Trade Creation Effects on Global Value Chains: A Case Study of BRICS[1]

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A B S T R A C T

Over the past two decades, international trade and production have become increasingly organised around what is commonly referred to as the Global Value Chains(GVCs). The BRICS trade volume greatly revolves around Global Value Chains (GVCs) or Global Supply Chains. In this context, BRICS institutional arrangements on FDI inflows, Foreign exchange reserves have positively impacted trade creation from BRICS countries thereby influencing the Global Value Chains. This paper intends to analyse the directional trade flows of BRICS and its intra trade volume towards the global value chains. Firstly, the institutional changes in the BRICS (FDI Inflow, and Foreign Exchange Reserve) can increase the merchandise trade within the BRICS countries, Secondly; an increase in the merchandise trade outflows from BRICS, and finally; an increase in the service trade outflows from BRICS. The first and third findings can be understood as trade creations due to increase in Foreign Exchange Reserve, and FDI inflows in the BRICS countries, and Rules of origin as an implicit trade barrier for imports from the rest of world. The Global Value Chains are most relevant to understand the third findings on the increase in trade flows from the BRICS. The key determinant of the increase in outflows is the imperative of the complementarities of value chains for imports of intermediates by member of the BRICS.

1. INTRODUCTION

The rise of Global Value Chains (GVCs) is a dominating feature of the recent evolution in the structure of international trade. In the OECD, the import content of exports increased by 63% between 1995 and 2011, reaching a value of 24.3% on average . This internationalization of production through global value chains calls for a revaluation of the effects of regional trade agreements (RTA) on trade flows. In reality, about 70% of international trade today involves global value chains (GVCs), as services, raw materials, parts, and components cross borders – often numerous times. Once incorporated into final products they are shipped to consumers all over the world[3].

The Exports from one country to another often involve complex interactions among a variety of domestic and foreign suppliers. Even more than before, trade is determined by strategic decisions of firms to outsource, invest, and carry out activities wherever the necessary skills and materials are available at competitive cost and quality (OECD)[4].

Since Viner (1950), the effects of regional trade agreements are framed in terms of two concepts: trade creation and trade diversion. An increase in intra-regional trade associated with a RTA is called trade creation. In turn, a decrease in trade between the region and the rest of the world is called trade diversion. Trade creation is thought to be associated with resources being shifted from relatively inefficient domestic suppliers towards more efficient regional suppliers. In contrast, trade diversion could be the result of resources being shifted from efficient extra-regional suppliers towards inefficient regional suppliers. The desirability of regional trade agreement depends on the balance between trade creation and trade diversion.

2. TRADE CREATION AND TRADE DIVERSION:THEORETICAL OVERVIEW

Jacob Viner was an eminent economist, and a supporter of economic regionalism and regional trade arrangements (intra-regional trade) during the post war period. Jacob Viner pointed out that regional trade arrangements can lead to trade creation, if due to the formation of regional agreements; regional trade arrangement members switch from in efficient domestic producers and import more from other members of regional trade agreement. On the other hand, trade diversion take place if, because of regional trade agreement, members switch imports from low cost production in the rest of the world and import more from higher cost producers in the partner countries.

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Trade diversion lowers welfare not only the partner countries, but also rest of the world too (Shameem, 2018). Viner's analysis shows that trade creation and trade diversion have opposite welfare implications and the net effect will have happened on which of these two effects dominate (Viner, 1937).

His famous book "The Customs Union Issues" published in 1950 is an undeniable classic in its field. Among contemporary international economists, the work became a classical making and justifying a field of enquiry. The writings of the classical economist on preferential trading arrangements are the first important influence on Viner's work.

Jacob Viner took a broad view of regional customs union, and his analysis is relevant to most regional preferential trade arrangements. "One of the number of arrangements for reducing tariff barriers between political units while maintaining barriers against imports, from outside the regions" while a 'perfect customs union' defined as an arrangement, which meets the following conditions (Viner, 1954) and (Shameem, 2018).

