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TRADE & INDUSTRIAL POLICY STRATEGIES



## THE IMPACT OF MODE IV ON TRADE IN GOODS IN THE SADC REGION: THE CASE OF SOUTH AFRICA

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**THE IMPACT OF MODE IV ON TRADE IN GOODS IN THE SADC REGION:  
THE CASE OF SOUTH AFRICA**

**REPORT PREPARED FOR TIPS FOR THE SADC TRADE DATA PROJECT**

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### Acronyms

GATS	General Agreement on Trade in Services
GDP	Gross Domestic Product
SA	South Africa
SADC	Southern African Development Community
SSA	Sub-Saharan Africa
WTO	World Trade Organization

## **Executive summary**

Information on the impact of immigration on a host country's trade with particular reference to the African continent and the SADC region remains scant, if indeed it is ever available. This study seeks to fill this gap with an analysis of data. More specifically, the main objective of this study is to analyze the impact of cross-border movements of SADC citizens into South Africa on the latter country's trade (exports and imports) with SADC countries from which the migrants had originated. The estimated results of this study confirm the existence of a positive and statistically significant migration-trade relationship in the case of South Africa's trade with its SADC trading partners.

Although there was a possibility of analyzing the perceived impacts of the various migration modes on South Africa's trade, the study analyzed only the impacts of total or aggregate annual migration from each of the top five SADC member countries from which migrants into South Africa originated. This was necessitated by two factors. Firstly, classification of migrant inflows from various SADC countries into South Africa as, for example, tourists, general workers, students or business visitors would have been difficult and might not have provided a true picture given that some foreigners enter the country ostensibly as tourists, but then stay and work (illegally). Secondly, and more importantly, there is no trade data classified in line with the categories of SADC migrants currently living in South Africa. For instance, export data will show only that South Africa exports X-amount of valued products annually to Zimbabwe (either at aggregate or at HS-digit levels), but such data will not show what proportion of those exports was influenced (or carried out directly) by Zimbabweans staying (or living) in South Africa as workers, students, tourists etc.

To achieve its objective, the study employed a gravity trade model in investigating the impacts of immigrant inflows into South Africa from five SADC countries on total trade, export trade and import trade with those countries. Estimations from the total trade gravity model indicated that a 1% increase in migrant inflows into South Africa from its five SADC trading partners increased total trade between South Africa and the five SADC countries by 0.17%. Results from the export gravity trade model show that a 1% increase in migrant inflows increased South Africa's exports by between 0.13% and 0.18%, and these results compare well with results from other previous studies. Lastly, results from the import gravity model equation indicated that a 1% increase in migrant inflows into South Africa raised the countries' imports by 1.9%. Overall, the findings of the study indicate that migrant inflows into South Africa from its SADC trading partners increase trade between South Africa and the SADC countries.

Whilst the estimated gravity model results clearly indicates the positive impacts of migrant inflows on South African's total trade, exports and imports the study does not recommend the South African government to encourage migrant inflows from other SADC member states based on the migrants' positive impacts on the country's trade. There are a number of reasons for this. Firstly, South Africa is still struggling with unemployment mostly of un-skilled and semi-skilled labour force, and allowing more migrants into the country may exacerbate this problem given that a larger proportion of

migrants from SADC countries are mainly un-skilled and semi-skilled. Secondly, increased migrants into South African will put pressure on government funded amenities such as housing and health, resulting in more pressure on government budget. Thirdly, given the relatively high rate of both crime in general and organized crime in particular, encouragement of migrant inflows into the country may even worsen the situation. Instead this research piece emphasises that, since trade (exports and imports) is just one of the many components which constitute the economic activities of the country, any policy which is aimed to encourage trade should be developed not in isolation, but should consider a range of factors, including those related to the movement of people.

# 1 Introduction and background

## 1.1 Introduction

*“Immigration...expands the size of the market. It will almost certainly enable many new interactions among workers and firms, so that both native workers and native-owned firms might potentially learn valuable information without paying for it. ...American firms...gain, because they can now use the social and information networks that link immigrants and the source countries to better market their products in foreign markets”, (Borjas, 1999, p. 96)*

The debate on whether the presence of migrants in a given country can result in positive externalities accruing to the destination host countries is of significant interest, not only because of immigration policy implications (Dunlevy and Hutchinson, 2001), but more so because of their effects on international trade. For instance, one of the major features of globalisation has been the escalation not only of trade in goods, but also in services and the rising cross-border flows of investments, accompanied by a surge in international movement of workers (Jansen and Piermartini, 2004). The movement of people across borders has been made easier by the availability of efficient transport and communication whose costs have also continuously been declining, especially in the past few decades. Falling costs in both communication and transport mean that migrants can now remain in constant communication with relatives in their home countries through cheaper email and phone communications, besides by regularly visiting their countries of origin.

Mrazova (2007) points to the fact that empirical literature is awash with evidence supporting the fact that migration has positive effects on trade between immigrants’ host and home countries. The pioneering empirical works of Gould (1994), and Head and Ries (1998) indicate the existence of a positive immigrant-trade nexus for both imports and exports in the cases of the United States and Canada respectively. Research studies by other scholars including Dunlevy and Hutchinson (2001), Rauch (1999), Girma and Yu (2002), Rauch and Trindade (2002), Wagner *et al.* (2002), Combes *et al.* (2005) found a statistically significant and positive correlation between trade flows and immigration. This has resulted in Parsons (2005, p. 1) concluding that there is “a robust and positive relationship between immigration and bilateral trade flows”. The magnitude of migrants impacts on trade are discussed later on in Section 3 of this paper.

