world fruit trade has increased slowly between 2001 and 2010 and therefore increased at a faster rate until recently. It is worth noting that world demand of fruit has been higher than exports which makes the world a net-importer.

Figure 2.2: World trade of fruits, 2001 - 2016

Source: Trade Map (2017)

2.5 South Africa's overview of fresh fruits trade

South Africa has a very strong agricultural sector with the favorable climatic condition to plant various agricultural products, and the country is self-sufficient in fresh fruits and vegetables as well as in inputs for its food processing sector (DAFF, 2017). Fruit South Africa (FSA) has highlighted that about 4.4 million tons of fruit is produced annually and 600 000 tons are supplied to the local market while the rest is exported to the international markets. It was, therefore, indicated that about 60 percent of fruit produced in South Africa is exported, while 26 percent is for processing, 13 percent is consumed locally and only 1 percent is dried.

The Netherlands Enterprise Agency (RVO) and the Embassy of the Kingdom of the Netherlands in South Africa (EKN) have dispatched a perusing study into the present situation of the agro-preparing industry in South Africa and its difficulties. The examination gives an outline of the degree to which the agro-preparing industry can include more worth, with the point of constraining imports. It was found that about 1.2 million tons of fruit is provided to processing plants for generation of fruit product concentrate, fruit juices, and canned fruit, while roughly 51 000 tons is prepared into dried fruits for local and export markets (Ministry of foreign affairs, 2018).

As demonstrated by FSA (2017), most of agricultural exports from South Africa were fresh products and greater than 2.7 million tons of fruits (out of 4.4 million tons delivered) were provided about 87 countries in the world yearly. Figure 2.3 features a proportion of fruit produced annually in South Africa measured in percentages. As indicated by USDA (2016), the citrus industry is the third greatest industry after deciduous. The figure shows that citrus fruit is largely produced (34 percent) in South Africa with oranges constituting a larger share. Pome fruits constituted about 25 percent of total fruits produced in the country (apples are more produced than pears), followed by subtropical fruits & nuts, stones fruits, and table grapes constituting about 22 percent, 10 percent and 9 percent respectively.

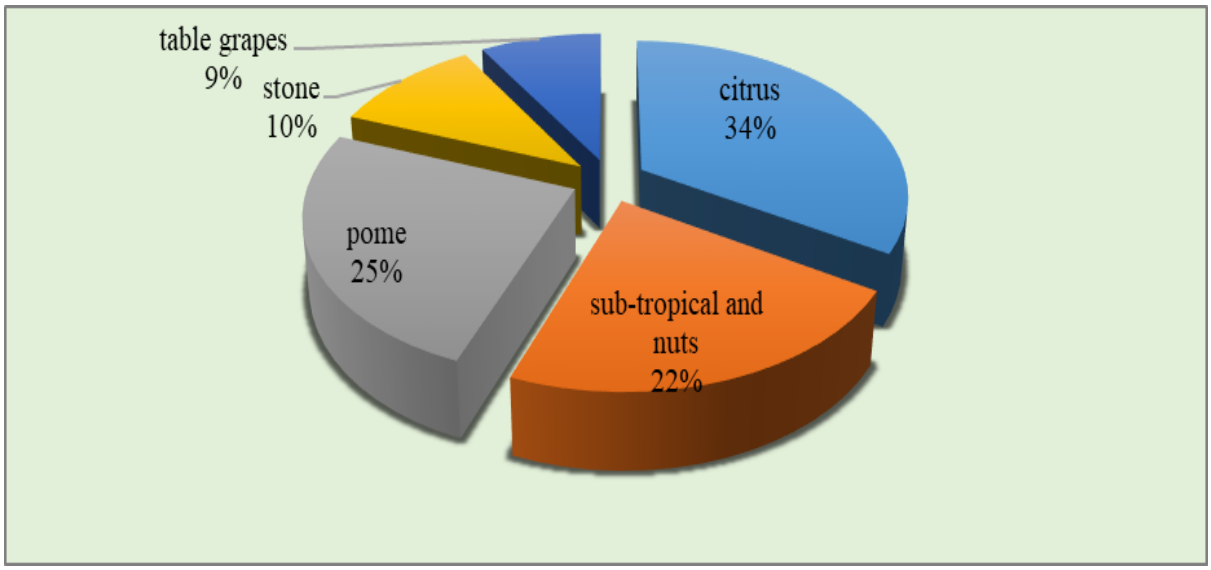

Figure 2.3: South Africa's fruits produced annually, 2017

Source: Trade Map (2017)

Table 2.3 illustrates importing markets of fruit exported by South Africa in the period under review, measured in millions of Rand and replicated using percentage share (and growth). The table highlights that South Africa's total exports of fruit were valued at R42,320 million in 2016, with a larger share destined to the European Union. The top three destinations were the Netherlands, UK, and Angola respectively (Table 2.3). The top 20 destinations represented 83 percent of South Africa's fruits exports to the world in 2016.

Table 2-3: Top twenty (20) importing markets of fruits from South Africa

	Exported value in R Million				**Growth value (%)**		**Share value (%)**	
Importers	**2001**	**2014**	**2015**	**2016**	**2015/16**	**2014/16**	**2016**	**2015**
World	**4616**	**30566**	**35870**	**42320**	**18**	**38**		
Netherlands	983	6651	7539	8683	15	31	21	21
UK	953	4587	6015	6391	6	39	15	17
Hong Kong	154	2416	2784	3110	12	29	7	8
!	!	!	!	!	!	!	!	!
!	!	!	!	!	!	!	!	!
!	!	!	!	!	!	!	!	!
!	!	!	!	!	!	!	!	!
Japan	148	385	317	488	54	27	1	1
Kuwait	3	357	259	452	75	27	1	1

Source: Trade Map (2017)

The African continent have vast potential to play a role in worldwide food markets and indirectly responding to hunger eradication and ensuring food security. This potential lies in its land, water, and determinants of exports. Farming produces a critical bit of the economies of each and every African nations, as a division it can along these lines contribute towards major continental needs, for instance, disposing of destitution and yearning, boosting intra-Africa exchange and ventures, brisk industrialization and economic expansion, maintainable resources, and natural administration, creating employment opportunities, human security and shared flourishing.

Boosting intra-Africa trade is one of the main priorities for African continent. Figure 2.4 highlights how South Africa trade with other African regions (East, Middle, North and West Africa) between 1994 and 2016. For the purpose of the study, Southern Africa sub-region was not included in the figure due to its FTA with South Africa. Therefore in the exclusion of southern Africa, West Africa became the largest region to import fruits from South Africa constituting 2.7 percent share of total exports. In West Africa, Nigeria was a leading importer of fruits from South Africa, followed by Senegal, Ghana, Cote d'Ivoire and Benin. Pome fruits, table grapes, citrus fruits, and subtropical fruits were the leading fruits destined to West Africa.

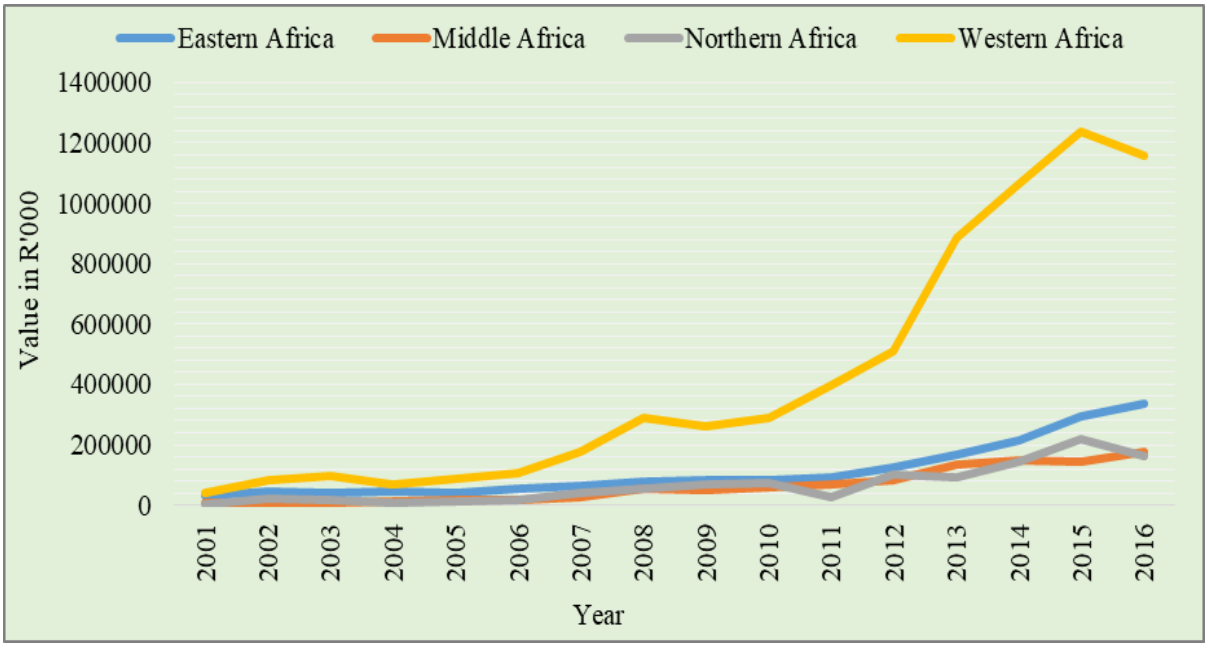

Figure 2.4: South Africa's exported trend to African regions, 2017

Source: Trade Map (2017)

Table 2.4 highlights SA's top importing trading partners in Africa, measured in million rand and percentages (%) in 2016. Nigeria with a share of 1.3 percent was ranked as the largest importer of fruits from South Africa. Botswana was the second principal consumer of fruits with a value of R569 million, followed by Namibia and Kenya with a growth rate of R353 million, and R281 million respectively in 2016.

Table 2-4: Top importing markets (in Africa) of fruits exported by South Africa, 2017

	Exported value in R 'Million					Growth value (%)	Global Share value (%)
Importers	**2012**	**2013**	**2014**	**2015**	**2016**	**2012/16**	**2016**
World	**19292**	**25356**	**30566**	**35870**	**42320**	**119**	
Nigeria	67	366	639	936	569	749	1.3
Botswana	189	226	246	273	353	87	0.8
Namibia	174	255	266	212	281	61	0.7
!	!	!	!	!	!	!	!
!	!	!	!	!	!	!	!
!	!	!	!	!	!	!	!
!	!	!	!	!	!	!	!
Togo	24	45	35	18	40	66	0.1
Tanzania	16	28	21	24	35	118	0.1

Source: Trade Map (2017)

Chapter 3 : Theoretical Framework and Literature Review

3.1 Introduction

The first part of this chapter provides the WTO perspective on export determinants and discusses its impact on exports. A brief overview of the theoretical models of export determination was then given. The third part looked at theories clarifying global trade patterns in addition to providing potential theoretical underpinnings for the gravity trade model. An evaluation of the interrelated studies is provided in the last part of the chapter.

3.2 Theoretical Framework of Export Determination

King (1997) attempted to recognize particular sorts of models to explain the association between a given country's exports to the remainder of the world and most analysts apply to see the exports of a country or a region viable. These are the export demand model, trade assurance models, and two-system models.

3.2.1 Single Equation Export Demand Model

The export demand model is the least hard strategy for breaking down the demand side determinants of the export of a country or the region by expecting the stock side to be price elastic. As demonstrated by King (1997), this model expect that the supply side either has an inert profitable limit or else the economy displays expanding comes back to scale. It is moreover accepted that the cost flexibility of supply of expots will, by and large, be boundless yet these uncertainties of expanded come back to scale or the assumption of full gainful limit sometimes fall short for the exports area of SSA. In most developing nations, the greater part of the imperatives originating from the export area are related with supply-side variables. What's more, trade is seen as exceptionally inelastic for their export. Since this model works under profoundly prohibitive suppositions, it cannot be acknowledged for the foundation of the model for developing country's exports inside this system. In view of this explanation, specialists constrain themselves from utilizing single equation model to clarify the export sector for developing country's.

3.2.2 Export Determination Models

The export models are set up by joining the theoretical hypothesis of export demand and supply model that would be assessed as a solitary equation utilizing basic normal least square (OLS) estimation (King, 1997). As indicated by King (1997), as refered to by Ibrahim (2007), local demand pressure (LDP) is viewed as a potential logical variable which assists with examining the implications of local movement over of exports for a country. Hence, LDP changes, subsequently, the income also changes. On the off chance that livelihoods increment because of expanding LDP, it cancels for enlisting laid staff, and bring stand-by hardware, contracting new specialists and an expansion in work. The effect of profitability over exports also identified with LDP. Thus, hypothetically, including LDP just as profitability indicator in the suppy equation of the export assurance model is expected to catch the supply side factors' effect on agribusiness, benefits just as production exports of a country.

3.2.3 Two-Regime Model

The two-system models are built on the possibility that either exporters are not only a social affair of homogeneous firms or the enronment which they effort may show urgent change normally. The exports of EA countries are essential item trades with little item differentiation. Additionally, for a considerable length of time practically all EA countries were working with the exchanging of and in a little produced and essential products and administration segment. The economies of the majority of the countries are static both underway and in trade. Subsequently, the model is not fitted to clarify the export sector of developing countries and nothing is done experimentally for its striking assumption. This approach was established in demonstrating total export, raw material exports, administration and production exports of EA. Detailed explanation of the model will also be given in the next chapter.

