Impact of Trade Facilitation Reforms on The Trade Volume of SAARC Countries

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ARTICLE DETAILS

ABSTRACT

Purpose: The purpose of the study is to inform the ministry of commerce and trade about the significant implications of trade facilitation for the improvement of trade in the SAARC region. This paper attempts to estimate the relationship between trade facilitation indicators and trade volume and also explored the correlation between trade facilitation reforms and the trade volume in the case of SAARC countries.

Design/Methodology/Approach: This paper is an empirical approach, which is based on secondary data from SAARC countries for the period 2006 to 2013. The study uses Pooled OLS, Fixed effect, and a random effect model for the empirical analysis.

Findings: The results of the study show, that is a significant relationship between trade facilitation and trade volume. Decreasing the total number of documents required will make it possible for SAARC countries to trade with high frequency. The study also found that a marginal decrease in the total cost of trade also encourages traders to reach the targeted trade volume.

Implications/Originality/Value: The trade facilitation reforms can be an effective policy option on the regional level across all the SAARC countries. However other policy reforms and actions such as basic physical infrastructure, good governance, and ensuring political stability are also obligatory for the possible improvement of the trading capabilities of SAARC countries.

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Introduction

Trade and economic growth are interlinked phenomena and there exists a long-run causal relationship between the production of goods and trade volume [Khan M. I. (2017)]. The study supplementary contended that trade is one of the most important influencing factors for the economic growth of a
developing country. To enhance the macroeconomic indicators, a country is expected to engage in internal and external trade. Countries with an easy mode of doing business setups and trade-related facilitation policies have achieved successive economic growth. According to Wilson, et al (2005) is very essential to define the trade facilitation measures on the national level. The United Nations Centre for Trade Facilitation and Electronic Business. (UN/CEFACT) has defined trade facilitation as the “simplification, standardization and harmonization of procedures and associated information flows required to move goods from seller to buyer and to make payment”. Assorted procedures and documentation raise costs and cause impediments not only for businesses but also for consumers’ Li, and Wilson (2009). This is quite a realistic approach for all economies of the world, but it has several negative implications, primarily for the developing countries of the world. that a 10% increase in export time reduces developing country’s export by 8-12% [Djankov, et al (2010)]. Furthermore, Exporter’s governance indicator exhibits a positive impact on export performance in developed and developing countries. Only a 1% increase in the average tariff rate is associated with a 0.8% of reduction in exports in a country. Sadikov (2007).

There is a need for reforms in favor of trade facilitation for developing countries which can further accelerate the escalating growth in trade volume and Gross domestic product (GDP) of the developing countries. This implies that the trade facilitation hypothesis is yet to be validated in different cases. According to Afridi et al (2019), most of the SAARC member countries are the poorest and the lowest per capita income countries. The most important channels to raise the economic growth of a country are trade and foreign direct investment. To attract foreign investment, it is important to provide facilities to investors to sustain the markets against the fast-growing competition. Traders and investors can be encouraged by removing unnecessary requirements for doing business and trade. Trade facilitation¹ has been a matter of great consideration for both public and private investors in the last few decades and has become a considerable part of the existing debate on trade liberalization policy all across the world. Based on the argument of Wilson, et al (2005), that trade facilitation indicators improvement should be at the center of trade development policies, especially in the case of developing countries. It can be observed that the world is talking about the expansion of trade through simplification. The WTO Doha Round discussion on trade facilitation is one of the important development in the matters of trade, particularly for developing countries because it is expected to create an ease of doing cross-border trade “to and from” developing nations. International trade has amplified extremely over the last few years due to reduction in tariff rates and liberalization policies, which also signify the implementation of trade facilitation in real economies of developing countries.

For the amplification of international trade flow, the key factors are the transaction cost of trade and the time that is consumed while delivering the products and services which if reduced can have a significant impact on trade volume [Diakantoni et al (2017)]. The direct and indirect trade transaction costs involved in export procedures might amount to a maximum of 15 percent of the value of traded goods Grainger, A. (2016). A cut of 5 percent on the transaction cost can boost the investment in trade due to the increased margin of profit. Better trade facilitation indicators of a country can help a nation to gain several potential benefits for the economy. It also increases tax collection and pushes the distributor toward better use of resources, which increases trade compliance, and attracts foreign direct investments (FDI). Trade facilitation plays a vital role to promote free trade across countries. Trade facilitation implies how procedures and controls prevailing the movement of goods across national boundaries can be improved by reducing the associated cost burdens to make it more efficient. Countries that implement trade facilitation reforms to enlarge the trade efficiency and connectivity are generally likely to create a center of attention for more FDI inflows and other traders across the world. There are tons of research papers, which show that synchronization of trade patterns is very important for increasing the trade volume and numbers of products traded, but to my knowledge, none of the studies has yet empirically tested the relationship between trade facilitation and trade volume in the context of SAARC countries. This paper