In the Southern African Development Community (SADC)<sup>1</sup> region, temporary<sup>2</sup> movement, as opposed to permanent movement, of workers has been the most dominant migration within member states with more than 80 percent of regional citizens drifting towards South Africa. The presence of these migrants (both legal and illegal), especially

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<sup>1</sup> The current 15 Member States are: Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. [www.sadc.int](http://www.sadc.int).

<sup>2</sup> Temporary movement is defined to imply a stay by a migrant in a foreign country of less than 12 months.

in South Africa, encouraged some positive dynamics in terms of the country's trade with these migrants' home (SADC) countries. The positive impacts of migrants on South Africa's trade with their countries of origin occur through at least four channels, namely (i) the preference effect, (ii) the information effect, (iii) the contract enforcement effect, and (iv) the goods remittance effect. These channels are detailed later on in Section 4.1 of this paper.

## 1.2 South Africa's Mode IV trade liberalization

Whilst South Africa is the preferred destination in Africa, not only for SADC migrants, but also for the migrants from the wider-region of Sub-Saharan Africa (SSA), the country (like other SADC countries) still has a number of barriers to the movement of people (Ndulo *et al.*, 2005). These barriers include: stringent visa requirements, quotas, application of economic needs tests (for example, employers might be required to search for a national employee before employing a foreign one) and limits on the recognition of professional qualifications.<sup>3</sup> Nevertheless, the country has made some Mode IV commitments, both at multilateral and regional levels.

At the multilateral World Trade Organization (WTO) level and with respect to the General Agreement on Trade in Services (GATS), South Africa has made some commitments in Mode IV. GATS Article 2(d) defines Mode IV trade in services as the supply of a service by a service supplier of one Member country, through presence of natural persons<sup>4</sup> of a supplying Member in the territory of any other Member. In simple terms, Mode IV can be implied to mean the migration of citizens from one country to another.<sup>5</sup>

According to WTO (1995), South Africa country made some commitments with respect to the movement of natural persons, both with respect to limitations to market access and limitation on national treatment. With regards to limitations to market access, South Africa's offer is grouped as "ABE" with 'A' implying limited access to highly skilled persons only; 'B' implying access limited to employees of companies operating in the country and 'E' implying professionals need to be domestically registered. Conversely, under the limitation on national treatment, the country's offer is categorized as 'D' implying no discrimination for those permitted to enter under market access commitment only.<sup>6</sup>

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<sup>3</sup> [http://www.anyworkanywhere.com/visas\\_sz.html](http://www.anyworkanywhere.com/visas_sz.html)

<sup>4</sup> GATS distinguishes a natural person as refereeing to a human being, from a legal person which refers to any formally or legally registered entity, such as a firm or organization.

<sup>5</sup> The other modes are: **Mode 1** – *Cross-border supply* where a service crosses a national border (an example is the purchase of insurance by a consumer from a producer abroad). **Mode 2** – *Consumption abroad*, where a consumer travels abroad to consume from the service supplier located in another country, such as in tourism, education, or health services, and **Mode 3** – *Commercial presence* where a foreign owned company establishes itself (or a branch) in a foreign country and sells its services in that foreign country (e.g. foreign branches of banks).

<sup>6</sup> Other potential offer that the country could have made at WTO horizontal commitments include category C which requires the development of locals.

At the SADC regional level, South Africa, together with other regional member states adopted the June 1995 'Draft Protocol on the Free Movement of Persons in the Southern African Development Community (SADC)'. This was subsequently replaced in January 1997 by the 'Draft Protocol on the Facilitation of Movement of Persons in the Southern African Development Community'. The 1997 protocol was in turn replaced in 2005 by the 'Protocol on the Facilitation of Movement of Persons within SADC'. Although the country has indicated its willingness to cooperate in the free movement of natural persons, it has to date signed only the latest (2005) protocol. That is it still has to ratify the latter document.

Migration in the SADC region shows that most regional citizens, when considering a move within the region or within Africa, will identify South Africa as a priority choice. This has been brought about by a number of reasons and factors, including the following two. Firstly, the country is by far the most developed in comparison to other regional member countries. Thus, potential migrant workers consider South Africa as having numerous job opportunities. Secondly, the country's historical evolution and position dating back to the 1800s shows that when colonizers settled in the southern African region, they used South Africa as a launch pad for conquering other nearby countries (including Southern Rhodesia, now Zimbabwe; Northern Rhodesia, now Zambia, and Botswana, to mention but a few). Most labourers from these neighbouring countries were dragged to South Africa and forced to work in mines and on farms. This labour link has continued to the present day.

The presence of migrants in South Africa over the years has, among other things, impacted positively<sup>7</sup> on the country's trade, especially the export side. Most migrants, once in a position to earn salaries, send a portion of their earnings to relatives in their respective countries of origin, either as remittances or in the form of goods from South Africa. The goods remittances channel, among others, has boosted South African exports within the region.

