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CONTENTS

DOES INTERNATIONAL TRADE ALWAYS IMPACT SIGNIFICANTLY THE REAL GDP PER CAPITA?: A STUDY ON BIMSTEC COUNTRIES USING DYNAMIC PANEL DATA

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Abstract

BIMSTEC came into being on 6 June 1997 through the Bangkok Declaration. It consists of seven Member States: five from South Asia that includes Bangladesh, Bhutan, India, Nepal, Sri Lanka, and two from Southeast Asia, including Myanmar and Thailand. BIMSTEC is a sector-driven cooperative organization. This paper investigates the trade- income relationship among the BIMSTEC nations using dynamic panel data regression model. The result suggests that it is possible to have the international trade having insignificant impact and that too negative on real GDP per capita of the nations. The entire study is based on secondary data, collected from the official sources of Ministry of Commerce, Govt. of India; World Bank and World Integrated Trade Solution.

Keywords: International Trade; Real GDP Per Capita; Population Density; Inflation; BIMSTEC.
JEL Classification: D74, F51, O11.

1. INTRODUCTION

The matter whether international trade enhances per capita income is one of the most vital issues in economics, both in empirical and theoretical research. The seven-nation Bay of Bengal Initiative for Multi-sectoral Technical and Economic Cooperation (BIMSTEC), comprising Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka and Thailand is emerging as one of the major sub regional groups in Asia. This regional grouping was formed to provide trade and technological cooperation among its members in the areas of trade and investment, tourism, transport and communication, technology, energy, and fisheries. BIMSTEC, in this context, is considered a highly innovative strategy that seeks to work around the currently problematical nature of regional integration in South Asia. BIMSTEC is faced by numerous challenges such as poverty, poor income distribution, political instability, slow per capita economic growth and stagnation in development. The proportion of world trade that BIMSTEC accounts for is low. BIMSTEC accounted for 1.4 percent and 2.3 percent of world exports and imports, respectively, in 2008-2010 as against the share of the European Union in world exports and imports being around 44.4 percent and 44.7 percent [1]. Another regional trade group, ASEAN, accounts for 4.2 percent of exports and 4.5 percent of imports[2]. In this context, this paper tries to study the impact of trade on the real GDP per capita of BIMSTEC nations.

2. REVIEW OF LITERATURE

Bayoumi and Eichengreen (1997) assessed the impacts of regionalism on European trade using a gravity model. The results revealed that the formation of Europe Economic Community (EEC) and European Free Trade Association (EFTA) had significant impact on Europe's trade and EFTA is heavily trade creating. EEC promoted intra-bloc trade through combination of both trade creation and trade diversion. EEC increased trade between its members at significant level but reduced trade with rest of the world significantly[3].

Korinek and Melatos (2009) analyzed the effects of three RTAs (i) ASEAN Free Trade Agreement (AFTA) (ii) Common Market for Eastern and South Africa (COMESA) and (iii) MERCOSUR on agricultural trade using a gravity model. The results suggest that AFTA, COMESA and MERCOSUR have increased trade in agricultural products between its member countries significantly and the agreements were net trade creating. The depth of integration within the agreement is important in determining the extent to which it is trade creating. Trade cost remains as

[1] UNCTAD (October 6, 2016). "Global Investment Trends Monitor" retrieved from http://unctad.org/en/PublicationsLibrary/webdiaeia2016d3_en.pdf

[2] N Chandra Mohan (August 5, 2004), "Long Road from BIMSTEC to BOBCOM, The Financial Express", retrieved from http://www.financialexpress.com/archive /long-road-from-bimstec-to-bobcom/111952/

[3] Bayoumi, T. and Eichengreen, B. (1997). "Is Regionalism simply a diversion? Evidence from the evolution of EC and EFTA". National Bureau of Economic Research, 6, 141 - 168

important determinant of agriculture trade flows of those member states. Furthermore, historical trade pattern and traditional economic ties are also important determinants of trade flows. It also highlights the fact that RTA creates free trade among member countries, but it does not guarantee welfare improvements either for members and non-members[4].

Mohammad Masudur Rahman and Chanwahn Kim(2006) has tried to study the trade and investment potential under the ambit of regional cooperation comprising the seven contiguous countries of Bangladesh, India, Sri Lanka, Nepal, Bhutan, Thailand and Myanmar (BIMSTEC). The study addressed the latest update of BIMSTEC economic cooperation and then explored the economic impact of the regional integration. The potential economic impact of the BIMSTEC economic cooperation as well as BIMSTEC FTA could promote the growth for the region. One of the major findings of the paper is that a large part of BIMSTEC's trade has remained unrealized and the trade transaction cost is one of the major trading barriers prohibiting the growth of BIMSTEC intra-regional trade. The study reinforces that improvement in infrastructure and connectivity that leads to less trade transportation costs should be a necessary step in order to realize BIMSTEC's trade and investment potential. The paper concludes that liberalization of non-policy barriers will spur BIMSTEC's trade and economic cooperation[5].