¹ Trade facilitation search for how procedures and controls prevailing the movement of goods across national boundary can be improved to decrease associated cost burdens and make the most efficiency.
attempts to empirically estimate the relationship between trade facilitation indicators and trade volume for SAARC countries. The following trade facilitation indicators for selected SAARC countries are given in Table 1 to understand the data on trade facilitation.

Table 1: Trade Facilitation Indicators for Selected SAARC Countries

| Countries  | Documents to Exports (Number) | Time to Exports (Days) | Cost to Exports (US $ Per Container) | Documents to Imports (Number) | Time to Imports (Days) | Cost to Imports (US $ Per Container) |
|------------|-------------------------------|------------------------|--------------------------------------|-----------------------------|------------------------|--------------------------------------|
| Afghanistan| 9                             | 71                     | 2761                                 | 11                          | 75                     | 2795                                 |
| Bangladesh | 7                             | 29                     | 903                                  | 9                           | 39                     | 1281                                 |
| Bhutan     | 9                             | 36                     | 1475                                 | 13                          | 39                     | 2301                                 |
| India      | 7                             | 21                     | 942                                  | 10                          | 25                     | 1058                                 |
| Maldives   | 9                             | 22                     | 1340                                 | 10                          | 22                     | 1488                                 |
| Nepal      | 8                             | 38                     | 1749                                 | 10                          | 32                     | 1869                                 |
| Pakistan   | 8                             | 20                     | 645                                  | 7                           | 20                     | 622                                  |
| Sri-Lanka  | 7                             | 19                     | 689                                  | 10                          | 20                     | 706                                  |
| Average    | 8                             | 32                     | 1313                                 | 10                          | 34                     | 1515                                 |

Source: Doing Business (World Bank)

The trade facilitation measure is based on several sub-indicators, which include the number of documents required for a trade transaction, the time required in days, and the cost of export or import per container. Trade facilitation indicators show that trade barriers are comparatively higher in Afghanistan, Buttan, and Maldives as a result of a high number of documents required for the transaction. Trade time for Afghanistan is the highest and the lowest in Sri Lanka. Additionally, it also shows that trade time for Pakistan is less than India, indicating greater facilities for trading with Pakistan as compared to India. In terms of restrictions on imports, Buttan is the strictest among the selected countries, imposing the requirements of the highest number of documents. Pakistan has the lowest cost of imports among all the SAARC countries listed above in table no 1.

Trade Facilitation and Trade Volume

There are almost a million studies conducted on trade and economic growth and other important indicators of trade and economy. The literature shows that trade facilitation is a very important approach to boosting the volume of trade in emerging economies. The study of Mufti, and Ali (2020) indicates that trade liberalization has significant implications for trade growth in SAARC countries. The study of Moïse and Sorescu (2013) highlights the importance of trade facilitation policy areas under negotiation at the WTO in the context of developing countries. The report established that trade facilitation is a helping hand for a country, which has the potential to trade across borders. Hyo and Chong (2012) analyzed the impact of trade facilitation on trade volume in the framework of cross-sectional data from 150 developing and 26 developed countries. This paper employed a pooled OLS estimation technique and found that an improvement of 1 percent, in the trade facilitation measures will increase the extensive margins of primary export by 1.3 % and manufactured export by 2.4 % respectively. It will be quite interesting to explore types of margins in the case of SAARC countries. Low-income countries (LIC) and low-middle-income countries have better logistic efficiency traded with more variety of primary products. while in the manufactured sector higher logistic capability had the highest impact for upper middle-income countries.