The customs union facilitate more economic interdependence among the member states thereby resolving the tariff issues and protecting external aggression within their trade sectors in a group. It protects domestic industry in regional group from external threats (Shameem, 2018). In the case of BRICS, its trade union handles matters of tariff and non- tariff issues, marking its growth path towards economic interdependence.

Customs union is more likely to operate in the regional free trade direction, whether the assessment is in terms of its consequences for customs union area alone or for the world as a whole. With polarization of Regional Trade Arrangements, the question arises as to how such arrangements benefit world trade, contribute economic development, enhance the welfare of regions (countries) and increase overall global welfare. The answer depends on the difference between trade creation and trade diversion effects of regional economic integration. Regional Trade Arrangements have been the subject of considerable economic analysis. Regionalism had its beginnings with the seminal contributions to the subject of customs union by Viner (1950) and Meade (1955) who states economic costs and benefits of the customs union to its members and to the rest of the world (Shameem and Jayaprasad, 2018).

The Viner's theory was later modified and broadened by (Geherls, 1956; Lipsey, 1957; Collier; 1979), who introduced into their models other welfare effects, such as consumption effects and terms of trade effects, in addition to the production effects. Lipsey's 1960 survey article was an important summary of the developments of customs union theory in the 1950's, though research on the welfare effects of changing trade flows continued thereafter. Trade, production, and welfare are correlated with each other in regional integration (Shameem and Jayaprasad, 2018).

After Lipsey's 1960 paper, economists shifted their research emphasis from the economic effects of customs unions to the question of why customs union formed in the first instance. Such a change, according to Melvyn Krauss, "reflects both theoretical and institutional imperative: the former being response to the failure of traditional international trade theory to explain why policies other than the free trade or modified free trade followed by governments; the latter, to recent interest in economic integration on the part of the world's developing countries as a means for accelerating their rate of economic progress" (Lipsey, 1960). The issue was tackled by (Cooper and Massell, 1965; Jhonson, 1965; Krauss; 1972; Floystad, 1975; Dauphin, 1978; Berglas, 1979) and others, who attempts to search for both economic and non-economic rationales for forming a customs union. The above studies are evidence of broadening the scope of regional integration in economics which paved the way for expansion all over the world. These theoretical literatures gave strong base for regional integration through intra-regional trade and promoted the expansion of economic regionalism all over the world (Shameem and Jayaprasad, 2018).

Jacob Viner concludes the discussion of economies by emphasizing that "customs unions are from a regional free trade point of view, not necessarily good nor necessarily bad; the circumstances discussed above are the determining factors".i In this context, free flow of goods and services help in reducing the tension between nation states in a group. So that customs unions have great advantages out of each national economy in the group and protects domestic industries from external threats (Shameem and Jayaprasad, 2018). The BRICS trade union protects its domestic industries from external threats (not put forward external tariff mechanism) and advantages on trade creation through intra-regional trade (Shameem and Jayaprasad, 2018).

Jacob Viner argued historically that, most customs unions that had actually been formed were driven by political rather than economic considerations and that political union always preceded economic union, and that is for good reasons (such as the absence of workable redistributive mechanism). Moreover, most economically beneficial customs unions are the hardest to form, a point rediscovered by Grossman and Helpman (1995) on the contemporary political economy of trade literature. Jacob Viner mentioned trade diversion from multi-level to regional level. Freund and Ornelas (2010) identified Viner as the originator of distinction between trade diversion and trade creation and this distinction gave their survey shape, as they assess whether recent empirical and political economy studies indicates trade diversion or creation predominance. The picture that emerges from the contemporary surveys of Viner as lauded but unread is reinforced by a scan of the contemporary journal literature on preferential trading arrangements (Shameem and Jayaprasad, 2018).

