ANALYSING ZAMBIA'S TRADE IN COMESA: A GRAVITY MODEL APPROACH

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DECLARATION

I, Chileshe V. Kapindula, declare that this dissertation

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ABSTRACT

This paper analyses the factors affecting bilateral trade flows between Zambia and other Common Market for Eastern and Southern Africa (COMESA) member states. Empirically, this looks at whether or not Zambia has become more integrated in the COMESA region. Two analytical approaches were used to determine this: calculation of Trade (export and import) Intensity Indices and (panel) estimation of gravity models for Zambia's export and import trade flows from the individual member states for the period 1995-2015. Fixed Effects and Random Effects models were used to estimate the gravity model to achieve specific objectives of the study. It was found that both Zambia and the trading partners' incomes were significant in determining Zambia's level of exports and imports from the region. There was significant export trade to countries sharing a border with Zambia. The common border was, however, not as significant for import trade. Infrastructure was significant in determining both exports and imports into Zambia. The distances between trading partners was significant and showed that an increase between distances reduces both export and import trade. It was also found that Congo D.R., Malawi, Zimbabwe, Swaziland, Rwanda, Mauritius, Kenya, Burundi and Uganda were the most open importers (from Zambia) while Zambia was found to be most open to imports from Zimbabwe, Congo DR, Swaziland, Malawi, Mauritius, Kenya Seychelles. The estimates of the other countries were found to be statistically insignificant. This was complemented by calculation of the export and import intensity indices to analyse the pattern of trade in the region. The pattern revealed that DRC, Zimbabwe, Malawi and Kenya have been strong partners both in terms of imports and exports. Swaziland and Mauritius were also found to be strong trade partner, although more so in terms of imports than in exports. In light of these findings, the study made the following recommendations: Firstly, the region as a whole must work to address the costs of business logistics, inland infrastructure; secondly, member states perpetuating noncompetitive trade practices should embrace competition and embrace the spirit of regional integration; and finally, more efforts should by focused on promoting trade to harness all the trade potential by addressing the existing Nontariff barriers (NTBs) between these member states.

Keywords: Zambia, COMESA, gravity model, trade intensity index

DEDICATION

TO MY DAUGHTER NTANDOYENKOSI BHEBHE.

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ABBREVIATIONS AND ACRONYMS

COMESA	Common Market for Eastern and Southern Africa
CSO	Central Statistical Office
CU	Customs Union
FTA	Free Trade Area
EAC	East African Community
GATT	General Agreement on Tariffs and Trade
LSDV	Least Square Dummy Variable
MCTI	Ministry of Commerce Trade and Industry
MFN	Most Favored Nation
PPML	Pseudo-Poisson Maximum Likelihood
PTA	Preferential Trade Arrangement
SADC	Southern African Development Community
TFTA	Tripartite Free Trade Area
UNCTAD	United Nations Conference on Trade and Development

CHAPTERONE

INTRODUCTION

1. Introduction

International trade is undoubtedly an economic positive. All countries are engaged at some level of trade; multilaterally, regionally or bilaterally. Therefore, the question is not whether or not a country should be involved, but rather if the system of (trade) engagement is structured well-enough to foster economic development and poverty reduction especially for developing countries.

While a fully liberalized trade regime is not feasible multilaterally, efforts have been made to move towards the 'second best' option through regional and/ or bilateral trade integration (depending on participating countries' willingness to subscribe to the conditions of the agreement).The GATT, and its successor the WTO, have facilitated trade integration of its member countries. It is grounded on principles that encourage members to move towards freer trade such as promoting trade without discrimination through the Most Favoured Nation (MFN) and National Treatment. The MFN entails that countries cannot discriminate between trading partners: if a country chooses to lower tariffs for one country in the WTO, then it must do so for all the other countries. Similarly, under National Treatment, a country is expected to give the same treatment to all foreign goods or services once they enter the local market. The WTO also encourages freer trade by addressing raised concerns on trade barriers. The use of import bans or quotas is not allowed. This institutional set-up is also an effort by participating members to create a stable and predictable environment for trade for all parties involved. It has also encouraged fair competition as well as development and economic reform among participating countries.

There are a variety of reasons that motivate countries to be part of a Regional Trade Arrangement (RTA). It can be purely economic interests as they search for access to larger markets. This motive has become particularly pronounced in the lack of willingness among WTO members to liberalize trade further on multilateral basis (Whalley, 1998:63). In this case, countries find it easier to engage one another at a regional or bilateral level to enhance trade. One such example is the aftermath of the setback of the Cancun ministerial conference. This precipitated the formation of many RTAs.

Participation in RTAs is also seen as a way of promoting deeper integration of participating countries in issues not fully dealt with multilaterally by the WTO (Chandran, 2017:2). This is so in areas such as investment, competition, the environment, labour standards and services. For example, preferential liberalization to trade in services differs significantly across RTAs in the context of policy instruments and approaches being used. Regional integration also affords countries (particularly 'small' countries) an opportunity to reap gains from trade in products which otherwise would not be able to compete internationally (DeRosa, 1998:31). A country with low labor costs that obtains access to larger and more developed market is also able to secure foreign direct investment through membership to RTAs. A success story of this is Mexico's membership to NAFTA (Whalley, 1998: 63).Increasingly, the formation of RTAs has also been reported to be based on political and security considerations where governments are seeking to increase peace and security with their RTA partners (Mwasha, 2009). They also secure their bargaining power in multilateral negotiations with the assurance of commitment from the (regional) partners while at the same time preventing backsliding on political and economic reforms(Mwasha, 2009). Larger countries are able to forge geopolitical alliances and cement diplomatic ties (and thus ensure political support) by providing increased access to a larger market.

Zambia has been no exception to trade integration. The economy has undergone various reforms aimed at promoting freer trade while taking into account the changes that have been experienced to both the local and international economies. This chapter highlights how trade policy has evolved in Zambia and gives a background on the main regional and preferential agreements Zambia is party to.

1.1 Zambia's Trade Policy Framework and Trade Landscape

Zambia is a landlocked country. In 2014, it was categorized as a lower-middle-income country after recording a Gross National Income (GNI) of USD 1,680 million(WTO, 2016).The basic problem faced by Zambia since its independence in 1964 is its overreliance on copper exports and only a few agricultural exports such as tobacco, maize and timber. The economic performance of Zambia has been a direct reflection of the copper trade on the international market. During the period 1946-1969, the high copper revenues produced robust growth with real GDP growth rate averaging 10.9% (UNCTAD, 2016). The country was able to sustain a high rate of real growth

from independence in 1964 until about 1974, when it suffered a major external shock in the form of a drastic, 40 percent fall in the price of copper (Seshamani, 2008). With plummeting copper prices, annual real GDP growth rate fell to about 1.5 percent in the 1970s, 1.4 percent in the 1980s and 0.2 percent in the 1990s (UNCTAD, 2016). Thereafter, copper prices remained weak and unstable. This crisis highlighted the weaknesses of the economy: its dependence on one commodity, a weak manufacturing base, an underdeveloped agriculture sector and a rapid opening up of the economy. Since then, the Zambian economy has undergone two major episodes of adjustment as part of the restructuring process and macroeconomic management fostered by the World Bank and International Monetary Fund (IMF). The first adjustment period (1985–1987) was brief because the domestic economy could not support the adjustment costs while the second adjustment has been under way since 1991(Ndulo and Mudenda, 2010). Following the second reinforcement of the policy reform programs in the early 1990s, the economy finally produced positive growth with the real GDP growing by 2.2% in 1999 (UNCTAD, 2016). The growth rate has since accelerated annually reaching 6.6% in 2015 (CSO, 2016).

Prior to the first adjustment period, the economic environment in Zambia was characterized by domestic price controls, trade restrictions and government allocation of foreign exchange which created severe internal and external disequilibria within the country (Ndulo and Mudenda, 2010). In 1975, following the collapse of the copper price in 1974 and the consequent shortage of foreign exchange, the Government imposed greater restrictions on trade. It introduced quantitative restrictions on imports, in addition to the existing high tariffs, and used import licences, import bans and foreign exchange controls to regulate the use of scarce foreign exchange and to protect domestic industry. By the early 1980s, quantitative restrictions on imports had become so extensive that the structure of protection could not be determined by the tariff schedule alone (World Bank, 1984:30). Furthermore, there was an emergence of an underground economy in international trade and a parallel market in goods and assets in domestic trade. The country also had a huge external debt, which worsened after the external shock, mainly because the Government responded by borrowing in order to resolve the crisis (Ndulo and Mudenda, 2010).

The first major attempt at tariff reform began in 1985 with the aim of accessing financial resources from multilateral institutions under a structural adjustment programme. One of the conditionalities of the World Bank was that the country introduce a more rational way of allocating foreign

exchange in the form of an auction system (Ndulo,1990:11). Therefore, tariff reforms were complementary to supporting the auction system (Ndulo and Mudenda, 2010). Import licenses were made freely available, and protection was to be provided only through tariffs. The maximum nominal tariff rate was reduced to 100 per cent and many zero tariff rates were increased to10 per cent and then 15 per cent in order to rationalize the tariff structure. Most of the quantitative restrictions on imports were removed. However, this reform process ended in 1987 when the adjustment costs became unbearable and led to social protests and unrest. During the period 1987–1989 the reform process saw a reversal. However, there was no adjustment to the previous high levels of tariffs. The country embarked on what it called a "growth from own resources" progamme (Ndulo and Mudenda, 2010). This later became unsustainable and Zambia had to revert to the IMF/World Bank-supported programme (Ndulo and Mudenda, 2010). There were no major changes to tariffs. Import licenses were reintroduced, but these were automatic, based on qualifying for allocation of foreign exchange and on the "use of own funds".

The second period of trade reforms has been implemented since 1991 and has involved a second wave of tariff reform. This began in 1989 with the New Economic Recovery Programme supported by the IMF and World Bank. The maximum nominal tariff rate was reduced to 50 per cent in 1991. In the 1993 budget, nominal tariff rates were reduced further and rationalized to 0, 20, 30 and 40 per cent. However, the major tariff reform effort was in 1996, when the nominal tariff rates were reduced to their current levels of 0, 5, 15 and 25 per cent, a reduction from the previous eleven tariff lines to just four (Seshamani, 2008:271).

The trade regime can now be said to be been fully liberalized. Import controls are maintained only for environmental, moral, health and security reasons while all quantitative restrictions on imports have been abolished and many exemptions eliminated. Zambia's import customs valuation has been changed from a free-on-board (f.o.b.) basis to a cost, insurance and freight (c.i.f.) basis (WTO, 2016). Many specific rates have been changed to ad valorem duties. Domestic and import sales tax rates were unified, and, subsequently, a value added tax replaced the sales tax. The current value added tax is 16 percent for both domestic and imported goods. On exports, all export restrictions have been removed.

Policy initiatives have also been undertaken under the adjustment programmes to promote non-traditional exports from Zambia. Since then, the share of nontraditional exports has increased over the years, reducing the share of copper exports to total exports from 94% at independence to about 68% by 2013 (UNCTAD, 2016). Despite this improvement, the increase in nontraditional exports has only been limited to auxiliary activities related to copper mining, primary agricultural products and processed goods from agricultural products, timber and non-metal products (UNCTAD, 2016). The adverse effects of overdependence on copper have been a constant reminder of the need to diversify the economy and the export base. In recognition of this, Zambia's first trade policy document was set out in 1994. It was aimed at pursing an open, export-led strategy based on open markets and global competition (GRZ, 1994). The objective was to ensure that Zambia reduced all import duties, eliminated import and export license requirements, abolished export bans and introduced a number of export incentives, removed subsidies and decontrolled prices.

The 1994 trade policy document was aimed at integrating Zambia into global trade, while increasing and diversifying its production and exports (UNCTAD, 2016). Resources were to be directed towards the most productive areas with highest export potential. It was revised in 2009 (MCTI, 2009). The revised policies were aimed at building on the 1994 trade policy document within the context of Vision 2030 and operationalised through the country's five-year national development plans. This vision is to transform the country into "an economy which is competitive, self-sustaining, dynamic and resilient to any external shocks" (GRZ, 2006: 2). The Fifth National Development Plan's (FNDP) for the period 2006-2010 was focused on strengthening the linkages between the resource sectors and manufacturing and fostering a competitive and outward economy (MoFNP, 2006). The Sixth National Development Plan (SNDP) for the period 2011-2015 reinforced these objectives while emphasizing trade liberalization, economic diversification and export-led growth (MoFNP 2011). The FNDP recognized the importance of trade in supporting the achievement of economic growth and development by mainstreaming trade into Zambia's national development plan for the very first time. It positioned the commerce and trade sector to become export-driven, competitive and commercially viable. The ultimate goal of this was to improve the quality of locally produced goods and services and to increase the country's share in world exports. The SNDP pronounced the Zambian government's dedication to expand the scope

and coverage of its multilateral, regional and bilateral arrangements to ensure greater access to markets, trade and investment opportunities.

