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Determinants of Indo–Gcc Trade: A Panel Data Analysis

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Abstract: This paper examines the impact of identified key variables on India's total trade (exports and imports) with GCC countries by using augmented gravity model on panel data. The export model results reveal that partner countries GDP, per capita GDP of partner countries, population in partner countries, trade openness in partner countries, total imports in GCC countries, export affinity in India, diaspora and trade agreement increase the volume of India's exports to GCC countries, whereas distance, real exchange rate, per-capita GDP difference, inflation in India and tariff rates in GCC countries reduce the volume of India's exports to GCC countries. On the other side, the results of import model explicate that reporter country GDP, GDP per capita in India, Indian population, import affinity in India, trade openness in India, real exchange rate and trade agreement have significant positive impact on India's imports from GCC countries, whereas tariff rates in India significantly reduce the volume of India's imports from GCC countries.

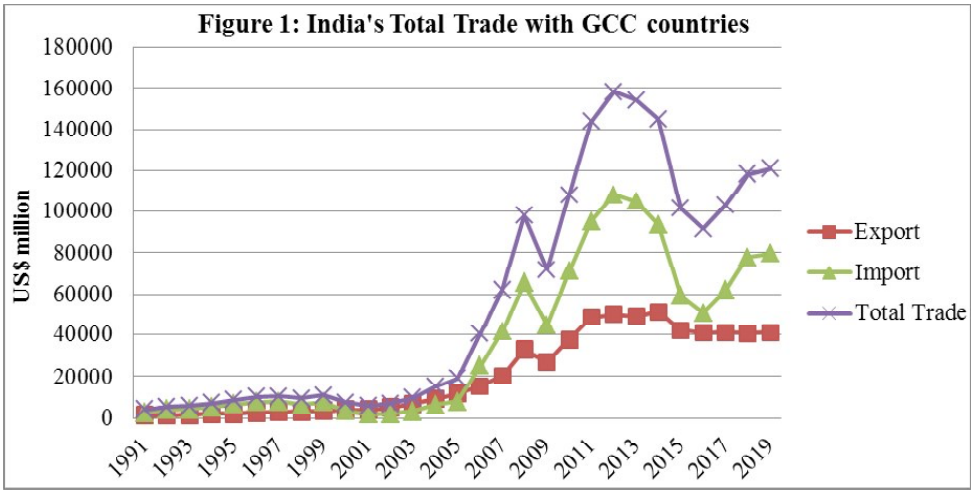
Keywords: Exports, Imports, Augmented Gravity Model, Panel Data, GCC countries

I. INTRODUCTION

As per the International Energy Agency (IEA) report, India is the third biggest oil-consuming nation in the world after the United States and China. India is the second fastest growing oil consuming nation in Asia. Gulf Cooperation Council (GCC) countries are the biggest suppliers of oil and gas in the world. India's economic linkages with GCC countries have increased steadily especially due to growth in oil imports. GCC countries contribute more than forty percent of crude oil and natural gas in India. Saudi Arabia is the largest crude oil provider, whereas Qatar is the dominant supplier of natural gas for India. Any interruption in energy imports from the GCC countries will have a serious impact on India's economic growth.

India's total trade with GCC countries increased from US$ 3.73 billion to US$ 143.62 billion in the year 1991-92 to 2011-2012. In 2012-13, India's total imports touched peak from GCC countries recorded at US$ 108.28 billion, and exports to the GCC countries were US$ 49.95 billion. It is clearly shown in figure-1, India's total trade with GCC countries has increased at a rapid pace, year 2016-17 showed a slight downfall registering total trade of US$ 91.68 billion. The volume of exports with GCC countries in the same year stood at US$ 40.80 billion and imports were US$ 50.87 billion. In 2017-18, India's total trade was US$ 103.01 billion which rose to US$ 118.23 billion in 2018-19. In 2019-20, total trade registered as US$ 120.82 billion with US$ 41.21 billion exports and US$ 79.61 billion imports. The trade balance has been heavily in favour of the GCC countries during the study period except from 2000-01 to 2005-06.

Figure 1: India's Total Trade with GCC countries



Source: Direction of Trade Statistics (complied), IMF Database

The remaining paper is structured as; section two reviews the literature on determinants of international trade, the third section discusses the variables and data sources. Section fourth specifies the export model, import model and methodology, the empirical results of export and import model are discussed in section fifth and section sixth concludes the observations.