Viner pointed out that regional trade arrangements can lead to trade creation (through intra-regional trade),

if due to the formation of regional agreements, regional trade arrangements members' switch from the inefficient domestic producers and begin to import more from other members of regional trade arrangement. On the other hand, trade diversion takes place if the Regional Trade Arrangement members switch imports from areas of low cost production in the rest of the world and import more from higher cost producers from their partner countries. Trade diversion lowers welfare not only of the partner countries, but also for the rest of the world. Viner's analysis shows that trade creation and trade diversion have opposite welfare implications and the net effect will have happened on which of these two effects dominate (Shameem and Jayaprasad, 2018).

Edward Mansfield and Helen Milner (1997) emphasize geographical proximity specifically as a key trait of a region. According to L. Alan Winters (1990) "any policy designed to reduce trade barriers between a subset of countries regardless of whether those countries are actually contiguous or even close to each other". In this context, regional proximity is an important factor to form mutual interest within the regional organization. During the Cold War, most regions were either political or mercantile clusters of neighbouring countries that found its place in the larger international system. In the past, regions were often delineated and compared in time and space inductively by using date on the economic and institutional ties between states (for example, Russettt 1967). Currently, most trade economists take regions as institutionally granted for example, the EU, NAFTA, BRICS and Mercosur Union- using them to study the changes in the shares of intra and inter regional trade (Frankel, 1997). Jeffry Frankel found in 1994 that regional trade concentration ratios were the highest in Mercosur Union and Andean community- followed by ASEAN, NAFTA and EU.

3. LITERATURE REVIEW

Estimating the effects of regional trade agreements requires to build a counterfactual world. There are two main approaches: using a structural model to simulate the counterfactual as in Caliendo and Parro (2015), or using gravity equations to predict the counterfactual as in Carrere (2006), Magee (2008), Baier and Bergstrand (2007) and Baier and Bergstrand (2015). This paper is closely related to Magee (2008), which estimates the effects of trade agreement using a panel of 133 countries from 1980 to 1998. Also closely related is Carrere (2006) who uses a gravity model to assess trade creation and trade diversion effects. Our contribution comes from the broader coverage of Regional Trade Agreements and countries, our focus on the effect of RTA on inflows to and outflows from the region, and on our account of the role of Global Value Chains. Also related is Baier and Bergstrand (2007) and Baier and Bergstrand (2015) who address the problem of endogeneity related to free trade agreements and trade flows by using panel data and average treatment effects (ATEs). They find positive estimates and conclude that

free trade agreements increase members' international trade.

Anderson and Yotov (2016) refer to a gravity model to estimate the effects of trade agreements on terms of trade and global efficiency. They face two main problems: heteroscedasticity in trade flows data, and indigeneity due to the two-way causality. To address the first one, they use the Poisson pseudo maximum likelihood (PPML). To address the second one, they introduce two variables, one for trade agreements between countries with low most-favoured-nation tariffs (MFN), the other for trade agreements between countries with high MFN tariffs. They find an increase in the global efficiency of manufactures trade over the period 1990-2002.

The behaviour of trade flows following a regional trade agreement is also impacted by the depth of the agreement, as analysed in Mattoo et al. (2019). Using a sample of 96 countries for the period 2002-2014, they show that deep agreements lead to more trade creation and less trade diversion than shallow agreements.

