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Determinants of Trade in Services: A Panel Data Analysis of Emerging Economies

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Abstract: Existing literature clearly indicates that emerging economies in Asia and Africa have shown robust economic growth during the global economic recession of 2007-08. The resurgence of emerging economies particularly from Asia and Africa can be attributed to effective trade liberalization measures. Against this background the present study makes an attempt to analyse the factors that determine trade in services in emerging economies. The Panel data analysis is based on 35 emerging economies for a period of 2005-2019. The study reveals that trade in goods and Gross Domestic Product influences trade in services in emerging economies. The study strongly recommends collaborative efforts by emerging economies to liberalize their trade in goods and services so as to reap the maximum benefits from international trade. A comprehensive policy network involving trade, financial and economic reforms would enable emerging economies to improve their economic growth rate leading to prosperity of the region.

Keywords: International Trade, Emerging Economies, Panel Data Models, Robust (HAC) Standard Error.
JEL C23, F1, F140.

1. Introduction

The phenomenal growth of the Chinese and Indian economies as also other emerging economies is changing the world economic equations. The early 1990s, witnessed how the developing nations have been growing rapidly in the world market in terms of goods and services. One has to acknowledge the fact that these economies have the abilities to achieve macroeconomic stability and manage global volatility by implementing policies which would help the local economy in adjusting to the changing situations. These economies have also focused on productivity and efficiency in their varied sectors to propel and push the economic graph of their countries.

Though emerging economies can provide immense diversification advantages at international level, it's their monetary policies and connect to the world economy which invariably is country-specific. Attention is warranted in terms of diversity and heterogeneity across these markets in terms of financial reforms, investment barriers, political stability, liberalisation policies etc. Moreover, apart from the conventional methods of regulating and playing with tariffs, FDI inflows, liberalisation etc. special attention is also given by these economies to innovation, research and development, new techniques and technology, these are the new and effective trajectories adopted to increase their international presence.

In this context, it would be interesting to study the factors that determine trade in services of emerging economies. The extent of influence exercised by trade in goods, Gross Domestic Product and foreign direct investment inflows will help emerging economies to devise trade policies that could enhance their gains and share in world trade. A proper policy framework with respect to international trade would also help policy makers to develop a holistic approach towards the development of their respective economies in particular and those of emerging economies in general.

2. Literature Review

Research articles reviewed for the purpose of study have been broadly divided into studies related to (i) The growth of international trade in emerging economies, (ii) The factors which contributed to the growth of international trade in emerging economies and (iii) Success stories of emerging economies which includes Brazil, India, China, South Africa and Vietnam. A study by Yavuz A., et. Al (2018) highlights the various facts and trends about globalisation in emerging market economies. The paper studies the important similarities and differences across countries with respect to FDI, international trade, global value chains and migration. Emerging economies have been contributing significantly to world trade since the last five decades due to trade openness or export-led strategy adopted by emerging economies. FDI as a ratio of GDP and as a share of total gross external liabilities have increased since the mid-1990's, thus helping in increasing employment, transferring skills and capital to these nations. Reduction in trade restrictive practices and progress in communication and technology has enabled nations to exploit the advantages of difference in factor endowment and comparative cost advantage. Emerging economies have experienced more emigration than immigration. The authors reveal that though reduction in trade barriers has increased the pace of globalisation in EME's, the extent of trade barriers on an average are higher in EME's compared to that of advanced economies.

An article on Global Trade Liberalisation and the Developing Countries by IMF staff (2001) stresses on the need for trade liberalisation by both developed and developing countries in the agriculture and manufacturing sector. Expansion of world trade has been found to be a powerful tool for nations to promote economic growth, development and to reduce poverty. Trade liberalisation and market-oriented reforms have helped emerging economies like China, India, S. Korea and Singapore in attracting huge foreign direct investment. Innumerable developing nations have evolved and have enjoyed competitive advantage in the manufacturing of certain products due to the opening up of their economies. India, Vietnam and Uganda have experienced faster economic growth and substantial poverty reduction in spite of opening up their economies recently. The IMF believes a new round of multilateral trade negotiation by the WTO would be an important step in ensuring the benefits of globalisation reaches every nation.