II. REVIEW OF LITERATURE

A number of researchers made attempts to identify determinants and examine their impact on international trade. They explicated that each determinant plays a different role depending on the economic status of country and time-span under study. Notable among them are Geraci and Perwo (1977), Brada and Mendez (1983), Bergstrand (1989),

Summary (1989) and McCallum (1995). They tried to investigate the role of income variable (GDP of reporter and partner's countries) in gravity equation. Srivastava and Green (1986) considered cultural similarity between countries as an important determinant of trade flows between nations. Linder (1961) stated that the country with similar per capita income would have similar demand. In the similar way, Thursby and Thursby (1987), Chow et al. (1999) and Choi (2002) strongly support Linder's assumption. Prasad and Gable (1997) examined the effects of macroeconomic fluctuations on international trade. Bryant et al. (2004) and Law et al. (2009) considered the effect of migration on international trade and observed that migration play a crucial role in trade between two countries.

Malik and Chaudhry (2012) attempted to examine the determinants of the import structure of Pakistan by using generalized least square method on panel data ranging from 1996 to 2006. The study observed partners GDP, exchange rate, and openness in the partner country as major determinants of increased import volume. Roy and Rayhan (2012) used gravity model to analyse the factors influencing imports in Bangladesh over a period from 1991 to 2007 from selected fourteen countries. The observed partner countries' income, distance, and exchange rate as important determinants of Bangladesh's imports, and concluded that Bangladesh has maximum import potential with the SAARC region.

Alleyne and Lorde (2014) applied traditional gravity model to explore controlling factors of trade in thirteen member states of Caribbean Community (CARICOM). The study observed significant positive impact of per capita GDP differential, trade to GDP and common language, and negative impact of exchange rate, distance, and historical trade links on international trade performance of selected CARICOM countries. Elhiraika and Mbate (2014) used the system generalized method of moments (S-GMM) model to assess the long-run determinants of export diversification in fifty-three African countries over a period 1995-2011. The results confirmed that human capital, infrastructure, institutional framework, per capita income and public investments play a significant role in export diversification in selected countries.

Kumar and Ahmed (2015) used gravity model by incorporating variables such as GDP, population, distance, and tariff to identify the determinants of export and import for selected eight countries of South Asian region on panel data for the period from 1985 to 2011. The results revealed that all variables included in the model have significant impact on trade of selected countries. For enhancing intra-regional trade, the study mentioned that South Asia Free Trade Agreement (SAFTA) has a positive impact on South Asian Association for Regional Cooperation (SAARC) countries. Almodarra (2017) analysed the impact of foreign direct investment flows from Gulf Cooperation

Council countries on trade by taking panel data from 2001 to 2012. The results suggested that both FDI inflows and outflows significantly increase imports from and exports to GCC countries.

Alam and Ahmed (2018) tried to trace the trade relationship between India and GCC countries. They applied gravity model on panel data with economic variables, like GDP, distance, population, trade openness, and dichotomous variables, namely common language, common colony, trading affinity and diaspora for 15 years annual data from 2001 to 2015. The study explicated that trade between India and GCC countries is positively influenced by GDP, trade openness, trading affinity and diaspora, while negatively affected by population and distance. The results of trade potential revealed that among all GCC countries, India has highest trade potential with Kuwait. The study also mentioned that proposed Free Trade Agreement (FTA) will boost bilateral trade between India and GCC countries.

Khayat (2019) applied gravity model by using random effect and ordinary least squares methodology to analyse the determinants of bilateral trade between the six GGC countries and six developed economies for a period from 2001 to 2012. The researchers considered GDP per capita, population and distance as trade determinants in the model. The research indicated that GDP per capita and population for source and destination countries have positive impact, and distance between countries has a negative impact on bilateral trade flow.

Most studies used gravity model on panel data to analyse the impact of identified determinants on trade volume. Though, GCC countries played a major role in India's global trade pattern; still, very few studies on India-GCC trade are available. Accordingly, researchers feel the need to investigate major determinants of India – GCC trade and analyse their impact on India's bilateral trade with GCC countries by using Augmented Gravity Model on panel data.