3.3 Theories explaining international trade patterns

The two expansive subjects in the model of global trade. Originally one is qualitative, being worried about the arrangement of trade, for example, which state determination trade which products. The typical concept narrates this to similar preferred standpoint, for example to global contrasts in comparative prospect prices and after that endeavors to clarify the relative benefit of differences in technologies, factor supplies and so on. This section is likewise concerned with the manner in which trade return affects such determinants of comparative advantage. The second wide theme is more on measureable and looks to clarify the terms of trade, for examples qualified values of trade in the world. It additionally looks at how changes in different determinants for example factor provisions, and strategies will affect the trade (Dixit & Norman, 1980). The following couple of sub-segments focus on different trade theories in international trade patterns.

3.3.1 New trade theory (NTT)

The new trade theory recommends that a basic factor in deciding international patterns of trade are the extremely significant economies of scale and system influences that can happen in key industries (Gouwa, 2005). Another component of new trade theory is that firms which have the upside of being an early participants can turn into predominant firms in the market. This is on the grounds that the principal firms increase significant economies of scale implying that new firms can compete against the existing firms.

3.3.2 Patterns of demand

A pattern of demand relies on the dimension of income. Thus, consumers in developed countries demand less advanced goods. At whatever point a country exports a specific product, it plans the product keeping in view the flavor of foreign consumers (Linder, 1961). It is on the grounds that fulfilling the needs of consumers is an essential concern. The manufacturers expand production so as to accomplish economies of scale and at exactly that point is it able to export the product. Exports are sent to comparable countries or countries with similar dimensions of income since it will not be acknowledged in countries with different dimensions of income (Sailors, Qureshi & Cross, 1973). In other words, international trade in manufactured goods is affected by the closeness of interest. For

example, if the level of income between South Africa and Botswana is similar, South African manufactured goods will be exported to Botswana. South African goods may not be in demand in West African countries because the living standard and consumption pattern there is quite different from that in South Africa.

3.3.3 Mercantilist version

For the purpose of this study, fresh fruit could best be accumulated through a trade surplus. In order to achieve a trade surplus, governments monopolize trade activities, provide subsidies and other incentives for export, and restrict imports (Heckscher, 1935). The concept of mercantilism targets at producing trade additional, which sequentially pays to the growth of a state's wealth. Among the sixteenth and nineteenth centuries, European imposing influences vigorously followed international trade to upsurge their capital of goods, which remained in order to capitalise the build of a powerful army and infrastructure.

3.4 The gravity trade model

3.4.1 The historical setting of gravity and its establishments

As indicated by Beghin & Bureau (2010), there are different techniques in writing literature which could be utilized for extensive analyses on the determinants of duty barriers and other trade barriers on international trade. Two originations have immediate results as far as the effect of trade and they result in diverse ways in dealing with the realistic estimates (Beghin & Bureau, 2010). From one perspective, if definite trade-arranged non-duty barriers are identified, the conceivable strategies to gauge its effect on export are for examples, methods dependent on surveys, gravity and price wedge estimates. However, NTB techniques such as general equilibrium and cost-benefit analysis may perhaps be utilized in a case where the measurement is welfare oriented.

Moreover, as indicated by Beghin & Bureau (2010), a run of the typical approach when attempting to evaluate tariff barriers and FDI in order to investigate the residuals and factors of cost-effective reversion models of trade streams on the different factors of export. In this manner, the gravity trade model demonstration is exceptionally compelling to economists,

these models have been utilized for quite some time as an approach to approximate different variables that hinder export (or international trade) (Beghin & Bureau, 2010).

During seventies and eighties, the famous trade mode "gravity" feel into some disfavor. It was alluded by Deardorff (1998) that the gravity model is having to some degree questionable hypothetical foundations. It was further expressed that a gravity model is the relapse of internal variables (Baldwin & Taglioni, 2006). The associated sub-section concentrates on the historic improvement of the gravity trade model and its establishments.

Dutch analysts in 1960s clarified the observation application and numerical plan of a gravity condition (Tinbergen, 1962). He remained to be the earliest to publish a gravity model with an observation application. He was supervised by Linnemann (1966) on his Ph.D. entitled "An econometric study of international trade flows" which resulted into an ordinary reference to the formation of the gravity condition. Most applications of gravity model include bilateral trade flows despite its application to complex economic phenomena.

Leamer & Stern (1970) expressed that "the significance of such theoretical fundamental research must be found in the context of seeking a broader understanding of the empirical base of the pure theory of international trade flows". This is the thing that various studies neglected to elucidate. As per Van Bergeijk & Brakman (2010), the gravity model can distinguish extraordinary instances of fake boundaries the part of the distance and the impacts of enrolment in different agreements. It was discovered that the small-scale establishment of the gravity model was additionally critical with regard to the asserted speculations (Deardorff, 1998).The interest originates after the constantly sold practical descriptive intensity of the gravity trade model, with R^2 values going from 65 to 95 percent, dependent upon the illustration, which has remained a powerful inspiration for its use, stated by Bergstrand (1985).

Anderson (2011) indicated that ancient researches conducted have functional the gravity model and has looked to evaluate the effect of different factors notwithstanding the fundamental gravity condition. Additionally, it was discovered that the value of trade and trade determinants or factors have a significant correlation in the gravity model that represents numerous fluctuation that is not clarified in the simple gravity calculation. The model unmistakably has a correlation with a geographical perception of trade, however, some

hypothetical validations have been proposed for the model. Subsequent to composing a powerful literature evaluation it was revealed that the list of experimental claims of and contemplates on the gravity trade model is broad.

It was clarified that specialized practical or mechanical particulars may contrast crosswise over models, however gravity condition on bilateral trade has been built or created from numerous small-established models of trade (Jacks, Meissner, & Novy, 2011). The factors resulting in bilateral trade erosions remain inadequately comprehended. Therefore, it is very risky, as trade costs on NTBs might be critical as the customary determinants of trade, or not progressively vital. Generally, numerous literature evaluations indicated that the absence of vigorous and complete hypothetical establishment for the gravity trade model deteriorates the reliability and prompted a questionable status among scholars, presents a level of bias in the elucidation of the assessed factors of the model. Along these lines, the model has been broadly utilized despite its having an incredibly realistic and practical. Currently, the examination for a complete small-establishment for the gravity trade model continues.

3.4.2 The gravity condition: theoretical basis

The current segment properly introduces the gravity trade condition, acknowledged through different economists within the trade field, as international trade analysis and evaluation of the impacts of various variables.

It was found that the originator of the gravity condition tried to clarify the extent of bilateral trade which can be estimated by the Newtonian model of gravitation (Chaney, 2011). The concept argues that somewhat two countries in the world interest to each other through a strength that is straightforwardly corresponding to the result of their masses and conversely relative to the square of the separation between them. The theory has been simply articulated by Beghin & Bureau (2001) with equation 3.1:

$$F_{ij} = G \times \frac{[Mi \times Mj]}{D_{ij}^2} \qquad (3.1)$$

Where,

F_{ij} is the appealing power between objects *i* and *j*,

G is the gravitational steady,

$Mi\ and\ Mj$ are the multitudes of the respective objects and

D_{ij}^2 is the separation between the objects.

The setup of the premise whereupon economists, for example, Tinbergen (1962) establish that this condition achieved fine in clarifying two-sided trade movements (Chaney, 2011; Beghin & Bureau, 2001). This Newtonian condition can be utilized in an economic setting through clarifying trade flows (shaping the premise of the gravity trade model) where Fij is the trade movement among countries of origin *i* and the country of destination *j*. *G* is a consistent economic structure. Mi & Mj are individual economic sizes (i.e. GDP) of more than one economies or countries and Dij the separation in terms of distance among trading nations (Hillman, 1986).

As indicated by this guide, Novy (2013) argued that gravity trade condition is a portrayal of an experimentally steady relationship of bilateral trade from one perspective and the extent of economies of the individual GDPs and their separated distance Tinbergen (1962) brought the fundamental gravity condition into international trade standard and in writing. Equation 3.2 of gravity trade was presented by Tinbergen (1962):

$$T_{ij} = a_0 \frac{X_i^{a1} X_j^{a2}}{D_{ij}^{a3}} \qquad (3.2)$$

Where;

T_{ij} = Exports of country *i* to country *j*

X_i^{a1} = Gross Domestic Product (GDP) of country *i*

X_j^{a2} = Gross Domestic Product (GDP) of country *j*

D_{ij}^{a3} = Distance between country *i* to country *j*

a_0 = is the general constant

Tinbergen (1962), expressed that the principal issues deciding the span of the trade movements among couple of countries are the economic magnitude of the exporting state (as far as GDP), the economic size of the importing country and the separation between them. Regularly, gravity model is commonly communicated as a trade correlation between the two countries. This is communicated as an element of:

- ❖ Revenue dimensions of economic magnitude regarding their GDP;
- ❖ Population estimate;
- ❖ The distance between the dualistic countries;

Beside, Paas, (2000) clarified the essential kind of the gravity model for the analysis of trade flows:

$$X_{ij} = \mathrm{a} Y_i^{b1} Y_j^{b2} N_i^{b3} N_j^{b4} D_{ij}^{b5} P_{ij}^{b6} \qquad (3.3)$$

Where,

X_{ij} Represent the estimation of trade flowing from country *i* to country *j*

a- constant

$b_1, b_2, b_3, b_4, b_5, b_6$ – coefficients of weighted geometric midpoints

Y_i *and* Y_j – countries (*i* & *j*) GDP's

N_i *and* N_j – populations of country *i* and country *j*;

D_{ij} – the distance between country *i* and country *j*;

Nothing unmistakable contrast in fundamental gravity trade model display by Tinbergen (1962) and Beghin and Bureau (2001). The essential of this trade model depends on Newton's rule of attractive energy however basically characterized as an arrangement of trade between countries with the fundamental to help clarify the degree of trade between them. As referenced previously, besides the gravity trade model efficient structure, two-sided trade ought to remain emphatically related with the two countries livelihoods or magnitude of a country as far as their individual GDP as well as the contrarily associated with the distance among them. Shipping expenditures which, coherently compare with the geographical separation among the two nations, can likewise be viewed by way of a principal trade obstacle.

The literature review made it obvious that the gravity trade model functions as an incredible methodical instrument which can be utilized to evaluate the influence(s) of different descriptive factors.

3.5 Empirical literature review

In this section, I present empirical review of some studies that are related to this study. The farming sector absorb 62 percent of the people of SSA (excluding South Africa) and produces 27 percent of GDP, by most of the underprivileged people situated in rural areas (FAO, 2006; World Bank, 2006; Staatz and Dembele, 2007) . Though, the region still records an extremely low share of world trade. The study on the determinants of exports to Jordan by Anlader (2010) found that there is a positive correlation among GDP as well as exports and the relative population in those countries. It was further discovered that an expansion in the income or the population in those countries drives export growth. The results of the model additionally demonstrate that the size of exports of Jordan was reduced with increase in distance and foreign exchange rate.

Tay (2014), used the gravity model to examine trade in training utilizing a nexus of worldwide trade theories. The analysis revealed that customary determinants of reciprocal trade, for instance, population and regular language have a positive and significantly tremendous impact on trade training. Greene (2013) also used the gravity model to look at government methodologies as well as various extents of market access for the United States (U.S) exports of pattern setting development products to India. The investigation found that per capita income coefficient for the exporting (United States) and bringing in (India) nations had the positive effects, of course; and remembering that population takes a negative and irrelevant factor.

Iqbal and Islam (2014) similarly concurred with Tay (2014), as they broke down bilateral trade among Bangladesh and its 15 critical trading accomplices of the EU.. Their examination findings found that the GDP of Bangladesh remains firmly associated with its exports, however EU economy is oppositely related with Bangladesh's exports. The analysis further exhibited that the factor of the real exchange rate and distance negatively influence Bangladesh's exports. Next is the examination by Pham, Dao, and Doan (2014) in assessing the exchange of services among Vietnam and the EU countries. This analysis furthermore demonstrated that population and GDP per capita are found to have the normal impact on complete services trade. Likewise, the distance variable performed by desires, however not

empirically significant. Suvankulov and Ali (2012), found a considerable advantageous result of population, GDP per capita both in the countrys of origin and destinaation of exports. The research additionally uncovered that a typical language between trading countries has a strong beneficial outcome on two-sided exchange.

The studies such as, Eita and Joordan (2007), Jordaan and Kanda (2011), consolidates the gravity model to investigate South Africa's exports streams. Then again, research on the factors of exports of aricultural products in South Africa are restricted or non-existent. The purpose of these studies was to explore the factors of horticultural, ranger service and fishing exports to SADC exchanging accomplices. Similarly, Mosikari (2016) studied the determining factor of South Africa's exports of AFF products to SADC and the gravity model methodology was used. The result indicated that the exporter's GDP, shipper's population, South African growth, and the exchange rate have a negative relationship with South African exports of AFF. However, the importer's GDP and exporter's population fundamentally influenced AFF export. The results suggest that development in GDP presents freedom and less need to export and GDP of SADC nations are crucial for exports.

More research findings state that internal determinants are imperative components in improving the export of a country concern (Gbetnkom & Khan, 2002; Abolagba *et al*, 2010). Confirmations additionally demonstrate that by improving internal determinants, for example, production capacity, infrastructures, and availability of the agricultural inputs help expand the export while different determinants remain consistent like domestic consumptions. Correspondingly, degrading or depreciation of the domestic currency has positive contributions to export since it makes the costs of exported commodities less expensive and improves the volume of a commodity (McKay, Morrissey, & Vaillant, 1997; Abolagba *et al*, 2010; Kingu, 2014). As indicated by Gbetnkom & Khan (2002), "great trade policy results in high export of a country and enables improving the supply chain mechanism within a country".