Shepherd, and Wilson (2009). Trade facilitation in ASEAN member countries: Measuring progress and assessing priorities. *Journal of Asian Economics, 20*(4), 367-383. pointed out in South East Asia that transport infrastructure and availability of communications technology are very important for trade volume in this region. The higher the efficiency higher will be the impact on manufactured export for the
upper middle-income countries, whereas the lower-income countries’ logistics efficiency has a more intensive impact on the exports of primary goods. Another study by Djankov et al. (2010) examined that each additional single day in the delay of products being shipped reduces trade by at least 1% for agricultural goods. The delay of one day reduces a country’s relative export by 6%. One additional signature required for exporting reduces the country’s export by about 4.5%. Business registration procedures affect exports of differentiated products due to the associated opportunity cost. A very comprehensive work by Iwanow and Kirkpatrick, (2009) analyzed 124 countries’ data set for the period 2003-2004 by using the second stage Hickman procedure and found that the trade cost is an important indicator of export performance. The findings unearthed that a 10% improvement in the regulatory environment increase 5% in manufactured export performance. Social factors, which include Common language and colonial heritage play a significant impact on bilateral trade. Furthermore, a study by Helpman, et al (2004) found that transport costs and tariffs have a strong negative effect on export sales relative to FDI. He also found that more heterogeneity at the firm level leads to significantly more FDI sales rebut to export sales. Lesser, and Moisé-Leeman, (2009), investigation proved that trade facilitation reforms improve the export performance of developing countries. The impact of physical infrastructure and information and communication technology plays an important role in the growth of exports on national and international levels. A conspicuous study by Hamanaka, (2014) found that an increase in physical infrastructure by 0.01 % corresponds to a 1.99% increase in TFP (total factor productivity). Similarly, 0.01 % increase in border & buss are associated with TFP growth of 0.36% & 0.37 % respectively. Control of corruption and openness are both associated with higher TFP. An empirical work conducted by Inma et al (2008) investigated that decreasing the number of days and low transport costs impact positively on the total volume of trade. Trade facilitation instruments have the potential to persuade traders to switch from informal to formal trade. It will also help to moderate direct and indirect transaction costs arising due to the mandatory obligations for imports and export-related measures. This mechanism helps to reduce trade-related regulations for some of the selected low-value transactions. [Caroline et al (2009)].

Data and Methodology
The data of the study is taken from World Bank Website, doing business Index, UNCTAD, and World Integrated Trade Solutions. The data is taken from multiple sources because of the integrated nature of this study. The study has applied Pooled OLS, Fixed Effect, and Random Effect regression models to estimate and compare results across different econometric techniques. The study used a fixed effect model to check the cross countries’ heterogeneities. In this model the parameters are fixed because it calculates the times series mean and process it as crossectional unit. While, incongruous to the first model random effect model has random parameters because the variables are random across the time, which captures the time bound variations. Use of random effect model is chosen on the bases of houseman test. This test is utilized to understand two important aspects of panel data or pooled data analysis. First, to detect the endogenous variables in the regression, endogeneity exists in the model if the variable has values that are determined by the other variable in the model. Finally, to test and understand the performance of fixed and random effect model, the pooled OLS is employed as a baseline model.

Model Specification and Data Sources
The following baseline econometric model is estimated to evaluate the impact of trade facilitation indicators on the trade volume of SAARC countries: This section represents the equation to answer the question that “Does trade facilitation measures matters for trade volume in the context of SAARC countries? In order to scrutinize the robustness of the results, three estimation techniques pooled OLS, FE (fixed effect,) RE (random effect,) and various model specifications are tested for the validation of results estimates.

\[
Trade_{jt} = \beta_0 + \beta_1 cdr_{jt} + \beta_2 trd_{jt} + \beta_3 ndoc_{jt} + \beta_4 GDP_{jt} + \beta_5 GDPP_{jt} + \beta_6 pop_{i} + \beta_7 popf_{j} + \beta_8 popj_{i} + \beta_9 trop_{jt} + \beta_10 trf_{jt} + \beta_11 Y_{it} + \beta_12 Y_{jt} + \beta_13 CB_{jt} + \beta_14 Cl_{jt} + \beta_15 D_{ijt} + \epsilon_{jt}
\]

Where
Trade$_{jt}$ is the total volume of bilateral trade (calculated as import + export) between importing and exporting countries in the given time period t which is taken as a thousand US dollars. This is the dependent variable of the study.

Ctd is the cost of trade measured in terms of US dollars per container from each SAARC country to the destination of the hosting country. This is an independent regressor, which indicates the trade facilitation in the model.

