

Assessing the nexus between market openness and economic growth: an emerging market perspective

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Abstract. *The countries with greater economic freedom are believed to have higher economic progress. Over the last two decades, researchers have focused on the impact of institutional quality on economic development of a country but not much insights are drawn about the individual components of economic freedom. The present study addresses this gap by assessing the impact of market openness on economic growth of the emerging economies, the BRICS bloc for the period 1995-2019 using Feasible Generalized Least Squares method. Our panel data analysis revealed a new evidence suggesting a negative impact of the sub-components of market openness on economic growth.*

Keywords: economic freedom, market openness, gross domestic product, panel data, BRICS.

JEL Classification: J43, C33.

Introduction

Assessing the impact of institutional quality of a country on its economic development has emerged as a significant area of research over the past two decades. Economists across the globe have a consensus that economic freedom is a significant factor that determines a country's institutional quality. The cross-country differences in the economic growth can be well understood by the difference in the levels of economic freedom achieved by the countries. The measurement of economic freedom has been a problem for a long period of time because of the absence of a formal definition of economic freedom and lack of data. However, the two institutions namely Fraser Institute and Heritage Foundation have solved this problem in the last two decades by providing the data for the economic freedom variable in a comprehensive manner. A good number of research studies along with several others have focused on the overall index of economic freedom and growth which failed to provide deeper insights on the relationship between the two variables as economic freedom constitutes the different sub-components viz., market openness, regulatory efficiency, rule of law and government size. The present study focuses on one important component of economic freedom, that is, market openness which constitutes trade freedom, investment freedom and financial freedom.

The research objective of the study aims at addressing the important question of whether a liberalized trade and investment regime coupled with a well-developed financial system exerts a significant effect on growth in the emerging market economies. BRICS economies, considered to be the representative developing countries, make an interesting case for this study as these countries have made tremendous efforts towards liberalization in trade and investment related aspects. The study found a significant negative impact of market openness on the economic growth of BRICS countries. The findings from the study serve as a caution to policymakers not to strive towards higher level of economic freedom without ascertaining the impact of the sub-components of economic freedom on growth.

Review of literature

Over the past two decades, economic freedom gained prominence in the economic growth literature due to its perceived role in a country's economic development. Researchers have tried to address the question whether economic freedom contributes to the economic growth of a country or not. A country progresses economically when it has different sorts of freedom like freedom in choice of resources, protection of property rights, engaging freely in trade among others (North & Thomas, 1973). In this section, the literature focused on the economic freedom-growth nexus has been reviewed thoroughly. The relevant key words have been used to source research papers suitable to the purpose of our study using several databases like Science Direct, Taylor and Francis, Emerald, Sage Publishers and Google Scholar.

As stated earlier, the studies assessing the relationship between economic freedom and growth have largely used the overall index for measuring economic freedom. A good

number of researchers have found a strong economic freedom-growth nexus using various samples of developing and developed countries (Spindler & Miyake, 1992: pp. 230-254; de Vanssay & Spindler, 1994: pp. 359-372; Dawson, 1998: pp. 603-619). Economic freedom was found to be a key driver of growth (de Haan, Lundstrom & Sturm, 2006: pp. 157-191; Berggren & Kurrild-Klitgaard, 2004; Berggren, 2003, pp. 3-41). The extensive review of literature conducted by (de Haan *et al.*, 2006: pp. 157-191) on the relationship between economic freedom and growth revealed a significant positive impact of freedom on growth. Some studies have tried to assess whether economic freedom exerts a direct impact on growth or indirectly through some channels. (Paakkonen, 2010: pp. 469-479) argued that economic freedom does not affect growth directly but indirectly through investment. However, (Gwartney, Holcombe and Lawson, 2004: pp. 205-233) found that economic freedom affects growth both directly as well indirectly. They held that countries having relatively higher freedom attain more investments and thus greater productivity gains from such investments. (Dawson, 1998: pp. 603-619) and (Gwartney, Holcombe and Lawson, 2004: pp. 205-233) confirmed the same in their empirical studies. The focus of research in this domain has also extended to address the question of whether the level of economic freedom or change in economic freedom exerts an impact on growth. Given such focus, (Dawson, 2003: pp. 479-495) observed a unidirectional causality running from level of economic freedom to growth, however, the bidirectional causality was found between change in economic freedom and growth. In addition to this, several other studies argued that the relationship between change in economic freedom and growth is stronger compared to the one between level of economic freedom and growth (Sturm & de Haan, 2001: pp. 839-844; de Haan *et al.*, 2006: pp. 157-191; Ashby & Sobel, 2008: pp. 329-346).