Santos-Paulino (2003), finds that when the income of trade partners improves, it additionally expands the export of the commodities. Simultaneously, if the world costs go up, it empowers a greater number of exports than when the costs are low or falling (Santos-Paulino, 2003). In reality, internal determinants are upheld by progressively experimental evidence that impacts export (Mesike, Giroh, & Owie, 2008; Kingu, 2014), though different studies observe that

export are affected by external determinants (Santos-Paulino, 2003; Kusi, 2002) and other studies additionally find that export is affected by both internal and external determinants (Agasha, 2009; Allaro, 2010; Anwar, Shaukat, & Hussain, 2010).Moreover, Bestbier (2016), in analyzing variables influencing trade patterns, showed that GDP, population, distance, and *ad valorem* tariff rate was observed to be measurable and significant on South African apple exports. He recognized that factors replied contrastingly to the exports of apples as paralleled to the absolute exports.

3.6 Literature gap

The review of literature on exports proposed on the number of researches conducted related to the study under analysis and previous researches has paid attention towards other industries from highly industrialised countries, particularly the European Union, Middle East and Americas. The lack of empirical understanding of the backgrounds on fruit export impedes an additional constant and applied conceptualisation of fruit export to African regions. A knowledge gap exists from the literatures therefore these defines an opportunity to construct, improve a hypothetical model to assess original and existing assumptions on the determinants influencing South Africa's fruits export in West Africa region. Lastly, there is a limited studies focusing on trade barriers encountered by South African exporters when trading with African countries. Clearly, there is no existing study conducted in South Africa regarding the determinants of fruit export to the African region. These research attempt to fill this literature gap and provide an empirical contribution to the principal factors influencing the of fruit exports.

Chapter 4 : Research Methodology

4.1 Introduction

The earlier chapters serve to provide an introductory highlighting the purpose and the significance of these study. The second and third chapters also contain the empirical literature review and an outline of local fruit industry. The current chapter is outline the research methology components such as the research approach, area of study, design then methods used in the study and to provide a brief overview for choosing the statistical methods and variables used in the analysis of the empirical data. Deviating from existing studies and South Africa's fruit industry, this study centers explicitly around the fruit so as to build an in-depth analysis of determinants applicable in this industry and to moreover present new potential determinants.

The gravity econometric model was utilized towards satisfying the targets and goals of this study. This methodology has few essential highlights and has been effectively verified in clarifying trade between countries. The model can be adjusted and adjusted without much of a stretch so as to research explicit determinants that impact global trade. Such highlights make this model suitable to achieve this study intended objectives. In this chapter, the study area (West Africa) is reviewed, followed by the research design and econometric model. Furthermore, talks about the information data detail and factors utilized for fundamental trade model applicable for the study.

4.2 Description of the study area

4.2.1 South Africa

The study was dependent on South African fruit export to West Africa. In this way, the study concentrated on South Africa and the West African region as a study region. There is a growing demand to improve the agricultural sector and affords accurate and fit-examined content on a diversity of subjects concerning to farming. South Africa is comprised of 9 (nine) provinces that produce various agricultural crops depending on the environmental and climatic conditions. Fruits are largely produced in Limpopo, Western Cape and Mpumalanga province.

South Africa is circumscribed by Namibia toward the northwest, by Botswana and Zimbabwe toward the north, and by Mozambique and Swaziland toward the upper east and east. Lesotho, a free nation, is a territory in the eastern portion of the republic, totally encompassed by South Africa. South Africa's coastlines fringe the Indian Ocean toward the southeast and the Atlantic Ocean toward the southwest. The nation has two little subantarctic islands, Prince Edward and Marion, arranged in the Indian Ocean around 1,200 miles (1,900 km) southeast of Cape Town. The previous South African ownership of Walvis Bay, on the Atlantic coast exactly 400 miles (600 km) north of the Orange River, turned out to be a piece of Namibia in 1994.

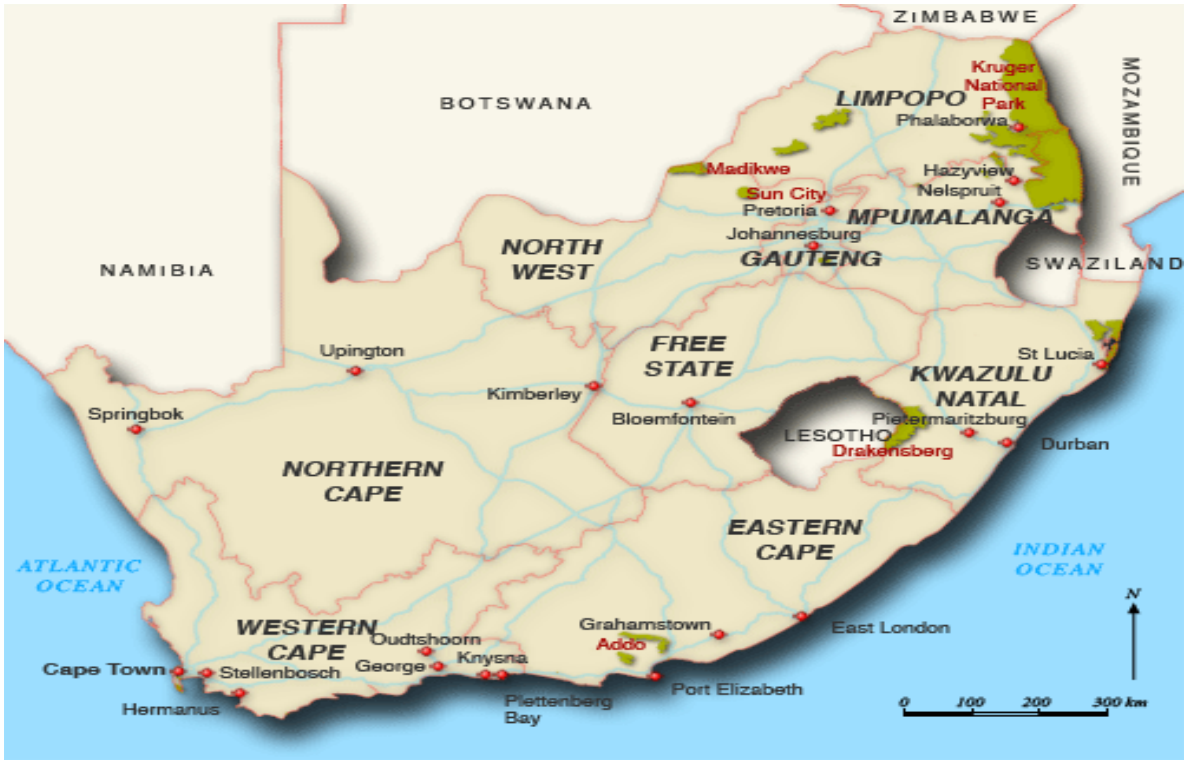

Figure 4.1: South Africa's map by provinces

4.2.2 West Africa

West Africa is a part of Africa that is situated in the Western part of the continent and its vast majority is in SSA. Out of the whole continent, there are 16 nations that are in the West African side. Topographically, West Africa is very easily recognized from different parts of Africa. The majority of West African countries were colonized by Britain and France and all parts of countries in West Africa include distinctive cultures within their borders.

On a singular origin, deprived of arrangement, several West African countries would discover it hard to overthrow the matters of deprived resource endowments, absence of methodological manpower and other socio-economic, governmental and ecological restrictions. It is trusted that regional integration would preserve these contests, which are the trouble of disengaged and deprived economies in the SSA countries and make ready for maintainable development and advance.

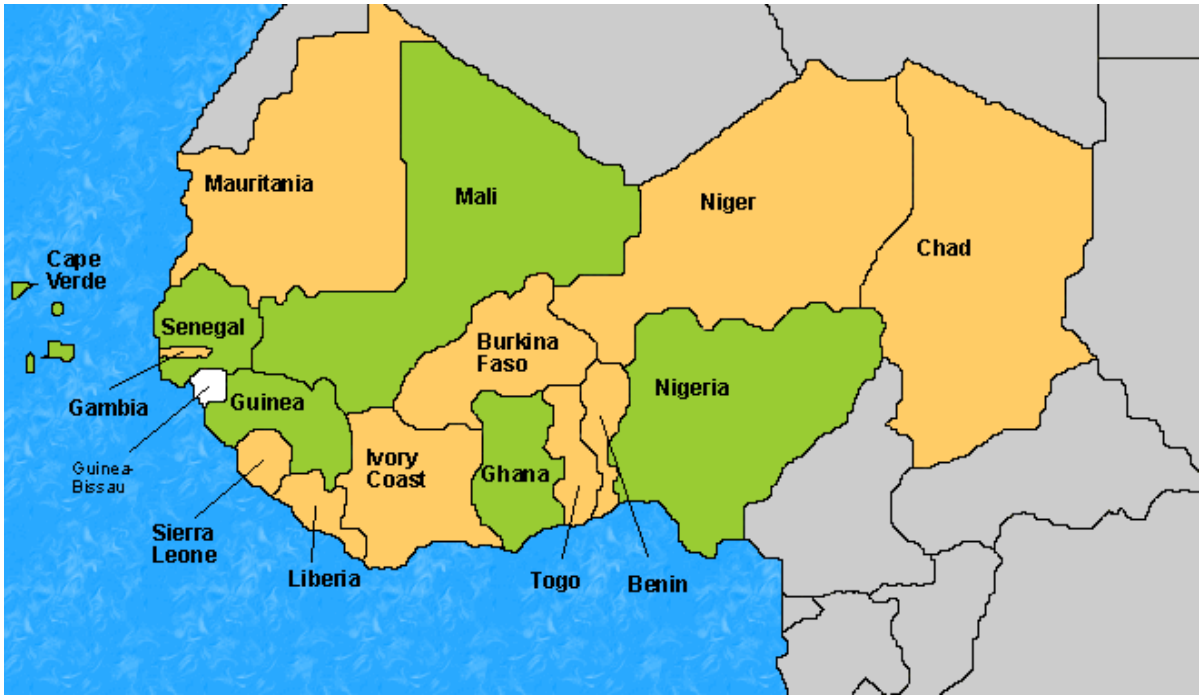

Figure 4.2: West Africa's map by trading partners

Source: http://www.mapsofworld.com/africa/regions/western-africa-map.html

4.3 Research Data

Previous studies on determining factor of trade in agricultural produces in both developed and emerging countries utilized the time arrangement information or data. However, this study finds that it is imperative to have a panel regression analysis to check whether it will bring diverse outcomes. The benefit of using panel technique over time series analysis is that in the panel method, individual heterogeneity can be controlled and measure the impacts that remain essentially not distinguishable in unadulterated cross-segment or unadulterated time series data. Moreover, panel technique permits the development and testing of more entangled models than in time series (Pedroni, 2004; Baltagi, 2005). The panel data technique, when compared with the time series data indexes and permits the identification of specific parameters, without the need to make prohibitive assumptions. It is also viewed as progressively informative when compared to time series data (Pedroni, 2004; Baltagi, 2005).
The information used in the study was secured from each of the 15 West African countries. As featured already, the panel data on the different selected commodities that were utilized involved commodities on *HS codes (0802)*. The decision of panel statistics stood knowledgeable through the way it rises the competence of the estimators and altogether

diminishes the prospective issue brought about by the exclusion of variables. The data used for the study is acquired from different online databases containing economic and trade indicators such as include ITC, COMTRADE, UNSD, utilized for all trade-related data questions. Different determinants, for example, GDP, population, official nominal exchange rate and other important factors for this study were sourced from World Bank; FAO and CEPII.

4.4 Analytical Approaches

The study examined the factors influencing South African export to West Africa countries urilizing the gravity model and panel statistics intended for years 1994 to 2016. Panel regression data are information where numerous cases are seen at least two or more timeframes (Woolridge, 2002). The accompanying areas of this section discuss the gravity model, operational model, and variables utilized and applied in the study.

4.4.1 Gravity Model

The gravity model is a broadly acclaimed observational apparatus for demonstrating respective bilateral trade (Zhang & Christensen, 1995). The determination of the gravity model study depends on its achievement in other empirical studies, in spite of the fact that criticisms with respect to feeble linkages to a hypothetical premise are recognized. A gravity model is regarded as an imperative tool for analyzing the determinants of the export utilized to evaluate the association among the capacity and bearing of rade. Tinbergen (1962) and Poyhonen (1960) established the indication of clarifying trade movements using Newton's rule of gravity. The monetary bulk of a country, through and huge, estimated by the GDP, goes about as the attraction factor between two economies. In any case, the desirability would be halfway balanced through the space among the countries, which functions as an instruction aspect. As shown by the literature, one would anticipate that nations having a vigorous GDP, which are in closeness to each other, would encounter greater sizes of trade. On the other hand, the less amount of trade take place as a result of weaker GDP and large distance among the trading countries.

Modeling and forecasting trade flows takes time been an essential undertaking in global international economics. A standout amongst the greatest productive approaches to formalizing this has experienced the use of a gravity type of model (Matyas, 1997). This fundamental theoretical trade model has a few critical highlights and effective in clarifying multi-lateral and bilateral trade. Moreover, the trade model adopted in the study show adaptive capability to explore explicit components that may affect on trade, through which this makes the adopted model an ultimate framework to satisfy the goals in this study.

