
**A DISSERTATION ON**

# A COMPARATIVE ANALYSIS OF INDIA'S TRADE RELATIONS WITH SOUTHERN AFRICAN DEVELOPMENT COMMUNITY (SADC) COUNTRIES USING GRAVITY MODEL

**SUBMITTED TO LOVELY PROFESSIONAL UNIVERSITY**
**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE**
**DEGREE OF**
**MASTER OF SCIENCE IN ECONOMICS**

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# CERTIFICATE

This is to certify that the dissertation statement made by the student is correct to the best of my knowledge and belief. The dissertation is fit for submission as a partial fulfillment of the conditions for the award of the degree of Master of Science in Economics from Lovely Professional University, Phagwara.

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# DECLARATION

I hereby declare that the dissertation work study "A comparative Analysis of India's Trade Relations With Southern African Development Community (SADC)" is an authentic record of my own work carried out as requirement of dissertation for the award of degree of Master of Science in Economics from Lovely Professional University, Phagwara, under the guidance of Mr. Dilfraz Singh from 2016 to 2017.

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## Abstract

The purpose of this study was to analyse the trade relations between India and the Southern Africa Development Community (SADC) countries. To analyse these relations the random effect gravity model was used, this helped in determining the impact different factors have on the India and Southern African Development Community countries trade. The study analysed the impact the following factors have on the trade: GDP of both India and the SADC countries which represented the economic size, distance (distance between India and each SADC country), FDI inflows (of both India and SADC countries) and Trade Openness (of both India and SADC countries). The study also took help of three dummy variables of Landlocked (whether the SADC country is landlocked or not), Language (if India and SADC countries share a common language) and Colony (if the SADC countries shared a common colonial power). The results revealed that the GDP of India and the GDP of SADC have a positive impact on the trade while distance between India and the SADC countries has a negative impact. The study also revealed that being landlocked has negative impact on the India-SADC countries trade.

**Key words:** SADC, India, panel data, gravity model, trade, GDP, FDI

## TABLE OF CONTENTS

# INTRODUCTION

Trade is essential in the growth and stability of any economy in the world whether developed or developing. For this purpose the present study is going to analyse the trade relations between one of the emerging economic powerhouse, India and the Southern African Development Community (SADC) countries. In 2015-16 India was the fastest growing economy in the world with the gross domestic product growth rate (GDP growth rate) of 7.6 and India is also the second populous countries in the world. India's trade with African countries has been increasing in the recent past and is still increasing. This growth in trade between African countries and India is of great importance to both parties because African countries will have another market for their exports and India will also have another export destination for their products or goods too. For India and African countries to continue to grow economically they need to be involved in trade and for this Indo-Africa trade to happen efficiently African countries need to be in an economic integration (such as the SADC). These integrations are of great importance because some countries in Africa are landlocked. If these economic integrations were not present, those countries that are landlocked can find it difficult to trade especially with countries such as India which are far. We can conclude to say that economic integrations (like SADC) play a pivotal role in increasing the bilateral trade volume.

The present study is going to analyse the bilateral trade of the SADC countries with India. The trade is going to be analysed with the help the gravity model.

## Southern African Development Community (SADC)

This alliance was formed in 1980 and it comprised of seven countries from the Southern Africa. These countries were Angola, Botswana, Lesotho, Mozambique, Swaziland, Tanzania and Zambia and this alliance was called Southern African Development Coordination Conference. This was later changed to Southern African Development Community (SADC) in the year 1992 and now SADC comprises of 15 member countries namely Angola, Botswana, D.R Congo, Lesotho, Madagascar, Mauritius, Malawi, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. The Southern African Development Community (SADC) region comprises of 27.7% of the African population and 32.5% of the area of the total African area. The Southern African Development Community (SADC) region is the second largest contributor in terms of gross domestic product (GDP) to Africa. South Africa is the largest economy in the Southern African Development Community on gross domestic product and it's followed by Angola. The combined gross domestic product of all the Southern African Development Community countries was $686.8 billion in 2014. The average gross domestic product at current price was $2222 in 2014.

As you may know that an increase in trade will boost the economic growth of the whole region. The foreign or International trade of the Southern African Development Community (SADC) countries has been on an increase in the past years. If we compare the trade in 2004 and 2014 there is a huge difference. In 2004 the Southern African Development Community had 0.7% of the world trade and in 2014 it had 1.1% of the world trade that shows the stable increase.

**Table1.1: Macroeconomic Snapshot of SADC countries.**

| COUNTRY/ REGON | NORMNAL GDP (USD billion) | | | REAL GDP GROWTH (%) | | | GDP PER CAPTA (USD) | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2013 | 2014 | 2015 | 2013 | 2014 | 2015 |
| **Angola** | 124.2 | 129.3 | 102 | 6.8 | 4.8 | 3.5 | 5245.4 | 5303.9 | 4061.8 |
| **Botswana** | 15.1 | 15.2 | 13.1 | 9.3 | 4.4 | 2.6 | 7261 | 7233.1 | 6149.7 |
| **DR Congo** | 32.7 | 35.9 | 39.1 | 8.5 | 9.2 | 8.4 | 424.4 | 452.9 | 478.2 |
| **Lesotho** | 2.3 | 2.2 | 2 | 3.6 | 3.4 | 2.6 | 1194.7 | 1161.7 | 1062.6 |
| **Madagascar** | 10.6 | 10.7 | 9.5 | 2.3 | 3.3 | 3.4 | 462.5 | 452 | 392.6 |
| **Malawi** | 5.4 | 6.1 | 6.4 | 5.2 | 5.7 | 4 | 317.5 | 344 | 352.7 |
| **Mauritius** | 11.9 | 12.6 | 11.6 | 3.2 | 3.6 | 3.2 | 9476.5 | 9999.3 | 9186.5 |
| **Mozambique** | 15.6 | 16.7 | 17 | 7.4 | 7.4 | 7 | 604.7 | 629.8 | 626.2 |
| **Namibia** | 12.9 | 13.6 | 12.9 | 5.1 | 4.5 | 4.8 | 5955.3 | 6188.1 | 5787.7 |
| **Seychelles** | 1.4 | 1.4 | 1.4 | 6 | 3.3 | 3.5 | 15187 | 15140.7 | 14466.2 |
| **South Africa** | 366.2 | 350.1 | 317.3 | 2.2 | 1.5 | 1.4 | 6889.7 | 6482.8 | 5783.5 |
| **Swaziland** | 4.6 | 4.4 | 4.3 | 2.9 | 2.5 | 1.9 | 4178 | 3994.2 | 3847.7 |
| **Tanzania** | 44.4 | 48.1 | 46.2 | 7.3 | 7 | 6.9 | 969.1 | 1028.8 | 968.8 |
| **Zambia** | 26.8 | 26.6 | 24.5 | 6.7 | 5.6 | 4.3 | 1845.4 | 1771.6 | 1576.4 |
| **Zimbabwe** | 13.5 | 13.8 | 13.9 | 4.5 | 3.3 | 1.4 | 1028.5 | 1043.1 | 1037.2 |
| **SADC** | 687.7 | 686.8 | 621 | 5.4* | 4.6* | 3.9* | 2278.8* | 2222.1* | 1962.4* |

**Source:** IMF, World Economic Outlook October 2015.

## Indian Economy

The India economy was the fastest growing economy in 2015-16 with gross domestic product (GDP growth rate) of 7.6 and it's presumed to be growing above at 7 GDP. The Indian economy is the 7$^{th}$ largest economy in the world on nominal basis or if it's measured on nominal GDP and it's the 3$^{rd}$ largest economy on purchasing power parity (PPP). The India foreign reserves stood at $360 billion at the end of March 2016 and this higher than the previous year at the same time which was $341 billion.

In force India has trade agreements with some African countries. According to the India trade portal out of the 19 trade agreements India is involved in with Africa 11 of those are with countries in the Southern African Development Community, namely: Zambia, Angola, South Africa, Botswana, Seychelles, Mauritius, Mozambique, Swaziland, Zimbabwe, DR Congo and Tanzania. This show how important trade between the Southern African Development Community and India is to both parties. These trade agreements include articles that will make both parties benefit and for trade to run smoothly.