III. DATA SOURCES AND VARIABLES DESCRIPTION

The Data

Present study considers India's (the reporter country) annual trade data (exports and imports) with six GCC member countries (partner countries): Bahrain, Kuwait, Oman, Qatar, Saudi Arab and UAE, and the selected explanatory variables for a period spanning from 1991-92 to 2019-20. All the currency variables are considered in US dollar terms. The trade data, viz., India's exports to and imports from GCC, India's total exports and imports, Total exports and imports of GCC is collected from IMF: Direction of Trade Statistics (DOTs) database; the data on GDP at current prices (India and GCC), per

capita GDP at current prices (India and GCC), per capita GDP difference between India and GCC, exchange rate (Indian Rupee and GCC currencies), and Inflation rate are extracted from International Financial Statistics (IFS) and World Economic Outlook (WEO) database published by the International Monetary Fund (IMF); and the data on tariffs collected from Trade Analysis and Information System (TRAINS) database. The source of data on population and diaspora is United Nations: Department of Economic and Social Affairs (DESA) – Population Division, and data on bilateral distance is taken from *Centre d'Études Prospectives* and d'*Informations Internationales* (CEPII) database. Trade openness, foreign trade agreement, export affinity and import affinity are considered as dummy variables.

Variables

Brief description of explanatory variables and dummies are as follows.

- GDPi and GDPj = Gross Domestic Product of India (i) and GCC countries (j) is taken as a proxy for capturing the economic mass in gravity model of trade. This model assumes that the more similar countries in terms of GDP may have a larger volume of bilateral trade between them. It is also believed that the larger the country in terms of economic size, the more numbers of varieties of goods they will offer. It is expected that larger the GDP of a county or size of the economy, the larger would be the volume of trade. Hence, it can be presumed that the variable will have a positive sign for the coefficient of trade.
- PGDPi and PGDPj = Per-capita GDP of India and GCC countries is taken as a proxy for income or level of development. If per person income in a country increases, the demand for more exotic foreign varieties of goods also increases. Moreover, developed countries have advanced technology, transportation and infrastructures that facilitate international trade. Thus, it can be expected that PGDP will have a positive sign of coefficient with trade.
- PGDPDij = Per-capita GDP difference between India and GCC countries is one of the important determinants of international trade. Linder's hypothesis states that the volume of bilateral trade flows will be greater when GDP per capita of trading countries are more similar. Thus, sign of the coefficient of PGDPD will be negative. Heckscher-Ohlin (H–O) theory, on the contrary mentioned that countries with dissimilar levels of per-capita GDP will trade more than the similar level countries; meaning that the coefficient of PGDPD will be positive.
- DISij = In international trade, distance is considered as a proxy of trade cost (transport and transaction costs) which implies that more the geographical

distance between two regions (here, India and GCC countries) will increase the trade cost and have negative impact on bilateral trade.

- POPi and POPj = The market size of a country, measured in terms of population of India (i) and GCC countries (j) is an important variable affecting the international trade. Population size is expected to have a positive coefficient with trade.
- TARij and TARji = Tariff levied by government of a country for revenue, protect domestic markets, or exert political leverage is an important barrier to international trade. If tariffs imposed by country (i) or (j) on its imports will increase, it will result into decrease in trade volume with country (j) or (i). Thus, tariff is expected to have negative coefficient.
- RERij = Real exchange rate between India and GCC countries, here, measured as the ratio between annual average of the national currency unit of India per US$ and the annual average of the national currency unit of countryj per US$, is expected to have negative association with imports and positive association with exports.
- CPIi and CPIj = Consumer price index of India and GCC countries is used to measure the impact of inflation on international trade between them. Higher inflation is expected to reduce exports and increase imports.
- TOi and TOj = Trade openness, measured as trade – GDP ratio implies that the countries which open their economies for trade or remove trade restrictions, are expected to have more trade.
- DIAij = Diaspora refers to movement of population of a country from their homeland to rest of the world. It is considered as a dummy variable to examine the dispersion of the Indian population in GCC countries. For the purpose of measurement, if diaspora population of countryi in the countryj is less than one percent of total population of the countryj during 1991-2018, the value of dummy variable be zero, otherwise one. This variable is expected to turn out with a positive coefficient.
- TA (XAij and MAij) = Trade affinity which refers to the level of cohesiveness or bonding between countries is considered as a dummy variable to analyse the trend of trade between partner countries. The value of this variable is considered one, if India's average total trade with GCC countries is more than one percent, otherwise zero. Accordingly, export affinity (XAij) and import affinity (MAij) will take value of one if India's average exports and imports with GCC countries is more than one percent during the period of study.

