Determinants of Bilateral Agricultural Trade of SAARC Region: a Gravity Model Approach

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Abstract

The South Asian Association for Regional Cooperation (SAARC) region is an important player in the world agriculture trade. They have vast potential to strengthen their position in global agricultural trade due to theregion's opportunities to increase agricultural production combined with growing global demand. To discover the SAARC potential of agricultural trade patterns, the present paper examines the determinants of bilateral agricultural exports from 2000 to 2019. The gravity model was estimated by employing the Poisson Pseudo Maximum Likelihood (PMML) technique, including zero trade flows for panel data. The results confirm the positive and significant impact of exporter gross domestic product (GDP), importer GDP, Broder, common language, South Asian Free Trade Area (SAFTA), and India-Sri Lanka Free Trade Agreement (ISFTA) on bilateral agricultural trade inthe SAARC region. On the other hand, distance and development levels significantly negatively impact bilateral agricultural trade. Lastly, the study showed an insignificant impact of the bilateral exchange rate.

Keywords	***DOI***	***JEL code***
SAARC, agricultural trade, SAFTA, gravity model, ISFT	*https://doi.org/10.54694/stat.2022.40*	*C23, F15, F43*

INTRODUCTION

Globalisation has evolved dramatically after World War Second. This trend occurred due to the increased international trade and investment activities (Urata, 2002). This was evident becausethe global trade growth outpaced the global output growth (Feenstra, 1998). In 2018, the international merchandise trade climbed

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by 3.0% and the global gross domestic product (GDP) increased by 2.9%. Such a pace of globalisation has gradually increased the trend toward regionalism. Countries worldwide developed regional agreements, whether bilateral, regional, or multinational, to speed up trade and, therefore, their integration into the global economy (Joshi, 2010). Over the past several decades, both developed and developing countries have significantly lowered trade restrictions, bringing a paradigm shift in the international trade patterns. Such a shift in trade patterns has been attributed to how globalisation gained momentum and its impact on speeding up regionalism.

Regionalism is referred to when a group of countries form regional blocks on a regional basis (Carbaugh, 2006). It is being found that both developed and developing countries have shifted towards and formed different regional trading blocs to meet their developmental agendas. Asa result, regional trading agreements worldwide have increased rapidly. Keeping in view the success of major regional trading blocs like encouraged the Indian sub-continent to form a regional trading block, namely The South Asian Association for Regional Cooperation (SAARC), an association of 8 South Asian nations, of which Indiais one of the primary founding members apart from Sri Lanka, Bhutan, Bangladesh, Pakistan, Nepal, Maldives and Afghanistan which joined later in 2008. To promote trade and commerce within the region, these countries entered into a preferential trade agreement SAPTA (South Asian Preferential Trade Agreement) in 1992, which fully came into effect in 1993 as the first level of trade arrangement among SAARC members. Moving ahead for further integration, SAPTA was transformed into a South Asian Free Trade Area (SAFTA) in 2006. One of the most common features of south Asian countries is that they are primarily agrarian in nature. However, over the years,the contribution of the agriculture sector to the GDPs of these countries has declined, but still, a good chunk of the population derives employment from the agriculture sector. Regarding regional trading agreements, the agriculture sector has not been covered under these trading agreements till 2000. However, since the Doha Round of Development in 2001, agriculture has become part of many foreign trade agreements (FTA) negotiations.

Unlike developed countries, the agricultural sector exceeds most of the economic activity in developing countries. Thanks to their structural nature, agriculture contributes to economic development as a continuous process of improving the standard of living of the population. In fact, agriculture is the first economic activity without which life cannot subsist. It is also responsible for the provision of food and clothing for the population of other non-agricultural economies. Likewise, it's capable of supplying a large part of the production materials, such as capital, raw materials and human material for other economic sectors. Many economic indicators and criteria are used to judge the efficiency of the performance of the agricultural sector, which mainly depends on the value of GDP, the volume of production, investments and exports. In this context, agricultural exports are regarded as one of the main means of economic growth and sustainable development of the countries. They are seen as a crucial means of acquiring currency, stimulating agricultural investment, increasing the employment rate, reducing the number of the unemployed and eliminating the poverty rate.