**Table 1.2: The following table show the trends of the Indian economy.**

| YEAR | Growth at 2011-12 prices | | | | Growth at current prices | | | |
|---|---|---|---|---|---|---|---|---|
| | GDP | GVA | GNI | NNI | GDP | GVA | GNI | NNI |
| **2015-2016** | 7.6 | 7.2 | 7.5 | 7.6 | 8.7 | 7 | 8.7 | 8.7 |
| **2014-2015** | 7.2 | 7.1 | 7.2 | 7.2 | 10.8 | 10.5 | 10.8 | 10.8 |
| **2013-2014** | 6.6 | 6.3 | 6.2 | 6.2 | 13.3 | 12.7 | 13.2 | 13.2 |
| **2012-2013** | 5.6 | 5.4 | 5.3 | 4.7 | 13.9 | 13.6 | 13.6 | 13.3 |

**Source:** IMF

## Indo-Africa Relations

India is becoming an increasingly important partner for African countries. This is so because India and Africa have common development challenges and people to people linkages. The India Africa relations are becoming stronger and stronger has time goes by with the organisation of the India-Africa forum summit. India is the fourth largest trading partner of Africa behind the European Union, China and the United States. To increase trade and ties Indian companies have become more involved with investment exceeding $35 billion in Africa, the India companies are mainly in the agriculture, oil and telecommunications.

**Table 1.3: Shows the exports of India to different regions of Africa from 2005 to 2013**

| REGION | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 |
|---|---|---|---|---|---|---|---|---|
| **North Africa** | 1593.21 | 1861.99 | 2652.26 | 3422.61 | 3125.18 | 3985.85 | 4693.63 | 5681.8 |
| **West Africa** | 1857.6 | 2446.76 | 3461.93 | 3357.08 | 3136.98 | 4296.61 | 6460.45 | 6523.39 |
| **Central Africa** | 165.27 | 203.54 | 257.7 | 384.87 | 349.63 | 465.03 | 707.8 | 931 |
| **East Africa** | 1437.42 | 2942.22 | 4214.15 | 4509.79 | 3512.18 | 5346.87 | 6594.24 | 8839.29 |
| **Southern Africa** | 1940.02 | 2814.93 | 3605.74 | 3139.07 | 3308.94 | 5619.11 | 6217.96 | 7166.98 |

**Source:** http://commerce.nic.in/eidb/ergn.asp

From Table1.3 above you can see how the trends in the exports of India to different African regions have been increasing from 2005 to 2013. We can conclude that as the relations are improving the trade volume are also improving.

## Indo-Africa Trade Agreements

At present India and 19 African countries are in agreement. Out of those 19 countries 11 are from the Southern African Development Community. This shows the seriousness of the India SADC trade. All the agreements were done to improve the efficiency of the bilateral trade between India and the African countries.

The agreements contained the following: In all the agreements there two parties agreed to trade under the World Trade Organization (WTO) laws. This means they will respect all the WTO rules of trade when trading. India and all the 19 African countries agreed to promote and accept the exports & imports from each other. All agreements also stated that payments between the contracting parties in pursuance of this agreement shall be effected in any freely convertible currency.

The agreements also included the follow: The contracting parties shall subject to laws and regulations in force in their respective countries and on conditions agreed upon by the competent authorities of both contracting parties, permit the import and export, free of custom duties, taxes and other similar levies or charges, not related to payment for services. The following statement applies on the following goods:

- Goods imported temporarily for experiments and research activities.
- Samples of goods and material required only for obtaining orders.
- Goods imported temporary for effecting repairs and which are re-exported.

In conclusion it can be said that these agreements were done to make the trade between the two parties easier and by so doing increase the bilateral trade flows. This is also an indicator of how essential trade is between the SADC countries and India.

## REVIEW OF LITERATURE

| AUTHOR | OBJECTIVES OF STUDY | METHODOLOGY | DATA SOURCES AND USED | MAJOR CONCLUSIONS |
|---|---|---|---|---|
| **Sinate, N.et al. (2016)** | The objective was to find out ways to improve or enhance India's engagement with the Southern African Development Community (SADC) countries on different aspects such as trade, investment etc. | Time series | IMF which included the Nominal GDP, Real GDP growth, GDP per capita, Consumer price inflation, Population and Land area of the member countries of SADC. | The major findings were that for the objectives to be attained there should be a strong development of the private sectors cooperation in the agriculture, manufacturing and also focus on IT development etc. |
| **Jozefina (2016)** | The objective of this paper was to find out the link between trade, trade openness and | OLS, time series and dependent variable and Independent variable | UNCTAD (trade balance 2015), OECD (gross exports 2015). | The result showed a positive effect of trade and trade openness on |

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| | the macroeconomic performance. | | | macroeconomic variables. |
| **Manzombi (2015)** | The objective of the study was to find out the fundamental determinants of the trade flows between the BRIC's countries and South Africa. This study employed the gravity model so that it can explain the bilateral trade between the countries. | Panel data, OLS, Time series. | World Bank (sectorial contribution to GDP and average annual % growth of the sectors) and from the IMF (GDP for the BRIC countries). | The conclusion to this study was that there was a positive significant relationship between the export flows of South Africa with the BRIC's and GDP in South Africa, real exchange rate and time dummy are found to have a negative relationship with export flows. |
| **Geda, Seid (2015)** | The objective of this study was to examine the potential of intra-Africa trade and also to find out the prospects of improving the regional economic integration with such trade. | Time series, dependent variable and Independent variable and OLS. | UNCTAD secretariat (regional integration, exports and imports). | The results of the research showed an existence of significant potential of intra trade and regional integration can improve the intra-trade. |
| **Lucey, N. et al. (2015)** | The objective of this paper was to examine ways in which various stakeholders can be involved in enhancing private-sector relations between India and Africa. | Time series data on exports to India, Indian investment flows to Africa and the FDI stock in India. | Ministry of Commerce and Industry, Government of India (FDI stock), Ministry of Finance, gov't of India (investment flows to Africa) and | The conclusion this paper was that private sector is one of the major driving force that can increase trade and investment between India and Africa. |

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| | | | UN COMTRADE (African export to India). | |
| **Were (2015)** | The objective of this paper was to analyze the effect of trade on the growth of the economy of the country and investment. This research was based on the cross-country data. | OLS, dependent variable and Independent variable | UNCTAD (exports) and WTO (exports shares). | In conclusion the results in this research showed that there is a positive impact of trade on the economic growth but for the Least Developed Countries (LDC) in which most of the African countries fall in trade is a major determinant of foreign direct investment (FDI). This also showed that domestic investment in developing countries and LDC's is driven by the trade and FDI. |
| **Conconi, N.et al. (2015)** | The objective of this paper is to examine how uncertainty affects firm's exports and FDI or Internationalization . | OLS, time series and dependent and Independent variables. | UNCTAD (world investment report). | The results indicated that firms tend to experiment with export to a particular country or market before establishing affiliates (FDI entry). |
| **Karambakuwa , N. et al.** | The objective of this research was | This used the gravity model and | European commission | The results showed a positive |

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| **(2015)** | to find out the determinants of trade flows between the European Union and Southern African countries (2001-2012). | used the OLS, Dependent and Independent variables. | and Caribbean community (interim EPA signatories) and SADC. | relationship between the population and GDP of Southern African countries on trade flows with European Union Countries. |
| **Doumbe, Belinga (2015)** | The objective of this research was to analyze the bilateral trade flows between Cameroon and the European Union countries. | The researchers used the gravity model, OLS and the independent and dependent variables. | Eurostat Comext (trade). | The results indicated that bilateral trade between Cameroon and European Union is positively affected by the size of the economy, per capita GDP and the distance between trading partners has a negative effect. |
| **Lucey, Makokera (2015)** | This papers objective was to examine ways improve private sector relations between South Africa and India. | Time series | Department of Trade and Industry, gov't of South Africa (trade). | The results indicated that a need to increase diversity trade was required and also involve the small and medium-sized enterprises. |
| **Prasai (2014)** | The objective of this is paper was to analyze the overall trade pattern and trade flows of Nepal by applying the gravity model. | OLS and dependent and Independent variables | IMF | The results revealed a positive relationship between trade and the economic size. It also showed a negative relationship between the |