Table 1 provides a snapshot of trends both in migrant inflows from the top five SADC countries from which migrants into South Africa originated, and in South Africa's annual trade flows (exports and imports in US\$ millions) with these countries for the period covering 2006 to 2008. Generally, the tabulated figures show that there was a positive correlation between South Africa's exports to these five SADC countries and immigrant inflows into South Africa from the same countries. Whilst there might be a number of factors which have caused this increased trend in exports, it can be argued that the inflow of migrants from these SADC countries into South Africa has also contributed towards South Africa's exports. At the same time, if informal trade exports figures were to be

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<sup>7</sup> It is important to note that the presence of foreigners might also have impacted negatively on South Africa as a host country, for instance in the form of increased crime; pressure on social services such as health care; xenophobia etc. Nevertheless, these negative impacts are beyond the scope of this analysis.



taken into account, the impact of these migrants on South Africa's exports would become even more significant.<sup>8</sup>

**Table 1: Migration and South Africa's trade (in US\$ m) with selected SADC countries**

	2006			2007			2008		
	Exports to	Imports from	Migrants from	Exports To	Imports from	Migrants from	Exports To	Imports From	Migrants from
<b>DRC</b>	364	7	5,582	622	8	6,571	1,125	6	10,047
<b>Malawi</b>	247	78	8,377	307	91	3,341	466	117	15,873
<b>Mozambique</b>	909	48	-	1,267	340	-	1,609	398	3,652
<b>Tanzania</b>	399	45	1,838	383	53	1,236	505	73	4,030
<b>Zimbabwe</b>	1,065	686	18,973	1,195	854	17,667	1,689	759	111,968

Sources: UNCOMTRADE database for exports and imports

: Department of Home Affairs (SA) for migrant inflows into South Africa

## 2 Study objectives

The main objective of this study is to analyze the impact of cross-border movements of SADC citizens into South Africa on South Africa's trade (exports and imports) with a number of selected SADC countries. The study is intended to investigate the link between immigration (into South Africa) and South Africa's trade (exports and imports) with the SADC countries from which the migrants originated. Given that past studies on the subject matter, as evidenced in the literature, were mostly focused on developed countries (with few research papers on developing nations), this study will fill a research gap by providing an analysis for a developing African country. To the best knowledge of the author, this study is the first of its kind in the SADC region, if not in the African continent.

Although it may be possible to analyzing the perceived impacts of the various migration modes on South Africa's trade, the study will analyze only the impacts of total or aggregate annual migration from each of the top five SADC member countries from which migrants into South Africa originated. This was necessitated by two factors. Firstly, a classification of migrant inflows from various SADC countries into South Africa as, for example, tourists, general workers, students or business visitors would have been difficult and might not have provided a true picture of the situation given that some foreigners enter the country ostensibly as tourists, but then stay and work (illegally). Secondly, and more importantly, there is no trade data classified in line with the categories of SADC migrants currently living in South Africa. For instance, export data will show only that South Africa exports X-amount of valued products annually to

<sup>8</sup> A case in point is where more than 80% of Zimbabweans have been importing their groceries from South Africa for nearly a decade. Given that these imports were mostly done in small amounts or informally (for instance, in the case of groceries of around US\$150 per month per individual) both South African customs and Zimbabwean customs were not officially recording these 'small figures'. However, if these small figures are aggregated, they run into millions of US dollars.

Zimbabwe (either at aggregate or at HS-digit levels), but this data will not show what proportion of those exports was influenced (or carried out directly) by Zimbabweans staying (or living) in South Africa as workers, students, tourists, etc.

### **3 Literature review**

#### **3.1 Results from previous studies**

Most studies on the impact of labour mobility on trade flows base their empirical analysis on an augmented form of the traditional gravity trade model, where the effect of migration on trade flows is captured by adding a measure of the migrant stock or flow to the conventional variables (GDP, distance, border, common language etc). As pointed out previously, the majority of studies was conducted on developed countries and has found migration to have a positive effect on trade.

The analysis by Mrazova (2007) concentrated on analyzing the impact of both immigrants and emigrants on the European Union's (EU) export and import flows by considering the effect arising from the 'home-biased preferences' channel. The study used data on European trade flows and migration before and after the 2004 EU enlargement. The research employed a gravity trade model and found that both immigrants and emigrants positively affected EU's exports and imports. The coefficients of migration variable on both the estimated export and import gravity trade models from the Mrazova study (2007) are shown in Table 2.

An empirical study by Javier *et al.* (2006) employed the gravity model in analyzing the impact of both immigration and emigration on Bolivia's exports and imports for the period 1990 to 2003. The estimated results confirmed that immigration had a positive effect on the country's exports even in this case where migration flows in Bolivia were not as high as in the case of most country studies that were done prior to Javier *et al.* (2006) and these studies includes Gould (1994) on US; Wagner *et al.*, (2002) on Canada; Girma and Yu (2002) on UK; and Combes *et al.* (2003) on French departments, an administrative geographical unit of decision-making. The coefficients of migration variable on both the estimated export and import gravity trade models from Javier *et al.*'s (2006) study are provided in Table 2.

Girma and Yu (2002) employed an augmented gravity trade model in which immigration variables were included to assess the link between immigration and bilateral trade between the UK and immigrations' countries of origin. The study's findings indicated that the arrival of immigrants from 48 countries into the United Kingdom (UK) during the period 1981 to 1993 increased the UK's exports to these countries. Specifically, a 1% increase in migrant population from these countries resulted in 0.16% rise in Britain's exports to these states. At the same time, the UK's imports from these nations also increased by 0.1%, annually. The coefficients of migration variable on both the estimated export and import gravity trade models from this study is also included in Table 2.

An empirical study by Wagner *et al.* (2002) which analyzed cross-province variations in international trade and immigration patterns for Canada, shows that the average new immigrant expands exports to his/her native country by 312 dollars per annum and expands imports by 944 dollars. The coefficients of migration variable on both the estimated export and import gravity trade models from Wagner *et al.* (2002) study are indicated in Table 2.