1.2 Zambia's Participation in Regional and Preferential Arrangements

To further boost trade development, Zambia is signatory to a number of preferential and regional integration agreements. The history of preferential trade agreements in Zambia dates back to pre-independence era. Zambia, formerly, Northern Rhodesia, was part of the Federation of Rhodesia and Nyasaland (GATT, 1995). The Federation was formed in 1953 and abolished in 1963. It comprised Southern Rhodesia, Northern Rhodesia and Nyasaland. The Federal government adopted a consolidated tariff stricture to be applied for territories constituting the federation (GATT, 1995). It also had new trade agreements for South Africa and another for Australia (GATT,1995). Notable success could be attributed to the formation of the Federation. One such example is the building of Kariba hydro-electric dam.

However, the minority white rule was met with a lot of resistance from the black majority which desired to take back control of its resources (Roberts-Wray, 1966). This was because, under an appointed governor-general, the federal government (minority white rule) handled most external affairs, defense, currency, inter-colonial relations, and federal taxes for its constituent members, which retained most of their former legislative structure (Roberts-Wray, 1966). The Africans, fearing continued domination by the whites, demonstrated (1960–61) against the federation, and in 1962 there was a strong movement for its dissolution, particularly from the new African-dominated regime of Northern Rhodesia. This led to the breakup of the Federation the constituting territories gained their independence.

Zambia has since become party to two regional economic communities, namely, the Southern Africa Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA). SADC was established as a development coordinating conference (SADCC) in 1980 and transformed into a development community in 1992 (Sandrey, 2015). It is an inter-governmental organization whose goal is to promote sustainable and equitable economic growth and socio-economic development among its fifteen (15) member states (Sandrey, 2015). COMESA was initially established as Preferential Trade Area for Eastern and Southern Africa in 1981 with a view of eventually transforming into a Common Market. In 1992, a tariff schedule

was adopted for the gradual removal of tariffs. This led to the signing of treaty that established the Common Market for Eastern and Southern Africa in 1993.

In terms of performance, SADC is Zambia's main trading partner in terms of both exports and imports. It accounts for approximately 52.9% of Zambia's imports and 21.4% of its exports in merchandise trade while COMESA accounts for 26.6% of Zambia's imports and 13.2% of its exports (WTO, 2016). Table 1.1 shows Zambia's merchandise imports for both SADC and COMESA. Overall, Zambia imports significantly more from the SADC region than COMESA. Zambia's share of imports as a percentage of GDP has also increased significantly under SADC than COMESA. In 1995, the imports (% of GDP) from both regions did not differ considerably. Imports from SADC made a share of 1.9% of Zambia's GDP while those from COMESA were at 1.7%. By 2000, the margin had widened quite significantly with SADC imports increasing to 16.93% 0f GDP while COMESA's only increased by a single percentage point to 2.62%. This share slightly reduced in 2010 to about 2.35% while SADC's increased to 17.47%. By 2015, imports to SADC accounted for 29.25% of GDP while imports to COMESA accounted for 13.79%. In value terms, the imports from SADC were nearly three times higher than COMESA imports; SADC imports were valued at USD 4.218 billion while COMESA imports were USD 1.988 billion of the total trade.

Table 1.1: Value of Merchandise Trade (Imports) in USD

Year	SADC total trade	SADC Imports	SADC Imports (%of GDP)	COMESA Total Trade	COMESA Imports	COMESA Import (%of GDP)
1995	162,884,040	73,272,138	1.92	140,112,855	65,082,185	1.71
2000	867,548,269	609,483,518	16.93	179,787,801	94,329,294	2.62
2005	2,165,930,996	1,455,760,749	17.47	450,276,492	196,184,492	2.35
2010	4,579,915,098	3,284,041,109	15.52	2,648,294,603	1,496,473,965	7.07
2015	5,881,173,937	4,218,063,865	29.25	2,959,032,166	1,988,949,996	13.79

Source: UNCOMTRADE database

Similarly, Zambia exported more goods to SADC than COMESA. Table 1.2 shows the export values for merchandise trade in dollars. In 1995, exports to SADC accounted for 2.35% of Zambia's GDP while exports to COMESA accounted for 1.97%. This figure increased significantly for SADC to 7.17% in 2000 while COMESA's increased marginally to 2.3%. In 2010, SADC's export share of GDP had reduced from 8.52% in 2005 to 6.13%. COMESA's export

share had increased from 3.05% in 2005 to 5.44% in 2010. By 2015, SADC's export share of GDP had increased to 10.91% while COMESA'S import share increased to 6.73%.

Table 1.2: Value of Merchandise Trade (Exports) in USD

Year	SADC Total Trade	SADC Exports	SADC Exports (% of GDP)	COMESA Total Trade	COMESA Exports	COMESA Exports (% of GDP)
1995	162,884,040	89,611,902	2.35	140,112,855	75,030,670	1.97
2000	867,548,269	258,064,751	7.17	179,787,801	85,458,507	2.37
2005	2,165,930,996	710,170,247	8.52	450,276,492	254,092,000	3.05
2010	4,579,915,098	1,295,873,989	6.13	2,648,294,603	1,151,820,638	5.44
2015	5,881,173,937	1,573,055,226	10.91	2,959,032,166	970,082,170	6.73

Source: UNCOMTRADE database

1.3 Statement of the problem

While trade is undoubtedly an economic positive, full integration of the world economy has proved to be unattainable. This has led to a rapid increase in the formation of regional trade arrangements (RTAs) often characterized by overlapping membership (countries belonging to more than one RTA) as countries seek benefits from trade. This proliferation of RTAs world over has prompted several studies examining their effectiveness. In Africa, RTAs such as ECOWAS, EAC, COMESA and SADC have played a crucial role in enhancing trade liberalization. These have also borne other successes in nontrade dimensions such as better quality of infrastructure as well as quality of institutions.Zambia is party to two main regional groupings: COMESA and SADC. It was shown (in the previous section) that its trade performance has been exceedingly better under SADC. Therefore, of concern to this study was the effectiveness of Zambia's participation under COMESA. Zambia has (comparatively) continued to record low levels of trade in the region.This study was purposed to investigate why this has persisted by analysing the country's pattern of trade in the region and investigating the factors that may be influencing this outcome using the gravity model.

1.4 General Objective

The general objective of this study is to analyse Zambia's Trade in COMESA

1.4.1 Specific Objectives

a. To investigate the pattern of trade between Zambia and other COMESA member countries
b. To determine the openness to trade for both Zambia and other COMESA member countries
c. To analyse the different factors affecting Zambia's bilateral trade flows with other COMESA member states

1.5 Hypotheses

a. Zambia is well-integrated and increasingly trading with each of the COMESA member states
b. COMESA member states are open to trade with Zambia
c. Zambia is open to trade with other COMESA member states

1.6 Justification of the Study

Regional integration is widely accepted as an appropriate mechanism to promote free trade among countries. Zambia is no exception to this and is today a member of several bilateral and multilateral trade agreements. Of particular interest to this study is Zambia's membership to the Common Market for Eastern and Southern Africa (COMESA) RTA. Being one of the founding members, it is in the interest of this research to empirically determine how well integrated the country is in the region (in terms of commodity trade) and the factors that are affecting trade between Zambia and the other member states. These results will help identify the key drivers of regional trade to enable the country design policies that promote its trade oriented development strategy. This requires an examination of appropriate ratios and augmentation of the standard gravity equation to get the desired results.

1.7Organisation of the Study

The study is organized as follows: Chapter One presents the introduction to the study. Chapter Two presents the background to the study. It includes highlights of the origin, composition and performance of COMESA. It also highlights Zambia's trade in the region. Chapter Three is a review of the theoretical and empirical literature that was relevant to this study. Chapter Four highlights the methodology and theoretical framework of the study. Empirical analysis and presentation of results are dealt with in Chapter Five and the conclusion and policy recommendations follow in Chapter Six.

CHAPTER TWO

OVERVIEW OF ZAMBIA-COMESA TRADE

2. Introduction

This chapter presents a brief background on COMESA highlighting its origin, composition and intra-regional trade performance. It also presents an analysis of the pattern of trade between Zambia and other COMESA member states trade using trade intensity indexes and a summary of trade (by products groups) with Zambia's largest trading partners in the region.

2.1 COMESA's Origin and Composition

COMESA was formed to promote intra-regional trade among member states with the ultimate objective of creating more wealth and more incomes for the people of the region (COMESA, 1993). This was expected to be achieved by progressively lowering trade barriers so as to promote trade and fair competition among member states.

Ibrahim and Obiageli (2015) trace COMESA's roots to the mid-1960s. At that time, countries in Eastern and Southern Africa initiated a process towards a co-operation agreement so as to promote economic development of the then fragmented post-colonial economies. It was in 1965, during a United Nations Economic Commission for Africa (UNECA) ministerial meeting held in Lusaka, Zambia, that the recommendation of creating an Economic Community of Eastern and Southern African states was made (Ibrahim and Obiageli, 2015). A treaty was later signed in 1981 to establish the Preferential Trade Area for Eastern and Southern Africa (PTA) in 1981(Ibrahim and Obiageli, 2015). However, the PTA only came into force in 1982. The PTA was created with a view of eventually transforming into a common market. In 1992, a tariff adoption schedule was adopted for the gradual removal of tariffs on intra-regional trade in an effort to move towards a customs union. To this effect, another treaty that established the Common Market for Eastern and Southern Africa was signed in 1993 in Kampala, Uganda(Ibrahim and Obiageli, 2015). It was ratified a year later in Malawi.In 2000, nine countries, namely,Djibouti, Egypt, Kenya, Madagascar, Malawi, Mauritius, Sudan, Zambia and Zimbabwe signed an agreement to eliminate tariffs on all COMESA countries. This marked the achievement of the COMESA Free Trade Area

(FTA). The COMESA Customs Union was launched in 2009 in Harare, Zimbabwe. From the time of the launching, member States agreed on a three-year transitioning period to domesticate the Customs Management Regulations (CMR), Common External Tariff (CET) and the Common Tariff Nomenclature (CTN) that would gradually form the Customs Union. The plan was to finalize the Customs Union by 2012, however, even after a second postponement of the transition period to 2014, the Custom Union is still not operational. COMESA is made up of nineteen member states, namely; Burundi, Comoros, Djibouti, Democratic Republic of Congo, Egypt, Ethiopia, Eritrea, Kenya, Libya, Malawi, Mauritius, Madagascar, Rwanda, Seychelles, Swaziland, South Sudan, Uganda, Zimbabwe and Zambia (COMESA, 2015).

Several countries in COMESA are characterized by overlapping and concurrent membership. In addition to COMESA, Zambia is also a member of SADC. The country has had to simultaneously engage in implementation of integration programs in both SADC and COMESA.SADC was established as a development coordinating conference (SADCC) in 1980 and transformed into a development community in 1992. It is an inter-governmental organization whose goal is to promote sustainable and equitable economic growth and socio-economic development among its fifteen (15) member states (Sandrey, 2015). Following the completion of the tariff phase-down in 2011, Zambia provided for the domestication and full implementation of the SADC FTA under Statutory Instrument Act 103 (Cheelo et. al, 2012). This implies granting duty-free and quota-free access to goods originating from the SADC region.SADC is also poised to establish a customs union. However, this has its ownimplications on Zambia.A country cannot be a member of two separate customs unions. Overlapping membership by customs unions members that are in different RECs will require Rules of Origin restrictions and, more importantly, border controls to ensure that goods that enter under preferences in one country are not diverted into the remaining countries custom union members' markets that are not party to the preferential trading arrangement (Edwards, 2012). These procedure undermine a key objective of forming a customs union, namely the removal of restrictions on internal trade flows (Edwards, 2012).

