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Trade Openness And Economic Growth Experience In Brics Countries

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Abstract:
In this research paper explores the growth experiences of the "BRICS nations (Brazil, Russia, India, China, and South Africa)" by analyzing their rapid development's key drivers, challenges, and implications. The relationship between economic growth and trade openness within the BRICS countries is analyzed. The study employs a panel vector autoregressive (PVAR) model in the Generalized Method of Moments (GMM) framework, data from 1990 to 2020 is taken annually. The variables of interest include GDP capita, trade openness, foreign direct investment (FDI), government expenditure, and investment.

The empirical results show that per capita GDP and investment are positively correlated, while trade openness is negatively correlated with per capita GDP. The study reveals the significance of the economic factors of per capita GDP, trade openness, foreign direct investment, government expenditure, and investment with each other and analyses causality relationships. Granger causality tests suggest bidirectional causality between per capita GDP and trade openness, with GDP per capita, investment, and trade openness and government expenditure. Additionally, there is unidirectional causality in several relationships among these economic factors within the BRICS nations.

The impulse response analysis demonstrates the immediate and lagged effects of shocks in FDI, investment, trade openness, and government expenditure on GDP per capita. The variance decomposition analysis provides insights into the percentage contributions of these variables to the overall variance in each economic indicator.

1. Introduction

There is the rise of globalization if economies are integrated through international trade and capital transfers, and have boosted global economic growth. The main subject of research and policymakers has been how to increase the economic growth of the developing countries. The main observation from the experience of the world is that foreign direct investment (FDI) and export-advancing activities are essential contributors to economic development. FDI serves as a vehicle for innovation transfer, increased domestic investments, and human capital development. Trade openness benefits specialization, cost-

effectiveness, and best use of resources and helps economic development. In the continuation of this research the growth experience of the BRICS nations—Brazil, India, Russia, China, and South Africa—has been a subject of global interest in recent decades. These countries have liberalized their economies at different times and embraced trade openness to varying levels. The BRICS nations have played a significant role in shaping the discourse on international economic governance, challenging traditional power structures, and advocating for a more inclusive global order.
From China's unprecedented economic expansion to Brazil's resilience in the face of economic uncertainties, each member nation's growth story adds a layer of complexity and richness to the collective narrative of the BRICS. Understanding the growth experiences of the BRICS nations is crucial to understanding their internal dynamics and the evolving dynamics of global economic governance.

Brazil started trade liberalization in the late 1980s, and it is one of the world's largest exporters of agricultural products, including soybeans, coffee, and beef. However, its trade openness has been affected by various protectionist measures and trade barriers. Brazil has engaged in bilateral and multilateral trade agreements, but its level of openness can vary depending on the government's policies.

Russia has substantial exports of oil, gas, and minerals which are natural resources. Its trade openness has been influenced by geopolitical factors, and it has faced sanctions from Western countries, which have limited its access to certain international markets. Russia has expressed interest in expanding its trade relations with various countries.

India has liberalized its economy and increased trade openness in recent decades. It has been actively involved in bilateral and regional trade agreements and is a member of organizations like the WTO. India has a diverse economy with strengths in IT services, pharmaceuticals, and textiles, making it a significant player in global trade.
China is one of the most open economies among the BRICS nations, has undergone significant economic reforms, and has become a major global trading partner. China's experienced export-led growth and is a key player in international trade, with a focus on manufacturing and technology products.
South Africa is the smallest economy in the BRICS group, but it has a relatively open trade policy, engaged in trade agreements with various countries and regional blocs. South Africa's economy is diverse, with sectors like mining, manufacturing, and agriculture contributing to its trade activities.
BRICS countries viz., Brazil, India, Russia, China, and South Africa have experienced rapid economic growth in GDP, and their contribution to world trade has also increased in the last decade. With the growing trade of BRICS in the world trade, it is interesting to investigate the relationship between trade openness and the economic growth of these countries.

2. Objective

This research paper delves into the multi-faceted journey of growth experienced by the BRICS nations, analyzing the key drivers, challenges, and implications of their rapid development. The paper studies the effect of openness of trade on growth with the member countries of BRICS. The paper discusses the literature review in Section 3, and Section 4 gives data description, methodology, and results, Section 5 provides a conclusion of the study.