Additionally, beyond complementarity in trade policy, GVCs also create strong interdependence of GDP fluctuation at business cycle frequency and are associated with network propagation effects of any reform aiming at reducing the cost of cross-country trade.2 Moreover, the segmentation of production across countries also has significant implications for the magnitude of estimated trade elasticities (Amiti et al. (2014), de Soyres et al. (2018)).
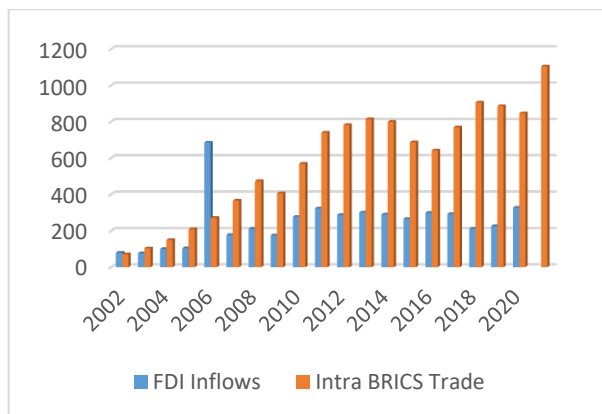
Finally, Estevadeordal et al. (2008) study the impact of regional trade agreements on trade liberalization towards non-members. Focusing on Latin American countries, they found "complementary effects" in the sense that a preferential tariff reduction leads to a reduction in the external tariff. Freund and Ornelas (2010) provide an insightful review of the literature on regionalism. The empirical findings of this paper, combined with theories of optimal trade policy suggest two opposing forces towards greater global integration: the response of trade flows to an RTA gives members an incentive to reduce trade barriers towards non-members; however, it gives non-members an incentive to increase trade barriers towards the region. The incentive for members to lower trade barriers echoes the literature on multilateralism (Estevadeordal et al. (2008), Bagwell and Staiger (1999)).

i. The BRICS FDI Inflows and Merchandise Trade Creations on GVC's

The BRICS FDI inflows significantly influenced on its intra BRICS trade volume. The BRICS formed 2009, the period of post global financial crisis the bellow figure gave the evidence of the BRICS institutional arrangements on FDI inflows leads to increase the intra BRICS trade volume which exhibits trade creations on global value chains. The detailed analysis is given bellow.

Figure 1

The BRICS FDI and Intra BRICS Merchandise Trade Volume (Values in Billion USD)

Source: ITC Calculation based on UNCOMTRADE, ITC Statistics, and BRICS Joint Statistical Report 2020.

https://www.trademap.org/Country_SelProduct_TS.aspx?nvpm=1%7c%7c6757%7c%7c%7cTOTAL%7c%7c%7c2%7c1%7c1%7c2%7c2%7c1%7c3%7c1%7c1%7c1

In the above figure 1 illustrates the impact of FDI inflows on the Intra BRICS merchandise trade volume. From 2002, Intra-BRICS merchandise trade volume were 71.73 Billion USD and the volume had increased up to 473.4 Billion USD in the year 2008. This data depicts pre-BRICS era wherein the intra BRICS trade volume had been positively influenced by the FDI inflows devoid of any institutional arrangements. During this period, the BRICS FDI inflow share had substantially increased from 79.99 Billion USD to 211.33 Billion USD.

After the formation of the BRICS i.e., post BRICS, the Intra BRICS merchandise trade volume had significantly risen due to an increase in the FDI inflows among the BRICS countries. In the year 2009, Intra BRICS merchandise trade volume stood at 406.05 Billion USD along with FDI inflows at 175.04 Billion USD.
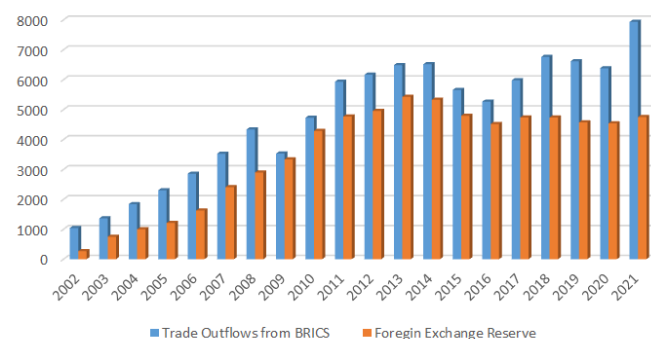
The period of 2010- 2018, the intra BRICS merchandise trade volume increased from 569.25 to 905.69 Billion USD. Similarly, the imports also increased from 358.54 to 552.42 Billion USD. The institutional arrangements on FDI inflows have influenced by increasing of Intra BRICS trade volume, which makes massive volume of trade creation in this group. The FDI inflows during this period constantly maintained at same pace with 211.19 Billion USD. The bilateral trade negotiations, the BRICS New Development bank financial assistances on transport sectors (9.56 Billion USD), Urban development projects (3.69 Billion USD), ICT projects (300 Million USD), and Multiple areas projects (2.15 Billion USD) are major factors positively influenced on Intra BRICS trade volume.

