

Role of Institutional Quality in Trade Openness and Economic Growth Nexus: Empirical Evidence from India

Suadat Hussain Wani¹ | *University of Kashmir, Srinagar, India*

Effat Yasmin² | *University of Kashmir, Srinagar, India*

Mohammed Ayub Soudager³ | *University of Kashmir, Srinagar, India*

Received 17.1.2023 (revision received 28.2.2023), Accepted (reviewed) 9.3.2023, Published 16.6.2023

Abstract

In changing context of the present-day world, trade openness has a crucial role to play in economic development of different countries. Besides other factors, institutional quality plays a vibrant role in achieving a high growth rate. The objective of the present study is to understand how institutional quality influences economic growth and trade openness in India. To achieve the objectives of the study, Autoregressive Distributed Lag bound testing approach has been used. The findings show that there exists long-run relationship between the variables used in this study. From the findings, it can be concluded that total trade has a negative impact, whereas export enhances economic growth in the country. The results also show that improvement in institutional quality has a positive impact on economic growth. Thus the findings suggest that the country needs to adopt policies that can improve the quality of institutions and can enhance the formation of physical and human capital.

Keywords

Institutional quality, economic growth, human capital, physical capital, trade openness, ARDL

DOI

<https://doi.org/10.54694/stat.2023.2>

JEL code

F00, C00, F43, O4

INTRODUCTION

In recent times, increased attention has been paid to examine the imprints of trade openness on the level of economic growth, particularly in case of emerging countries. This increased attention is due to the fact that the integration of different countries in world economy has increased over the last few decades.

¹ Department of Economics, University of Kashmir, Dargah Hazratbal, Srinagar, 190006, Jammu and Kashmir, India. E-mail: suadat.scholar@kashmiruniversity.net.

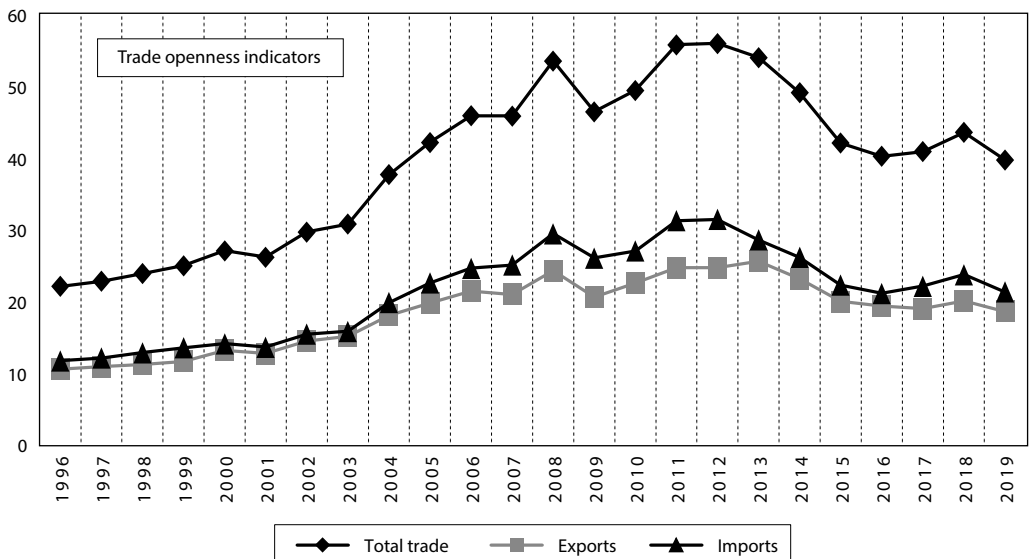
² Department of Economics, University of Kashmir, Dargah Hazratbal, Srinagar, 190006, Jammu and Kashmir, India. E-mail: fgulwani@gmail.com.

³ Department of Economics, University of Kashmir, Dargah Hazratbal, Srinagar, 190006, Jammu and Kashmir, India. E-mail: muhammadayub@kashmiruniversity.ac.in.

Further, given the changing economic scenario around the world, particularly since the 1990s, trade integration is considered a necessary condition for transaction from closed to open economy (see Zahonogo, 2016). A look at the theoretical aspect indicates that high degree of openness encourages the transmission of new technology and enables technological advancement and innovations, which augments productive knowledge and hence boost employment and real earnings (see Grossman and Helpman, 1991). This theoretical justification and partly disappointed performance of import substitution strategy have motivated many developing economies to switch to more liberalized trade regimes (see Udeagha and Ngepah, 2021; Akpan and Atan, 2016; Chatterji, Mohan and Dastidar, 2014). However, despite theoretical connection, the available empirical findings (see Rivera-Batiz and Romer 1991) point towards the group of the model, which contend that trade openness may either improve or retard international economic growth. If countries have divergent factor endowment, then (see Young, 1991; Kind, 2002) individual countries may face adverse impact even though economic integration increases global economic growth. Another strand of literature highlights negative link of economic growth with trade openness (see Akinlo and Okunlola, 2021; Sarkar, 2005; Rigobon and Rodrik, 2004; Batra, 1993; Leamer, 1995; Vamvakids, 2002; Kim, 2011).

This study is induced by the fact that India decided to open the domestic market to outside world in early 1990s to enhance the process of economic development. A look at the economic history of the country shows that there have been two major policy regimes that have contributed to its economic progress (see Aggarwal and Kumar, 2012). The state-led growth model was established Between 1950–80, state-led growth model was adopted in which the public sector was given a key role in the process of economic development. But starting in 1980, the nation began transition to a more liberal and open system. From the middle of the 1980s, this movement toward market-led growth intensified, and from 1991 onwards, more extensive and systemic liberalization measures were implemented (Chatterji, Mohan and Dastidar, 2014). The graph of the various trade openness indicators used in the current study is presented in Figure 1.

Figure 1 Evolution of trade in India



Note: X-axis represents time, and Y-axis represents the value of exports, imports, and total trade as percentage of GDP.
Source: Author's calculation based on data from WDI using EViews 10

Several empirical studies have highlighted poor institutional quality as one of the reasons for the negative impact of trade openness on economic growth. These findings indicate that trade openness accompanied by high institutional quality has a strong growth effect. In case of advanced countries, institutional quality tends to accelerate trade benefits (see Nguyen and Nguyen, 2018). Similarly, Hall and Jones (1999) contended that the difference in output per labor across nations is widely attributed to institutional quality. Few studies have emphasized the importance of institutions in fostering economic growth (see Subramanian and Trebbi, 2004; Matthew and Adegboye, 2014). To effectively coordinate efforts to achieve economic growth, good governance, including the rule of law, property rights, control of corruption, accountability, and regulatory quality is crucial. Given this background, the present study attempts to demonstrate what role institutional quality plays in the link between trade openness and economic growth in case of India. This is crucial as one finds a gap in the reviewed literature on economic growth in India. In the available literature, there has not yet been a thorough examination of the role that institutional quality plays in trade openness and economic growth.