3. Literature Review

Rodriguez and Rodrik (2001) and Baldwin (2003), Edwards (1993a) studied the relationship between openness and economic growth for specific countries and also conducted cross-country analyses, suggesting a positive relationship between growth and openness which proved that openness improves growth. Sachs and Warner (1995) suggested a positive and significant relationship between openness and growth from 1970 to 1989 with five different indicators of openness. They designed openness with five variables; they were Non-tariff Barriers (NTBs), black market premiums, average tariff rate, and socialistic and government monopolies of exports. The study concluded that the openness index and growth rate of per capita GDP exhibited a statistically significant positive relationship. Harrison (1996) analyzed the effect of trade openness on growth using panel data and found that the results of the Granger causality test show openness and growth have bi-directional causality. Frenkel and Romar's (1999) model takes geographical factors as instrumental variables. Hye and Lau (2015) developed a trade openness index to examine trade openness and economic growth relationships in India. The results of the ARDL model confirm the positive relationship between human and physical capital to economic growth. However, negative relationship between the trade openness index to economic growth in the long run and a positive relationship between the trade openness index to economic growth. Sakyi, Commodore, and Opoku (2015) study the long-run relationship between FDI, openness in trade, and economic growth for Ghana's ARDL model. The findings confirm the positive relationship between the FDI, trade openness to economic growth. Mahmoodi and Mahmoodi (2016) studied the causal relationship between exports, FDI, and economic growth in eight European countries and eight Asian countries panel. For the short-run, the findings of panel-VECM causality for the European panel indicated the presence of bidirectional causality between GDP and FDI and the unidirectional relationship between GDP and FDI to exports. For Asian countries, the findings confirm the bidirectional causality between exports and GDP. Keho (2017) investigated the relationship between trade openness and economic growth for Cote d'Ivoire by using the ARDL bound test and the Granger causality test. The study found that positive effect of trade openness on economic growth for both long and short periods, with a strong complementary relationship between trade openness and capital formation. Latif et al. (2018) conducted a study to investigate the relationship between ICT, FDI, globalization, and economic growth in BRICS countries. By

employing various techniques like OLS with fixed effects, FMOLS, DOLS, and group mean estimator, the study suggested that in the long run, ICT positively contributes to economic growth. Also, bidirectional causality exists from FDI, globalization, and trade to economic growth. Prabhakar, Azam, Bakhtyar, and Ibrahim studied the relationship between FDI, trade, and economic growth in the BRICS countries for the period 1993–2012, and found a positive impact of FDI inflow and trade on economic growth for BRICS countries. Ross (2019) found the relationship between macro governance and foreign direct investment (FDI) using the 'good governance index' for the period 2002–2017, significant and the growth of FDI and countries that absorb FDI will struggle to attract FDI. The vast amount of empirical literature has analyzed empirically the nexus between FDI inflows, trade openness, and economic growth. However, not many empirical works analyzed the causal relationship between the FDI, trade openness, and economic growth for BRICS economies. The present study employs the ARDL model and analyzes the causality relationships among the BRICS countries.

4. Data and Methodology

Our sample comprises annual data from BRICS countries which are Brazil, India Russia, China, and South Africa. This paper uses panel data from 1990–2021. This study used data from the World Bank database, few of the relevant variables have been identified from the literature and employed in this analysis. By following the pioneers of economic growth theory and findings of previous empirical studies (Solow, 1956; Romer,1986; Lucas,1988; Barro,1991; Grossman and Helpman,1991; Aghion and Howitt,1992; Baumol et al., 1994; Sala-i-Martin,1995), variables of interest are economic growth), foreign direct investment (FDI), trade openness (TO), government expenditure (GE), and investment (INV). This paper proxied economic growth as GDP per capita, TO as the ratio of export and import of goods & and services to GDP per capita (current US $), FDI as net inflow foreign direct investment (BOP Current US $), GE as general government expenditure (current US $) and INV as gross fixed capital formation (current US $). The functional form of the model is expressed as:

GDPit = f (Gross capital formation, Govt $expenditure$, $Trade\ openness$, $Foreign\ Direct\ Investment$)

To prevent the problem of heteroscedasticity and intra-group variance, we have transformed all the variables into their natural log form. The model is specified by estimating the following equations:

GDPit = α + β1 lnINVit + β2l$nTO it$ + β3$lnFDIit$ + β4l$nGEit$ +εit ……

where GDPit is the GDP per capita, FDI_{it} is the Foreign direct investment the net inflows of investment at the percentage of GDP, INV_{it} is the Gross fixed Capital Formation, TO_{it} is expressed as a ratio of import of goods and services to GDP, GE_{it} is the Government expenditure, i for a country and t for time.

4.1Variable Description

GDP per capita: It is the gross domestic product of a country divided by its population, used to measure the economic well-being of the people within the country. Gross capital formation: consists of investment of households, firms, and the government realized throughout the year in a country. Both neoclassical and endogenous growth models identify investment to have a significant impact on economic growth. Trade Openness is the ratio of trade (imports + exports) to GDP and is used as a measure of the openness of an economy, although other measures exist. The larger the volume of the sum of imports to exports as a percentage of GDP the more open the country, influences economic growth. A positive relationship is expected between trade openness and growth. Foreign Direct Investment (FDI), is foreign investments by foreign companies either by establishing business operations or acquiring business assets in the domestic country, which stimulates additional investment in both human and physical capital. The study uses net inflows of FDI as a percentage of GDP, a positive relationship is expected between FDI and economic growth. The government expenditure on growth impact is ambiguous in the literature, either a positive or negative relationship is expected to exist between government expenditure and economic growth.

Table 1 and 2 presents the statistical summary of the data. The highest mean is 26.03 of INV and the lowest is 8.02 of GDP. The highest and lowest SD of FDI and GDP are 2.00 and 1.08, respectively. The intercorrelation among the variables is shown by the correlation matrix in Table 2.

Table 1. Descriptive Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
TO	160	18.50829	1.259124	16.4737	20.55524
INV	160	26.02649	1.378902	23.6196	29.63601
GE	160	25.6551	1.138824	23.7988	28.66891
GDP	160	8.016481	1.080446	5.708774	9.678758
FDI	159	23.19319	2.002313	15.02686	26.53434

Table 2. Correlation matrix.

	TO	INV	GE	GPC	FDI
TO	1.0000				
INV	0.7260	1.0000			
GE	0.4821	0.9426	1.0000		
GPC	-0.4633	0.2099	0.4900	1.0000	

FDI	0.5317	0.8284	0.8537	0.3233	1.0000

4.2 Econometric model

This paper employed the panel vector autoregressive (panel VAR) model in the Generalized Method of Moments (GMM) framework to study the impact of FDI, INV, TO, and GE on economic growth in BRICS countries.

4.3 Panel vector autoregressive (PVAR) model

Panel vector autoregressive (PVAR) models, allow to augment unit-specific models with lagged variables of another unit, to model covariances between the error terms of different units, and to specify unit-specific coefficient matrices. Panel VAR analysis is used to predict for choosing the optimal lag order in both panel VAR specification and moment condition. Andrews and Lu (2001) proposed consistent moment and model selection criteria (MMSC) for GMM models based on Hansen's (1982) *J* statistic of over-identifying restrictions.

4. 4 Results and analysis

4.4.1 Unit Roots tests

A stationarity test is needed to implement the PVAR model, therefore, panel unit root test of Im–Pesaran–Shin (IPS) and Fisher-type tests to check the stationarity of the series are performed. One of the major advantages of the test is that it can handle unbalanced data and is applicable for heterogeneous panels. The result of the unit root test is presented in Table 3.