The fundamental gravity model identifies with the proportion of respective trade toward the size of the economy between the trading countries and the distance.

$$TRADE_{ijt} = \alpha (Y_{it}\ Y_{jt}) + \theta (P_{it}\ P_{jt}) + \beta D_{ij} + \mu_i \quad (3.1)$$

Where:

- $TRADE_{ijt}$ is trade between country i and country j
- $Y_{it}\ Y_{jt}$ is the GDP for country i and country j
- $P_{it}\ P_{jt}$ is the population in the country i and country j
- D_{ij} is the distance between country i and country j

Interpreting the above into a calculated expression, the resulting model arises:

$$LogX_{ij} = log\alpha_0 + \alpha logy_i + \alpha logy_j + \alpha logY_i + \alpha logY_j + \alpha logD_{ij} + \alpha_6 L_{ij} + \sum_z \alpha P + \sum_z \alpha Q + \mu_{ij} \quad (3.2)$$

Where:

- X_{ij} is the total fruit's exports from i to j
- Y_i, Y_j is the countries' incomes (GDP)
- D_{ij} is the population country i and j.
- L_{ij} length of the coast line;
- Q^{ij} is a trade policy dummy (anti-export bias)
- Production capacity (in SA & West Africa region)
- μ_{ij} is the normal random error term

4.4.2 Operational model

The size of countries were 15 of which South Africa exported to in the period 1994 to 2016. The names of the countries included in the analysis are shown in the map in figure 3.1.The sample for the total model (i.e. fresh fruit exports) in the period from 1994 to 2016.

Thus, following functional form was adopted for the gravity model used in this research:

$$lnX_{ijt} = \beta_0 + \beta_1(lnGDP_{jt}) + \beta_2(lnPOP_{jt}) + \beta_3(lnFDI_{jt}) + \beta_4(lnTRADEOP_{jt}) + \beta_5(lnAVE_{SAjt}) + \beta_6(lnPRODUC_{SAt}) + \beta_7(lnINFLAT_{jt}) + \beta_8(lnEXCHA_{SAjt}) + \varepsilon_i + \eta_t \quad (3.3)$$

Where the capitalized letters are the regular logarithm (logs) of the particular informative or independent factors, such include GDP, POP, EXCHA, AVE, FDI, PRODUC, INFLAT, and TRADEOP. β_0 (Beta) delineates the normal intercept (coefficient). $\beta_{1\text{-}15}$ (Beta) represents the regression parameter also called unidentified or anonymous parameter represented as an independent factor in the trade model. *t* symbolizes the period pattern, for example *t* = 1994, 1995, 1996…..2016 and *j* = importing country group, otherwise called the objective country group (*West African countries*) and *i* symbolized the supplying country *(South Africa)*. Lastly, the error term (ε_i) capture different elements excluded from the adopted trade model.

4.4.3 Description of variables (dependent and independent variables)

- ***Exports (lnX_{ijt})***

An export variable is used to indicate the volumes (tons) of total fruit exported and the selected the selected fruit from South Africa to country (j) .i.e. West Africa. This was obtained by summing all fresh fruit that was exported from South Africa (*i*) to country *j*. The information for the variable ranges from 1994 to 2016 and Quantec easy data was the main source of the information. The following independent variables were described on how they determine the of the export variable.

❖ ***Importers GDP (GDP_{jt})***

The expansion of GDP (nominal GDP) show a more noteworthy assimilation capability, and this drives demand for foreign goods produced in high-value cultivars. Therefore, positive expansion of GDP tends to encourage the expansion of import demand in the importing nations due to its capacity to import more.

❖ ***Importers population (POP_{jt})***

The absorption effects indicate the negative correlation between the population and exports, according to Zarzoso and Lehmann (2003). South Africa's growth in a population could diminish commodity outflows because of the contending domestic consumption for specific products. It is expected that the indication of the importing countries to be significant through deference of exports from the supplying country.

❖ ***Inflation rate ($INFLAT_{jt}$)***

As indicated by Herrera & Baleix (2010), inflation effect on traded commodities can either indicate a significant or insignificant correlation on the projected structure. In the event that importing (West African) countries have a generally high rate of inflation, domestic buyers or consumers are probably going to purchase a noteworthy number of imports. In other words, an expanding West African country' inflation, the higher the imports of fresh fruits from South Africa. Then again, a fall in inflation for the importing countries would expand the country's international competitiveness and would probably diminish imports.

❖ ***Exchange rate ($EXCHA_{SAjt}$)***

There is a significant indication of the exchange rate coefficient (measured in ZAR) among the bilateral or multilateral trading nations. The effect of the importing coefficient turns to be less severe for the exporters and producers of fruits, however, importers are likely to adjust. The volume of fruits exported and exchange rate are having positive correlation especially when importers currency depreciates *vice-versa* to other currency. From another perspective, inputs and cost of production tend to be higher if importers currency deteriorates when looking at the real currencies. Amid the way towards exporting fruits, transport costs (shipment) of containers of fruit is typically cited in US dollar ($) terms, which additionally

increment significantly in a devaluation rotation. The higher cost of fruits per ton is driven by the drives increasing production costs and depleting intensity.

Then again, the supply expansion of fruits destined to West Africa in a short run could be driven by the profitability of the producers and exporters. Jordaan & Kanda (2011), argued that the demand for South African exports are likely to rise because it will be inexpensive for the importers to import required volumes and resulting in high demand for South African exports.

- ***Importers Foreign Direct Investment (FDI_{jt})***

From South Africa's perspective, FDI and worldwide trade are progressively integral and commonly supportive, yet additionally progressively indivisible as opposite margins of the procedure of monetary globalization (Ruggiero, 1996). Besides, inner FDI may animate exports from local regions by modern relationship or overflow impacts, particularly by reverse relationships, purchasing domestic primary goods to manufacture secondary goods for exports (Haddad & Harrison, 1993). Inward FDI to the importing country is anticipated to influence export from the quantity side. FDI could upgrade export-oriented efficiency that additionally expands export.

- ***Ad valorem equivalent (AVE_{SAjt})***

The coefficient or normal indication of the *ad valorem* equivalent (AVE) is predicted to take a negative correlation between exports. The high import duty of fruits would negatively affect on consensual trade in fruit products on the grounds that an expanding AVE demonstrates that higher operating costs are incurred due to the duty applied per ton. Thus tends results in minimal revenue and profit margin for the fruits exporter which will spill-over the producer.

- ***Domestic production capacity ($PRODUC_{SAt}$)***

Van Niekerk & Viviers (2014), contends that the domestic production capacity variable is utilized as an explanatory variable since exporter's ability and willingness to supply exports is reliant on the production capacity of the economy all in all.

❖ ***Trade openness ($TRADEOP_{jt}$)***

This factor is determined as a proportion of financial strategies limiting or welcoming trade among countries. As illustration, a nation arranges high exchange levies, in this manner confining the attractive quality of global exchange, this prohibitive approach will repress different nations from sending exports and tolerating imports from that nation. As indicated by overwhelming economic theory, this limitation, this absence of exchange transparency, will have a monetary impact of abating financial advancement/development. On the other hand, as per the monetary hypothesis, exchange transparency will have a financial impact of expanding monetary advancement and development.

Variables used in gravity trade model

$$lnX_{ijt} = \beta_0 + \beta_1(lnGDP_{jt}) + \beta_2(lnPOP_{jt}) + \beta_3(lnFDI_{jt}) + \beta_4(lnTRADEOP_{jt}) + \beta_5(lnAVE_{SAjt}) + \beta_6(lnPRODUC_{SAt}) + \beta_7(lnINFLAT_{jt}) + \beta_8(lnEXCHA_{SAjt}) + \varepsilon_i + \eta_t$$

Table 4-1: Variables description and expected sign

Variable Name	Description	Sign
Exports	The quantity of fruits exported in tons	
β_0	Common intercept (coefficient)	(+) or (-)
Importers GDP	Value of GDP of country j at time t	(+)
Importers POP	Population level of country j at time t	(+)
Importer's FDI	Inward foreign direct investment in country j at time t	(-)
Importers trade openness	The degree of invite trade between trading partners	(+)
Ad-valorem equivalent (AVE)	Import duty (percent) applied to the imported fruits	(-)
Production capacity	Production capacity of South Africa at the time	(+)
Inflation rate	The inflation rate of country j at time t	(+)
Exchange rate	The South Africa's exchange rate against its trading partners at time t	(+)
ε_i	The country-specific one-way error term	

Source: own construction supported by literature

Chapter 5 : Results of Data Analyses and Discussion

5.1 Introduction

The current chapter present the result of the study. The main aim of the chapter was to measure the objectives of this reading using yearly adjusted panel data, where every one of the factors were observed for each cross-segment and each timeframe.

5.1.1 South Africa's fruits export to West Africa

As has been demonstrated, South Africa's fruit industry is export-oriented, implying that the bulk of the fruits produced for the most part went to the export market. Annual fruit exports by South Africa to West Africa from 1994 to 2016 are presented in Figure 5.1. The results show that South Africa's fruit exports to West Africa has remained expanding in the period under study, and it achieved a high value in 2014 at R1 239 million. South Africa is intending to improve its agricultural exports to the African continent through her participation in the Free Trade Agreements (FTA) and the removal of non-duty boundaries (NTBs). Along these lines, West Africa was featured as the second largest importer of South Africa's fruit in Africa after Southern Africa, about R1.8 millions worth of fruits were exported to West Africa in 1994 and R1 023 million worth in 2016.

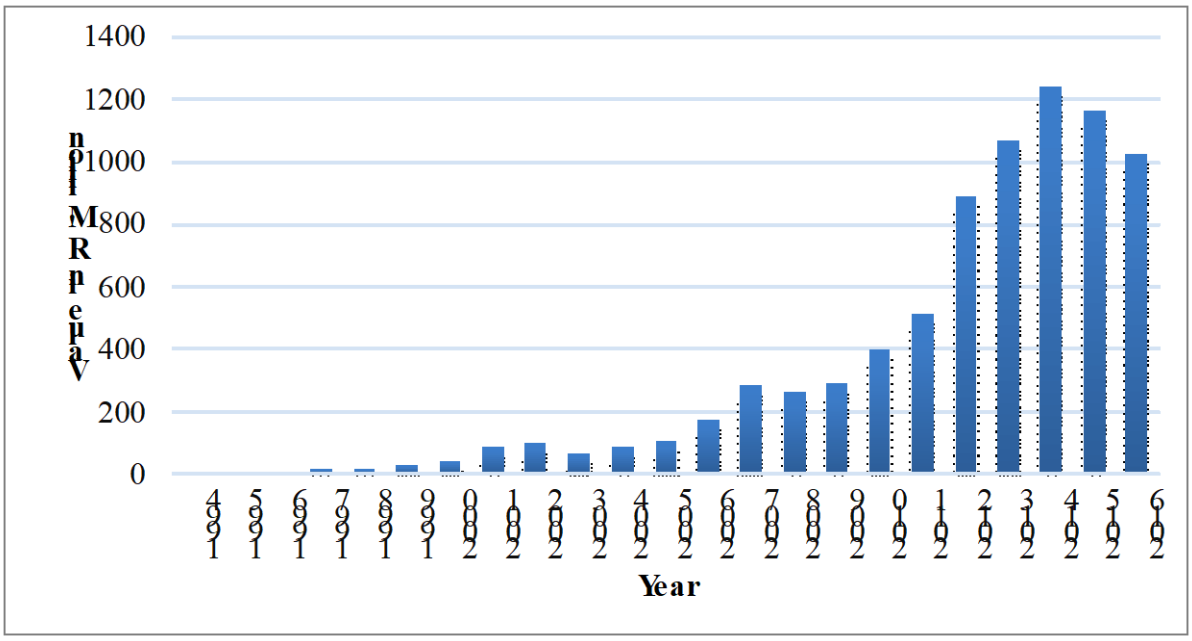

Figure 5.1: South Africa's export trend in West Africa, 1994 - 2016

Source: Quantec easy data (2017)

5.1.2 South Africa's fruit export in West Africa, by product

Table 5.1 shows the top fruits harmonized system classification 04 that were exported to West African countries between 1994|97 and 2014|16 period. The fruit exported are measured in the average of million of rands in the period under review. Pome fruits were the largest fruit that dominated the West African markets (see Table 5.1), and these products have enjoyed market access of an average value of R2 077 million in the identified markets. Table grapes (fresh) were the second largest fruit been exported toward West Africa at an average value of R12.2 million in 1994|97 and R404 million 2014|16. Citrus were ranked third with an average value of R17.9 million exported in 1994|97 and in 2014|16 about an average value of R376.7 million was exported. This is followed by other fruits (R177 million), bananas (R143 million), stone fruit (R89.6 million), subtropical fruits (R82.4 million), dried fruit (R62.7 million), and other nuts (R40 million) respectively.

Table 5-1: South Africa's fruits export to West Africa, by product (*harmonized system classification*: 04)

	Average value of Fruits exported measured in R'Million					
	1994|1997	**1998|2001**	**2002|2005**	**2006|2009**	**2010|2013**	**2014|2016**
Apples, pears and quinces	56.5	117.6	188.6	507.4	1404.4	2076.9
Grapes	12.2	18.0	31.9	108.5	223.1	404.4
Citrus fruit	17.9	66.5	120.5	184.1	306.5	376.7
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!	!	!	!	!	!	!
!	!	!	!	!	!	!
!	!	!	!	!	!	!
Fruit and nuts, preserved	0.2	0.3	0.6	0.7	8.0	10.7
Peel of citrus fruit	0.1	0.1	0.0	0.1	0.4	0.2

Source: Quantec easy data (2017)

It is important to disaggregate fruits exported into *harmonized system classification 0*8 as to be able to identify which specific fruits are performing better in the West African markets. Table 5.2 highlights the top 20 fruits destined to West Africa from South Africa at *harmonized system classification 0*8 between 1994|1997 and 2014|2016. These are ranked based on the average value exported for a period of 4 (four) years and the table does not reflect the top fruits based on the current period for the study (i.e. 2016). The fruit exports were low during 1994 as compared to 2016 period. Oranges constituted a larger share of total fruit export to west Africa at an average value of R8 832 million in 2014|2016, followed by grapes (R6 581 million), apples (R5 038 million), lemons (R3 619 million), pears (R2 505 million) and mandarins (R2 488 million) respectively.

