IMPACT OF REGIONAL TRADE AGREEMENTS ON TRADE.A CASE OF ZIMBABWE.(2000 – 2014)

BY

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Abstract

The study was aimed at analysing the impact of regional trade agreements on Zimbabwe's trade using the augmented gravity model for the period 2000 to 2014. The trade agreements under study were Southern Africa Development Community (SADC) and Common Market for East and Southern Africa (COMESA).

The results of the gravity model revealed that GDP is negatively related to both exports and imports, whilst population and distance had the theoretically expected effect on trade. Exchange rate was positive and statistically insignificant for both regressions meaning exchange rate had no effect on trade in the period under study.

Results also show that the impact of SADC and COMESA FTAs is the same for both imports and exports. Overally the implementation of the two trading agreements has caused intra and extra-regional trade diversion as Zimbabwe's trade levelsare below what is predicted by the standard gravity model in the period 2000 to 2014. This study recommends that, for Zimbabwe to experience the full gains of regional integration they should revise their RTA membership, ensure economic and political stability, increase productivity, adopt policies that foster both intra and extra regional trade and develop its infrastructure.

CHAPTER 1: INTRODUCTION

Introduction

The number of Regional Trade Agreements (RTAs) in both developing and developed countries has increased during the past two decades. Africa is home to 11 economic blocswhich include Southern African Customs Union (SACU), Southern African Development Community (SADC), Economic Community of West African States (ECOWAS), Economic Community of Central African states (ECCAS), Common Market for East and Southern Africa (COMESA),East African Cooperation (EAC), among others. There has been rising debates on the impact of these RTAs on trade performance (Peridy 2005). It is argued that some African countries have been experiencing a disappointing trade performance for years albeit being signatories to RTAs. The share of Sub Saharan Africa countries' trade to global trade is a mere 3.5% (www.one.org). Thus it is cautioned that RTAs can have a negative impact on trade performance of both member and non-member countries causing more trade diversion from non-member countries than the trade creation it results among member countries (Freund and Ornelas, 2010). This study thus seeks to provide further empirical evidence on the impact of RTAs on Zimbabwe's trade performance.

The impact of RTAs on trade in Zimbabwe has never been examined despite episodes of poor economic and trade performance since the 1990s; the period characterised by the proliferation of bilateral and regional trade agreements between Zimbabwe and its African partners as well as in the globe. Zimbabwe is a member of both SADC and COMESA regional trading blocs and holds 5 bilateral trade agreements with its neighbouring countries.The country is battling with negative trade balances. Trade balance has plummeted to negative US$3.1 billion in 2013 as imports of US$6.8 billion overshadowed exports valued at US$3.7 billion. The trade balance further worsened in 2014 to US$3.3 billion as the growth of imports continues to surpass that of exports (World Bank). The increase in imports has been caused mainly by the closure of local manufacturing industries due to high production costs. This has left the economy to depend on imported goods from its neighbouring African countries(South Africa, Zambia, Tanzania among others) as well as other European and Asian markets (China, Singapore, USA, UK). In addition the composition of exports has shifted from manufactured goods to raw/unprocessed minerals. Manufactured exports as a percentage of total merchandise exports were 40.90% in 2002 but have reduced to 14.48% in 2014. Exports of minerals as a percentage of merchandise exports have increased from 22.1% in 2002 to 55.56% in 2014 (ZIMSTAT). This has contributed to the

decrease in the value of exports and thus culminating to the continuous increase in the country's trade deficit.

This poor trade and economic performance has pushed the country into undertaking macroeconomic reforms aimed at improving the country's external performance through value addition and beneficiation as enunciated in the country's trade policy and economic document, the Zimbabwe Agenda for Sustainable Socio-Economic transformation (ZimAsset).

The study employs the augmented gravity model specified by Ghosh and Yamarik (2004) and a panel data estimation as defined in the study by Martinez-Zarzoso and Nowak-Lehmann (2003) are used in this study.

1.1 What is International trade and Regional Trade Agreements

International trade can be defined as the exchange of goods and services across country borders which allow goods and services to be available globally and ensures increased competitive pricing in economies. Trade flows can be measured in terms of trade volumes, trade value, trade concentration and trade penetration. Trade values include exports (as reported by destination country), imports (as reported by source country). In this study the term trade and/or trade flows will mean the value exports and imports.

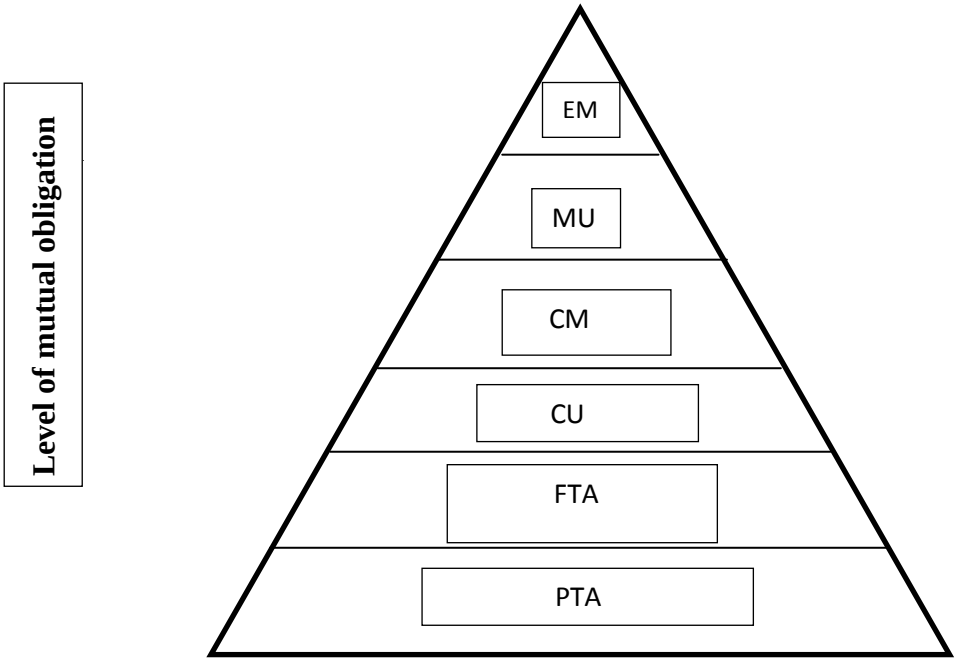
Sawyer & Sprinkle (2004) define regional trade agreement as an agreement between two or more countries that enhances economic integration by reducing tariffs, among other trade impediments. RTAs improve the trade performance of a country by expanding its market and enabling the importation of inputs at low cost. However, the exact impact of RTAs is not straight forward as it depends on design and implementation, simplicity of rules of origin, the strengths of institutions, trade enhancing infrastructure and characteristics of partners in the agreement.

Regional trade agreement can also be defined as an agreement that two or more countries enter into, where the countries agree to reduce tariff and non-tariff barriers, quotas and other trade restrictions between them(Brownsell, 2012). Both trade in goods and services are included in these trade agreements, i.e., issues to deal with intellectual property rights protection are also covered.

RTAs can be separatedinto six groups, that is:

- Preferential Trade Agreement (PTA) – this is an agreement between countries to give each other preferential treatment in the exchange of goods and services. The agreement may not include total removal of tariff nor include all goods and services.
- Free Trade Agreement (FTA)–this is an RTA where member states remove trade barriers only on goods produced within the union and not on goods from non-member countries. The countries however remain with their individual external tariffs to non-FTA countries (Freund & Ornelas 2010). SADC is an example of an FTA.
- Customs Union (CU) – this is an FTA in which signatory countries subject a common external tariff (CET) on goods imported from non-member countries (Panagariya 1999). An example of a Customs Union is the South African Customs Union (SACU).
- Common Market (CM) – this is a CU where there is free movement of factors of production within member states and common policies on product regulation. An example of a Common Market is European Economic Community (EEC).
- Monetary Union (MU)– this is a CM with a common monetary policy and common currency. An example of a Monetary Union is the Common Monetary Area between Namibia, Swaziland, South Africa and Lesotho with the South African Rand as the common currency.
- Economic and Monetary Union – this is the highest stage of integration, where there is central determination of economic policy, that is fiscal policy. An example of an Economic and Monetary Union is the European Union.

Figure 1: Levels of Regional Trade agreements



Source: Own computation

The level of RTA starts from a PTA and rises to an Economic and Monetary Union as shown in Figure 1 above. In this study the term RTA will be used to mean any of the forms of regional integration mentioned above in general even though the countries would be geographically distant.

1.2 Background of the study

Zimbabwe gained its independence in 1980 and during the first decade after independence, important sectors of the economy like health and education were heavily subsidised as the government adopted socialist policies. In addition, most economic activities were under government control that is prices, exchange rates and imports. Economic challenges however forced the government to embark on economic reforms (Economic Structural Adjustment Programme (ESAP)) aimed at trade and fiscal liberalisation, removing of price controls, deregulating the economy, among others. Before the 1991 economic reforms, Zimbabwe had a very stringent trade policy. The trade reforms that came with ESAP in 1991 were aimed at removing the quantitative controls on goods imported and exported, removal of import licensing controls and lowering of tariffs, among others. Most goods could now be imported under Open General Import Licence (OGIL) except goods that are considered to be sensitive or strategic. There was an introduction of Export Processing Zones with export incentives that encouraged production for export. The new trade policy gave more attention to regional integration and trade liberalisation through increased commitment to the WTO uniform tariff structure strategy.

Actually, the end of the country's reform coincided with the forming of the WTO in 1995 and by then Zimbabwe's trade policy had become more liberal with controls on imports removed and import tariffs reduced. Trade liberalisation under WTO was considered, by Zimbabwe to be complimentary international instruments supporting national efforts. Trade was thus expected to increase and the country was expected to record increased economic growth. The success of the program was however limited due to poor timing (delayed start) because of not enough funding and lack of commitment by the government (Tekere 2005).

The economy of Zimbabwe was once one of the strongest economies in the SADC region before it was hit by a plethora of economic problems which were caused by massive economic mismanagement by the government (e.g. participating in the DRC war, fast track land redistribution) in the period 2000 to date. There was loss of investor confidence and subsequent capital flight. The country suffered shortage of basic commodities, fuel, local and foreign currency. The withdrawal of International financial institutions like World Bank and IMF from financing Zimbabwe's balance of payment and from extending other forms of aid can also be attributed to the collapse of the Zimbabwean economy.The last funds received by Zimbabwe from IMF were in 1999. The performance of the economy between 2000 and 2015 is reflected in Table 1 below:

Table 1: An Overview of Zimbabwe's Economic Performance between 2000 and 2015

	2000	**2005**	**2009**	**2012**	**2014**
GDP (Current US$ bill)	6,69	5,76	8,16	12,39	14,19
GDP growth (annual %)	-3.1	-5.7	6	10.6	3.8
Merchandise exports (US$ bill)	1, 93	1,85	2,20	3,80	3,44
Merchandise imports (US$ bill)	1,78	2,35	2,95	4,40	4,20

Source: World Bank.

Table 1 indicates that GDP (Gross Domestic Product) growth rate was in the negative in the period before 2009 with the worst in 2008, being negative 17,7%. Exportsand imports are increasing but imports continue to overshadow exports since the past decade culminating to increasing trade deficit. The growth of exportsis at a decreasing rate showing a deterioration in

export competitiveness which may be explained by high output prices due to exorbitantly high production costs associated with Zimbabwe.This review of statistics shows that Zimbabwe's economy has been struggling with depression since theyear 2001.

1.3 Problem Statement

The exact impact of regional trade agreements on a country's trade still remains a paradox, with some authors, for example Evans (1997), Helliwell et al (1998) and Jayasinghe and Sarker (2004), subscribing to the school of thought that RTAs are trade creating and on the other hand some, for example, Alemaheu and Haaile (2002) and Khorana et al (2007), argue that RTAs are trade diverting and a stumbling block to multilateral trading system. Whether Zimbabwe's membership to SADC and COMESA has brought about the desired trade creation and not trade diversion is still unclear. Zimbabwe, despite being a member of two RTAs has been grappling with reduced exports, trade deficits(US$3 billion in 2015)and its share of trade to the region has been insignificant in the past decade (UNCTAD).The country has been dutifully implementingtrade liberalization strategies as directed by the RTAs it is signatory to but is still struggling with trade deficits perpetrated by reduced exports and high imports. On the other hand, other countries like South Africa and Angola are flourishing in their trade. The problem is thus, what role has being signatory to, SADC and COMESA played in Zimbabwe's trade dynamics. To what extent has trade among Zimbabwe and its SADC and COMESA partners changed and how much of the change can be attributed to trade creation and trade diversion caused by RTAs. Should the country put its resources into the proposed SADC-EAC-COMESA free trade agreement, given the poor trade performance of the country with the existing RTAs?

1.4 Objectives of the study

This study's main objective is to investigate the effects of Regional Trade Agreements onZimbabwe's trade flows.

Specific Objectives

The specific objectives of this study are to:

i. Examine trade creation, trade diversion effects of regional trade integration in Zimbabwe.
ii. To analyse Zimbabwe's changing trade dynamics and economic consequences.

iii. Account for factors that may impede Zimbabwe from achieving gains from RTAs.

iv. Make recommendations to guide policy makers, based on the major findings of the study.

1.5 Research Questions

1. Are regional trade agreements causing trade creation or trade diversion in Zimbabwe?
2. Howis Zimbabwe's trade changing and what are the economic consequences?
3. To what extent did Zimbabwe's exports to and imports from other RTA members change with the implementation of the RTAs?
4. What policy options can be considered in view of the study findings?

