

## A comparative analysis of export-led and domestic demand-led growth hypotheses in BRICS economies

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**Abstract.** *The elevation of economic growth and development of an economy has always been a prime concern for nations. In this context, exports and domestic demand are the two economic growth components that promote and accelerate economic growth. While exports are given more emphasis whereas domestic demand is underestimated. Moreover, the present study argues the superiority of domestic demand-led growth over export-led growth. As a novel contribution, the study compares export-led growth (ELG) and domestic demand-led growth (DDLG) hypotheses by employing a newly developed methodology for BRICS for the period 1991-2019. The data in the study is found to be heterogeneous and cross-sectionally dependent. Therefore, the study further employs Dumitrescu-Hurlin causality test, common correlated effects (CCE) mean group estimator which considers cross-sectional dependence and heterogeneity between the variables. Our findings support both hypotheses and also report that DDLG contributes more towards the economic growth of an economy than ELG. Based on the results, the study claims that ELG and DDLG are complementary to each other rather than competitive.*

**Keywords:** Export, Economic Growth, BRICS, Cross-section Dependence, CCE Mean Group Estimator.

**JEL Classification:** F1, O4, C1.

## 1. Introduction

Every economy has an objective to achieve more balanced growth in the economy. To pursue this objective, various economies follow several strategies depending on the country-specific characteristics. Export-led growth (ELG) is one such strategy among all. ELG strategy is one where a country opens itself to international trade to develop its economy. New growth theories also suggest that open economies grow faster than closed economies as it leads to the adoption of new technologies and more efficiency in production (Jalil and Rauf, 2021). While this strategy worked for many nations it comes with significant risks such as dependency on foreign demand, ignorance of domestic priorities, and wage suppression. Moreover, many economists hypothesized that after the East Asian crisis export-led growth strategy that was earlier followed by East Asian economies as an optimal growth strategy ultimately abandon and even harmed the prospects of growth in developing economies (Palley, 2002; Felipe and Lim, 2005; Sgro, 2009; Mohanty, 2012). Krueger (1980) also recommends that the biasness of foreign demand in trade strategies is not sustainable in the long term because these policies are associated with higher costs. ELG is not a sufficient strategy to revamp the performance of the external sector and tweak the domestic growth of any economy. Such a type of trade policy is highly elastic to exogenous shocks. Moreover, many empirical studies realised the need of an alternative strategy that can promote economic growth (Tang et al., 2015; Venkatraja, 2015; Abosedra and Tang, 2019; Odhiambo, 2021). Therefore, to achieve the goal of balanced growth many developing economies started shifting focus from export-led growth (ELG) to domestic demand-led growth (DDLG). A high growth path should be achieved only through a long-term development policy. Within this frame of reference, DDLG emphasizes that the economic fundamentals of the emerging economies are eroded by over-depending on foreign demand and foreign capital. Therefore, the focus of the policies should be more on private consumption to enhance the domestic manufacturing sector strategy (Mohanty, 2012; Venkatraja, 2015; Saglam and Egeli, 2017).

As per the macroeconomic accounting identity, there are numerous factors that affect the economic growth of an economy. Economic growth or GDP of an economy is composed of private consumption, government consumption, gross domestic investment, and net exports. Private consumption, government consumption, gross domestic investment or gross domestic capital formation (GDCF) are the components of domestic demand while net export (exports – imports) is the other component of GDP that is a foreign component. Therefore, any change in these components will bring a change in economic growth (Felipe and Lim, 2005; Mishra and Nancharaiyah, 2016; Saglam and Egeli, 2018). Thus, four possibilities may arise: First when domestic demand is increasing and net exports are decreasing, if the resulting GDP growth is positive then this will be the result of rising domestic demand and this refers to domestic demand-led growth. Second, when domestic demand is falling and net exports are rising, if the growth is positive then growth must be net export-led. Third when domestic demand and net exports are deteriorating then the resulting negative growth would be the result of both domestic demand and net exports. Fourth and last when domestic demand and net exports are rising then this growth is due to both domestic demand and net exports. The share of which component is more in accelerating economic growth is not known and is part of empirical analysis.