In the period of COVID-19 pandemic, the BRICS intra trade volume have played significant role on their economic recoveries. The BRICS emergency programme loan for economic recovery (6 Billion USD), and Emergency assistance programme in combating COVID-19 (6 Billion USD). The above economic recovery assistance by New Development Bank platform necessitated 2 Billion USD on each BRICS member states. Under this platform total distributed 12 Billion USD financial assistances on combating on COVID-19 situation. The COVID pandemic period of 2019 -21 data shows that intra BRICS exports increased from 354.49 to 451.26 Billion USD. The intra BRICS trade volume increased from 886.45 to 1104 Billion USD. The intra BRICS trade volume increased this situation because of the BRICS emergency loan, and economic assistance programme under the new development bank institutional arrangement. The BRICS FDI inflows increased from 226.14 to 327.31 Billion USD in 2019-20 period. In this pandemic uncertainties, the BRICS institutional involvement on the basis of New development bank projects, Emergency loan, and FDI inflows have greatly influenced the intra trade volume and economic recoveries. The increase in the FDI inflows leads to creation of intra BRICS trade volume on global value chains.

ii. The BRICS Foreign Exchange Reserve and Trade Creation on GVC's

The BRICS group have contributed to the largest level of foreign exchange reserve which consist of 4.75 Trillion USD in 2021. The BRICS foreign exchange reserve have influenced its inter BRICS merchandise trade volume over the years. The below figure illustrates the relations of foreign exchange reserve and Inter BRICS Merchandise Trade volume.

Figure 2
The BRICS Foreign Exchange Reserve and Inter Merchandise Trade Volume (Values in Billion USD)

Source: ITC Calculation based on UNCOMTRADE, ITC Statistics, and BRICS Joint Statistical Report 2020.

https://www.trademap.org/Country_SelProduct_TS.aspx?nvpm=1%7c%7c6757%7c%7c%7cTOTAL%7c%7c

The above figure 2 illustrates inter BRICS merchandise trade relations, in the case of inter BRICS merchandise trade volume (2002-2008) increased from 1041.37 to 4337.1 Billion USD. Similarly, BRICS Foreign Exchange Reserve also increased from 268.41to 2894.32 Billion USD during this period. The BRICS foreign exchange reserve act as catalyst and boost external trade sector of BRICS.

In the period of 2009-18, inter BRICS merchandise trade volume increased from 3527.78 to 6760.3 Billion USD, and in the case of BRICS foreign exchange reserve increased from 3335.18 to 4739.25 Billion USD. The inter BRICS trade volume and foreign exchange reserve have helped the BRICS economy at a greater level to recover these nations from global financial crisis, and Eurozone crisis.

In the case of pandemic period (2019-21), inter BRICS trade volume increased from 6616.18 to 7933.52 Billion USD. In the case of BRICS foreign exchange reserve volume increased from 4573.54 to 4755.3 Billion USD. The above data portray BRICS as an institution that is actively engaged in the global volume of trade and global value chains on merchandise trade. The BRICS have succeeded to combat global financial crisis, and Eurozone crisis certain level.