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| | | | | distance between partners and trade. The results went further to show that there was no significant structural break in determinants of trade after economic liberalization. |
| **Nayyar, Aggarwal (2014)** | This research analyzed the trends in trade and investment between India and Africa. | Time series | Ministry of Commerce, gov't of India. | The results shows that the improved business climate and macroeconomic policies adopted by Africa will I increase trade and investment tremendously. |
| **Chakrabarti, Ghosh (2014)** | This paper investigated the foreign direct investment coming from China and India to Africa in current past. | Time series | UNCTAD (United Nations Conference of Trade and Development) , United Nations industrial development organization etc. | The research reveals that India is emerging as a preferred development partner because of the inclusive transparent and cooperative development linkages with Africa. |
| **Tripathi, Leotao (2013)** | The objective of this research was to analyze India's trade flows, this paper was using gravity model. | Panel data, Time series | Kof globalization index (variables). | The research revealed that political globalization and cultural proximity have a positive influence on bilateral trade. The common |

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| | | | | boarder, economic size also has a positive relationship with bilateral trade. |
| **Ecobank (2013)** | The objective was to analyze the India and Africa trade in soft commodities. | Times series | This research used the data it previously primarily collected in a different research. | In this research the results showed that in recent times the bilateral trade between Africa and India is increasing and there goods been traded are agricultural products and foodstuffs. |
| **Puseletso (2013)** | This paper tried to highlighted opportunities in which India and Africa can strength there connections. | Times series | | This paper revealed that the economies of India and China are becoming powerhouses of the global economy. This will lead to more opportunities for the private sectors and this will lead to more trade and ties. |
| **Lopes (2013)** | This papers objective was to find out the effect of trade and investment of the BRICS on the growth, employment and structural transformation in Africa. | Time series | African Development indicators, UNCTADstat etc. | This concluded that doing trade with the BEICS is important because its Carter's of 40% of the world population so negotiations of trade and investment that |

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| | | | | will benefit both parties is important. |
| **Didier, Hoarau (2013)** | The objective of this paper was to determine factors of bilateral trade flows between Sub-Saharan African and the BRIC's. | Time series, OLS and dependent and Independent variables. | World development indicators (WDI) and world bank. | The findings showed a negative impact of distance and geographical remoteness and a positive effect of SSA and BRIC's on GDP. |
| **Baynton-Glen (2012)** | The objective of this paper was to analyze the trade and investment between India and Africa. | Time series and dependent and Independent variables. | IMF, World Bank and Standard Chartered research. | This research showed that the trade between Africa and India is relatively small but is growing fast and is projected to increase in future due to Indian companies coming to Africa. |
| **Sinate, N.et al. (2012)** | This paper highlights India's trade and investment with Southern African Development Community (SADC). | Time series | IMF | The results of this research showed that for trade to increase at a high rate the following sectors should be targeted: Agricultural development, development of manufacturing sector, cooperation in hotel and tourism industry. |
| **Sharma, Ganeshan (2011)** | The objective was to analyze the India Africa partnership in the field of | Time series | The data was sourced from international trade Centre | The paper revealed that as the India economy is |

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| | energy. | | (trade performance), Ministry of Commerce and Industry, gov't of India. | growing and the demand for energy to support its development have opened up new dimension of India -Africa relations. |
| **Meyer, N. et al. (2010)** | The objective of this paper was to analyze the bilateral and regional trade and technical barriers from the views of Africans. | | World Bank, economic commission for Africa. | The findings showed that TBT infrastructure remains a handicap for business and government with exception of Southern African Development Community (SADC) and I'm SADC investment by regional economic communities in institutional infrastructure related to TBT has not been significant. |
| **Kabir, Salim (2010)** | The objective of this paper was to see if the gravity model can explain the BIMSTEC's trade. | OLS, time series and dependent and independent variables. | World Bank, IMF (trade direction). | The results indicated that common language and trade agreements have a positive relation on trade. Also the governance of both destinations can affect trade positively. |
| **Srinivasan, Archana** | This objective was to analyze the | This paper used the gravity model and | UNCTAD | The findings showed that the |

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| **(2009)** | determinants of aggregate and bilateral trade flows and firms decisions to export. | the OLS, dependent and Independent variables. | | pursuit of preferential trade agreements was counterproductiv e and the other options to solving this were unilateral and multilateral trade liberalization. |
| **Feyrer (2009)** | The objective of this paper was to analyze the effect of distance on trade taking an example of the closing of the Suez canal, In this paper the researcher used gravity model. | OLS and dependent and Independent variables | Glick and Taylor (2008) using the IMF direction of trade. | The findings showed that distance has a significant impact on the trade with an elasticity that is about half as large as estimate from topical cross-sectional estimates .while distance has an impact on trade, trade as an impact on income. |
| **Korinek, Melatos (2009)** | This paper examined the trade effect of the three regional trade agreements: the ASEAN Trade agreement, The Common Market for Eastern and Southern African and the Southern Cone Common Market in the agriculture sector. | This uses the gravity model, OLS and the dependent and Independent variables | WTO, CIA fact book etc | The findings showed that there was a strong trade creation with non-members in case of any RTA's. In some cases lack of transport and communication infrastructure, in addition to supply constraints lessens the effect of RTA on trade flows. |
| **Mohanty,** | The objective of | Time series | Ministry of | The results |

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| **Chaturvedi (2008)** | this paper was to analyze the India Africa partnership, trends and prospects. | | Commerce and Industry, gov't of India | showed India as an important export destination for several African countries in future and there is potential for more mutual gains in future too. |
| **Bhattacharyya, Banerjee (2006)** | The objective was to analyze India's trade direction using the gravity model. | OLS and dependent and Independent variables | | The findings were as follows; **1.**The core gravity model can be explain around 43% of the fluctuations in India's trade direction in the second half of the twentieth century. **2.** India's trade responds less than proportionally to the size and more proportionally to the distance. **3.** Colonial heritage is still an important factor in determining India's direction of trade at least in the second half of the twentieth century. **4.** India's trade is more with develop countries rather than the underdeveloped countries, |

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| | | | | however size is a more determining influence on India's trade than the level of development of the trading partner. |
| **Battersby, Ewing (2005)** | The objective of this paper was on how distance and economic size influences the level of international trade, taking an example of Australia. | This uses the gravity model and the OLS, dependent and Independent variables. | OECD (economic indicators) | The results showed that Australia is not doing as bad in comparison to the distance between its partners and it's also concluded that geographical location, economic size clearly plays a big role in international trade. |
| **Lai, Zhu (2004)** | The objective of this paper was to analyze the determinants of bilateral trade | Dependent and Independent variables | yearbook industrial statistics and international yearbook of industrial statistics | The results indicated that trade liberalization will shift trade from rich countries to poor countries and from within continental trade partners with preferential trade agreements in intercontinental trading partners. |
| **Faye N. et al. (2004)** | The objective of the paper was to analyze the challenges facing landlocked developing | Dependent and Independent | IMF | The findings showed that landlocked countries tend to lag behind because they |

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| | countries. | | | depend on the neighbour's infrastructure, cross-border political relations, dependence on neighbours peace because they are far from the cost. |

## Objectives of Study

- To analyse the trends in mercantile trade of the Southern African Development Community and India.
- To analyse the impact of economic size of their mercantile trade between India and the Southern African Development Community (SADC) countries.
- To analyse the impact or effect of distance (between SADC countries and India) on the bilateral trade.
- To analyse the effect of geographical location (whether landlocked or not)
- To analyse the impact Foreign Direct Investment (FDI) and trade openness on India SADC countries trade.

## Rationale of Study

Bilateral trade play an essential role in the growth and stability of any economy in the world and for this reason this paper is going to analyse the bilateral trade between the Southern African Development Community (SADC) countries with India. This study will show the impact or effects of trade factors on the bilateral trade and this will help the countries to strategize so that it can benefit more.

