

## **SOUTH-SOUTH TRADE: THE POTENTIAL FOR MAURITIUS**

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The objective of the paper is to investigate into the benefits of South-South for a small country like Mauritius in terms of improved trade. Using, UN Comtrade data for the period 1990 to 2018, the study first analyses Mauritius trade patterns with developing and developed markets. Second, the paper probes into South-South trade across 46 countries over the last 29 years and applies the gravity model of trade, using the Poisson Pseudo Maximum-Likelihood Estimator. There is evidence that South-South trade is beneficial to Mauritius, hence the need for greater diversification of its markets away from the traditional European and US markets. The study further reveals that the small island economy must take advantage of growing consumer demand from developing regions, like Africa, China and India. Mauritius being part of different regional trading blocs helps in improving its trade performance.

*Keywords:* South-South Trade, Developing Countries, Gravity Model of Trade  
*JEL Classification:* F13, F14, C33

### 1. INTRODUCTION

Existing theories and empirical work have long probed into the potential of South-South trade for the developing world, but so far, there is no clear and unambiguous result. South-South trade has been presaged as “vital for development” (OECD, 2006) and viewed as essential to “rebalance the global economy” (UNCTAD, 2011a). Along the same lines, Borota (2012), Choi (2007) and Yong (2012) assert that North-South trade benefits mainly developed countries whereas South-South trade allows poor nations to attain higher welfare and more gains from trade. This arises from the fact that trade takes place among countries having more or less the same level of economic development and needs, as compared to North-South trade where there are significant differences in the countries’ development levels. Since countries in the South are at different stages of diversification and specialisation, their productive areas and demand for imports are increasingly more diverse, hence promoting greater trade among the South (UNCTAD, 2007). However, there are still various hurdles encountered by

developing nations to foster trade amongst themselves so much that the intended “win-win” notions of South-South development cooperation remains unknown. Thus, relatively little evidence exists on the economic realities of this new geography of trade (Horner, 2016).

The case for promoting South-South trade as a means of sustaining growth impetus in developing economies has called for greater attention in international development policy debates. Although, South-South flows have been rising faster than international trade, only a few countries appear to be dominating these trade flows, namely Brazil and Asian nations, particularly China and India. In effect, these emerging economies act both as sources of demands and as production sites and are vital drivers of the South-South economic globalisation. The South as a market is particularly important for harnessing exports from lower-income countries, particularly those in Africa. The interest of China and India in Africa is viewed as a new scramble for Africa (Lee, 2006) to seeing it as a relationship that is beneficial to all parties. There is a growing literature on the role of China in Africa (see for instance Alden, 2005; Large, 2008; Brautigam, 2011; Kaplinsky and Morris, 2009; Carmody, 2011), and to a lesser extent of India in Africa (see Mawdsley and Mc Cann, 2011). Overall, these studies state that while trading relationships may overlap with some of the intended aims of South–South cooperation, the impacts may not necessarily be a win-win situation.

Hence, the benefits of South-South trade to small and developing economies remains an empirical question. Mauritius has long been trading mostly with Europe and USA, following trade preferences with these countries. However, high reliance on traditional markets can prove to be harmful to the economy. In fact, the dismantling to the Multi-Fibre Agreement in 2004 and the EU sugar reforms with a drastic fall in sugar prices by 36 per cent in 2005 had devastating impacts on the island. In addition to these, the financial crisis of 2008 has led to a further reduction in the European demand for Mauritian products and services. Moreover, the competition from emerging countries like China, India and Brazil has made it more difficult for Mauritius to ensure its presence in developed countries’ markets. Hence, the potential of South-South trade as a driver of trade and development is often discussed in terms of the capacity of economies to reduce their dependence on Northern markets and overcome bottlenecks related to resource endowments and the small size of domestic markets (Tandrayen-Ragoobur, 2019).

In essence, the small island economy has negotiated membership across different Regional Economic Communities (RECs), notably Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA). SADC and COMESA remain the focus of the country’s ‘trade in goods’ dimension with the continent. This economic space will broaden considerably with the African Continental Free Trade Agreement (AfCFTA). In 2018, Mauritius signed the AfCFTA, which is likely to boost further trade among Southern African economies as it aims at expanding intra-African trade through better harmonisation and coordination of trade liberalisation and facilitation across the RECs and across Africa in general. In addition,

Mauritius is party to 16 Double Taxation Avoidance Agreements (DTAAs) with its African neighbours<sup>1</sup>. This study thus innovates by focusing on Mauritius, which is highly dependent and vulnerable to trade shocks on the international markets. As such, Mauritius must perceive South-South trade as a potential for expanding its trade potential and at the same time reduce its dependency on Northern markets. Thus, with high dependence on traditional markets and the current international environment coupled with rising competition from the emerging nations, it is high time for Mauritius to find other development pathways.

With mixed and controversial empirical findings whereby it is not clear whether South-South trade benefits systematically all developing countries (Abrams 1980; Frankel et al., 1995), this paper fills the gap by focusing on the trade potential of South-South trade for the small island economy of Mauritius. First, the study analyses the scope for trade between Mauritius and the developing world. Second, the paper probes into adherence to or being part of regional trading groups can promote greater South-South trade. Within this context, the gravity model has been the traditional tool investigating the determinants of bilateral trade flows across countries; hence, gravity modeling techniques are applied to UN Comtrade data for 46 countries from 1990 to 2018. Different estimation techniques are adopted namely the pooled Ordinary Least Squares (OLS) Method, the Random Effects and the Pseudo Poisson Maximum Likelihood (PPML) estimator to ensure the robustness of the results and account for any data issues.