Balchin N., et.al (November 2016) investigates the role of trade in services in promoting economic transformation of nations particularly of low-income countries. The authors stress on adopting a balanced growth path due to explicit and implicit linkages between different sectors of the economy, trade policies focusing on export promotion, trade liberalisation, market access and competitive environment to help trade in services bring in maximum benefits to host economies. Maureen W. (2015) studied the various impact of trade on investment and economic growth on cross-country data. The study shows that the impact of trade on economic growth of least developed countries particularly in African region was insignificant. Domestic and foreign direct investment are found to be largely influenced by international trade in both developing and the least developing economies. The author believes that the structure and pattern of trade in Least Developed Countries from African region needs a transformation along with a favourable institutional framework and supportive national policies, so as to enable these economies to gain maximum advantages from trade. While Dollar D. and Kray A. (2004) have found that the countries which have liberalized have experienced a higher rate of increase in their real income compared to countries which did not adopt trade liberalisation measures. For example, in 1990s, the countries which opted for liberalising trade grew at 5 percent per capita, while rich countries experienced a growth rate of 2.2 percent however non-liberalising developing countries grew at only 1.4 percent. The authors are of the opinion that countries adopting the path of globalisation are developing faster compared to non-globalising countries.

Wahab A. and Kaplan Z. (December 2017) with the help of a Gravity Model examined the factors that determine the trade between emerging economies in Africa and other major emerging economies in the world. The study made an attempt to explore the fundamental macroeconomic and socio-cultural factors of bilateral trade between the two groups of countries. The study concluded that economic and socio-cultural factors that determine the bilateral trade between the two groups of emerging economies are size of GDP, geographical distance between the capital cities of both groups of countries, common religion and language. On similar lines a study by Hildegunn, Kyvik, Nordås (2018) empirically analyses the impact of cultural, non-actionable institutional factors and actionable policy measures on service market integration of Nordic countries. Nordic countries except Denmark are found to be restrictive in terms of trade in services. Intra-Nordic trade is found to be three times higher than trade between EU and Nordic. Though Nordic have benefitted from the Free Trade Agreement; there still exist high level of trade barriers for trade in services. The authors believe that the role of regulatory cooperation and labour market reforms will be very much crucial in determining the benefits of service trade liberalisation. The study recommends FTA with countries that share common cultural, institutional and geographical features. A study by Harms P. and Shuvalova D. (2020) adopts Geert Hofstede's score to examine the influence of cultural distance on global trade in services. The study suggests that cultural factors such as obedience to higher authorities and to established customs and values, appraisal of self-orientation, willingness of people to cooperate affect trade in services. The impact of above cultural factors differs on different types of services. For instance, the impact of cultural distance is more on cultural, financial and travel services while transportation services are not much affected by cultural differences. The study also finds an impact of cultural distance on goods trade. Interestingly, Gianmarco I.P.O. et.al (2018) concluded that the role of immigration on trade and productivity in services on the basis of evidence from firms in the United Kingdom. Immigrants' workers are found to positively impact service trade and its productivity in three ways. First, the skilled immigrants' workers help to reduce production cost and thus improve the productivity of firms and thereby help firms

to export more. Secondly, the country-specific skills possessed by immigrants' workers help to reduce import of intermediate services and lastly, country-specific knowledge of immigrants helps to increase the bilateral exports to their country of origin. These effects are observed to be higher in services which are country-specific and are largely influenced by culture similarities.
Following studies find strong evidence to show that goods trade is an important determinant of service trade. For instance, A study based on Panel data by Yujiang Bi., et.al (2019), revealed that the trade in goods determines the trade in services for a group of 46 Organisation for Economic Co-operation and Development (OECD) and non-OECD countries during the period of 2004-2015. A study by Karmali D. P. and Sudarsan P.K. (2008) on the basis of panel data modelling concluded that trade in goods had a clear positive impact on trade in services of all the countries across different income groups during 1985 to 2003. A study conducted by Fieleke, N.S. (1995) showed that trade in services clearly rises with rise in trade in merchandise. With the help of empirical analysis Deardorff (2001), Blyde J. and Sinyavskaya N., (2007) clearly reveal that liberalisation of trade in services positively influences the goods trade.