- FTAijt = India – GCC Framework Agreement on economic cooperation, signed in 2004 is also considered as a dummy variable to examine the impact of agreement on trade between two parties. This is considered as one if country i and j were the party of agreement at time t, otherwise zero.

IV. MODEL SPECIFICATION AND ECONOMETRIC METHODOLOGY

The Model

Augmented gravity model is used to examine the impact of identified variables on India's exports to and imports from GCC countries.

The log-linear form of basic gravity model of trade is presented as follows:

$$\text{Ln (Trade}_{ij}) = \alpha_0 + \beta_1 \text{Ln (GDP}_i * \text{GDP}_j) + \beta_2 \text{Ln (Dis}_{ij}) + u_{ij} \quad (1)$$

Where, α_0 is the intercept, $\beta_1, \beta_2, \beta_3$ are the coefficient and uij is the error term.

The basic gravity model (equation – 1) is augmented by adding some important qualitative and quantitative variables, such as trade openness (TO), trade agreement (FTA), diaspora (DIA), trading affinity (TA), per-capita GDP at Current Prices (PGDP), per-capita GDP difference (PGDPD), exchange rate (RER), inflation rate (CPI), tariffs (TAR), and population (POP) that may affect bilateral trade flow between India (i) and GCC countries (j).

Econometric Methodology

Model 1: Export (Xij)

$$\text{Ln(Xijt)} = \alpha 0 + \beta 1 \ln(\text{GDPjt}) + \beta 2 \ln(\text{DISij}) + \beta 3 \ln(\text{PGDPjt}) + \beta 4 \ln(\text{PGDPDijt}) + \beta 5 \ln(\text{POPjt}) + \beta 6 \ln(\text{TOjt}) + \beta 7 \ln(\text{TMjt}) + \beta 8 \ln(\text{TXit}) + \beta 9 \ln(\text{RERijt}) + \beta 10 \ln(\text{CPIit}) + \beta 11 \ln(\text{CPIjt}) + \beta 12 \ln(\text{TARjit}) + \beta 13(\text{XAijt}) + \beta 14\ (\text{DIAijt}) + \beta 15(\text{FTAijt}) + \text{Uijt} \quad (2)$$

Model 2: Import (Mij)

$$\text{Ln(Mijt)} = \alpha 0 + \beta 1\ \ln(\text{GDPit}) + \beta 2\ \ln(\text{DISij}) + \beta 3\ \ln(\text{PGDPit}) + \beta 4\ \ln(\text{PGDPDijt}) + \beta 5\ \ln\ (\text{POPit}) + \beta 6\ \ln\ (\text{TOit}) + \beta 7\ \ln(\text{TMit}) + \beta 8\ \ln(\text{TXjt}) + \beta 9\ \ln(\text{RERijt}) + \beta 10\ \ln(\text{CPIit}) + \beta 11\ \ln(\text{CPIjt}) + \beta 12\ \ln(\text{TARijt}) + \beta 13(\text{MAijt}) + \beta 14(\text{DIAijt}) + \beta 15(\text{FTAijt}) + \text{Uijt} \quad (3)$$

V. RESULTS AND DICUSSION

Unit Root Test

Modelling of panel dataset differs from time series in terms of unit root tests and estimation techniques as former contains properties of both the time series and cross-

section data. However, before estimating specific model, it is important to test whether panel dataset contains a unit root or not. Here, the null hypothesis (Ho) is that the series contains a unit root (non-stationarity), and the alternative hypothesis (Ha) is that the series does not contain a unit root (stationarity). To ascertain stationarity of selected variables in the present study, the researcher used two popular unit root tests, viz., Breitung t-stat and Im, Pesaran and Shin (IPS) W-stat. The test statistic used are Schwarz info lag length and Newey-West bandwidth selection criterion at 5 percent level of significance.

The results of Breitung and IPS tests presented in table-1 indicate that all the variables except tariff and population are stationary at the first order of integration I(1). Individually, IPS unit root test results show that CPI, tariff and population are stationary at level I(0), and Breitung test indicates tariff and population are stationary at level I(0). Unit root testing of dummy variables is not needed because of their discrete dichotomous nature.