The PVAR should be used in the stationary form since the unit root test results indicate that the series is stationary at their first difference. The panel unit roots test result shows that, at level, panels contain unit roots for all variables except FDI. However, the null hypothesis of unit roots is rejected at a 1% significance level at the first difference, showing that all variables are stationary at the first difference. Therefore, the prerequisite to estimate PVAR is fulfilled. The optimal length of lag is necessary for the PVAR model estimation. We have estimated the optimal lag length by using the Andrews and Lu (2001) three model selection criteria. Table 4 presents the result of optimal lag. The first-order panel VAR is the preferred model because it has the smallest MBIC, MAIC, and MQIC.

Table 3. Unit roots tests.

	Test at level		Test at 1st difference	
	IPS	Fisher	IPS	Fisher
TO	-0.3874	4.3788**	-7.5595*	29.5232*
INV	0.3992	-1.0693	-5.6802*	13.6032*
GE	0.7939	-1.6835	-5.4846*	13.9628*

GDP	1.4117	-1.7283	-5.5328*	14.1259*
FDI	-3.9750*	2.1080**	-8.1337*	36.7964*

***, **, * indicate significant at 10%, 5% and 1% level respectively

Table 4 Optimal lag

lag	CD	J	J pvalue	MBIC	MAIC	MQIC
1	.8409705	88.57146	.1353976	-275.9145	-61.42854	-148.5785
2	.9501999	60.93244	.1382984	-182.0582	-39.06756	-97.16755
3	.6822745	22.10862	.629464	-99.38669	-27.89138	-56.94137

4.4.2 Panel VAR estimates

The provided analysis presents the results of a Panel Vector Autoregression (PVAR) model for BRICS countries, focusing on GDP per capita., trade openness (TO), investment (INV), government expenditure (GE), and foreign direct investment (FDI).

Using the GMM approach, we have estimated the PVAR model at the first difference for every variable. The output of the first-order panel VAR model is shown in Table 5. According to Table 5, the BRICS countries exhibit statistically significant GDP per capita., trade openness, and investment for the GDP per capita equation. Specifically, the findings indicate that, for the BRICS, trade openness has a negative correlation with GDP per capita, whereas the first lags of GDP per capita and investment have a positive correlation. This suggests that a rise in the starting GDP per capita and investment values for BRICS will induce an increase in the current level of GDP per capita whereas trade openness will decrease it.

Secondly, for the trade openness equation, GDP per capita, investment, trade openness, and government sector expenditure are statistically significant for the BRICS countries. The first lag of GDP per capita is positively correlated with trade openness whereas, the first lag of trade openness, investment, and government expenditure are negatively correlated with trade openness. This shows that for the BRICS countries, an increase in initial values of GDP per capita induce an increase but trade openness, investment, and government expenditure will cause a decrease in the current level of trade openness.

Thirdly, the results of the investment equation shows that the GDP per capita and investment are statistically significant for the BRICS countries. In particular, the results show that the first lags of a per capita GDP are positively correlated with the current level of investment while the first lag of investment is negatively correlated with the current level of investment. This indicates that an increase in the initial value of GDP per capita induce an increase in the current level of investment but investment will cause a decrease in the current level of investment.

Fourthly, for the government expenditure equation, the results shows that the GDP capita, trade openness, and government sector expenditure are statistically significant for the BRICS countries. In particular, the results show that the first lags of GDP per capita and trade openness are positively correlated with the current level of government expenditure but the first lags of government expenditure are negatively correlated with the current level of government expenditure. This indicates that an increase in GDP per capita and trade openness will induce an increase in the current level of government expenditure but government expenditure will cost a decrease in the current level of government expenditure.

Finally, for the foreign direct investment equation, the results reported show that all variables are statistically significant for the BRICS countries. In particular, the results show that the first lags of trade openness and government expenditure are positively correlated with the current level of foreign direct investment while the first lags of GDP per capita, investment, and foreign direct investment are negatively correlated with foreign direct investment. This indicates that an increase in trade openness and government expenditure will induce an increase in the current level of foreign direct investment but GDP per capita, investment, and foreign direct investment will cause a decrease in the current level of foreign direct investment.