Fiorini M., and Hoekman B. (2018) believes that the performance of the service sector and access to specific services in developing countries are crucial in achieving 'Sustainable Development Goals'(SDGs). The study reveals a positive association between trade in services, investment policies and indicators of access to services that help in achieving SDGs. The author feels that the importance of goods trade in attaining SDGs is overrated while the role of the service sector is neglected in many developing countries. The authors stress the importance of adopting a more liberal service trade and investment regime so as to realize SDGs. Innocents E. and Kgaphola H. (2017) studied the effects of international trade on India as an emerging economy. Since the economic reforms of 1991, India has emerged as one of the fastest growing and attractive destinations for foreign investment. The factors that have contributed to export promotion and trade expansion of India includes fiscal reforms, reduction in trade barriers such as tariffs and liberalized exchange rate system. Political stability and investor-friendly climate has earned India a position in international trade groups such as G-8, G-20, ASEAN and EU. The authors reiterate linkage between trade, productivity and economic growth as also emphasized by economic theory and empirical evidence. Large internal market is also benefiting India in integrating well with the world economy. Toh M. H. and Vasudevam G. (2004) provides an evaluation of Vietnam's trade liberalisation policy through participation in regional trade agreements such as ASEAN Free Trade Area, ASEAN-China Free Trade Agreement. The study makes use of computable general equilibrium models to measure the quantitative impact of different free trade agreements on Vietnam. The study concludes that FTA's have resulted in positive welfare effects, substantial rise in bilateral trade and a modest rise in real GDP for Vietnam. Though the trade balance is still negative due to imports of intermediaries and capital goods required for boosting the productive capacity of industrialization, its terms of trade are improving. The study recommends implementation of transparent trade policies, minimizing bureaucratic red tape, eliminating non-tariff barriers or converting them into moderate levels of tariffs. Further trade liberalisation and active participation in more regional agreements is considered to be beneficial to the economy of Vietnam.

Brandi C. (June 2013) reviews the trade performances of China, India and Brazil in terms of trade facilitation, infrastructural progress and state-business relations which would help low-income economies to facilitate their trade performance and economic development. The high cost of trading has been a major

obstacle in improving trade performance for many emerging and developing economies. China being a centrally planned economy it was easier to build the required infrastructure for facilitating trade compared to India and Brazil. Appropriate institutional and policy frameworks have helped these nations to overcome the problem of limited public finance through Public Private Participation, domestic and foreign institutional investors. Political will and ability to implement trade facilitative measures and standardized state-business relations have helped these nations to improve their economic performance. A competitive market is crucial for ensuring market efficiency required for growth and development. Other factors which facilitated trade expansion in China, Brazil and India include increasing the use of information and communication technology, promotion of electronic data interchange, single-window clearance to facilitate business activities and introduction of industry and sector specific trade facilitation initiatives.

Hanson G. H. (Spring 2012) in his study on 'Emerging Economies in Global Trade' reveals that the global financial crisis of 2008-09 adversely impacted the high-income countries like the United States, European Union and Japan compared to emerging economies like China, India and Brazil. The author analyses the changes in international trade due to incorporation of low- income and middle-income countries into the global economy. The robust growth of China, India and other middle-income economies is changing the world economy. The authors believe that the pattern of world trade is changing from North-North trade (high-income countries) to South-South and North-South trade. This is showing the emergence of middle and low-income countries as major traders. Comparative cost advantage, reduction in trade barriers, factor endowment, high rate of urbanization and industrialization, foreign direct investment inflows seem to have fueled the growth of emerging economies in the world market.