Rauch and Trindade (2002) investigated the effect of ethnic Chinese networks on trade for a number of countries using the gravity trade model approach. The study's point of departure was that "business and social networks have a considerable quantitative impact on international trade by helping to match buyers and sellers in characteristics space, in addition to their effect through enforcement of community sanctions that deter opportunistic behavior" (p.116). Their model results indicated that bilateral trade between countries which were host to a significant ethnic Chinese populations (networks) increased with the "smallest estimated average increase in bilateral trade in differentiated products attributable to ethnic Chinese networks is nearly 60%" (p.116). The coefficients of migration variable on both the estimated export and import gravity trade models from Rauch and Trindade (2002) study are provided in Table 2.

**Table 2: The impact of immigrants on trade**

Authors	Sample countries	Period covered	Migrant Receiving countries	Export elasticity	Import elasticity
Mrazova (2007)	EU member countries	1996 to 2006	Developed	0.37 to 0.44	0.29 to 0.31
Javier <i>et al.</i> (2006)	Bolivia and its 30 trading partners	1990 to 2003	Developing	0.006	0.089
Jansen and Piermartini (2004)	US and partners	2001	Developed	0.18 to 0.27	0.28 to 0.30
Girma and Yu (2002)	UK and 48 partners	1981 to 1993	Developed	0.16	0.1
Combes <i>et al.</i> (2005)	95 French departments	1993	Developed	0.25	0.14
Rauch and Trindade (2002)	63 Nations	1980, 1990	Developed & developing	0.16	0.23
Wagner <i>et al.</i> (2002)	5 Canada provinces and 160 partners	1992 to 1995	Developed	0.08 to 0.01	0.25 to 0.09
Dunlevy and Hutchinson (2001)	US and 17 partners	1870 to 1910	Developed	0.08 to 1.21	0.29
Head and Ries (1998)	Canada and 136 partners	1982 to 1992	Developed	0.1	0.31
Gould (1994)	US and 47 trade partners	1970 to 1986	Developed	0.02	0.01

**Source:** Author's own compilation.

The study by Dunlevy and Hutchinson (2001) investigated the impact of migrants from 17 countries living in America on the exports of the later country for the period covering 1870 to 1910. The research employed the gravity trade model framework and concluded that migrants had a positive and significant impact on America's aggregate export trade. The positive impact was evidence on America's export trade with the following group of

countries: Old Europe, New Europe, non-European as well as other regions from which the migrants originated from. The coefficients of migration variable on both the estimated export and import gravity trade models from Dunlevy and Hutchinson (2001) study are indicated in Table 2.

Whilst the reasons behind the disparities in the impact of migrant on both exports and imports indicated across the studies reviewed in the above paragraphs may be difficult to establish, few possible factors can be suggested. Firstly, variations in the coefficients might be due to regional and country specific effects. Given that these analyses were done on different countries and regions, each with different export and/or import composition and trends, it follows that the impacts of migrants on such export and import will tend to differ across these regions and countries. Secondly, differences in time periods and data used can also account for some of these variations, especially for variations in the impacts of migrants in a given country but at different time periods.

### **3.2 Conclusion**

This section presented the results of the impacts of migrants on host countries' exports and imports (flows) from previous studies carried out using a gravity trade model and related equation/econometrics. Whilst the magnitude of the impacts vary across the studies surveyed, the overall findings of all the studies briefed above and summarized in Table 2 show that migrant flows has positive impact on both exports and imports of host countries. The positive coefficients of migrant variable on the export gravity equations that are found in the literature reviewed in this paper range from 0.006 to 1.21, while on the import gravity equation varies from 0.01 to 0.31. It is also important to note that the impacts of migrant inflows could be relatively higher on developed host countries than on developing host countries as hinted at by the lower impact of migrant flows on Bolivia as shown in Table 2.

## **4 Methodology**

### **4.1 Conceptual framework**

There are a number of channels or mechanisms through which migration can boost trade among countries. The relationship between Mode IV (or migration) and merchandise trade is normally linked by four channels which indicate the way in which the stay of people in a foreign country, both permanently and temporarily, may enhance bilateral merchandise trade flows between the host country (say South Africa) on one hand, and the respective countries (e.g., SADC states) from which the migrants originated. These channels, as found in literature,<sup>9</sup> include the following:

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<sup>9</sup> For instance by Dunlevy and Hutchinson (2001), Mrazova (2007), Rauch and Trindade (2002), Gould (1994) and Rauch (2001), and Greif (1993),

- i. *Preference effect:* Culture and taste differences mean that some migrants will be continue consuming certain types of products that they were consuming or using in their home countries (Dunlevy and Hutchinson, 2001). Nevertheless, given differences in climate and tastes, some of these products may not be available in the foreign countries in which they will be staying. As such, most migrants will end up importing such goods or products from their home countries for consumption or use in their currently foreign countries of residence. Thus, the presence of these migrants will increase demand for foreign goods, especially from their respective countries of origin<sup>10</sup> and, according to Mrazova (2007), this mechanism's (channel) mostly positively affects imports.
- ii. *Information effect:* The fact that business and social networks are paramount in overcoming information barriers to international trade has been widely investigated in literature (Rauch and Trindade, 2002). Migrants normally have information about their native country of origin which makes it relatively easier for them to obtain relevant business information about possible profitable international trading opportunities. This ability of migrants in sourcing such pertinent information reduces informal barriers to trade, especially trade between their host country and their native countries. As an illustration, the fact that migrants are knowledgeable about the consumer preferences in their native country means that they are better placed to inform exporters in the host country about the extent to which their products could be marketable in the migrant's native countries (based on tastes and preferences) or that there will be need for those products to be adapted to importers' preferences. Thus, migrants have the potential to reduce demand and supply matching costs.