Table 5 Panel vector autoregression estimates result

	DGDP	DTO	DINV	DGE	DFDI
DGDP L1.	.2892843**	1.348833*	.587981**	1.024561*	-1.615082***
DTO L1.	-.049444**	-.3206968*	.0484907	.0596447***	1.520656*
DINV L1.	.1754343**	-.2126029***	-.2148201**	-.1228717	-2.765233*
DGE L1.	-.075302	-1.147151*	.1577241	-.3451937**	5.430812*
DFDI L1.	-.0059958	.0047797	.011279	-.0066434	-.1664986**

***, **, * indicate significant at 10%, 5% and 1% level respectively, ‘d’ represents first difference operator

4.4.3 Granger causality tests

After the estimation of the PVAR model, we checked the stability of the model and then performed the Granger causality Wald test. The null hypothesis is the absence of causality. The result of the Granger causality test is presented in Table 6.

According to Table 6, there is bidirectional causality between GDP per capita and trade openness, and GDP per capita, investment, and trade openness, and government expenditure among BRICS countries. Also, there is a unidirectional relationship from GDP per capita to government expenditure, GDP per capita to foreign direct investment, trades openness to foreign direct investment, investment to trade openness, investment to foreign direct investment, and government expenditure to foreign direct investment among BRICS

countries. There is no causal relationship between investment and government expenditure among the BRICS.

Table 6: Granger causality tests.

	DGDP	DTO	DINV	DGE	DFDI
DGDP		41.323*	10.189**	30.956*	2.919***
DTO	5.383**		1.555	3.088***	43.409*
DINV	5.297**	3.237***		1.488	17.814*
DGE	0.709	115.400*	1.736		62.776*
DFDI	0.864	1.098	1.623	0.862	
ALL	10.588**	150.471*	49.040*	81.724*	79.517*

The results show that the effect of one standard deviation shock in the FDI and GE on GDP per capita was instantaneously negative but increased from the first year to year 2 and after that equal to zero for the BRICS countries. Moreover, the results show that the effect of one standard deviation shock in the investment on GDP per capita is positive but decreasing from the first year to year 3 for the BRICS countries. The effect of one standard deviation shock in the TO on GDP per capita was instantaneously negative but increased from the first year to year 4 and after that equal to zero for the BRICS countries.

4.4.4Variance decomposition

Impulse responses don't establish the strength and scope of an effect, even though they can reveal information about how changes in one variable affect another. To find this, we therefore used variance decomposition techniques. Information regarding changes in percentages in the dependent series resulting from shocks induced by other variables in addition to their shocks is provided by variance decomposition. Table 7 displays the findings of the variance decomposition derived from the orthogonalized response of the impulse of coefficient matrix. In this study, the decomposition of the error variance is interpreted by concentrating on the 10th period, where the majority of the variables have the highest explaining power relative to the other periods.

Although impulse responses can provide details about the effect of variations in one variable on another, they do not determine the magnitude and extent of this effect. As a result, we performed variance decomposition techniques to determine this. Variance decomposition provides information about variations in percentages in the dependent series that are caused not only by their shocks but also by shocks generated by other variables. The results of the variance decomposition obtained from the orthogonalized response of the impulse coefficient matrix are presented in Table 7. For this study, we interpret the decomposition

of the error variance by focusing on the 10th period in which most variables have the highest explaining power than the others.

The result shows that TO, INV, GE, and FDI approximately explain 0%, 0.5%, 0.1%, and 0% respectively of the variance in GDP per capita for the BRICS countries. In the same vein GDP per capita, INV, GE, and FDI explain approximately 6%, 9%, 22%, and 0.4% respectively for the BRICS countries of the variance in TO. GDP per capita, TO, GE, and FDI approximately explain 84%, 0.5%, 0.4%, and 0.3% respectively for the BRICS countries of the variance in INV. The result shows that GDP per capita, TO, INV, and FDI approximately explain 81%, 2%, 2%, and 0.1% respectively of the variance in GE for the BRICS countries. In the same vein, GDP per capita, TO, INV, and GE explain approximately 5%, 2%, 11%, and 24% respectively for the BRICS countries of the variance in FDI.