Export Model (Xij)

The pooled OLS model for India's exports presented below shows the relationship between India's exports to GCC countries (Xij) as dependent variable, and a set of independent variables which included partner countries income (GDPj), geographical distance (DISij), per-capita GDP of partner countries (PGDPj), per-capita income difference (PGDPDij), population in partner countries (POPj), trade-GDP ratio or trade openness (TOj), total imports of partner countries (TMj), India's total exports (TXi), real exchange rate (RERij), India's inflation rate (CPIi), inflation rate in partner countries (CPIj), average tariff rate on imports from India in partner countries (TARji), India's export affinity towards GCC countries (XAijt), Indians in GCC countries (DIAij), trade agreement between India-GCC countries (FTAij).

$$Xijt = 7.176+0.424\ (GDPjt) -2.760(DISij) + 1.009(PGDPjt) -0.932\ (PGDPDijt)+ 0.526(POPjt) + 0.241(TOjt) + 0.451(TMjt) -0.036(TXit)-0.407(RERijt)-2.830(CPIit)-2.292(CPIjt)-0.251(TARjit) +2.402\ (XAijt)+ 0.191(DIAijt)+ 0.642(FTAijt)+ Uijt \quad (3)$$

The results of pooled OLS estimation (table-2) show that India's exports to GCC countries are positively influenced by GDPjt, PGDPjt, POPjt, TOjt, TMjt, XAijt, DIAijt, and FTAijt; and negatively by DISjt, PGDPDjt, TXit, RERijt, CPIit, CPIjt, and TARjit. Further, the model indicates that one percent increase in GDP of countries j will raise the demand for Indian products in the host market by 0.42 percent. Similarly, one percent increase in per-capita GDP of partner countries will proportionately increase (about 1.00 percent) India's exports to GCC countries. The per-capita income difference

seems to have significant negative impact on India's exports. It is expected that one percent increase in per-capita income difference will cause 0.93 percent fall in India's export.

As expected, distance between exporting country and the host market shows statistically significant negative impact on trade. Its coefficient implies that one percent increase in distance will lead to 2.76 percent decrease in India's exports. The statistically significant coefficient of partner country's population hints that one percent increase in partner country's population will result into 0.53 percent increase in India's exports to GCC countries. Inflation in India has a significant negative impact (2.83 times of change in inflation rate) on India's exports to GCC countries. Inflation in partner countries also has highly negative (β = -2.29), but insignificant impact on India export to GCC countries.

Partner countries' trade openness implies that one percent increase in trade–GDP ratio of partner countries will raise India's export to these countries by 0.24 percent. Similarly, statistically significant and positive coefficient of total imports in GCC countries shows that one percent increase in partner countries' total imports will increase India's exports to GCC countries by 0.45 percent. However, India's total export has insignificant impact (β = – 0.04) on India's export to GCC countries.

Surprisingly, real exchange rate has significant negative impact on India's export to GCC countries. It indicates that one percent increase in exchange rate (fall in the value of Indian rupees) will reduce India's exports to GCC countries by 0.41 percent. Trade affinity between India and GCC countries is expected to increase India's exports to GCC countries by 2.40 percent. In the same line, foreign trade agreement is expected to have positive impact on India's export to GCC by 0.64 percent. Tariff rates in GCC countries are expected to have negative impact on India's exports by 0.25 times, and one percent increase in the diaspora may lead to increase India's export to GCC countries by 0.19 percent. The coefficient of determination of India's exports to GCC countries (r^2 = 0.976) indicates that 97.6 percent of variations in dependent variable are explained by independent variables considered in the model.

Import Model (Mij)

The model for India's imports from GCC countries (model – 2) shows the relationship between India's imports from GCC countries (Mij), the dependent variable and selected independent variables which include India's GDP (GDPi), Distance between India and partner country (DISij), per-capita GDP in India (PGDPi), per capita GDP difference between India and GCC countries (PGDPDij), India's population (POPi), trade openness in India (TOi), India's total imports (TMi), total exports of partner country (TXj), real

exchange rate (RERij), CPI in India (CPIi), CPI in partner country (CPIj), average tariff rate in India (TARij), import affinity (MAij), diaspora/ migrants (DIAij) and free trade agreement (FTAij). The mathematical form of the model can be represented as:

$$Mijt = 46.350 + 1.368(GDPit) - 3.789\ (DISij) + 2.282(PGDPit) + 0.617(PGDPDijt) + 2.853(POPit) + 0.430(TOit) - 0.076\ (TMit) - 0.435(TXjt) + 0.381\ (RERijt) - 0.951\ (CPIit) - 1.526(CPIjt) - 0.286(TARijt) + 1.560(MAijt) + 0.544(DIAijt) + 0.799(FTAijt) + Uijt \quad (3)$$