The present study enriches the current literature in two significant ways. First, all three measures of trade openness, which include exports, imports, and total trade, are used. As highlighted in Figure 1, the magnitude of exports and imports is different, which may offer different options for policy formulation. Second, in case of India, the role of institutions in the link between openness and economic growth is missing in the available literature. The present study attempts to make significant contribution in this direction. To achieve objectives of the study, an extended Cobb-Douglas production function has been used. It applies Autoregressive Distributed Lag (ARDL) procedure which is relatively a new cointegration technique (see Pesaran et al., 2001). The structure of the present study is as follows: review of the literature is discussed in Section 1, followed by methodology in Section 2. Empirical results are elaborated in Section 3 and main findings and policy implications are discussed in final Conclusion.

1 REVIEW OF LITERATURE

1.1 Trade openness and economic growth

In recent times, the link between trade openness and economic growth has received enough attention. However, no common consensus has been reached on this link between the two.

Regarding studies on India, Barua and Chakraborty (2006) are of the view that trade openness has enhanced consumer surplus but has reduced industrial concentration and the surplus of producers. Similarly, Topalova and Khandelwal (2004, 2011) conclude that the productivity of firms improves with an increase in trade openness. In case of China and India, Marelli and Signorelli (2011) argue that there is positive link between trade openness and economic growth. Similarly, Mercan et al. (2013) argue that in case of Brazil, China, India, Russia and Turkey, trade openness augments economic growth and these countries need to formulate policies to enhance exports. Besides, Chatterji, Mohan, and Distidar (2014) are of the view that in increase in trade volume have enhanced economic growth in India over the years. However, (see Hye and Lau, 2015; Sengupta, 2020) have concluded that in the long run, there is a negative link between trade openness and economic growth in case of India.

Regarding other countries, Kind (2002) argue that there is ambiguous effect of trade openness on economic growth given the different size of domestic markets in different countries. Yanikkay (2003) argue that through several channels like transfer of technology, comparative advantage, and economies of scale, trade augments growth and development of different countries. However, the study concludes that under certain conditions, trade restrictions can promote economic growth particularly in developing countries. Besides, Ved and Sudesh (2007) have concluded that higher level of trade openness increases economic growth.

In comparison, Hye (2012) has concluded that in case of Pakistan, human and physical capital enhances economic growth. In the case of Australia, Singh (2011) is of the view that exports enhance economic

growth, whereas imports have a negative link with economic growth of the country. Similarly, Adhikary (2011) have concluded that trade openness has a negative link with economic growth. Xie et al. (2018) examined causal link between trade openness, financial development and economic growth in case of china. The study finds that financial development and trade openness promote economic growth. However, increase in economic growth leads to decline in trade openness.

1.2 Economic growth and institutional quality

In the available literature, trade openness has been widely acknowledged as the determinant of economic growth; however, another parallel strand of literature has documented non-economic factors, such as institutional quality, as an important determinant of economic growth. As Rodrik (1999) stated, economies with defective or weak institutions are less able to react appropriately to external shocks, such as openness shocks, which can lead to a long-term slowdown of economic growth. Institutional quality and its interaction with trade openness are considered significant in determining economic growth (see Stensnes, 2006; Akpan and Atan, 2016; Doan, 2019). According to empirical findings, institutions are critical for the success of economic reforms in developing countries. The failure of trade reforms to enhance international trade and growth in these countries is attributed to low institutional quality (see Addison and Bali moune-Lutz, 2006; Kraay, 2003). In another study, Rodrik, Subramanian and Trebbi (2002) concluded that Institutions are better predictors of economic growth than trade openness. In the absence of quality institutions, trade openness either retards or has a modest effect on economic growth.

1.3 Capital formation and economic growth

The availability of capital, natural resources, and common elements of production are not distributed equally among all economies in the world. The majority of the growth hypothesis has been based on this unevenness. Neoclassical synthesis states that high levels of capital formation result in higher productivity, which fosters economic growth (see Aslan and Altinoz, 2021). Hye and Lau (2015) argue that physical and human capital is mainly related to economic growth. Numerous studies have scrutinized the connection between capital formation and economic growth in various nations. According to these empirical findings, as compared to physical capital, development of human capital, which includes literacy, skill acquisition, access to healthcare, and experience, enriches economic growth (see Todaro, 2002; Ali et al., 2012; Mahmood et al., 2014; Munir and Arshid, 2018). Furthermore, the developing countries rated low in the inequality-adjusted Human development index were found to benefit more from capital formation than developed countries (Ahumada et al., 2020). Therefore, governments in these countries should spend more on providing social provisions. Baker (2011) found a positive association between capital accumulation and growth nexus in the case of Nigeria. His findings suggested more government involvement in encouraging savings to foster the environment of investment and promote economic growth.

A plethora of literature discussed above supports the positive relation between trade openness and economic growth (see Yanikkay, 2003; Ved and Sudesh, 2007; Klasra, 2011). However (see Hye, 2012; Adhikary, 2011; Hye and Lau, 2015; Sengupta, 2020), there is negative relation between trade openness and economic growth. Thus it is not surprising that the debate on the connection of trade openness with economic growth continues to crawl and needs further empirical studies to contribute to the validation of available literature. Further from the studies (see Rodrik, 1999; Rodrik, Subramanian and Trebbi, 2002; Kraay, 2003; Addison and Bali moune-Lutz, 2006; Stensnes, 2006; Akpan and Atan, 2016; Doan, 2019), it can be concluded that institutional quality, as well as its interaction with trade openness, plays a dynamic role in the economic growth of a country. Available literature in the case of India (Barua and Chakraborty, 2006; Topalova and Khandelwal, 2004 and 2011; Marelli and Signorelli, 2011; Mercan et al., 2013; Chatterji, Mohan and Distidar, 2014) has ignored or overlooked

the role of institutional quality in economic growth. As a contribution to available literature, the present study aims to include role of institutional quality in the link between trade openness and economic growth in Indian context.