Table 5-2: South Africa's fruits export to West Africa, by product (*harmonized system classification*: 08)

	Average value of Fruits exported measured in R'Million					
	1994|1997	**1998|2001**	**2002|2005**	**2006|2009**	**2010|2013**	**2014|2016**
Oranges	650.0	1187.3	1845.9	3570.7	5339.3	8832.3
Grapes	552.9	1162.4	1704.3	2719.2	4083.2	6581.3
Apples	494.2	636.9	1070.4	1852.7	3276.6	5038.4
!	!	!	!	!	!	!
!	!	!	!	!	!	!
!	!	!	!	!	!	!
!	!	!	!	!	!	!
Raspberries, and berries	0.1	0.2	3.2	26.1	83.1	170.0
HST080719: -- Other (1996-)	23.7	4.8	3.1	15.2	26.8	168.9

Source: Quantec easy data (2017)

5.1.3 South Africa's fruit export in West Africa, by country

The following feature is on South African fruit exports (harmonized system classification: 08) to West Africa in the period under review (1994|1997 – 2014|2016) measured in millions of rand. Both Cape Verde and Saint Helena were not considered in the analysis due to unaccessibility of data which resulted in exclusion from the analysis. The analysis for the study was based on fifteen (15) West African countries (see Table 5.3). Table 5.3 shows the West African countries that imported fruits from South Africa. Burkina Faso was the biggest importer of fruits from South Africa in 2014|2016, and this represent 100 percent average growth value from 1994|1997 and 2014|2016. Benin has been indicated as the second largest importer of fruit from South Africa, and has been able to import an average value of R201 million tons, followed by Cote d'Ivoire (R125 million), Ghana (R49.6 million), Gambia (R43.1 million), Guinea-bissau (R16 million), Liberia (R10.7 million) and Mali (R8.3 million) respectively.

Table 5-3: South Africa's fruits export to West Africa, by country

	Average value of Fruits exported measured in R'Million					
	1994|1997	***1998|2001***	***2002|2005***	***2006|2009***	***2010|2013***	***2014|2016***
Burkina Faso	0.0	0.3	1.1	2.4	273.7	585.1
Benin	1.1	7.7	15.6	40.1	90.7	201.2
Côte d'Ivoire	1.2	4.9	14.6	33.4	94.2	125.4
!	!	!	!	!	!	!
!	!	!	!	!	!	!
!	!	!	!	!	!	!
!	!	!	!	!	!	!
Togo	1.4	0.2	1.2	0.3	0.3	0.8
Guinea	0.0	0.7	2.1	0.2	0.0	0.0

Source: Trade Map (2017)

The next section concentrated on the main five (5) importers of fruit products in 2016, which were Nigeria, Senegal, Ghana, Cote d'Ivoire and Benin. The point of the section is to draft a short outline concentrating on the fruit products that these countries imported, potential fruits that can be exported by South Africa to those countries and the competitors.

5.2 Overview of the top West African importers of fruit from South Africa

The South African fruit industry comprises of deciduous, citrus, subtropical fruits and pome fruits. The focus of this section is on the top five importers which gave definitely detailed analysis of the previously mentioned harmonized system classification products from a South Africa's viewpoint. The principal focus is around the analysis of the 2016 and 2015 seasons of fruit.

5.2.1 South Africa and Nigeria

South Africa has, over the review period 2001-2016, maintained a trade surplus with Nigeria, mostly ascribed to the huge agricultural exports and fruits which have reliably represented 82.5 percent (ITC, 2017). From a global perspective, Nigeria is positioned 32nd among South Africa's export destinations representing under 1 percent of South Africa's total exports. Regarding imports, Nigeria is positioned tenth import supplier to the South African market. Notwithstanding, while considering the African market, Nigeria is positioned 12th export

destination for South Africa's goods and is positioned the first and most critical source of import from Africa. Figure 5.2 features fruit trade between South Africa and Nigeria. It is observed that South African fruit was low between 2001 and 2010, and began to increase at an accelerating rate from 2010 to 2015. On the other hand, South African fruit imports had been unstable (fluctuating).

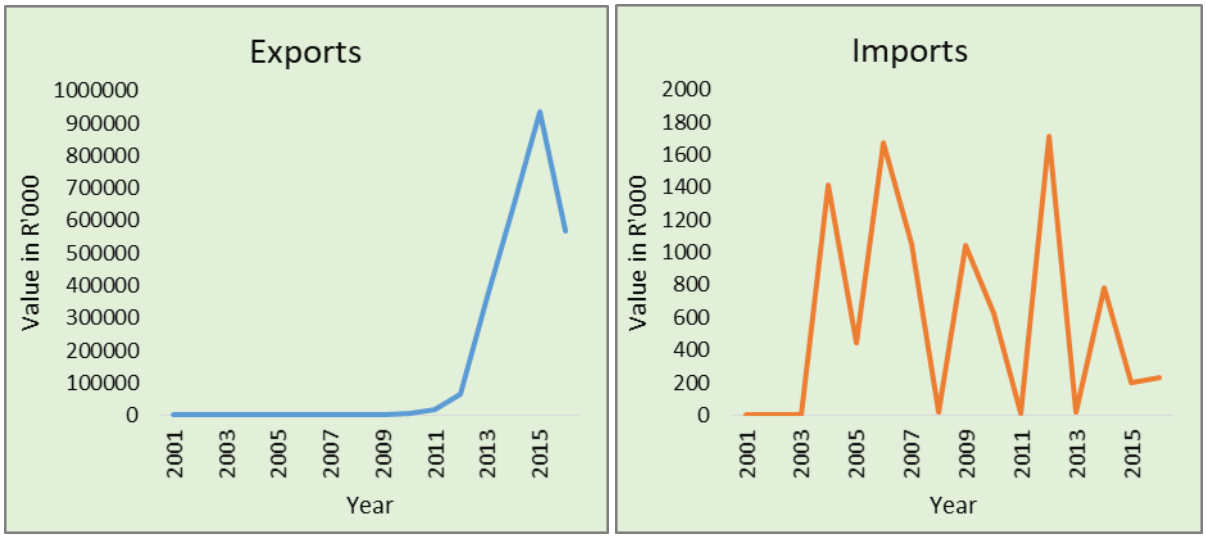

Figure 5.2: South Africa's trade (exports and imports) between Nigeria

Source: Trade Map (2017)

Table 5.4 underneath demonstrate the top fruits sourced in South Africa by Nigeria between 1994 and 2016, estimated in a thousand rands. The investigation of South African fruit exports uncovers that the main export fruit product to Nigeria include: fresh apples, fresh grapes, fresh pears, and fresh plums. Fresh apples were positioned as the biggest fruit products destined to Nigeria in 2016 at an estimation of R469 million (negative growth of 17.8 percent between 2014 and 2016) and pursued by table grapes at a growth value of 84.2 percent. South Africa is rivaling with countries such as China, Mauritius, Ghana and Morocco which constituted a share value of 3.4 percent, 3.2 percent, 1.9 percent, 1.7 percent, individually and they all faced 19.1 percent AVE beside Ghana (0 percent AVE).

Table 5-4: Top fruits destined to Nigeria from South Africa, 2017

		Exported value in R'000			Growth value in %
HS code	**Product description**	**1994**	**2015**	**2016**	**1994-2016**
080810	Fresh apples	571046	878962	469302	-17,8
080610	Fresh grapes	23699	9500	43644	84,2
080830	Fresh pears	29416	32750	40611	38,1
!	!	!	!	!	!
!	!	!	!	!	!
!	!	!	!	!	!
!	!	!	!	!	!
081340	Dried peaches, pears, papaws	4385	1167	1055	-75,9
081350	Mixtures of nuts or dried fruits	346	63	1011	192,2

Source: Trade Map (2017)

5.2.2 South Africa and Senegal

Senegal is the second biggest importer of fruit from South Africa, after Nigeria. Figure 5.3 features South Africa's export and import pattern with Senegal under the period in review. It can be seen that South African fruit exports to the Senegal market have been expanding between 2001 and 2016, this demonstrates that South African fruit continues to enjoy market access benefit. Moreover, the South African exports are expected to continue expanding particularly after the recent bilateral agreement that has been concluded between the two countries (DIRCO, 2010). Trade between South Africa and Senegal has been relentlessly expanding since 2001. In 2016, South African exported fruits were to the estimation of R218 million while Senegal did not export anything.

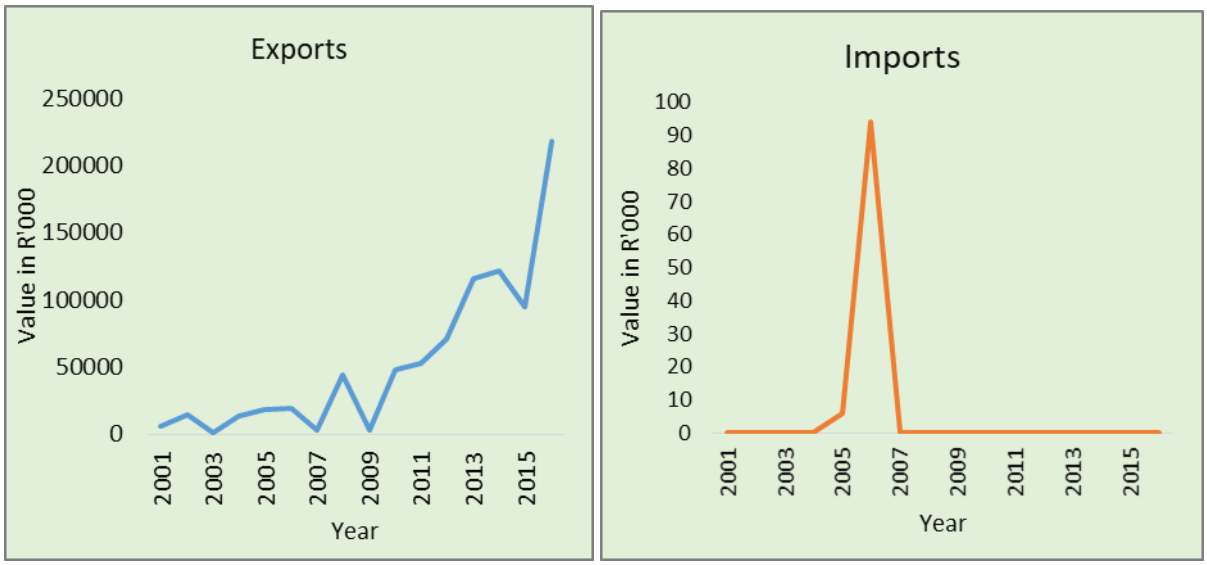

Figure 5.3: South Africa's trade between Senegal, 2017

Source: Trade Map (2017)

South African exports comprise of, among others, fresh produce, manufacturing equipment, and household appliances. South Africa's imports from Senegal are principally household furniture and effects, textile materials and original sculptures. Figure 5.4 represents the top fruit imported by Senegal from South Africa in 2016. It can be observed that fresh apples are a critical fruit in Senegal as they make up 70 percent of total fruits imported, while oranges were the second in line for the Senegalese market. Table grapes were third, followed by fresh pears and mandarins at a share value of 8 percent, 7 percent, and 5 percent respectively. Côte d'Ivoire was Senegal's main exporter of fruits constituting about 33.9 percent, followed by South Africa, Ghana, and France at a share of 29.1 percent, 7.4 percent and 6 percent respectively.

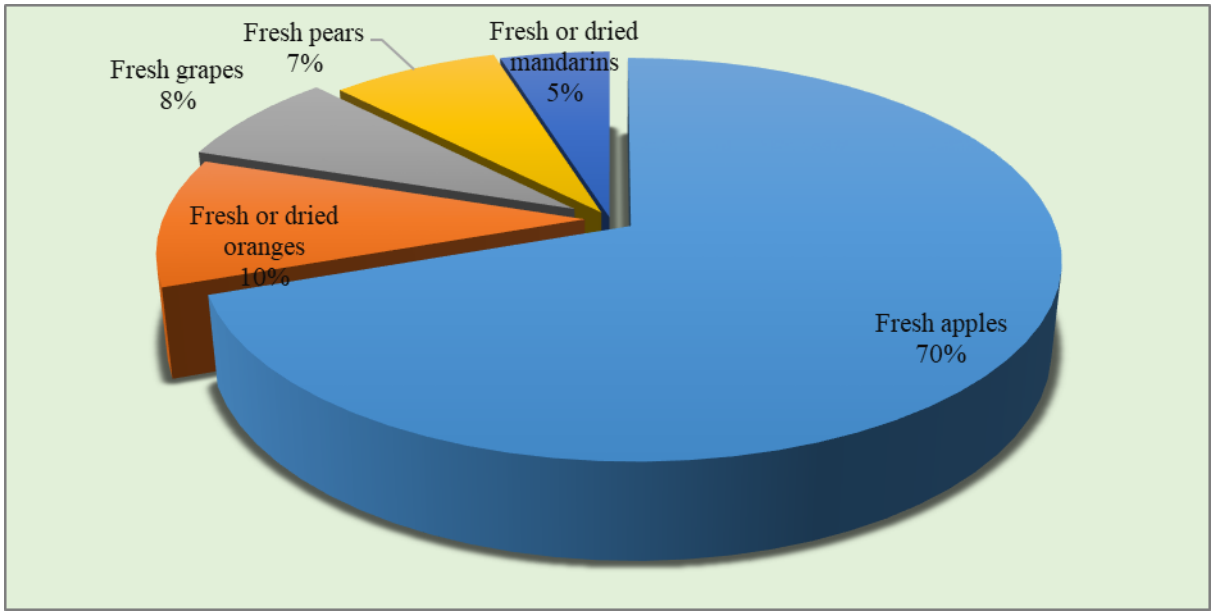

Figure 5.4: Main fruits exported to Senegal from South Africa, 2017

Source: Trade Map (2017)

5.2.3 South Africa and Ghana

Ghana is a significant export market for South Africa's fruit after Nigeria and Senegal whereas keeping in mind that absolute trade values remain static generally small in total terms, it is anticipated that these facts drive raise (DIRCO, 2010). Recentlythe South Africa's trade with Ghana has improved considerably with about R13.5 million between 2001 and 2016. Similarly, fruit imports from Ghana have been unsteady fluctuation throughout the same period, yet it has been low in the past five years.