To remedy the inconsistencies associated with overlapping membership, members of COMESA, SADC and the EAC officially launched Tripartite Free Trade Area (TFTA) in 2015. The TFTA was being formed with objectives of promoting social and economic development of the region by creating a single large market with free movement of goods and services (Mold and Mukwaya,

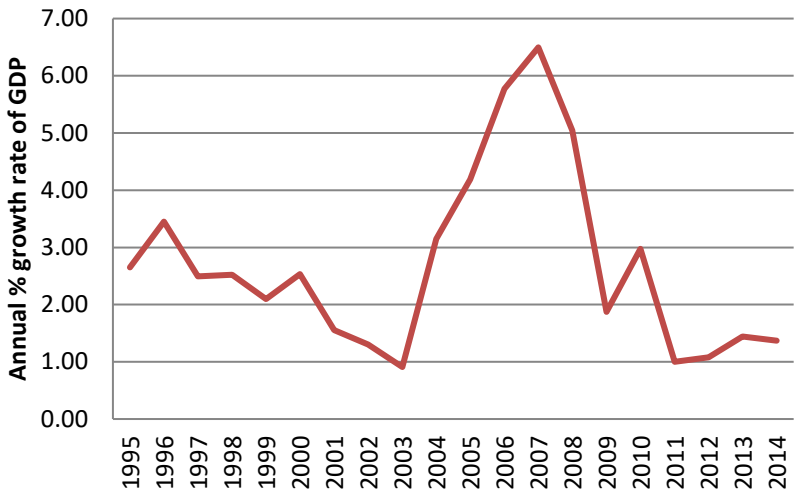
2017).The Tripartite Summit gave Member States 12 months from the launch of the TFTA to conclude outstanding negotiations issues on rules of origin, trade remedies and tariff offers. However, due to a number of challenges faced in the process, the deadline of June 2016 was not met, and the commencement of Phase II negotiations – covering trade in services and other trade related matters – has been delayed pending the conclusion of negotiations on Phase I issues (Mold and Mukwaya, 2017). Twenty four Member States have signed the Declaration; only Libya and Eritrea have yet to sign. The TFTA Agreement has been signed by 20 of the 26 member countries, namely Angola, Burundi, Comoros, Democratic Republic of Congo (DRC), Djibouti, Egypt, Kenya, State of Libya, Malawi, Namibia, Rwanda, Seychelles, Sudan, Tanzania, Uganda, Swaziland, Zambia and Zimbabwe. The Republic of South Africa and the Republic of Madagascar signed the TFTA Agreement on 7 July and 13 July 2017, respectively. The Agreement requires 14 ratifications to enter into force. So far, no country has ratified it (Mold and Mukwaya, 2017).

2.2 Intra-COMESA Performance

a) Annual GDP growth rate

Intra-regional performance in the period under study was generallylow with a few marked years relatively high intra-regional trade. Figure 2.1 shows annual growth rate of GDP in the COMESA region. In 1996 the region's GDP grew by 3.45% before declining and reaching an all-time low in 2003 of only 0.91%. Thereafter, the annual growth rate in GDP rises and reaches its highest in 2007 of 6.5%. Between 2007 and 2009, there is a sharp decline in the annual growth rate from 6.5% peak to only 1.88%. This was largely a result of the global financial crisis and subsequent economic recession between this period. The region's economy has not quite recovered from this meltdown and has since continued to fluctuate between 2.98% and 1%.

Figure 1.1: Annual Growth Rate (COMESA)



Source: COMSTAT data portal

b) Trade Performance

Since the establishment of the COMESA FTA in 2000, intra-regional trade has increased from US$ 1.5 billion to US$ 10.1 billion in 2014(COMESA, 2016). This trade has however remained low compared to the region's trade with the rest of world both in terms of exports and imports. For example, COMESA's exports to the rest of the world grew from US$ 28.3 billion in 2000 to about US$ 106.4 billion in 2013 while the exports to EU and China alone accounted for US$ 56.8 billion with the EU importing goods worth US$ 45 billion from the region in 2013.Intra-regional trade has been found to be dominated mainly by six countries. Egypt makes up for 31.8 percent of the region's intra-trade followed by Kenya with 15 percent, DRC (13.8 percent), Zambia (11.3 percent), Uganda (7.5 percent) and Malawi (6.5 percent).

Intra-COMESA Trade performance has improved since the launch of the FTA. Table 2.1 shows the changes in intra-COMESA trade performance. Generally, all countries have had an increase in the value of intra-COMESA trade both in terms of exports and imports. A notable pattern in intra-COMESA trade is the large difference between the highest and lowest trade values of countries in the region. Intra-exports for some countries like Egypt and Kenya have been consistently high. The share of Egypt's exports to other COMESA members has risen from US$113.8 million in 2000 to US$2343.7 million in 2010 (reporting a highest rate in COMESA) before falling to US$1672.8million in 2015. Kenya also reported notable increase in intra-COMESA exports from

about US$595.7 million, US$1658.4 million in 2010 to US$1309.1 million in 2015. Exports for Zambia, DR Congo and Uganda followed with US$976.5 million, US$896millionandUS$835.9 million respectively. Intra-COMESA exports performance for other countries like Comoros, Eritrea and Seychelles was relatively low and did not exceed US$2.5 million. Major intra-regional export products are black tea, copper ore and concentrates, portland cement, sulphuric acid, cobalt ores and concentrates, live animals, surface-active washing or cleaning preparations, among others (COMESA, 2015).

Table 2.1: Intra-COMESA Exports and Imports (USD Millions)

Member	Intra-COMESA Exports			Intra-COMESA Imports-			Intra-COMESA Trade Balance		
State	US$ million			US$ million			US$ million		
	2000	2010	2015	2000	2010	2015	2000	2010	2015
Burundi	5	24.6	48	19.9	105.9	177.3	-14.9	-81.3	-129.3
Comoros	0.1	2.5	2.2	5	13	22.3	-4.9	-10.5	-20.1
Congo	33.7	1134.3	896	107.1	806.1	882.1	-73.4	328.2	13.9
Djibouti	4.1	601.7	6.8	73.4	78.2	93.8	-69.3	523.5	-87
Egypt	113.8	2343.7	1672.8	239.1	961.8	550.9	-125.3	1381.9	1121.9
Eritrea	0.2	2.1	9.2	7.8	155.5	99.1	-7.6	-153.4	-89.9
Ethiopia	155.1	287.3	162.1	107.6	286.2	296.4	47.5	1.1	-134.3
Kenya	595.7	1658.4	1309.1	77.3	504.1	612.6	518.4	1154.3	696.5
Libya	50.4	334.8	85.8	69.3	1378.3	624.1	-18.9	-1043.5	-538.3
Madagascar	19.1	47.1	45.9	63.5	197.3	143.80	-44.4	-150.2	-97.9
Malawi	41.5	215.6	212	52.8	231.8	224.1	-11.3	-16.2	-12.1
Mauritius	96.8	155.7	225.7	58.3	125.3	171.3	38.5	30.4	54.4
Rwanda	35.1	82.7	321.5	28.7	415.2	394.8	6.4	-332.5	-73.3
Seychelles	2.4	2.5	1.6	12.5	47	84.9	-10.1	-44.5	-83.3
Sudan	78.7	336.5	481.9	201.2	767.9	796.1	-122.5	-431.4	-314.2
Swaziland	65	140.3	174.3	0.5	10.7	21	64.5	129.6	153.3
Uganda	77.1	713	835.9	152.4	586.9	699.2	-75.3	126.1	136.7
Zambia	152.1	690.2	976.5	85.3	1394.2	2003.6	66.8	-704	-1027.1
Zimbabwe	170.7	267	101.4	57.7	271.2	432.7	113	-4.2	-331.3
COMESA	**1696.5**	**9039.8**	**7568.7**	**1419.4**	**8336.6**	**8330.1**	**277.1**	**703.2**	**-761.4**

Source: COMSTAT database

With regard to intra-COMESA import market share, Zambia registered the biggest share at 24% with goods worth US$ 2.0 billion in 2015. It was followed byCongo D.R., Sudan, Uganda, Libya, Kenya and Egypt followed with 11%, 10%, 9%,8% 7.4% and 6.7% respectively.

In terms of the trade balance, the region as a whole recorded surpluses in 2000 and 2010of US$277.1 million and US$703.2 million respectively. However, intra-regional exports reduced in 2015 leading to a trade deficit of US$761.4million dollars. Egypt and Kenya recorded the highest trade surpluses of US$1121.9 million and US$696.5 million respectively in 2015. Other countries recording surpluses include Congo DR, Mauritius and Swaziland. Despite the increase in Zambia's exports, the country's intra-regional imports soared making Zambia the highest importer in the region with a trade deficit of US$1027.1 million in 2015.

2.3 Zambia-COMESA Trade

2.3.1 Trade Intensity Index

The trade intensity index (T) provides a complementary method of analysing trade flows to the gravity model as it measures trade performance between any two countries. It was initially developed by Brown (1949) then later popularised by Kojima (1964) and Drysdale and Garnaut (1982). Several studies have employed this index in explaining the patterns, composition and trends of trade between countries. Bano(2002) employed the index to examine the strength of trade relations between New Zealand and its major trading partners (Australia and selected Asia-Pacific nations) for the period 1981-1999. He observed that bilateral trade had strenthened (that is, become more 'intense') but also that in other cases trade between the trading partners has decreased.Bhattacharya and Bhattacharya (2007) applied the trade intensity index to measure the trade potential between China and India. Their study revealed that India and China possess a significant bilateral trade potential, which has not been fully utilised.

The index diverts from the gravity model's focus on the sizes of the trading partners but only focuses on variations in bilateral trade levels. Therefore, the trade intensity index measures the share of one country's trade with another country (or region) as a proportion of its share of the world trade (Drysdale, 1982).

In the context of this study, both the export and import intensity indexes were calculated. The formula used was:

$$T_{ij} = \frac{\frac{X_{ij}}{X_{it}}}{\frac{X_{wj}}{X_{wt}}}$$

Where x_{ij} and x_{wj} are the values of Zambia's exports (imports) and of world exports (imports) to country j and where X_{it} and X_{wt} are Zambia's total exports (imports) and total world exports(imports) respectively. An index of more (less) than one indicates a bilateral trade flow that is larger (smaller) than expected, given the partner country's importance in world trade.

The Export Intensity Index (EII)

An EII equal to one (1) is indicative of a bilateral pattern of trade identical to the rest of the world while a higher index shows an intense trade relation (relative to the rest of the world).

Zambia's export intensities with major partners are shown in Table 2.2. (Complete tables are shown in the appendix.)Results revealed that the most intense export relationship was between Zambia and the Democratic Republic of Congo (DRC), Zimbabwe, Malawi and Kenya. The DRC has shown a consistently strong index throughout the period under study and seems to be the main trading partner in the region. It is followed by Zimbabwe and Malawi, which like the DRC, share a common border with Zambia. Kenya has also been a strong export destination and its intensity index shows spikes between 2000 and 2007 and again in 2010. The EII for Mauritius has been increasing over the years (under study). Before 2000, the index was consistently below one. Since the launch of the COMESA FTA, export trade to Mauritius has increased with the index going as high as 35.8 in 2010. This may be taken as an indication of the advantages of the FTA to the member states. Rwanda, Swaziland and Uganda also recorded indexes above one. Rwanda's index shows that exports to Rwanda were very high both pre- and post-launch of the FTA. For most of the years under the period of study, Egypt's export trade with Zambia remained below one except from 2006-2009 and once again in 2011 when the index exceeded but remained below 25. The Index for Burundi, Comoros, Djibouti, Eritrea, Libya, Madagascar and Seychelles either remained below one or in some cases could not be calculated due to missing values on bilateral trade flows.