The results highlight the proportion of variance in each variable explained by shocks from itself and other variables. For example, the 84% variance in investment is explained by GDP per capita, while GDP per capita is primarily explained by itself. In summary, these findings provide valuable insights into the dynamic relationships and causalities among economic variables in the context of BRICS countries, offering implications for policymakers and researchers in understanding the drivers of economic phenomena.

5. Conclusion

In conclusion, the research contributes to the understanding of the intricate growth dynamics within the BRICS nations. The findings highlight the multifaceted relationships of foreign direct investment, government expenditure, trade openness, investment, and GDP per capita. The bidirectional and unidirectional causality relationships identified through Granger causality tests shed light on the complex interplay of these factors.

The paper's insights have implications for policymakers and researchers aiming to comprehend the factors driving economic growth in emerging economies. The identified relationships can inform strategies for fostering sustainable development and improving economic performance within the BRICS countries. Overall, this research adds valuable knowledge to the discourse on global economic governance and the role of emerging economies in shaping the international economic landscape.

Impulse response

Fig 1. Impulse -Response Results

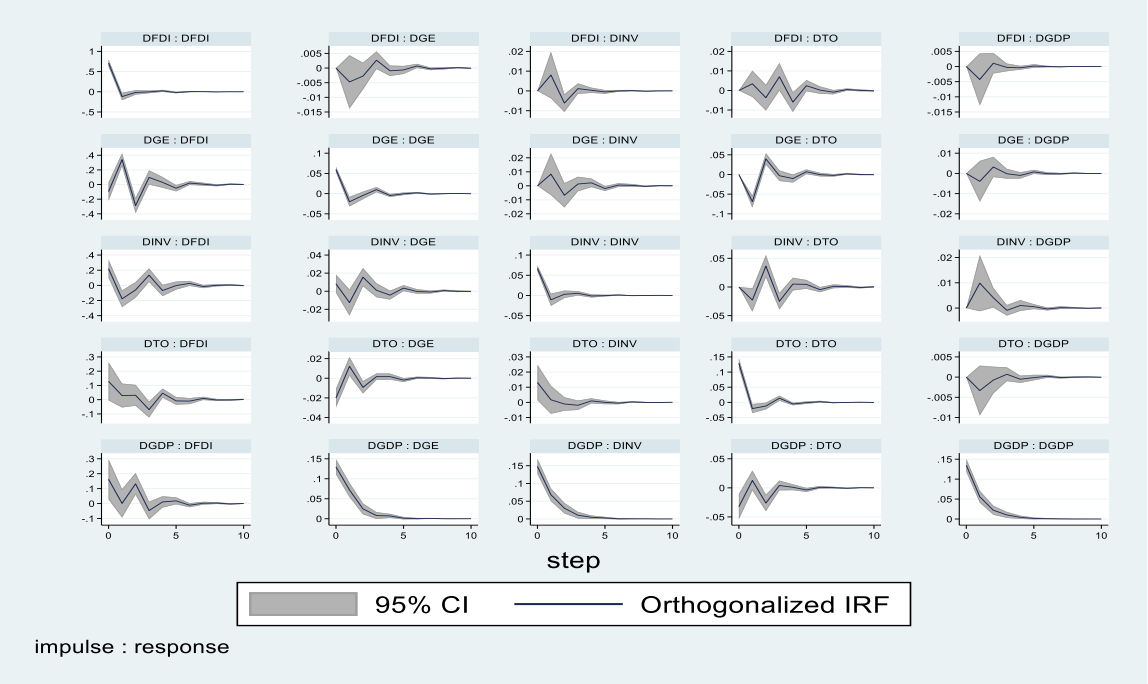


Table 7. Error variance decomposition impulse response function.