Ttrad is the time to trade taken as a number of days for declaration of the port. This indicates the port inefficiency which is expected to have an adverse association with trade volume.

Dtrad is the total number of documents required to trade (export/import) a standard container of merchandise, requires certain registration documents, which show and make the trade counted in our national accounts.

GDP is the gross domestic product at the constant price of the exporting country and importing country denoted by i and j respectively in the given time period, represented by the subscript t in the equation. Higher GDP can have two directional impacts on trade volume. Reduction in imports also reduces trade volume and it can be also in a manner that increases exports due to a greater amount of goods produced. These impacts are more of a definition concern in empirical studies.

Pop$_{it}$ is the population of exporting country and importing country denoted by i and j respectively in the given time period t. while pop$_{ijt}$ are the number of common people in both countries.

Trop is trade openness which is taken as (import + exports = TRADE/GDP).

Trf is the tariff rate applied MFN which is applied by the host country to the other country.

CB is a dummy for common border 1 if trading countries share a common border takes value one and 0 otherwise.

CL is a dummy variable for a common language in exporting and importing countries, it takes value of one if the exporting and importing countries share a common language and 0 otherwise.

D$_{ijt}$ is the distance between trading countries, taken in kilometres by CEPII.

it is the error term.

**Uniqueness of this work**
This paper is unique in terms of capturing the counterfactuals Vs causal effects to understand the difference of outcomes for something is happening or the SAARC countries do and something had done by any of the members.

**Empirical Results for Trade Facilitation Indicators and Trade**
The results of the study indicate that all the three measures of trade facilitation are significantly associated with trade volume across the SAARC countries, and these findings are largely consistent with the results and findings of previous studies. The sign of coefficients shows negative causal effects of growing cost of trade, increasing time to trade and number of documents on trade volume of the SAARC countries. The number of documents has a time oriented causal effects on trade volume. Documents requirements are increasing over time but remains almost same across the SAARC member countries.

The positive link between trade facilitation measures and trade volumes is well documented for developing countries before and SAARC block is not an exception. However, effects of trade barriers on trade are much higher out of SAARC region. It indicates that export promotion agencies of SAARC block are effectively contributing in safeguarding the value of trade markets in SAARC countries. The second important finding from the results can be seen as the tariff rate is negatively influencing the trade volume of SAARC member countries. Furthermore, all other macroeconomic indicators are statistically
significant, indicating a positive association with trade volume. The study found that the GDP of importing and exporting countries both are highly significant, which implies that countries with high GDP are frequently involved in bilateral trade and thus contribute to the trade volume of these countries. The distance and tariff are the only control variables whereas the time and cross-sectional differences are observable across the different three models. However, the time effect is statistically stronger in this case. Detail results for all three models are provided in appendices a1, a2, and a3 right after the bibliographic references of the study.

**Discussion on Findings in Light of Literature**

The results of this study are consistent with the findings of previous studies in the literature. Trade facilitation for investment in infrastructure and regulatory reform can drastically enhance export performance, which is particularly true for (Portugal-Perez and Wilson 2012), and this study indicates such findings from the fixed effect model. Similar Studies have shown that Improvement in trade facilitation increases export diversification in developing countries (Dennis and Shepherd 2001). However, this study has some limitations, it doesn’t cover export diversification. The study by Wilson et al. (2005) pointed out that improvements in the customs and regulatory environment, port efficiency, and e-business infrastructure would raise exports of African countries by almost ten percent. Research findings reveal that simplifying and harmonizing the trade procedures increases the volume of trade in SAARC countries.

This finding is in the line of study by Hausman, et al (2013). They found that a 1% reduction in the cost of trade would lead to an increase of 2.6% in export of that country. The second measure of trade facilitation; Time to trade is also negatively associated with trade volume. Coefficients of concern variable are highly significant and reveal that increase in time delay to complete the trade procedure would cause to decrease in the trade volume. this negative correlation finding of the current study is supported empirically by Sadikoun (2007) that a 1% increase in border delays would on average lead to the export volume being diminished by 0.44%. Finally, Documents to trade (the third measure of trade facilitation) is also highly significant and negatively related to trade. Empirical results suggest that by decreasing the number of documents required in completing the trade procedure would positively enhance the trade volume of the member countries of SAARC.²