The structure of the paper is as follows: Section 2 studies the literature on South-South trade. Section 3 analyses the trade patterns between Mauritius and other developing countries over the recent years. Section 4 explains the methodology used in terms of the gravity model of trade. Section 5 analyses the findings and the paper concludes in section 6 with relevant policy recommendations.

## 2. LITERATURE REVIEW

Trade theory identifies several factors that prompt comparative advantage in the production of goods and services among nations (Greenaway and Milner, 1990). The notion of comparative advantage indicates that trade and welfare gains are higher for trade between countries which are relatively dissimilar in terms of factor endowments or technology. In essence, traditional theories stress on the role of dissimilarity of economic structures among countries and thus, within this paradigm, North-South trade achieves higher gains. Similarly, the transfer of technology linked to trade in capital goods with more technologically advanced countries hold better prospects for developing countries than trade with less advanced countries (OECD, 2006).

<sup>1</sup> DTAAs have been signed and ratified with Botswana, Senegal, Madagascar, South Africa, Lesotho, Swaziland, Mozambique, Zimbabwe, Namibia, Uganda, Rwanda, Seychelles, and Tunisia.

Conversely, more recent trade models stress on similarity. Three main factors namely, increasing returns to scale, differentiated goods and imperfect competition explain trade patterns across similar countries (see Brander and Spencer, 1985; Eaton and Grossman, 1986; Grossman and Horn, 1988 and Grossman and Helpman, 1991). Countries with similar economic conditions, level of expertise and factors of production trade more among themselves (Davis, 1997; Grossman and Rossi-Hansberg, 2011). It is stated that gains from intra-industry trade (for instance, among similar low-income countries) may be achieved through less significant marked structural adjustment than inter-industry North-South trade. For example, Behar and Criville (2010) argue that South-South trade creates twice as much trade as North-South trade, mainly because developed countries are relatively more competitive and efficient. In addition, they also have higher expertise, more facilities and better infrastructure. They also consider South-South to be a way of enhancing economic and political relations between developing countries. If the conditions for South-South intra-industry trade exist or can be developed, such trade can offer an opportunity for learning by doing and for developing externalities to tap the North's markets and access more technologically advanced products at a later stage (Otsubo, 1998).

Further, a developing country, with limited technological skills, is able to increase successfully its volume of production by importing from another developing country with higher levels of technology rather than importing from developed countries with advanced technological expertise (Yong, 2012). Developing economies tend to complement each other, where their goods are offered at lower prices, because of cheaper factors of production such as lower labour costs and input prices. Similarly, Athukorala and Nasir (2012) note that South-South trade has had a great impact in global production sharing since the last twenty years, especially with the participation of East Asian countries. South-South trade is perceived to be complementary rather than a conflicting factor to North-South trade because developing nations export significantly to the North. Along the same line, Agatiello (2007) emphasises that South-South trade will remain significant for developing countries, particularly for the Asian- Pacific region, since they can benefit from cheaper factors of production and economies of scale.

It has also been claimed that promoting South-South trade is a necessity for reducing global imbalances (Ratna, 2009). South-South trade is thus seen as a global public good, necessary for both the North and the South since they have moved away from resource-based exports to manufacturing exports. The global manufacturing potential of the South not only offers better and cheaper goods to North consumers due to cheaper labour costs in the South amongst others, but the South's stronger economic growth has also generated several backward-forward linkages among industries. The promotion of South-South trade may be instrumental in the industrialisation process of Southern economies (Ratna, 2009).

Hence, South-South cooperation to promote trade and investment flows has been rising over time with a number of regional trading blocs being set up. Hitherto, the level

of regional trade in the different groups remains low. For instance, Moncarz and Vaillant (2010) state that the benefits in a South-South trade agreement vary in accordance with the development level of the country. The economic and political strength of a country determine trade agreements and the poorest countries may suffer in such agreements. Results have been mixed and controversial (Frankel et al., 1995) and it is not clear whether regional trade agreements benefit systematically all developing countries. On the one hand, developing nations can be irregular trading partners due to similar endowments, smaller economic size and higher trade costs (Krugman, 1991; Magee, 2003) implying limited trade from South South agreements (Behar and Criville, 2010). On the other hand, they may share demand for similar commodities and succeed in securing more attractive trade concessions from the developing world relative to the rich nations (UNCTAD, 2007). Further, the potential for trade based on economies of scale among the small and poor nations of the South is ambiguous. It has been postulated that certain forms of integration between developing countries may lead to trade divergence and hence non-convergence of per capita incomes (for instance, Venables, 1999). This unsolved part of trade between similar countries thus necessitates deeper analysis as there is no clear answer as to the potential of South-South trade for the developing world.