So this backdrop, the present study will try to find out the impact of various determinantson the regional agriculture trade flow among SAARC. Such an analysis will benefit policy-related issues to promote agriculture trade in this region. To the authors' best knowledge, this research is the first attempt to employ the gravity model in determining the major determinants of bilateral agricultural exports of the SAARC region using the PPML econometric technique. For this purpose, a well-known gravity methodology will be employed. Unlike supply-side models such as the Ricardian and Heckscher-Ohlin, the gravity model of trade considers both supply and demand factors (GDP and population) as well as trade resistance factors (geographical distance, trade policies, uncertainty, and various bottlenecks) and trade preference factors (preferential trade agreements, monetary unions, political blocs, common language, and common borders) (Bacchetta et al., 2012; Benedictis and Vicarelli, 2004). Therefore, the research

will help to identify the major determinants of bilateral agricultural exports of the SAARC region,which will allow this research to contribute to the existing literature with the necessary information during the decision-making processes of both public and private policymakers.

The present study has two-fold novel contributions to the analysis of bilateral agricultural exports of the SAARC region. The first is due to methodological concerns. In contrast to the previous studies of SAARC agricultural trade data, such as Dembatapitiya (2015), we apply Poisson Pseudo Maximum Likelihood (PPML) to generate our parameter estimates rather than the more conventional Ordinary Least Squares (OLS) technique. PPML has shown fewer bias estimators than conventional OLSas an estimation method of choice. The second novel contribution of the present research is the inclusion of both SAFTA and the India-Sri Lanka Free Trade Agreement (ISFTA) trade agreements as control variables on agricultural trade of the SAARC region.

The paper is structured as follows: current section introduces background, importance and novelty of the theme; first section presents the literature review; second section discusses methodological aspects of the article like the identification of variables through the gravity model, data and data sources and the PPML econometric technique for the gravity model; third section presents empirical results; and the final section concludes the paper with policy implications and future research gaps.

1 LITERATURE REVIEW

This part highlights the review of previous studies that have used the gravity model to examine the fundamental determinants of trade and its potential. International trade flows were studied using the gravity equation for the first time in 1962 by Nobel Prize-winning economist Jan Tinbergen. Using the data covering 18 countries in his first study in 1958, he found that the trade flow between the countries was proportionate to the product of an index of their economic sizes, and the factor of proportionality was dependent on the measures of trade resistance between them. Anderson (1979) was the first who tried to provide the theoretical underpinnings to the gravity equation based on the Armington (1969) assumption. He argued that the nation of origin differentiates goods, consumers have established preferences for all the differentiated goods assumption, and consumers have established preferences for all of the differentiated items. Later it was found that a multitude of international trade theories, such as the Ricardian model, Heckscher–Ohlin model, and new theories of economies of scale, monopolistic competition, and intra-industry trade, can be used to derive the gravitation equation Bergstrand (1985), Helpmann and Krugman (1985), Helpmann (1981), Alan (1995), and Anderson and Van Win coop (2003).

Srinivasan (1994) employed the gravity model to examine the impacts of SAPTA, and they found that smaller countries have more chances to get benefited from SAPTA. Rajapakse and Arunatilleke (1997), while examining the trade between Sri Lanka and its major trading partners through the gravity model approach, found that the abolition of restrictive trade policies has the ability to boost trade potential between Sri Lanka and its trading partners. Examining the trade among south Asian countries, Samaratunga et al. (2001), employing the gravity model, came up with the result that there is a potential for southAsian exports to expand and increase their volume. For the period 1996–2002, Shukar and Hassan (2001) used both panel and cross-sectional data to assess trade creation and trade diversion effects under the current SAFTA system by applying the gravity model to the panel data. According to a study, there was no indication of trade diversion between SAARC countries and other countries. Rahman, Shadat and Das (2006) studied additional regional trading blocs with an extended gravity model. SAPTA was proven to have considerable intra-regional trade creation, according to their findings. In contrast, Rodrguez-Delgado (2007) modified the gravity equation and found SAFTA's trade liberalisation programme to have limited effects on regional trade flows. Dayal et al. (2008) found that estimated trade is much higher than actual trade, indicating a huge potential for intra-regional trading in South Asia.