This finding is consistent with the work of Moïsé, et al (2011). Trade facilitation indicators: The impact on trade costs. Control variables of host country and investing country both are highly significant and positively affect the trade volume. Increased GDP of any trading partner would boost the trade volume of that country. The Population of the host country positively impacts the trade volume. Trade openness is also positively associated with trade volume. The increasing effect of trade openness would also increase the total trade volume of that country. The tariff rate is highly significant and consistent with three measure of estimation technique pooled OLS, fixed effect, and random effect shows that a 1% reduction in tariff rate applied by a country cause to increase the trade volume by 5.53%. Per capita income of host and source countries is positively related to trade inflow. Increasing the impact of per capita income on the people of a country would encourage them to spend more and indirectly increase the trade volume of the country. Common border (CB) and common language CL are also positively correlated and have significant impacts on trade volume. Distance between trading partners shows ambiguous but significant results with pooled OLS and RE

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²Research study on OECD lower middle income countries of Asia demonstrates that these countries can easily enhance trade volume by reducing the cost of trade. Another study assessed the impact of sixteen trade facilitation measures and analyzing the potential impact of these trade facilitation indicators on trade of developing countries. The findings of this research demonstrate that simplifications and harmonization of documents, stream ling of procedures and available information have the greatest impact on trade volume and trade cost for imports and export performance of the countries. The combined effects of improvement in TFIs leads 14.5% reduction of trade cost for LICs (lower income countries), 15.5% for LMICs (lower middle income countries) and 13.2% for UMICs (upper middle income countries).
Table 2 trade facilitation and Trade Volume

| Independent Variables                          | Pooled OLS | Fixed Effect | Random Effect |
|-----------------------------------------------|------------|--------------|---------------|
| CTRD = Cost of The F Trade                   | -5.96**    | -1.14e7***   | -6.96e5**     |
| (0.013)                                       | (0.001)    | (0.022)      |               |
| TTRD = Time To Trade                          | -9.41***   | -5.27e7***   | -5.67e7***    |
| (0.000)                                       | (0.000)    | (0.000)      |               |
| DTRD = Total Number of Documents              | -6.38e8*** | -6.86e6      | -2.15e8***    |
| (0.000)                                       | (0.495)    | (0.000)      |               |
| Gdpi = Gross Domestic Product of Exporting    | 2.0e5***   | 2.55e7***    | 2.44e5***     |
| Country                                       | (0.000)    | (0.000)      | (0.000)       |
| Gdpj                                          | 8.52e5***  | 1.79e5***    | 1332.74***    |
| (0.000)                                       | (0.000)    | (0.000)      |               |
| Popi Population of Exporting Country          | 2.50e6***  | 2.86e7***    | 3.7e7***      |
| (0.000)                                       | (0.000)    | (0.000)      |               |
| Popij                                         | 4.42e5***  | 6.48e7***    | 5.58e6***     |
| (0.000)                                       | (0.000)    | (0.000)      |               |
| TROP = Trade Openness                         | 1.63e5***  | 1.51e5***    | 1.52e5***     |
| (0.000)                                       | (0.000)    | (0.000)      |               |
| TRF = Rates of Tariff                         | 5.53e7*    | -2.97e8***   | -2.75e8***    |
| (0.081)                                       | (0.000)    | (0.000)      |               |
| CB = Common Boarder                           | 4.15e9**   | -           | 4.17e9***     |
| (0.032)                                       | (0.000)    | (0.000)      |               |
| CL = Common Language                          | 1.19e9***  | -           | 1.19e9***     |
| (0.000)                                       | (0.000)    | (0.000)      |               |
| Dijt = Distance                               | -7.92e6*** | -           | 1.65e8***     |
| (0.000)                                       | (0.000)    | (0.000)      |               |
| Yit = Error Term                              | 1.37e7     | 6.56e7***    | 5.2e7***      |
| (0.058)**                                     | (0.000)    | (0.000)      |               |
| Yjt                                           | 2.69e7     | 6.36e7***    | 4.51e7***     |
| (0.000)**                                     | (0.000)    | (0.000)      |               |

1 %(***) , 5 %(**) and 10 %(*).