Table 2.2: Export Intensity Index

Year	DRC	Kenya	Malawi	Zimbabwe
1995	101.26	4.11	90.84	64.32
1996	121.99	5.81	247.58	70.50
1997	149.66	2.72	235.56	73.75
1998	306.84	3.04	544.30	58.38
1999	390.72	8.81	166.89	73.75
2000	429.28	13.62	239.83	87.58
2001	327.45	26.18	149.06	83.50
2002	316.31	11.04	166.18	85.48
2003	343.34	12.66	369.96	91.93
2004	482.41	12.05	388.69	294.77
2005	330.26	13.71	524.12	211.61
2006	139.05	13.50	235.74	70.27
2007	247.17	9.83	107.38	92.96
2008	220.96	8.47	151.78	71.58
2009	261.31	7.01	175.01	93.20
2010	271.68	14.75	197.91	139.14
2011	125.36	5.02	156.47	54.14
2012	221.33	6.94	219.21	174.56
2013	286.83	9.07	193.58	110.43
2014	219.89	5.10	181.46	87.17
2015	239.57	5.02	201.92	173.73

Source: author's calculations based on data obtained from COMSTAT database

The Import Intensity Index (III)

Analogous to the EII, the import intensity index(III) indicates strength of Zambia's imports from the selected trading partners relative to the rest of the world. Table 2.3 shows the import intensity index between Zambia and other COMESA member states. Similar to the EII, the III for DRC, Kenya Malawi, Mauritius, Swaziland and Zimbabwe remained consistently high throughout the period under study. The DRC reports an III as high as 649.9. It remains well- above one for all years under study except in 1997 and 1998 when it records 0.92 and 0.26 (respectively). For Kenya, the index was above one for all the years under study. Mauritius' index has a notable upward trend after 2000. The index shows that imports from Mauritius (relative to the rest of the world) have increased and the country has gone on to become one of the strongest trading partners in the region. The index for Egypt has been between zero and one two throughout the period. This shows that import pattern with Egypt does not vary greatly with the rest of the world. Zambia is importing,

almost in equal proportions, from Egypt as it is from the rest of the world. A similar pattern is noted with Uganda. The III for Seychelles showed no regular pattern. It fluctuated between 0 and 25, showing alternate highs and lows throughout the period. Imports from Burundi, Comoros, Djibouti, Ethiopia, Eritrea, Madagascar and Libya either had an index below one or could not be calculated due to missing values.

Table 2.3 Import Intensity Index

Year	DRC	Kenya	Malawi	Mauritius	Zimbabwe
1995	17.94	7.98	21.12	4.01	224.51
1996	36.12	18.17	126.32	2.11	228.38
1997	0.92	11.26	34.64	4.31	188.05
1998	0.26	8.51	18.11	5.11	310.95
1999	2.34	9.80	39.35	8.36	262.38
2000	71.56	10.88	37.43	14.57	259.71
2001	2.94	16.57	40.11	13.39	299.01
2002	6.45	32.70	45.53	18.52	316.76
2003	52.10	48.03	80.51	6.15	510.91
2004	48.85	51.76	62.40	5.96	271.25
2005	58.10	48.57	87.39	4.02	221.87
2006	81.84	65.01	90.65	4.53	306.76
2007	209.51	74.66	46.59	12.45	158.27
2008	445.12	51.46	66.88	16.82	148.45
2009	559.18	61.10	40.60	18.21	160.93
2010	649.86	82.12	58.18	18.55	168.64
2011	441.58	29.51	27.22	11.13	69.14
2012	368.07	107.09	122.63	32.27	86.28
2013	423.63	228.04	43.92	19.47	94.22
2014	379.57	229.39	38.40	88.40	75.10
2015	351.02	203.44	32.53	389.51	80.76

Source: author's calculations based on data obtained from COMSTAT database

Overall, the indices revealed an interesting pattern in trade between Zambia and other COMESA member states. Throughout the period under study, DRC, Kenya, Zimbabwe and Malawi have been very strong trade partners both in terms of exports and imports. Trade with Swaziland and Mauritius was also found to be more intense in terms of imports than exports. Exports to Egypt were marked only for a few years but registered stronger import trade. The remaining COMESA member states have had consistently little or no reported trade with Zambia.

2.3.2 Composition of Zambia-COMESA Trade

a) Export Shares

The composition of export trade (by product group) between Zambia and major trading partners in COMESA is shown in Table 2.4. Notably, Zambia's exports have largely been in intermediate goods to the DRC, Kenya and Zimbabwe.

Table 2.4: Percentage of Share of Exports by Product Group

Democratic Republic of Congo					
Product Group	**1995**	**2000**	**2005**	**2010**	**2015**
Capital goods	2.09	1.37	0.90	4.18	3.06
Consumer goods	10.18	2.69	10.40	7.01	7.97
Intermediate goods	17.45	23.05	20.73	20.50	20.72
Chemicals	0.59	1.87	2.57	8.91	8.57
Minerals	1.47	2.86	2.87	5.14	4.87

Kenya					
Product Group	**1995**	**2000**	**2005**	**2010**	**2015**
Intermediate goods	32.31	26.13	26.77	20.22	24.51
Metals	29.21	25.60	26.75	20.09	11.40
Raw materials	0.03	2.60	4.23	7.46	5.13
Consumer goods	0.95	2.97	2.17	5.53	1.74
Fuels	0.06	0.00	0.15	2.50	0.57

Malawi					
Product Group	**1995**	**2000**	**2005**	**2010**	**2015**
Raw materials	10.6	15.6	24.9	21.4	22.4
Food Products	3.2	8.1	19.9	20.9	15.4
Consumer goods	6.8	2.7	6.4	3.6	6.0
Intermediate goods	9.7	14.5	1.7	7.1	3.9
Chemicals	0.8	0.3	1.6	1.8	2.6

Zimbabwe					
Product Group	**1995**	**2000**	**2005**	**2010**	**2015**
Vegetable	0.46	1.73	4.14	6.91	19.29
Raw materials	2.31	8.71	13.65	14.41	19.17
Consumer goods	1.52	8.68	16.83	7.74	7.49
Intermediate goods	28.73	13.78	2.58	9.49	5.76
Food Products	1.31	8.12	10.29	18.43	5.24

Source: author's calculations based on data obtained from WITS database

b) Import Shares

Composition of import trade (by product group) between Zambia and major trading partners in COMESA is shown in Table 2.5. Imports from Kenya and Malawi were largely in consumer foods. There was also an increase in imports in fuels from the two countries. Imports from the DRC and Zimbabwe were largely in raw materials and intermediate goods.

Table 2.5: Percentage Share of Imports by Product Group

Democratic Republic of Congo					
Product Group	**1995**	**2000**	**2005**	**2010**	**2015**
Raw materials	0.15	32.15	30.62	22.08	20.65
Minerals	0.00	27.81	30.61	22.07	20.64
Intermediate goods	32.07	0.17	1.30	10.93	12.59
Chemicals	0.08	0.50	0.50	4.68	9.95
Metals	0.15	4.35	1.41	6.27	2.66

Mauritius					
Product Group	**1995**	**2000**	**2005**	**2010**	**2015**
Consumer goods	1.42	9.03	5.00	21.58	29.34
Intermediate goods	28.47	24.11	19.14	6.99	2.02
Chemicals	24.37	24.09	11.63	2.35	1.85
Fuels	0.00	8.23	0.00	0.01	28.41

Kenya					
Product Group	**1995**	**2000**	**2005**	**2010**	**2015**
Consumer goods	19.91	22.84	16.93	22.83	31.82
Fuels	0.68	0.00	0.83	4.91	28.46
Chemicals	15.29	11.13	5.75	5.78	1.17
Capital goods	4.73	3.94	0.88	1.01	0.85
Intermediate goods	8.45	5.86	14.14	8.79	0.9

Zimbabwe					
Product Group	**1995**	**2000**	**2005**	**2010**	**2015**
Raw materials	7.78	7.83	7.12	7.01	11.42
Intermediate goods	13.85	10.50	10.89	12.13	10.79
Consumer goods	8.52	12.15	11.75	9.23	8.03
Vegetable	11.45	7.67	3.51	1.65	2.37

Source: author's calculations based on data obtained from WITS database

CHAPTER THREE

LITERATURE REVIEW

3. Introduction

The aim of this chapter is to provide theoretical and empirical arguments underlying wider debates on the effectiveness of regional trade integration. In this respect, this chapter presents theory on primary reasons and considerations for countries' involvement in international trade. This is supported by empirical evidence on factors that influence export and/or import trade among integrating countries. In the literature, variables influencing export and/or import trade are generally modeled on the premise of the Newtonian gravity model. The model is usually augmented depending on the research interest. Primarily, the gravity model includes variables that encourage trade between countries as well as proxies for barriers to trade. Various augmentations of the model will be discussed in this chapter.

3.1 Theoretical Literature Review

The rapid increase in Regional Trade Agreements among countries (and their overlapping tendencies ('spaghetti bowl') as a result of one country belonging to multiple RTAs) has generated debate on the effectiveness of RTAs. Yeats (1997), for example, raised empirical questions on whether RTAs stimulate growth and investment, facilitate technology transfer, shift comparative advantage towards high value activities, induce political stability or just divert trade toward inefficient channels and undermine the multilateral trading system.

Why trade?

Theories explaining why countries seek to trade date back to those explaining the gains in international trade when countries move from autarky. The Ricardian classical trade theory of comparative advantage argued that trade raises a country's welfare compared to autarky through complete specialization (Salvatore, 2013). It assumed labor as the only factor of production. The difference in the productivity of labor across countries implied technological differences and thus formed the advantageous basis for trade. Countries, therefore, should shift resources to production of goods which they most efficiently produce and import goods they produce less efficiently

(Salvatore, 2013). This model, however, fell short due to some of its unrealistic assumptions; the assumption of labor as the only factor of production and also that of perfect competition when in reality imperfection exists.

The Heckscher-Ohlin (H-O) model was developed by Eli Heckscher and Bertin Ohlin. It was an improvement over the Ricardian model as it provided more realistic assumptions. It also demonstrated how a country can improve its welfare through international trade based on differences in countries' factor endowments (Salvatore, 2013). It assumed two factors of production, labor and capital, and that countries have access to identical production technologies. The Heckscher-Ohlin proposition maintains that countries tend to export goods whose production makes intensive use of relatively abundant factors of production. With these conditions, a country with a relatively large labor supply will specialize in the production and exportation of labor-intensive goods and import capital-intensive goods. The converse is true for countries that are relatively capital-rich (Salvatore, 2013).

The H-O model, however, still does not encompass other outcomes of trade. For example, when trade opens up, it is followed by adjustment not only across industries, but within them as well. Increased competition from foreign firms puts pressure on profits, forcing less-efficient firms to contract, making room for more efficient firms (Macdonald, 2017). Expansion and new entry introduce better technologies and new product varieties. Furthermore, trade enables greater selection across different types of goods which helps to explain the prevalence of intra-industry trade (Macdonald, 2017).There are clear efficiency benefits from trade that result in more products. This is not only more of the same products but greater product variety (Macdonald, 2017). An even greater benefit is the more efficient investment spending that results from the firms' access to wider variety and quality of intermediate and capital inputs.

Movement towards free trade?

Since the full integration of the world economy has proven to be unattainable, a group of countries can instead integrate. This can be bilaterally or regionally. There are different theories used in determining whether formation of an RTA will leave a country better off or worse off. Analyses of welfare effects of RTAs inevitably begin with the influential concepts of trade diversion and

trade creation introduced by Viner (1950). Trade creation is the replacement of domestic production by lower cost imports from a partner while trade diversion is the replacement of lower cost imports from the world market by more expensive imports from a partner (Viner, 1950). He, therefore, associated trade creation with welfare gain and trade diversion with welfare loss. However, it is only the relative strength of these two effects that determines whether or not a trade bloc is welfare enhancing.

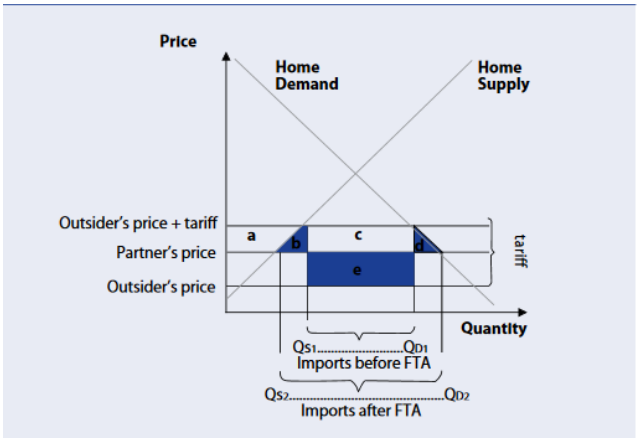
Figure 3.1 illustrates the partial equilibrium analysis of Viner's concepts of trade creation and trade diversion summarized by Plummer et. al.(2010). It shows the demand and supply curves of a certain good in the domestic market of a country that joins an FTA. We will refer to this country as the "home" country, other FTA member countries as "partner" countries, and non-member countries as "outsiders." Further, we assume for the moment that the home country is small in an economic sense, meaning that it is unable to influence international prices (and, therefore, can always buy its imports at a constant price from abroad).