2 METHODOLOGY

2.1 Collection of data and transformation

In the present study, annual data from 1996–2019 has been applied in case of India. Given the availability of data for institutional quality, 1996 has been taken as starting year. Following the available literature discussed above, secondary school enrollment (% gross) is used as a proxy for Human Capital (HC), real gross fixed capital formation for Physical Capital (PC), and real GDP for economic growth. The institutional quality index is developed using the WGI dataset, which provides data for six dimensions⁴ to capture institutional quality. Each dimension falls within the range of –2.5 and +2.5. Following Raychaudhuri and Haldar (2009), an institutional quality index is constructed to achieve the objectives. The required data for selected variables was extracted from WDI (World Development Indicators) and WGI (World Governance Indicators, World Bank, 2021).

2.1.1 Trade openness index

The available literature indicates that various proxies for trade openness like exports, imports and total trade as a percentage of GDP have been used to examine the impact of trade openness on economic growth of different countries. Each of these measures captures a different aspect of trade openness. Grossman and Helpman (1989) argue that trade openness leads to the production process in a country according to its comparative advantage. Similarly, exports as a percentage of GDP are used as a proxy for openness to capture the length of trade openness related to scale economies. Besides, to measure the level of international competition in the domestic market, imports as a percentage of GDP are used as a proxy for trade openness. Further, the share of total trade as a per cent of GDP provides a representation of technological spillover due to trade liberalisation measures by a particular country (Hye and Lau, 2015). In the present study, given the importance of each indicator, all three proxies of trade openness have been included.

2.2 Theoretical framework and model specification

Following Mankiw et al. (1992), Omoke and Opuala–Charles (2021), and Shahbaz (2012), the Cobb–Douglas production function in period t is given as:

$$Y = A(t)L(t)^\alpha C(t)^{1-\alpha} \quad \text{where } 0 < \alpha < 1, \quad (1)$$

where Y represents real Gross Domestic Product (GDP), A stands for technological progress, L for labor, and C for capital stock. In the present study, this production function is extended by assuming that the technological progress is determined by trade openness, institutional quality and capital formation which include both human and physical capital formation. This is given as:

$$A(t) = \varphi \cdot TO(t)^\beta IQI(t)^\delta HC(t)^\sigma PC(t)^{1-\sigma}, \quad (2)$$

where φ is the time-invariant constant, TO represents trade openness, IQI stands for institutional quality index, HC for human capital and PC for physical capital. The extended log-linear form of Formula (2) is given as:

⁴ Control of corruption (CC), Government effectiveness (GE), Political stability and absence of violence/terrorism (PA), Rule of law (RL), Regulatory quality (RQ), and Voice and accountability (VA).

$$LnY_t = \beta_0 + \beta_1 LnTO_t + \beta_2 IQI_t + \beta_3 LnHC_t + \beta_4 LnPC_t + \varepsilon_t, \tag{3}$$

where L_nY_t represents real gross domestic product, L_nTO_t trade openness, IQI_t institutional quality index, L_nHC_t denotes human capital, L_nPC_t represents physical capital, and ε_t represents ordinary disturbance term. In the available literature, various proxies for trade openness as discussed above have been put to use to dig into the link of trade openness with economic growth in different countries. It is important to mention here that a low value of these variables shows a high degree of policy intervention, given the fact that each variable captures different aspect of openness. Thus given the importance of each of these proxies of trade openness, the present study uses all three indicators. Following Duodu and Baidoo (2020), Formula (3) is extended to incorporate the interaction of trade openness and institutional quality as given in Formula (4):

$$LnY_t = \beta_0 + \beta_1 LnTO_t + \beta_2 IQI_t + \beta_3 LnHC_t + \beta_4 LnPC_t + \beta_5 (LnTO_t * IQI_t) + \varepsilon_t. \tag{4}$$

Theoretically, all the variables, which include trade openness, human and physical capital, and institutional quality, are expected to enhance the country’s economic growth. $(LnTO_t * IQI_t)$ is an interaction term that captures the combined effect of institutional quality and trade openness.

2.3 Estimation framework

In recent years, different cointegration models have been developed for non-stationary variables. Among various techniques, the “Autoregressive Distributed Lagged Model (ARDL)” advanced by Pesaran et al. (2001) works well. This technique aims to inquire into the stable long-run stationary relationship between non-stationary variables.⁵ The technique of cointegration is used to model the log-linear specifications in Formulas (4) and (5) as follows:

$$LnY_t = \alpha_0 + \sum_{i=0}^n \alpha_{1i} LnY_{t-i} + \sum_{i=0}^n \alpha_{2i} LnTO_{t-i} + \sum_{i=0}^n \alpha_{3i} IQI_{t-i} + \sum_{i=0}^n \alpha_{4i} LnHC_{t-i} + \sum_{i=0}^n \alpha_{5i} PC_{t-i} + \beta_1 LnY_{t-1} + \beta_2 LnTO_{t-1} + \beta_3 IQI_{t-1} + \beta_4 LnHC_{t-1} + \beta_5 PC_{t-1} + \varepsilon_t, \tag{5}$$

$$LnY_t = \alpha_0 + \sum_{i=0}^n \alpha_{1i} LnY_{t-i} + \sum_{i=0}^n \alpha_{2i} LnTO_{t-i} + \sum_{i=0}^n \alpha_{3i} LnIQI_{t-i} + \sum_{i=0}^n \alpha_{4i} LnHC_{t-i} + \sum_{i=0}^n \alpha_{5i} PC_{t-i} + \sum_{i=0}^n \alpha_{6i} LnTO * IQI_{t-i} + \beta_1 LnY_{t-1} + \beta_2 LnTO_{t-1} + \beta_3 LnIQI_{t-1} + \beta_4 LnHC_{t-1} + \beta_5 PC_{t-1} + \beta_6 (LnTO * IQI_{t-1}) + \varepsilon_t. \tag{6}$$

The parameters $(\alpha_0 - \alpha_6)$ capture short-run relationships and $(\beta_1 - \beta_6)$ measure long run relationship among the variables. The ARDL framework has been used to estimate Formulas (5) and (6). After cointegration, Error Correction Model (ECM) has been estimated. This model provides information regarding the rate of adjustment and aids in the study of short-run dynamics. Thus following ECM models have been specified:

⁵ This method has many advantages: first, it can apply irrespective of whether the regressors are integrated of order one or order zero or mutually (Pesaran et al., 2001); second, the ARDL model is free from serial correlation and endogeneity problems; finally, a dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation.