This study will also help in policy formation (like policies that facilitate trade) by either India or SADC countries and this will help in having effective bilateral trade and this will lead to an increase in trade volume and revenue. It will also encourage more economic integration among countries in the same geographical region because of the benefit they can get from trade when in an integration such as SADC. When two countries or more are having good relations (trade or political) this boosts private companies confidence to be involved in trade by setting up affiliates in the other countries and this will lead to more in the trade flows.

## METHODOLOGY

The present study will analyse the bilateral trade between India and Southern African Development Community (SADC) countries. The analysis will show the effects or impact of some variables of trade on the bilateral trade of India and SADC countries. In other words, the present study will analyse the determinants of the India SADC trade. The gravity model will be used to analyse the determinants of bilateral trade of India and the SADC countries. The gravity model has become one of the common models used to analyse trade in recent past. This model originally came from physics, in which it was used to analyse the gravitation pull between two objects which are close and far apart. This model showed that there is a greater gravitation pull between objects close than those far apart, this model was given by Newton in the 1600s. Using the similar concept an economist Timbergen in 1962 came up with how to analyse the trade flows between two countries near and far apart. Since its inception in economics the gravity model has been used to analyses the bilateral trade flows.

$$\boldsymbol{Fij = G * \frac{Mi^{a} Mj^{b}}{Dij^{c}}} \qquad (1)$$

Where **Fij** denotes the flow of trade between two countries **i** & **j**. **$Mi^{a}Mj^{b}$** are the economic sizes of two countries, which is usually measured by GDP or per capita GDP and **$Dij^{c}$** denotes the distance between the two countries. **G** denotes a gravitational constant.

### Econometrics Specifications

In order to facilitate the econometric conditions we are apply logs on both sides of the gravity equation. After apply logs on both sides of the gravity model equation (1) above its transformed into a linear econometric equation (2) below.

$$\boldsymbol{LnFij = LnG + aLnMi + bLnMj - cLnDij + \varepsilon ij} \qquad (2)$$

To analyse the determinants of the India SADC countries bilateral trade, this paper will take the trade flows (exports & imports) between India and each SADC country, the GDP's of the SADC countries and India's GDP on nominal basis and the distance between each SADC country with India. All the above will be analysed using the gravity model, the gravity model we will see the level of impact the GDPs which shows the size of the economy and distance (between each SADC country with India) have on the trade flows between India and the SADC partners. This paper will also use the dummy variables, In the present study the following dummy variables are going to be used, landlocked (whether the country is landlocked or not), language (whether the SADC countries share a common language with India or not) and the colony (whether India and SADC countries shared the same colonial power, which for India was Britain) this will help us analyse the impact of the listed dummy variables on the bilateral trade. Dummy variable or indicator variable shows two outcomes which can either be 0 or 1, this shows the absence and presence of some categorical effect which have different outcomes.

$$X = \begin{cases} \mathbf{1}, & \boldsymbol{The\ presence} \\ \mathbf{0}, & \boldsymbol{otherwise}\ (\boldsymbol{absence}) \end{cases}$$

In the equation above X is the independent dummy variable, the can indicate the following: if the SADC country is landlocked we put 1 and if not 0, If the SADC country shares a common language with India we put 1 if not 0 and If the SADC country had a same colonial power with India we put 1 and if not 0.

## EMPIRICAL ANALYSIS

This study was attempting to analyse the determinants that influence mercantile trade between India and SADC countries. This study took the total trade (exports + imports) as the dependent variables. The explanatory (independent) variables were GDP of India, GDP of partners (SADC countries), distance, FDI inflows of India, FDI inflows of partners (SADC countries), Trade openness of India, Trade openness of partners (SADC countries) and this study also took help of dummy variables of landlocked (whether the SADC country is landlocked or not), colony (whether they shared the same colonial powers) and the other dummy variable was language (whether India and SADC countries share a common language). The equation (3) below is an example of the regression equation which will be applied in this study.

$$\boldsymbol{Total\ trade_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \cdots + \varepsilon_i} \qquad (3)$$

**Total trade** is the dependent variable

$\mathbf{X_1}$ , $\mathbf{X_2}$ , $\mathbf{X_3}$, $\mathbf{X_4}$ Are the explanatory variables and $\boldsymbol{\varepsilon}$ denotes the disturbance term or error term.

$\boldsymbol{\alpha}$ Is the intercept and $\boldsymbol{\beta}'$s are the coefficients, where **i** show different years as of this study.

### Data and Sample Size

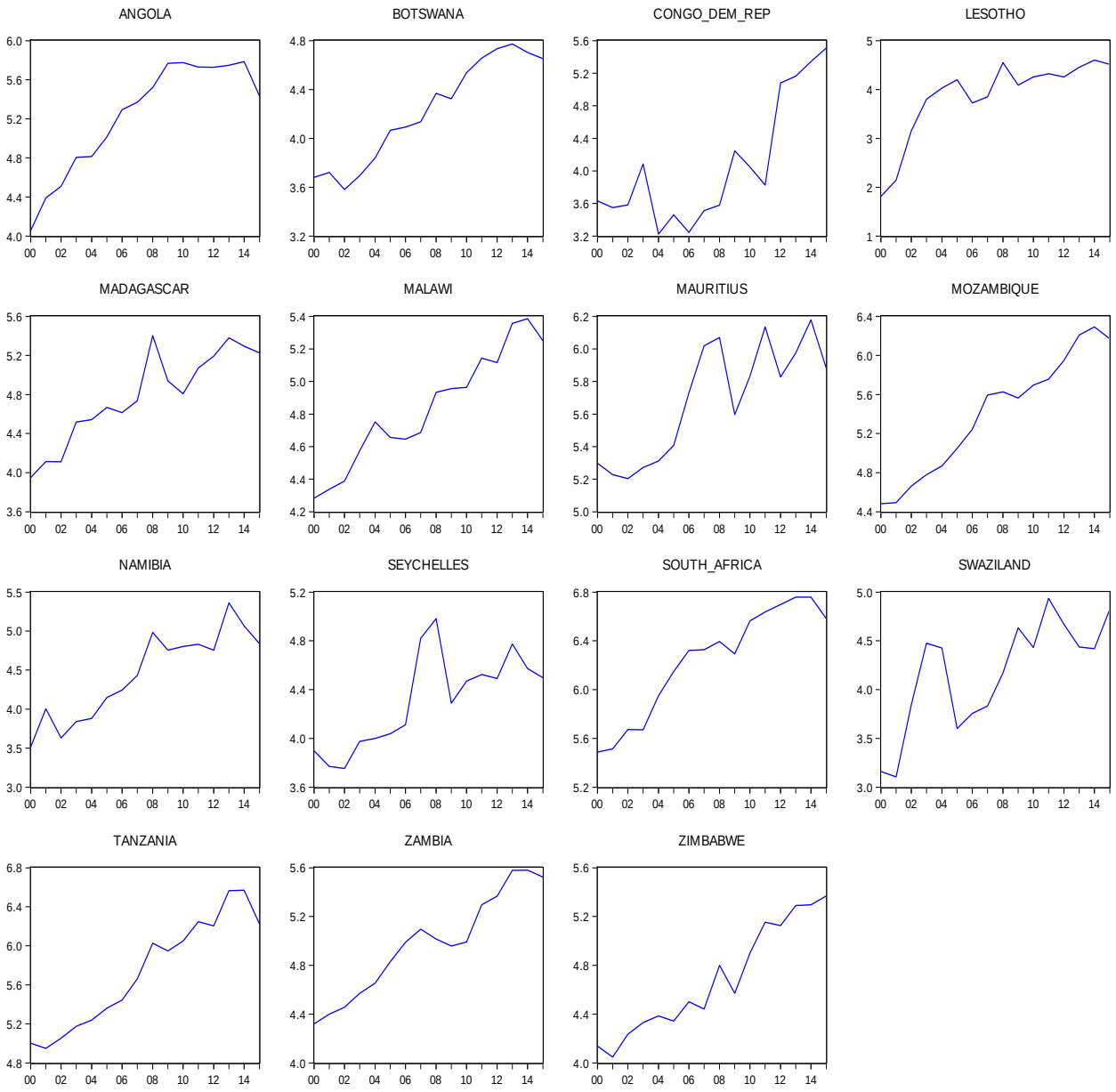
The data used in this paper is based on the secondary data. The data to be used to analyse the determinants of the India SADC trade will be based on the 15 years (2000-2015) data. The trade flow (exports & imports), GDP etc of the countries are sourced from World Bank, International Monetary fund world Economic Outlook. The data used in this study was in panel data form.