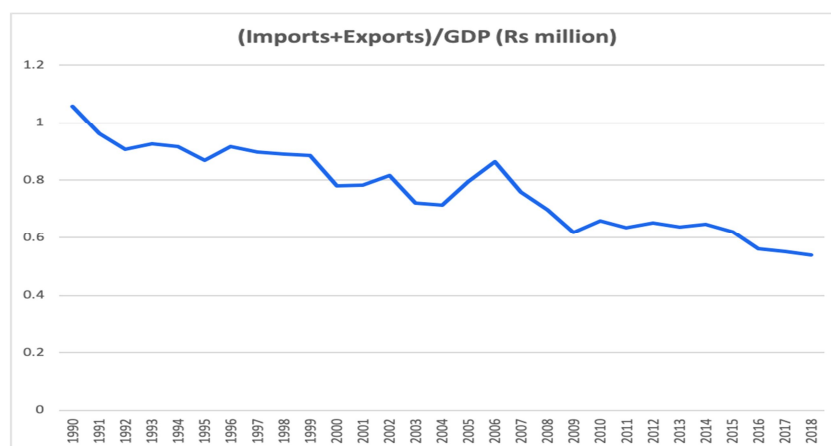
### 3. DATA ANALYSIS

#### 3.1. Overall Trade Pattern of Mauritius

Located in the middle of the Indian Ocean, near Madagascar, Mauritius has 1.3 million inhabitants and a total land area of 2,040 km<sup>2</sup>. Mauritius has recently moved into the high-income league with a GNI per capita of US\$ 12,740 in 2019, a 3.5 percent increase over the 2018 figure (World Bank, 2020). The island's economy has gone through major structural changes in the last five decades. In the early 1970's, the Mauritian economy was highly dependent on the sugar sector and there seemed to be little scope for economic development. It was predicted that given the large population, political instability, poor job prospects and high levels of income inequality in the country, it would be very difficult for it to achieve a sustainable economic growth (Subramanian and Roy, 2001). However, Mauritius proved all negative predictions wrong. The establishment of the EPZ in the 1970s, led to higher levels of foreign investment, productivity and exports. The preferential access of Mauritius into the EU and US markets helped in attracting foreign investors from Hong Kong and China. Mauritius also embarked on a gradual trade liberalization process, with the steady reduction of protectionism on the level of imports. The island has diversified gradually to manufacturing, financial services, tourism, seafood processing, real estates, and Information and Communication Technology (ICT). Today, the country's landscape has changed to a service-oriented economy where the services sector contributed to around 76 percent of GDP in 2019. It is now one of the strongest economies of Africa, because

of its diversification and development strategies.

Mauritius has a liberal economic and trade policy and is a member of the World Trade Organisation since 1995. The island forms part of different regional economic groups namely the Common Market for Eastern and Southern Africa (COMESA), the Southern African Development Community (SADC) and the Indian Ocean Commission (IOC).



Source: Statistics Mauritius data.

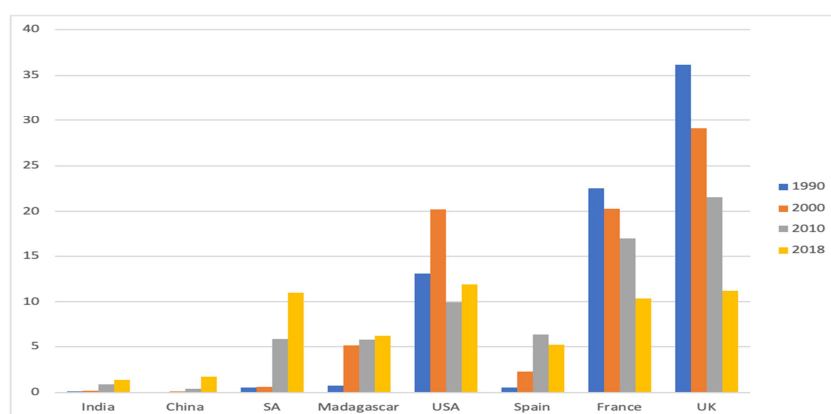
**Figure 1.** Trade pattern of Mauritius, 1990-2018

It is also a beneficiary of the Generalized System of Preferences (GSP) offered by Japan, Norway, Switzerland, the U.S., and the customs union of Belarus, Kazakhstan, and Russia. Moreover, it has a Free Trade Agreement with Turkey and a Preferential Trade Agreement with Pakistan. The U.S and Mauritius signed a Trade and Investment Framework Agreement (TIFA) in September 2006 to address bilateral trade issues and expand trade and investment relations between the two countries. Mauritius is eligible for the trade benefits under the African Growth and Opportunity Act (AGOA), which provides for duty free and quota free access to the U.S. market for over 6,000 products from eligible Sub-Saharan African countries. Export of apparel from Mauritius to the United States made from fabric imported from any country is duty free under the AGOA Third Country Fabric Provision. The U.S. has renewed AGOA until 2025. Mauritius is an important player in global trade, where it trades significantly with advanced countries, like France, Europe, India, China and USA. Figure 1 shows Mauritian trade as a share of GDP from 1990 to 2018, where since 2005, there has been a constant fall mainly attributed to the phasing out of the Multi-Fibre Agreement, which affected significantly exports of textile, apparel and sugar products to Europe. Moreover, due to the financial crisis in 2008, Mauritius suffered in terms of falling demand from abroad, especially

from USA and Europe, which represent the main trading partners. However, the trade sector picked up again as from 2009. This is due to a combination of policies namely the use of foreign labour in the textile sector, the inflow of foreign investment and restricting existing sectors. As from 2016, trade as a share of GDP has been following a constant downward trend due to intense competition from emerging economies on existing markets. There is the need for Mauritius to be more competitive and produce better quality goods and services with high value addition.