**Conclusion**

This paper is based on secondary data and the study attempts to explore the relationship between trade and trade facilitation. The study explored in the literature that trade facilitation is important for the growth of trade volume and Export-trade-led growth theories have established that trade is one of the most important contributors to economic growth. Better trade facilitation indicators of a country help to gain several potential benefits for that economy for insentience, tax collection, use of resources and trade compliance, and the inflow of FDI, these all indicators can be improved if the trade facilitation policies are implemented through powerful negation across the countries of interest. The main point of this paper is whether the trade facilitation indicators affect the trade inflow in the region of SAARC. To assess this research question, whether improved trade facilitation measures enlarge the trade volume of the SAARC countries? Three indicators of trade facilitation: such as time to trade is taken in a number of days, cost of trade is taken as US dollars per standard container, and a number of total documents required for trade procedure is included in the different model specifications to investigate their impact on the trade volume of SAARC countries. Overall all three measures of trade facilitation are significant, broadly consistent, and support the hypothesis, that trade facilitation increases the trade volume in the region of SAARC. Hence decreasing the cost of trade, time to trade and the number of documents to trade can increase the trade volume of sample countries. The results of this hypothesis confirm the very important link between trade facilitation measures and trade for SAARC countries. The findings on the trade facilitation measures support the hypothesis that improvement in trade facilitation and SAARC countries’ trade are positively linked. Poor trade facilitation indicators seem to be impediments to their trade performance and the results confirm that there is a dire need for the improvement of these measures.

While other control variables of the model included in the model are the GDP of importing and exporting...
countries, the population of both countries, and trade openness (TROP) tariff rate (TRF) and show significant and consistent results with the expected sign of the theory. Common border (CB) and common language (CL) are significant but with different signs of general theory show a negative relation between variables with trade volume in the region of SAARC. Overall findings suggest that trade facilitation is an effective policy tool to enhance trade volume of the SAARC region. So it is important to take action for the relaxation of the regulatory environment in SAARC countries. Unfortunately, trade facilitation indicators of the region are very disappointing as compared to other developing countries. Hence, the government and policymakers of the SAARC region need to pay special attention to reforms for improvement in these trade facilitation measures particularly for enhancing the volume of international trade.

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### Appendix A1: Table 3: Fixed Effect (Independent variable: trade)

|    | 1         | 2         | 3         | 4         | 5         | 6         | 7         | 8         |
|----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| CTRD | -6.7E7*   | -7.67E7***| -         | -         | 7.5e7***  | -8.96e7***| -7.65e7***| -         |
| TTRD | -         | -9.5e7*   | -         | -         | -         | -         | -         | -         |
| DTRD | -         | -         | -         | -2.6e9**  | -         | -         | -         | -2.44e9** |
| GDPI | 2.46e7*** | 7.5e6***  | -         | -         | 2.97e7*** | -         | 2.6e7***  | -         |
| GDPJ | -         | 2.95e7*** | 1.18e6*** | 2.68e7*** | -         | 1.17e7**  | 2.96e7*** | -         |
| POPI | -         | -         | 2.68e6*** | 1.34e8*** | 2.9e5***  | -5.35e7   | -         | -         |
| POPIJ | -        | 2.23e7*** | 2.7e7**   | 1.62e7    | 1.92e7**  | 1.33e7    | 2.17e7**  | 1.68e7    |
| TROP | 1.68e7*** | -         | 4.0e5     | 3.56e7    | -         | -         | -8.60e6   | 3.83e7    |
| TRF  | -9.29e7***| -         | -3.29e8   | -3.95e8** | -4.62e8** | -         | -         | -         |
| Yit  | -         | 2.07e7    | -         | -4.86e6** | -         | -         | -         | 4.88e7*** |
| Yjt  | -         | -         | -6.28e7   | -7.93e7   | -         | -9.09e7   | -7.83e6   | 4.23e7    |
| R²   | 0.4637    | 0.4929    | 0.4756    | 0.4620    | 0.4620    | 0.5016    | 0.5037    | 0.4710    |
| C    | 2.89e7**  | -6.41e9   | -1.94e10  | -4.73e10* | -5.72e10**| 1.76e10   | -6.46e9   | 8.63e9    |