1.6 Hypothesis Statement

H_0: RTAs have positively influenced trade in Zimbabwe.

1.7 Justification of the Study

This study estimates the different effects of RTAs in Zimbabwe using the gravity equation first proposed by Tinbergen (1962) and developed theoretically by Anderson (1979). COMESA FTA was formed in 2000 and SADC protocol on Trade was signed and adopted by member states in 1996. Since the formation of these regional trade agreements, very few studies have been done giving analysis of the impact of these agreements on Zimbabwe's trade. The last study done on the impact of RTAs in Zimbabwe was in 2004 by A Bara thus theoretical and empirical contributions in recent years of the effectsof RTAs on trade in Zimbabwe are not evident in existing literature. Most of empirical studies that have been done on the impact of RTAs, were done on a group of countries such as Africa or Sub-Saharan Africa, not on a specific country (Mangesha, 2009; Boakyewaa, 2010). Such studies are bleak in telling the country specific effects of RTAs. This study is thus motivated by this gap and will investigate the impact of COMESA and SADC RTA's, specifically on Zimbabwe's trade flows. Findings in this paper will be valuable knowledge for policy makers in their decision making processes on how to strengthen domestic markets in Zimbabwe so as to increase intraregional trade.

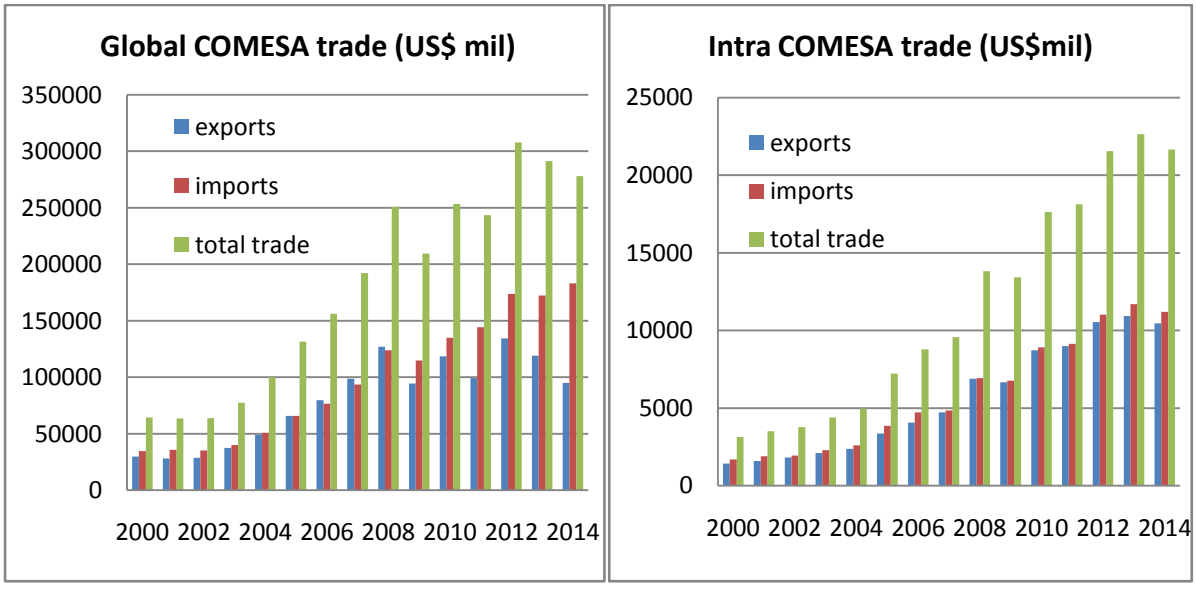
1.8 Overview of trade in SADC and COMESA regional Blocs

COMESA

COMESA was formed in 1994 replacing the former Preferential Trade Agreement (PTA) (formed in 1982)and has 19 member countries, which are Burundi, Comoros, Democratic Republic of Congo (DRC), Djibouti, Rwanda,Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Libya, Malawi, Mauritius, Seychelles, Swaziland, Sudan, Uganda, Zambia and Zimbabwe.The regional bloc's main objective is to form a big economic and trading unit able to overcome barriers that individual countries face. The COMESA FTA was launched in November 2000with duties on a wide range of goods reduced to zero. The COMESA region boasts of a Gross Domestic Product (GDP) of overUS$360 billion and a GDP growth rate of 5.4% with a population size of around 430 million, according to the International Trade Statistics Bulletin No. 12 2013.

The global trade in the COMESA region has generally been on an increasing trend since the formation of the FTA. The global tradestood at US$99 billion in 2004 and increased to US$307 billion in 2012. However after 2012, there is a noted decline in COMESA trade which was caused by a reduction in exports of oils due to internal political crisis. In 2014 the global trade in the region was US$270 billion, a 13% decrease from the year 2012 (UNCTAD).In terms of intra-COMESA trade the trend is similar with that of global trade. Intra COMESA trade has been on an increasing trend since the year 2000 with the value of intra COMESA trade in 2014 being US$21 billion, a 16% increase from 2011 (UNCTAD). **Figure 2** below shows the global and intra COMESA trade trend discussed above.

Figure 2: COMESA global and intra trade 2000 - 2014



Source: Own computation from UNCTAD Database

Egypt, Swaziland, Comoros,Madagascar,ZambiaandBurundi have been the major contributors of the recent growth in intra COMESA trade. Egypt exports were the major contributors to export growth in 2013 as it had the biggest share of 24% of intra COMESA exportmarket.Swaziland's exports and imports grew by a record 177%and 165% respectively, whilst exports and imports of Madagascar increased by 77% and 5% respectively(COMESA Annual Report 2014). On the imports side, the major contributors to COMESA's imports have beenZimbabwe, Zambia, Kenya, Egypt, Malawi, DRC and Uganda with Kenya being the biggest importer in the year 2013followed by D.R. Congo and Kenya respectively.

In terms of the main products being exported, copper ores and concentrates, Portland cement, black tea, sulphuric acid and petroleum oils topped in terms of value in the year 2013 (ranked in terms of value). The major export markets have over the past 5 years been the EU, having 38% of COMESAs export market, followed by China (11%) and COMESA (9%) with petroleum oils, natural gas and copper being exported. EU and China have also been the first and second major import markets followed by South Africa and the COMESA region, with mainly manufactured products being imported.

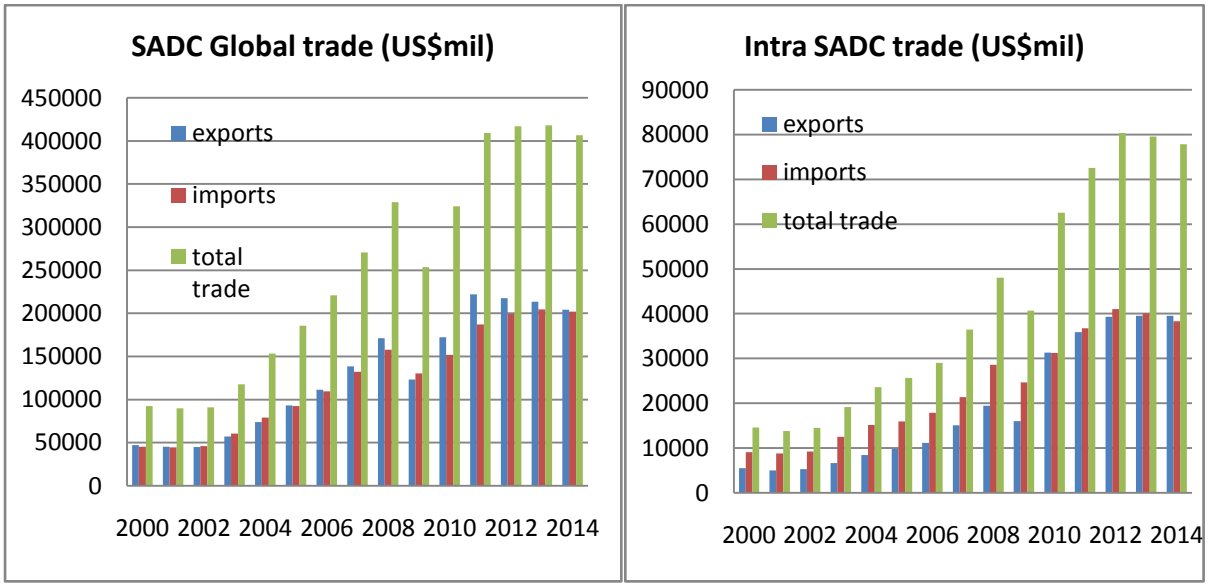
SADC

SADC is a Free Trade Area (FTA) with 15 member countries, a population of 277 million and GDP of US$129,3 billion.SADC was established in 1992 from Southern African Development Co-ordination Conference (SADCC). The SADC trade protocol was signed in 1996 and the regional group became a Free Trade Area in2008. 85% of the trade flows in SADC were duty free by 2008, with the remaining 15% being sensitive products.SADC member states include Malawi, Angola, Botswana, The Democratic Republic of the Congo, Mauritius, Mozambique, Madagascar, Namibia, Lesotho Seychelles, South Africa, Swaziland,Tanzania, Zambia and Zimbabwe.

The global and intra SADC trade flows have been on a generally increasing trend since the start of implementation of the SADC Trade protocol in 2000, as shown by Figure 3 below.The global trade increased from US$92 billion in 2000 to US$328 billion in 2008 and intra SADC trade also increased from US$14 billion to US$48 billion in the same years. However in 2009, there was a decline in both global and intra SADC trade due to global recession (SADC facts and figures, www sadc.int). The global and intra SADC trade values in the 2014 were US$406 billion and US$77 billion respectively which is a 341% and 450% increase since the implementation of the

SADC trade protocol respectively. After the SADC FTA was formed in 2008, SADC trade has been exhibiting an increasing trend, though at a decreasing rate. These trends are shown in **Figure 3** below.

Figure 3: SADC global and intra trade 2000 – 2014



Source: Own computation from UNCTAD Database

The highest contributor to the regional block's global and intra trade has been South Africa. Since 2000 South Africa has contributed more than 50% of SADC's intra-regional trade, that is, 60% in 2001, 52% in 2007 and49% in 2011. Angola and Mauritius were the second and third

highest contributors to intra trade respectively in the year 2001 while Angola and Botswana took the second and third position respectively in 2007. In 2014, South Africa remained the main contributor to intra SADC trade with Angola and Zambia being the second and third contributors to SADC trade (COMTRADE).

Intra SADC major export items include agricultural products, electricity petroleum oils, clothing as well as textile products, whilst the main products exported to the rest of the world are coal, manganese, precious metals and tobacco. In terms of the major export markets for the period 2000 to 2014, the Asia Pacific Market has been the leading market for SADC exports enjoying 45% of its market share. The EU and the rest of the World follow with an export market of 27% and 15% respectively. Intra SADC and the rest of Africa have the least share of COMESA's export market, i.e. 10% and 3% respectively (SADC facts and figures, www sadc.int).On the imports side, the trend is the same, with the Asia Pacific Market having the highest share of imports followed by the EU, Rest of the World and Rest of Africa in that order.

It can be noted that SADC's trade with other member African countries is very minimal and most exports are going to destinations outside Africa. This indicates that SADC has failed to gain market shares of its own export growth, thus it has missed out on opportunities to benefit from its own integration process (Kalaba and Tsedu, 2008:10).

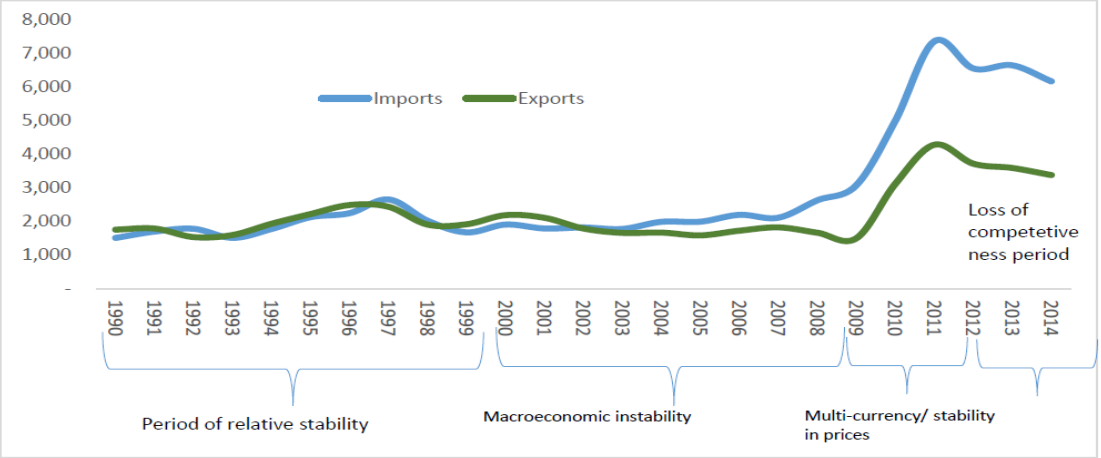
1.9 Other Trade Agreements

Above being a member of Southern African Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA), Zimbabwe also has five preferential bilateral trade agreements with Zambia, Botswana, Namibia, South Africa and Malawi. All these Agreements have the same purpose and offer the same benefits. They aim to encourage and stimulate trade between the bilateral partners through the elimination of tariffs and other non-tariff barriers to trade. The agreements allow the importer to purchase goods from the signatory country without paying duty or paying a reduced agreed duty rate, if the goods in question qualify under the terms of the agreement. The Zimbabwe-South Africa trade agreement of November 1964 allows goods to be traded between the two countries duty free or under rebates. Goods however have to satisfy rules of origin to qualify as duty free. Specifically for goods to be considered as originating from the export country, there are supposed to have a local content of at least 25% to be imported duty free. All the other agreements have a similar structure. However some goods like certain types of textile and clothing are not covered in the agreements to eliminate competition (Zimbabwe-Botswana agreement).