Response variable and Forecast horizon |					
|	DGDP	DTO	DINV	DGE	DFDI
DGDP					
0	0	0	0	0	0
1	1	0	0	0	0
2	.9933878	.0005166	.0045265	.0007167	.0008523
3	.9922277	.0005296	.0051913	.0011666	.0008848
4	.9922016	.0005497	.0052026	.001162	.0008842
5	.9920977	.0005614	.0052445	.0012053	.000891
6	.9920556	.000562	.0052583	.001232	.0008921
7	.9920473	.0005638	.0052642	.0012326	.0008921
8	.9920434	.0005644	.0052657	.0012341	.0008924
9	.9920418	.0005644	.0052659	.0012353	.0008925
10	.9920413	.0005645	.0052663	.0012354	.0008925
DTO					
0	0	0	0	0	0
1	.0590084	.9409916	0	0	0
2	.0511728	.7247761	.0219059	.2016525	.0004927
3	.0690157	.6310939	.0674751	.2314879	.0009274
4	.0674147	.6180371	.087357	.224548	.0026432

5	.0669796	.6146844	.0876572	.2267956	.0038832
6	.0672149	.6127883	.0881322	.22778	.0040846
7	.0671821	.6123766	.08879	.2275692	.004082
8	.0671671	.6122283	.0888118	.2276853	.0041076
9	.0671756	.6121398	.0888267	.2277438	.0041142
10	.0671749	.6121194	.0888568	.2277348	.0041141

DINV

0	0	0	0	0	0
1	.8237411	.0065193	.1697397	0	0
2	.8432145	.0055974	.146932	.002204	.0020521
3	.8451797	.0054596	.142667	.0035375	.0031563
4	.844806	.0055459	.142891	.0035738	.0031834
5	.8447295	.0055697	.1428071	.00371	.0031837
6	.8446616	.0055676	.142758	.003823	.0031898
7	.8446143	.005575	.1427887	.0038323	.0031896
8	.8446043	.0055778	.142792	.0038354	.0031904
9	.8446003	.0055778	.1427909	.0038401	.0031909
10	.8445984	.005578	.1427921	.0038406	.0031909

DGE

0	0	0	0	0	0
1	.8065736	.0194167	.0032743	.1707353	0
2	.8222592	.0206472	.0084429	.1478139	.0008369
3	.8156245	.0230033	.0168741	.1434197	.0010783
4	.8128389	.0229567	.0168087	.1460651	.0013306
5	.8119174	.0229814	.0174173	.1463271	.0013568
6	.8114701	.023089	.0178267	.1462433	.0013711
7	.8113358	.0230946	.0178262	.1463541	.0013893
8	.8112838	.0230953	.0178516	.1463775	.0013918
9	.8112645	.0230998	.0178694	.1463741	.0013921
10	.8112586	.0231002	.0178697	.1463786	.0013928

DFDI

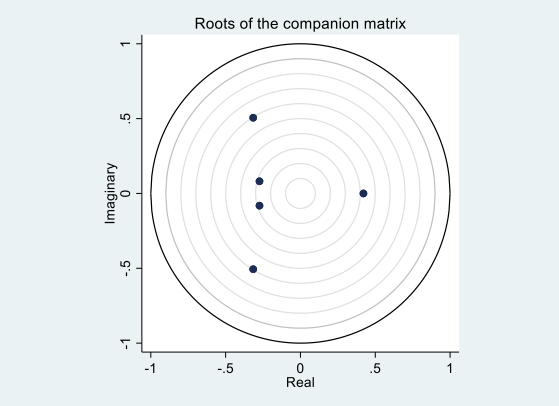
0	0	0	0	0	0
1	.0434131	.0272579	.0791425	.0151211	.8350654
2	.0342828	.022622	.1033569	.1620593	.6776791
3	.0501603	.0210053	.0951003	.2365975	.5971366
4	.050655	.0255227	.1114866	.2379105	.5744252
5	.0503335	.0275627	.115515	.2367391	.5698496
6	.0505149	.0275416	.1151177	.2386182	.5682076
7	.0505717	.0276083	.1156944	.2387163	.5674093
8	.050557	.0276832	.1159056	.238653	.5672013

9	.0505611	.0276835	.1158883	.2387368	.5671303
10	.0505646	.0276856	.1159097	.2387459	.5670942

'd' represents the first difference operator.

4.6. Model Stability

Fig 2. Module Stability.