The present study is different from the previous studies and contributes to the existing literature in a way as first there are plenty of studies (see section 3) which explore the export-led growth policy but the author realized that there are limited studies on domestic demand-led growth strategy. Second, a comparison between ELG and DDLG has been done for many countries but the study for BRICS nations is left untouched. Third, the present study is using a newly developed methodology for panel data. Therefore, this study aims to explore and compare the export-led growth and demand-led growth strategy using panel data for BRICS during 1991-2019.

Hence, keeping in view the above background and the importance of such hypotheses, this study proposes to address the following research objectives:

- First, to examine the existence of a long-run relationship between net exports, domestic demand and economic growth in BRICS for 1991-2019.
- Second, to assess the direction of causality between the variables.
- Third, to assess to what extent net exports and domestic demand impact the economic growth in BRICS.

The rest of the article is organized as follows. The second section presents the institutional background of the BRICS organization. Section third extensively reviews the literature on the topic. The fourth section describes the data and its sources. Empirical analysis and results are reported in the fifth section, and the sixth section presents the conclusion of the study.

## 2. BRICS: Institutional background

The BRICS is an association of five emerging economies (Brazil, Russia, India, China and South Africa) that are critical players in international trade. Climbing economic integration has been observed worldwide over the past three decades. International trade is one of the factors that play an important role in a modern economy. Knowing the pros and cons of export-oriented growth policy is a matter of research for every economy. Over the last decades, most of them have experienced rapid growth in trade with China and India on top. Moreover, BRICS alliance is a vital institution having a large share in global growth. Despite the adverse effects of the global crisis of 2008 in the world, the average GDP per capita for the BRICS countries was higher than worldwide (Larionova, 2020). Table 1 reports the GNP per capita for the different groups of countries and for the World during the last three consecutive ten-year periods. The period 2008-2017 defines the repercussions of the global economic crisis of 2008. As it is clear from Table 1 that the world was growing at 1.4% at the earliest period (1988-1997) and the growth rate rose to 2.8% from 1998 to 2007. BRICS was leading the board, averaging 6.7% during this period which was only 2.1% in 1988-1997. This highlights the BRICS standing out and emerging as a major global economic alliance.

Afterward, the global economy was suddenly hit by the financial crisis of 2008. This had adversely affected worldwide and the effects are persisted till now. Growth rates were slowed down and the economy stagnated. But BRICS was one of the few institutions which were least affected and are the major engine of economic growth. Their joint growth rate

has been 5.4% with the most noteworthy countries China and India. Further, economists predicted that the growth rate of BRICS which is higher than the global growth rate will lead to a further rise in share in the global trade and it will surpass the USA and European countries combined by 2030 (Larionova, 2020; Rani and Kumar, 2018).

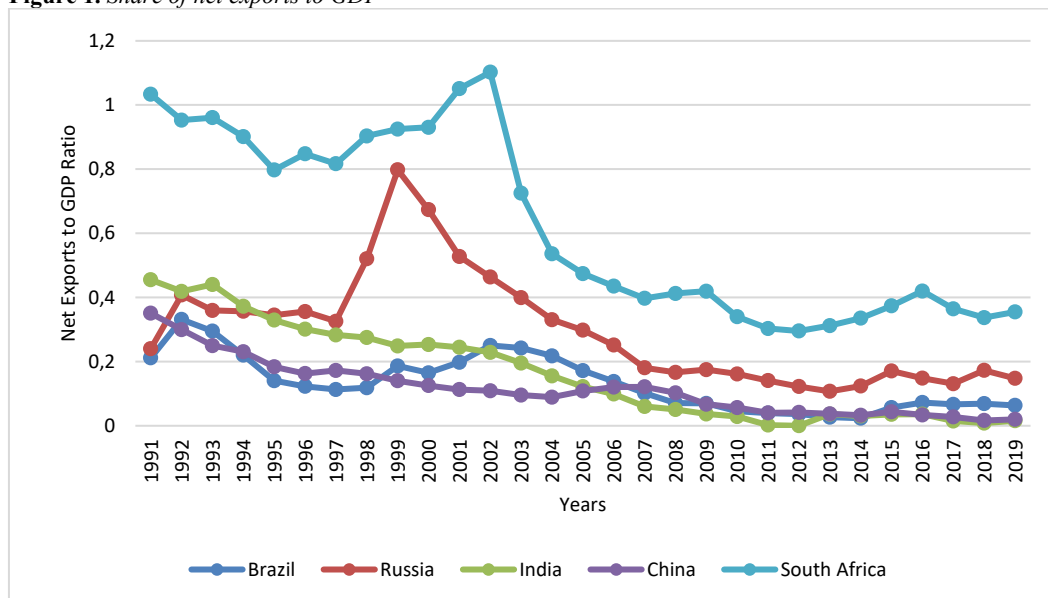
**Table 1.** Annual growth rates of GNP per capita (%) (2005 \$PPP)