Besides reducing matching costs, migrants can also help in the reduction of network search costs. According to Gould (1994) and Rauch (2001), the reciprocal knowledge of trade partners will reduce costly opportunism in business, with business networks being potential substitutes of contract enforcement laws (Mrazova, 2007). That is, through their ability to establish network connections with the business communities in their countries of origin, migrants can be catalysts in facilitating the connection between producers of consumer goods from the host country to wholesalers, distributors, assemblers etc. in their native countries. As pointed out by Rauch and Casella (1998), migrant networks can stimulate bilateral trade by providing market information and by supplying matching and referral services, for example by helping producers find the right distributors for their consumer goods or assemblers find the right suppliers for their components. Some of these business connections may even end up in the form of successful joint-ventures.

- iii. *Contract enforcement effect:* Migrants may assist in the establishment of stronger contract enforcement. According to Greif (1993), migrant networks have the potential to stimulate international trade by providing community enforcement of

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<sup>10</sup> A good example of this is with Chinese migrants who continue to import their special or traditional food products from their home country, mainland China

rules that deter violations of contracts in a weak international legal system. This is pertinent even when the transaction involves entities from different countries since execution of international transactions is premised on mutual trust between the parties to the contract, especially given that work deliverables and payment may not be synchronised. Given that migrants possess enhanced knowledge of their respective native countries' business laws, regulations, norms and practices, uncertainties connected with international transactions will be reduced through this effect, thus stimulating mostly exports.

- iv. *The goods remittance effect:* Migrants, besides sending money earned in the host country, also send groceries and other goods bought in the host country to their native countries. In the case of the SADC region, and given the relative advancement of South Africa, most products produced in this country are considered to be the best in the region. This prompts regional migrants working in South Africa to buy such products and send them to their native (SADC) country. In this way, South Africa's exports are boosted.

Overall, the information and enforcement effect suggest that cross-border movement of people has a positive impact on both imports and exports. The preference effect and the goods remittance effect, however, most strongly affect imports, and exports, respectively.

## 4.2 Analytical framework

To analyse bilateral trade between South Africa and its SADC trade partner countries, this study employs the gravity trade model approach. This is the empirical approach that has been employed by most past studies on the subject matter including Dunlevy and Hutchinson (2001), Rauch and Trindade (2001), and Jansen and Piermartini (2004), among others. Whilst the gravity model<sup>11</sup> has been used in a number of fields of studies such as human migration and investment flows across countries, its application in international trade seems to dominate its overall empirical application. In its trade application, Tinbergen (1962) and Poyhonem (1963) were the first to independently apply this methodology in their analysis of international trade flows. The gravity trade model borrows from Isaac Newton's "Law of Universal Gravitation"<sup>12</sup>. Newton's theory

<sup>11</sup> Frankel (1997) and Deardorff (1998) among others provide theoretical micro foundations of the gravity trade model and Frankel (1998, p.2) pointed out that the gravity equation has recently "gone from an embarrassment of poverty of theoretical foundations to embarrassment of riches".

<sup>12</sup> Following Newton's (1687) "Law of Universal Gravitation", classical gravity theory states that the attractive force,  $F_{ij}$ , between two entities  $i$  and  $j$  is proportional to their respective masses  $m_i$  and  $m_j$  and inversely proportional to the squared distance  $d_{ij}^2$  between these entities. This law is formalized as:

$$F_{ij} = G \frac{M_i M_j}{D_{ij}^2}$$

where

$F_{ij}$   
 $M_i$  and  $M_j$   
 $D_{ij}^2$   
 $G$

= the attractive force.  
 = are the respective two countries' masses.  
 = the distance between the two objects.  
 = a gravitational constant depending on the units of measurement for mass and force.

postulates that the force of attraction between two separate entities  $i$  and  $j$  is a positive function of the entities' respective masses and inversely related to the squared distance between the objects. In analysing trade using the same gravity principle, the entities are replaced by a pair of countries, while the countries' masses are proxied by the respective gross domestic product (GDP) with distance replaced by a variable representing resistance (which in most cases is the actual distance between the pair of trading countries).

Although most trade researchers agree to the basic empirical gravity trade model specification where trade (or export/import) is the dependent variable while importers' and exporters' GDPs and distance are the core explanatory variables, contention still exists as to which other variables should be included in the extended gravity trade model. Illustrating this contention, Ghosh and Yamarik (2004) provided a list of 49 variables (one dependent and 48 independent variables) which have been used in literature to estimate the gravity trade model, though in various combinations. Among the multitudes of possible explanatory variables, an array of dummy variables ranging from regional trade agreement (RTA), to common border and common language is included.

Given that the focus of this study is on the impact of Mode IV or migrant flows on trade, a variable to capture immigration flows into South Africa in the gravity trade model is introduced. Following other studies - for instance those by Dunlevy and Hutchinson (2001), by Rauch and Trindade (2001), and by Jansen and Piermartin (2004) -, Model V or migrant inflows in the gravity model will be represented by migrant inflow of service or labour providers moving from other SADC states into South Africa. The gravity trade model to be estimated therefore takes the following algebraic representation as shown in Equation (1):

$$\ln X_{ijt} = A + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln(\text{distance}_{ij}) + \beta_4 \ln P_{it} + \beta_5 \ln P_{jt} + \beta_6 \ln M4_{it} + \beta_7 \ln \text{lan}_{ij} + \beta_8 \text{border}_{ij} + \varepsilon_{ij} \quad (1)$$

Where:

$X_{ijt}$  = is the current US dollar value of total South African trade (and/or exports and imports) to (from) country  $j$  at time  $t$ .

$GDP_{it}$  and  $GDP_{jt}$  = are nominal gross domestic products of country  $i$  (South Africa) and country  $j$  in year  $t$  in US dollars

$\text{Distance}_{ij}$  = the weighted distance in kilometers between country  $i$  (South Africa) and country  $j$ .