### Appendix A2: Table 4: RANDOM EFFECT (INDEPENDENT VARIABLE: trade)

|    | 1         | 2         | 3         | 4         | 5         | 6         | 7         | 8         |
|----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| CTRD | -8.8E7*** | -8.37e7***| -         | -1.35e7***| -         | 1.15e5*** | -         | 1.15e7*** |
| TTRD | -         | -4.62e7*  | 4.34e7*   | -5.59e7** | -         | -         | -         | 1.25e7*   |
| DTRD | -         | -         | -         | -         | 1.92e9*   | -         | -         | -         |
| GDPI | -         | -         | -         | 2.58e7*** | 7.8e5***  | 1.40e5*** | -         | 2.53e7*** |
| GDPJ | 2.89E7*** | 2.82e7*** | 2.84e5*** | 3.11e5*** | 2.51e5*** | 2.40e5*** | 1.35e7*** | 1.34e7*** |
| POPI | 1.94E7*** | 1.70e7*** | 2.81e5   | -3.5e7    | -         | 3.71e5*** | -         | 4.28e7    |
| POPIJ | 1.16E7** | 9.8e8**   | -         | -         | 6.31e5*   | 1.39e7**  | -         | -         |
### Appendix A3: Table 5: Pooled OLS (independent variable: trade)

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Ctrd | -1.7e7*** (0.000) | -1.9e7 (0.585) | - | - | -7.4e7*** (0.000) | - | - | -8.97e7*** (0.000) |
| ttrd | -1.89e8* (0.100) | -1.79e8* (0.061) | - | - | - | - | - | - |
| dtrd | - | -2.4e9*** (0.001) | - | -2.86e9*** (0.000) | - | -2.98e9 (0.000) | -3.09e9*** (0.000) | - |
| GDPi | 10458.6*** (0.000) | 7.59e7*** (0.000) | 1.17e7* (0.076) | 1.65e7 (0.657) | - | 7.96e7 (0.000) | 8.0e6*** (0.000) | 1.18e7*** (0.000) |
| GDPj | 2471.60*** (0.000) | - | - | 2.43e7*** (0.000) | 2.36e7*** (0.000) | 2.43e7 (0.000) | - | 2.11e7*** (0.000) |
| POPi | - | - | | | | | | |
| POPij | 5984056*** (0.005) | 7.94e7*** (0.000) | 6.94e7*** (0.002) | 7.95e7*** (0.000) | 7.56e7*** (0.000) | 8.30e7 (0.000) | 8.36e7*** (0.000) | 1.04e7*** (0.000) |
| TROP | 1034882* (0.060) | - | - | 1.52e7*** (0.006) | 1.24e7** (0.022) | 1.67e7 (0.003) | 1.67e9*** (0.003) | 1.0e7* (0.055) |
| TRF | - | -2.34e8** (0.035) | -5.43e8*** (0.0078) | -5.11e8*** (0.006) | -4.60e8** (0.050) | -2.25e8 (0.033) | -2.23e8** (0.033) | -1.35e7* (0.091) |
| CB | -7.49e9*** (0.000) | -7.4e9*** (0.008) | -1.0e10*** (0.001) | -7.23e9*** (0.005) | -1.06e10*** (0.000) | -5.11e7 (0.006) | -5.994e9** (0.018) | - |
| CL | -5.6e9*** (0.009) | -4.63e9** (0.045) | -5.39e9*** (0.001) | -4.65** (0.037) | -5.52e9 (0.008) | -5.60e9*** (0.008) | -6.19e9*** (0.004) | - |
| Dijt | - | 1.0e7 (0.677) | -4.85e7 (0.851) | -1.02e7 (0.671) | 2.23e7 (0.377) | - | -1.18e7 (0.617) | -1.07e7 (0.673) |
| Yit | - | - | - | - | - | 3.32e7*** (0.009) | - | - |
| Yjt | - | - | - | - | - | - | - | -6.71e7 (0.913) |
| R2 | 0.5628 | 0.5892 | 0.5325 | 0.5915 | 0.5807 | 0.6026 | 0.6033 | 0.6253 |
| C | 6.19e9* (0.146) | 1.8e10*** (0.004) | 1.21e10** (0.017) | 2.40e10*** (0.000) | 1.41e10*** (0.002) | 2.35e10*** (0.000) | 2.46e10*** (0.000) | 8.75e9* (0.063) |

- R2: 0.5973 | 0.5743 | 0.4573 | 0.2143 | 0.5504 | 0.206 | 0.2756 | 0.2078 |
- C: 8.99e9 (0.256) | 1.06e10* (0.086) | -1.26e8 (0.985) | 9.24e8 (0.140) | 1.21e10 (0.205) | 9.95e7 (0.849) | 1.72e9*** (0.000) | 1.06e8** (0.013) |