	1988-1997	1998-2007	2008-2017
World	1.4	2.8	1.7
USA	2.0	2.0	0.7
Europe	1.8	2.3	0.6
Other Developed countries	2.5	1.8	0.8
BRICS	2.1	6.7	5.4
Other emerging countries	1.5	3.2	1.1
Developing countries	0.3	2.5	2.7

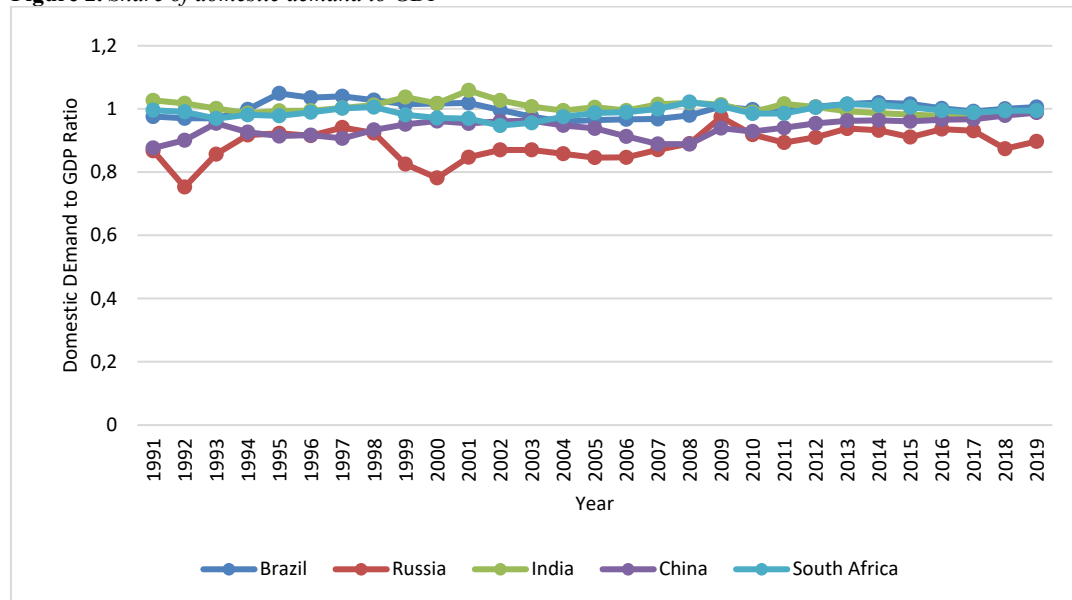
Source: CAM World Databank (WD).

Many factors lead to the higher growth of the BRICS organization as a whole such as exports, and domestic demand. Figure 1 and 2 compares the share of net exports and domestic demand to the growth of BRICS during 1991-2019. It is clear from the figures that share of domestic demand is higher for BRICS as a whole since it ranges between 0.75 to 1.05 whereas the share of net exports is lower for all BRICS countries except South Africa which was 1.10 in 2002. However, the trend of share of net exports to GDP is dropping whereas the trend of domestic demand to GDP remains almost constant throughout all five countries. Conclusively, both domestic demand and net exports play a vital role in the economic growth of BRICS countries. This study explores the nexus between these three using cointegration analysis. Moreover, it is further complemented by CCE mean group estimator to know the share of both domestic demand and net exports in the growth of BRICS.