$P_{it}$  and  $P_{jt}$  = are country  $i$  (South Africa) and country  $j$ 's respective populations.

$M4$  = is the bilateral flow of natural persons from SADC countries into South Africa

$Lan_{ij}$  = dummy variable representing the trading countries' respective common international language(s)

$border_{ij}$  = indicates whether trade partners, country  $i$  (South Africa) and country  $j$ , share a common border or not

#### 4.2.1 Selected variables that determine trade in the gravity model equation

With regards to factors and variables that determine exports in the gravity trade model framework, there is a pool of potential variables, besides the three core variables of importer GDP, exporter GDP and distance, which explain direction of exports. Ghosh and Yamarik (2004) indicate that there are around 48 factors that have been used in gravity trade model literature which seek to explain the direction of exports.<sup>13</sup> Table 3 present some of the determinants found in literature and especially those that will be used to explain South Africa's total trade as well as its exports and imports.

*Mode IV (M4)* is our variable of primary attention and, in this study, refers to total or aggregate annual migration from each of the five SADC member countries from which the largest numbers of immigrants into South Africa have originated. The countries are the Democratic Republic of Congo (DRC), Malawi, Mozambique, Tanzania and Zimbabwe. As presented in sub-section 4.1, the presence of migrants from these five countries is expected to positively affect South Africa's trade (both exports and imports) with these SADC member states. Thus, a positive sign is expected on the coefficient of M4 in all three of the gravity trade model equations. The three gravity trade models that this study will estimate and analyze are total trade, exports and imports equations.

*GDP or economic mass:* The  $GDP_i$  of South Africa measures productive capacity of the country. It is also considered as a proxy for the range of product varieties available and which increase the availability of the country's exports. The  $GDP_j$  of the importing country measures absorptive capacity and represents potential demand for imports from South Africa. Thus,  $\beta_1$  and  $\beta_2$  in Equation (1) are expected to have positive signs.

*Distance between trade partners:* Weighted distance (as opposed to the simplest measure of geo-distance between capital cities which considers only the main city of the country) is used because the study considered that some capital cities are neither populated enough nor do they engage in economic activities that represent the "economic centre" of the country. Thus, the weighted distance measures use city-level data to assess the geographic distribution of population and economic activities inside each nation. The idea is to calculate distance between two countries based on bilateral distances between the largest cities of those two countries, those inter-city distances being weighted by the

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<sup>13</sup> This study has experimented with a number of possible variables in each of the three gravity models and the ones presented in this section are the most significant ones. Some the variables experimented with includes GDP per capita, product of importer and exporter GDPs, land area and landlocked-ness, among others.



share of the city in the overall economic activities of the country and its population (<http://www.cepii.fr>).

Head (2003) alluded to the fact that distance in gravity models acts as a sort of tax “wedge,” imposing trade costs and resulting in lower equilibrium trade flows. Ram and Prasad (2007) consider the following five factors as the reasons for inclusion of distance as an explanatory variable in gravity trade models:

- Distance acts as better measure of transport costs;
- Time elapsed due to shipment can be indicated by distance, with the probability of perishable goods surviving intact diminishing with time in transit;
- Distance is normally correlated with transaction costs in the form of searching for trading opportunities and the establishment of trust between potential trading partners;
- Synchronization costs are positively related to increasing distance, that is, the synchronization costs incurred in cases where production factories combine multiple inputs from different countries in order to prevent delays or emergence of bottlenecks; and
- Distance captures cultural diversity, which can retard trade due to inhibiting communication, difference in negotiating styles, etc.

Thus, as distance between trading partners increases, both export and import trade flows are expected to decline. In this case, theory predicts a negative relationship between export trade and distance.

*Population:* Population is used as a measure of country size, and larger countries (as measured by population) are assumed to have more diversified production, a large domestic market, a high probability of self-sufficiency and less need to trade. A negative correlation will be expected between population and export trade in such a scenario. However, Bergstrand (1985) pointed out that there is an inconsistency in this argument, as larger populations allow for economies of scale which are translated into higher exports and result in a positive relationship between population and exports. Therefore, the sign of the coefficient of the exporting country would be indeterminate. At the same time, a large population in the importing country can affect imports negatively or positively due to the same reasons as given for the exporting country.

*Common border and common language* are each expected to be positively related to trade. A common border means that the countries are close to each other. In such a case, trade impediments such as the problems and delays brought about by having to pass through more than one border post are reduced. As such, closer countries that share a common border will be expected to trade more than countries that do not. At the same time, a positive relationship between trade and common language comes from the fact that when citizens of different countries share the same language, it means that, *ceteris*

*paribus*, they will be more inclined to trade with each other than when they speak different languages (which causes possible communication problems).

Table 3 refers to the information laid out above and presents the determinants (and their corresponding expected theoretical signs) that will be used to explain South Africa's trade with SADC countries.

**Table 3: Gravity model explanatory variables**

Variable	Measured by	Expected sign	Theoretical intuition
Exporter GDP	US dollars	+	Measures production capacity, more production means more exports
Importer GDP	US dollars	+	Measures absorption capacity, higher GDP, means higher import demand
Distance	Kilometers	-	Imposes trade costs, greater distance means more costs, hence less trade
Population	Numbers	?	<ul style="list-style-type: none"> <li>- Larger population means more diversification and self-sufficiency (negative sign)</li> <li>- Larger population allows economies of scale resulting in more exports (positive sign)</li> </ul>
M4	Numbers	+	Movement of service providers/labour migrants results in more trade
Language	Dummy	+	Common language reduces communication problems and hence facilitates trade
Common border	Dummy	+	Closer countries trade more than distant countries, <i>ceteris paribus</i>

**Source:** Author's own compilation.

### 4.3 Data sources

All South African export and import series in US dollars (USD) used in this analysis for the period covering 2006 to 2008 are taken from the UNCOMTRADE database. The trade data series are at aggregate level, that is, exports and imports figures used in the estimations done in this study are totals (and not disaggregated to various HS levels). Data on weighted distance in kilometers, common language and common border are taken from the website <http://www.cepii.fr>. Population data and national GDP series are from the International Monetary Fund (IMF)'s World Economic Outlook (WEO).