$$\text{Ln}Y_t = \alpha_0 + \sum_{i=0}^n \alpha_{1i} \text{Ln}Y_{t-i} + \sum_{i=0}^n \alpha_{2i} \text{LnTO}_{t-i} + \sum_{i=0}^n \alpha_{3i} \text{IQI}_{t-i} + \sum_{i=0}^n \alpha_{4i} \text{LnHC}_{t-i} + \sum_{i=0}^n \alpha_{5i} \text{PC}_{t-i} + \lambda_1 \text{ECM}_{t-1} + \epsilon_t, \tag{7}$$

$$\text{Ln}Y_t = \alpha_0 + \sum_{i=0}^n \alpha_{1i} \text{Ln}Y_{t-i} + \sum_{i=0}^n \alpha_{2i} \text{LnTO}_{t-i} + \sum_{i=0}^n \alpha_{3i} \text{LnIQI}_{t-i} + \sum_{i=0}^n \alpha_{4i} \text{LnHC}_{t-i} + \sum_{i=0}^n \alpha_{5i} \text{PC}_{t-i} + \sum_{i=0}^n \alpha_{6i} \text{LnTO} * \text{IQI}_{t-i} \lambda_1 \text{ECM}_{t-1} + \epsilon_t. \tag{8}$$

In Formulas (7) and (8), ECM indicates speed of adjustment.

3 EMPIRICAL RESULTS

3.1 Unit root test

The present study make use of ADF (Augmented Dickey-Fuller) and PP (Phillips-Perron) to check the stationery nature of the selected variables. Both tests assume the unit root problem under the null hypothesis. Table 1 shows the result of both these tests. It is important to note here that at first difference all the variables are stationary. Following (Tahir and Hayat, 2020; Omoke and Opuala–Charles, 2021), the ARDL approach seems to be most suitable for the present study given the nature of selected variables.

Table 1 Share of positive answers to job search questions and item-response probabilities

Variables	ADF test		PP test	
	Level	First difference	Level	First difference
LnY	0.58	-3.69**	0.79	-4.11***
LnHC	-0.34	-4.24***	-0.38	-4.26***
LnGCF	-1.54	-4.33***	-1.62	-4.37***
LnTO	-1.92	-3.74**	-1.87	-3.81***
LnExp	-1.93	-3.77**	-1.93	-3.87***
LnImp	-1.84	-3.41**	-1.79	-3.38**
IQI	-1.82	-3.12**	-1.98	-4.47***

Note: ***, **, * represent 1%, 5% and 10% level of significance.

Source: Author’s calculation

3.2 Results of Bound test

Table 2 presents the calculated f-statistics from the ARDL cointegration test and compares it with critical values from Narayan (2005). The results show that the alternative hypothesis of cointegration is accepted in all specifications and null hypothesis of no cointegration is rejected. This indicates long run causal relationship between economic growth, trade openness, human and physical capital formation and institutional quality in India. The table shows lower and upper bound values only in case of first specification.⁶

⁶ Additional material is available from the author: suadat.scholar@kashmiruniversity.net.

Table 2 Bounding test

Dependent variables	F-test	Optimal lag length	Decision
D(LnY) D(LnPC) D(LnHC) D(LnTO)	10.05	(3, 1, 3, 3)	Co-integrated
D(LnY) D(LnPC) D(LnHC) D(LnTO) D(IQI) D(LnTO_IQI)	13.48	(2, 0, 2, 2, 2)	Co-integrated
D(LnY) D(LnHC) D(LnExp) D(LnPC) D(LnExp_IQI) D(IQI)	5.65	(2, 1, 2, 2, 2, 2)	Co-integrated
D(LnY) D(LnPC) D(LnHC) D(LnExp) D(LnImp_IQI) D(IQI)	11.13	(2, 1, 2, 0, 1)	Co-integrated
Critical values	Lower bound 1(0)		Upper bound 1(1)
1%	3.65		4.66
5%	2.79		3.67
10%	2.37		3.2

Source: Author’s calculation

3.3 Long and short-run results

Specifications 1 and 2 in Table 3 present the ARDL estimates from Formula (6). In specifications 1 and 2, total trade as percentage of GDP is taken as a measure of trade openness. The estimated long-run coefficients are presented in panel A. In contradiction to theoretical and empirical findings (see Romer, 1990; Ynikkaya, 2003; Wacziarg et al., 2008; Dash, 2009; Marelli et al., 2011), trade openness shows negative relationship with economic growth. The results indicate that 1 percent increase in trade openness leads to 0.07 percent decline in economic growth. Earlier findings (see Kind, 2002; Kim, 2011; Lawal et al., 2016) are in line with the findings of present study. In case of less developed countries, Kim (2011) found negative relationship between trade openness and economic growth. Moreover, in the case of Pakistan and India, Hye (2012) and Hye and Lau (2015) found inverse relation between trade openness and economic growth. However, in terms of magnitude, the results of the present study reveal that impact of trade openness on economic growth is lowest compared to other variables. Hye and Lau (2015) show that a 1 percent increase in trade openness leads to a 0.301 percent decline in economic growth in the long run in the case of India. However, the results in the present study indicate that a 1 percent increase in trade openness leads to a 0.07 percent decline in economic growth in the long run. Comparing the results in these studies indicate that in the long run, trade openness would reap its benefits and help in the long-run development of the country. Available literature, (see Batra, 1992; Batra and Slottje, 1993; Vamvakidis, 2002) point out that if trade liberalization is not managed in a proper way in a particular country, it can adversely impact economic performance of that country.

In line with the theoretical justification and findings of Wani (2022), the results reveal a direct link between HC and PC with economic growth. The results show that 1 percent increase in physical capital enhances economic growth by 0.11 percent in the country. Thus domestic investment shows positive and cogent effect on economic performance. The results of the present study align with findings of Barro (2003), and Tahir and Hayat (2020). Besides, human capital has a positive impact on economic growth of the country in long run. However, in contrast to the theoretical background, short-run results indicate the negative impact of human capital on economic growth. Nevertheless, it is hard to find an explanation for this relationship; one possible reason may be the insufficient quality of education

to produce the required skill to enhance economic performance particularly in short run (Altinok, 2007). Further, Tahir and Azid (2015) argue that human capital may enhance economic growth in the future due to the nonlinear impact of human capital on economic growth. Available literature (see Hanushek and Woessmann, 2010; Pelinescu, 2015) also found a negative relationship between human capital and economic growth. Besides, the findings indicate that 1 percent improvement in institutional quality enhances economic growth by 0.52 percent (specification 2). Thus it can be concluded that policymakers need to pay special attention to improve the quality of institutions. The results accord with the findings of Stensnes (2006), Akpan and Atan (2016), Doan (2019), and Duodu and Baidoo (2020).