Fandle (2008) presented his views about RTA between developing and developed countries and indicated that RTA between developing and developed world may be detrimental and multilateral negotiations be preferred. Fry and Honnold (2010) presented a report on economic integration and export competitiveness for ASEAN countries. Their findings indicated that intra-regional trade in the areas of agro-based products auto motives, electronics, textile and apparel and wood based products increased very significantly due to trade agreements and trade facilitation measures[6].

Nuzhat Falki (2009) examined the Impact of FDI on Economic Growth of Pakistan. She collected the data of FDI from the Handbook of Pakistan Economy-2005 published by the State of Pakistan and the World Bank Development indicators-2008 from 1980 to 2006 with variables of domestic capital, foreign owned capital and labor force. With the help of endogenous growth theory and applying the regression analysis she concluded that FDI has negative statically insignificant relationship between GDP and FDI inflows in Pakistan[7].

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[4] Korinek, j. and Melatos, M. (2009). "Trade impacts of selected Regional Trade Agreements in Agriculture". OECD Trade Policy Working Papers, 87, OECD publishing.

[5] Mohammad Masudur Rahman and Chanwahn Kim (2006). "Impact of Regional Trade Agreements: Trade creation and trade diversion in Western Hemisphere". International Journal of Economic Issues, 3(2), 221 – 238

[6] Fandle, K.J (2008), "Making Trade Liberalization Work for Poor, Trade Law and Informal Economy in Colombia", Texas International Law Journal, Vol.43.

[7] Nuzhat Falki (September 2009). "Impact of Foreign Direct Investment on Economic Growth in Pakistan", International Review of Business Research Papers Vol. 5 No. 5.

Anokye M. Adam & George Tweneboah (2009) examined the Foreign Direct Investment and Stock Market Development in Ghana. They collected the data of market capitalization as a proportion of GDP, Ghana cedi-Dollar exchange rate and Net FDI inflow quarterly data from 1991 to 2006. They apply multivariate co integration analysis and Vector Error Correction Model (VECM) and concluded that FDI has significant influence in the development of Ghana stock market and also concluded that there is long-run relationship between FDI and nominal exchange rate and stock market in Ghana perspective[8].

3. DATA & METHODOLOGY

The present study is based on secondary data. The data has been collected from the official website of the Ministry of Commerce, Govt. of India and the World Bank. Base shifting index has been used to standardize per capita GDP (at Constant US$) of BIMSTEC countries. GDP of 2010-11 has been used as base. The period from 1997-98 to 2014-15 has been taken into consideration for the present study.

Econometric techniques like panel data regression has been used to study the impact of trade on real GDP per capita of BIMSTEC countries.

$$RG_{it} = \alpha + \beta_1 TS_{it} + \beta_2 PD_{it} + \beta_3 IN_{it\,t} + e_{it} \qquad (1)$$

$i=1,2,.....,7\ ;\ t=1,2,.....,18$

Where, RG_{it} is real GDP per capita of country i at time t. TS_{it} is trade share(% of GDP) of country i at time t. PD_{it} is the population density of country i at time t. IN_{it} is the annual inflation rate of country i at time t.

The panel data estimation is employed in the study to capture the dynamic behaviour of the parameters and to provide more efficient estimation and information of the parameters. Panel data techniques are used because of their advantages over cross-section and time series in using all the information available, which are not detectable in pure cross-sections or in pure time series. Panel data suggest individual heterogeneity to reduce the risk of obtaining biased results and provide a large number of data points (observations) to increase the degrees of freedom and variability and to be able to study the dynamics of adjustment.

The Panel data model includes two different methods:

Random Effects Method*:* The Random effects method is an alternative method of estimation which handles the constants for each section as random parameters rather than fixed. Under this model, the intercepts for each cross-sectional unit are assumed to arise from a common intercept α (which is the same for all cross-sectional units

[8] Anokye M. Adam & George Tweneboah (2009). "Foreign Direct Investment and Stock Market Development: Ghana's Evidence", International Research Journal of Finance and Economics, Issue 26.

and over time), plus a random variable ϵ_i that varies cross-sectionally but is constant over time. ϵ_i measures the random deviation of each entity's intercept term from the 'global' intercept term α. We can write the random effects panel model as

$$Y_{it} = \alpha + \beta x_{it} + \omega_{it}$$

where, $\omega_{it} = \epsilon_i + V_{it}$

Here X_{it} is still a $1\times k$ vector of explanatory variables. The parameters (α and the β vector) are estimated consistently, but instead of OLS, Generalized Least Square method (GLS) is used.

Fixed Effects Method*:* The Fixed effects method treats the constant as group (section)-specific, i.e. it allows different constants for each group (section). The Fixed effects are also called as the Least Squares Dummy Variables (LSDV) estimators. The model for fixed effect method is

$$Y_{it} = \alpha + \beta X_{it} + U_i + V_{it}$$

where, U_i and V_{it} are decomposition of disturbance term. U_i represents individual specific effect and V_{it} represents 'remainder disturbance that varies over time and entities (capturing everything that is left unexplained about Y_{it}).