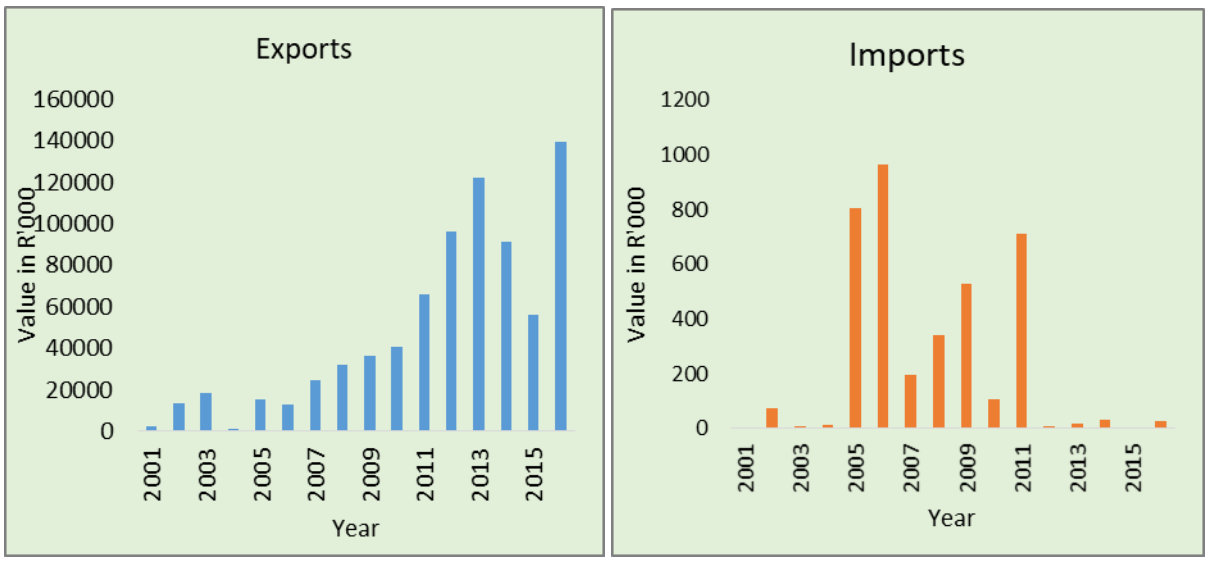

Figure 5.5: South Africa's trade (exports and imports) with Ghana

Source: Trade Map (2017)

Ghana is one of the fundamental suppliers of fruit juice in the continent, the vast majority of its juice has been imported by Ghana's neighboring countries. However, a larger quantity of fruits that are used for agro-processing is being imported from different countries. For example, South Africa has remained the main supplier of fruits to Ghana which constituted about 75.6 percent of all fruit imports by Ghana. France was the primary competitor as it was positioned the second principal supplier of fruits with 8.4 percent in 2016, followed by the Netherlands, Spain and Côte d'Ivoire at a share of 3.6 percent, 2 percent, and 1.8 percent individually. Figure 5.6 illustrates the main South Africa's exported fruit to Ghana in 2016. Note that apples remained an essential fruit product to Ghanaian consumers (generally in West Africa). Guava fruit came after apples constituting approximatrly 13.3 percent, followed by table grapes (6.3 percent) and pears (4.0 percent).

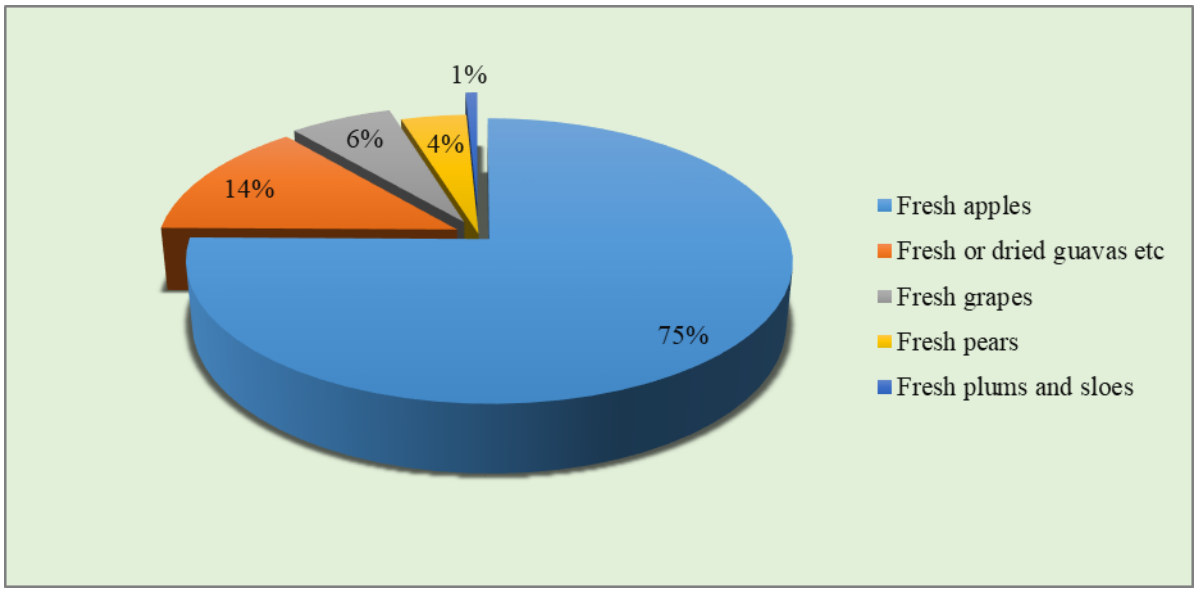

Figure 5.6: Top fruits destined to Ghana from South Africa, 2017

Source: Trade Map (2017)

5.2.4 South Africa and Cote d'Ivoire

Côte d'Ivoire stands as the 75th biggest export economy in the World, and one of the principal producers of cocoa and pineapples. Figure 5.7 features South Africa's fruit export

with Côte d'Ivoire in the previous sixteen years. It can be observed from the figure below that both exports and imports patterns have been fluctuating, yet both have achieved the highest value in 2016. Côte d'Ivoire imports a greater amount of fruit than it exports, and this can be driven by different factors such as production level, consumer demand, and preference. On the exports side, South Africa has exported about R9.7 million of fruits in 2001 while R84.6 million was exported in 2016 period. While R2.7 million of fruit was imported by South Africa from Côte d'Ivoire in 2001 and R11.9 million in 2016.

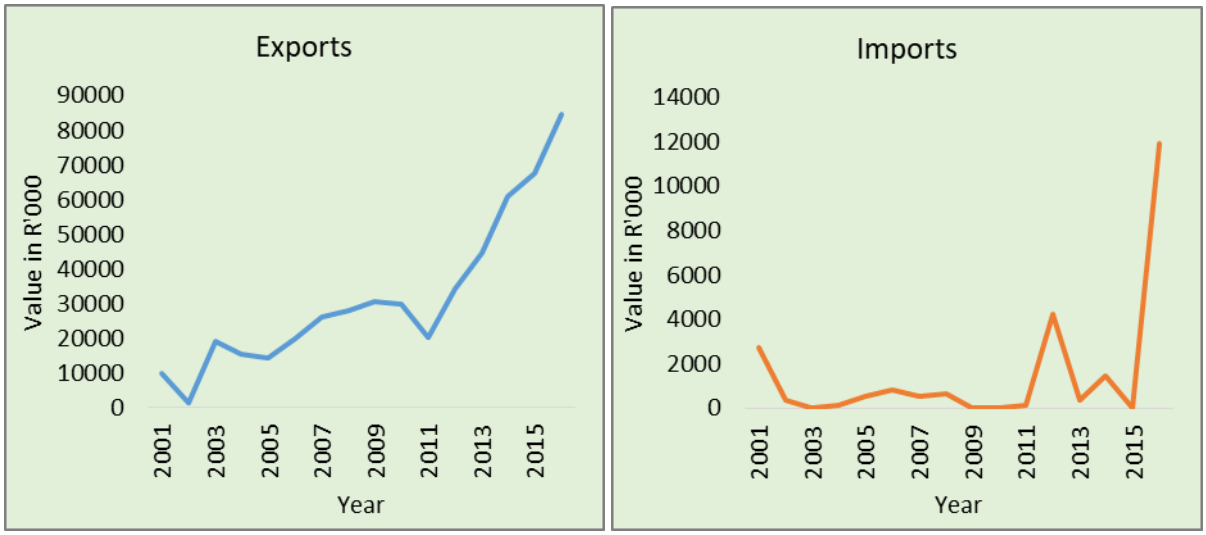

Figure 5.7: South Africa's trade between Cote d'Ivoire, 2017

Source: Trade Map (2017)

Côte d'Ivoire takes an interest in GVCs including numerous primary products that can be included in the value chain and manufacturing industries are in overwhelming demand globally. Figure 5.8 presents the top fruit imported by Côte d'Ivoire from South Africa in 2016. Fresh apples were positioned as the main fruit product imported comprising 72.6 percent of total fruits bound to Côte d'Ivoire. Table grapes were next after fresh apples with an estimation of R8.6 million, followed by pears, oranges, and mandarins at an estimation of R7.2 million, R3.4 million and R2.2 million individually.

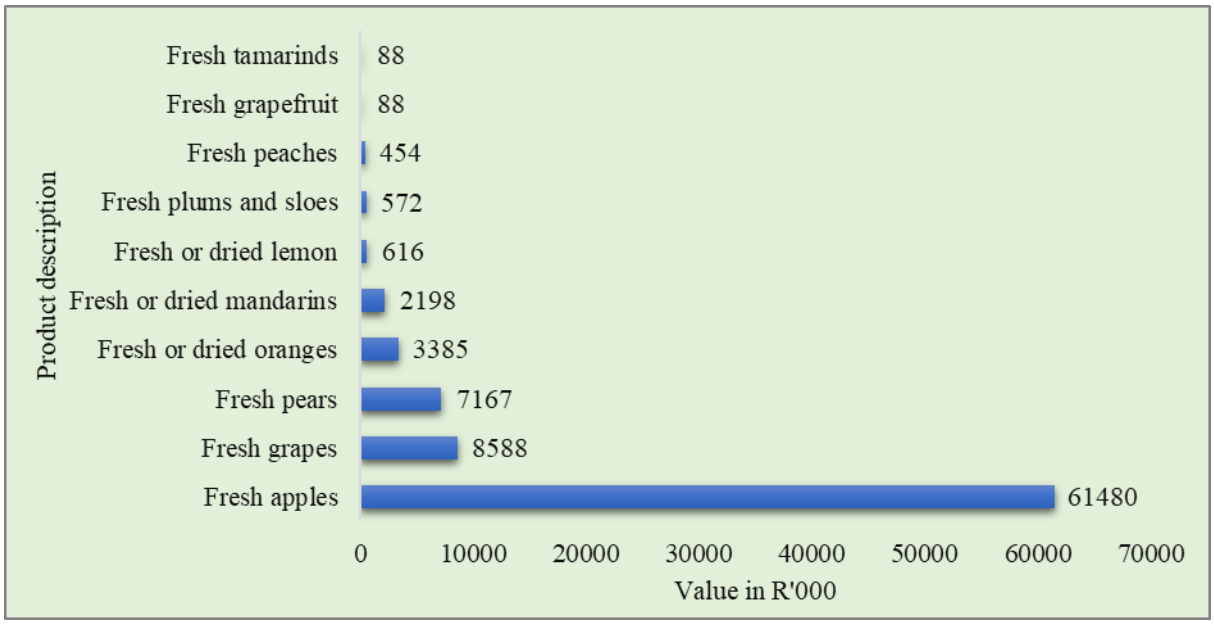

Figure 5.8: Main fruits exported to Cote d'Ivoire from South Africa, 2017

Source: Trade Map (2017)

5.2.5 South Africa and Benin

The Beninese economy remains intensely reliant on agricultural production, especially cotton and a broadening of agricultural production for export so as to improve the trade balance. South Africa and Benin established formal diplomatic relations on 19 May 1994 (DIRCO, 2017). Benin was positioned as the fifth primary destination for South African fruit exports in 2016. Figure 5.9 demonstrates the South African fruit trade with Benin in 2016. The trade of fruit has been fluctuating in the period under review, and South Africa experienced a positive trade balance when trading with Benin. In 2001, a value of R18.6 million and R0 was exported and imported respectively by South Africa while in 2016, R53 million and R15 thousand were exported and imported.