Panel B in Table 3 present the ARDL estimates from Formula (7). The results specify that in contrast to theoretical justification, the findings disclose that human capital has an adverse effect on economic growth. One possible reason may be insufficient quality of education necessary to deliver appropriate skills that can improve economic performance in the short run. The specification extended Formula (6) by incorporating an interaction term to capture role of institutions in trade openness – economic growth nexus in case of India. The coefficient of the interactive term is negative in all specifications. The results match the findings of Stensnes (2006), who concludes that as long as increased trade openness exposes an economy to stronger external shocks, it will adversely impact the growth of those economies with weak institutional capacity. According to Rodrik (1999), external shocks will negatively impact the economic growth of those countries that lack the proper institutional capacity to respond to them. The interaction term is positive and significant when lag is taken into consideration, given that trade policy and improvement in institutional quality impact the economic conditions after a span of time.

Table 3 Long run and short run results

Variables	Coefficients	T-statistic	Coefficients	T-statistic
Panel A: long-run coefficients	Specification 1		Specification 2	
LnPC	0.11**	2.65	0.08*	3.49
LnHC	0.15	1.52	0.18**	2.67
LnTO	-0.07*	-2.01		
IQI			0.52**	2.85
LnTO_IQI			-0.12**	-2.45
C	0.06***	24.4	0.06***	30.16
Panel B: Short-run coefficients				
LnPC	0.14***	8.98		
LnHC	-0.21***	-4.58	-0.08*	-1.82
LnHC(-1)	-0.58***	7.30	-0.25***	6.25
LnTO	-0.07***	-4.50		
LnTO(-1)	0.05**	2.58		
IQI			0.45***	5.46
(LnTO_IQI)			-0.10***	4.55
LnTO_IQI(-1)			0.06**	2.49
ECM(-1)	-1.65***	-9.15	-1.39***	-11.46
Adj. R: 0.93			0.94	

Note: ***, **, * stands for 1%, 5%, and 10% level of significance.

Source: Author's calculation

Table 3			Continuation	
Variables	Coefficients	T-statistic	Coefficients	T-statistic
Panel C: long-run coefficients	Specification 3		Specification 4	
LnPC	0.12**	1.73	0.05	1.40
LnHC	0.08	0.66	0.22*	2.00
LnExp	0.01	0.50		
IQI	3.91**	3.02	0.28**	3.02
D(LnExp_IQI)	-0.14**	2.93		
D(LnImp_IQI)			0.005	0.85
C	0.06***	11.34	0.05***	5.23
Panel D: short-run coefficients				
LnPC	0.18***	17.83	0.11***	7.89
LnHC	-0.17***	-5.72	-0.09**	-2.15
LnHC(-1)	-0.11**	-3.52	-0.27***	6.65
LnExp	0.06***	3.20		
LnExp(-1)				
IQI	2.66***	6.20	0.45***	5.46
LnExp_IQI	-0.09**	-6.01	-0.10***	4.55
LnImp_IQI	-0.14***	9.01	-0.08***	-7.95
ECM(-1)	-1.19***	-9.95	-1.16***	-10.01
Adj. R: 0.97			0.93	

Note: *** ** * stands for 1%, 5%, and 10% level of significance.

Source: Author's calculation

These results highlight the importance of building quality institutions as part of strategy to benefit from trade openness. Finally, the coefficient of ECM (-1) is negative and significant in all specification. This shows rate of change from short-run disequilibrium to established long-run equilibrium over a year. The results are in line with the findings of Wani (2022).

In Panel (C) and (D) of Table 3, trade openness is decomposed into two components.⁷ Panel (C) shows long run estimation and panel (D) short run estimation. Interestingly the results show that exports positively contribute to the economic growth of India. The results show that 1 percent increase in exports enhances economic growth by 0.6 percent in long run. These findings lead to the conclusion that economic growth in India is export-led. In addition, the results reveal that total trade negatively impacts economic growth in the country. One possible reason may be the magnitude and composition of total trade between India and the outside world. A look at the total trade volume indicates that India imports more than exports and faces a trade deficit, as seen in Figure 1. From trade composition, it is clear that the import of capital goods has increased slightly from 19.23 percent in 1996 to 22.75 percent in 2019. On the other hand, the import of consumer goods, intermediate goods, and raw materials increased from 75.02 percent in 1996 to 76.8 percent in 2019. It is important to remark here that the availability of capital goods

⁷ Export of goods and services as a percentage of GDP and import of goods and services as a percentage of GDP.

enhances the economic growth process in a country over the years. Thus from the data available, it is clear that given the low share of capital goods in the import basket, imports, as well as total trade, have an unfavorable impact on economic growth of the country. On the other hand, exports, irrespective of the composition, enhance economic growth in a particular country, given that they enhance aggregate demand. In the export basket, the chunk of raw materials and intermediate goods used in the production process has declined from 54.42 percent in 1996 to 38.25 percent in 2019, which is a healthy sign for the economy. At the same time, the share of consumer goods and capital goods has increased from 43.81 percent in 1996 to 61.67 percent in 2019, which shows the enhanced capacity of the economy to export to the outside world (data source: WITS World Bank, 2022). The coefficient of ECT (-1) is negative in all specifications, which shows that short-run disequilibrium may converge to the established long-run equilibrium.

3.4 Diagnostics testing

The results of some selected diagnostic tests which include serial correlation and heteroscedasticity are presented in Table 4. The results confirm that there is no such problem of heteroscedasticity and serial correlation. Moreover, the functional form of the model is confirmed by the Ramsey test. Finally, the stability of the model is confirmed by plots of CUSUM and CUSUMQ as shown in Figures A1 to A4 in the Appendix.

Table 4 Diagnostic checking

Diagnostics	F-statistic	F-statistic	F-statistic	F-statistic
LM test	0.004 (0.88)	0.02 (0.77)	0.35 (0.13)	0.13 (0.57)
ARCH	0.43 (0.49)	0.05 (0.81)	0.00 (0.97)	1.00 (0.30)
Breusch-Pagan-Godfrey	1.29 (0.32)	0.32 (0.86)	0.63 (0.52)	1.98 (0.17)
Normality	0.72 (0.69)	0.26 (0.87)	0.67 (0.71)	1.40 (0.49)
Ramsey test	4.18 (0.09)	0.26 (0.62)	0.00 (0.96)	2.73 (0.13)

Note: P-value in parenthesis.

Source: Author's calculation

3.5 Future research guidelines

In future studies, the time dimension can be increased. Similarly, the researchers can use all six dimensions individually from WGI to analyze their effect on the process of economic growth in the case of India. Further, given the present findings, export-led growth can be tested in the future.