Hausman Specification Test*:* The test evaluates the significance of an estimator versus an alternative estimator. It helps one evaluate if a statistical model corresponds to the data.

- Null Hypothesis: Random Effect model is appropriate
- Alternative Hypothesis: Fixed Effect model is appropriate

Following Hausman Specification Test if it is found that the P value of Chi-Square statistic is more than 5% we cannot reject the null hypothesis. If null hypothesis is accepted, we will choose Random Effect model. If null hypothesis is rejected, we will choose Fixed Effect model.

4. RESULTS & DISCUSSIONS

We have used software for analyzing the factors affecting real GDP per capita of BIMSTEC nations. The estimated results are discussed below. The entire analysis is carried out at 5% level of significance.

Table 1. *Estimation Results of FEM (Fixed Effect Model) of Equation 1*

Fixed-effects (within) regression	Number of observation = 126
Group variable: country code	Number of groups = 7
R-sq: within = 0.11	Observation per group: min = 18
Between = 0.11	Avg = 18.0
Overall = 0.09	Max = 18
F (3,116) = 5.02	
Corr (ui, Xb) = 0.00	Prob > F = 0.37

Real GDP per ~a	Co eff.	Std. Err.	t value	P>|t|	[95% Conf. Interval]	
Trade share ~p	-5.89	4.06	-1.45	0.15	-13.94	2.15
Population ~f	4.89	1. 25	3.85	0.00	2.35	7.33
Inflation	3.66	8.95	-0.41	0.68	-21.40	14.07
_cons	490.99	387.17	1.26	0.21	-279.82	1261.80
Sigma _u	2707.95					
Sigma _e	442.70					

From the above result we find that the coefficient of trade share (% of GDP) is -5.89. The p value shows that it is statistically insignificant. So, the trade of BIMSTEC countries has no impact on the real GDP per capita. The coefficient of population density is 4.89. The p value is less than 0.01, so it is statistically significant. Population density of BIMSTEC countries has a positive relationship

with real GDP Per capita. The coefficient of annual inflation rate is positive. But it is statistically insignificant (P value is 0.68).

Table 2. *Estimation Results of REM (Random Effect Model) of Equation 1*

Random-effects GLS regression	Number of observation = 126
Group variable: country code	Number of groups = 7
R-sq: within = 0.09	Observation per group: min = 18
Between = 0.10	Avg = 18.0
Overall = 0.08	max = 18
Wald chi2 (3) = 3.08	
Corr (ui, X) = 0 (assumed)	Prob > chi2 = 0.49

Real GDP per~ a	Co eff.	Std. Err.	t value	P>|t|	[95% Conf. Interval]	
Trade share ~p	-0.17	3.92	-0.04	0.96	-7.86	7.51
Population	1.54	.89	1.73	0.08	-0.20	3.30
Inflation	.89	9.23	0.10	0.92	-17.31	19.10
_cons	1146.73	555.84	2.06	0.03	57.29	2236.17
Sigma _u	1070.80					
Sigma _e	443.98					

From the above result we find that the coefficient of trade share (% of GDP) is -0.17. The p value shows that it is statistically insignificant. So, the trade of BIMSTEC countries has insignificant impact on the real GDP per capita. The coefficient of population density is 1.54. The p value is above than 0.01. So, it is statistically insignificant. Population density of BIMSTEC countries has no effect on real GDP Per capita. The coefficient of annual inflation rate is positive. But it is statistically insignificant (P value is 0.92).

Table 3. *Hausman Test Specification*

Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		13.56	4	0.00
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
Trade share ~p	-5.89	-0.17	-5.71	1.05
Population	4.84	1.54	3.29	0.89
Inflation	-3.67	0.89	-4.55	0.92

The Hausman test result shows that the p value of Chi-Sq statistic is less than 5%. So we can reject the null hypothesis. Therefore we can say that fixed effect model is appropriate for equation 1.

5. CONCLUSION

We can, therefore, say that though theoretically it is expected that economic openness and cross border trade should have positive impact on GDP, the impact of trade on per capita real GDP may also be negative. What has happened in case of BIMSTEC countries bears its evidence. There can be a number of logical explanations for such an outcome in BIMSTEC countries. The outcome is possible if the population growth rate happens to be more than the rise in GDP solely on account of international trade. One more reason may be that the intra-regional trade of BIMSTEC countries as a proportion of world trade is low as compared to other regional trade blocks like European Union, ASEAN etc.

There is also negative relationship between real GDP per capita and inflation. This is because price rise offsets the economic boom by having a negative impact on demand. As a result of which real GDP per capita gets affected. On the other hand, the population density does have an impact on real GDP per capita. A large portion of world population belongs to BIMSTEC countries. Population

density tends to be higher in such areas which provide greater job opportunities through increased economic activity. Thus, it can impact on real GDP per capita.

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