### 3.2. Mauritius's Main Trading Partners

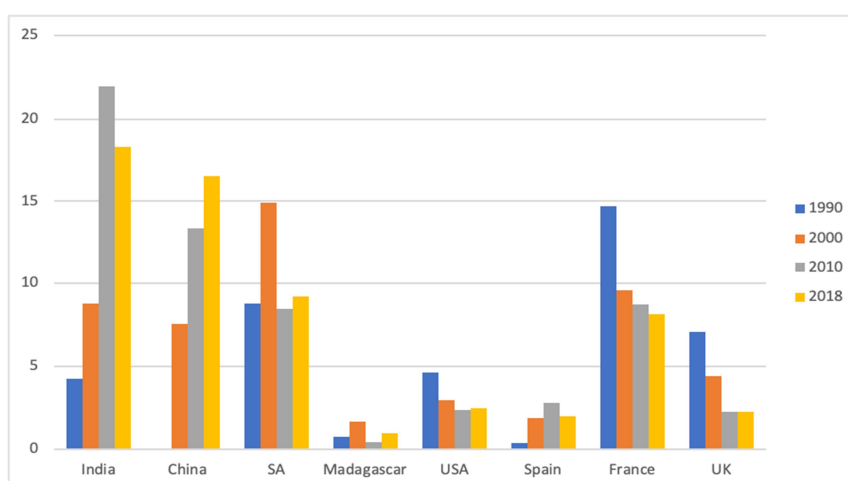
Mauritius trades considerably with the developed economies. The eight major trading partners are UK, France, Spain, USA, Madagascar, South Africa, China and India. Figure 2 shows the main destinations of the Mauritian's exports in 1990, 2000, 2010 and 2018. Over more than two decades, UK has been one of the most important export markets for Mauritius. However, the percentage of total exports to the UK fell over the years to only 11.2 per cent in 2018. The same trend is observed for France, where exports has fallen by twice from 20.3 per cent in 2000 to 10.3 per cent in 2018. Such drop in exports to the traditional markets was due to the phasing out of preferences as well as increased competition from low-cost emerging nations. In contrast, exports to South Africa, China, India and Madagascar have gone up over the recent years. For instance, Madagascar accounted for merely 1.1 per cent of Mauritius's exports in 1990 and this rose to 6.5 per cent and 6.1 per cent in 2000 and 2018 respectively. Over the years, there has been a diversification of exports to markets like South Africa and other African economies. One main reason behind this was the adherence of Mauritius into a number of regional trade agreements, like SADC and COMESA, which helped to increase trade with the African continent.



Source: Statistics Mauritius data.

**Figure 2.** Mauritius' Main Export Markets (as a Percentage of Total Exports)

In terms of imports, Figure 3 illustrates the main countries from which Mauritius imports its commodities from 1990 to 2018. Over that period, imports from the traditional markets like France, UK, USA and Spain have been declining while imports from South Africa, India, China and Madagascar have been on the rise. France was the main source of imports for Mauritius in 1990 and its imports share has declined over the years from 14.7 per cent in 1990 to 8.1 in 2018. The same trend holds for UK and USA, which account for only 2.2 per cent and 2.4 per cent respectively in 2018. On the other hand, imports from China grew from 3.4 per cent in 1990 to 16.5 per cent in 2018 and those from India rose from 4.2 per cent to 18.3 per cent over the same period. Cheap labour and cheap raw materials in these countries enable them to set prices that are more competitive and as such secure an important place in global trade (Kasseeah, Ancharaz and Tandrayen-Ragoobur, 2013). Hence, imports originating from developing countries are on the rise and this confirms greater trade with the South.



Source: Statistics Mauritius data.

**Figure 3.** Mauritius' Main Import Markets (as a Percentage of Total Imports)

### 3.3. Mauritius' Manufacturing Trade Pattern

Next, the paper analyses the main manufacturing exports to developing and developed economies. It can be observed that the main exports consist of articles of apparel, accessories, knit (and not knit) or crochet, fish, crustaceans, molluscs, aquatic invertebrates, pearls, precious stones, metals, coins, sugars and sugar confectionery, electrical and electronic equipment. The main difference in terms of Mauritian exports of manufacturing products to developed and developing markets is that meat, fish and seafood food preparations was the lead product across developed economies.