Before the FTA, the home country imposed a tariff on all imports of the good regardless of the source. Tariff revenue is simply the tariff multiplied by the quantity of imports. We also assume that the outsider is more efficient at producing the good than either the home or partner countries and, therefore, its price is the lowest among the three countries.Before the FTA, domestic producers supply Q_{s1}units of the good, and local consumers purchase Q_{D1}units, which is the sum ofQ_{s1}domestically produced units plus imported units from the outsider, who is able to supply the product at a lower price than the partner country. However, after joining the FTA, the removal of the tariff on imports from the FTA partner makes these imports cheaper than those from the outsider to the consumer. As consumers now face a lower price, they purchase more, at Q_{D2}. The country now sources all of its imports from an FTA partner rather than an outsider. The lower domestic price causes local production to shrink and domestic producers now supply only Q_{s2} units of the good.

The trade creation effect, as strictly defined by Viner (1950), is the reduction in domestic production that is now met by more efficient imports; $Q_{S1} - Q_{S2}$. In addition, as the FTA lowers the domestic price, there is a rise in consumption, $Q_{D2} - Q_{D1}$, that is also satisfied by increased imports. We can define gross trade creation as the change in imports due to the FTA,$Q_{D2} -$

Q_{S2},minus$Q_{S2} - Q_{S1}$. This is the sum of the production and consumption effects of the FTA. On the other hand, the FTA also causes trade diversion because the imports previously sourced from the outsider,$Q_{D1} - Q_{S1}$, are displaced by imports from the partner country. The country loses tariff revenue on this quantity of imports. The shifting of the source of imports from the outsider to the FTA partner occurs because the FTA makes imports from member countries cheaper relative to those from non-member countries.

Figure 2.1: The Vinerian FTA Model



Source: Plummer et. al. (2010)

To understand the welfare effects of an FTA on the home country, we have to look at changes in producer surplus, consumer surplus, and tariff revenue. Producer surplus captures how much domestic producers benefit from selling their output in the market and is represented as the area above the supply curve but below the market price while consumer surplus measures the consumers' net benefit from the market and is represented in the diagram as the area below the demand curve but above the market price (Plummer et. al, 2010). The net welfare effect of the FTA in the home country is the combined effect of the changes in producer surplus, consumer surplus, and tariff revenue (Plummer et. al, 2010).

In Figure 3.1, the loss in producer surplus corresponds to the trapezoid a, while the gain in consumer surplus is the sum of the areas a, b, c, and d. The loss in tariff revenue is the total area of rectangles cand e. So, the net welfare effect of the FTA is (b+ d–e). Areas band dshow the net gains from trade creation. Area brepresents the gain from switching from higher-cost domestic output to lower-cost imports.Area drepresents a gain from being able to consume more of the good

given the lower price of imports. Area e shows the net loss from trade diversion. Area of e depends on the original quantity of imports and the difference between the partner's and outsider's prices exclusive of tariffs. It is an efficiency loss because the discriminatory tariff regime under the FTA causes the country to lose tariff revenue while forgoing the lowest-cost imports. If the sum of the efficiency gains, as represented by the areas b+ d, is larger than the efficiency loss shown by area e then the FTA is beneficial to the home country in question. Otherwise, the net welfare effect is negative. The Viner model thus shows that the net welfare effect of an FTA on an importing country is ambiguous.

Viner's influential work has since formed a basis for further analyses on welfare outcomes of trade blocs. Meade (1955) pointed out that, although crucial, the relative magnitudes of trade creation and trade diversion alone are insufficient to determine the welfare effect of a bloc on world welfare because the benefits of preferential liberalisation depend not only upon the extent of trade creation but also on trade costs. Similarly, he noted that losses are determined not just by the amount of trade diversion but also the magnitude ofthe increase in costs due to trade diversion (Meade 1955). Furthermore, Bhagwati and Panagariya (1996) also argued out that conventional trade creation and trade diversion cannot entirely explain the welfare outcome for an individual member of a trade bloc. Even if trade creation is larger than trade diversion, so that the bloc as a whole benefits, an individual member could lose on account of adverse income distribution effects arising from tariff revenue redistribution. This implies that, when an economy with a high degree of protection forms a trade bloc with an economy with relatively open markets, the former may well be faced with a net welfare loss. Several other studies have also shown that trade diversion can also, under certain circumstances, be beneficial. For example, if a member country introduces imports into the domestic market that reduce distortions in consumers' patterns of consumption (Meade 1955; Gehrels 1956–1957; Lipsey 1957). Also, if economies of scale are present that allows production at a lower cost (Corden 1972; Venables1987) or when new competition reduces the market power of inefficient domestic monopolies

3.2 Empirical Literature Review

Unfortunately, the empirics of trade creation and trade diversion cannot be easily worked out. This is because it has to take into account both trade and nontrade data. A gravity equation may instead be estimated to help determine whether an FTA is trade creating or trade diverting.

The standard model used in ex-poste analyses of trade policy is the gravity model. The standard gravity model of trade was derived from the Newtonian theory of gravitation. By this theory, planets are mutually attracted depending on their proximity and sizes. In the same way, countries trade in proportion to their GDPs and distances from each other. The application of the gravity model to assess international trade flows was first done by Tinbergen (1962) and Pöyhönen (1963). Since these foundations were laid, the gravity model has become a popular empirical trade approach that has been used widely for analyzing the impact of different trade policies on bilateral trade flows between different geographical entities.

The general gravity equation is given by

$$X_{ij} = GS_i M_j \emptyset_{ij} \qquad (1)$$

whereX_{ij} is the monetary value of exports (or imports) from country *i* ocountry *j*, $M_j$denotes all importer-specific factors thatmake up the total importer's demand (such as the importing country's GDP) and $\emptyset_{ij}$comprises exporter-specific factors (such as the exporter's GDP) that represent the total amount exporters are willing to supply. G is a variable that does not depend on *i* or *j* such as the level of world liberalization. Finally,$\emptyset_{ij}$represents the ease of exporter i to access of market *j* (that is, the inverse of bilateral trade costs).

The model predicts that bilateral trade is a function of two important economic variables. These are trade enforcement variables and trade resistance variables. Trade enforcement variables include a measure of national output of both importing and exporting countries while trade resistance variables include distance and a dummy variable for common border. Distance is used

as a proxy for transport costs. Output of the exporting country represents the propensity to supply while that of the importing country represents its propensity to demand. Hence trade flows are expected to be positively related to the exporting and importing country's output.

In greater detail, the general gravity model specifies that the bilateral trade between countries *i* and *j* in year *t* is positively related to the economic sizes of the two countries, proxied by a measure national output such by GDP per capita, and negatively related to the trade costs, proxied by distance between the two countries' capital cities. In the importing country, a higher level of income should imply greater imports. In the exporting country, a higher level of income will give rise to a greater level of overall production and this, in turn, will increase the availability of goods for export. Distance drives a wedge between demand and supply, resulting in a lower equilibrium export flows.

This is summarized in the equation below:

$$X_{ij} = \frac{Y_i Y_j}{Y_W}\left(\frac{T_{ij}}{P_i P_j}\right)^{1-\eta} \qquad (2)$$

In the gravity equation above, country i's exports to country j (X_{ij}) depends on the GDP of country *i* (Y_i), country j's GDP$(Y_J)$and the world production (Y_W), trade cost and price indexes interpreted as the multilateral resistance term$\left(\frac{T_{ij}}{P_i P_j}\right)$.

Empirically, gravity models have always exhibited a high statistical explanatory power (Matyas et al. 1997). However, they were heavily criticized for lacking basis and theoretical foundation. Particularly, they were said to lack ingredients from the prominent Ricardian and Heckscher-Orlin models at the time. Theories were since developed to provide underpinnings of the gravity model.

Anderson's Theoretical Foundation of the Gravity Equation

Anderson (1979) attempted to produce a theoretical explanation of the gravity equation applied to commodities. He used the properties of expenditure systems with a maintained hypothesis of identical homothetic preferences across regions. Products are differentiated according to country of origin. The gravity model constrained the pure expenditure system by specifying that the share of national expenditure accounted for by spending on tradeables (openness to trade) was a stable unidentified reduced-form function of income and population. The share of total tradeable goods expenditure accounted for by each tradeable good category across regions was an identified (through preferences) function of transit cost variables. Partial identification was, therefore, achieved. This interpretation had four distinct advantages:

i. It explained the multiplicative form of the function
ii. It permitted an interpretation of distance in the equation, identifying the estimated coefficient and could, therefore be used as part of an attack on estimating the effect of instrument changes
iii. The vague underlying assumption of 'Structure' across region and countries was straight forwardly interpreted as identical expenditure functions; suggesting appropriate disaggregation
iv. Following logic of this interpretation implied that the usual estimator of the gravity equation may be biased, requiring change in the method of estimation

Based on this interpretation, Anderson (1979) developed a simple linear pure expenditure system model, encompassing a large portion of the explanatory power of the gravity model. This was achieved through a rearrangement of a Cobb-Douglas expenditure system under the following assumptions:

i. Each country is completely specialised in the production of its own good
ii. No tariffs or transport costs exist
iii. The fraction of income spent on the product of country is *i*is denoted b_i and is the same across all countries (identical Cobb-Douglas preferences everywhere)
iv. With cross-section analysis, prices are constant at equilibrium values and units are chosen such that they are unity

Consumption in value and quantity terms of good i in country j (imports of good i in country j) is thus :

$$M_{ij} = b_i Y_j \qquad (2)$$

The requirement that income must equal sales implies that

$$Y_i = b_i(\sum_j Y_i) \qquad (3)$$

Solving (3) for b_i and substituting in (2), we obtain

$$M_{ij} = Y_i Y_j / \sum Y_j \qquad (4)$$

Anderson (1979) defined equation (4) as the simplest form of the gravity model. Since this model was based on identical Cobb-Douglas preferences, it implied identical expenditure shares and gravity equation income elasticities of unity. While such a gravity model was produced by such a framework, the real variables of interest were nonincome-dependent expenditure shares. He, therefore, appended to the Cobb-Douglas expenditure system for traded goods, a differing trade-nontraded goods split and produced an unrestricted (non unit income elasticity) gravity equation. To achieve this, he made the following additional assumptions:

i. All countries produce a traded and nontraded good; the overall preference function assumed in this formulation is weakly separable with respect to the partition between traded and nontraded goods. That is, U= u(g(traded goods), nontraded goods).
ii. Given the level of expenditure on traded goods, individual traded goods are determined as if a homothetic utility function in traded goods alone g() were maximized subject to a budget constraint involving the level of expenditure on traded goods the individual traded goods shares of total trade expenditure with homotheticity are functions of traded goods prices only
iii. For simplicity, g() has the Cobb-Douglas form. Within the class of traded goods, since preferences are identical, expenditure shares for any good are identical across countries. Thus for any consuming country j, θ_i is the expenditure on country i's tradeable good divided by the total expenditure in j on tradeables (this implied that $\theta$is an exponent of g().

Let ϕ_j be the share of expenditure of all traded goods in the total expenditure of country j and ϕ_j=F(Y_j, N_j).

Demand for country i's good in country j (j's import of i's good) is

$$M_{ij} = \theta_i \phi_j Y_j \qquad (5)$$

The balance-of-trade relation for country implies

$$Y_i \phi_i = (\sum_j Y_j \phi_j)\theta_i \qquad (6)$$

Equation (6) shows that the value of imports of country i plus the domestic spending on domestic tradeables is equal to the value of exports of i plus domestic spending on domestic tradeables.

Solving (6) for θ_i and substituting into (5) we obtain

$$M_{ij} = \frac{\phi_i Y_j \phi_j Y_j}{\sum_j \phi_j Y_j} = \frac{\phi_i Y_j \phi_j Y_j}{\sum_i \sum_j M_{ij}} \qquad (7)$$

With F(Y_i, N_i), taking a log-linear form is the deterministic form of the gravity equation (1) with the distance term suppressed and a scale term appended. More realistically, if trade imbalance due to long-term capital account transaction is a function of (Y_i, N_i), we may write the 'basic' balance $Y_i \phi_i m_i$=($\sum_j Y_j \phi_j$) θ_i with m_i=m(Y_i, N_i) and substituting into (6) and (7). This yields:

$$M_{ij} = \frac{m_i \phi_i Y_i \phi_j Y_j}{\sum_i \sum_j M_{ij}} \qquad (8)$$

with log-linear forms for *m* and F, (8) is again essentially the deterministic gravity equation.

Other theoretical foundations for the gravity model

Since Anderson(1979) laid the foundation, Bergstrand (1985, 1990), Deardorff (1998), and Eaton and Kortum (2002)- among others- have also developed micro-foundations for the gravity model.