Since the greater portion of growth literature in this direction is focused mainly on the impact of an overall index of freedom on growth, much deeper insights have not been gained on the subject. The study conducted by (Carlsson and Lundstrom, 2002: pp. 335-344) revealed that economic freedom-growth nexus is largely contingent upon the sub-components of economic freedom. While assessing the freedom-growth nexus, (Justesen, 2008: pp. 642-660) argued that some components of freedom like size of government and regulatory policy framework exert a strong positive influence on economic growth whereas the other components do not have a significant impact on growth. More emphasis was thus laid on analyzing the relationship between the sub-components of economic freedom and growth. It has been found by several researchers that some components of economic freedom have a greater impact on growth compared to others (Heckelman & Stroup, 2000: pp. 527-544; Heckelman, 2000: pp. 71-91; Berggren & Jordahl, 2006: pp. 141-169; Ayal & Karras, 1998: pp. 327-328). Therefore, it becomes imperative to assess the influence on individual components of economic freedom on the economic growth to gain a deeper understanding in this regard. Against this backdrop, we aim at assessing the impact of market openness (a component of economic freedom) on growth in this study. We find it interesting to study the relationship between market openness and growth in the fastest emerging market economies, that is, the BRICS countries which have made good progress towards openness of their markets in terms of trade and investment related aspects.

Materials and methods

The present study uses secondary data over the period 1995-2019. The data for Gross Domestic Product growth (proxy for economic growth) has been taken from the World Investment Reports given by World Bank and UNCTAD. The data for market openness variable has been taken from the Heritage Foundation. Heritage foundation releases data annually for all the sub-components of economic freedom variable. In this study, we aim at examining the impact of the 3 components of market openness viz., trade freedom, investment freedom, financial freedom on growth of BRICS countries. The dependent variable (DV) is GDP growth and independent variables for the study are trade freedom, investment freedom and financial freedom. Since the data is panel in nature, we use panel data methods for analyzing our data. The equation that specifies our model is as follows:

$$\text{GDPG}_{i,t} = \beta_{1i} + \beta_2 \text{TF}_{i,t} + \beta_3 \text{IF}_{i,t} + \beta_4 \text{FF}_{i,t} + u_{i,t}$$

where:

GDPG = gross domestic product growth;

TF = trade freedom;

IF = investment freedom;

FF = financial freedom and $u_{i,t}$ is the error term.

First and foremost, we begin our econometric analysis by conducting the unit root test so as to ascertain if our variables are stationary or not. The unit root test (LLC) suitable for panel data analysis proposed by Levin, Lin & Chu (2002) has been used in this study. It tests the hypothesis of whether panels contain a unit root or not. After the unit root test is conducted, the data is subjected to panel data regression analysis. The main models used for panel data analysis are Pooled Ordinary Least Squares (POLS) regression, Least Squares Dummy Variable model (LSDV), Fixed Effects (FE) and Random Effects (RE) models. The simplest of all the models used for panel data analysis is Pooled Ordinary Least Squares (POLS) regression assuming no cross-sectional differences (Asteriou and Hall, 2007). LSDV model assumes slope to be constant and intercept to vary. Fixed effects (FE) model allows data transformation within the groups (Brooks, 2008). In this model, the dependent and explanatory variables are shown as deviations from mean (Gujarati and Porter, 2009). Random effects model assumes an intercept arising from a common intercept, β_i and a random variable, ε_i which remains constant over time but varies across cross-sections (Brooks, 2008). We use model selection criteria to evaluate the different panel data models. F-test is used to evaluate pooled ordinary least squares regression against LSDV model and Breusch-Pagan Lagrange Multiplier (LM) is used to evaluate random effects model against pooled ordinary least squares regression model (Breusch and Pagan, 1980: pp. 239-253). Hausman test is applied to evaluate fixed effects model against random effects model (Hausman, 1978: pp. 1251-1271).