**Figure 1.** Share of net exports to GDP



Source: Authors' own computation using WDI, World Bank database.

**Figure 2.** *Share of domestic demand to GDP*

**Source:** Authors' own computation using WDI, World Bank database.

### 3. Literature review

Exports and domestic demand are the two components that boost the economic growth of an economy. Most countries gave importance to the exports but after the East Asian crisis, the focus shifted from foreign demand to domestic demand. In the literature also exports have been given more importance. There are numerous studies that study the export growth nexus or export-led growth hypothesis. The empirical results vary depending on the country-specific characteristics, data and methodology used. Based on their results, there are two groups of studies: The first found a positive association and the second group of studies found a negative association between exports and growth. Most of the studies found a positive relationship between export and growth and conclude that exports promote growth (Parida and Sahoo, 2007; Amiri and Gerdtham, 2011; Hye, 2012; Korhan et al., 2015; Al-Assaf and Al-Abdulrazag, 2015; Ee, 2016; Raghutla and Chittedi, 2020). However, some recent studies based on time series analysis raised some doubts and fail to support the positive long-run relationship between exports and economic growth using cointegration analysis (Cuadros et al., 2004; Bajo-Rubio and Diaz-Roldan, 2012). Therefore, it is necessary to find other complementary means by which economic growth drives. Domestic demand is one such component. Here we briefly provide a critical appraisal of existing studies comparing ELG and DDLG hypotheses.

Medina-Smith (2001) analyzed the ELG hypothesis for the period 1950-1997 in case of Costa-Rica. The results find a positive relationship between exports and economic growth but their impact is relatively small. The study suggests that the ELG is beneficial only for limited developing countries and only to a certain extent.

Yew Wah (2004) examined the role of domestic demand in economic growth in Malaysia using cointegration analysis. He found that both ELG and DDLG hypothesis is valid in the short run but in the long run results did not support the ELG hypothesis. Despite there being a positive effect of domestic demand on economic growth which implies that domestic demand is important for Malaysian Growth.

Tsen (2007) examines the relationship between exports, domestic demand and economic growth in the Middle East countries using the granger causality test and Geweke decomposition of causality. He found that consumption is more important than investment in contributing to economic growth. The result of the study suggested that both exports and domestic demand should be promoted for sustainable economic growth. Venkatraja (2015) estimated the relative influence of domestic demand and export demand on economic growth in China and India by using the linear regression model. The results show that China's economic growth is driven by export demand and further analysis indicates that such growth is not sustainable whereas India's growth is driven by domestic demand and is sustainable.

Tang, Lai and Ozturk (2015) and Abodesra and Tang (2019) both empirically investigated the export-led growth hypothesis for Asia's four little dragons and five countries in MENA region respectively. Both the studies find the long-run positive relationship between exports and economic growth but they are not in the favor of ELG hypothesis as it is not stable over time. They suggest that policymakers should opt for other alternatives instead of export to accelerate the growth of the economies. Abodesra and Tang (2019) analyzed the period from 1980-2012 using the time-varying TYDL Granger causality test. Additionally, it also suggests that government should target domestic and foreign investment in key sectors to improve the macroeconomic fundamentals. While Tang, Lai and Ozturk (2015) employed cointegration and rolling causality test on both bivariate and trivariate models.

Saglam and Egeli (2017) employed the dynamic panel data analysis to compare the export-led growth and domestic demand-led growth hypothesis in East Asian countries during 1983-2015. The findings of the causality test show that there is two-way causality between net exports, domestic demand and economic growth. The dominance of a hypothesis depends on the country as DDLG is dominant in South Korea and ELG is dominant in Hongkong. It is recommended that a good combination of both ELG and DDLG is necessary for persistent economic growth. Saglam and Egeli (2018) comparatively analyzed the export-led and domestic demand-led growth hypothesis for European transition economies over the period 1990-2015 using dynamic panel data techniques. The results of the analysis found that DDLG is accepted and the contribution of domestic demand to economic growth is seven times more than the net exports. Odhiambo (2021) employed panel cointegration and the Granger causality test to examine the link between export and economic growth in sub-Saharan African countries for 1980-2017. The study found the existence of a long-run association between the variables but the study suggests that the strategy has limited scope and is not desirable for low-income and middle-income countries.