Using an augmented gravity model with trade costs as an additional variable, Banik and Gilbert (2008) investigated whether the presence of trade costs influences trade flows in the South Asian region. According to the report, South Asia has greater trade costs because of a lack of physical and service-related infrastructure, government regulation, port inefficiency, and corrupt customs officials. Jeevika's (2009) studies have shown that South Asia had only a moderate success in liberalising regional trade because of the leftover trade barriers, the lack of complementary production and consumption, and political friction between countries. This was demonstrated through sectoral gravity models of exports of five product categories related to food and agriculture: livestock, vegetables, processed foods, and manufactured goods. It was concluded in Moinuddin's (2013) study that lowering tariffs and non-tariff obstacles will have a positive impact on intra-bloc trade among South Asian economies.

Recently Kahaer and Buwajian (2020) used the gravity approach to determine the impact of international logisticsfrom the 22 countries of western and central Asia on the agricultural export growth of China during 2012–2019. The results of the study reveal that the population, GDP, mutual memberhood of the member countries and performance of international logistics significantly impacted the country's agricultural export growth. Similarly, González et al. (2018) confirm that population, GDP per capita, real exchange rate, and free trade agreements positively impact Nicaragua's agricultural exports, while distance significantly negative impacts agricultural exports. Fiankor, Haase and Brümmer (2021) applied the translog gravity model to determine the heterogenous effects of food standards on agricultural trade. The study confirms the negative impact of importer standards on agricultural trade flow. By using the two-step system generalised moment methods (two-step sys GMM) on agricultural exports on agricultural exports, Eshetu and Mehari (2020) confirms the GDP, road connectivity, exchange rate, domestic savings, tax revenue, and lagged agricultural exports as a major determinant of agricultural exports of Ethiopia. Bakari and Zidi (2021) found the positive impact of GDP in the agricultural sector, bank loans to the agricultural sector, agricultural imports, and imports of agricultural machinery on agricultural exports in the long run of Tunisia agricultural exports. On the other hand,the exploitation of agricultural land and domestic investment tothe agricultural sector harms Tunisia's agricultural exports.

2 METHODOLOGY AND DATA

The methodology of the paper is as; first, the determinants of bilateral agriculture of the SAARC region are identified using the gravity model of agricultural trade; second, the impact of identified determinants on agricultural exports is estimated using the PPML econometric technique and lastly, the methodology provides the data sources of all interesting variables.

To account for a comprehensive analysis and to examine the determinants of agricultural exports within the south Asian block. We have employed a widely celebrated gravity model technique derived from Newton's universal law of gravitation, which states that trade between two countries is directly related to the GDP of two countries and inversely determined by the distance between the countries. The model was first used by Tinbergen (1962), Pöyhönen (1963), and Pulliainen (1963) to explain bilateral trade. The theoretical model of gravity model is borrowed from Newton's law of gravity which assumes that the attraction between two bodies in the universe is directly proportional to their masses and inversely related to the distance between them. In international trade economics, the gravity model suggests that trade between two countries is proportional to their national incomes and inversely related to the distance between them. Therefore, the gravity model predicts that economically rich and closer countries trade more than developing countries. Braha et al. (2017) suggest that the gravity model efficiently explains a large proportion of international trade. Following Braha et al. (2017), the gravity equation of international trade is expressed as follows:

$$X_{ij,t} = \alpha GDP_{i,t}^{\beta 1} GDP_{j,t}^{\beta 2} Dis_{ij}^{\beta 3}, \ \beta_1 > 0, \ \beta_2 > 0, \ \beta_3 < 0, \tag{1}$$

where $X_{ij,t}$ is the dependent variable representing the bilateral trade flow from country i to country j. The independent variables includes the GDP_i (economic size of the exporter country), GDP_j (economic size of the importer country), and Dis_{ij} (distance between the exporting and importing countries).

Traditionally, the gravity model is estimated through log-linearisation and is estimated through linear estimators like OLS. Taking the logarithm on both sides of Formula (1) as:

$$lnX_{ijt} = \alpha + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{ij} + \beta_3 lnDis_{ij} + \varepsilon_{ijt}, \tag{2}$$

where β_1, β_2 and β_3 are elasticity coefficients showing the impact of export's GDP. Importer's GDP and bilateral distance on trade flow between countries.