Annual statistics on the inflows of labour migration into South Africa from other SADC countries have been obtained from South Africa's Department of Home Affairs. Despite the fact that "anyone who has done any work on migration knows that migration data is a very scarce resource" (Mrazova, 2007, p. 7), this study managed to obtain data on migrant inflows from five SADC countries into South Africa for the recent three-year period covering 2006 to 2008. As pointed in Section 2, the study uses total or aggregate annual migration from each of the top five SADC member countries from which migrants

into South Africa originated, and does not employ migration data broken down by any of the various categories including gender, students, tourists, miners, etc.

## 5 Estimation results

### 5.1 Introduction

The study estimated a pooled time-series, cross-sectional regression for the period covering 2006 to 2008 using ordinary least squares (OLS) procedure<sup>14</sup>. Three gravity models analyzing South Africa's total trade, exports and imports are estimated and the analysis examines five SADC countries which are the Democratic Republic of Congo (DRC), Malawi, Mozambique, Tanzania and Zimbabwe.<sup>15</sup>

### 5.2 Total trade estimations

Table 4 contains the estimated gravity results for South Africa's total trade with its SADC trading partners. The estimated importers' GDP and exporters' GDP coefficients have the expected positive signs in all three equations presented in the table and are significant at the 5% level. Across all the tabulated results in Table 4, the estimated coefficients on both the importers' GDP and exporters' GDP range from 0.47 to 0.75, and 1.75 to 3.6, respectively. Specifically, interpreting model III, a 1% increase in South Africa's GDP will result in a 1.75% increase in its total trade with its five SADC trading partners, while a unit percent increase in GDP of the five SADC countries will increase South Africa's exports to these countries by 0.48%. Thus, the results show that there is a statistically significant positive relationship between bilateral trade and the incomes (or GDPs) of trading partners.

The impact of distance on South Africa's total trade is negative and according to theoretical expectations. Specifically, a 1% increase in distance reduces trade by 0.78% (according to estimated results of model III). Contiguity and proximity as indicated by the border dummy variable shows that South Africa's trade is positively enhanced when the trading partners are neighbours.

**Table 4: The effect of Mode IV on South African merchandise trade**

Variable	I	II	III
Importer GDP	0.47 (2.3)**	0.75 (3.9)***	0.48 (2.7)**
South Africa GDP	3.6 (8.78)***	3.41 (10.2)***	1.75 (2.7)
Distance	-1.93 (-5.74)***	-2.07 (-7.5)***	-0.78 (-1.9)*
<b>M4</b>		<b>0.18 (2.78)**</b>	<b>0.17 (3.2)***</b>
Border			0.87 (2.9)**

<sup>14</sup> In this analysis, the pooled model is the most preferred model because it allows one to estimate an equation with dummies as some of the variables, and also because it is the most used estimation procedure in the literature analyzing the impact of migrants of host country's trade.

<sup>15</sup> These countries were selected on the basis that they were the countries from which most immigrants into South Africa originated from during the period under study.

R <sup>2</sup>	0.72	0.72	0.79
F-test	19.2	22.5	29.8

Notes: [\*\*\*], [\*\*], [\*] significant at 1%, 5%, 10% level  
t-statistics in parenthesis

Turning to the variable of interest, M4, the tabulated results indicate that the coefficient of this variable is positive and statistically significant at a level of significance of at least 5%. For instance, estimated model (III) in Table 4 shows that a 1% increase in migrant inflows into South Africa from its five SADC trading partners will increase total trade between South Africa and the five SADC countries by 0.17%.

### 5.3 Exports estimations

The results of South Africa's export trade as shown in Table 5 are symmetrical from the total trade point of view. The estimations of the various gravity model equations indicates that both South Africa's GDP and the GDP of its SADC trading partners positively affect South Africa's exports to the five SADC countries. For instance, a 1% increase in South Africa's GDP will result in its exports to its SADC partners increasing by between 1.57% and 3.25%. Conversely, a 1% increase in the GDPs of SADC countries will increase South Africa's exports to these countries by a margin of between 0.23% and 0.56%.

**Table 5: The effect of Mode IV on South Africa merchandise exports**

	I	II	III	IV
South Africa GDP	3.25 (8.1)***	1.57 (2.1)*	1.77 (3.1)**	2.53 (4.5)***
Importer GDP	0.56 (2.8)**	0.56 (2.7)**	0.52 (3.3)***	0.23 (1.4)
Distance	-1.72 (-5.24)***	-0.66 (-1.2)	-0.81 (-1.8)	-1.54 (-3.4)***
Border		0.79 (2.3)**	0.62 (2.2)*	0.12(0.82)
<b>M4</b>		<b>0.15 (2.4)**</b>	<b>0.18 (3.7)***</b>	<b>0.13 (3.1)**</b>
Lang			0.34 (2.8)**	
Importer population				0.67 (3.8)***
R <sup>2</sup>	0.67	0.82	0.79	0.81
F-test	15.5	17.5	24.7	33
No. of obs.	15	15	15	15

Notes: [\*\*\*], [\*\*], [\*] significant at 1%, 5%, 10% level  
t-statistics in parenthesis

Distance, as expected, has a negative coefficient, with each 1% increase in distance between South Africa and any of its five SADC trading partners reducing trade by between 0.66% and 1.72%. The effect of the existence of a common language between South Africa and its SADC trading partners on South Africa's exports is positive and this is in line with theoretical expectations.