### Trend Lines of Trade (Exports and Imports)

Figure 1 shows the trend lines of exports by India to each of the SADC countries while Figure 2 shows the trend lines of imports by India from the SADC countries. From the results of the trend lines it can be seen that the trade in on an increase in all the countries even though in some of the years the trade declined. Trade between India and the SADC countries has been increasing as the years goes by, the SADC countries have become a market for Indian products (such as pharmaceutical products) and India is also a big market for SADC countries products (such as minerals). In recent years the India-Africa relations have been improving, these improved relations have paved way for more trade and investment my Indian companies in African countries. These improved relations have allowed more trade agreements to happen and as of 2016 India has 19 trade agreements with 19 African countries. Out of those 19 trade agreements

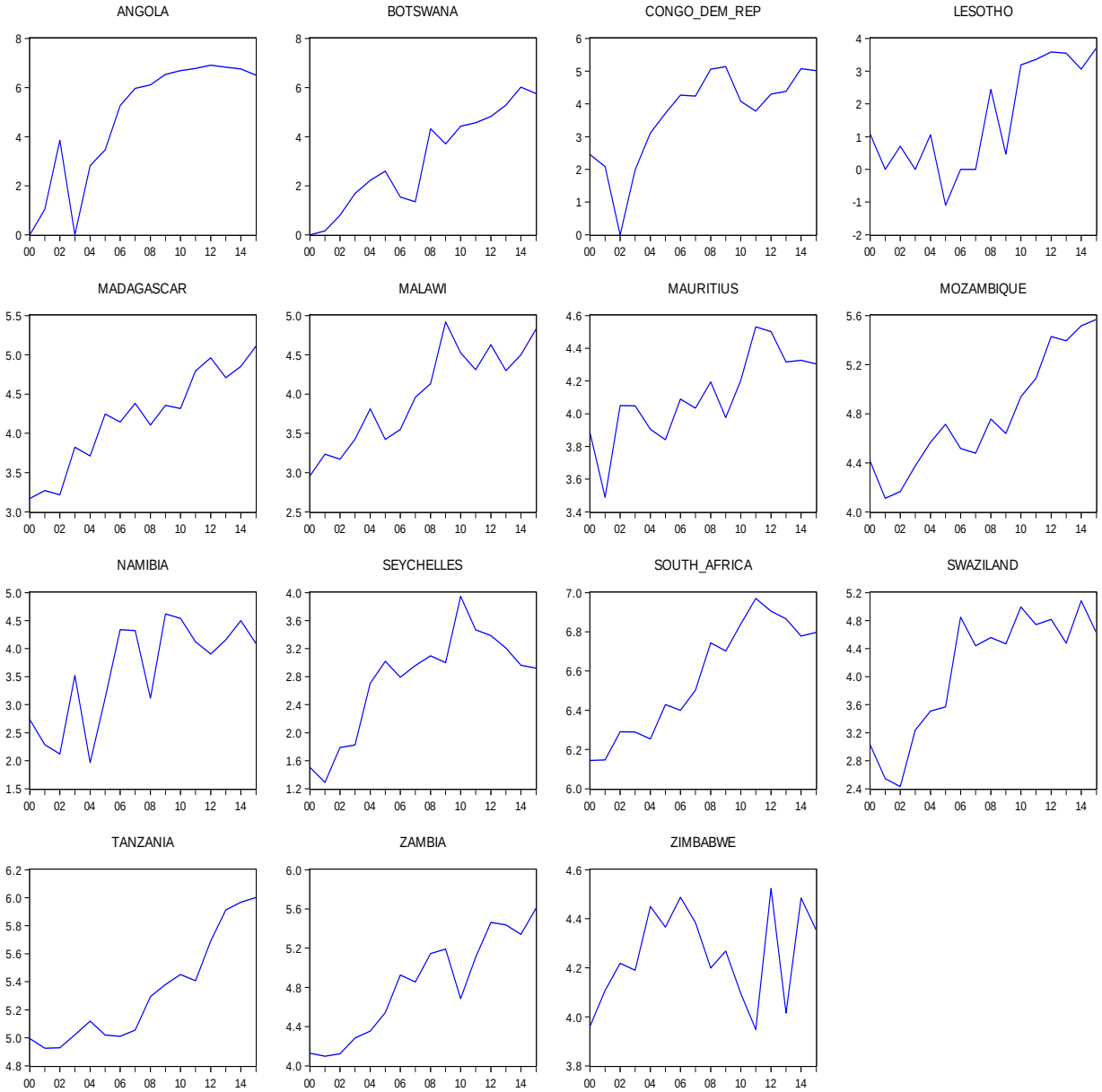
11 of them are with SADC countries, this shows the importance India-SADC trade. These trade agreements will allow more trade to happen between India and the SADC countries.

**Figure 1: Trend lines of exports from India to SADC countries or Imports by SADC countries from India (2000-2015)**




The above figure clearly shows how India's exports to the SADC countries have been increasing over time. The following are some of the major products India exports to SADC countries: Pharmaceutical products, electrical machinery & equipment, vehicles, and articles of iron or steel, the list goes on but these are some of the products.

**Figure 2: Trend lines of Imports by India from SADC countries or Exports by SADC countries to India (2000-2015)**




The exports by the SADC countries (imports by India from SADC countries) is also shows increasing trend lines although in some countries it's fluctuating. As you can see the exports in 2015 are more than the exports in 2000 by the SADC countries to India, this is a good indicator of trade growth.

Both figure 1 and 2 show increasing trade trends that means both sides are benefiting from trade to a certain extent. With the trade agreements in place as earlier discussed in this paper trade will continues to grow between India and the SADC countries.

## Empirical Results

### Table 2.1: Correlation between all the variables

| Correlation between Variables | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *LnTrade* | *LnGDPi* | *LnGDPj* | *LnDistance* | *FDI inflows j* | *FDI inflows i* | *Trade Openness j* | *Trade Openness i* | *Landlocked* | *Language* | *Colony* |
| *LnTrade* | 1 | | | | | | | | | | |
| *LnGDPi* | 0.5349 | 1 | | | | | | | | | |
| *LnGDPj* | 0.7943 | 0.3198 | 1 | | | | | | | | |
| *LnDistance* | 0.0537 | 0 | 0.4405 | 1 | | | | | | | |
| *FDI inflows j* | 0.3858 | 0.1395 | 0.4403 | 0.1657 | 1 | | | | | | |
| *FDI inflows i* | 0.4829 | 0.8664 | 0.2761 | 0 | 0.1691 | 1 | | | | | |
| *Trade Openness j* | -0.0054 | 0.0358 | -0.1932 | -0.4216 | -0.0694 | 0.0285 | 1 | | | | |
| *Trade Openness i* | 0.4854 | 0.8875 | 0.295 | 0 | 0.1057 | 0.7956 | 0.0805 | 1 | | | |
| *Landlocked* | -0.3525 | 0 | -0.3376 | 0.3193 | -0.1942 | 0 | -0.2243 | 0 | 1 | | |
| *Language* | -0.0734 | 0 | -0.2025 | -0.0086 | 0.0154 | 0 | 0.0143 | 0 | 0.4924 | 1 | |
| *Colony* | -0.087 | 0 | -0.1501 | 0.0105 | 0.0648 | 0 | -0.1396 | 0 | 0.6667 | 0.7385 | 1 |
| **Authors Estimations** | | | | | | | | | | | |

Table 2.1 shows the correlation between the variables in the study. Correlation measures the strength of relationship between two variables, it can range from negative one **(-1)** to positive one **(1)**. The value -1 or 1 indicates a perfect and strong correlation between the variables while zero **(0)** indicate weak correlation. The negative values indicate an inverse relationship and positive values indicate a direct relationship. The following is how the results can be interpreted, when it is -1 it means perfect negative correlation, between -0.50 and -1 means strong negative correlation, -0.50 means moderate negative correlation, between 0 and -0.50 is weak negative correlation, zero (0) means no correlation, between 0 and 0.50 means weak positive correlation, 0.50 means moderate positive correlation, 0.50 means strong positive correlation and 1 means perfect positive correlation. The diagram above shows a 0.5349 correlations between **LnGDPi** (Indian GDP) and **LnTrade** (trade between Indian and SADC countries) this means there is a moderate positive to strong positive correlation between the GDP of India and the trade between India and SADC countries. The above diagram also shows a 0.7943 correlation between **LnGDPj** (SADC countries GDP) and **LnTrade** (trade between Indian and SADC countries) this implies there is a strong positive correlation between the GDP of SADC countries and trade (trade between Indian and SADC countries).