Further, the paper figures out some studies which are done for the BRICS alliance. Mishra and Nancharaiyah (2016) examined the role of domestic demand and external demand in BRICS countries for the period 1991-2012. Though domestic demand plays an important role in enhancing growth, external demand cannot be neglected. Both the policies should be complementary rather than competitive to accelerate the pace of development. Rani and Kumar (2018) and Raghutla and Chittedi (2020) examined the association between export, import and economic growth in the case of BRICS countries. Raghutla and Chittedi (2020) applied the Johansen cointegration test and Granger causality test for 1979-2018. Whereas, Rani and Kumar (2018) employed FMOLS, dynamic OLS and VECM using panel data from 1967-2014. Both the studies find a positive association between export, import and growth and support the ELG hypothesis. Mishra (2020) examined the role of external and domestic demand in the growth of BRICS countries using vector autoregression analysis. The results are mixed depending on the individual countries of BRICS.

From the above empirical literature, it is observed that if the export-led growth hypothesis is complemented by an alternative strategy it can boost economic growth. There are plenty of studies that explore the export-led growth policy for various countries but a lacuna of studies on domestic demand-led growth strategy for BRICS nations. Additionally, the present study is using a newly developed methodology for panel data. Therefore, this study aims to explore and compare the export-led growth and demand-led growth strategy using panel data for BRICS during 1991-2019.

#### 4. Methodology and data

This section deals with the discussion of the methodology and data used in the study. The empirical estimation done in the study passes through five steps. First, the study tests the characteristics of the data such as homogeneity and cross-section dependence. Towards this, the study employs the Delta test for homogeneity and Pesaran's test for cross-section dependence. Second, based on the data characteristics Pesaran's panel unit root test is applied to test the stationarity of data. Third, to test the long-run relationship (cointegration) between variables Westerlund cointegration test is used. Fourth, Dumitrescu-Hurlin causality test is employed to examine the direction of causality between variables. Fifth, common correlated effect (CCE) mean group estimator is employed which accounts for heterogeneity and cross-section dependence among variables to estimate the coefficients of the explanatory variables.

Moreover, the paper employs panel data for BRICS (Brazil, Russia, India, China and South Africa) for the period 1991-2019. As we know from the theory that economic growth is a function of domestic demand and net exports. It can be expressed as:

$$Y = f(DD, NE) \quad (1)$$

The econometric form of the regressors and dependent variable can be written in the following form:

$$Y_{ti} = \alpha + \beta_1 DD_{ti} + \beta_2 NE_{ti} + \mu_{ti} \quad (2)$$

The present study uses the following model specification:

$$LY_{ti} = \alpha + \beta_1 LDD_{ti} + \beta_2 LNE_{ti} + \mu_{ti} \quad (3)$$

Y is the GDP at the current US\$ which is used as a proxy for economic growth, DD is domestic demand which is the summation of consumption expenditure, investment expenditure and government expenditure. The study used the aggregation of household final consumption expenditure, general government final consumption expenditure and gross fixed capital formation at the current US\$. NE is net exports that are equal to the subtraction of exports of goods and services and imports of goods and services at current US\$. The prefix ‘L’ before each variable in equation 3 represents the natural logarithmic transformation of the variables. The secondary data for the above variables have been collected from WDI, World Bank for BRICS (Brazil, Russia, India, China and South Africa) countries for the period 1991-2019.

## 5. Empirical analysis

In this section, we represent the empirical analysis and its results using STATA software. First of all, the paper tested for the homogeneity of the data using the delta test given by Pesaran and Yamagata (2008). This test is the standardized version of Swamy’s test of slope homogeneity for panel data models that is suitable for large samples. The test is generally denoted by delta ( $\Delta$ ) (Pesaran and Yamagata 2008).