Bergstrand (1990) derived a gravity equation from a monopolistic competition trade model in which the countries are completely specialized in different product varieties. In this case, the gravity model has identical countries that trade in differentiated products because consumers have

a preference for variety. This feature of Bergstrand's model overcomes the undesirable effect of Armington models that differentiate goods by location of production. Deardorff (1998) further demonstrated that the gravity model can arise from the Heckscher-Ohlin model, which explains trade based on relative differences in factor endowments across countries. Eaton and Kortum (2002) obtained a gravity equation from a Ricardian type of model, which explains trade based on relative differences in technology across countries.

Empirical Applications of the Gravity Model of Trade

Bendjilali (2000) applied the gravity model to a sample of OIC countries that represent various geographical regions and levels of economic development, and examined the main determinants of intra-OIC bilateral trade in 1994 with reference to the characteristics of these countries. The results showed that the larger the population, the larger the domestic market and the less are the exports while a larger population could also be interpreted as a bigger market for imports.

Feenstra (2004) noted that the conventional gravity model assumes identical prices across countries. Therefore, price is not to be included in the gravity equation as a variable that affects bilateral trade flows. Under the micro-foundations approach this results in misspecification of the gravity model. It is important to allow for differing prices due to trade barriers between the countries. The gravity equation with so called 'price effects' was derived by Anderson (1979).

Feenstra (2004) further suggested three approaches to estimating this equation. First, the price effects may be measured by price indexes, as in Bergstrand (1985)and Baier and Bergstrand (2001). Second, estimated border effects may be used as an alternative measure, as in Anderson and van Wincoop (2003). Third, a fixed-effects approach, which allows each country to be different, may be applied as in Redding and Venables (2000) and Rose and van Wincoop (2001).

Filippini C, (2003) used a gravity equation model to analyze trade flows between Eas tAsian industrializing countries (including China) and some developed countries in order to show the surprising trade performance of East Asian countries. He found that all signs of coefficients were consistent with model assumptions. He also found high propensity of Asian countries (including China but excluding Japan), to exchange high-tech manufactured products with Japan and USA.

Another interesting result was that among the East Asian economies, China plays a very important role as an exporter and as importer too in recent years.

Rahman (2004) applied a generalized gravity model to analyze Bangladesh trade flows with its trading partners using the panel data estimation techniques. They estimated the gravity model of trade (sum of imports and exports). The results showed that Bangladesh's trade is positively determined by the size of the economies, per capita GNP differential of the countries involved and openness of the trading countries. The major determinants of Bangladesh's exports were found to be exchange rate, partner countries' total import demand, and openness of the Bangladesh's economy. All these factors affected the Bangladesh's exports positively. Transportation cost was found to be a significant factor in influencing Bangladesh's trade negatively.

Achay L. (2006) investigated the determinants of trade flows between various countries of the world. He applied the gravity model on a sample of 146 countries for the five-year sub-periods between 1970 and 2000. His model included such determinants of trade as GDP, distance, and regional integration agreement. His findings showed that all estimated coefficients were statistically significant and their signs were in conformity with expectations. The adjustment quality of the model as measured by determination coefficient (adjusted R2) was quite high, standing at 71%. He found that GDP, GDP percapita, common frontier, common official language, common currency or common colonial past have a positive impact on the volume of bilateral trade. On the other hand, the geographical distance factor had a negative effect on the volume of trade.

One groundbreaking development in estimation of the gravity model was done by Silva and Tenreyro (2006). They brought to light one critical implication of Jensen's inequality [$E(\ln y) \neq \ln E(y)$] in econometrics: under heteroskedasticity, the parameters of log-linearised models estimated by OLS lead to biased estimates of the true elasticities. This finding was very important in empirical analyses of international trade as it is commonplace knowledge that trade data is inherently heteroskedastic. They were able to show that the gravity equation (and more generally, constant elasticity models) should be estimated in their multiplicative form and that this could be achieved using a simple Pseudo-Poisson Maximum Likelihood (PPML) estimation technique. Using Monte-Carlo simulations, they compared the performance of their estimator to that of the OLS (in log-linear specification) and found that in the presence of heteroskedasticity, estimates

obtained using the log-linearised models were severely biased, therefore leading to incorrect inferences. Specifically, the estimated elasticities obtained from the log-linearised model were almost twice as large as those predicted by PPML. The OLS also predicted a large role for common colonial ties, which implied that sharing a colonial history practically doubled bilateral trade. In contrast, the PPML estimator led to a statistically and economically insignificant effect.

Geda and Kebret (2007) used an augmented gravity model in analyzing the problems and prospects of regional integration in Africa in a case study of COMESA trade. The results showed that determinants of trade flows using the experience of COMESA as a case study. The major conclusions that emerged from the study were, firstly, bilateral trade flows among the regional groupings could be explained by standard variables as demonstrated by the results of the conventional gravity model. The result shows that regional groupings had insignificant effect on the flow of bilateral trade. Secondly, their review of the issues indicated that the performance of regional blocs is mainly constrained by problems of variation in initial condition, compensation issues, real political commitment, overlapping membership policy harmonisation, lack of diversification and poor private sector participation. They concluded that it is these problems that have made building successful economic groupings in Africa a daunting task, despite its perceived importance in the increasingly globalised world.

Simwaka (2006) used a sample of eight countries (Malawi, Zambia, Zimbabwe, Mozambique, South Africa, UK and USA) for the period 2000 to 2004 to investigate the dynamics of Malawi's Trade flows. He found that Malawi's bilateral trade is positively determined by the size of the economies (GDP of the importing country) and similar membership to regional integration agreement. On the other hand, transportation cost, proxied by distance, is found to have a negative influence on Malawi's trade. Likewise, exchange rate volatility depresses Malawi's bilateral trade whereas regional economic groupings have had insignificant effect on the flow of bilateral trade.

Darku (2007) demonstrated the appropriate econometric technique of testing regional integration effect on bilateral trade by augmenting the standard traditional gravity model with country specific effects instead of regional integration dummies for Tanzania and 23 major trading partners (in the EU and EAC) over the period 1980-2004. He diverted from the traditional use of pooled time series data. Instead, he used time series data on bilateral trade flows between Tanzania and each

of the countries included in the study. In this way the coefficients that were obtained were specific to Tanzania and each country and not just averages. In addition, Darku(2007) argued that use of local country and target country specific dummies to cater for the regional integration effect is the correct way of specifying the gravity model as use of RTA dummies leads to incorrect interpretations and consequently wrong inferences. He estimated his model using Ordinary Least Squares and reported three main results: firstly, that both the EU and EAC have had moderate trade creation effects on Tanzania's bilateral trade flows. Secondly, that Tanzania's non-traditional trading partners such as Japan, India, Singapore, Hong Kong and USA are relatively more open to Tanzania's exports and, thirdly, the results showed that whereas it was difficult for Tanzania's exports to penetrate foreign markets, foreign goods easily penetrate Tanzania's market.

Simwaka (2011) used a gravity model to assess the success of SADC FTA over the period 1998-2007. He separated the data sample into two periods; pre-integration that before the adoption of FTA (1998-2000) and post-integration that after SADC FTA came into operation (2003-2007). He found that the predicted trade is higher than the observed intra-regional trade, suggesting an existence of trade potential among member states. Therefore, he concluded that SADC FTA leads to trade creation and enhances the trade capabilities of member countries.

Mulenga (2012) investigated Intra-Industry Trade (IIT) between Zambia and SADC trading partners using a modified gravity model in a panel data framework for the 1998-2006 period. The estimation results from the Feasible Generalized Least Squares in the random effects model evaluated the existence of IIT between Zambia and its trading partners in the SADC. The empirical results revealed that gross domestic product, dissimilarities in per capita income, transportation costs (distance and common border) and colonial ties (common language) are significant factors explaining IIT between Zambia and its trading partners in the SADC. The results also reveal that IIT between Zambia and its trading partners in the SADC is positively determined by GDP, distance, and dummies for common border and common language while dissimilarities in per capita income (DPCI) depresses it.

Shinyekwa and Othieno (2013) examined factors that determine Uganda's trade flows. They compared the impact and performance of the different trading blocs (COMESA, EAC and the EU) on Uganda trade patterns and flows using different trade indicators as well as the gravity models

with panel data from 2001-2009. They estimated determinants of export and import trade flows using static random, dynamic random and IV GMM models. The results suggested a strong relationship between belonging to a trading bloc and trade flows. They found that whereas exports were more integrated in the COMESA and EAC regions, imports were more integrated in the Asian and EU trading blocs. This showed that there were strong links with trading blocs outside EAC.

MacPhee and Sattayanuwat (2014) used an augmented gravity equation to study the effects of RTAs on world and regional trade patterns concentrating on data for 12 developing-country RTAs in the period 1981-2008. The effects were captured by dummies that reflect intra-trade bloc, import extra-bloc trade and export extra-bloc trade separately using the PPML technique. Their main finding was that not all RTAs succeed in raising intra-bloc trade creation. Some RTAs were found to have negative intra-bloc effects largely due to the member states failure to eliminate tariffs and non-tariff barriers across the board for other member states.

CHAPTER FOUR

METHODOLOGY

4.Introduction

This chapter presents the methodology employed in the study. It highlights the bases for selecting the preferred methodology in estimating the standard gravity model and also presents how the gravity model was augmented for the purpose of this study. We also discuss the data sources and sample period used in the study.

4.1 Theoretical Framework

The standard gravity model developed in theory is given by:

$$X_{ij} = \frac{Y_i Y_j}{Y_w}\left(\frac{T_{ij}}{P_i P_j}\right)^{1-\eta} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

The standard model is augmented depending on the research interest. Some previous empirical studies using have used pooled time series dataof all countries involved in study so that the coefficients obtained are just averages for all the countries included in the study. This paper diverged from that approach and applied methods used by Darku (2007) in the case study of Tanzania. He recognised the limitation of using pooled time series data and instead utilised data on bilateral trade flows between Tanzania and each of the selected trading partners so that results obtained are specific to each country included in the study. Using this approach, Darku (2007) was also able to determine the openness of one country in relation to Tanzania and vice-versa.

The empirical framework of this study involves regressions of augmented gravity equations based on approaches drawn from previous studies such as those done by Shinyekwa and Othieno (2013), Simwaka (2006) and Mulenga (2012) using either fixed or random effects modelling in their estimation. This study also used findings by Silva and Tenreyro in their study of the log of gravity (2006). Specifically, Silva and Tenreyro (2006) recognised that trade data is inherently heteroscedastic and, therefore, the most appropriate method of estimating the gravity equation is in its multiplicative form using the pseudo-poisson maximum likelihood method (PPML).

Furthermore, they found that the elasticties obtained under OLS tend to be overestimated as they are twice as large as those obtained under PPML. This makes the PPML a better estimation method.

4.2Model specification.

As stated earlier, the analysis involved a quantitative analysis using an augmented gravity equation. The augmentation of the standard gravity model is always motivated by the research interest. Specifically, the model to be used depends on the method used to control for the multilaterateral resistance terms.The estimations weredone using two models: the fixed effects model and the random effects model.

The Fixed effects model (FEM)

A very useful property in panel data estimation is the individual effects. These can either be fixed or random. For this study, a fixed effects model was useful when analysing the impact of variables that are not time-invariant. The model has an important assumption that time-invariant characteristics are unique to the individual and are not correlated with the other individual characteristics. In this particular case, it controls for time-invariant differences between the countries so that the estimated coeeficients are not biased because of the omitted time-invairiant characteristics (like distance between capital cities). This property made it possible to determine how open each COMESA member state was in relation to Zambia and vice-versa.

For the purpose of this study, the basic gravity equation introduced was augmented using country-specific dummies and transformed into a logarithmic function as follows:

The basic equation (2) is augmented by replacing the multilateral resistance term$\left(\frac{T_{ij}}{P_i P_j}\right)^{1-\eta}$ with country-specific dummies and transformed into a logarithmic function:

$$logX_{ijt} = \beta_0 logY_{it} + \beta_1 logY_{jt} + \beta_2 Dummy_j + u_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

Where β_0, β_1denote income elasticities for country i and j respectively

β_2 denotes the extent of openness

X_{ij}denotes Zambia's exports (or imports) to country j at time t

Y_{it}denotes Zambia's income (GDP) at time t

Y_{jt}denotes country j's income (GDP)

$Dummy_j$ is the country-specific dummy variable

$u_{it}$is the error term

High level of GDP indicates a high level of production in the exporting country, which increases the availability of exports, and which represents a potential supply of exports. Similarly, theimporter's GDP represents potential demand for imports. With a high level of GDP (income) in the importing country, the expectation is increased import value. The GDP coefficients of both the importer and exporter therefore are expected to be positive.