**Table 2.2: Summary statistics**

| *Variables* | *Observations* | *Mean* | *Std. Dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| ***LnTrade*** | 240 | 5.051959 | 0.9294239 | 1.883377 | 7.135095 |
| ***LnGDP(i)*** | 240 | 12.03494 | 0.2256122 | 11.67816 | 12.32127 |
| ***LnGDP(j)*** | 240 | 9.970313 | 0.5977606 | 8.78879 | 11.61953 |
| ***LnDistance*** | 240 | 3.816219 | 0.0868633 | 3.580585 | 3.917205 |
| ***FDI inflows(j)*** | 240 | 8.865104 | 9.255273 | 0 | 9.995196 |
| ***FDI inflows(i)*** | 240 | 10.33846 | 10.15836 | 9.553883 | 10.64345 |
| ***Trade Openness(j)*** | 240 | 0.8379851 | 0.4419576 | 0 | 2.250231 |
| ***Trade Openness(i)*** | 240 | 0.4294488 | 0.1015147 | 0.2554527 | 0.5575262 |
| ***Landlocked*** | 240 | 0.4 | 0.4909218 | 0 | 1 |
| ***Language*** | 240 | 0.7333333 | 0.4431408 | 0 | 1 |
| ***Colony*** | 240 | 0.6 | 0.4909218 | 0 | 1 |

Authors Estimations

When the mean of the variables are close to each other or then there is not much difference between the means of the variables it implies that there is a symmetrical distribution. ***LnGD Pi***, ***LnGDP j***, ***FDI Inflows i*** and ***FDI inflows j*** have little difference in their means, implying a more symmetrical distribution. This is not the case with the rest. ***Std. Dev.*** (Standard deviation) shows or measures how concentrated the data are around the mean. The more the data is concentrated the data the smaller the standard deviation. The small standard deviation is desirable because there is less outliers. Outliers affect the mean and the standard deviation because it doesn't show or interpret the data well or correctly. From the diagram above we can see that the Standard deviations are small which a desirable situation.

## Results based on the Pooled OLS, Fixed Effects and Random Effects Models

Table 2.3 shows the results from all the three techniques used in this study. This is applied on all the models in this study, the table shows the estimator coefficients and there P-values (P>|t| or P>|z|). The estimator coefficients show the impact the explanatory variables will have on the dependent variable if a particular explanatory variable had to increase or decrease by one (1) unit or any percentage. For example if the explanatory variable ***LnGDP i*** in the Model One pooled OLS increases by one unit the dependent variable ***LnTrade*** will increase by 1.04 (coefficient of ***LnGDP i***). The P-values shows the significance of that specific explanatory variable, this shows if the variable actually has a significant impact on the dependent variable. The explanatory variables can be significant at 1%/5%/10 levels of significance. From table below it can be seen that most of the variables in the table below really have an impact on the India and Southern African Development Community (SADC) trade from the levels of significances of the variables. The Probability F-statistics (general model significance) in all the four models was (Prob > F) = 0.000 which means the model was significant at 1%/5%/10% levels of significance.

**Table 2.3: Estimated Results of the Gravity Model**

| **MODEL ONE (1)** | | | | | | |
|---|---|---|---|---|---|---|
| **Dependent variable: *LnTrade*** | | | | | | |
| | **Pooled OLS** | | **Fixed Effects** | | **Random Effects** | |
| **Explanatory variables** | **Coef.** | **P>\|t\|** | **Coef.** | **P>\|t\|** | **Coef.** | **P>\|z\|** |
| ***Intercept*** | -7.64 | 0.001 | 790.62 | 0.834 | -8.42 | 0.111 |
| ***LnGDP i*** | 1.04 | 0.000 | 1.1 | 0.000 | 1.08 | 0.000 |
| ***LnGDPj*** | 1.37 | 0.000 | 1.3 | 0.000 | 1.32 | 0.000 |
| ***LnDistance*** | -3.58 | 0.000 | -212.72 | 0.830 | -3.37 | 0.013 |
| ***Landlocked*** | 0.005 | 0.954 | (omitted) | (omitted) | -0.028 | 0.913 |
| ***Language*** | 0.21 | 0.003 | (omitted) | (omitted) | 0.21 | 0.397 |
| ***R-Square*** | 0.809 | | 0.791 | | 0.809 | |
| ***Adjusted R-Square*** | 0.805 | | | | | |
| **MODEL TWO (2)** | | | | | | |
| **Dependent variable: *LnTrade*** | | | | | | |
| | **Pooled OLS** | | **Fixed Effects** | | **Random Effects** | |
| **Explanatory variables** | **Coef.** | **P>\|t\|** | **Coef.** | **P>\|t\|** | **Coef.** | **P>\|z\|** |
| ***Intercept*** | -6.757 | 0.005 | 790.62 | 0.834 | -7.847 | 0.168 |
| ***LnGDP i*** | 1.032 | 0.000 | 1.103 | 0.000 | 1.08 | 0.000 |
| ***LnGDPj*** | 1.382 | 0.000 | 1.3 | 0.000 | 1.323 | 0.000 |
| ***LnDistance*** | -3.787 | 0.000 | -212.73 | 0.830 | -3.504 | 0.017 |
| ***Landlocked*** | 0.093 | 0.397 | (omitted) | (omitted) | 0.034 | 0.919 |
| ***Colony*** | 0.032 | 0.700 | (omitted) | (omitted) | 0.06 | 0.837 |
| ***R-Square*** | 0.802 | | 0.791 | | 0.802 | |
| ***Adjusted R-Square*** | 0.798 | | | | | |
| **MODEL THREE (3)** | | | | | | |
| **Dependent variable: *LnTrade*** | | | | | | |
| | **Pooled OLS** | | **Fixed Effects** | | **Random Effects** | |
| **Explanatory variables** | **Coef.** | **P>\|t\|** | **Coef.** | **P>\|t\|** | **Coef.** | **P>\|z\|** |
| ***Intercept*** | -4.747 | 0.130 | -2045.4 | 0.620 | -5.053 | 0.277 |
| ***LnGDP i*** | 0.811 | 0.001 | 0.853 | 0.000 | 0.799 | 0.000 |
| ***LnGDPj*** | 1.304 | 0.000 | 1.246 | 0.000 | 1.309 | 0.000 |
| ***LnDistance*** | -3.43 | 0.000 | 531.337 | 0.623 | -3.322 | 0.003 |
| ***FDI Inflows i*** | 4.87 | 0.198 | 5.78 | 0.018 | 5.74 | 0.018 |
| ***FDI Inflows j*** | 1.51 | 0.370 | -2.61 | 0.061 | -2.07 | 0.092 |
| ***R-Square*** | 0.802 | | 0.79 | | 0.798 | |
| ***Adjusted R-Square*** | 0.798 | | | | | |
| **MODEL FOUR (4)** | | | | | | |
| **Dependent variable: *LnTrade*** | | | | | | |
| | **Pooled OLS** | | **Fixed Effects** | | **Random Effects** | |

| Explanatory variables | Coef. | P>\|t\| | Coef. | P>\|t\| | Coef. | P>\|z\| |
|---|---|---|---|---|---|---|
| ***Intercept*** | -8.257 | 0.014 | 93.74 | 0.981 | -9.22 | 0.061 |
| ***LnGDP i*** | 1.072 | 0.000 | 1.08 | 0.000 | 1.089 | 0.000 |
| ***LnGDPj*** | 1.325 | 0.000 | 1.363 | 0.000 | 1.342 | 0.000 |
| ***LnDistance*** | -3.366 | 0.000 | -30.22 | 0.976 | -3.22 | 0.007 |
| ***Trade Opennes i*** | 0.015 | 0.979 | -0.103 | 0.796 | -0.081 | 0.835 |
| ***Trade Opennes j*** | 0.036 | 0.596 | 0.142 | 0.124 | 0.127 | 0.136 |
| ***R-Square*** | 0.8002 | | 0.794 | | 0.79 | |
| ***Adjusted R-Square*** | 0.795 | | | | | |