3. Methodological Framework

Data and Variables

The study is based on country level panel data of 35 'Emerging Economies' for a period of 15 years i.e., from 2005 to 2019. The classification of countries into emerging economies is based on the latest annual report of the world bank. The data has been collected from UNCTAD Stat and World Bank Data Centre. The variables included in the study are (i) GDP of a Country (GDP), (ii) Trade in services (TS) (iii) Trade in goods (TG) and (iv) Foreign Direct Investment Inflows (FDI). It is balanced panel data. For the purpose of analysis, log-log models have been considered.

Panel Data Regression Models

Model I: Pooled Ordinary Least Square (OLS) Estimates

$$\text{Log TS}_{it} = \beta_0 + \beta_1 \text{logGDP}_{it} + \beta_2 \text{logTG}_{it} + \beta_3 \text{logFDI}_{it} + U_{it}$$

Model II: Pooled OLS Estimate (with Time Dummies and Robust (HAC) Standard Error)

$$\text{Log TS}_{it} = \beta_{0t} + \beta_1 \text{logGDP}_{it} + \beta_2 \text{logTG}_{it} + \beta_3 \text{logFDI}_{it} + U_{it}$$

Model III: One Way Effect Model

$$\text{Log TS}_{it} = \beta_i + \beta_1 \text{logGDP}_{it} + \beta_2 \text{logTG}_{it} + \beta_3 \text{logFDI}_{it} + U_{it}$$

Model IV: One Way Effect Model (with Robust (HAC) Standard Error)

$$\text{Log TS}_{it} = \beta_i + \beta_1 \text{logGDP}_{it} + \beta_2 \text{logTG}_{it} + \beta_3 \text{logFDI}_{it} + U_{it}$$

Model V: Two Way Effect Model

$\text{Log TS}_{it} = \beta_{it} + \beta_1 \text{logGDP}_{it} + \beta_2 \text{logTG}_{it} + \beta_3 \text{logFDI}_{it} + U_{it}$

Model VI: Two Way Effect Model (with Robust (HAC) Standard Error)

$\text{Log TS}_{it} = \beta_{it} + \beta_1 \text{logGDP}_{it} + \beta_2 \text{logTG}_{it} + \beta_3 \text{logFDI}_{it} + U_{it}$

The dependent variable in the model (I -VI) is Trade in Services (TS) while independent variables are Gross Domestic Product of a Country (GDP), Trade in Goods (TG) and Foreign Direct Investment inflows (FDI). The assumption of intercept varies depending on choice of model. B_0 is a common group intercept in Model I whereas Model II assumes common group intercept which varies over time (B_{0t}). The country-specific intercept is assumed in one-way effect model represented in (Model III and IV) while B_{it} is a country-specific intercept which varies over time (Model V and VI).

Tests to Determine the Validity of Estimates

(i) Hausman's Specification (H) Test

Hausman's Specification Test helps in selecting fixed effect estimates over random effect estimates. If the effects are uncorrelated with the explanatory variables, then the random effect estimator is consistent and efficient. If the effects are correlated with the explanatory variables, the fixed effects estimator is consistent and efficient over random effect estimates. Statistically significant Value of H test favours fixed-effect estimates over random-effect estimates.

(ii) Breusch and Pagan's Lagrangian Multiplier (LM) Test

This test helps to choose between pooled OLS and Random Effect estimates. It is based on the OLS residuals. The null hypothesis suggests that the OLS estimator is consistent. Rejection of null hypothesis suggests the use of random effect estimates. If LMc> LMT, reject the null hypothesis and choose the random effect model according to John, DiNardo and Jack, Johnston (1997).