The result of pooled OLS estimation presented in table-3 shows that GDPi, PGDPi, PGDPDij, POPi, TOi, RERij, MAij, DIAij and FTAij have positive coefficients meaning that these variables positively influence India's imports (Mij) from GCC countries. Similarly, negative coefficient of DISij, TMi, TXj, CPIi, CPIj, and TARij indicate negative association with Mij. Among these factors, coefficient of GDPi, PGDPi, POPi, TOi, RERij, TARij, MAij, and FTAij are significant, rest of the variables have insignificant coefficient.

The results reveal that the most prominent factors having significant positive impact on India's imports from GCC countries are GDPi, PGDPi, POPi, RERij, TOi, MAij, and FTAij; their coefficients are 1.37, 2.28, 2.85, 0.38, 0.43, 1.56, and 0.80 respectively. These statistics indicate that individually, one percent increase in India's population, GDP per capita, import affinity, and India's GDP will result into increase in India's imports from GCC countries by 2.85, 2.58, 1.56, and 1.37 percent respectively. Similarly, India–GCC trade agreement, trade openness in India, and real exchange rate is expected to affect India's imports from GCC countries by 0.80, 0.43, and 0.38 times respectively. The coefficient of per capital GDP difference and diaspora, though is 0.62 and 0.54, but insignificant.

TARij has significant negative coefficients; meaning that one percent increase in tariff rates imposed by India on imports from GCC countries will reduce India's imports from GCC countries by 0.29 percent. The coefficient of other variables, such as distance, India's total imports, total exports of GCC countries, inflation in India and GCC countries is –3.79, –0.08, –0.44, –0.95 and –1.53, but insignificant. Basically, India imports a huge volume of essential goods from GCC countries due to this factor these explanatory variables do not cause a significant impact on dependent variable. The coefficient of determination (r^2) of the model is 0.906. It implies that 90 percent of variations in the dependent variable are explained by explanatory variables considered in the model; remaining 10 percent variations in Mit are caused by other factors.

VI. CONCLUSION

The result of augmented gravity model for India's exports to GCC countries reveals that partner countries GDP, per capita GDP of partner countries, population in partner

countries, trade openness in partner countries, total imports in GCC countries, export affinity in India, diaspora, and Indo–GCC trade agreement have significant positive impact on India exports to GCC countries. Real exchange rate, per-capita GDP difference between India and GCC countries, inflation in India, and tariff rates in GCC countries have significant negative impact, while India's total exports and inflation rates in GCC do not have significant impact on India's exports to GCC countries. The result of panel OLS model for India's imports from GCC countries shows that India's population, GDP, GDP per capita, import affinity, trade openness, trade agreement, and real exchange rate have significant positive impact on India's imports from GCC countries, whereas tariff rates imposed by India on imports from GCC countries significantly reduce the volume of India's imports from GCC countries. However, this study is limited to secondary data and no qualitative determinants are included in the analysis. Further studies may use some other macroeconomic variables or microeconomic aspects related to the problem or may incorporate views and opinions of experts and executives of regulatory authorities in the study.

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APPENDIX

Table 1: Unit Root Test

Variables	*Test*	*t-Statistic**	*P-Value*	*Order of Integration*
LnX	Breitung t-stat	-4.73649	0.0000	I(1)
	Im, Pesaran and Shin	-10.2437	0.0000	I(1)
LnM	Breitung t-stat	-4.50738	0.0000	I(1)
	Im, Pesaran and Shin	-6.59161	0.0000	I(1)
LnGDPj	Breitung t-stat	-5.52262	0.0000	I(1)
	Im, Pesaran and Shin	-6.39804	0.0000	I(1)
LnGDPi	Breitung t-stat	-6.71328	0.0000	I(1)
	Im, Pesaran and Shin	-7.19778	0.0000	I(1)
LnTARi	Breitung t-stat	-3.05025	0.0011	I(0)
	Im, Pesaran and Shin	-2.68785	0.0036	I(0)
LnTARj	Breitung t-stat	-3.89139	0.0000	I(0)
	Im, Pesaran and Shin	-2.19464	0.0141	I(0)
LnCPIi	Breitung t-stat	-3.82539	0.0001	I(1)
	Im, Pesaran and Shin	-9.49325	0.0000	I(0)