1.10 Zimbabwe Trade overview Global trade

Statistics indicate that in the past decade Zimbabwe's trade performance has been poor against regional standards, though much better considering the country's poor overall economic growth performance record (Mugano 2013).Period 1990 to 1999 highlights a phase of relative macroeconomic stability where the trade deficit remained favourable and sustainable. The period 2000-2008 was largely characterised by macroeconomic instability, which saw the widening of the trade deficit underpinned by the excess of imports over exports. This isshown in Figure 4 below.

Figure 4: Zimbabwe's Merchandise Imports and Exports from 1990 to 2014(USD mill)



Source: ZIMSTAT

In the year 1990, Zimbabwe's merchandise exports were USD1.75 billion and imports were USD1.07 billion, giving a surplus of USD664 million. The exports and imports were fluctuating together since 1990 but took separate paths in 2002 when imports started overshadowing exports. There has been a steady increase in exports since 2002 which can be attributed to discovery of minerals and rebound in tobacco output, but imports are growing at a faster rate, owing to the

ever increasing trade deficit. The widest gap between exports and imports was experienced in 2011. In the year 2014 exports of merchandise steadily increased to USD3.47 billion whilst imports were USD6.18 billion giving a trade deficit of USD2.71 billion. This reflected a 12% decrease in the exports from 2012 and an 8 % increase in imports from 2012 as well(RBZ working paper series No 1-2015). The decline in exports can be attributed to the general decrease in international commodity prices and loss in competitiveness of the country's exports.

The composition of exports has not been left out in the changing dynamics of exports. Reflecting reduced competitiveness of manufactured exports, Zimbabwe's exports gradually shifted from manufactured exports in 2002 to minerals in 2014. The composition of manufactured exports to total exports decreased from 40.90% in 2002 to 14.48% in 2014 as shown in the Table 2 below. In addition trade has also shifted from agricultural feeds and foods to raw material and minerals. This can be shown by Table 2 below, which indicates a decline in share of exported agricultural products from 32.40% in 2002 to 27.57% in 2014. Subsequently share of mineral exports have increased to 55.56% in 2014 from 22.10% in 2002.

Table 2: Composition of Exports in 1990 and 2014

	Exports	**Exports**
	2002(% Share)	**2014(% Share)**
Mineral	22.10	55.56
Agriculture	32.40	27.57
Manufactured	40.90	14.48
Other	4.60	2.39
Total	**100.00**	**100.00**

Source: ZIMSTAT and RBZ computations

The country's main trading partner for the past decade has remained South Africa with 67% of its exports going to South Africa and the remainder going toMozambique (19%), Belgium (4%), Zambia (3%), UAE (3%) and Botswana (1%). This shows that 90% of Zimbabwe's exports are going to the SADC region showing an increase in intra-regional trade. On the import side, South Africa remains the main source of Zimbabwe's imports (43%) and 18% of other imports are coming from Singapore. Imports from China and UK amount to 6% and 3% respectively. The

rest of the imports come from Zambia (3%), Mozambique (2%), UAE (2%), India (2%), Botswana (2%) and Japan (2%) (RBZ working paper series No 1-2015).

Considering trade by Regions, the SADC region contributed 65.1% of Zimbabwe's trade flows, and was seconded by Asia which contributed 24.8%. The European Union contributed 7.4% and the rest of the world 2.7% (RBZ working paper series No. 1-2015). The major products being exported by the country according to the World Integrated Trade Solutions (WITS) include tobacco, gold (to South Africa), nickel ores (to South Africa), Ferro-chromium (to Italy, Spain and China), diamonds (to U.A. Emirates, Belgium and India) and cotton (to Mauritius and South Africa). On the imports side, petroleum oils, medicaments, ammonium nitrate, trucks and maize have been the major imports.

Trade with COMESA

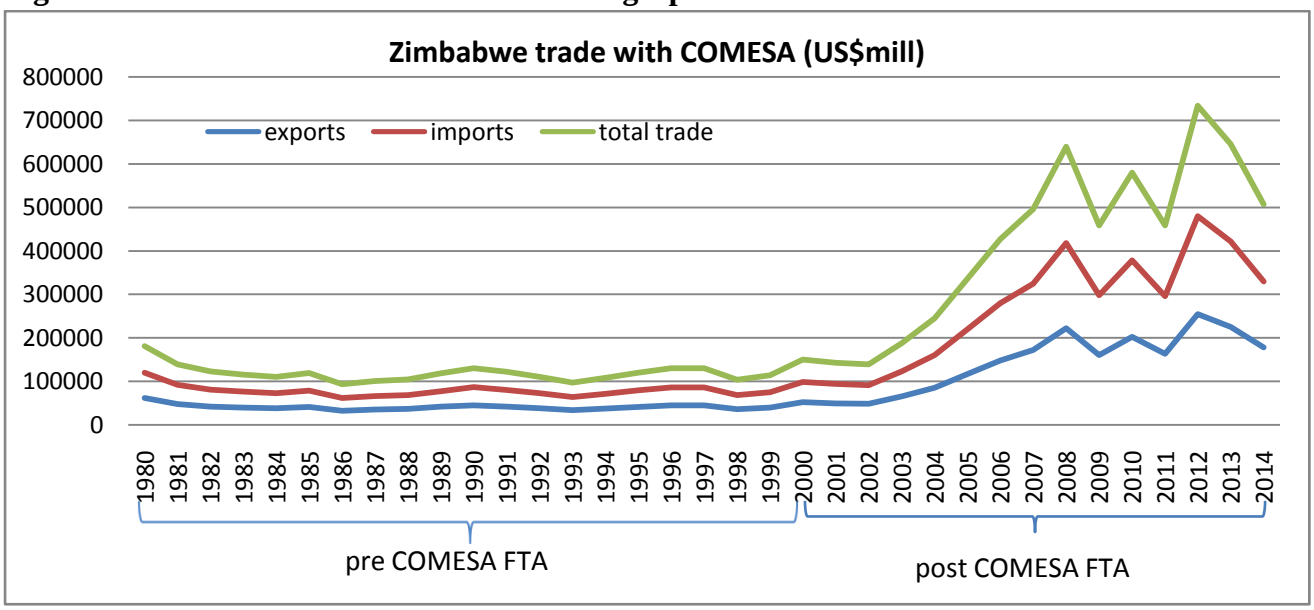
As reflected in **Figure 5** below, Zimbabwe's trade with countries in COMESA bloc was very minimal in the period 1980 to 2000 that is before the formation of the COMESA FTA. There were minimal fluctuations in total trade which was ranging between US$96 million to US$180million. The countrywas experiencing regional trade deficit in this period as its imports were more than exports throughout the pre-COMESA FTA period. After the formation of the COMESA FTA in 2000, there was a marked increase in Zimbabwe's exports and imports to and from the COMESA region. Zimbabwe's intra COMESAtrade has increased from US$150 million in 2000 to US$507 million in the year 2014, which is a 238% increase since the formation of COMESA FTA. Huge fluctuations in the country's intra COMESA trade experienced in the period 2008 to 2012 were reflective of the harsh economic conditions experienced between 2008 and 2009 which reduced the trade volumes, followed by the adoption of the multi-currency regime which boosted trade activity.

This increasing trend of exports and imports shows that the implementation of the trade agreement has brought about positive change to the trade of Zimbabwe. However, the country's problem of trade deficits is still persistent. In addition, the share of Zimbabwe's trade as a percentage of total COMESA trade is very low. Zimbabwe's exports and imports in the region as a percentage of total trade was a record low of 3% in 2003 and sharply increased to 13% in 2014, but has been on a declining trend since 2007 (COMESA International Trade Statistics Bulletin No. 13). This can be attributed to the many economic challenges which the country has been facing during the past decade, among them lack of funding from International Financial Institutions, a very huge and unsustainable debt and record high levels of inflation (2007-2008)

among others. Another reason is that productswhich Zimbabwe can export are also produced by the COMESA countries thus it cannot export to them.

Zimbabwe's exports into COMESA have been cotton (to Mauritius), unused postage stamps, bank notes, food products, tobacco (to Kenya), Ferro chrome (to Zambia) and its major imports include food live animals, crude material, manufactured products, beverages and tobacco.The trade trend discussed above is shown in Figure 5 below.

Figure 5: Zimbabwe's intra-COMESA trade graph 1980 to 2014



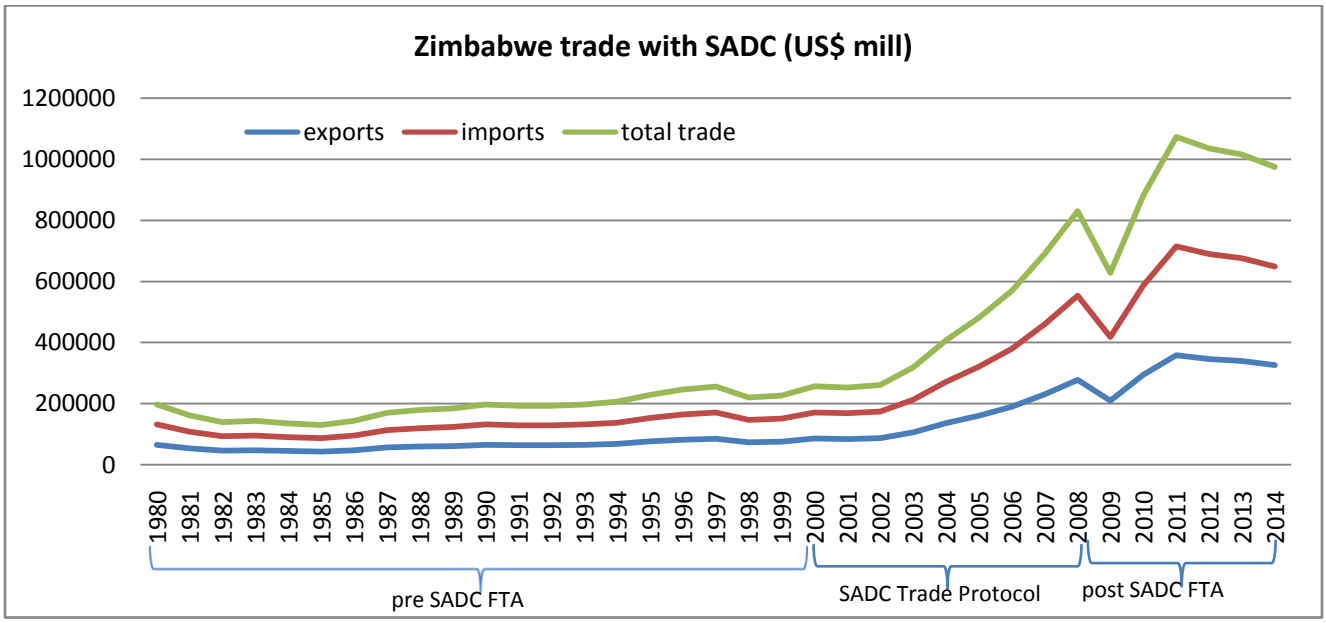
Source: Own computation from UNCTAD Database

Trade with SADC

Trade between Zimbabwe and its SADC counterparts in the pre SADC Trade Protocolera (1980 to 2000) resembles that of COMESA. There was very little trade by Zimbabwe with its SADC member states. The amount of exports and imports to the SADC region in the year 1980 were a mere US$65 million andUS$131 million only respectively. Upon starting the implementation of the SADC Trade protocol between 2000 and 2008, there was a significant increase in the trade that was taking place in the region. Total trade increased from US$257 million in 2000 to US$830 millionin 2008, showing the positive impact that the Trade Protocol brought to the country's trade performance within the SADC region. In this period, the bloc was working towards the formation of an FTA, which came into force in 2008. Though there have been increases in the exports and imports after the SADC FTA formation and implementation, Zimbabwe's trade did not benefit fully from the formation of the FTA as it was undergoing serious economic challenges as discussed before. This is reflected by a low share of the Zimbabwe's exports to total SADC exports which were at 1.5% in 2012, a further decline from 2.2% in 2008 (COMTRADE).

The main products that Zimbabwe exports to its SADC counterparts include maize, cotton, tobacco, oil cake and soya beans, live bovine animals, coniferous wood, cotton seeds, light manufactures and it imports exchange fuels, plastic, vehicles, explosives, chemicals machinery, paper and steel. Though Zimbabwe's share of total export in SADC has been on a downward trend, the volume of trade between Zimbabwe and its SADC counterparts has been on an increasing trend since 1980 as shown in Figure 6 below.

Figure 6: Zimbabwe's intra-SADC trade graph 1980 to 2014



Source: Own computation from UNCTAD Database

Given the statistical evidence of Zimbabwe's poor trade performance as compared to other countries in the region, though there is increased trade between Zimbabwe and its neighbouring countries that are members of the COMESA or SADC agreements,it is imperative at this time to carry out a study on the extent to which these trade flows have been influenced by regional trade agreements which Zimbabwe subscribe to, i.e. SADC and COMESA, especially at a time countries are proposing the SADC-EAU-COMESA Tripartite Free Trade Area. The study will investigate the impact of these regional trade agreements (RTAs) on Zimbabwe's trade flows. The study analyses and sheds light on whether and to what extent these agreements enhance trade in goods between their members, and divert trade from partners outside the RTA.