CONCLUSION

The present study explores the association between trade openness and economic growth in India from 1996–2019, incorporating other factors, which include capital formation and institutional quality. The study employs three indicators of trade openness which include total trade, exports and imports as percentage of GDP. ARDL provides evidence of long run relationship among the selected variables. The estimation suggests that economic growth in the country has a negative link with trade openness. However, decomposing total trade into exports and imports yield interesting results. The estimation confirms that the growth of exports has a significant and positive impact on the economic growth of the country. In addition, the estimation reveals that institutions play an important role in economic development of the country both in short run and long run. Interestingly further empirical analysis through

the introduction of interaction term of institutional quality and trade openness shows negative impact on economic growth of India. This indicates that trade openness accompanied by weak institutional quality may hamper the process of benefiting from opening the economy to outside world.

These findings highlight the need for number of policy consideration in case of India. Among others, the findings in the present study highlight the need to take necessary policy initiatives and introduce trade reforms to expand exports. Given that India has opened up its economy particularly from 1991 to outside world, the findings suggest benefits from trade openness will depend on the quality of institutions. Thus there is need to improve quality of institutions which will help to channel the benefits of trade openness into economic growth of the country. Similarly, in case of capital formation, the government of India needs to pay special attention to increase expenditure to enhance the skill level of available labor force. In addition, the economy of the country is benefiting from domestic investment, which is seen to have a positive impact on economic growth. Thus the need of the hour is to introduce various policy initiatives for both foreign and domestic investors.

ACKNOWLEDGEMENTS

The author Dr. Suadat Hussain Wani is the awardee of the ICSSR Post-Doctoral Fellowship. This paper is largely the outcome of the Post-Doctoral Fellowship sponsored by the Indian Council of Social Science Research (ICSSR). However, the responsibility for the facts stated, opinions expressed, and the conclusions drawn are entirely of the author.

References

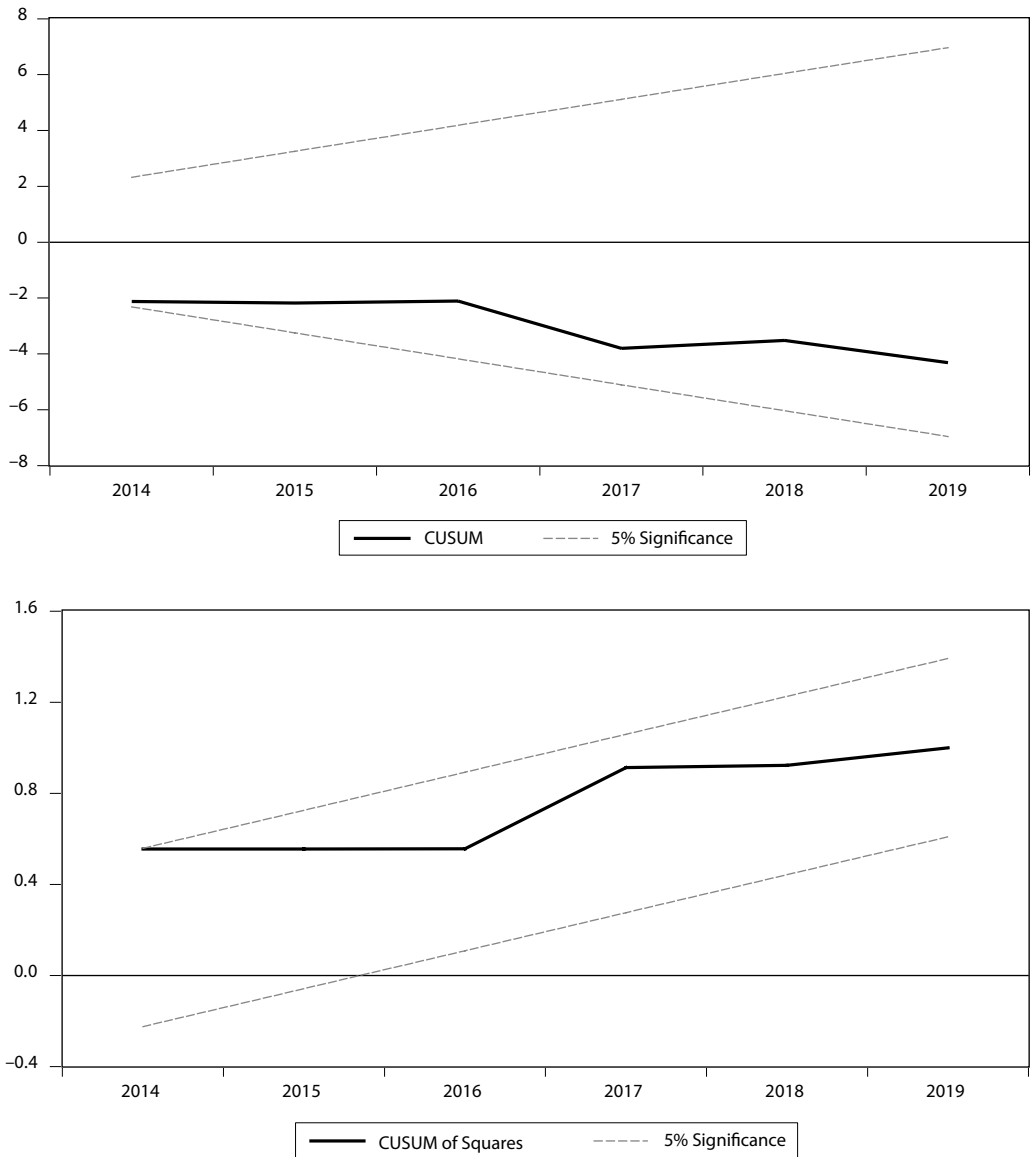
- ADDISON, T., BALIAMOUNE-LUTZ, M. (2006). Economic reform when institutional quality is weak: the case of the Maghreb [online]. *Journal of Policy Modeling*, 28(9): 1029–1043. <<https://doi.org/10.1016/j.jpolmod.2006.04.004>>.
- ADHIKARY, B. K. (2011). FDI, trade openness, capital formation, and economic growth in Bangladesh: a linkage analysis. *International Journal of Business and Management*, 6(1): 16–28.
- AGGARWAL, A., KUMAR, N. (2012). *Structural change, industrialisation, and poverty reduction: the case of India*. South and South-West Asia Development Paper, 1206, ESCAP.
- AKCAY, S., DEMIRHAN, E. (2005). The causal relationship between openness and economic growth: Evidence from selected MENA countries. *Yapi Kredi Economic Review*, 16(2): 77–83.
- AKINLO, T., OKUNLOLA, C. O. (2021). Trade openness, institutions and economic growth in Sub-Saharan Africa [online]. *Jurnal Perspektif Pembiayaan Dan Pembangunan Daerah*, 8(6): 541–560. <<https://doi.org/10.22437/ppd.v8i6.10653>>.
- AKPAN, U. F., ATAN, J. A. (2016). Relationship between trade openness, institutions and economic growth in Sub-Saharan Africa: a further look at the evidence. *British Journal of Economics, Management & Trade*, 15(1): 1–20.
- ALTINOK, N. (2007). *Human capital quality and economic growth* [online]. HALSHS. <<https://halshs.archives-ouvertes.fr/halshs-00132531v2>>.
- AMNA INTISAR, R., YASEEN, M. R., KOUSAR, R., USMAN, M., MAKHDUM, M. S. A. (2020). Impact of trade openness and human capital on economic growth: a comparative investigation of Asian countries. *Sustainability*, 12(7): 2930.
- BAL, D. P., DASH, D. P., SUBHASISH, B. (2016). The effects of capital formation on economic growth in India: Evidence from ARDL-bound testing approach [online]. *Global Business Review*, 17(6): 1388–1400. <<https://doi.org/10.1177/0972150916660403>>.
- BALASSA, B. (1983). Policy responses to external shocks in sub-Saharan African countries [online]. *Journal of policy Modeling*, 5(1): 75–105. <[https://doi.org/10.1016/0161-8938\(83\)90023-6](https://doi.org/10.1016/0161-8938(83)90023-6)>.
- BARRO, R. J. (2003). Determinants of economic growth in a panel of countries. *Annals of economics and finance*, 4: 231–274.
- BARUA, A., CHAKRABORTY, D. (2006). Liberalisation, trade and industrial performance: an empirical analysis for India. *The 2nd APEA Conference*, Center for International Economics, University of Washington, Seattle.
- BATRA, R. (1992). The fallacy of free trade. *Review of International Economics*, 1(1): 19–31.
- BATRA, R., SLOTTJE, D. J. (1993). Trade policy and poverty in the United States: Theory and evidence, 1947–1990. *Review of International Economics*, 1(3): 189–208.
- CHATTERJI, M., MOHAN, S., DASTIDAR, S. G. (2014). Relationship Between Trade Openness and Economic Growth of India: a Time Series Analysis. *Journal of Academic Research in Economics*, 6(1).