However, Formula (2) is subject to two econometric issues which have received attention in recent methodological development. First, the original gravity model omits the multilateral resistance terms which are correlated to trade costs. Ignoring the multilateral trade costs could lead to biased estimators. To capture the trade costs a number of control variables are used as a proxy to capture the trade costs that are specific to our theme, including the binary variable, the border between trading countries, a binary variable of common language and others. The augmented gravity model with multilateral resistance variables is shown in Formula (3) as:

$$lnX_{ijt} = \alpha + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{ij} + \beta_3 lnDis_{ij} + \beta_4 lnExc_{ij} + \beta_5 lnGDPC_i + \beta_6 lnGDPCj + \beta_7 Lng_{ij} + \beta_8 Bor_{ij} + \beta_9 SAFTA_{ij} + \beta_{10} ISFT_{ij} + \varepsilon_{ijt}. \tag{3}$$

The second issue is the treatment of zero trade flow years between the trading countries. Ignoring the zero trade years may lead to another source of bias if ignored. The log-linearised model leads to a truncated dependent variable due to the non-existence of a natural log of zero observations. To address this issue, we apply Santos-Silva and Tenreyro's (2006) so-called PPML estimator. Not only does it capture the useful information contained in zero trade flows, but the PPML estimation technique is also a suitable method in the presence of heteroscedasticity. With a solid theoretical foundation and substantial empirical evidence, the PPML approach has been regarded as one of the most effective techniques for calculating gravity equations. The PPML equation of the augmented gravity model is as:

$$X_{ijt} = \alpha + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{ij} + \beta_3 lnDis_{ij} + \beta_4 lnExc_{ij} + \beta_5 lnGDPC_i + \beta_6 lnGDPCj + \beta_7 Lng_{ij} + \beta_8 Bor_{ij} + \beta_9 SAFTA_{ij} + \beta_{10} ISFT_{ij} + \varepsilon_{ijt}, \tag{4}$$

where $GDPC_i$ is the income-effecting variable measured by the GDP per capita of the exporting country, $GDPC_j$ is the income-effecting variable of importing country. Exc_{ij}, presents the bilateral exchange rate. Lng_{ij}, is a dummy variable showing whether exporting and importing country has a common primary language. The dummy variable, Bor_{ij}, if countries *i* and *j* share a common land border. $SAFTA_{ij}$ and $ISFT_{ij}$, are free trade agreements.

The fundamental premise of the model is that trade flow between countries increases with the increase in their GDPs and decreases with the distance between countries. So the GDP of both the countries that is exporting and importing countries is expected to have a positive impact on trade flows.GDP is taken as a proxy for income. The higher the income level, the higher thecountry's productive capacity, which means a greater amount of goods available for export. So, the coefficient of exporter GDP is expected to have a positive sign which means an increase in the goods available for exports. In the same way,a higher level of GDP of an importing country means a higher level of income, which means a higher absorptive

capacity for importing country. The coefficient of importer GDP is also expected to have a positive sign (Harris and Matyas, 1998; Rahman, 2005; Jayasinge and Sarker, 2008). The distance, which is expressed in km, is the distance between two economic centres/capitals.

The distance, which is a proxy for transportation and other transaction costs,negatively impacts trade flows between countries. Therefore, it is expected to have a negative sign (Zorzoso and Lehman, 2000; Abraham and Hove, 2005; Rahman, 2005). The border, which we take as a dummy variable between country pairs. Countries which share borders carry the value1 and 0 otherwise. Common border reduces transaction costs, increasing trade volumes and is expected to have a positive sign. Language is another dummy variable expected to influence trade flows positively, therefore its coefficients are expected to have a positive sign. It takes the value 1 if counties have the same language and 0. It captures cultural characteristics and similarities/differences between two countries (Zorzoso and Lehman, 2000; Abraham and Hove, 2005; Rahman, 2005).

The coefficient of the per capita difference variable can be both positive or negative. The positive sign of this variable indicates that the trade pattern follows the H-O theory, which says countries that are similar trade less than those that are not. The negative coefficient of this variable indicates that the trade pattern follows the Linder demand hypothesis, which postulates that countries which are similar tend to trade more than otherwise.

The agricultural gravity trade model is frequently augmented by using the impact of the exchange rate. In our study annual exchange rate is determined by the export's currency units per unit of the importing currency. An increase in the exchange rate would be expected to devaluate the exporter currency, and exports would become cheaper. Therefore, the expected sign of the exchange rate is positive (Hatab et al., 2010).