1.11 Organisation of the study

The rest of the study is organized as follows:

Chapter 2 will give theoretical and empirical Literature perspective on Regional Trade agreements, while Chapter 3 will dwell on the methodology of this study. This chapter will also include discussion of the econometric techniques to be used in this study. Chapter 4 will be on

estimation of the gravity model and analysis of results. This will be followed by chapter 5 which will give the conclusion and recommendationsbasing on the results obtained in Chapter 4.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The theory of regional trade agreements dates back to 1950 with Viner and Meade being the first to distinguish between trade creation and trade diversion in their study which analysed the

welfare of customs unions. The authors used the assumption of constant cost of production and zero elasticities of demand. Viner suggests that trade creation takes place as low cost member countries take the place of high cost producers in the domestic market and on the other hand trade diversion takes place when member countries shift their trade from low cost countries that are not members of the RTA to member countries. Viner (1950) and Meade (1955) conclude that the impact of RTAs on welfare can either be positive or negative, depending on the magnitude of trade diversion and trade creation caused by the RTA.

2.2 Theoretical literature Review

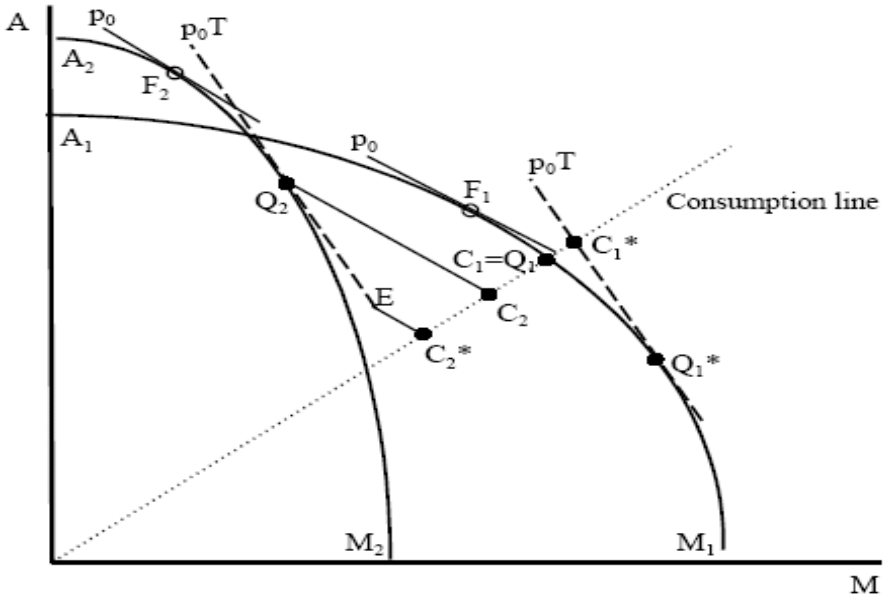
2.2.1 Regional Integration: Neo-Classical Theory and New Trade Theory

Neo-Classical Theory of Trade

According to the Neo-Classical theorists, there are greater trading opportunities between countries that have bigger differences between their productive endowments. Countries thus specialise in the production of the goods that they have comparative advantage in and export that good whilst importing the other commodity (inter-industry trade). The Heckscher Ohlin Samuelson (H.O.S) theorem is one of the Neo-Classical theories of trade. The basic assumptions of the H.O.S theorem are that there are 2 goods, 2 countries and 2factors of production. The production functions are assumed to exhibit constant returns to scale and the model also assumes there is perfect competition.In the H.O.S model, comparative advantage and trade are determined by national differences in factor endowments. The H.O.S theorem states that, given the assumptions of the model, a country will export the commodity that intensively uses its relatively abundant factor, i.e. in our case; Zimbabwe has abundant supplies of agricultural land so it tends to be net exporter of agricultural products (Bara 2004).

To institute the effects of RTAs and the gains from trade under the H.O.S framework, Venables (2002) came up with a model which illustrated the relationship between trade creation/diversion and comparative advantage. The relationship is illustrated in the diagram below.

Figure 7: Comparative Advantage and Trade Creation / Diversion



Source: Venables J .A. (2002)

Assuming that there are 3 countries, i.e. country 0 (a large rest of the world) and 2 small countries (1 and 2). Two goods A and M are produced. The axes measure the quantities of A and M and the 45 degree line is the consumption line (consumption takes place in fixed proportions). A_1M_1 and A_2M_2 are the production possibilities of countries 1 and 2 respectively whilst the world price of product Mis P_0. Country 2 has comparative advantage in the production of good A relative to country 1 and countries 1 and 2 have comparative advantage in good A relative to country 0.

When there is free trade between the countries, country 1 and 2 will be producing at points F_1 and F_2 respectively as shown in the figure above. Countries 1 and 2 will be exporting product A but country 2 exports more than country 1.Initially all country 1 and 2's imports are subject to a tariff (T > 1) which is set high enough to make country 1 self-sufficient. Trade is not profitable at point C_1= Q_1 as price of product M is between P_0T, the domestic price ratio that would be applicable if product M was to be imported, and P_0/T, the price which would rule if good A were to be imported. Country 2 produces and consumes at points Q_2 and C_2 respectively, thus importing product M at price P_0T. Since country 1 has comparative advantage in product M relative to country 2, it will export good M at a price P_0T thus increasing its production of M from Q_1 to Q_1*.

What would be the effect if there is a regional trade agreement between country 1 and country 2? The two countries will continue to import product M from the rest of the world such that the price of M settles at P_0T. Country 1 produces at Q^*_1 and country 2 produces at Q_2 and internal

trade is shown by the vector $Q_1{*}C_1{*} = Q_2E$ as shown in **figure 7** above. Country 1 only has internal trade whilst $EC{*}_2$ is the vector for external trade of country 2. This shows that the implementation of RTA has brought about gains to country 1, as $C_1{*}$ is above C_1. However, country 2 has lost because of trade diversion. Before the trade agreement, it was importing all of product M from the rest of the world but now it is importing some of M from its RTA partner with higher cost.

This implies that according to the H.O.S framework, intermediate countries gain more from RTAs because small countries with an extreme comparative advantage will have their trade diverted to a partner country which has comparative advantage which is nearer to the rest of the world. Trade with the rest of the world and partner country are less substitutes for an intermediate country thus it is less vulnerable to trade diversion.

The H.O.S theorem was tested by Leontief (1953) using U.S. exports and import data and he came up with what was referred to as the Leontief paradox. U.S., which is believed to be capital abundant, was surprisingly importing goods that had a higher capital to labour ratio than its exports. The paradox was questioned by Leamer (1980), who argued that the Leontief test had been badly performed and suggested another test to be done where the capital to labour ratio of net exports is to be compared to that of consumption and not comparing capital to labour ratio of imports and exports as Leontief had done. This was developed by Vanek (1968) and was known as the Heckscher-Ohlin-Vanek theorem and it stated that countries abundant in capital have a higher capital to labour ratio in production than in consumption. The theorem still assumed equal technology as the H.O.S theorem, which is not realistic. Newer trade theories thus came up with different assumptions of different technology, increasing returns to scale and imperfect competition. These will be discussed below.

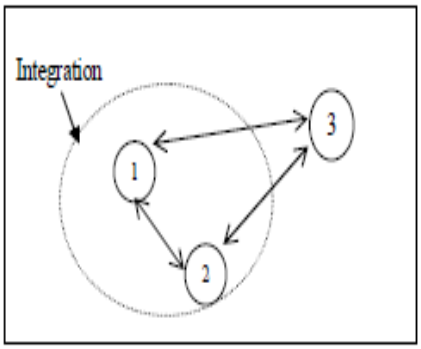
New Trade Theory (NTT)

New trade theories explain trade of similar products between countries (Intra-Industry Trade (IIT)). The New Trade Theories date back to the 1980s and they argue that it is the economies of scale and product differentiation that determine trade between two countries and not just the differences in the countries' endowments as in the Neo-Classical Theory. The Dixit and Norman theory (1980), which is a combination of the H.O.S theory and the NTT, is a model which introduces a monopolistically competitive sector (X) with economies of scale and product

differentiation to the H.O.S framework. This model of trade is closer to the real world trade practice. In this model, factor endowments still play a part in determining trade, but in addition, the market size also plays a role in determining trade. Markussen and Venables go on to add the trade costs to the Dixit-Norman model such that the large country will have a comparative advantage in sector X because of its size. Thus, both factor endowments and market size will determine trade between the countries. This therefore means that, larger countries tend to be net exporters of goods produced in the sector with monopolistic competition due to economies of scale and larger domestic markets, and import less differentiated products (Home Market Effect) (Baldwin and Venables, 1995).

Formation of a RTA between countries of different sizes under imperfect competition will have an effect of product shifting from the rest of the world to the regional bloc and also from smaller countries to larger countries (Baldwin and Venables, 1995). The Baldwin and Venables model can be illustrated in the diagrams below, where an RTA is formed between country 1 and 2 in a three country world.**Figure 8** illustrates the entering into a regional trade agreement between country 1 and 2 in a three country case.

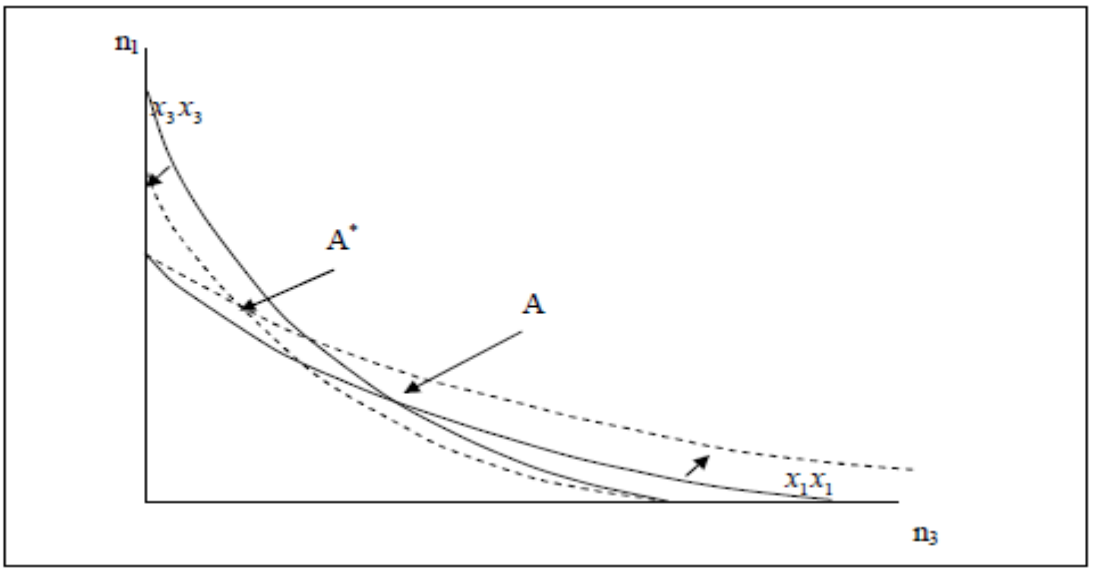
Figure 8: Integration between Two Countries in a Three-Country Trade Cycle



Source: Own computation

Following Baldwin and Venables' model of trade, there are 2 sectors in an economy, sector X has imperfectly competitive firms with production functions exhibiting increasing returns to scale producing differentiated products and sector Z has perfectly competitive firms producing homogenous products and production functions exhibit constant returns to scale.θ is the volume of output.

Figure 9: "Production Shifting" in a Three-Country Case



Source: Baldwin R.E and Venables A.J (1995)

In **figure 9**above, $\mathbf{n_k}$represents the variety of goods produced by the country k and $\mathbf{n_1}$ (=$\mathbf{n_2}$) and $\mathbf{n_3}$ are the axis. Functions $\boldsymbol{x_1x_1}$give the combinations of $\mathbf{n_1}$and $\mathbf{n_3}$ where industry is in autarky and $\boldsymbol{x_3x_3}$is the combination of$\mathbf{n_1}$ and $\mathbf{n_3}$whereindustry in country 3 is in equilibrium as well.Area above the curve represents negative profits and below the curve profits are positive. The point A is the equilibrium before there is a RTA between country 1 and 2. When countries 1 and 2 enter into an RTA, **θ** increases thus $\boldsymbol{x_1x_1}$and$\boldsymbol{x_3x_3}$shift to the new dashed curves. Given that the number of firms does not change, the firms in the RTA have increased production thus make profits (equilibrium A is below new $\boldsymbol{x_1x_1}$) but firms in country 3 will have reduced sales and losses (equilibrium A is above $\boldsymbol{x_3x_3}$). This happens because RTA firms now have a cost advantage in their partner countries as compared to non RTA firms (Baldwin and Venables 1995). Free entry and exit of will make profits level to zero and equilibrium is restored at A* as firms in country 3 exit and more firms enter in country 1 and 2. This is referred to as product shifting into the RTA and its magnitude depends on the level of trade barriers between the RTA and country 3.

Production shifting within the region will occur in cases where countries in the RTA are different in size. Melchior (1997) notes that when there is a removal of intra-regional trade barriers, there is an increase in the trade surplus of the large country which leads to firms reallocating from the small to the large country in the region.

In this study the Baldwin and Venables (1995)"core model of trade and imperfect competition" is used as a theoretical basis for explaining the trade creating and diverting effects of RTAs as it is a closer reflection of real world trade.