**Source:** Authors Estimates

## Diagnostic Tests

Before selecting the most efficient or effective technique and examining the estimated results of the panel regression in agreement with the best appraisement technique in this study, a number of diagnostic tests are required. Adhering to this prerequisite ensures that the estimated regressions depicting bilateral trade flows between India and Southern African Development Community (SADC) countries will no longer be biased and their coefficient estimators accurately explained.

## Hausman Test

In panel data analysis like this study the Hausman test is used to choose between the fixed effect model and the random effect model. So by applying this test we will be able choose the appropriate model to use in the study. The Hausman test also tests the endogeneity, endogeneity is when there is a correlation between the explanatory variables (X) and unique errors ($\mu_i$).

**Table 2.4: Hausman Test (Fixed Effect Model verses Random Effect Model)**

| | Model One (1) | Model Two (2) | Model Three (3) | Model Four (4) |
|---|---|---|---|---|
| **Hausman test (prob>chi2)** | 0.947 | 0.9432 | 0.8203 | 0.984 |

Source: Authors Estimates

**Null hypothesis (H0):** The Random effect model is the preferred model.

**Alternative Hypothesis (H1):** The Fixed effect model is the preferred model

Table 2.4 shows the p-values of the Hausman test and these results can be interpreted as follows. If the p-value is smaller than 0.05 (<0.05) the null hypothesis is reject, meaning accepting the alternative hypothesis and if the p-value is greater than 0.05 (>0.05) the null hypothesis is accepted. In all the models in this study the p-values are all greater than 0.05 and this implies that in all the models the random effect model is preferred over the fixed effect model. It can also be concluded that there is no problem of endogeneity in the preferred model because there was no correlation between the explanatory variables (X) and the unique errors ($\mu_i$) **{corr ($\mu_i$, X) = 0}**.

## Breush-Pagan Lagrange Multiplier (LM)

The Breush-Pagan Lagrange Multiplier is applied to see which technique between the pooled OLS and Random effect model to take in the study. Table 2.5 shows the probability chi-square results of all the models in the study (Model one, Model two, Model three and Model 4).

**Table 2.5: Breush Pagan Lagrange Multiplier (LM)**

| | Model One (1) | Model Two (2) | Model Three (3) | Model Four (4) |
|---|---|---|---|---|
| **Lagrange Multiplier (prob>chi2)** | 0.000 | 0.00 | 0.00 | 0.00 |
| Source: Authors Estimates | | | | |

**Null hypothesis (H0):** Pooled OLS should be used or is preferred

**Alternative hypothesis (H1):** Random Effect model should be used or is preferred

From the results of all the probability chi-square (prob>chi2) in the table above it can be concluded that the null hypothesis in all the models shouldn't be accepted. This is so because the probability chi-square in all the models was less than 0.05 (<0.05) which implies that in all the models the alternative hypothesis should be accepted, which means the random effect model should be used in the study.

## Random Effect Model

The following are some of the distinct differences of the random effect model in relation with the fixed effect model. Unlike the fixed effects model the variation across entities is anticipated to be random and uncorrelated with explanatory variables in the model. One of the major differences between the fixed effect model and random is whether the unobserved individual embodies elements that are correlated with the explanatory variables in the model. The random effect model takes into consideration that there some differences entities across that have some influences on the dependent variables. The random effect also takes into consideration the country specific factor these are factors which are present in that particular country and are not present in other countries these factors can be geographical location or minerals. In random effect model some time invariant variables can also be included, time invariant variables are those variables that does not depend on time.

$$\boldsymbol{Y_{it} = \alpha + \beta_{it} + \mu_{it} + \varepsilon_{it}} \qquad (4)$$

$\boldsymbol{Y_{it}}$ Is the dependent variable

$\boldsymbol{\beta_{it}}$ Is the explanatory variable

$\boldsymbol{\alpha}$ Is intercept term

$\boldsymbol{\mu_{it}}$ Is the between entity error and $\boldsymbol{\varepsilon_{it}}$ is within entity error

In this study the random variables is going to be used to analyse the determinants of the India-SADC bilateral trade.

## Interpretation of the Results

Since the random effect model was selected in all the models (model one, model two, model three and model four) after the Breush-Pagan Lagrange Multiplier test this implies that the random effects model is the one that shows the right representation of the bilateral trade between India and the Southern African Development Community (SADC). The following are the interpretation of the results in Table 2.3.

## Model One (1)

The first regression equation (model one) has six explanatory variable and two dummy variables. The follows is how the results of the random effect model can be represented in a regression equation.

$$\boldsymbol{LnTrade = -8.42 + 1.08(LnGDP\ i) + 1.32(LnGDP\ j) - 3.37(LnDistance) - 0.028(Landlocked) + 0.21(Language)}$$

According to Table 2.3 the results of random effects estimates for the gravity equation one (Model One), R-square value is 0.809 which indicates that the overall presentation of the model is really good. The coefficient of determination (R-square) shows that 80.9% variations in the dependent variable ($\boldsymbol{LnTrade}$) are being explained by the explanatory variables. The estimation of gravity equation gave signs of coefficients as predicted by the economic theory. According to the economic theory both GDPs of countries involved in bilateral trade have a positive impact and that is what the results in this study shows. From the above equation it can be concluded that LnGDP i and LnGDP j have a positive impact on the India-SADC countries trade has earlier mentioned while LnDistance and landlocked has a negative impact. This can be simplified has follows; India trade more with countries near or close in distance than country further way, so it can be concluded that distance has a negative impact on trade and this can be seen from James Feyrer study 2009 (Distance, Trade, and Income – The 1967 to 1975 Closing of the Suez Canal as a Natural Experiment, Dartmouth College and NBER). The equation also shows that landlocked (whether the SADC country is landlocked or not) has a negative impact on trade, this can be interpreted that being landlocked hinders some trade from happening because a landlocked country highly depends on the use of other country's seaports. This dependence usually affects the trade negatively, so it can be concluded that being landlocked affects India-SADC trade negatively. From the equation above it can be seen that Language (whether a SADC country shares a common language with India) has a positive impact on trade which implies that the India-SADC trade it's impacted positively by the common language share by both India and the SADC countries.

## Model Two (2)

The second regression equation has six explanatory variables with two dummy variables which are landlocked (whether a SADC country is landlocked or not) and Colony (whether a SADC country and India had common colonial power)

$$\boldsymbol{LnTrade = -7.847 + 1.08(LnGDP\ j) + 1.32(LnGDP\ j) - 3.504(LnDistance) + 0.034(Landlocked) + 0.06(Colony)}$$

The R-square the second random effect model was 0.802 which implies that 80.2% variations in the dependent variable (***LnTrade***) are being explained by the explanatory variables (LnGDP i, LnGDP j, LnDistance, Landlocked and Colony. The impact of the explanatory variables on the on the dependent variables is great, so Model two is good too. As it was in the first model the GDPs of India and SADC countries has a positive impact in this model two which is in line with the economic theories. In this model distance also has a negative impact as the earlier model while colony (sharing a common colonial power) has a positive impact on the India-SADC trade, in other word it can be said that share a common colonial power in the past can have a positive in the present bilateral trade volume.