The effects of trade liberalisation on agricultural exports are observed by using dummy variables of free trade agreements (FTAs). We incorporated two dummies, SAFTA and ISFTA, to observe the impact of free trade agreements in the SAARC region. SAFTA is a 2006 regional trade agreement among SAARC countries, and ISFT is a bilateral free trade agreement between India and Sri Lanka. Economists have debated the impacts of FTAs through trade creation and diversion effects. Trade diversion leads the inefficiency due to trade preferences for higher costs of member countries with FTA. On the other hand, the trade creation benefits of FTAs depend the initial structural conditions of member countries.

In order to estimate the panel gravity equation, the study uses the bilateral agricultural trade of seven SAARC countries, namely Bangladesh, Nepal, Sri Lanka, India, Pakistan, Bhutan and Maldives, for the time 2000–2019. Data on agriculture trade flows were extracted from the UNCOMTRADE database[4] at SITC code (0–12 and 4–27–28 define the agriculture sector under such classification, data in annual terms). Data regarding dummy variables like a common language, common border and distance are obtained from the CEPPI database.[5] SAFTA and *SFT* are self-constructed dummy variables. The data of macroeconomic variables of GDP, GDP per capita and exchange rate of importing and exporting countries are obtained from the World Bank database.[6] The description of variables is presented in Table 1.

3 EMPIRICAL RESULTS

In the presence of zero trade flows and heteroscedastic, OLS estimates will be inconsistent andbiased. To avoid such inconsistency and bias, the study estimates the gravity equation using the PPML and the OLS techniques. So here, we will discuss the results of the PPML estimation technique. We have

[4] <*https://comtrade.un.org*>.
[5] <*http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele.asp*>.
[6] <*https://data.worldbank.org*>.

Table 1 Description of variables

Dependent Variable	Description	Expected sign
lnX_{it}	Log of bilateral agricultural exports	
Independent variable		
$lnGDP_{it}$	Log of the gross domestic product of reporter country *i*	+
$lnGDP_{jt}$	Log of the gross domestic product of partner *c* country *ij*	+
$lnGDPC_{it}$	Log of GDP per capita of reporter country *i*	+/–
$lnGDP_{jt}$	Log of GDP per capita of partner country *j*	+/–
$lnDis_{ij}$	Log of Distance between country *i* and *j*	–
$lnExc_{ij}$	Log of relative exchange of ratio of export currency and import currency	–
Bor_{ij}	Dummy variable = 1 if country *i* and *j* have a common border; 0 otherwise	+
Lng_{ij}	Dummy variable = 1 if country *i* and *j* have a common ethnic language; 0 otherwise	+
$ISFT_{ij}$	Dummy variable = 1 if country *i* and *j* are members of ISFT; 0 otherwise	+
$SAFTA_{ij}$	Dummy variable = 1 for the year 2006; 0 otherwise	+/–

Source: Authors´ calculation

estimated two PPML models. First, we include only basic fundamental variables in the model second of PPML, we introduce trade agreements. SAFTA is a regional trade agreement, and ISFT is a bilateral free trade agreement between Sri Lanka and India.

Table 2 Estimates of the Gravity model

	OLS (1)	PPML (1)	PPML (2)
$lnGDP_{it}$	0.582*** (0.259)	0.683*** (0.0333)	0.534*** (0.0342)
$lnGDP_{jt}$	0.444 (0.258)	0.619*** (0.0339)	0.473*** (0.0378)
$lnDis_{ij}$	0.460 (0.887)	0.259* (0.129)	0.230* (0.145)
$lnExc_{ij}$	0.576 (0.701)	0.0381 (0.0929)	0.0489 (0.0727)
$lnGDPC_{it}$	0.0659 (0.675)	0.115 (0.0826)	0.200** (0.0757)
$lnGDPC_{jt}$	2.737*** (0.677)	0.271** (0.0926)	–0.360*** (0.0836)
Bor_{ij}	1.360 (1.792)	0.363* (0.142)	1.368*** (0.136)
Lng_{ij}	1.360 (2.871)	0.363* (0.156)	1.368*** (0.156)
$SAFTA_{ij}$	1.380* (0.666)		0.553*** (0.142)
$ISFT_{ij}$	0.787 (.696)		1.650*** (0.146)
Cons	–23.38* (10.01)	–9.894*** (1.592)	–2.558 (1.816)
N	280	280	280
R-sq	0.713	0.643	0.752