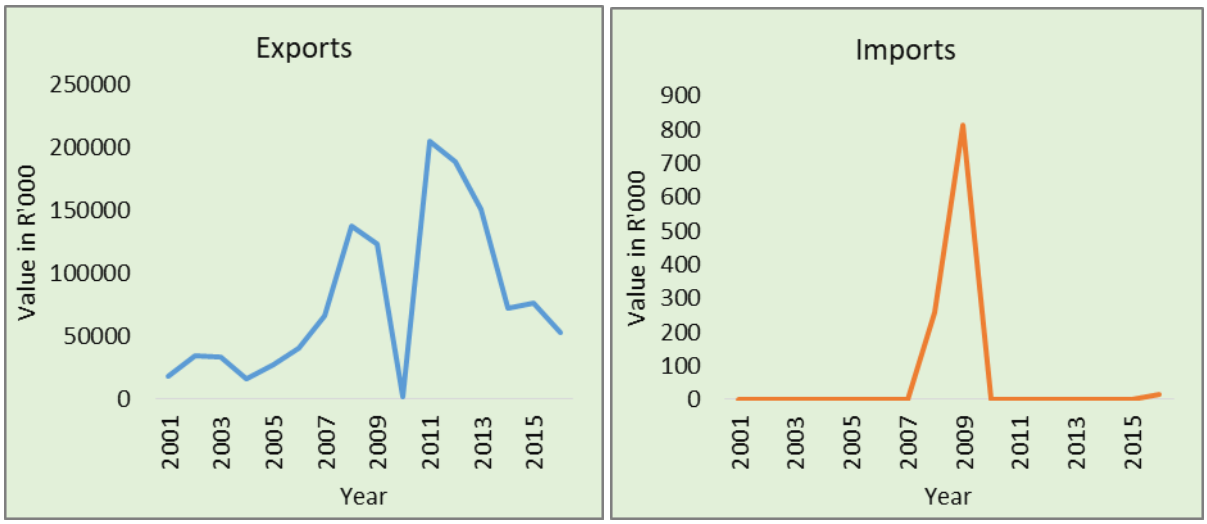

Figure 5.9: South Africa's trade between Benin, 2017

Source: Trade Map (2017)

Figure 5.10 illustrates the top fruits imported by Benin from South Africa in 2016. Benin is not the main producer of fresh fruit and most of its fruit are imported from its partner countries. South Africa was the fundamental supplier of fruit to Benin which constituted a share of 46 percent in 2016. Fresh apples represent 90 percent of total fruits imported by Benin from South Africa, followed by pears, table grapes, oranges and mandarins with a share value of 4 percent, 4 percent, 1 percent, and 1 percent respectively. Togo was the principal competitor for South Africa as it was positioned second primary supplier of fruits with 17.4 percent share value and faces 0 percent duty, not at all like South Africa which faces a 19.1 percent duty. Togo was followed by France, Ghana, Saudi Arabia, and Spain with shares of 16.7 percent, 11.5 percent, 4.6 percent and 1 percent respectively (ITC, 2017).

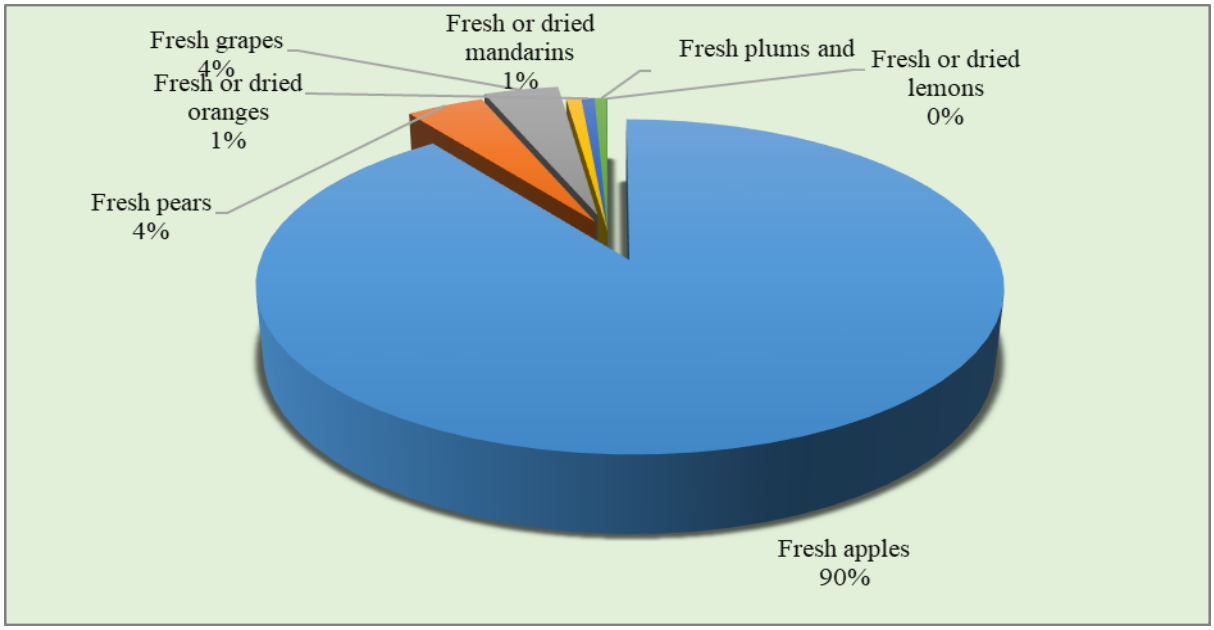

Figure 5.10: Top fruits exported to Benin by South Africa, 2017

Source: Trade Map (2017)

5.3 Results of the estimated model

The study examine and evaluate the determinants of the overall fruit exports from South Africa to 15 West African countries, and estimations are conducted using a gravity trade model. The outcomes and demonstrates every factor's dimension of effect on the overall exports..

5.3.1 Estimation procedure

There are three models that can be assessed in panel information estimation. These models are pooled, fixed impacts and random impacts. Since singular effects are joined into the relapses a decision should be made whether they are treated as random or fixed. An irregular impacts model can be progressively fitting when assessed exchange streams between arbitrarily drawn examples of exchanging accomplices from a huge populace. A fixed impacts model would be a predominant model while surveying the progressions of trade between an ex-risk foreordained choice of nations (Eita and Joordan, 2007). Meanwhile, this examination manages the progressions of trade between South Africa and its 15 West African coutries, the fixed impact will be a more appropriate model than the random impact detail.

Fifteen (15) West African countries chosen as part of study area during 1994 to 2016. the study adoptedHausman test to assess the relevant model that will provide accurate findings and fixed model seem to be more profient. The descriptive analysis of the data displayed in Table 5.5 was conducted. Typically regularly conveyed factors give preferred outcomes over factors which are not ordinarily dispersed. The table exhibits the normality test of the variables. It was found that a portion of the information or the data is not normally distributed as shown in table 5.5 below. As evident from the table 5-5, the value of mean, standard deviation, maximum and minimum are indicated with respective variables.

Table 5-5: Descriptive statistics

Variable	***Obs.***	***Mean***	***Std. Dev***	***Min***	***Max***
Export	*368*	*21960.56400*	*6216.66900*	*0.00000*	*61524.84000*
Importer's population	*368*	*17.09836*	*33.35875*	*0.379156*	*185.98960*
Importer's GDP	*368*	*17754.19000*	*65574.31000*	*132.20000*	*548498.9000*
Exchange rate	*368*	*722.73430*	*1256.13000*	*0.09560*	*8361.04800*
Importers production capacity	*368*	*101.53370*	*27.38441*	*43.40000*	*179.00000*
Inflation	*368*	*8.314896*	*13.82071*	*-29.17246*	*113.07640*
Importer's FDI	*368*	*472.72090*	*1202.62900*	*-132.13000*	*8841.11300*
Ad-valorem equivalent	*368*	*16.77500*	*5.735308*	*2.50000*	*20.00000*
Importer's trade openness	*368*	*70.62300*	*32.10319*	*21.12435*	*311.3553*

Source: STATA and own calculation

In addition to the descriptive statistics, the Variance Inflation Factor (VIF) test was the initial phase in deciding a conceivably coordinated connection between the factors. If the factors are nonstationary a test for co-integration is essential. The initial step embraced for the gravity model was to test multicollinearity among the factors. In this way, Table 5-6 speaks to correlational examination that shows coefficients that recommend that multicollinearity would not be an issue for model determination.

Table 5-6: Correlation matrix of explanatory variables

	SA's Export	*Importer's population*	*Importer's GDP*	*Exchange rate*	*Importers production capacity*	*Inflation*	*Importer's FDI*	*AV*
SA's Export	*1*							
Importer's population	*0.4049*	*1*						
Importer's GDP	*0.6188*	*0.8139*	*1*					
Exchange rate	*-0.0924*	*-0.1078*	*-0.0848*	*1*				
Importers production capacity	*0.2321*	*0.0018*	*0.0737*	*0.2336*	*1*			
Inflation	*-0.0580*	*0.2118*	*0.1128*	*0.1541*	*0.1563*	*1*		
Importer's FDI	*0.3263*	*0.8102*	*0.7800*	*-0.0932*	*0.1541*	*0.1563*	*1*	
Ad-valorem equivalent	*0.1582*	*0.2121*	*0.1167*	*0.2121*	*0.0482*	*0.1653*	*0.1037*	

Importer's trade openness	*-0.0721*	*-0.1377*	*-0.1266*	*-0.1639*	*0.1877*	*-0.0496*	*-0.0257*	*-0.4*

Source: STATA (2017) and own calculation

5.3.2 Gravity model estimation Results and discussion

Table 5-7 shows the consequences of the gravity condition. The table facilitates shows the consequences of pooled, fixed and arbitrary impacts as recreated from stata. The consequences of the three impacts are extraordinary, and with the fixed impacts model presenting heterogeneity through evaluating the nation impacts, the Hausman test was utilized to test the capacity of the introduced models and their outcomes. Eita (n.d) study argured that the Hausman test presents whether invalid theory isn't connected between factors in the model. Futhermore, this used to separate the fixed impacts and arbitrary impacts model. Along these lines, if the invalid speculation isn't dismissed implies that the irregular impacts are preferre, if in any case the fixed impacts model will be suitable. For the instance of this investigation, the Hausman test shows that the invalid speculation is dismissed, with a sign that nation's particular impacts are corresponded. Hence, the fixed impacts is proper to decipher the outcomes.

Table 5.7 outlines the empirical outcomes obtained from evaluating **Equation 3.6**, using pooled model, fixed effects (within) regression, and random effect. It shows that the F-statistic is substantial at 1 percent, eliminating the null assumptions. In other words, F-statistics of 22.93 recommends that illustrative variables together influence exports. In addition, adjusted R-squared, estimates the decency of appropriate of the factors, is adequately extensive; showing that 59.9 percent of the variations in fruit export is together clarified by the descriptive factors.

Table 5-7: Estimated results of export of all fruits

Variables	**Pooled model**	**Fixed Effects**	**Random Effects Model**
Importer's GDP	0.08359 (0.000)***	0.04074 (0.000)***	0.08359 (0.000)***
Importer's population	39.31613 (0.231)	429.1301 (0.000)***	39.31613 (0.149)**
Importer's FDI	-2.85143 (0.049)***	-3.27204 (0.000)***	-2.85143 (0.000)***
Importer's trade openness	-3.63374 (0.526)	-7.26353 (0.373)	-3.63374 (0.660)
Ad-valorem equivalent	159.1981 (0.125)*	-5.52285 (0.010)**	159.1981 (0.228)
Production capacity	40.94092 (0.024)**	22.84165 (0.022)**	40.94092 (0.000)***
Inflation	-45.05822 (0.078)**	-31.2814 (0.047)**	-45.05822 (0.004)***

Exchange rate	-0.49734 (0.190)	-0.41313 (0.136)	-0.49734 (0.061)**
_cons	0.016	0.000	0.029
Number of observations	368	368	368
Adjusted R squared	0.5796	0.6048	0.5796
F-test		65.80***	
LM test			
Hausman test		22.28***	

Notes. Significant level: * = 10%, ** = 5%, and *** = 1%.

Haussin findings revealed that fixed effect clarified 60.5 percent export to West Africa. The results show that a growth in importer's GDP (lagged) reasons an increment in South Africa's fruit exports. This basically implies that an expansion in importers GDP causes an expansion in South Africa's fruits exports. The factors of the determinants are significantly positive, and consistent with economic theory. Consequently, an expansion in GDP for West African countries result in advanced production volume, which would result in expanding demand for explicitly imported fruits for further processing. These outcomes are consistent with the findings by Thomas et al, (1991), Joshi & Little (1996), and Ahmed (2000) affirmed that countries importer's GDP improves export of the exporting trading partner.

The parameter of West African countries' population has a positive sign and a statisticaly significant. Theoretically, it was expected that there is a positive correlation among importers population and export. This implies expansion in importer's population positively affects South Africa's fruit exports, and is consistent with theoretical expectations. Studies on the impact of FDI on imports are limited. The parameter of the importers FDI is withnegative sign and statistically significant (see Table 5.7). The interrelated studies proposed that FDI is likely to impact imports negatively. The importer's FDI is statistically significant at 1% as expected.