References:

Ashok Parikh*, Miyuki Shibata, Does trade liberalization accelerate convergence in per capita incomes in developing countries? Journal of Asian Economics 15 (2004) 33–48

Barro, R. J., & Sala-I-Martin, X. (1992). Convergence. Journal of Political Economy, 100(2), 223–251. Barro, R. J., & Sala-I-Martin, X. (1995). Economic growth. New York: McGraw Hill Inc.

Barro, Robert, and Xavier Sala-i Martin. (1997)"Technological Diffusion, Convergence, and Growth." Journal of Economic Growth 2(1):1-26.

Bernard, A. B., Jones, C. I. (1996). Comparing apples to oranges: Productivity convergence and measurement across industries and countries. American Economic Review, 1216–1238.

Ben David, D. (1993). Equalizing exchange: Trade liberalization and income convergence. Quarterly Journal of Economics, 108, 653–679.

Dollar, D. (1992). 'Outward-oriented developing economies do grow more rapidly: evidence from 95 LDCs, 1976-1985', Economic Development and Cultural Change, vol. 40 (3), pp. 523-44.

Dollar D, Kraay A (2004) Trade, Growth and Poverty. Econ J 114: 22-49.

Dollar, D. and A. Kraay. (2001). Trade, Growth and Poverty, World Bank Policy Research Department Working Paper No. 2587, Washington DC.

Dollar, D. and Kraay, A. (2003): Institutions, trade, and growth. Journal of Monetary Economics 50,133–62.

Edwards, S., (1992). Trade orientation, distortions, and growth in developing countries.Journal of Development Economics 39, 31– 57

Edwards, S. 1992. Trade orientation, distortions and growth in developing countries, Journal of Development Economics 39(1): 31–57. http://dx.doi.org/10.1016/0304-3878(92)90056-F

Engle, R. F.; GrangWacziarg, R. 2001. Measuring the dynamic gains from trade, The World Bank Economic Review 15(1): 393–429. http://dx.doi.org/10.1093/wber/15.3.393

Frankel, J. and D. Romer (1999), "Does Trade Cause Growth?" The American Economic Review, vol.89, No. 3, pp. 1-21.

Frankel JA, Romer D (1999) Does trade cause growth? Am Econ Rev 89: 379-399.

Huang LC, Chang SH (2014) Revisit the nexus of trade openness and GDP growth: Does the financial system matter? J Int Trade Econ Develop 23: 1038-1058.

Kim DH, Lin S (2009) Trade and growth at different stages of economic development. J Development Stud 45: 1211-1224.

Kim DH, Lin SC, Suen YB (2012) The simultaneous evolution of economic growth, financial development and trade openness. J IntTrade Econ Development 21: 513-537

Kunofiwa Tsaurai, International Journal of Economics and Business Administration Volume IX, Issue 1, 2021 pp. 318-330 Determinants of Trade Openness in Transitional Economies: Does the Complementarity between Foreign Direct Investment and Human Capital Development Matter

Mercan, M., Gocer, I., Bullit, S., & Dam, M. (2013). The effect of openness on economic growth for BRIC-T countries: Panel data analysis. Eurasian Journal of Business and Economics, 6, 1–14.

Nirmal Kumar January 24, (2009) Economic & Political Weekly EPW 41 China and India: Convergence in Economic Growth and Social Tensions?

Sakyi D, Villaverde J, Maza A (2015) Trade openness, income levels, and economic growth: The case of developing countries 1970–2009. J Int Trade Econ Development 24: 860-882.

Shayanewako VB (2018) The Relationship between Trade Openness and Economic Growth: The Case of BRICS Countries. J Glob Econ 6: 289.

Vijayakumar, N., Sridharan, P., & Rao, K.C.S. (2010). Determinants of FDI in BRICS Countries: A panel analysis. International Journal of Business Science and Applied Management, 5, 1–13.

Yanikkaya, H. 2003. Trade openness and economic growth: a cross country empirical investigation, Journal of Development Economics 72(1): 57–89. http://dx.doi.org/10.1016/S0304-3878(03)00068-3

Young, A. 1991. Learning by doing and the dynamic effects of international trade, Quarterly Journal of Economics 106(2): 369–406. http://dx.doi.org/10.2307/2937942