Notes: Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001.
Source: Authors´ calculation

The PPML (2) confirms that the results of the baseline gravity model are persistent with the theoretical framework. The coefficient of GDP of exporter and importer countries are positive and significant. The coefficient of the exporter GDP suggests that a 1 percent increase in GDP will increase the agricultural trade flow by 0.53 per cent. Results also suggest that trade flow will increase with the increase in importing country's purchasing power. Importer country GDP coefficientsuggests that the increase 1 percent of the trade flow will improve by 0.47 per cent. Results indicate that the SAARC region's agricultural exports proportionally with an increase in the sizeof member countries. As expected, our results confirm that distance significantly negatively impacts agricultural exports. As expected, our results confirm the negative and significant impact of distance on agricultural exports. Increasing distance between the capital city of SAARC member countries proxies higher transport costs.

In addition to the classical variables, we adjust the basic model with the variables of GDP per capita as a proxy for the level of development and relative exchange rate. However, the estimates of the model find the negative and significant impact of the level of development on bilateral agricultural exports. This reason may be due to the fact negative elasticity of agricultural exports. The other variable of the relative exchange rate has an insignificant impact on bilateral agricultural exports. The reason may be that the consumption of agricultural goods is based on the customs and habits of people.

Results of the model, augmented with the effect of the common border and common language, confirm the validity ofthe theoretical foundation of the gravity model. The significant and positive coefficient of these variables depicts that SAARC agricultural exports are strongly influenced by transaction and transportation costs. Indeed results predict higher bilateral agricultural exports between countries that share a common language and broader.

The finding of the study confirms the agricultural export creation impact of trade agreements. SAFTA confirms the significant and positive impact on bilateral agricultural exports of the SAARC region. Many studies found that SAFTA has not led to any trade creation among member nations. However, the present study finds that in the case of agricultural trade, it has significantly improved or led to trade creation among member countries. Also, the bilateral free trade agreement ISFT between India and Srilanka has enhanced agricultural trade between these counties as its coefficient is positive and statistically significant.

CONCLUSION

The study investigates the nature of fundamental determinants of agricultural trade flow among SAARC nations through the gravity model approach. It utilises the econometric approach using PPML for bilateral agricultural exports, involving seven SAARC nations, excluding Afghanistan, for the period 2000–2019. Since most of the SAARC nations are agrarian, it is imperative to analyse the nature of trade flow among SAARC nations. The study reveals that the GDP of both exporting and importing countries positively impacts the agriculture trade within the SAARC region. The results indicate that increase in the region's GDP will enhance interregional agricultural trade, revealing a higher impact of member SAARC countries absorbing potential for enhancing bilateral agricultural trade. From the results, it can also be inferred that geographical distance impedes the trade between costs, resulting in higher trade costs. It indicates that geographical proximity and transport cost costs are the key drivers of agricultural exports. Such an outcome is further supported by the significant positive impact of a common language and common border on the bilateral trade of SAARC members. The results also reveal that SAFTA has been a trade-creating agreement and has improved the intra-regional agricultural trade in the SAARC region. Therefore, the present study prompts a need for deeper integration in South Asia to improve trade relations and tackle the poverty and unemployment this region has been facing for decades. Deeper integration will help in the development of better infrastructure, higher productivity and sustainable growth in GDP. The nature of agricultural commodities is such that they are mostly perishable and less durable. For such trade, distance plays an important role, and, therefore, steps must be taken to increase

the connectivity channels and invest in roadinfrastructure is important in this region. Further special attention should be given to the competitiveness of farmers. Public investment in irrigation should be accompanied by direct support to farmers.

While our study examined the determinants of bilateral agricultural trade in the SAARC region beyond the traditional gravity model, it would be worthwhile to raise some of the limitations of the present study that should be incorporated into further research to improve our understanding of the central theme. Some of the issues are: first future research should use the sectoral GDP rather than the overall national income, second other factors, including tariffs, geopolitical concerns, import substitution policy and pricing that influence the bilateral trade in the SAARC region should be included in future research, thirdly, the authors recommend the future studies with a larger dataset about these variables and also comparison between different regions for better results and fewer errors. However, from this research point of view, it has some interesting findings that can help policymakers achieve a better view of the SAARC region's bilateral agricultural trade.

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