The parameter of *ad-valorem* equivalent (AVE) is statistically significant and negatively correlated at 5 percent. It was concluded through the literature that a higher AVE would adversely influence the export of fruit in light of the fact that an expanding AVE demonstrates that duty applied per ton on fruit result in high costs of the imported fruits and generally, be costly for the consumers in the importing countries. Inflation coefficient was found to be statistically significant at 5 percent and negative (see Table 5.7). This implies that

an increase in inflation coefficient will in general decrease imports from the importing country. In simple terms; a fall in inflation for the importing countries would expand the country's international intensity and would probably diminish imports. The domestic production capacity is statistically significant and positively correlated at 10 percent. The outcomes are significance with the theoretical expectations and Van Niekerk and Viviers (2014) contend that the domestic production capacity indicates South Africa's capacity to supply for exports is reliant on the volume produced and consumed.

Table 5.8 represents the estimated equation by the fixed effects model as per top three (3) exported fruit from South Africa, destined to West Africa; namely apples, pears, and grapes. ***Apples***: An increase in importers GDP causes apple exports to increase. The coefficient of this variable gives solid positive and significant sign (1 percent and 5 percent) and this is in accordance with the theoretical expectations. The assessed coefficient of importers GDP is 0.04 which implies that holding consistent for different variables, a 1 percent point increases in importers GDP will result in a generally 0.04 percent point increment in South Africa's total apple exports. The negative coefficient can be recognized to the enhanced monetary development rate in the importing countries, accompanied by the increasing population of the trading partners. Table 5.7 further demonstrates that an expansion in importers population positively affects South Africa's apple exports. Importers GDP and AVE show significant coefficients and resulted in a positive effect on South Africa's apple exports. Importers trade openness and exchange rate do not indicate significant coefficients and are not consistent with theoretical expectations. Export of apples is significantly driven by positive coefficients of inflation and production capacity.

Table 5-8: Estimation results on export of some selected fruits

Variables	**Apples**	**Pears**	**Grapes**
Importer's GDP	0.04174 (0.000)***	0.05224 (0.365)	-0.00093 (0.104)*
Importer's population	357.3762 (0.000)***	40.27294 (0.000)***	8.40013 (0.054)**
Importer's FDI	-2.97938 (0.000)***	-0.22082 (0.000)***	-0.02428 (0.145)*
Importer's trade openness	-6.63127 (0.368)	-0.13653 (0.748)	-0.15206 (00720)
Ad-valorem equivalent	-0.78654 (0.042)**	-0.01842 (0.089)*	1.09128 (0.11284)*
Production capacity	21.3641 (0.018)**	-0.77460 (0.345)	0.42938 (0.408)

Inflation	-28.70147 (0.044)**	-0.00633 (0.660)	-0.42229 (0.606)
Exchange rate	-0.34341 (0.170)	0.000	-0.02734 (0.058)*
_cons	0.000		0.231
Number of observations	368	368	368
F-test	66.21	73.61	2.27
Adjusted R squared	0.6063	0.599	0.5002

***/**/* Significant at 1%/5%/10% level.

Pears: The impact of importers GDP was found to be positive and statistically insignificant in pear fruit estimated models. In addition, the projected coefficient of importers population is 40.3 which means that a 1 percent increases in importers population will result in a 40.3 percent increase in South Africa's pear exports. On the other hand, importers FDI and AVE coefficients give a negativelysignificant and this is correlated with findings on apples. Importers GDP, trade openness and exchange rate do not indicate significantly but have a positive significant sign.

Grapes: In the model for grapes domestic country GDP is negatively correlated with the exports from South Africa to the importing countries. Populations of importing countries are positively correlated with South Africa's grape exports. The estimated coefficient of importers population is 8.4 which means a 5 percent increase in importers population will result in an 8.4 percent increase in South Africa's grape exports. The impact of the exchange rate was found to be positively significant at 10 percent. This suggests that the export of grapes is significantly influenced by the exchange rate during the period of study. Importers trade openness, production capacity, and inflation had an irrelevant coefficient, implying that it did not affect South Africa's grape exports.

Chapter 6 : Conclusion and Recommendations

6.1 Introduction

This study examined the factors determining South Africa's fruit export to West African trading partners. In view of the panel data (regression analysis), the gravity model approach was used to evaluate South Africa's fruit exports over yearly statistics from 1994 to 2016 for 15 West Africa countries. The gravity model was embraced in the study since it is valuable instrument in assessing trade. The fixed effect clarified 59.9 percent of the variations in South Africa's fruit exports to West Africa. The study was persuaded by the fact that West Africa keeps on taking substantial amounts of fruit that South Africa export to the African continent and the West African region was positioned as the biggest importer of fruit when compared to North, East, and Central Africa.

A few studies have demonstrated that determinant of export is contingent upon the trading countries and products. There is no explanatory procedure or methodology in managing the determinants influencing exports and diverse economic effects, though, gravity trade model has been an impressive instrument for analyzing the determinants of the export. Consequently, the gravity trade model was used in identifying the determinants and its impact on South Africa's fruit exports. The effect of identified determinants on fruits exports was hypothetically depicted. In spite of the advances of references, the gravity model was identified and recognized as the ultimate framework to address the objectives. Different explanatory mechanism was analyzed based on South Africa's fruit exports to West Africa using econometric model referred to as fundamental gravity model.

6.2 Conclusion

In this chapter, a prologue to the study was given, deliberating the foundation, a look into the research issue, objectives, hypothesis, and chapters' layout. The initial section of the literature concentrated on export and the intention to remove or reduce tariffs through the

promotion of free trade (formulation of trade agreements). Theories on explaining international trade patterns such as new trade theory, patterns of demand and mercantilist version were additionally described in detail which was used to clarify international trade patterns. Notwithstanding, it was indicated that the identified three (3) international trade theories have not successfully given hypothetical support to the gravity trade model. Featured theories are as yet useful and they still continue in aiding clarifying the fundamental economic intuition behind international trade. The gravity trade model was additionally explained based on its importance in explaining trade between trade partners

Chapter 2 included a review on the global fruit trade and South Africa's fruit trade. In a global perspective, the United States continues to dominate the production of fruit and is positioned as the leading importer and exporter. The production of fruit in the country is dominated by citrus, pome, subtropical (and nuts), stone and table grapes fruits, respectively. West Africa imported large amounts of fruit from South Africa as compared to other regions in the continent. The effect of the determinants of fruit exports gives an indication of the factors to be considered when exporting fruit to other African regions (i.e. East Africa, Middle Africa, and North Africa).

The second piece of chapter 3 gave a review of different methods and past studies carried out with respect to distinguishing the determinants that better clarify the export. Previous researchers had discovered that export depends on various factors among the trading partners. This study examined major determinants of export of South Africa's fruit exports to fifteen (15) West African countries using time series annual data (panel regression analysis) from 1994 - 2016.

The information detailing and model procedure was described in chapter 4. The gravity trade model approach was adopted in order to investigate explanatory variables of fruit export and one step regression technique was followed. Panel regression analysis allows the construction and testing of more complicated models than in time series (Pedroni, 2004; Baltagi, 2005). The variables description and expected sign were assessed in order to conclude based on the theoretical expectation, supported by previous findings of similar topics.

The first section of the chapter 5 discussed the composition and trends of fruit exports for South Africa and it was found that fruit exports have been increasing between 1994 and 2016.

Apples, grapes, and pears fruit were the top three fruits destined to West Africa in 2016; while Nigeria, Senegal and Ghana imported a large share from South Africa, respectively. Top importers of fruit from South African were assessed based on trade trends (both export and imports) and fruit imported from South Africa; such countries included Nigeria, Senegal, Ghana, Cote d'Ivoire and Benin.

The estimation method looked at three regression models which were evaluated in a panel data estimation (for example pooled model, fixed effect and random effect). Adjusted R-squared was found to be 59.9 percent, which proposed that the variations in fruit export were together clarified by the explanatory factors. The previously indicated theories are consistent with the findings from the fixed effects model of the descriptive factors. Additionally, it was found that importers GDP and population are statistically significant. The importers GDP coefficient likewise showed an upward indication based on the theoretical projection and significant. The coefficient of importers population showed a positive correlation and it was statistically significant. In three models utilized, the imported inward Foreign Direct Investment (FDI) coefficient displayed the correct relationship (negative sign) and was statistically significant at 1 percent.

The correlation of exchange rate coefficient and export is statistically insignificant and pose negative correlation. South Africa's production capacity coefficient displayed the correct sign and was statistically significant; the increase in production capacity has an impact on the volume of fruit exported to West African countries. High production means that South Africa has a surplus to supply international markets with fruits.

This is negatively affecting the total fruit destined to the West African market, consequently going about restricting fruits from South Africa. The piece of the fixed effect model demonstrates that AVE imposed by the importing countries displayed a negative sign and was statistically significant. This was found to be consistent with theoretical expectations. The inflation, importers trade transparency and exchange rate coefficients do not significantly impact the volume of fruit exported from South Africa to the West African region.

The third objective regression was on estimations for the top three (3) fruit imported in the West African region. Apples: the R squared indicated that about 60 percent of the inconstancy in all apple exports between South Africa and West Africa can be clarified by the

explanatory variables included. GDP, and population of the importing countries had a positively affected South Africa's apple exports. The outcomes additionally recommended that South Africa's apples exported were negatively impacted by importers FDI, AVE and ultimately, inflation. The production capacity coefficient showed a positive indication and significance at 5 percent. Importers trade openness and exchange rate coefficients do not significantly affect the export of apples from South Africa to West Africa.

Pears: the outcomes demonstrate that importers population had a affirmative and substantial effect on South Africa's pear exports, while importers FDI and AVE resulted in a undesirable association on South Africa's pears exports. An increase in the highlighted explanatory variables results in low pear exports for South Africa. Grapes: importers GDP, population, AVE displayed a positively significant outcome on the export of fruit from South Africa. This suggests that the increase of highlighted explanatory variables result in high grape exports. Importers GDP, FDI and exchange rate displayed a negative sign and significant effect on grapes exported from South Africa.

6.3 Policy recommendation

The millennium development growth (MDG) 8 in building up a worldwide association for advancement featured that there is a requirement for a solid spotlight on both the fundamental drivers of expansion and interventions that evidently address basic structural barriers to growth and employment. These include scaling up dimensions of foreign and local investments, developing a stronger savings environment, improving South Africa's export and upgrade its knowledge economy. The study is in accordance with the objectives of MDG 8, and it is vital for South African fruit producers to consistently evaluate the boundaries or the determinants of fruit export to the international markets. South African fruit producers need to put resources into new ideas (thoughts) or researchers so as to identify key drivers (regardless of whether negative or positive) on export and furthermore investigate on potential markets that may exist in the global markets.

So as to remain economically focused on the changing global fruit market, exporters are required to reposition and expand their fruits destinations taking into account the factors affecting their export are concerned. The study focused on West African countries for which the determinants of fruit export were identified looking at 15 countries, however, other African markets are engaging prospects for development and expansion. The competition is increasing in African markets particularly in West Africa and North African markets as other exporters like European countries will snatch an opportunity to rule the African markets. Notwithstanding, it is fundamental for South African fruit producers and exporters to strategically put their exports appropriately to guarantee that they dominate the African markets. South Africa has a chance to take control of the African markets when compared to European, Middle East, and Asian competitors.

There are other determinants which influence the South African fruit exports, especially to our neighboring African countries. Therefore, government institutions, for example, the DTI, ITAC, FSA, and others should assist the South African fruit industry in identifying the important and less important determinants of fruit exports, in order to address those that continue to impede trade. Additionally, it is necessary for our government institutions to compile a database of the important determinants of exports that should be considered especially when trading with other countries preferably the African regions as previously indicated. The information and database can be utilized by exporters and producers of fruit to successfully recognize potential trade as well as to assist in planning on how they are going to be affected.

Additionally, there are crucial determinants identified in the study and some have a negative impact on fruit export to West Africa, and special attention is required to ensure that their influences are minimized. Determinants such as importers FDI, *ad-valorem* equivalent, inflation, and exchange were found to pose a negative influence of fruit exports destined to West Africa. A decrease of the featured determinants positively influence fruit export through genuinely repositioning fruits and growing market destinations in developing continents such as Africa, Asia, etc. The recently signed continental agreement called AfCFTA bring hope for the African countries to address some of the stumbling blocks caused through tariff barriers. Therefore, it is recommended that South Africa can address the issue of tariff barriers through the development of free trade agreements (FTAs).

Further research work should impressively still be done, especially in broadening the study territories through investigating other African continents, for example, Eastern, Northern, Central, and Southern Africa. It is comprehended that this study only centered on West African countries as a market destination for South African fruits exports. Furthermore, the evaluation of individual countries will be a key as to perceive how each country behaves when a certain factor changes, and also looking at a particular commodity. The study covered absolute fruits and also the main three exported fruits to West Africa (i.e. apples, pears, and grapes). It will be useful to assess the determinants that influence fruits that are trading at lower volumes.

The prescribed for forthcoming researches in the fruit sub-sector which utilize the gravity model, and center in concluding proxies towards considering other determinants. The consideration of additional variables could add to clarify the movement of exports in the

targeted destinations and additional variables include the following but not limited: political stability, adverse weather patterns, labor availability, trade agreement, consumption patterns. The effect of the extra explanatory factors may have on the South African fruits will be intriguing. However, it is constantly difficult or extremely to gauge the particular factors of the highlighted factors and some of these variables are not actually access as different countries not report.

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