- DASH, R. K. (2009). Revisited export-led growth hypothesis: an empirical study on India [online]. *South Asia Economic Journal*, 10(2): 305–324. <<https://doi.org/10.1177/139156140901000203>>.
- DOAN, H. Q. (2019). Trade, institutional quality and income: Empirical evidence for sub-Saharan Africa [online]. *Economies*, 7(2): 48. <<https://doi.org/10.3390/economies7020048>>.
- DOLLAR, D. (1992). Outward-oriented developing economies really do grow more rapidly: evidence from 95 LDCs, 1976–1985. *Economic development and cultural change*, 40(3): 523–544.
- DOLLAR, D., KRAAY, A. (2003). Institutions, trade, and growth. *Journal of monetary economics*, 50(1): 133–162.
- DUODU, E., BAIDOO, S. T. (2020). How does quality of institutions affect the impact of trade openness on economic growth of Ghana? [online]. *Cogent Economics & Finance*, 8(1). <<https://doi.org/10.1080/23322039.2020.1812258>>.
- FRANKEL, J. A., ROMER, D. (1999). Does trade cause growth? *The American Economic Review*, 89(3): 379–399.
- GROSSMAN, G. M., HELPMAN, E. (1989). Growth and welfare in a small open economy. *NBER working paper*, w2970.
- HADHEK, Z., MRAD, F. (2015). Trade openness, institutions and economic growth. *European Journal of Economics, Finance and Administrative Sciences*, 75: 96–104.
- HAIDER, S., GANAIE, A. A., KAMAIAH, B. (2018). Total factor productivity and openness in Indian economy: 1970–2011 [online]. *Foreign Trade Review*, 54(1): 46–57. <<https://doi.org/10.1177/0015732518810835>>.
- HANUSHEK, E. A., WOESSMANN, L. (2010). Education and economic growth. *Economics of education*, 60: 67.
- HARRISON, A. (1996). Openness and growth: a time-series, cross-country analysis for developing countries. *Journal of development Economics*, 48(2): 419–447.
- HYE, Q. M. A. (2012). Long term effect of trade openness on economic growth in case of Pakistan [online]. *Quality & Quantity*, 46(4): 1137–1149. <<https://doi.org/10.1007/s11135-011-9612-0>>.
- HYE, Q. M. A., LAU, W. Y. (2015). Trade openness and economic growth: empirical evidence from India. *Journal of Business Economics and Management*, 16(1): 188–205.
- INTISAR, R., YASEEN, M. R., KOUSAR, R. et al. (2020). Impact of trade openness and human capital on economic growth: a comparative investigation of Asian countries. *Sustainability*, 12(7): 1–19.
- IYOHA, M., OKIM, A. (2017). The impact of trade on economic growth in ECOWAS countries: Evidence from panel data. *CBN Journal of Applied Statistics*, 8(1): 23–49.
- KARTAL, Z., ZHUMASHEVA, A., ACAROGLU, H. (2017). The effect of human capital on economic growth: a time series analysis for Turkey. In: *Regional Studies on Economic Growth, Financial Economics and Management*, Springer, Cham, 175–191.
- KEHO, Y. (2017). The impact of trade openness on economic growth: the case of Cote d'Ivoire [online]. *Cogent Economics & Finance*, 5(1). <<https://doi.org/10.1080/23322039.2017.1332820>>.
- KIM, D. H. (2011). Trade, growth and income. *The Journal of International Trade & Economic Development*, 20(5): 677–709.
- KIND, H. J. (2002). Endogenous growth and trade liberalization between small and large countries. *Review of International Economics*, 10(1): 151–165.
- KLASRA, M. A. (2011). Foreign direct investment, trade openness and economic growth in Pakistan and Turkey: an investigation using bounds test. *Quality & Quantity*, 45(1): 223–231.
- KONG, Q. et al. (2021). Trade openness and economic growth quality of China: Empirical analysis using ARDL model [online]. *Finance Research Letters*, 38. <<https://doi.org/10.1016/j.frl.2020.101488>>.
- KYRRE, S. (2006). *Trade Openness and Economic Growth: Do Institutions Matter?* Norwegian Institute of International Affairs (NIIA), 702.
- LAWAL, A. I., NWANJI, T. I., ASALEYE, A., AHMED, V. (2016). Economic growth, financial development and trade openness in Nigeria: an application of the ARDL bound testing approach [online]. *Cogent Economics & Finance*, 4(1). <<http://dx.doi.org/10.1080/23322039.2016.1258810>>.
- LEAMER, E. E. (1995). A trade economist's view of US wages and globalisation. In: *Brooking Conference Proceedings*, Brookings.
- MALEFANE, M. R., ODHIAMBO, N. M. (2021). Trade openness and economic growth: empirical evidence from Lesotho [online]. *Global Business Review*, 22(5): 1103–1119. <<https://doi.org/10.1177/0972150919830812>>.
- MARELLI, E., SIGNORELLI, M. (2011). China and India: Openness, trade and effects on economic growth. *The European Journal of comparative economics*, 8(1): 129.
- MATTHEW, O., ADEGBOYE, F. B. (2014). Trade openness, institutions and economic growth in Sub-Saharan Africa (SSA). *Developing Country Studies*, 4(8): 18–30.
- MERCAN, M., GOCER, I., BULUT, 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(11): 1–14.
- OMOKE, P. C., OPUALA-CHARLES, S. (2021). Trade openness and economic growth nexus: Exploring the role of institutional quality in Nigeria [online]. *Cogent Economics & Finance*, 9(1). <<https://doi.org/10.1080/23322039.2020.1868686>>.
- PELINESCU, E. (2015). The impact of human capital on economic growth. *Procedia Economics and Finance*, 22: 184–190.
- PESARAN, M. H., SHIN, Y., SMITH, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3): 289–326.
- RAYCHAUDHURI, A., HALDAR, S. K. (2009). An investigation into the inter-district disparity in West Bengal, 1991–2005. *Economic and political weekly*, 258–263.