The coefficients of income give elasticities while that of the country-specific dummy variable are intepreted as extent of openness of the trading partners (in terms of export regression) or the extent of Zambia's openness (in terms of import regression)

The Random Effects Model (REM)

The gravity model, however, includes variables that are time-invariant. The fixed effects model in this case could not be useful in investigating time-invariant effects on the dependent variable as they tend to be perfectly collinear with it. Therefore, for this purpose, the random effects model was also used. The rationale behind the random effects model is that the variations across the countries are assumed to be random and uncorrelated with the predictor or independent variables included. This then enables us to include the time-invariant variables which are otherwise absorbed by the intercept in the fixed effects model.

The random effects model was estimated using the Pseudo-Poisson Maximum Likelihood method as suggested by Silva and Tenreyro (2006) in its multiplicative form as:

$$X_{ij} = \exp(\beta_o + \beta_1 lnY_{it} + \beta_2 lnY_{it} + \beta_3 lnpop_{it} + \beta_4 lnpop_{jt} + \beta_5 lninfrast_j + \beta_6 contig_j + \beta_7 comlang_j + \beta_8 comcol - \beta_9 Distance)\mu$$

……(4)

Where X_{ij}denotes Zambia's exports (or imports) to country j at time t

β_0 is the constant term

β_1, β_2 denote income elasticities of county i and country j respectively

β_3, β_4 denote population elasticities of county i and country j respectively

β_5 denotes infrastructure elasticity

β_6, β_7, β_8 denotes dummy variable coeeficients for contiguity, common language and common coloniser infrastructure elasticity

$\beta_9$denotes the elasticity of distance

Y_{it}denotes Zambia's income (GDP) at time t

Y_{jt}denotes country j's income (GDP)

pop_{it} is the population of Zambia

pop_{jt} is the population of country j

$infrast_j$ is the state of infrastructure in country j

$contig_j$ dummy variable=1 if Zambia shares a common boarder with country j

$comlang_j$ dummy variable=1 if Zambia shares common official language with countryj

$comcol$ dummy variable=1 if Zambia shares a common coloniser with countryj

$Distance$is the distance between Zambia's capital city and that of country j

μerror term

Similar to the FEM, the coefficients for GDP for both importer and exporter are expected to be positive.

It is widely agreed by now that more and better infrastructure reduces trade-related transaction costs (e.g., Limao and Venables 2001; Vijil and Wagner 2012; Francois and Manchin 2013). Therefore, an increase in infrastructure development is expected to have a positive effect on trade.

Oguledo and MacPhee (1994) and Eita and Jordaan (2007) in their studies specified that the effects of population for both the exporting and importing countries cannot be assigned a *priori* as they are ambiguous. For example, a large population indicates a large domestic market that can lead to a decline in cross-border trade as a result of higher degree of self-sufficiency and less need to trade. On the other hand, a large population can also encourage division of labor and this means that there will be economies of scale in production, and opportunities to trade with a variety of goods.

The coefficient for distance is expected to have a negative sign. This is because it is assumed in the model to be a measure of transportation cost. High transports costs are a barrier and, therefore, reduce trade between countries

Common language, common boarder and common language are all variables that have been found to be positive and significant determinants of trade.

4.3 Data

The data for this study comprised bilateral trade flows(import and export trade) between Zambia and COMESA member states from 1995 to 2015. The paper estimates four gravity equations using panel data for the stated period using panel data on annual bilateral trade flows obtained from the COMSTAT data portal.

Data on GDP and Infrastructure (road connectivity in km) was obtained from the World Development Indicators . The distance between capital cities was obtained from CEPII database. The variables were chosen in accordance with theory of international trade and related empirical work done in the past.

Stata was used in both fixed effects and random effects models.

The sample period is chosen due to consistency and availability in data after major transformation in the Zambian trade policy post 1991. It was also after the launch of COMESA from its predecessor, the PTA.

CHAPTER FIVE

RESULTS AND EMPIRICAL ANALYSIS

5.Introduction

This chapter presents the results of the augmented gravity equations estimated. The equations were estimated using a fixed effects model and a random effects model.

5.1 Estimation of the gravity equations

5.1.1 The Fixed Effects Model

One of the most natural ways of measuring a country's integration into global or regional trade is by measuring it openness (WTO, 2012). Openness is measured as the sum of a country's total imports and total exports over GDP. Alternatively, Darku (2007) has shown that regression of export or imports on country-specific dummies can achieve the same results. These findings were useful to this study in determining the openness of both Zambia and it partners. The results are presented in Table 5.1 and Table 5.2.

Exports Regression: analyzing trading partners openness

Table 5.1 presents the output of an export regression. Making use of Silva and Tenreyro's finding that estimates obtained using OLS are usually larger and biased, we do not interpret the elasticities. Their inferences would be overestimated and, thus, incorrect. Instead, we only make use of the results of the magnitude and significance of the estimates of the dummy variables to interpret openness.

Table 5.1: Trading Partners' Openness to Zambia			
	(AREG)	(XTREG)	(LSDV)
VARIABLES	Exports	Exports	Exports
Importer's GDP	1.530***	1.530***	1.530***
Zambia's GDP	0.553***	0.553***	0.553***
Burundi	-	-	9.528***
Comoros	-	-	2.297
Congo DR	-	-	11.01***
Djibouti	-	-	-
Egypt	-	-	1.837
Eritrea	-	-	1.892
Ethiopia	-	-	1.401
Kenya	-	-	6.392***
Libya	-	-	-2.391*
Madagascar	-	-	1.799
Malawi		-	10.65***
Mauritius	-	-	6.672***
Rwanda	-	-	7.539***
Seychelles	-	-	3.142
Uganda	-	-	5.322***
Zimbabwe	-	-	9.814***
Constant	-33.80***	-33.80***	-39.38***
R-squared	0.787	0.312	0.787
*** p<0.01, ** p<0.05, * p<0.1			

Table 5.2: Zambia's Openness to COMESA Trading Partners			
	(AREG)	(XTREG)	(LSDV)
VARIABLES	Imports	Imports	Imports
Importer's GDP	1.750***	1.750***	1.750***
Zambia's GDP	0.239	0.239	0.239
Burundi	-	-	4.629**
Comoros	-		3.451*
Congo DR	-	-	10.00***
Djibouti	-	-	5.416***
Egypt	-	-	2.253***
Eritrea	-	-	3.703**
Ethiopia	-	-	2.145*
Kenya	-	-	7.266***
Libya	-	-	-1.889
Madagascar	-	-	1.1
Malawi	-	-	9.456***
Mauritius	-	-	8.015***
Rwanda	-	-	3.261**
Seychelles	-	-	7.620***
Swaziland	-	-	9.501**
Uganda	-	-	4.179***
Zimbabwe	-	-	10.50***
Constant	-32.21***	-32.21***	-37.45***
R-squared	0.892	0.423	0.892
*** p<0.01, ** p<0.05, * p<0.1			

The countries found to be most open to Zambia's exports were Congo DR, Malawi, Zimbabwe,Swaziland, Rwanda,Mauritius, Kenya, Burundi and Uganda. These results agree to a large extent with the pattern of trade that was established using the export intensity index.Comoros, Egypt, Eritrea, Ethiopia, Madagascar, Libya were found to be least open to Zambia's exports and their estimates were statistically insignificant.

Imports Regression: analyzing Zambia's openness to its COMESA trading partners

Table 5.2 presents the output of the import regression.The results showed that Zambia was most open to imports from Zimbabwe, Congo DR, Swaziland, Malawi, Mauritius, Kenya, and Seychelleswhile the estimates of Madagascar and Libya were found to be statistically insignificant.

5.1.2 The Random Effects Model

Table 5.3: Determinants of Trade (Random Effects, PPML)

	(PPML)	(PPML)
VARIABLES	Exports_Zambia	Imports_Zambia
Trading Partner's GDP	2.431***	0.0477***
	(0.000394)	(0.000352)
Zambia's GDP	2.569***	0.155***
	(0.000144)	(0.000221)
Trading Partner's Population	-1.182***	2.090***
	(0.00164)	(0.00202)
Zambia's Population	-9.060***	7.284***
	(0.00221)	(0.00206)
Trading Partner's infrastructure	0.110**	0.396***
	(0.000266)	(0.000112)
Common Boarder	4.211***	-2.262
	(1.453)	(1.523)
Common Official Language	-1.066	-6.130***
	(1.635)	(1.745)
Common Coloniser	-2.469	9.425***
	(1.743)	(1.829)
Distance	-0.273***	-0.0757***
	(4.12e-05)	(5.84e-05)
Constant exports_zambia	69.76***	
	(0.823)	
Constant alpha	1.384***	1.552***
	(0.294)	(0.272)
Constant import_zambia		-135.5***
		(0.827)
Observations	72	79
Number of country1	14	16

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.2 shows the estimation results of the gravity equation. It shows that the trading partner's income (GDP) is highly statistically significant both in terms of exports and imports. A one percent increase in the partner's income leads to 2.4% increase in Zambia's exports, a sure sign of the

trading partners increase in spending power. The same percentage increase in the trading partner's income would also lead to an increase in Zambia's imports by 0.04%. It was also found that Zambia's own income affects its exports and imports to other COMESA member states. A one percent increase in Zambia's income leads to 2.5% increase in its exports while the same percentage increase would lead to a 0.1% increase in its imports from other COMESA member states. Similar results were obtained regarding Zambia and the trading partners' population. In terms of imports, both variables showed that a one percent increase in Zambia's and/or the partner's population would lead to an increase in imports (into Zambia) by 7% and 2% respectively. This conformed to theory and was statistically significant. However, the sign in terms of exports instead showed decreasing exports from Zambia with an increase in population. This result was, however, very significant.

These results are consistent with previous studies. Kalbasi (2001) explored bilateral trade among 76 countries; this involved bilateral trade among 19industrial countries, bilateral trade among 57 developing countries, industrial countries' exports to developing countries and finally developing countries' exports to industrial countries. The empirical findings of Kalbasi (2001) reported the expected signs for the coefficients of the GDP, population and distance. The GDP variables of both the exporter and importer were positively significant. These results also proved the ambiguity of the effect of population on trade. Population variables possessed negative coefficients (in terms of exports) hence negative effects on export flows among the developing countries. In short, a developing country's export supply is positively related to its GDP and negatively related to its population size. The importers' population negative coefficient suggests that as the trading partners' populations grow, they become self-sufficient and have less need to engage in trade

Distance between trading partners' capitals was found to be negative and statistically significant. This relationship implied that the further away a country's capital is from Lusaka, the higher the transportation costs and, therefore, the less exports to/ imports from that particular country. The coefficient value of -0.273 implies that 1% increase in distance between Zambia and her trading partner leads to .27% (approximately 0.3%) decrease in exports to that particular country. Similarly, the coefficient value of -0.0757 implies that a 1% increase in distance between Zambian and her trading partner leads to a 0.076 decrease in imports from that particular country. Orindi's (2011) study on determinants of trade in Kenya revealed a negative value of the distance

coefficient, reflecting that transportation in Kenya is generally more costly thus acts as a significant barrier to trade.

The trading partner's infrastructure seemed to favor more of Zambia's import trade that it did export trade. A 10% improvement in the partner's infrastructure significantly improves the Zambia's level of imports by 3% while improving the exports from Zambia by 1%.

The dummy variable showing whether Zambia shares a common border with the trading partner was positive and highly significant for exports while it was insignificant in terms of imports. This may be seen in the results of the trade indexes where Zambia's largest export destinations are mainly the neighboring Democratic Republic of Congo, Malawi and Zimbabwe while the largest exporters also includes Mauritius, which does not share a boarder with Zambia. It was also found that having a common colonizer as well as having a common official language was insignificant in terms of exports but very significant in terms of imports.