Finally, the assumptions of classic linear regression model like serial correlation, cross-sectional dependence and heteroscedasticity are checked using appropriate diagnostic tests before the final model is used to achieve the research objective.

Results

1.1. Summary Statistics

Descriptive/summary statistics is conducted to check the behavior of data. The two descriptive measures that we used in our panel data study are mean and standard deviation. The mean of dependent variable, that is, GDP growth is 4.65 and the standard deviation of the same is 3.83 (Table 1). The mean of independent variables namely trade freedom, financial freedom and investment freedom is 59.39, 42.64 and 43.68 and the standard deviation is 17.4 for trade freedom (TF), 13.1 for investment freedom (IF) and 12.3 for financial freedom (FF).

Table 1. *Descriptive Statistics*

Variables	N	Mean	Std. Deviation
DV			
GDPG	125	4.65	3.83
IV			
Trade Freedom	125	59.39	17.41
Investment Freedom	125	43.68	13.12
Financial Freedom	125	42.64	12.32

1.2. Correlation Analysis

The results of correlation analysis reveal that there exists a significant negative correlation between the components of market freedom, viz trade freedom, financial freedom and investment freedom and GDP growth, which contrasts with some earlier studies (Barro, 1991: pp. 407-443; de Vanssay & Spindler, 1994: pp. 359-372) as shown in Table 2.

Table 2. *Correlation between DV and IV*

Variables	GDPG	Trade Freedom (TF)	Investment Freedom (IF)	Financial Freedom (FF)
GDPG	1.000			
TF	-0.278 (0.0017)	1.000		
IF	-0.349 (0.0001)	-0.2063 (0.0210)	1.000	
FF	-0.4833 (0.000)	0.2052 (0.000)	0.6351 (0.0217)	1.000

1.3. Stationarity (LLC unit root) test

Using Levin-Lin-Chu unit root test to check the presence of unit root in our panel data series, we found that that both dependent and explanatory variables are stationary at level and do not have a unit root (Table 3).

Table 3. *LLC Unit Root test*

Variables	LLC Unit Root Test		
	Stationary At	T-Stat	P-Value
GDPG	Level	-2.226	0.0130
Trade Freedom	Level	-3.55	0.0002
Financial Freedom	Level	-1.77	0.038
Investment Freedom	Level	-2.871	0.0020

1.4. Panel Data Analysis

1.4.1. Panel Data Regression Models

The four panel data models discussed in methodology section compared against each other using model selection criteria. We run all these models but after selection of final panel data model only can we interpret the results.

Table 4. Results of Panel Data Analysis

	Pooled OLS	Fixed Effects LSDV	Fixed Effects (within)	Random Effects
VARIABLES	GDPgrowth	GDPgrowth	GDPgrowth	GDPgrowth
TF	-0.0582 (0.0376)	-0.0190 (0.0211)	-0.0190 (0.0211)	-0.0220 (0.0206)
IF	-0.0643 (0.0502)	-0.00625 (0.0333)	-0.00625 (0.0333)	-0.0108 (0.0326)
FF	-0.0901*** (0.0171)	-0.0586* (0.0313)	-0.0586* (0.0313)	-0.0613** (0.0308)
2.id		5.440*** (1.066)		
3.id		2.858** (1.097)		
4.id		-0.427 (0.906)		
5.id		0.711 (0.826)		
Constant	14.76** (3.977)	6.837** (2.843)	8.554*** (2.479)	9.048*** (2.871)
Observations	125	125	125	125
R-squared	0.290	0.515	0.039	
Number of id			5	5

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Evaluation of panel data models

F-test (Table 5) has been used to see if fixed effects model is appropriate or Pooled OLS model, the results suggest fixed effects model to be more suitable in comparison to OLS regression model and the results of Breusch Pagan LM test (Table 5) found random effects model to be more appropriate than the pooled OLS regression model. Finally, we conduct the Hausman test to see if fixed effects model is better than random effects model or not and results (Table 6) found that Random effects (RE) model is better.