**Table 1.** Mauritius' Main Manufacturing Exports to Developing Market Economies (as a Share of Mauritius' Total Product Exports to Developing Market Economies - %)

Product Name	2001	2006	2011	2016	2018
Articles of apparel, accessories, not knit or crochet	2.62	2.82	12.35	9.60	11.77
Articles of apparel, accessories, knit or crochet	1.96	3.40	17.04	10.07	10.87
Fish, crustaceans, molluscs, aquatic invertebrates nes	0.12	4.88	3.91	7.34	9.18
Pearls, precious stones, metals, coins, etc	2.74	1.15	0.53	7.59	8.37
Sugars and sugar confectionery	0.93	0.63	2.72	4.83	7.29
Electrical, electronic equipment	1.86	44.56	2.36	15.16	5.94
Cotton	27.83	3.60	7.16	4.78	5.60
Plastics and articles thereof	2.10	1.86	4.07	2.67	5.02
Knitted or crocheted fabric	13.91	1.57	5.74	4.51	4.55
Residues, wastes of food industry, animal fodder	2.20	1.50	3.38	3.21	2.51
Cereal, flour, starch, milk preparations and products	0.27	0.59	2.30	1.49	2.08
Pharmaceutical products	0.48	0.67	2.51	1.53	1.51
Machinery, nuclear reactors, boilers, etc	7.71	7.62	2.80	2.31	1.48
Articles of iron or steel	0.99	1.87	1.94	0.35	0.19
Iron and steel	0.82	1.94	3.38	0.43	0.14

Source: International Trade Centre, Trade Statistics, 2020.

The exports of articles of apparel, accessories, knit or crochet have been rising across both developing and developed markets since 2001, and peaked in 2011, fell in the following years in 2016 but went up again in 2018. The same trend can be observed for articles of apparel, accessories, not knit or crochet. This good performance of the textile industry until 2012 was attributed essentially to the presence of migrant labour from China, India and Bangladesh. Cheaper foreign labour and higher productivity have enabled manufacturing firms to survive the competition on the world market. However, the increasing competition from emerging countries, such as China, India and Brazil has posed problems for many manufacturing firms, which had to close down or relocate to cheaper locations. Europe remains the most important market for Mauritian products, with United Kingdom, France, Italy and Germany as main export destinations. Sugar is also an important export commodity to developed economies, as well as exports of pearls, precious stones and metals which have constantly been on the rise.

**Table 2.** Mauritius' Main Manufacturing Exports to Developed Market Economies (as a Share of Mauritius's Total Product Exports to Developed Market Economies - %)

Product Name	2001	2006	2011	2016	2018
Meat, fish and seafood food preparations nes	4.44	9.81	15.85	18.30	22.97
Articles of apparel, accessories, not knit or crochet	27.98	12.27	13.95	17.50	18.72
Articles of apparel, accessories, knit or crochet	33.44	33.46	28.05	17.87	17.33
Sugars and sugar confectionery	20.31	22.14	16.91	14.80	7.40
Fish, crustaceans, molluscs, aquatic invertebrates nes	0.05	2.36	2.10	5.35	6.69
Pearls, precious stones, metals, coins, etc	4.14	4.98	7.80	4.59	4.13
Optical, photo, technical, medical, etc apparatus	1.23	1.16	2.03	1.90	2.53
Live animals	0.67	1.58	1.21	1.42	1.60
Articles of leather, animal gut, harness, travel goods	0.26	0.69	1.41	0.92	1.07
Electrical, electronic equipment	0.27	2.25	0.45	0.50	0.72
Plastics and articles thereof	0.12	0.53	0.36	0.37	0.70
Machinery, nuclear reactors, boilers, etc	1.16	0.66	0.29	0.57	0.55
Aircraft, spacecraft, and parts thereof	0.42	1.52	0.21	0.18	0.51
Vehicles other than railway, tramway	0.25	0.09	0.09	0.09	0.06
Other made textile articles, sets, worn clothing etc	0.07	0.13	0.09	0.14	0.12

Source: International Trade Centre, Trade Statistics, 2020.

#### 4. THE GRAVITY MODEL OF TRADE

To analyse bilateral trade flows between Mauritius and a group of developing countries, the gravity model is applied. The gravity model shows trade flows between two trading partners dependent on the economic size of the countries and the distance between them (Tinbergen, 1963; Bergstrand 1985 and 1989; Helpman and Krugman; 1985; Eaton and Kortum, 1997; Deardorff, 1998). The gravity equation is thus set as follows:

$$T_{ij} = F(G_i^{\alpha_1} G_j^{\alpha_2} / D_{ij}^{\alpha_3}) U_{ij}. \quad (1)$$

$T$  denotes the amount of trade that take place between country  $i$  and country  $j$  while  $G_i$  and  $G_j$  represent the GDP of each country. The distance between the two trading partners is represented by  $D_{ij}$  and  $U_{ij}$  is an error term having expectation equal to 1. Taking logs on both sides gives Equation (2) as follows:

$$\ln(T_{ij}) = \alpha_0 + \alpha_1 \ln(G_i) + \alpha_2 \ln(G_j) - \alpha_3 \ln(D_{ij}) + e_{ij}. \quad (2)$$

Bergstrand (1985), Helpman (1987), Wei (1996) and Limão and Venables (1999),

among others add new variables such as common language, same coloniser and involvement in regional trade blocs. Hence, an augmented gravity equation, in log-linear form, is shown below:

$$\ln(X_{ijt}) = \beta_0 + \beta_1 \ln(Y_i) + \beta_2 \ln(Y_j) + \beta_3 \ln(D_{ij}) + \beta_4 \ln(L_{ij}) + u_{ijt}. \quad (3)$$