The impact of migrant inflows from SADC countries into South Africa on South Africa's exports to the countries from which these migrants originate is positive and in line with

theory. A 1% increase in migrant inflows will increase South Africa's exports by between 0.13% and 0.18%.

#### 5.4 Imports estimations

Whilst the impact of importing countries' GDPs on South Africa's imports from the SADC countries is not statistically significant in most of the gravity equations shown in Table 6, the GDP of South Africa is important in determining its imports from its SADC trading partners. That is, as South Africa's economic activities increase (as evidenced by increases in GDP), the country will import more products from its SADC trade partners. Specifically, a 1% increase in South Africa's GDP will increase the imports from SADC countries by between 4.1% and 6.21%.

The coefficients on distance are negative and in line with theoretical expectations, while the sharing of borders between South Africa and its trading partners increases South Africa's imports from those neighbouring countries.

**Table 6: The effect of Mode IV on South Africa merchandise imports**

	I	II	III	IV	V
GDP Importer	0.02 (0.04)	0.72 (2.4)**	0.45 (1.4)	0.62 (1.8)	0.29 (0.81)
SA <sup>+</sup> GDP	5.74 (5.3)***	6.21 (11.1)***	4.13 (3.2)***	6.3 (10.6)***	4.1 (3.2)**
Distance	-3.7 (-4.2)***	-4.37 (-9.4)***	-2.82 (2.9)**	-4.3 (-8.9)***	-2.6 (-2.6)**
Lang		1.71 (5.9)***	1.8 (6.7)***	1.76 (5.8)***	-0.11 (-1.0)
Border			1.08 (1.8)		1.2 (1.9)*
<b>M4</b>				<b>0.07 (0.65)</b>	<b>1.9 (6.8)***</b>
R <sup>2</sup>	0.64	0.80	0.78		0.82
F-test	13.7	26.8	22.6		34.7
No. of obs	15	15	15		15

Notes: [\*\*\*], [\*\*], [\*] significant at 1%, 5%, 10% level  
t-statistics in parenthesis  
: '+' SA refers to South Africa

The impact of migrant inflows into South Africa from SADC countries has a positive impact on South Africa's imports from its SADC trading partners. Specifically, a 1% increase in migrant inflows into South Africa will cause the country's imports to increase by 1.9%.

#### 5.2 Conclusion

This section presented the gravity model estimated results of the impacts of migrants on South Africa's total trade, exports and imports. The overall findings of this study as reported in Table 4 through to Table 6 show that migrant inflows into South Africa from five SADC trading partners has positive impact on South Africa's total trade, exports and imports. The findings of this study agrees with findings from other previous studies (see

Table 2) which have also found positive impacts of migrants on host countries' total trade (including exports and imports). Specifically, estimations from the total trade gravity model indicated that a 1% increase in migrant inflows into South Africa from its five SADC trading partners increased total trade between South Africa and the five SADC countries by 0.17%. Results from the export gravity trade model show that a 1% increase in migrant inflows increased South Africa's exports by between 0.13% and 0.18%. Lastly, results from the import gravity model equation indicated that a 1% increase in migrant inflows into South Africa raised the countries' imports by 1.9%.

## **6 Conclusions and Policy implications**

### **6.1 Conclusions**

Whilst information on the impact of immigration on a host country's trade especially on the African continent and in the SADC region is still scant (if it is available), the estimated results of this study confirm the existence of a positive and statistically significant migration-trade relationship in the case of South Africa's trade with its SADC trading partners.

The study employed a gravity trade model in investigating the impacts of immigrant inflows into South Africa from five SADC countries on total trade, export trade and import trade with those countries. Estimations from the total trade gravity model indicated that a 1% increase in migrant inflows into South Africa from its five SADC trading partners increased total trade between South Africa and the five SADC countries by 0.17%. Results from the export gravity trade model show that a 1% increase in migrant inflows increased South Africa's exports by between 0.13% and 0.18%. Lastly, results from the import gravity model equation indicated that a 1% increase in migrant inflows into South Africa raised the countries' imports by 1.9%. Overall, the finding of the study indicate that migrant inflows into South Africa from its SADC trading partners increase trade between South Africa and the SADC countries.

### **6.2 Policy implications**

Whilst the estimated gravity model results clearly indicates the positive impacts of migrant inflows on South African's total trade, exports and imports, this paper does not recommend that the South African government should encourage migrant inflows from other SADC member states based on migrants' positive impacts on the country's trade. There are a number of reasons for not recommending such a policy suggestion, even though presence of migrants positively affects the country's trade. Firstly, the country is still struggling with unemployment mostly of un-skilled and semi-skilled labour force, and allowing more migrants into the country may exacerbate this problem given that a larger proportion of migrants from SADC countries are mainly un-skilled and semi-skilled. Secondly, increased migrants into South African will put pressure on government funded amenities such as housing and health, resulting in more pressure on government

budget. Thirdly, given the relatively high rate of both crime in general and organized crime in particular, encouragement of migrant inflows into the country may even worsen the situation. Lastly, since trade (exports and imports) is just one of the many components which constitute the economic activities of the country, any policy which is aimed to encourage trade should be developed not in isolation, but in consideration of other factors, and components.

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