The Null hypothesis of the test claims that the slope coefficients are homogeneous. The results of the test are shown in Table 2. Here p-value is smaller than 0.05 therefore we reject the null hypothesis. This implies that slope coefficients are heterogeneous.

**Table 2.** Slope homogeneity test

Delta	Statistics	p-value
$\Delta$ performing	10.596	0.000
$\Delta$ adj.	23.693	0.000

**Source:** Author’s own computation using Stata15.

Cross-section dependence is one of the most important diagnostics that a researcher should investigate before a panel data analysis. Traditional tests unrealistically assume cross-section independence which leads to inadequate results. In real life, cross-section dependence can arise due to spatial or spillover, or unobservable effects (Baltagi and Pesaran, 2007). Therefore, the present paper uses Pesaran’s CD test which is developed by Pesaran in 2004.

The null hypothesis claims that there is no cross-section dependence. According to Table 3, we reject the null hypothesis and there is cross-section dependence in the data.



**Table 3.** Pesaran’s test of cross-section dependence

CD test	Test Statistics	p-value
Pesaran (2004)	4.582	0.0000

**Source:** Author’s own computation using Stata15.

Pesaran (2007) panel unit root test is a second-generation panel unit root test and takes into account both the heterogeneity and cross-sectional dependency. The Pesaran (2007) test states that all series are non-stationary under the null hypothesis while the series is stationary under the alternative hypothesis. Table 4 shows the findings of the test and indicates that the null hypothesis can be rejected for all variables at 0.05 significance level. Thus, the variable LNE is stationary at trend and LDD and LY are stationary at both constant and trend.

**Table 4.** Pesaran (2007) panel unit root test

Variable	t-bar	z(t-bar)	p-value	Result
LNE	-2.314	-1.276	0.101	Non-stationary
ΔLNE	-3.020	-1.707	0.044	Stationary
LDD	-2.687	-2.136	0.016	Stationary
ΔLDD	-3.334	-2.462	0.007	Stationary
LY	-3.007	-2.874	0.002	Stationary
ΔLY	-3.614	-3.135	0.001	stationary

**Source:** Author’s own computation using Stata15.

Table 5 illustrates the cointegration test using Westerlund's (2007) cointegration test. This test assumes that all variables are stationary at first difference. The null hypothesis claims no cointegration between variables against the alternative that some panels are cointegrated.

The p-value of 0.0517 shows that we reject the null hypothesis at 5% level of significance and states that there is cointegration between variables.

**Table 5.** Westerlund cointegration test

	Statistics	P-value
Variance Ratio	-1.6284	0.0517

**Source:** Author’s own computation using Stata15.

Dumitrescu and Hurlin (2012) introduced a test to detect granger causality in panel dataset. The test estimates three statistics that are  $\bar{W}$ ,  $\bar{Z}$  and  $\tilde{Z}$ . The null and alternative hypotheses are described as follows:

$$H_0: \beta_{i1} = \dots = \beta_{iK} = 0 \quad \forall i = 1, \dots, N \tag{1}$$

$$H_1: \beta_{i1} = \dots = \beta_{iK} = 0 \quad \forall i = 1, \dots, N1$$

$$\beta_{i1} \neq 0 \text{ or } \dots \text{ or } \beta_{iK} \neq 0 \quad \forall i = N1 + 1, \dots, N$$

Null hypothesis implies the absence of causality for some individuals in the panel. Table 6 illustrates the result of the DH test for net exports and GDP.

The p-value rejects the null hypothesis and states that there is a two-way causal relationship between net exports and GDP relationship during 1991-2019 for BRICS countries.

**Table 6.** *Dumitrescu-Hurlin causality test*

Null Hypothesis		Statistics	P-value
LNE does not granger cause LY.	W bar	3.5326	
	Z bar	4.0044	0.0001
	Z bar tilde	3.3278	0.0009
LY does not granger cause LNE.	W bar	2.4223	
	Z bar	2.2489	0.0245
	Z bar tilde	1.8170	0.0692

**Source:** Author's own computation using Stata15.

On the other hand, Table 7 shows the findings of the DH test for domestic demand and GDP. The results show that domestic demand and GDP have a two-way causal relationship during 1991-2019 for BRICS countries.