The dependent variable  $X_{ijt}$  in the above equation denotes country  $i$ 's exports to country  $j$  for time period  $t$ . As for the explanatory variables,  $Y_i$  and  $Y_j$  indicate GDP of the exporter and importer respectively. Real GDP per capita can also be used (Bussière and Schnatz, 2006).  $D_{ij}$  shows the distance between the two trading partners. Other dummy variables in terms of  $L_{ij}$  can be added to the equation, such as common language, common border and regional trade agreements. Finally  $u_{ijt}$  is an error term. However, Silva and Tenreyro (2006) and Westerlund and Wilhelmsson (2011) believe that this method is unreliable as the presence of zero trade flows can lead to biased results. Hence, the gravity equation must be estimated by means of the Poisson Pseudo-Maximum Likelihood Estimation (PPMLE). The latter is based on the multiplicative form of the gravity equation. It is expressed as follows:

$$X_{ijt} = \exp[\beta_0 + \beta_1 \ln(Y_i) + \beta_2 \ln(Y_j) + \beta_3 \ln(D_{ij}) + \beta_4 \ln(L_{ij})]u_{ijt}. \quad (4)$$

Bobkova (2012) compares the traditional approach and the Poisson technique of estimating the gravity equation and concludes that the Poisson estimation technique is more reliable and provides accurate results in the presence of heteroscedasticity.

#### 4.1. Methodology

To estimate the exports and trade flows between Mauritius and 46 developing countries from 1990 to 2018, the following equation is estimated based on the gravity model discussed above:

$$\ln(MusExpts_{ijt}) = \beta_0 + \beta_1 \ln(MusGDP_{it}) + \beta_2 \ln(LDCsGDP_{jt}) + \beta_3 \ln(Dis_{ij}) + \beta_4 ComLang_{ij} + \beta_5 Colony_{ij} + u_{ijt}. \quad (5)$$

$$\ln(MusTrade_{ijt}) = \alpha_0 + \alpha_1 \ln(MusGDP_{it}) + \alpha_2 \ln(LDCsGDP_{jt}) - \alpha_3 \ln(Dis_{ij}) + \alpha_4 ComLang_{ij} + \alpha_5 Colony_{ij} + \varepsilon_{ijt}. \quad (6)$$

where  $\ln(MusExpts_{ijt})$  and  $\ln(MusTrade_{ijt})$  are the log of Mauritius's total exports and trade to the developing countries for the period 1990 to 2018. Other variables are  $\ln(MusGDP_{it})$  and  $\ln(LDCsGDP_{jt})$  which are the log of Mauritius's and the developing countries' real Gross Domestic Product over the same period.  $\ln(Dis_{ij})$  is the distance between Mauritius and each of the developing countries in the sample.

$ComLang_{ij}$  is a dummy variable, which takes value of 1 if two trading partners have at least one common official language and 0 otherwise. Similarly,  $Colony_{ij}$  is 1 if the trading economies were previous colonies of similar colonial powers. Finally  $u_{ijt}$  and  $\varepsilon_{ijt}$  are error terms. The definitions of the variables apply to both equations (5) and (6).

Developing countries also form part of different regional trading groups and Mauritius may be trading more with countries in similar RECs like SADC and COMESA, so equations (5) and (6) are further extended to include whether countries in the sample are also part of trading blocs such as SADC and COMESA. The extended equations are as follows:

$$\begin{aligned} \ln(MusExpts_{ijt}) = & \rho_0 + \rho_1 \ln(MusGDP_{it}) + \rho_2 \ln(LDCsGDP_{jt}) + \rho_3 \ln(Dis_{ij}) \\ & + \rho_4 ComLang_{ij} + \rho_5 Colony_{ij} + \rho_6 SADC_{ij} \\ & + \rho_7 COMESA_{ij} + d_{int}. \end{aligned} \quad (7)$$

$$\begin{aligned} \ln(MusTrade_{ijt}) = & \theta_0 + \theta_1 \ln(MusGDP_{it}) + \theta_2 \ln(LDCsGDP_{jt}) + \theta_3 \ln(Dis_{ij}) \\ & + \theta_4 ComLang_{ij} + \theta_5 Colony_{ij} + \theta_6 SADC_{ij} \\ & + \theta_7 COMESA_{ij} + e_{ijt}. \end{aligned} \quad (8)$$

where  $SADC$  and  $COMESA$  are dummy variables which takes the value 1 when the country belongs to one of these regional trade agreements or 0 otherwise.  $d_{int}$  and  $e_{ijt}$  are error terms.

#### 4.2. Sample and Testing Strategies

The pooled OLS method was initially used because of its finite sample properties (Dougherty, 2002). For panel data models, the Hausman test is applied to choose between the two estimation methods namely the Fixed Effect and the Random Effect. The Hausman test has a p-value greater than 0.05 in all cases, indicating that there is no evidence to reject the null hypothesis of using the Random Effect model. Finally, robust standard errors are reported to account for heteroscedasticity and autocorrelation.

One of the most recognised problem faced by researchers when estimating gravity models is the presence of nonnegative trade flows with possibly many zeros presents in datasets. Dealing with these zeros calls for particular caution because the traditional log-log form leads to biased estimators. One of the solutions is to replace all observations in the data-series by adding a value of 1 to the trade flows to prevent zero values. However, as highlighted by De Benetictis and Taglioni (2011), this procedure leads to inconsistent estimator. To deal with the zeros trade flows, we adopt the approach of Santos-Silva and Tenreyro (2006) who recommend the use of a Poisson Pseudo Maximum-Likelihood (PPML) estimator, using a log-linear instead of log-log function. For robustness check, the Heckman Sample Selection Estimator as developed by Helpman et al. (2008) is also performed.