In the case of the BRICS merchandise exports share contribution on world exports increased in the period of 2002-08. The percentage of exports share increased from 8.80% in 2002) to 14.73% in 2008 (see table 5 in the appendix part). The period of 2009 -2018, same tendency also exhibited from 15.28 (2009) % to 18.63% (2018). In the period of pandemic (2019-21) BRICS exports share increased from 18.96 % (2019) to 20.07% (2021) on over World merchandise trade exports volume.
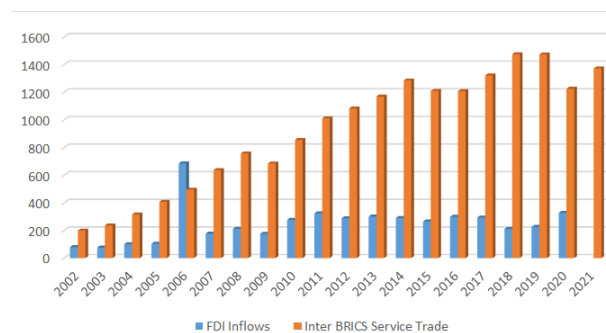
In the case of the BRICS merchandise imports share contribution on world imports increased in the period of 2002-08. The percentage of imports share increased from 7.15% in 2002 to 12.08% in 2008 (see the table 6 in the appendix part). The period of 2009-18, the imports contribution share increased from 12.94% (2009) to 16.04% (2018). In the period of pandemic (2019-21), the BRICS imports share increased from 15.99% (2019) to 16.52% (2021) on over World merchandise trade imports volume. To, conclude that the BRICS contributed total merchandise trade share on global trade volume reached 10.01% in 2021, 18.09 % in 2020, and 17.43% in 2019. This evidence clearly marked that the BRICS actively participated during the pandemic on global value chains and global supply chains of the trade in merchandise.

iii. The BRICS FDI Inflows and Trade Creation on GVC's

The BRICS FDI inflows significantly influenced on its inter BRICS service trade volume. The bellow figure gave the evidence of the BRICS institutional arrangements on FDI inflows leads to increase the intra BRICS service trade volume which exhibits trade creations on global value chains. The detailed analysis is given bellow.

Figure 3
The BRICS FDI Inflows and Inter BRICS Service Trade (Values in Billion USD)

The above figure 3, depict inter BRICS service trade relations, in the case of inter BRICS service trade volume (2002-2008) increased from 198 to 756 Billion USD. Similarly, BRICS Foreign Direct Investment Inflows also increased from 79.99 to 211.33 Billion USD during this period. The BRICS FDI inflows boost inter BRICS service trade volume such that the economy revives as a result of the pandemic shocks wherein the global value chains can positively benefit from such trade creations.

In the period of 2009-18, inter BRICS service trade volume increased from 684 to 1475 Billion USD, and in the case of BRICS FDI inflows increased from 175.04 to 211.19 Billion USD. The inter BRICS service trade volume and FDI inflows have helped the BRICS economy at a greater level to recover these nations from global financial crisis, and Eurozone crisis.

In the case of pandemic period (2019-21), inter BRICS service trade volume decreased from 1473 to 1372 Billion USD. In the case of BRICS FDI inflows volume reached 327.31 Billion USD in 2020. The economic system suffered a major setback as most parts of the world were forced into a complete lockdown due to the ongoing fatal contagion, causing a major decline in employment, output, and service trade. The Inter BRICS service trade volume assists in the economic recovery of these economies from pandemic uncertainties.

In the case of the BRICS service exports share contribution on world service exports increased in the period of 2005-10. The percentage of exports share increased from 7.29% in 2005 to 9.86% in 2010 (see table 7 in the appendix part). The period of 2011 -2018, same tendency also exhibited from 10.13 (2011) % to 9.74% (2018). In the period of pandemic (2019-21) BRICS exports share increased from 9.80 % (2019) to 11.42% (2021) on over world service trade exports volume.