Variables	*Test*	*t-Statistic**	*P-Value*	*Order of Integration*
LnTOi	Breitung t-stat	-3.63820	0.0001	I(1)
	Im, Pesaran and Shin	-6.14423	0.0000	I(1)
LnTOj	Breitung t-stat	-3.12361	0.0009	I(1)
	Im, Pesaran and Shin	-5.95504	0.0000	I(1)
LnPGDPD	Breitung t-stat	-4.92016	0.0000	I(1)
	Im, Pesaran and Shin	-6.82876	0.0000	I(1)
LnRER	Breitung t-stat	-5.33366	0.0000	I(1)
	Im, Pesaran and Shin	-6.28706	0.0000	I(1)
LnCPIj	Breitung t-stat	-2.88975	0.0019	I(1)
	Im, Pesaran and Shin	-3.13365	0.0009	I(0)
LnTXi	Breitung t-stat	-8.05955	0.0000	I(1)
	Im, Pesaran and Shin	-5.91803	0.0000	I(1)
LnTMj	Breitung t-stat	-4.08758	0.0000	I(1)
	Im, Pesaran and Shin	-5.4855	0.0000	I(1)
LnPOPj	Breitung t-stat	-3.30638	0.0005	I(0)
	Im, Pesaran and Shin	-5.52112	0.0000	I(0)
LnPGDPj	Breitung t-stat	-5.07694	0.0000	I(1)
	Im, Pesaran and Shin	-6.8091	0.0000	I(1)
LnPGDPi	Breitung t-stat	-6.63459	0.0000	I(1)
	Im, Pesaran and Shin	-7.14986	0.0000	I(1)
LnPOPi	Breitung t-stat	-5.63863	0.0000	I(0)
	Im, Pesaran and Shin	-2.403	0.0081	I(0)
LnTMi	Breitung t-stat	-7.61654	0.0000	I(1)
	Im, Pesaran and Shin	-5.48695	0.0000	I(1)
LnTXj	Breitung t-stat	-3.58241	0.0002	I(1)
	Im, Pesaran and Shin	-7.65167	0.0000	I(1)

Source: Own Calculations

Table 2: Panel OLS Estimation

Dependent Variable: X_{ij}

Variable	*Coefficient*	*Probability*
Constant	7.1767	0.0003
GDP_j	0.4243	0.0005
DIS_{ij}	-2.7609	0.0000
$PGDP_j$	1.0096	0.0000
$PGDPD_{ij}$	-0.9320	0.0009

Variable	*Coefficient*	*Probability*
POP_j	0.5262	0.0000
TO_j	0.2412	0.0000
TM_j	0.4513	0.0036
TX_i	-0.0366	0.9135
RER_{ij}	-0.4070	0.0000
CPI_i	-2.8303	0.0000
CPI_j	-2.2921	0.0731
TAR_{ij}	-0.2514	0.0000
XA_{ij}	2.4029	0.0000
DIA_{ij}	0.1917	0.0004
FTA_{ij}	0.6424	0.0000
$R^2 = 0.9764$ Adj. $R^2 = 0.9740$ F-Statistic (Prob.) = 0.0000		

Source: Own Calculations

Table 3: Panel OLS Estimation

Dependent Variable: M_{ij}

Variable	*Coefficient*	*Prob.*
Constant	46.3502	0.4768
GDP_i	1.3682	0.0000
Dis_{ij}	-3.7890	0.2522
$PGDP_i$	2.2823	0.0086
$PGDPD_{ij}$	0.6173	0.2396
POP_i	2.8535	0.0002
TO_i	0.4309	0.0051
TM_i	-0.0767	0.8159
TX_j	-0.4359	0.0581
RER_{ij}	0.3811	0.0000
CPI_i	-0.9513	0.4321
CPI_j	-1.5265	0.0997
Tar_{ij}	-0.2860	0.0007
MA_{ij}	1.5600	0.0000
DIA_{ij}	0.5449	0.0954
FTA_{ij}	0.7993	0.0000
$R^2 = 0.9055$ Adj. $R^2 = 0.8962$ F-Statistic (Prob.) = 0.0000		

Source: Own Calculations