## Model Three (3)

The third regression equation (model three) has five explanatory variables. This equation can be interpreted has follows

$$\boldsymbol{LnTrade = -5.053 + 0.799(LnGDP\ i) + 1.309(LnGDP\ j) - 3.322(LnDistance) + 5.75(FDI\ inflows\ i) - 2.07(FDI\ inflows\ j)}$$

The regression equation is showing the third random effect model from Table 2.3. As the two previous models this model also shows the positive impact of the GDPs on the India-SADC countries trade, this model is also showing a negative impact if distance on trade. The regression equation is also showing the positive impact of the India's FDI inflows on the India-SADC trade. This can be simplified has follows: if there is more FDI inflow in India this will impact the India-SADC countries trade positive which means that when the India's FDI inflows increases by one unit or one percent (%) the India-SADC trade (LnTrade) will increase by 5.053 units or 5.053%. In conclusion it can be said that the FDI inflows in India highly impacts the India-SADC trade. The equation also shows a negative impact of the FDI inflows into SADC countries on the India-SADC trade. In other words this can be explained as follows: when there are more FDI inflows into SADC countries the trade between India and SADC countries will reduce. From the above equation it was that when FDI inflows into SADC countries increases by one unit or one percent (%) the India-SADC trade will reduce by 2.07 units or 2.07%.

## Model Four (4)

The fourth and last model in this study also has five explanatory variables. From Table 2.3 the fourth random effect model can be written as follows in the regression equation form.

$$\boldsymbol{LnTrade = -9.22 + 1.089(LnGDP\ i) + 1.342(LnGDP\ j) - 3.22(LnDistance) - 0.081(Trade\ openness\ i) + 0.124(Trade\ openness\ j)}$$

As the earlier three models this model is also showing a positive impact of the GDPs and a negative impact if the distance. This model is also showing a negative impact of the trade openness of India (***Trade openness i***) the overall trade between India and the SADC countries. Trade openness is called using the following formula

$$\boldsymbol{Trade\ Openness = \frac{Exports + Imports}{GDP}}$$

Using the above formula we find trade openness of the countries, as you can see trade openness highly depends on three components which are exports, Imports and GDP. From the regression

equation it also shows that the trade openness of the SADC countries impacts the India-SADC countries trade positively implying that India trade more with a SADC country with more trade openness.

## CONCLUSION AND POLICY RECOMMENDATION

The objectives of this study were to analysis the determinants of the India and Southern African Development Community (SADC) bilateral trade and the trends of the India-SADC bilateral trade. In conclusion it can be said that the bilateral trade between India and the Southern African Development community (SADC) countries has been on an increase. This increase can be seen from each of the SADC country's exports and imports trend lines with India. This increase in exports and imports from both sides is a good indicator of the good prospects of the India-SADC countries trade.

In the panel data analysis were the random effect model was selected as the best model representing the impacts of the explanatory variables on India-SADC trade. After applying the random effect gravity model the following were the findings: The results revealed that the economic size which was represented by the GDP has a significant impact of the India-SADC countries bilateral trade. The results also showed that distance between India and SADC countries has a negative impact on trade which meant the further the SADC country from India less the bilateral trade with India. The study also showed that sharing a common language and colony (if India and any SADC country shared a common colonial power) has a significant impact on the bilateral trade of the SADC countries with India. The panel data analysis findings also revealed that FDI inflows in India and trade openness of the SADC countries have a significant impact on the trade between India and SADC countries.

This study also highlighted a strong positive correlation between the GDPs of SADC countries and the trade between India and the SADC countries and a moderate to strong positive correlation of the India GDP with the trade between India and the SADC countries. These were later backed by the coefficients of these variables in the equations. This showed how pivotal GDP is to trade though trade also plays an important role on GDP growth.

The following are some of the policy recommendations after the findings in this study. India and SADC countries should formulate and implement policies that will make the easy of doing business by so doing it will make the trade openness better. As you may know due to the improved policies on the easy to do business will have some multiplier effects of increase in trade volume which will also lead to growth in economic size (GDP). These policies can incentives in the trade sector of each country, reduces the paper works so that efficiency is improved. The FDI inflows in some sectors like manufacturing should be promoted by allowing more percentage in those sectors.

## REFERENCES


Alemayehu Gedaa & Edris Hussein Seidb (2015). The potential for internal trade and regional Integration in Africa. Journal of African Trade 2 (19–50).

Amanda Lucey, Mark Schoeman & Catherine Grant Makokera (2015). India–Africa relations: The role of the private sector. Institute of Security Studies (ISS paper 285)

David Sinate, Vanlalruata Fanai & Snehal Bangera (2016). Focus Africa: Enhancing India's Engagement with Southern African Development Community (SADC). Export Import Bank of India, working paper series (paper No 50).

Devika Sharma & Swati Ganeshan (2011). Before and Beyond Energy: Contextualising the India–Africa Partnership. SAIIA. Occational paper 77.

Ecobank (2013). India's soft commodity trade with Africa: Vital flows. Middle Africa insight series

Eric Doumbe Doumbe & Thierry Belinga (2015). A Gravity Model Analysis for Trade between Cameroon and Twenty-Eight European Union Countries. Open Journal of Social Sciences, 3, 114-122.

Huiwen Lai & Susan Chun Zhu (2004). The determinants of bilateral trade.

IMF (World Economic Outlook October 2015).

India Africa trade agreements (http://commerce.nic.in/eidb/ergn.asp).

Indian trade portal, Accessed in November 2016 (www.indintradeportal.in).

James Feyrer (2009). Distance, Trade, and Income – The 1967 to 1975 Closing of the Suez Canal as a Natural Experiment.

Laurent Didier & Jean-François Hoarau (2013). Determinants of bilateral trade between the BRICs and Sub Saharan Africa. CEMOI, University of La Reunion. JEL classification: O55 ; F1 ; F14

Mahfuz Kabir & Ruhul Salim (2010). Can Gravity Model Explain BIMSTEC's Trade? Journal of Economic Integration 25(1) 144-166.

Maureen Were (2015). Differential effects of trade on economic growth and investment: A cross-country empirical investigation. Journal of African Trade 2 (71–85).

Meyer, N. et al. (2010), Bilateral and Regional Trade Agreements and technical barriers to trade:

An African Perspective, OECD Trade Policy Working paper (No. 96) OECD Publishing.

Michael L. Faye, John W. Mcarthur, Jeffrey D. Sachs & Thomas Snow (2004). The challenges facing landlocked developing Countries. Journal of Human Development (Vol. 5, No. 1) Carfax publishing.

Prisca Manzombi (2015). Estimating trade flows: Case of South Africa and BRICs. University of South Africa.

Ranajoy Bhattacharyya & Tathagata Banerjee (2006). Does the gravity model explain India's direction of trade? A panel data approach. Indian Institute of Management Ahmedabad-380 015.

Rishika Nayyar & Priti Aggarwal (2014). Africa-India's new trade and investment partner. International Journal of Scientific and Research Publications (Volume 4, Issue 3) ISSN 2250-3153.

S. K. Mohanty & Sachin Chaturvedi (2008). India-Africa Economic Partnership: Trends and Prospects. RIS-DP # 134.

Sabyasachi Tripathi & Nuno Carlos Leitao (2013). India's Trade and Gravity Model: A static and dynamic panel data. MPRA Paper No. 45502.

Sarah Baynton-Glen (2012). African India trade & investment: playing to strengths. OTG on the ground (Standard Chartered global research)

Sukalpa Chakrabarti & Ishita Ghosh (2014). FDI in Africa: A Comparison of the Indian and Chinese Experience. Procedia - Social and Behavioral Sciences 157 ( 2014 ) 340 – 352.

T.N. Srinivasan & Vani Archana (2009). India in the Global and Regional Trade: Determinants of aggregate and bilateral trade flows and firms' decision to export. Working Paper No. 232.

www.archves.gov.in (accessed in November 2016).