In the case of the BRICS service imports share contribution on world imports increased in the period of 2005-10. The percentage of imports share increased from 8.75% in 2005 to 11.99% in 2010 (see the table 8 in the appendix part). The period of 2011-18, the imports contribution share increased from 12.96% (2011) to 15.30% (2018). In the period of pandemic (2019-21), the BRICS service imports share decreased from 14.59% (2019) to 11.56% (2021) on over world service trade imports volume. To, conclude that the BRICS contributed total service trade share on global trade volume reached 11.49% in 2021, 12.59 % in 2020, and 12.03% in 2019. This evidence clearly marked that the BRICS actively participated during the pandemic on global value chains and global supply chains of the trade in service.

The paper postulated the following hypotheses based on the literature and theoretical explanations. Firstly, the institutional changes in the BRICS (FDI Inflow, FDI Outflow, and Foreign Exchange Reserve) can increase the trade within the BRICS countries, secondly; a decrease in the trade outflows, and finally; an increase in the trade inflows. The following functional model can represent the three hypotheses mentioned above.

a. *Change in trade within the BRICS = f [BRICS Institutional Arrangements]*
b. *Change in Trade Inflows to the BRICS = f [BRICS Institutional Arrangements]*
c. *Change in Trade outflows from the BRICS = f [BRICS Institutional Arrangements]*

Table: 1			
Correlation between Institutional Arrangements and BRICS Trade			
	FDI Inflows	FDI Outflows	Foreign Exchange Reserve
Intra BRICS Trade	0.32	0.90	0.97
Inter BRICS Service Trade	0.30	0.91	0.94
Trade Outflows from BRICS	0.35	0.90	0.97

In the first hypothesis, it is expected that institutional arrangements can positively impact the trade within BRICS, meaning that trade within BRICS will increase along with FDI inflow and Foreign Exchange reserve, and trade will decrease with an increase in FDI outflow. To test the same, a multiple linear regression was performed. The model is as follows:

Δ Trade within BRICS= f [Δ FDI Inflows, Δ FDI Outflow, Δ Foreign Exchange Reserve]

The regression result is explained in Table 1. It shows the model is significant where the R squared value is 0.93 and the model F value is less than 0.05. With respect to individual coefficients, it expects a positive relationship between Trade within BRICS and FDI inflow and Foreign Exchange Reserve with a statistical significance. However, the regression result revealed that both have a positive relationship with Trade within BRICS with no statistical significance where their corresponding p-values are greater than 0.05. On the other hand, we expect a negative relationship between Trade within BRICS and FDI outflows, although, it is statistically not significant.

Table: 2				
Regression Analysis of Trade within BRICS and BRICS Institutional Arrangements				
	Coefficients	Standard Error	t Stat	P-value
Intercept	-20.1171571	53.86403	-0.37348	0.714386
FDI Inflows	0.000428431	0.150097	0.002854	0.997763
FDI Outflows	-0.77592637	0.766379	-1.01246	0.328499
Foreign Exchange Reserve	0.190778916	0.035783	5.331496	0.000106
R Square	0.936754723			
Standard Error	78.86251389			
Significance F	1.23609E-08 (95%)			

The second hypothesis, that is trade Inflow to the BRICS is dependent on BRICS institutional arrangements (FDI Inflow, FDI Outflow, and Foreign Exchange Reserve). As done in the first hypothesis test, a similar multiple regression is performed and Table 2 reveals the result. It shows the model is significant where the R squared value is higher and the F value is less than 0.05. With respect to individual coefficients, it expects a positive relationship between trade inflows to the BRICS and FDI inflow and Foreign Exchange Reserve. However, the regression result revealed that Foreign Exchange Reserve has a positive relationship with Trade within BRICS with a statistical significance where its corresponding p-values is less than 0.05. As against the hypothesis, the result shows a negative relationship between Trade inflows to the BRICS and FDI inflows, still, it is not significant. On the other hand, we expect a negative relationship between Trade Inflows to the BRICS and FDI outflows, but the result shows a positive relationship with no statistical significance.