CHAPTER SIX

CONCLUSION AND POLICY RECOMMENDATIONS

6. Introduction

The increasing desire of many developing countries to pursue an export growth development strategy has led to increased emphasis on formation of RTAs. Almost all countries have aligned their trade policies to encourage national economies to be more open to foreign competition and to grant them increased access to the ever-expanding international market. In addition to increasing preferential access to desirable markets, RTAs are structured in a way that can promote domestic productive capacity, promote upward harmonization of standards, improve institutions and introduce technical know-how into the domestic market (UNCTAD, 2017). These are outcomes that could benefit developing economies in general and particularly the least developed countries (LDCs) and other low-income countries. However, some studies have shown that, on average, low-income countries benefit less (for example Ariyasajjakorn et al., 2009; Feenstra, 1996) from regional trade arrangements.

Zambia has been no exception in the pursuit of export-led development. Despite its continued reliance on copper exports, a number of trade policy reform programs have been introduced and continue to be reinforced in an effort to promote diversity. This has seen reduction in the share of copper exports to total exports from 94% at independence to about 68% by 2013 (UNCTAD, 2016). In addition, Zambia has increased its efforts of promoting freer trade by reducing and/or eliminating trade barriers through several preferential and regional trade arrangements. It has since become party to two regional economic communities, namely, the Southern Africa Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA). In terms of performance, SADC is Zambia’s main trading partner in terms of both exports and imports. It accounts for approximately 52.9% of Zambia's imports and 21.4% of its exports in merchandise trade while COMESA accounts for 26.6% of Zambia's imports and 13.2% of its exports (WTO, 2016).

6.1 Summary of main findings

Of concern to this study was the relatively low level of trade in COMESA. This study analysed the effectiveness of Zambia's participation in the region by determining its pattern of trade, Zambia's and trading partners' openness to trade and the factors influencing the level of bilateral trade. Export and import intensity indices were calculated to analyze the pattern of trade in the region. It was found that DRC, Zimbabwe, Malawi and Kenya have been the strong partners in terms of both imports and exports throughout the period under study. Swaziland and Mauritius were also found to be strong trade partners, although more so in terms of imports than in exports. In some instances, the amount of trade was found to be intense only in some of the years under study (as was the case for Zambia's exports to Egypt). In other cases, the indices could not be calculated due to missing trade values.

The gravity model was estimated to determine countries most open (to trade) with Zambia and viceversa. Zambia's exports were Congo DR, Malawi, Zimbabwe, Swaziland, Rwanda, Mauritius, Kenya, Burundi and Uganda. Zambia was found to be most open to imports from Zimbabwe, Congo DR, Swaziland, Malawi, Mauritius, Kenya and Seychelles. The estimates of the other countries were found to be statistically insignificant. The gravity model was also estimated to analyze the factors that affect bilateral trade flows between Zambia and other COMESA member states. It was found that both Zambia and the trading partners' incomes were significant in determining Zambia's level of exports and imports from the region. As expected, better infrastructure promotes the ease of doing business and therefore was significant in determining both exports and imports into Zambia. As observed from the trade intensity indices, there was significant export trade to countries sharing a border with Zambia. The common border was highly significant in terms of exports. However, it was not as significant for import trade. This may have been because some of the largest trading partners in terms of imports do not share a border with Zambia. The distances between trading partners was significant and showed that an increase between distances reduces both export and import trade, a priori.

Overall the results showed that Zambia's trade with COMESA countries has been primarily with neighboring countries. That is, it is not fully integrated into the region and, thus,doesnot take advantage of its revealed intra-regional tradepotential estimated to be worth US $7.7 billion

(COMESA, 2016).It can be concluded that unless Zambia trades more intensely with the rest of the region, it may continue experiencing relatively low levels of trade. In light of these findings and, particularly, in view of the factors found to influence trade in the region, the study makes the following recommendations

6.2 Policy Implications:

Firstly, having found that distance is a significant factor in determining bilateral trade flows, the region as a whole must work to address the costs of business logistics, inland infrastructure which (a lack of) would only makes it most profitable for exporting countries to be located along the coast. Zambia, being a landlocked country is especially hard-hit by these challenges. Therefore, member states should improve on the border process and management to ensure efficiency in goods clearance. There is need to improve the interconnectivities such as seamless boarders, logistics and transport in order to increase competitiveness (COMESA, 2016). This could minimize time and additional costs to the logistics providers who pass the same costs to the supplier or importer, hence, affecting the final price of the good and its competitiveness within the region.

Secondly, Member States perpetuating noncompetitive trade practices should embrace competition and embrace the spirit of regional integration. Particularly, for countries (such as DRC, Zimbabwe, Malawi and Kenya) having a common border/ in close proximity to Zambia which were found to be the strongest trading partners in the region, more efforts should by focused on promoting trade to harness all the trade potential by addressing the existing Nontariff barriers (NTBs) between these member states. This is especially important since it has also been found that there is a general lack of political goodwill in some member states that perpetuates resistance to free trade (COMESA, 2016). This is especially the case on commonly consumed products such as dairy products and beverages. For example, most goods in Zambia are South African. South Africa tries to protect this market by making it very difficult for other competing countries to penetrate the Zambian market (COMESA,2016).

Finally, there is need for all countries to harmonise customs procedures with the regional initiative in order to reduce delays. It has been noted, for example, that Comoros does not grant preferential treatment of goods exported under the COMESA Certificate of Origin (COMESA, 2016).

6.3 Limitations for the study

The greatest challenge faced in carrying out this research was data limitations. Specifically, there were zero-trade flows trade values between Zambia and some of the trading partners. It was impossible to determine whether there truly was no trade between Zambia and these countries or if it was poor reporting of trade usually experienced in developing countries. Therefore, some ratios could not be obtained.

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APPENDIX

Exports Intensity Index

	Burundi	Comoros	Djibouti	DRC	Egypt	Eritrea	Ethiopia	Kenya	Libya	Madagascar
1995	0.003	-		101.263	0.001	-	2.769	4.111	-	-
1996	0.002	-	-	121.994	5.754	-	0.006	5.809	-	-
1997	0.001	-	-	149.659		-	-	2.716	-	-
1998	0.002	-	-	306.842	0.202	-	0.162	3.037	-	-
1999	0.003	-	-	-	0.009	-	0.199	8.814	0.002	-
2000	0.003	-	-	429.28	0.046	-	0.634	13.617	0.006	1.388
2001	-	-	-	327.447	0.023	-		26.184	0.001	0.002
2002	-	-	-	316.31	0.345	-	1.732	11.039		-
2003	0.002	-	-	343.338	0.435	-	0.032	12.658	0.008	0.003
2004	0.001	-	-	482.405	0.189	0.229	0.057	12.049	0.006	0
2005	0	-	-	330.258	0.019	-	0.174	13.711	0.002	0.014
2006	0	-	-	139.05	14.574	-	0.22	13.499	0.001	-
2007	0	-	-	247.165	15.745	0.001	0.027	9.832	-	0.043
2008	0.001	-	-	220.956	21.833	-	0.003	8.47	0.001	0.022
2009	0.001	-	-	261.308	6.177	0.058	0.007	7.012	0.001	3.014
2010	0.004	-	-	271.68	0.241	-	0.019	14.746	-	0.376
2011	0.003	-	-	125.364	1.591	-	0.015	5.018	0.01	0.418
2012	0.004	-	-	221.334	0.248	-	0.004	6.941	-	0.049
2013	-	0.008	-	286.83	0.002	-	0.012	9.07	-	-
2014	-	-	-	219.887	0.005	0.022	0.749	5.103	0	0.031
2015	-	-	-	239.568	0.034	-	0.099	5.022	-	0.033

	Malawi	Mauritius	Rwanda	Seychelles	Swaziland	Uganda	Zimbabwe
1995	90.838	-	5.074	-	-	8.307	64.321
1996	247.575	0.29	28.506	-	-	1.981	70.496
1997	235.562	0.122	19.736	0.163	-	4.198	73.753
1998	544.296	0.195	308.079	0.142	-	4.006	58.381
1999	166.887	0.144	63.79	-	-	45.112	73.751
2000	239.831	1.525	117.988	0	8.704	16.819	87.576
2001	149.06	10.111	148.974	-	14.193	12.905	83.495
2002	166.175	23.789	37.038	2.065	38.167	6.136	85.483
2003	369.955	14.386	0.037	0.209	10.12	1.778	91.929
2004	388.685	8.844	7.127	-	16.477	2.236	294.766
2005	524.12	3.108	0.338	-	33.962	3.421	211.608
2006	235.741	0.678	71.746	-	18.883	1.431	70.273
2007	107.376	0.029	12.553	-	53.383	2.321	92.962
2008	151.784	14.304	5.464	-	33.976	1.586	71.576
2009	175.005	25.76	16.487	0.001	48.032	1.701	93.201
2010	197.905	35.812	23.594	0.001	8.735	2.094	139.139
2011	156.466	7.413	5.677	0.03	5.134	0.369	54.144
2012	219.205	21.854	13.26	0.003	7.963	0.896	174.563
2013	193.576	19.883	6.229	-	4.274	0.799	110.434
2014	181.456	13.051	9.707	-	17.602	4.283	87.169
2015	201.922	4.711	11.423	-	12.274	5.376	173.729

Import Intensity Index

	Burundi	Comoros	Djibouti	DRC	Egypt	Eritrea	Ethiopia	Kenya	Libya	Madagascar
1995	0	-	-	17.94	0.17	-	0.49	7.98	-	0.02
1996	0	-	-	36.12	0.14	-	0.66	18.17	-	-
1997	0	-	-	0.92	1.4	-	1.19	11.26	-	0.69
1998	-	-	-	0.26	0.38	0.38	1.23	8.51	-	0.22
1999	-	-	0.68	2.34	0.23	-	1.56	9.8	0	0.01
2000	0	-	216.22	71.56	0.61	-	0.46	10.88	-	0
2001	-	-	4.3	2.94	0.7	4.59	0.34	16.57	-	-
2002	-	-	-	6.45	0.43	0.13	0.8	32.7	-	0
2003	-	-	-	52.1	1.13	1.87	1.64	48.03	0.01	-
2004	0	-	-	48.85	1.43	0.39	0.32	51.76	-	-
2005	-	0.06	-	58.1	1.72	0.68	0.12	48.57	-	0.06
2006	0	-	-	81.84	1.23	0.86	0.53	65.01	-	0
2007	0	-	-	209.51	1.29	0.86	0.35	74.66	0.01	-
2008	0	-	-	445.12	1.48	2.61	0.44	51.46	0	-
2009	0	-	0.35	559.18	2.07	0.11	0.09	61.1	-	0
2010	0	-	-	649.86	2.99	4.57	0.37	82.12	0	0
2011	0	-	-	441.58	1.11	0.06	0.1	29.51	0	0.01
2012	0	-	0.07	368.07	5.9	0.31	0.2	107.09	0.08	0.01
2013	-	-	-	423.63	1.76	0.13	0.04	228.04	0	0.1
2014	-	-	0.07	379.57	1.76	0.02	0.05	229.39	0	0.02
2015	-	-	0.29	351.02	2.49	0.16	0.33	203.44	0	0.03

	Malawi	Mauritius	Rwanda	Seychelles	Swaziland	Uganda	Zimbabwe
1995	21.116	4.011	16.445	-	-	0.391	224.51
1996	126.319	2.113	-	0.697	-	0.553	228.377
1997	34.636	4.306	0.134	-	-	0.934	188.045
1998	18.105	5.108	0.043	24.353	-	0.898	310.948
1999	39.354	8.36	0.847	0.546	-	4.844	262.379
2000	37.429	14.573		0.114	91.668	1.395	259.708
2001	40.112	13.394	0.926	0.053	44.224	0.205	299.01
2002	45.528	18.515	0.261	-	24.941	38.927	316.757
2003	80.511	6.147	0.279	-	34.718	51.088	510.906
2004	62.404	5.96	0.208	0.127	28.157	1.82	271.249
2005	87.389	4.019	-	0.483	17.576	2.633	221.865
2006	90.647	4.529	0.719	1.618	22.072	0.805	306.759
2007	46.588	12.453	0.087	7.337	28.263	0.184	158.265
2008	66.882	16.817	0.008	23.652	28.808	2.669	148.446
2009	40.597	18.21	0.443	7.106	24.528	0.235	160.931
2010	58.181	18.548	3.742	-	17.078	1.115	168.638
2011	27.222	11.126	3.618	4.996	16.984	1.002	69.138
2012	122.633	32.268	2.54	0.059	19.005	4.18	86.283
2013	43.917	19.468	0.745	1.21	14.432	2.642	94.217
2014	38.399	88.403	0.063	4.54	13.103	2.124	75.104
2015	32.529	389.505	0.045	-	23.297	1.453	80.756