Table 5. F-test and LM Test

Models	Tests	Model: GDPG (DV) TF, FF, IF (IV)	Decision
Fixed versus OLS	F-test P-value	13.6* 0.000	Rejection of null hypothesis (Ho)
Random versus OLS	LM test P-value	93.52* 0.000	Rejection of null hypothesis (Ho)

* Significant at 1%

Table 6. Hausman Test

	Coefficient
Chi-sq. value	0.54
P-value	0.909

1.5. Diagnostic tests

Before interpretation of results from RE model, it is important to check the model for assumptions of classic linear regression.

Wooldridge autocorrelation test is conducted to check if the model is free from the problem of serial correlation. The results from Table 7 reveal that the hypothesis of no serial correlation is rejected which means that the model suffers from the problem of serial correlation.

Table 7. Wooldridge Autocorrelation test

H ₀ : there exists no autocorrelation	
F(1, 4)	37.92*
Probability > F	0.0035

*Significant at 1%

It is important that the residuals should not be correlated with each other. In this regard, Pesaran's cross sectional dependence test the results of which reveal that the model suffers from the problem of cross sectional dependence (Table 8).

Table 8. Pesaran's CD (Cross Sectional Dependence) Test

H ₀ : Residuals are not correlated cross sectionally	
Pesaran's Statistics	4.55*
P-value	0.000

*Significant at 1%

Wald's group-wise heteroscedasticity test indicates that our model suffers from the issue of heteroscedasticity as shown in Table 9.

Table 9. Wald's Group-Wise Heteroscedasticity

H ₀ : $\sigma^2(i) = \sigma^2$ for all i	
Chi-square (5)	3577.56*
Prob. > chi-square	0.0000

*Significant at 1%

1.6. Feasible Generalized Least Squares Model

Since RE model was found to be the most appropriate for our panel data analysis, however, the model suffered from the problems of serial correlation, cross sectional dependence and heteroscedasticity. To avoid misleading results obtained from running such model, it is recommended to conduct cross sectional time series Feasible Generalized Least Squares (FGLS) model the results of which are shown in Table 10.

Table 10. Feasible Generalized Least Squares (FGLS) Regression

DV: GDPG	Coeff.
TF	-0.0582*** (0.0189)
IF	-0.0643** (0.0318)
FF	-0.0901*** (0.0339)
Constant	14.76*** (1.573)
Observations	125
Number of id	5

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Discussion

It has been found that the independent variables viz. trade freedom, investment freedom and financial freedom have a significant negative impact on the GDP growth of BRICS countries. GDP growth decreases by 0.058 units due to 1 unit increase in trade freedom. Economic growth declines by 0.064 units for 1 unit increase in investment freedom and for same 1 unit increase in financial freedom, growth decreases by 0.09 units. Some researchers have found a positive impact of economic freedom on growth (Barro, 1991, pp. 407-443; de Vanssay & Spindler, 1994, pp. 359-372). However, it is important to decompose the overall index of economic freedom for revealing its growth performance as some sub-components of freedom exert a positive growth impact while others have a negative impact on growth (Carlsson & Lundstrom, 2002, pp. 335-344), thereby emphasizing the significance of analyzing the impact of individual components of economic freedom on growth to derive valuable insights for policy making.

Conclusion

For understanding the relationship between economic freedom and growth in a comprehensive manner, it is important to examine the impact of components of economic freedom on growth. Given such focus, we assessed the relationship between market openness (an individual component of economic freedom) and growth in the BRICS bloc, the emerging market economies, for the period 1995 to 2019 using FGLS model. A new evidence was found in our paper that market openness comprised of trade, investment and financial freedoms exerts a significant negative impact on the economic growth of BRICS countries. This contradiction to previous studies conducted in this regard which reveal a positive relationship between overall economic freedom index and growth makes it clear to policymakers that they should not only strive towards higher level of economic freedom without examining the impact of its sub-components on economic growth. The upcoming research in this direction should be focused on studying the impact of other individual components of economic freedom on the growth of emerging economies.

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