(iii) Wald Test for Significance of Time Dummies

The Wald Chi-squared test helps to identify the joint significance of time dummies in panel data modelling. A statistically significant Chi-squared value implies that the impact of unobserved variables accounted in the model through country specific dummies vary across the countries and also over the time periods included in the study. Statistically insignificant Wald test favours one-way effect model over two way-effect model. Thus, suggesting that unobserved variables vary between the countries and not over time. {(Wooldridge, J., M. 2000), (Gujarati D., 2003) (Agresti A., 2007)}

(iv) Robust (HAC) Standard Error Estimates for Panel Data Model

The Pooled and Fixed effect model has been examined for robust (HAC) Standard error of Arellano, the use of robust standard error in panel data helps to take care of heteroskedasticity and autocorrelation in panel data estimation. Inclusion of robust (HAC) standard error does not change the coefficient estimates but in fact helps in making them more reliable.

Panel Data Unit-root Test for Stationarity

The stationarity of individual panel series is tested with the help of Levin-Lin-Chu test.

The null hypothesis of Levin Lin Chu Test (LLC) for stationarity is as follows;

H_0 = All the individual time series contain a unit root

H1= All the individual time series are stationary

The necessary condition of Levin-Lin-Chu test is: $\sqrt{}\ N_T /T \rightarrow 0$ whereas the sufficient conditions are $N_T /T \rightarrow 0$ and $N_T /T \rightarrow \kappa$. (where N_T implies that the cross-sectional dimensions N is a monotonic function of T which is time dimension). According to Levin A., et al (2002), Levin-Lin-Chu test of stationarity performs effectively when N (cross-section units) lies between 10 and 250 and T (time-periods) lies between 5 and 250. As our analysis includes 35 cross-sectional units and 15 time periods, the choice of LLC test of stationarity is validated.

4. Data Analysis and Discussion

The results of Levin-Lin-Chu's unit root test for stationarity are given in table (1). The table (2) shows results for pooled OLS estimates (Model I) and pooled OLS estimates with time dummies and robust (HAC) standard error (Model II), Model III and IV represent the estimates of one-way effects models: random/fixed estimates whereas two-way effects models for random/fixed estimates are shown in Model V and Model VI.

Table 1. Result of Levin-Lin-Chu Unit Root test for Stationarity

Variable	coefficient	coefficient
Log TG	-0.386 (-13.95) ***	-0.666 (-16.34) ***
Log TS	-0.180 (-10.37) ***	-0.69185 (-16.86) ***
Log FDI	-0.557 (-12.89) ***	-0.883 (-17.10) ***
Log GDP	-0.18268 (-11.84) ***	-0.4639 (-13.94) ***

*** implies rejection of null hypothesis at 1percent level of significance

Lag length – 1

All the variables included in the study are found to be stationary at level (Table 1)

Table 2. Regression Result of Pooled Ordinary Least square (POLS)

Variable	Coefficient (Model I)	Coefficient (Model II)
Constant	0.022	0.120
	(0.11)	(0.18)
Log GDP	0.028	−0.008
	(0.93)	(−0.08)
Log TG	0.840	0.843
	(27.48) ***	(9.10) ***
Log FDI	0.008	0.028
	(0.45)	(0.57)
F-test	1086.74***	72.79***
Adjusted R^2	0.86	0.87

Values in parenthesis are t-values: *** implies statistical significance at 1percent

Table (2) reveals the result of pooled OLS estimates with and without time dummies and robust (HAC) standard error. The only independent variable found to be statistically significant at one percent level is trade in goods. It suggests that one percent increase in trade in goods brings about a 0.84 percent increase in trade in services. Gross Domestic Product and Foreign Direct Investment inflows do not have any impact on trade in services. Significant value of F-test and high adjusted R^2 shows the good fit of the model. Statistically significant LM test favours random effect estimates over pooled ordinary least square estimates (Table 3).