2.2.2Main implications of the theoretical models for Zimbabwe

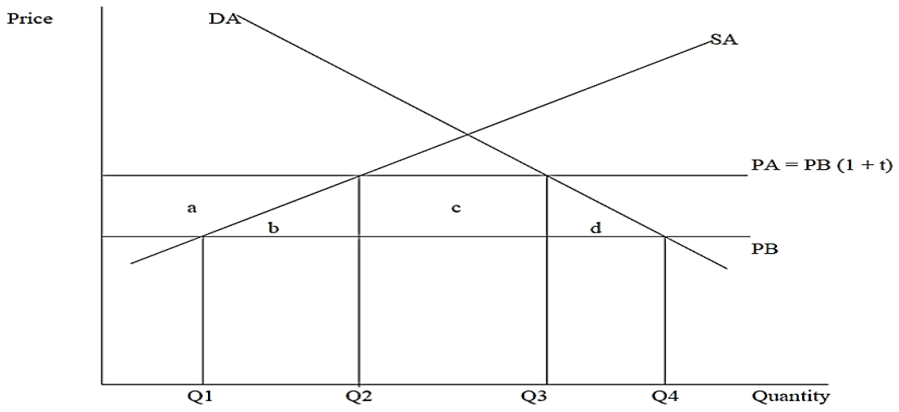
1) Neo-Classical Theory: The H.O.S based Model – Considering the Venables model within SADC and COMESA regions, Zimbabwe can be classified as an intermediate country. This is so because Zimbabwe's comparative advantage in goods that are capital intensive is intermediate and not extreme since there are other countries that are worse off than Zimbabwe. From the model explained above, it is expected that Zimbabwe gains from regional trade integration as an intermediate country is expected to gain. This, however, is going to be tested using econometric estimations in the following chapter.
2) New Trade Theory: Core model of trade and imperfect competition –Emphasis on the economies of scale and market size is given as the determinants of trade in this model. Since Zimbabwe is an intermediate country in the SADC and COMESA region it is expected that there should be product shifting from the rest of the world to the economic blocs and also from other smaller countries in the blocs toZimbabwe and larger countries within SADC and COMESA.This means that integration is expected to be beneficial to Zimbabwe in products that dependon market size for their trade.

2.2.3Theoretical Framework on Effects of Regional Economic Integration

Trade creation and diversion

Oluwatoba (2013) argues that a RTA shifts production of traded goods from a high cost partner country to a lower cost country, leading to trade creation. There should thus be stimulation in intra-regional trade due to this trade creation and in turn lead to more efficient resource allocation and gains in the welfare of consumers and producers. This is illustrated in the figure below.

Figure 10: Trade Creation Effects



Source: Du Plessis *et al*., 1998
Note: DA= demand, SA= Supply, PA= Price of country A, PB= Price of country B.

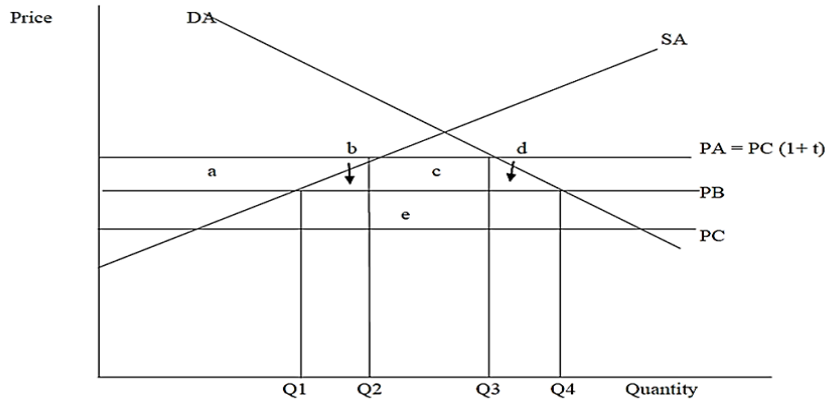
Figure 10above shows that before an RTA between country A and country B was entered into, country A was importing quantity (Q_3-Q_2)from B at price PA, which is inclusive of tariff. After the integration goods traded between the two countries are no more subject to tariff and country A imports increased quantity ($Q_4 - Q_1$) from B at price PB. (Q_2-Q_1)represents an increase in imports that replace the reduced production in country A whilst (Q_4-Q_3) represents an increase in consumption level at the reduced price PB. The areas b and d represent the trade effects of an RTA. Thus it means that there has been a creation of trade that never existed before there was integration and production is shifted to the more efficient producer (Oluwatoba 2013).

On the other hand, trade diversion is when a country imports from member countries of the RTA, products that they used to import from the rest of the world before the RTA. This is because trade barriers have been removed in the RTA and not externally, thus there is a discrimination against foreign supply and producers in member states are induced to expand production even if they have higher costs than firms outside the regional bloc (Venables 2000). Many RTAs in Africa are said to have failed due to this diverted trade because it is economically inefficient as firms do not specialize in the production of goods they can produce most efficiently (Evans, Holmes and Mandaza, 1999).

Figure 11 below illustrates trade diversion. Before an RTA between country A and B is formed, country A's imports are subject to a tariff. Thus the price in country A of goods imported from country C will be PA = PC (1 + t). Before a trade agreement is done, A imports quantity (Q_3-Q_2) from C. After a trade agreement is entered into (between country A and B), there is removal of tariff on imports from country B and country A imports all quantity ($Q_4 - Q_1$) from B. It

therefore means the RTA has diverted trade that existed prior to its formation. The net effect of the trade agreement on trade will thus be the difference between areas b + d and area e(Oluwatoba 2013).

Figure 11: Trade diversion effects



Source: Du Plessis et al., 1998. **Note: PC is price in country C**

The net effects of RTAsare subject to comparative advantage of member countriesrelative to each other and also relative to the rest of the world. Venables (2000) alludes that intermediate countries (countries with comparative advantage that lies between their trading partner and the rest of the world) gain more than extreme countries. The argument is that for the extreme country, being a signatory to an RTA will mean that former imports from low income countries are replaced by imports from its partner country. The analysis implies that trade agreements can lead to gains if all barriers to trade are reduced and not when there is partial reduction of barriers or when the reduction of barriers is discriminatory.It also implies that a Regional Trade Agreement between low income countries leads to divergence of incomes of member countries and RTA between high income countries leads to a convergence of their incomesVenables (2000).

2.3 Overlapping multi-RTA membership

Africa is home to numerous trade agreements and there is a great deal of multiple memberships to these trade agreements by African countries. Zimbabwe is a member of both SADC and COMESA regional blocs.Many authors concur to the fact that overlapping membership weakens the effectiveness of RTAs. They argue that being a member of more than one regional economic community ends up being a burden to member countries. Countries face several financial obligations, and have to cope with different procedures, schedules, rules and policy decisions from the different economic blocs. Paperwork for customs processes and trade documentation required increases with multiple membership as customs officials enforce different rules of origin and tariff reductions, thus going against the objective of simplifying customs procedures that each bloc intends to achieve. Yang and Gupta (2005) and Chacha (2008)also argue that the potential of these blocs is not realised fully because multi membership reduces the commitment of member states which is necessary for the success of RTAs.

Other authors, for example, Cheng et al (2009) on the other hand view multiple memberships as having benefits to the countries. Overlapping membership is viewed as the Hub and Spokes system where one country is termed a hub and the other countries which the country overlaps with in membership of the RTAs is termed the spokes. Overlapping membership of the hub country reduces the chances of it being discriminated against in trade by the spokes countries who are not members of the hub's first RTA, thus increasing bilateralism Cheng (2009).

SADC and COMESA have 8 countries (including Zimbabwe) that are both members of these two trading blocs, thus overlapping membership. Lee (2003) asserts that SADC's strategy of market integration is challenged by Southern African Customs Union (SACU), Common Market for Eastern and Southern Africa(COMESA) and East African Community (EAC) with all of member countries of EAC being members of COMESA except Tanzania and all SACU members are also SADC signatories. He argues that the overlapping membership has a possibility of bringing conflict of interest among member countries thus reducing the impact of RTAs on member country's trade.

2.4 Theoretical Foundation of Gravity Model

The gravity model has been used successfully in the empirical analysis of the impact of trade policies on bilateral trade flows.The gravity model of trade was borrowed from Newton's gravity law in mechanics which states that the pull of gravity between two bodies is proportional to the product of the bodies' mass divided by the square of the distance between their centres of gravity respectively.The gravity model of trade was first used by Tinbergen in 1962 and it states that volume of trade is directly proportional to the economic size of the countries in trade and inversely related to distance between the two countries.

The basic idea of the gravity model as noted by Poyhonen (1963) and Pulliainen (1963) is that bilateral trade flows are between two countries are explained by factors affecting a country's potential to export goods, factors affecting the import capacity of a country and all the other factors that may attract or distract trade (Oluwatoba 2013). The economic size of the exporting country (GDP) is used to proxy productive and supply capacity of a country to the export market. GDP or economic size of the importing country represents the country's absorptive capacity. The GDPs of both the countries are expected to have a positive relation with bilateral trade flows. In terms of population, the relationship with bilateral trade flows is ambiguous as economies of countries with large populations are more diversified hence they are self-sufficient but however, they also capture more economies of scale when producing goods because of their large industrial base thus they can export and import larger quantities. Distance between the two trading partners is included in the model to proxy the transaction costs involved in trade and it is inversely proportional to bilateral trade. The model can be augmented to include other variables that impact on the volume of trade, for example, common language, sharing a border, exchange rates and colonisers.

However it has been criticised for its lack of theoretical foundations. The theories used to explain international trade patterns were the Ricardian and the H.O theorem which stated that trade was determined by differences in comparative advantage (thus technology) and differences in factor endowments, respectively. These theories did not give a theoretical basis of the gravity model. Anderson (1979) was first to try and come up with theoretical justification of the model. He assumed constant elasticity of substitution preferences and that countries would specialise in the production of one differentiated good. This became known as the Armington assumption. The assumptions implied that countries consume some goods from every country thus every country participates in trade and all goods are traded, meaning that a country's income is the total of local and foreign demand of the good that the country produces. It implies that large countries import and export more. The model was further expounded by Bergstrand (1985) and Helpman (1987)

who added prices to the model and added the assumption of increasing returns to scale with product differentiation by monopolistically competitive firms and not only by country (Oluwatoba 2013)

Recently, the validity of gravity model has been criticised by some authors as they dispute the log linearization process of the model when there is heteroskedasticity. There is also loss of information due to the presence of zero trade flows between partners. Silva and Tenreyro (2006) argue that ordinary least square estimation cannot be used in the presence of heteroskedasticity thus non-linear estimations should be done. Eichengreen and Irwin (1998) suggested that to overcome the loss of information due to zero trade flows, a value of one should be added to the dependent variable before taking the natural logarithm, such that the dependent variable becomes $X_{ijt}^* = X_{ijt} + 1$. When the bilateral trade volume is zero, $X_{ijt}^* = 1$ and taking the natural log of X_{ijt}^* will give us 0, **(**$\ln(X_{ijt}^*) = \ln(1) = 0$**).** Where bilateral trade value is greater than zero, the dependent variable is $\ln(X_{ijt} + 1)$ and it is not significantly different from $\ln(X_{ijt})$.

2.5 Empirical Literature Review

Numerous studies have been done in the past on the impact of various regional trade agreements but the conclusions have not always concurred. There is a debate whether RTAs lead to increased trade or otherwise. In this study, empirical studies done by various authors using different methodologies is going to be reviewed to examine the impact of being signatory to trading blocs. For better analysis, studies will be reviewed according to the methodology that was used by the researcher, that is, simulation approach, (Computable General Equilibrium Approach (CGE)), descriptive approach and econometric approach (gravity model).

Simulation Approach: Computable General Equilibrium Approach (CGE)

The CGE model uses agent's detailed economic structures and behaviors to simulate the impact of regional trade agreements that are in force or that are still to be enforced. Simulations done using the CGE model have found out that trade agreements have an effect of increasing trade between member countries. Brown and Stern (1989), Brown et al (1992), and Haaland and Norman (1992) all used the CGE model to analyse the effect of RTA on trade. More recent studies have been done by Hertel et al (2006) on the impact of Free Trade Area of the Americans (FTAA). They found out that there has been an increase in trade in and outside the region due to the FTAA. Keck and Piermartini (2005) in their study on the impact of Economic Partnership Agreements on the SADC economies found that EPAs increased welfare and economic size

(GDP) of member countries. Results also revealed that if the European Union entered an agreement with other countries like Mercosur it would lead to a reduction of gains, though they remained positive. It was also found that the estimated gains of the EPA would be less if the agricultural sector is not liberated far enough as the liberalisation of the import sector.

The model possesses many features which render it a powerful policy analysis tool and these include that utility and profit maximisation assumptions are used in modelling the behaviour of economic agents. The model is also multi-sectoral. The CGE model has been however criticised for its high sensitivity to its parameters, assumptions and the use of Constant Elasticity of Substitution (CES)functional form causes major restrictions to the model's structure. In addition it is not appropriate in the analysis of the trade diversion and trade creation effects of RTAs on trade flows as it does not answer the questions at hand (i.e. whether RTAs are trade creating or trade diverting). In addition CGE model is viewed as prospective rather than retrospective and furthermore it requires a lot of data, and the policy information used is usually outdated and less factual, making the validity of the Computable General Equilibrium model results doubtable in some instances since they are without firm evidence (Krueger 1999).