### 4.3. Data Source

The variables specified in the gravity model are taken from different sources. Data from the UN COMTRADE from 1990 to 2018 is provided by the United Nations Conference on Trade and Development database (UNCTADSTAT) to capture bilateral trade flows between Mauritius and 46 developing countries (UN Comtrade Data, 2020). The data collected consists of total goods exported and traded, denoted in US dollars. Data on distance, the use of the same official language and common colonial power, are from the CEPII database<sup>2</sup> (CEPII Database, 2019). Data on GDP per capita (current US\$) was collected from the World Bank Development Indicators database 2019 (World Bank, 2019). All variables are collected for the period 1990 to 2018 for 46 countries.

## 5. FINDINGS

### 5.1. Pooled OLS and Random Effects

Table 3 shows the results from equations (5) and (6). Across all the tests, the variables have the expected signs and are around the same value range. The coefficients of the random effects are much larger than those of the pooled OLS regression.

The signs and the level of significance of the variables are as predicted in the theoretical and empirical literature of gravity models. GDP of the local country implies the ability to supply and the output of the importing country represents the propensity to demand. Mauritius tend to export and trade more with countries with high GDP. The higher the foreign GDP, the higher the volume of trade and it is also a proxy of market size, where higher demand in the foreign country encourages Mauritian exports. Similar findings were obtained by Baier and Bergstrand (2009) and Lee and Park (2007) to name a few. The results thus reveal that bilateral trade flows is directly proportional to the home and destination economies (represented by GDP) and inversely proportional to the distance between two locations. The distance is a trade-resisting factor, as greater distance reduces import demand through increasing the price of traded items due to higher transport costs (Kabir et al., 2017). Distance plays an important role as it determines transportation costs, marketing costs and other transactions costs involved in trading. Conversely, geographical proximity helps increase trade flows and is thus favourable for economic regionalism in attaining mutual gains from trade. If the distance between country  $i$  and  $j$  increases by 1 per cent, bilateral exports of country  $i$  from country  $j$  will decline by 1.23 to 1.73 per cent (holding all other things constant). Similarly, with the same rise in distance by 1 per cent, total trade will fall in the range of 1.39 to 1.87 per cent. Having a common official language doesn't seem to have a

<sup>2</sup> Centre d'Etudes Prospectives et d'Informations Internationales (English: Institute for Research on the International Economy).

statistically significant influence on either exports or total trade but having similar colonial powers tend to improve exports and trade between countries.

**Table 3.** Mauritius's Exports and Trade to Developing Countries from 1990 to 2018

	Pooled OLS		Random Effects	
	Exports	Total Trade	Exports	Total Trade
lnForeignGDP	0.293*** (10.46)	0.241*** (11.48)	0.499*** (5.07)	0.338*** (4.72)
lnLocalGDP	0.310 (1.07)	0.919*** (4.06)	1.268*** (6.93)	1.862*** (14.22)
lnDistance	-1.228*** (7.63)	-1.391*** (12.21)	-1.733*** (3.09)	-1.869*** (4.61)
Common official Language	-0.616*** (3.21)	-0.026 (0.19)	-0.964 (1.47)	-0.066 (0.14)
Common Colony	0.779*** (3.89)	0.947*** (6.64)	1.369* (1.95)	1.113** (2.19)
Constant	8.108 (1.08)	-3.914 (0.68)	-19.330*** (2.99)	-28.001** (6.07)
R-Squared	0.11	0.20	0.23	0.24
N	1,339	1,234	1,339	1,234

Source: Authors' Computation. \*\*\* Significant at 1%, \*\* Significant at 5% and \*Significant at 10%.

The regression results from equations (7) and (8) showing the effect of regional trade agreements on exports and trade with developing countries are presented in Table 4 below. The signs and the level of significance of the GDP variables, common colony and distance are as expected. The coefficients for countries belong to the same regional economic community like SADC tend to be positive and statistically significant only for total trade rather than exports. Members within COMESA also tend to trade more but the results are statistically significant only for the pooled OLS and proved to be statistically insignificant under the random effect estimation. The impact of trade agreements in African countries (COMESA, ECCAS, ECOWAS) was also analysed by Musila (2005) where there was no evidence of any considerable impacts in terms of trade diversion and creation. Similar conclusions were also drawn for the COMESA region by Rojid (2006).

There are however, important limitations for estimating the impact of RTAs on trade so much that the dummy variables included to account for countries being part of the regional trading group or not may be endogenous and as such, the estimates may be biased. Further, in many instances, regional agreements are formed to pursue other non-trade goals (see Limão, 2006) or in which they have "non-traditional" gains (see

Ethier, 1998). Hence, South-South agreements have very often been more effective in non-trade dimensions like the management of common resources than in the dimension of trade promotion.