Table: 3 Regression Analysis of Trade Inflows to the BRICS and BRICS Institutional Arrangements				
	Coefficients	Standard Error	t Stat	P-value
Intercept	149.4699468	111.7667556	1.337338155	0.202435166
FDI Inflows	-0.105916187	0.311449205	-0.340075315	0.738848312
FDI Outflows	1.091043943	1.590221588	0.686095543	0.503857601
Foreign Exchange Reserve	0.180547784	0.074249775	2.431627373	0.029051999
R Square	0.93775944			
Standard Error	163.6381			
Significance F	1.10307E-06 (95%)			

The third hypothesis is trade outflow from the BRICS is dependent on BRICS institutional arrangements (FDI Inflow, FDI Outflow, and Foreign Exchange Reserve). As done in the previous analysis, multiple regression is performed and Table 3 reveals the result. It shows the model is significant where the R squared value is higher and the F value is less than 0.05. With respect to individual coefficients, it expects a positive relationship between trade outflows to the BRICS and FDI inflow and Foreign Exchange Reserve with a statistical significance. However, the regression result revealed that Foreign Exchange Reserve has a positive relationship with trade within BRICS with statistical significance where its corresponding p-values is less than 0.05. However, the result shows a positive relationship between trade inflows to the BRICS and FDI inflows with no statistical significance. On the other hand, we expect a negative relationship between trade inflows to the BRICS and FDI outflows, but it is not statistically significant.

Table: 4 Regression Analysis of Trade outflow from the BRICS and BRICS Institutional Arrangements				
	Coefficients	Standard Error	t Stat	P-value
Intercept	519.7003899	312.4668057	1.663217918	0.118484303
FDI Inflows	0.544366005	0.8707199	0.625190724	0.541902914
FDI Outflows	-6.660548235	4.445789422	-1.498169977	0.156294951
Foreign Exchange Reserve (FER)	1.364212298	0.207580418	6.571970077	1.24529E-05
R Square	0.977			
Standard Error	457.483			
Significance F	1.17601E-09 (95%)			

To conclude that, it is hypothesized that BRICS institutional arrangements have an impact on Intra BRICS Trade, Inter BRICS Service Trade, and Merchandise Trade Outflows from BRICS. The study considers FDI inflows, outflows, and foreign exchange reserves as proxies for BRICS institutional arrangements. A multiple regression analysis is performed to assess the impact of institutional arrangements on trade and it developed three models based on the hypothesis. The regression result revealed that all the three models are fit and statistically significant, meaning that institutional arrangements can explain the changes in the BRICS trade. With respect to individual coefficients, the sign of FDI inflow, outflow, and FER are as expected, however, they are statistically not significant. In the second test, as against the expectation, FDI inflows had a negative sign and outflows had a positive sign, which reveals an opposite relationship. Although, the values are statistically not significant. In the third model, the signs of the coefficients are as expected, however, only the coefficient of the Foreign Exchange Reserve is statistically significant. To overall conclude that the BRICS FDI inflows have positively influenced inter service and intra merchandise trade volumes. In the case of BRICS, foreign exchange reserve influenced them for inter merchandise trade volume. The above institutional arrangements on FDI inflows, Foreign exchange reserves made impacts in trade creations in BRICS group. This would be exhibiting factors of trade creation on global value chains along with total trade volume 10.4 Trillion USD in 2021 compare with previous year data of 8.44 Trillion USD volume. There are 1.95 Trillion USD trade volume difference between 2020 and 2021. The above trade creation also good for global value chains and global supply chains in the era of pandemic. The BRICS contributed total volume of merchandise trade on 7.93 Trillion USD out of 43.38 Trillion USD world merchandise trade volume in 2021 along with 18.28 % share of global merchandise trade volume. The BRICS also contributed total service trade on 1.37 Trillion USD out of 10 Trillion USD world service trade volume in 2021 along with 13.7% share of global service trade volume.

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