Descriptive approach

Yeats (1998), Anderson and Norheim (1993) and dell'Aquila et al (1999) have analysed the impact of regional economic integration on trade using the descriptive approach. Different indicators have been used to measure the regional concentration of trade. More recently, Haddoud et al (2011) did a study on the impact of the European Union Association agreement on Algeria's trade using the descriptive approach as their methodology. The authors used trade movements and trade indicators like revealed comparative advantage, regional orientation and regional interdependence indicators to analyse the ex-ant and ex-post impact of the trading agreement on Algeria's trade.The ex-ante analysis revealed that the Algeria-EU Association Agreement was projected to have trade creation effects and improve the welfare of the economy. The ex-post analysis concurred with the ex-ant analysis as it showed that there was trade creation and increased economic welfare due to the implementation of the trade agreement.

The approach assumes that the volume of trade taking place between partner countries would not be the same if there was no trade agreement between the trading countries thus it has a static framework (Jayasinghe and Sarker, 2004). This approach also fails to quantify the trade creation and trade diversion effects of RTAshence it is inappropriate to use this approach in this study.

Gravity model

Various authors have used the gravity model to analyse the trade creating and trade diverting effects of RTAs (ex-post analysis) with the results being a mixed bag with no consensus. A study done by Frankel (1992) and Frankel and Wei (1993) to test the level of trade creation in EU, NAFTA, APEC and ASEAN in the 1980s using the gravity model had product of per capita real GDP, common land border and exchange rates as the control variables. The study showed that there was trade creation in the APEC and EU blocs. Trade increased by 170% to 350% and 25% to 80% in the two blocs respectively. Another study by the same authors on the same trading blocs was done for the period 1965 to 1990 with factor endowments as an additional control variable but exchange rate excluded, found evidence of trade creation in EFTA (18% increase in trade), EU (18% increase in trade), APEC (215% increase in trade), NAFTA (43% increase in trade) and ASEAN (146% increase in trade) and trade diversion in NAFTA and EU.

Most of the literature on impact of RTA on trade is on aggregated data but it is believed that there may be many changes caused by RTAs that are not revealed if analysis is done at aggregated level. To counter this deficiency in literature, Clausing (2001) undertook a study on the impact of RTAs on a commodity level (disaggregate data) and results showed that the RTA under study (CUSTA) was trade creating. Claussing argued that the use of disaggregate data allows a better analysis of the effect of tariff changes to trade flows and it allows for the distinction between the effects of a trade agreement from other factors affecting trade.Jayasinghe and Sarker (2004) also did a study on the trade creating and diverting effects of NAFTA on a disaggregated level. The study covered six agricultural commodities and covered the period 1985 to 2000. The extended gravity model was used and pooled cross section estimation revealed that there was growth in the share of intra-regional trade in NAFTA.

Most studies found in literature that used the gravity model to analyse the impact of RTAs on trade have used regional dummies to quantify the trade creation and trade diversion effects of RTAs. However, Darku (2009) in his study on "The gravity model and the test for regional integration effect" argued that the correct econometric technique was to use country specific dummies. The study was for Tanzania and he used data for Tanzania's 23 trading partners for the period 1980 to 2004. The study's results showed that EU and EAC have had modest trade creating effects on Tanzania's trade and that countries like Hong Kong, India, Singapore and USA were more open to Tanzania's trade.

Another study done by the Bank of Tanzania on assessing the condition of dynamism of intra SADC trade in 2014 also used a gravity model, but differently from most studies, included value of manufacturing as a control variable. The variable was found to have a significant positive relationship to Tanzania's trade flows. Other control variables like GDP, population, exchange rate and landlocked also showed significant positive effects on trade flows. In addition the Seemingly Unrelated Regression (SUR) estimation was done to capture individual heterogeneity of countries. The results of the SUR estimates showed that GDP has a positive effect on trade for all SADC countries except for Mauritius which had a negative significant effect.

Lee and Shin (2006) examine the trade creation and trade diverting effects of RTAs in East Asia and cover 175 countries for the period 1948 to 1999. The authors use regional trade dummies that take the value of one if a country belongs to some other RTA and zero if otherwise, to be able to capture trade diverting effects of RTAs. To be able to capture the impact of characteristics of member states on trade creation and diversion, the authors included dummies such as language, border and colonial history. The results revealed that the regional trade agreements in East Asia were more trade creating than diverting and that country specific effects contributed significantly to trade flows in that region. The study showed that countries that are close to each other and share a common language and a common border are more trade creating than trade diverting.

2.7 Summary and Conclusion

The chapter gave an overview of theoretical and empirical literature on the different trade aspects. A detailed account of the Neo-classical and New Trade theories of trade was given, as well the implications of trade agreements using these trade theories. The trade creating and trade diverting effects of RTAs were also discussed. Empirical studies that used different methodologies have also been reviewed and these are the simulation approach, descriptive approach and the econometric approach. The general conclusion from results of most studies is that RTAs are more trade creating than they cause trade diversion. Most studies have used the simulation approach (CGE) and the econometric approach. Concerns however have been raised over the validity of the CGE model due to the parameter selection criterion used and the fact that it is prospective rather than retrospective.The econometric approach (gravity model) has more advantage over other methodologies as it can be appraised with standard statistical criteria. The

objective of this study is to assess the impact of SADC and COMESA on Zimbabwe's trade using the gravity model.

CHAPTER 3: METHODOLOGY

Introduction

This chapter explains the traditional gravity model as well as the model specification for the present study. The rationale behind variables selected is also given and the data description and sources are given. The theoretical expectations of the signs of variables are also discussed. Lastly, econometric issues which include how to deal with zero trade values and the econometric tests to be undertaken are also detailed in this chapter.

3.1 The Gravity Model

The gravity model will be used in this study to analyse the impact of RTAs on Zimbabwe's trade flows. The gravity model of trade was adopted from Newton's Law of Universal Gravitation (1687) which states that force of gravity between a pair of objects is proportional to the product of their masses divided by the square of the distance between the two objects, that is:

$$F_{ij} = G \cdot \frac{M_i . M_j}{D^2{}_{ij}} \quad \ldots\ldots (1)$$

Where F_{ij} is attractive force, M_i is the mass of object i, M_j is the mass of object j, D_{ij} is the distance between the objects and G is the gravitational constant. The gravity model was first applied to international trade by Tinbergen (1962) and Poyhonen (1963) and the model has been used in many empirical studies [Gosh and Yamarik (2004), Sawyer & Sprinkle (2004)and Darku (2009) among others]. The model sates that trade flows between two countries are explained by their economic masses and distance between them. The economic size of a country (proxied by GDP) is assumed to be directly proportional to trade flows whilst distance is inversely proportional to trade flows.

$$trade_{ij} = A \frac{(GDP_i \, GDP_j{}^{b1})}{distance_{ij}{}^{b2}} \quad \ldots\ldots (2)$$

Where-$trade_{ij}$ is the bilateral trade value between countries i and j,

- GDP_i and GDP_j are the GDPs of country i and j respectively,

-A is a constant.

Linearizing equation (2) will give equation (3):

$$logtrade_{ij} = A + b_1 \log(GDP_i . GDP_j) - b_2 \log(distance) + \varepsilon_{ij} \quad \ldots\ldots (3)$$

Where A, b_1 and b_2 are coefficients and ε_{ij} is the white noise error term.

The gravity model has proven to be a strong econometric model in ex post trade analysis due to its simplicity in implementing empirically and that it can be derived from underlying macroeconomic foundations (Bergstrand 1985). The model is also less subject to omitted variables problem when compared to the CGE model. More reliable data isalso used in the gravity model than in the CGE or descriptive models (Learmer and Levinsohn, 1995).

Though the gravity model has been used intensively in the empirical studies of trade, it is criticised for being a crude tool for policy analysis and for lacking coherent theoretical foundation. The model does not incorporate dynamic effects and also industry cross linkages thus may underestimate the impact of tariffs on trade. However the discussion done in section 2.4 on studies done by Anderson (1979) and Bergstrand (1985, 1989) among others, indicate that the gravity model of international trade does have a theoretical foundation.In addition, to capture dynamic effects, the gravity model can be augmented with lagged variables.

3.2 Gravity Model for the present study

There is general consensus among researchers on the specification of the general gravity equation but disagreements exist on the other variables that are to be included in the extended gravity model. Various researchers have included different explanatory variables to assess the impact of several trade policy issues, as discussed in section 2.6. To assess the impact of RTAs, dummies for each RTA under study are added to capture the trade diversion and trade creation effects of the RTAs between member states. Other variables thatcan be included in the extended gravity equation are exchange rates, interest rates, common border, language and inflation among others.

In this study, the author will follow the Ghosh and Yamarik (2004) gravity model specification and the following gravity model will be estimated:

$$lnx_{ijt} = \beta_0 + \beta_1 ln(y_{it}) + \beta_2 \ln(y_{jt}) + \beta_3 \ln(n_i) + \beta_4 \ln(n_j) + \beta_5 er_{it} + \beta_6 d_{ij} + \beta_7 maf_{it} + \beta_8 Boder_{ij} + \beta_9 inf_{it} + \gamma_1 COMESA_{ij} + \gamma_2 COMESA_i + \gamma_3 SADC_{ij} + \gamma_4 SADC_i + u_{ij} \quad \ldots\ldots(4)$$

Where:

x_{ijt} isexports from Zimbabwe (i) to its trading partner (j) at time t,

y_{it} is Zimbabwe's GDP at time t,

y_{jt} is trading partner's GDP at time t,

n_i isZimbabwe's population,

n_j is the tradingpartner's population,

er_{it} is the real effective exchange rate at time t,

maf_{it} is the value of manufacturing for the reporting country (Zimbabwe) at time t,

inf_{it} is inflation rate of the reporting country (Zimbabwe) at time t,

d_{ij} is the distance between Zimbabwe and the trading partner,

$Boder_{ij}$ is the dummy variable representing whether *i* and *j* share a border,

*j*are all countries in the SADC and COMESA trading blocs,

$COMESA_{ij}$, $COMESA_i$,$SADC_{ij}$ and $SADC_i$ areregional integration dummy variables,

where:

$COMESA_{ij}$ = 1 if Zimbabwe and its partner, j, both belong to COMESA and 0 otherwise,

$COMESA_i$ = 1 if the trading partner, j, is not a member of COMESA and 0 otherwise,

$SADC_{ij}$ = 1 if Zimbabwe and its partner, j, both belong to SADC and 0 otherwise,

$SADC_i$ = 1if the trading partner, j, is not a member of SADC, and 0 otherwise.

A model with Zimbabwe's imports as a dependent variable (equation 5) will also be estimated. The distinction between the exports and imports regression is to enable the researcher to identify whether the estimates differ between exports and imports thus being able to determine the effect of RTAs on imports and exports individually.

The import gravity equation to be estimated is as follows:

$$lnm_{ijt} = \beta_0 + \beta_1 ln(y_{it}) + \beta_2 \ln(y_{jt}) + \beta_3 \ln(n_i) + \beta_4 \ln(n_j) + \beta_5 er_{it} + \beta_6 d_{ij} + \beta_7 maf_{it} + \beta_8 Boder_{ij} + \beta_9 inf_{it} + \gamma_1 COMESA_{ij} + \gamma_2 COMESA_i + \gamma_3 SADC_{ij} + \gamma_4 SADC_i + u_{ij} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(5)$$

Variable x_{ijt} is Zimbabwe's exports in U.S. dollars andm_{ijt} is Zimbabwe's imports in U.S. dollars. A large number of studies have used bilateral trade flows as the dependent variable but this study will use both exports and imports instead. This is because Cernat (2001) argues that using bilateral trade flows fails to distinguish between the effects of RTAs on exports (imports) from non RTA members to member countries from exports (imports) from RTA members to non-member countries.y_{it} andy_{jt} are GDPs in nominal terms. The distance variabled_{ij} is in kilometres and it measures the weighted distance and not actual distance between the capital cities as some capital cities do not represent the economic centre of the country.

$Boder_{ij}$ is a dummy variable which takes the value of 1 if Zimbabwe and its trading partner share a common border and zero if otherwise. The regional integration variables measure the trade creation and diversion effects of the two agreements under scrutiny. $COMESA_{ij}$ and$SADC_{ij}$ measure the amount intra-regional trade. Ifγ_1 and $\gamma_3$are positive and significant, it means that there is increased intra-regional trade between Zimbabwe and its trading partner that is stimulated by the implementation of SADC and COMESA trade agreements and this is evidence that there is trade creation.

$COMESA_i$and$SADC_i$ measure the amount extra-regional trade.The coefficients measure the extent to which regional bloc member countries under imported or over imported from non RTA members relative to what the standard gravity model predicts. If $\gamma_2$and γ_4 are positive and significant, then it indicates presence of extra regional trade. This means that the regional blocs are open to rest of the world imports. If the coefficients are negative and significant, it indicates that there is less trade with non RTA members. There is areduction in imports from the rest of the world and member states have moved to exporting to members rather than to non-member countries. This is referred to as trade diversion that has been induced by the implementation of the RTAs. The table below summarises the interpretation of the regional dummy coefficients.

Table 3: Interpretation of regional dummy coefficients

	$COMESA_{ij}$ and $SADC_{ij}$	$COMESA_i$ and $SADC_i$
Trade creation and trade expansion	> 0	> 0
Trade diversion	> 0	< 0
Trade expansion	< 0	> 0
Trade contraction	< 0	< 0

Source: Own computation from Cernat (2003)

3.3 Data description and data sources

The data for exports and imports is from COMTRADE database whilst data on GDP, population and exchange rate is from IMF data base. Distance data was obtained from Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) data base and real effective exchange rate data was obtained from UNCTAD data base. The data is annual and focuses on the 25 countries that are members of SADC and/or COMESA for the period 2000 to 2014. The period 2000 to 2014 was chosen because thestart year 2000 coincides with the year SADC trade protocol began to be implemented as well as the launch of the COMESA FTA. This enables the author to trace the progress of SADC FTA and COMESA FTA trade patterns.