**Table 4.** Mauritius's Exports and Trade to Developing Countries from 1990 to 2018

	Pooled OLS		Random Effects	
	Exports	Total Trade	Exports	Total Trade
lnForeignGDP	0.273*** (9.50)	0.244*** (11.05)	0.508*** (5.08)	0.356*** (4.92)
lnLocalGDP	0.368 (1.28)	0.881*** (3.84)	1.258*** (6.71)	1.805*** (13.44)
lnDistance	-1.772*** (8.54)	-1.398*** (9.12)	-1.617*** (2.73)	-1.672*** (3.96)
Common official Language	-0.392** (1.97)	0.002 (0.01)	-1.013 (1.53)	-0.114 (0.24)
Common Colony	0.654*** (3.40)	0.935*** (6.67)	1.424** (2.01)	1.151** (2.27)
SADC member	0.347 (1.21)	0.407 (1.97)**	0.094 (0.20)	0.59* (1.91)
COMESA member	1.238** (4.26)	0.454** (2.30)	0.443 (1.25)	-0.011 (0.05)
Constant	12.104 (1.63)	-2.961 (-0.51)	-20.366*** (3.09)	-28.782*** (6.19)
R-Squared	0.12	0.21	0.22	0.25
N	1,339	1,234	1,339	1,234

Source: Authors' Computation. \*\*\* Significant at 1%, \*\* Significant at 5% and \*Significant at 10%.

## 5.2. Poisson Pseudo Maximum-Likelihood (PPML) Estimator

We next account for zero trade flows and undertake the Poisson Pseudo Maximum Likelihood. The results are reported in Table 5 below. The coefficients remain robust with a 1 per cent rise in foreign GDP leading to an average of 0.02 per cent rise in exports or total trade while a 1 per cent rise in domestic GDP may lead to an increase in the range of 0.03 to 0.06 per cent in exports or total trade among developing countries. Though the coefficients may be small, there is a potential for Mauritius as a small nation to develop its trade with other developing countries in order to gain higher benefits. There is evidence that countries within COMESA can benefit from greater trade while the dummy for SADC is not statistically significant for exports but is significant for total

trade.

**Table 5.** Mauritius's Exports and Trade to Developing Countries from 1990 to 2018

	PPML		PPML	
	Exports	Total Trade	Exports	Total Trade
lnForeignGDP	0.021*** (10.58)	0.016*** (11.54)	0.020*** (9.61)	0.016*** (11.05)
lnLocalGDP	0.022 (1.04)	0.060*** (4.02)	0.026 (1.23)	0.058*** (3.81)
lnDistance	-0.090*** (7.55)	-0.092*** (12.14)	-0.131*** (8.52)	-0.094*** (9.14)
Common official Language	-0.045*** (3.19)	-0.002 (0.190)	-0.028* (1.92)	0.001 (0.06)
Common Colony	0.056*** (3.85)	0.062*** (6.73)	0.046*** (3.37)	0.061*** (6.74)
SADC member	–	–	0.027 (1.30)	0.024* (1.80)
COMESA member	–	–	0.091*** (4.28)	0.03** (2.37)
Constant	2.237*** (4.08)	1.465*** (3.81)	2.544*** (4.68)	1.541*** (3.99)
R-Squared	0.10	0.20	0.11	0.20
N	1,339	1,234	1,339	1,234

Source: Authors' Computation. \*\*\* Significant at 1%, \*\* Significant at 5% and \*Significant at 10%.

## 6. CONCLUSION

The study shows that South-South trade represents an opportunity for Mauritius to diversify its trade towards new markets. The paper reveals that an increase in Mauritius's real GDP has a positive impact on its exports and trade with developing countries. This indicates that developing economies represent potential markets for Mauritian goods. However, existing markets namely European countries and USA remain important to Mauritius, given their stable demand for Mauritian products. Nevertheless, the unstable conditions of the global economy, where the most advanced economies have not been spared by the financial crisis and the Euro-Zone crisis along with increasing competition from emerging low-cost economies make it challenging for Mauritius to maintain its presence in these markets in the long run. Hence, diversifying into new markets will create more long-term gains to the Mauritian economy.

An increase in distance is associated with a fall in exports and trade, indicating that lower transport costs increase Mauritian imports from these countries. Mauritius must take advantage of growing consumer demand from developing countries within the



African continent, China and India as these countries have achieved high growth rates, despite the economic turmoil. The results of the trade agreements show that trade blocs involving developing countries are positively associated with higher trade. Overall, South-South trade is likely to help reduce Mauritius over-dependence on traditional markets. Some changes are already taking place, with China and India being the two most important sources of imports. These two countries have been able to secure important positions in global trade, over the years. Further, there are still unexploited business opportunities in Africa and Mauritius is showing growing interest in the African continent. Though, trade with developed economies remains important for Mauritius, South-South trade reduces the chance of facing unfair competition from more powerful partners and also mitigate the island's greater exposure, vulnerability and risks faced on the developed markets.

However, for South-South trade to work and help in the trade performance of Mauritius, it depends on the direction of the trade flows that is whether they are inter-regional, regional, sub regional or bilateral trade and which sectors are targeted and as a result, the value added generated in the trade process. There is a need to work on a strategic approach to analyse the benefits of South-South trade within the relevant sectors and with appropriate countries or regions. There is no one-size-fits-all policy as it varies across sectors, industries as well as market demands and needs. To be able to capture more trade opportunities and play an important role in South-South trade, Mauritius needs to diversify its products and markets. At present, South-South trade is dominated by a few countries selling a handful of products so penetrating these markets will not be easy without massive investment in technology and innovation, greater public-private collaboration, better incentives to producers and exporters, to name a few.

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