**Table 7.** *Dumitrescu-Hurlin causality test*

Null Hypothesis		Statistics	P-value
LDD does not granger cause LY.	W bar	2.8539	
	Z bar	2.9313	0.0034
	Z bar tilde	2.4043	0.0162
LY does not granger cause LDD.	W bar	4.8746	
	Z bar	6.1263	0.0000
	Z bar tilde	5.1538	0.0000

**Source:** Author's own computation using Stata15.

The DH test only determines the causality between variables. However, it is not known which variables are contributing more to economic growth in the long term. Therefore, the value of coefficients should be estimated. Common Correlated Effects (CCE) model has been developed by Pesaran (2006). Many unobserved common factors are present in the panel dataset because of the large no. of observations. CCE approach estimates both mean group and pooled estimators depending on the assumption of slope homogeneity. CCE mean group estimator is more suitable in the case of data heterogeneity. The CCE mean group estimator is a simple average of the estimators of the individual slope coefficients (Pesaran, 2006). The study estimated the CCE mean group estimator model since the data in our study is heterogeneous. Table 8 represents the results of CCE mean group estimates. It is seen that there is a positive association between economic growth, net exports and domestic demand. It is also seen that all the coefficients are individually statistically highly significant as their p-values are very low.

**Table 8.** *CCE mean group estimates*

LY	Coefficient	Standard Error	P-value
LNE	0.1351	0.5159	0.009
LDD	0.9716	0.0211	0.000

**Source:** Author's own computation using Stata15.

The value of coefficients suggests that when the net exports increase by 1 percent, on average, the GDP or economic growth will increase by 0.13 percent holding the domestic demand constant. Similarly, if domestic demand increases by 1 percent, on average, the GDP goes up by 0.97 percent holding the net exports constant. This implies that a percentage increase in domestic demand contributes more toward economic growth than the percentage increase in net exports. The results of the present study are in line with Yew Wah (2004), Felipe and Lim (2005), Mishra and Nancharaiyah (2016), Saglam and Egeli (2018), and Mishra (2020).

## 6. Conclusion

The study primarily compares the export-led growth hypothesis and domestic demand-led growth hypothesis for BRICS (Brazil, Russia, India, China and South Africa) alliance during 1991-2019. The preliminary analysis shows that variables are heterogeneous and cross-sectionally dependent. Therefore, further tests are chosen while considering the above characteristics of the variables. The results of the Pesaran unit root test and Westerlund cointegration test indicate that net exports, domestic demand and economic growth are stationary at trend and have long-run relationships among the variables. On the basis of the Dumitrescu-Hurlin causality test, there is two-way causality between net exports – economic growth and domestic demand – economic growth. Further, the study employs CCE mean group estimates for the panel data from 1991-2018. The findings of the study show that there is a significant positive relationship between net exports – economic growth and domestic demand – economic growth. This implies that both the hypotheses (ELG and DDLG) are accepted in the BRICS organization for 1991-2019. Moreover, a comparison between ELG and DDLG indicates that a percentage increase in domestic demand contributes more toward economic growth than the percentage increase in net exports.

The findings of the paper are straightforward and useful for policymakers. They provide a clear message to policymakers that domestic demand should be given first importance rather than foreign demand. In spite of this BRICS should not totally discard the export-led growth strategy. To sum up, the policy mix of both the strategies would be more meaningful in accelerating the growth of an economy and that growth would be stable and sustainable. Further, a country should be careful in choosing the appropriate strategy for its economy as the effect of exports and domestic demand on economic growth varies with the country's stage of development. Odhiambo (2021) suggests that low-income countries should pursue a domestic demand-led growth strategy to expand the real sector of the economy and middle-income countries should pursue a mix of both export-led and domestic demand-led growth strategies. One can extend the work by including disaggregated analysis. By this, we mean that one can include the various components of domestic demand and analyze them individually. Moreover, the long-term coefficient for each cross-section unit of BRICS can also be individually estimated.

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