Table 4: Apriori theoretical expectations

Name of Variable	**Expected sign**	**Theoretical intuition**
Exporter GDP/ Importer GDP	positive/ negative	-Exporter GDP measures production capacity, and importer GDP measures absorption capacity. Growth in economic capacity means a boost in exports. -Increase in exporter GDP means more income and more demand for locals hence less exports. -Increase in importers GDP means more production hence becoming self-sufficient and less imports
Common border	positive	Sharing a common border facilitates trade.
Distance	negative	Distance is a proxy for trade costs and other trade restrictions, the greater the distance, the more the costs, thusthe lesser thetrade.
Population	negative/ positive	A big population can mean self-sufficiency, thus less trade (absorption effects) and can also imply larger economies of scale resulting in increased exports.
Regional dummies (COMESA and SADC)	positive	The objective of entering into an RTA is to boost trade flows.
Exchange rate	positive	Depreciation of currency (higher exchange rates) makes the local currency to effect payments for imports cheaper for trading partners. Demand for Zimbabwean exports increase.
Inflation	positive	Inflation causes depreciation of currency makes the

		local currency cheaper for trading partners. Demand for Zimbabwean exports increase.
Value of manufacturing	positive	Increased manufacturing means increased capacity to export

3.4 Handling the problem of zero values

The data includes some zero trade flows which may pose as a problem when we take the natural logarithm of the data as natural logarithms are only valid for values greater than zero. Dropping the zero variables will result in biased estimates as there may be a reason why the trade flow is zero, to curb this problem Sandberg et al (2006) suggests that a value of 1 be added to the dependent variable before the natural logarithm transformation is done. The dependent variable thus will be $x_{ijt}{}^{*} = x_{ijt} + 1$. This implies that if trade flow is zero, it means $x_{ijt} = 0$ and $x_{ijt}{}^{*} = 1$. Taking the natural logarithm of $x_{ijt}{}^{*}$ will give the value of 1 ($\ln(x_{ijt}{}^{*}) = 1$). Where the trade flows are greater than zero, the natural logarithm of $x_{ijt}{}^{*}$ will not be significantly different from that of x_{ijt}. The above also applies for the imports model.

3.5 Econometric tests

Equation (4) and (5) are estimated using the Pooled Cross Section (PCS) and Random Effects (RE) and the Breusch-Pagan test isused to test which model is appropriate for the data. The Hausman Taylor test is also conducted to compare the appropriateness of Random effects versus the Fixedeffects. Multicollinearity test will also be conducted. The unit root test will also be performed to check for stationarity of the data.

3.6 Conclusion

The chapter discussed the origins of the basic gravity model and the augmented gravity model which will be estimated in this study. The explanatory variables of the augmented model chosen in this study are exchange rate, common border, value of manufacturing, inflation and the regional integration dummies which enable the isolation of trade diversion and trade creation effects of RTAs. The problem of zero trade flows will be solved by adding 1 to the dependent variable before taking the logarithm. The data sources are also discussed as well as the expected signs of the estimates. The next chapter is on empirical results and discussion.

Chapter 4: Estimation Results and Discussion

4.1 Econometric method

Equations (4) and (5) are estimated using the Pooled Cross Section (PCS) and Fixed Effects (FE). The Breusch- Pagan test for Random effectsis conducted to determine the poolability of countries (whether they are homogenous or heterogeneous) and the null hypothesis of poolability is rejected for both the exports and imports model (p value = 0.000), accepting the alternative hypothesis that there are random effects (i.e. specific individual effects). Results are shown in **Table 4**Appendix 1.

The Hausman- Taylor Test for fixed-random effects is also conducted to check which model best fits the data. The Hausman Test results show that random effects are preferable than fixed effects for both the imports and exports models as we fail to reject H_0 (p value= 1.000)(results in Appendix I in **Table 5**).Another reason to choose random effects is that the aim of this study is to assess the impact of RTAs on Zimbabwe's trade, which is an aspect of trade policy analysis, but if the aim of the study was for structural analysis, fixed effects would have been preferable. This study therefore estimates the gravity modelusing Ordinary Least Squares method with the random effects specification.

To test for multicollinearity this study used the Correlation Matrix. Results in Appendix 1 **Table 6**show that there is no multicollinearity between the variables used in the study as all values in the correlation matrix are below 0.8.

The test for stationarity used is the Augmented Dickey Fuller unit root test. Results in Appendix 1 **Table7** show that the null hypothesis that there is a unit root is rejected at 1% level of significance (p value = 0.0000). This means that the data is stationary.

4.2 Econometric findings

Table 8: Export regression results

Dependant variable: EXPO

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1507.914371	388.877834	3.877604	0.0001***
GDPZIM	-29.312478	9.944595	-2.94758	0.0035***
GDPIMP	-0.78591	0.495935	-1.5847	0.1144
POPZIM	-106.348891	35.817040	-2.96923	0.0033***
POPIMP	1.136819	0.408688	2.781630	0.0058***

DIST	-0.343473	0.927325	-0.37039	0.7114
CB	4.197956	2.312931	1.814994	0.0708*
INF	0.002082	0.002216	0.939424	0.3485
MAF	43.138576	5.734123	7.523134	0.0000***
ER	0.235119	0.100702	2.334801	0.0204**
SADCi	-5.307273	2.464263	-2.1537	0.0323**
SADCij	-1.115789	2.531461	-0.44077	0.6598
COMESAi	-0.011172	2.325068	-0.00481	0.9962
COMESAij	-2.000395	2.265509	-0.88298	0.3781

R Square = 0.453586

Number of observations = 250

Number of groups = 25

Note *, ** and ***means coefficient is significant at 10%, 5%and 1% level of significancerespectively

Source: Regression results

Table 9: Imports regression results

Dependent Variable IMP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	993.070512	325.257385	3.053184	0.0025***
GDPZIM	-20.775056	8.181157	-2.53938	0.0117**
GDPIMP	-0.698298	0.567249	-1.23103	0.2195
POPZIM	-82.143146	29.851193	-2.75175	0.0064***
POPIMP	0.895732	0.494772	1.810393	0.0715*
DIST	0.662340	1.124359	0.589082	0.5564
CB	4.172006	2.803497	1.488143	0.1380
INF	0.002769	0.001827	1.515563	0.1310
MAF	39.302770	4.691316	8.377772	0.0000***
ER	0.208683	0.082367	2.533577	0.0119**
SADCi	-5.761533	2.993958	-1.92439	0.0455**
SADCij	2.144418	3.067477	0.699082	0.4852
COMESAi	-3.715983	2.826826	-1.31454	0.1899
COMESAij	-4.073584	2.751443	-1.48053	0.1401

R Square = 0.580680

Number of observations = 250

Number of groups = 25

Note *, ** and ***means coefficient is significant at 10%, 5% and 1% level of significance respectively

The exports and imports regression results in Table 8 and 9 reveal that some explanatory variablesthat have been included in the model are highly insignificant, that is, GDPIMP, DIST, CB, INF, SADCIJ, COMESAI and COMESAIJ. The models were successively reduced to get rid of redundant variables until parsimonious and robust models are estimated. Results are represented in **Tables 10** and **11** respectively.

Table 10: Export regression results for reduced model

Dependant. Variable: EXPO

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	25.134320	40.524405	0.620227	0.5355
GDPZIM	-14.69089	3.387648	-4.336605	0.0000***
GDPIMP	-1.152996	0.437511	-2.635351	0.0088***
POPZIM	3.480909	1.323648	2.629785	0.0089***
POPIMP	1.130365	0.405606	2.786858	0.0056***
DIST	-0.824652	0.250748	-3.288768	0.0030***
MAF	13.828685	2.488327	5.557423	0.0000***
ER	0.010265	0.044224	0.232111	0.8166
COMESAi	-0.97384	2.265990	-0.429764	0.6676
COMESAij	-1.33126	0.656941	-2.026453	0.0440**
SADCi	-6.460917	2.450539	-2.636529	0.0087***
SADCij	-1.034995	2.494439	-0.414921	0.6784

R Square =0.399814
Number of observations = 250
Number of groups = 25

Note *, ** and ***means coefficient is significant at 10%, 5% and 1% level of significance respectively.

Table 11: Imports regression results for reduced model

DependantVariable: IMPORTS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	47.518829	38.917477	1.221015	0.2229
GDPZIM	-13.70556	3.227742	-4.24618	0.0000***
GDPIMP	-0.315525	0.470782	-0.67022	0.5031
POPZIM	-8.330677	1.260854	-6.60717	0.0000***
POPIMP	0.802033	0.454971	1.762822	0.0788*
DIST	-0.109306	0.045886	-2.38212	0.0490**
MAF	19.866931	2.415021	8.226400	0.0000***
ER	0.028430	0.042164	0.674258	0.5006

COMESAi	-1.10709	0.552385	-2.0042	0.0402**
COMESAij	-1.376415	0.613501	-2.24354	0.0255**
SADCi	-1.620396	0.793522	-2.04203	0.0419**
SADCij	2.777494	2.798921	0.992344	0.3217

R Square =0.541409
Number of observations = 250
Number of groups = 25

Note *, ** and ***means coefficient is significant at 10%, 5% and 1% level of significance respectively

4.3 Critical analysis of the results

4.3.1 Exports Regression

The coefficients of GDP of both exporting country (Zimbabwe) and the importing countries are significant at 1% level of significance but carry a negative sign. This means that a 1% increase in Zimbabwe's GDP causes a decrease in exports by 14,69% and a 1% increase in GDP of Zimbabwe's trading partner reduces exports by 1.15%. This is in line with the model predictions, an increase in GDP of the exporting country means that individuals have more income hence there is increased demand by locals thus less goods are exported. Also, an increase in importer's GDP could be because the importer is producing more thus becoming self-sufficient and importing less from the exporting country (Zimbabwe).

The estimates for exporter and importer populations for the export regression are positive and significant at 1% level. This means that there is a statistically significant relationship between population of Zimbabwe and its trading partners and trade. A 1% increase in the population of Zimbabwe will result in the increase in trade by 3,48%. This is the economies of scale effect, where an increase in population in the exporting country means that more people are available in the production activities resulting in increased production for export.The results are in line with other studies' findings such as Makochekanwa (2012) and Eita and Jordaan (2007). An increase in the importer's population by one percentage point causes an increase in exports by 1,13%. Increased population in the importing country means increased consumption so the country imports more to cater for increased demand.

The effect of manufacturing on exports is positive and significant at 1% level of significance. A 1% increase in the value of manufacturing causes exports to increase by13,82%. This is

consistent with theoretical expectations since increase in manufacturing means more products are available for export. The study done by Bank of Tanzania (2014) also had similar findings.

Distance is negative and statistically significant at 1% level of significance. This is in line with theory since distance is a proxy of costs. A 1% increase in distance causes a reduction in exports by 0.8%. Jayasignhe and Sarker (2007) and Negasi (2009) obtained similar results.
Exchange rate was found to be positive and statistically insignificant. This means that the real effective exchange rate has no impact on its trade.

Trade creation and diversion effects of RTAs

The coefficients for the dummy variable for intra SADC trade (SADCij) and that for extra-COMESA trade (COMESAi) were negative and statistically not significant. This means that for the period under review there is no statistical evidence that Zimbabwe traded less with its SADC counterparts over and above what the standard gravity model predicts. Also there is no statistical evidence of fewer exports to non-COMESA countries (i.e. no statistical evidence of trade diversion emanating from being a signatory to COMESA regional bloc).

The coefficient for COMESAij is negative and statistically significant at 5% level of significance. This is an indication that Zimbabwe and countries in the COMESA FTA traded less over and above the levels that basic explanatory variables predict. **Table 12** below shows that Zimbabwe traded 65.69% $[(e^{-1.034995} - 1)x100\%]$ less with its COMESA counterpartsthan it traded with non-member states in the years under study. This means that there has been intra COMESA exports diversion. A possible explanation of this is the fact that many of the COMESA countries under study have not fully implemented the intra COMESA tariff reductions and elimination schedules thus intra COMESA exports has remained minimal. In addition most members of COMESA are small economies which rely on similar comparative advantage thus less chance of significant exchanges within the region.

The coefficient of SADCi is also negative and significant at 1% level of significance. This is a dummy that shows the openness of the SADC region. Calculations in Table 12 indicate that Zimbabwe exported64.47% $[(e^{-6.460917} - 1)x100\%]$ less to the rest of the world in the period 2000 to 2014. This is evidence of extra SADC trade contraction and trade diversion under SADC regional integration. It shows that SADC is not open to non-member countries. However,

caution has to be exercised when interpreting these results. In the first half of the period under study (2000 to 2007), the SADC FTA was not yet existent and most countries only implemented reduction in tariffs in 2008.In addition the region's intra trade could have been low due to the fact that its Rules of Origin are considered very complex and difficult to implement (Brenton 2005) and countries may choose to use bilateral agreements where there are in existence.