Table 3. Regression Result of One-way and Two-Way Effect Models: Random Effect Estimates

Variable	Coefficient (Model III)	Coefficient (Model V)
Constant	−2.100 (−6.27) ***	−0.402 (−0.83)
Log GDP	0.540 (10.85) ***	0.273 (5.49) ***
Log TG	0.504 (9.33) ***	0.617 (11.03) ***
Log FDI	−0.020 (−1.65)	0.000 (0.99)
LM Test	1944.92***	2461.24***
H Test	38.08***	10.41**
Wald Test	-	196.63***

Values in parenthesis are t-values: *** imply statistical significance at 1percent

Random effects estimate for one-way (Model III) and two-way effects (Model V) are represented in Table (3). The country-specific one-way effect model finds that GDP and trade in goods positively influences trade in services. A one percent increase in GDP leads to 0.54 percent increase in trade in services while it increases by 0.50 percent if trade in goods experiences an increase of one percent. A statistically significant value of Wald test favours two-way effects (Model V) over one-way effects (Model III). The two-way effect model shows that one percent rise in GDP and goods trade leads to 0.27 percent and 0.62 percent surge in service trade. H test values are statistically significant at one percent, this clearly implies that fixed-effect estimates are superior to random-effects estimates for Model III and Model V.

Table 4. Regression Result of Fixed Effect Model

Variable	Coefficient (Model III)	Coefficient (Model IV)	Coefficient (Model V)	Coefficient (Model VI)
Constant	−2.534 (−7.08) ***	−2.534 (−3.28) ***	−0.558 (−0.83)	−0.558 (−0.46)
Log GDP	0.682 (12.48) ***	0.682 (5.36) ***	0.355 (6.29) ***	0.355 (2.87) ***
Log TG	0.389 (6.47) ***	0.389 (3.39) ***	0.546 (7.92) ***	0.546 (4.10) ***
Log FDI	−0.016 (−1.35)	−0.016 (−0.87)	−0.000 (−0.04)	−0.000 (−0.02)
F-statistics	62.66***	194.60***	76.34***	140.33***
Wald Test	-	-	169.86***	88.15***

Values in parenthesis are t-values: *** imply statistical significance at 1percent

The statistically significant value of F-statistics in Table (4) rejects the null hypothesis that the group has a common intercept, thus favouring fixed-effect estimates over pooled OLS estimates in Model III, IV, V and VI. Two-way effects models (V and VI) are chosen over one-way effect models (III and V) due to statistically significant Wald tests. Trade in goods and GDP of the nation are found to be statistically significant. A one percent rise in GDP and goods trade of emerging nations leads to an increase of 0.35 percent and 0.55 percent respectively in-service trade of these economies (Model V and VI). Cameron, Colin A. and Trivedi, Pravin K. (2005) strongly recommend the application of Robust (HAC) standard error of Arellano (2003) to ensure strong estimates and valid results from panel data analysis.

5. Conclusion

Global trade has witnessed the growth of emerging economies as an important player since the early 1990's. The changing scenario in world trade could be attributed to economic, financial and trade reforms adopted and effectively implemented in these countries. As per IMF report, world trade expansion would help in reducing poverty and bring about economic progress as also development of emerging economies. The attainment of 'Sustainable Development Goals' is found to be positively influenced by trade in services and

investment reforms in developing countries. The present study on the basis of Panel Data Modelling finds a positive influence of growth in Gross Domestic Product and goods trade on trade in services. There was no statistical evidence to determine the influence of Foreign Direct Investment inflows on service trade of emerging economies during 2005 to 2019. It helps us to conclude that Gross Domestic Product and trade in goods helps in determining the possible increase in trade in services in emerging economies.

The findings of this particular study are in line with existing literature which indicates that Gross Domestic Product and trade in goods are important determinants of trade in services. Hence, the study strongly recommends collaborative efforts by emerging economies to liberalize their trade in goods and services so as to reap the maximum benefits from international trade. A comprehensive policy network involving trade, financial and economic reforms would enable emerging economies to improve their economic growth rate leading to prosperity of the region. There is also a need for multilateral trade negotiations particularly on service trade liberalization as the service sector is found to be an engine of growth for many developing economies. A sincere effort towards service trade liberalisation and growth at global level would definitely help to bring in just and equitable new international economic order as desired by the United Nations for the global economy.

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