Table 12: Percentage change in intra and extra RTA dummy coefficients

Dependent variable: Exports			**Dependent variable: Imports**	
Variable	Percentage		Variable	Percentage
SADCij	-99.84		SADCij	1507.86
SADCi	-64.47		SADCi	80.22
COMESAij	-65.69		COMESAij	-74.75
COMESAi	-62.23		COMESAi	-66.95

4.3.2 Import Regression

Zimbabwe's GDP was found to be statistically significant at 1% level of significance but with a negative coefficient. This implies that a 1% increase in Zimbabwe's GDP results in the reduction in imports by 13.7%. This can be due to the fact that Zimbabwe's industry is under producing and the economy depends on imports to cover the production gap. An increase in GDP due to increased production of goods previously imported would mean that there is reduced need to import. Thus a negative relationship between GDP and imports. The GDP for the importing country was negtive and statistically insignificant for the import regression, though it was found to be negative and statistically significant in the exports regression.

The coefficient for Zimbabwe's population was negative and statistically significant at 1% level of significance. An increase in the country's population results in the decrease in imports by 8.33%. This means that an increase in population means that more people are available in the production activities resulting in increased production and less imports as people consume locally produced goods.Jordaan and Kanda (2011) found similar results. Trading partner's population was positive and significant at 10% level of significance. A 1% increase in the trading partners' population results in the increase in Zimbabwe's imports by 0.8%. Increased population means increased economies of scale in the partner countries thus they produce more for export to Zimbabwe. Zimbabwe's imports thus increase with an increase in trading partners' population.

The effect of manufacturing on imports is not different from that on exports. Value of manufacturing coefficient is positive and significant at 1% level of significance. A 1%increase in value of manufacturing causes an increase in imports by 19.86%.

The coefficient of distance was negative and statistically significant at 5% level of significance. A 1 % increase in distance reduces imports by 0.1%. This is also consistent with theory and the results are similar with what Jayasignhe and Sarker (2007) and Negasi (2009) found out.
Similar to the export regression results, exchange rate was found to be statistically insignificant. This means that the real effective exchange rate has no impact on its imports.

Trade creation and diversion effects of RTAs

The coefficients for the dummy variable for extra-COMESA trade (COMESAi) and that for intra-COMESA trade (COMESAij) were negative and statistically significant at 5% level of significance.This indicates that Zimbabwe and any of its member states traded less than the generally expected levels of trade. The results in table 12 for the coefficient of COMESAij show that Zimbabwe traded66.95% $[(e^{-1.37641} - 1)x100\%]$ less with COMESA member states than they did with the rest of the world. Also, Zimbabwe imported 74.75% $[(e^{-1.10709} - 1)x100\%]$ less from non-COMESA states than the predictions of the standard gravity model during the period 2000 to 2014.
This indicates that there has been intra and extra COMESA imports diversion emanating from being signatory to the COMESA regional bloc. The explanation given for exportsto account for the trade diversion in the regional bloc also applies with imports, that is, COMESA countries under study have not fully implemented the intra COMESA tariff reductions and elimination schedules thus intra and extra COMESA imports have remained very low.

Extra-SADC trade coefficient(SADCi) is also negative and significant at 5% level of significance. **Table 12** indicates that Zimbabwe traded 80.22% $[(e^{-1.620396} - 1)x100\%]$ less with SADC member states than it traded with non-SADC countries, thus there is extra-SADC trade diversionin the period under study. SADCij (intra SADC trade) is positive and statistically insignificant.

4.4Implications of the results on the impact of regional trade agreements on Zimbabwe

Basing on the findings in section 4.3 which presented the critical analysis of the results, the effects and implications of these results will be discussed in this section. This will assist in pointing out the effects of regional trade agreements on Zimbabwe's trade.

Zimbabwe's trade was found to be distance sensitive. Estimates are larger for exports than for imports, implying that the country's exports have a local scope. Most exports are thus destined to countries nearer to Zimbabwe, that is: South Africa, Mozambique and Zambia. An explanation of such a scenario is that when regional markets where opened up by the implementation of SADC FTA and COMESA FTA, more exports to and imports from neighbouring countries were realised because of the advantage of reduced costs of transportation. This means that entering into the regional trade agreement addressed the barrier to trade that transport costs bring. Also failure of Zimbabwe's exports to meet international standards has left the country with its COMESA and SADC counterparts as its export market since their standards have been harmonised by implementation of the trade agreements.

Zimbabwe's trade was found to be positively affected by value of manufacturing. Also, analysis in Chapter 2 revealed that Zimbabwe is an intermediate country with intermediate comparative advantage. The country should thus increase its manufacturing so that being part of the two regional blocs will be of maximum benefit to it. Venables theory of integration implies that integration will not only boost large country's (e.g. South Africa) exports to Zimbabwe but will also increase Zimbabwe's exports to other smaller countries in the regional bloc which cannot afford to import from larger countries in the region. Thus if Zimbabwe manufactures enough for export it will achieve increased trade from SADC FTA and COMESA FTA

The real effective exchange rate has no statistical effects on Zimbabwe's trade. It implies that movements in the currency values have no significant effect on the country's trade. A possible explanation is that the country has adopted the multi-currency regime, which gives it advantage to trade with its regional bloc member states without fearing the risks associated with movements in the value of currency. Costs of hedging against exchange rate movements are also eliminated.

Chapter 5:Conclusion and recommendations

5.1 Conclusion

This study investigated the impact of Regional Trade Agreements (RTA) on Zimbabwe's trade using an augmented gravity model with aggregated data for the period 2000 to 2014. The regional trade agreements under study were the Common Market for East and Southern Africa (COMESA) and Southern African Development Community (SADC).

The gravity model results show some expected signs for the variable GDP in both the exports and imports regression. The coefficients were negative and statistically significant for both the regressions except for the coefficient for GDP of the importer in the imports regression which was negative and insignificant. This implies that for the period under study, GDP was negatively related to exports and imports.

The distance variable was negative and significant for both regressions as expected in literature, whilst exchange rate was positive and not statistically significant for both regressions as well.

As for the variables that are of most interest to this study, results show that the magnitude of the impact of SADC and COMESA FTAs is the same for imports and exports. Overally the implementation of the two trading agreements has caused intra and extra-regional trade diversion. There is statistical evidence of less intra and extra COMESA imports as well as extra SADC imports than the levels predicted by the gravity model. This is all evident of the trade diversional effects that the regional trade agreements have caused in the period under review.

Though the results of the study show that RTAs have trade diversional effects on Zimbabwe, the theoretically expected trade creational effects of RTAs may not have been so for the Zimbabwean data used in this study due to certain critical issues that are associated with the country that impede the theoretically predicted positive effects of regional trade agreements. These include:

Overlapping multilateral and bilateral agreements- Zimbabwe is signatory to several bilateral and two multilateral trade agreements discussed in chapter 1. These overlapping trade agreements, according to Piazolo (2001) bring about difficulttrade regulations especially for Zimbabwe which has very little knowledge and administrative capacity. This results in reduced commitment by government agencies when implementing trade agreements.

Political and economic stability -Countries inAfrican region are characterised by civil and social unrest which supress impacts of integration. Burundi, Congo, Angola are marred with civil wars whilst Zimbabwe is battling with social and economic problems which have taken away their dominance in agricultural production in the African region. This has left the country with very little to export as it even struggles to meet the local demand.

Commitment by member states–Failure by member states to fully commit to the regional trade agreements is another reason Zimbabwe is not realising the full benefits of membership to regional trade agreements. For example, in instances were opening of the domestic market results in severe loss of tariff revenue, commitment by member states is very minimal. Thisresults in countries, Zimbabwe included, not fully realising gains from the RTA.

In conclusion, analysis of the effects of regional trade agreements done at country level does matter and it gives more appropriate and useful guidelines to policy. This is so because, all studies done on a group for countries, for example SADC countries (Negasi 2009), Eastern and Southern Africa (Makochekanwa 2012) have found trade creation effects of regional trade agreements but the exact effect on Zimbabwe is to the contrary according to the results of this study.

5.2 Recommendations

For Zimbabwe to fully gain from the regional trade agreements that it is signatory to, this study recommends the following:

Revision of regional trade blocs membership -Zimbabwe should resign from membership to trading blocs and bilateral trade agreements that are of little benefit to it. Zimbabwe is not benefiting much from being a signatory to COMESA FTA. This is because COMESA consists of small and poor countries like Rwanda, Burundi and Uganda which it rarely trades with because of the large distances between them. Also large countries like South Africa and Botswana with huge trade flows are not members of COMESA so Zimbabwe benefits very little from that trading bloc.

Political and economic stability -there is need to address the issue of political and economic instability as it affects investment into the production sector. Revision of the indigenisation policy is key to the country's economic break through and needs urgent attention so that investor confidence is restored.

Development of Infrastructure -infrastructural development in the form of transport links, that is resuscitation of the dying railway system, maintenanceof road networks among others, will go a long way in reducing costs associated with transport of goods for export and thus boosting trade since Zimbabwe's trade was found to be cost sensitive.

Increase productivity – Zimbabwe's monetary value of trade has been substantially low due to limited production capacity. In addition, the fact that most African countries in the region produce similar products makes meaningful trade between African regional blocs very difficult. This study thus recommends that the government of Zimbabwe follow policies that encourage sector cooperation so that there are benefits of economies of scale and increased productivity. Also incentives to manufacture high technology goods for export should be given to increase value of exports.

Adopt policies that foster both intra and extra regional trade – Successful experience shows that government should adopt policies that concurrently address the twin issues of growing the intra-regional market as well as the foreign market without isolating any one of the two. Concentrating on foreign market will result in weakening of intra- regional trade.

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Appendix 1

Table 5: Random Vs Pool effect test and Fixed Vs Random effects test

Breusch-Pagan test		Hausman test	
Exports model	**Imports model**	**Exports model**	**Imports model**
Null hypothesis: Variance of the unit specific error = 0	Null hypothesis: Variance of the unit specific error = 0	Null hypothesis: GLS estimates are consistent	Null hypothesis: GLS estimates are consistent
Asymptotic test statistic: chi square = 333.08	Asymptotic test statistic: chi square = 0.0000	Asymptotic test statistic: chi square =	Asymptotic test statistic: chi square = 0.0000
P Value = 0.0000	P Value = 1.0000	P Value = 0.0000	P Value = 1.0000

Source: Regression results

Table 6: Correlation Matrix: Testing for multicollinearity

	COMESAI	COMESAIJ	DIST	ER	EXPO	GDPIMP	GDPZIM	IMP	MAF	POPIMP	POPZIM	SADCI	SADCIJ
COMESAI	1.000000	-0.692533	-0.160002	1.04E-30	0.272957	0.259207	-0.000714	0.212631	6.27E-18	0.003764	-0.06183	-0.498117	0.498117
COMESAIJ	-0.692533	1.000000	0.177137	4.18E-18	-0.35445	-0.390206	0.000465	-0.354602	2.29E-17	-0.205613	0.039532	0.373300	-0.3733
DIST	-0.160002	0.177137	1.000000	-5.42E-19	-0.29669	0.123871	0.000217	-0.213064	-1.02E-17	0.024579	0.015860	0.318498	-0.345133
ER	1.04E-30	4.18E-18	-5.42E-19	1.000000	-0.15341	-0.049048	0.737856	-0.095513	0.349065	-0.00425	0.249670	1.02E-17	2.00E-17
EXPO	0.272957	-0.354448	-0.296685	-0.153414	1.000000	0.082159	-0.08183	0.692097	0.052969	0.231498	0.005000	-0.455349	0.405032
GDPIMP	0.259207	-0.390206	0.123871	-0.049048	0.082159	1.000000	0.107230	0.160422	0.217178	0.350908	-0.02411	-0.060729	-0.057509
GDPZIM	-0.000714	0.000465	0.000217	0.737856	-0.08183	0.107230	1.000000	0.093434	0.830865	0.023839	0.245507	0.001245	-0.00097
IMP	0.212631	-0.354602	-0.213064	-0.095513	0.692097	0.160422	0.093434	1.000000	0.280634	0.176426	-0.24156	-0.497137	0.471639
MAF	6.27E-18	2.29E-17	-1.02E-17	0.349065	0.052969	0.217178	0.830865	0.280634	1.000000	0.041278	0.136382	9.59E-18	3.48E-17
POPIMP	0.003764	-0.205613	0.024579	-0.00425	0.231498	0.350908	0.023839	0.176426	0.041278	1.000000	0.007253	0.153113	-0.144625
POPZIM	-0.061833	0.039532	0.015860	0.249670	0.005000	-0.02411	0.245507	-0.24156	0.136382	0.007253	1.000000	0.100227	-0.076057
SADCI	-0.498117	0.373300	0.318498	1.02E-17	-0.45535	-0.060729	0.001245	-0.497137	9.59E-18	0.153113	0.100227	1.000000	-0.837662
SADCIJ	0.498117	-0.3733	-0.345133	2.00E-17	0.405032	-0.057509	-0.00097	0.471639	3.48E-17	-0.144625	-0.07606	-0.837662	1.000000

Table 7: Unit Root Test Results: Testing for stationarity

Group unit root test: Summary

Series: GDPZIM, GDPIMP, POPIMP, POPZIM, CB, COMESAIJ, COMESAI, SADCI, SADCIJ, ER, DIST, EXPO, IMP,INF, MAF				
Date: 04/16/16 Time: 19:17 Sample: 2000 2014 Exogenous variables: Individual effects Automatic selection of maximum lags Automatic lag length selection based on SIC: 0 to 2 Newey-West automatic bandwidth selection and Bartlett kernel				
			Cross-	
Method	Statistic	Prob.**	sections	Obs
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	810.924	0.0000	220	2849
PP - Fisher Chi-square	1090.58	0.0000	220	2905

** Probabilities for Fisher tests are computed using an asympt
-square distribution. All other tests assume asymptotic normality.