- RIGOBON, R., RODRIK, N. (2004). *The Determinants of Institutions, Openness, and Income*. MIT, Mimeo.
- RIVERA-BATIZ, L. A., ROMER, P. M. (1991). Economic integration and endogenous growth. *The Quarterly Journal of Economics*, 106(2): 531–555.
- RODRİK, D. (1999). Where did all the growth go? External shocks, social conflict, and growth collapses. *Journal of economic growth*, 4(4): 385–412.
- RODRİK, D., SUBRAMANIAN, A., TREBBI, F. (2004). Institutions rule: the primacy of institutions over geography and integration in economic development. *Journal of economic growth*, 9(2): 131–165.
- ROMER, P. M. (1990). The problem of development: a conference of the Institute for the study of free enterprise systems. *Journal of Political Economy*, 98(1): 1–11.
- SARKAR, P. (2005). Is there any impact of trade liberalisation on growth? Experiences of India and Korea. *Revue Tiers Monde*.
- SARKAR, P. (2008). Trade openness and growth: Is there any link? *Journal of economic issues*, 42(3): 763–785.
- SENGUPTA, S. (2020). How trade openness influenced economic growth in India: an empirical investigation. *Indian Journal of Economics and Development*, 8: 1–14.
- SHAHBAZ, M. (2012). Does trade openness affect long run growth? Cointegration, causality and forecast error variance decomposition tests for Pakistan. *Economic Modelling*, 29(6): 2325–2339.
- SINGH, T. (2011). International trade and economic growth nexus in Australia: a robust evidence from time-series estimators. *The World Economy*, 34(8): 1348–1394.
- SU, D. T., NGUYEN, P. C., CHRISTOPHE, S. (2019). Impact of foreign direct investment, trade openness and economic institutions on growth in emerging countries: the case of Vietnam [online]. *Journal of International Studies*, 12(3): 243–264. <<https://doi.org/10.14254/2071-8330.2019/12-3/20>>.
- SUBRAMANIAN, A., TREBBI, F., RODRIK, D. (2002). Institutions rule: the primacy of institutions over integration and geography in economic development. *IMF Working Papers*, 189.
- TAHIR, M., AZID, T. (2015). The relationship between international trade openness and economic growth in the developing economies: Some new dimensions. *Journal of Chinese Economic and Foreign Trade Studies*.
- TAHIR, M., HAYAT, A. (2020). Does international trade promote economic growth? An evidence from Brunei Darussalam [online]. *Journal of Chinese Economic and Foreign Trade Studies*. <<https://doi.org/10.1108/JCEFTS-03-2020-0010>>.
- TOPALOVA, P., KHANDELWAL, A. (2011). Trade liberalisation and firm productivity: the case of India. *Review of economics and statistics*, 93(3): 995–1009.
- UDEAGHA, M. C., NGEPAH, N. (2021). The asymmetric effect of trade openness on economic growth in South Africa: a nonlinear ARDL approach [online]. *Economic Change and Restructuring*, 54(2): 491–540. <<https://doi.org/10.1007/s10644-020-09285-6>>.
- VAMVAKIDIS, A. (2002). How robust is the growth-openness connection? Historical evidence. *Journal of Economic Growth*, 7(1): 57–80.
- VED, P., SUDESH, P. (2007). An empirical investigation of the casual: relationship between openness and economic growth in India. *Asian Economic Review*, 49(3): 485–494.
- WACZIARG et al. (2008) Trade liberalisation and growth: New evidence. *The World Bank Economic Review*, 22(2): 187–231.
- WANI, S. (2022). Trade Openness, Capital Formation, and Economic Growth: Empirical Evidence from India. *Eurasian Journal of Business and Economics*, 15(29): 35–49.
- WEI, S. J. (2000). *Natural openness and good government* [online]. Working paper 7765. <https://www.nber.org/system/files/working_papers/w7765/w7765.pdf>.
- WINTERS, L. A. (2004). Trade liberalisation and economic performance: an overview. *The Economic Journal*, 114(493): F4–F21.
- XIE, H., CAI, Y., SAM, C. Y., CHANG, T. (2018). Revisit Financial Development, Trade Openness and Economic Growth Nexus in China Using a New Developed Bootstrap ARDL Test. *Economic Computation & Economic Cybernetics Studies & Research*, 52(4).
- YANIKKAYA, H. (2003). Trade openness and economic growth: a cross-country empirical investigation [online]. *Journal of Development Economics*, 72(1): 57–89. <[https://doi.org/10.1016/s0304-3878\(03\)00068-3](https://doi.org/10.1016/s0304-3878(03)00068-3)>.
- YOUNG, A. (1991). Learning by doing and the dynamic effects of international trade. *The Quarterly Journal of Economics*, 106(2): 369–405.
- ZAHONOGO, P. (2016). Trade and economic growth in developing countries: Evidence from sub-Saharan Africa. *Journal of African Trade*, 3(1–2): 41–56.

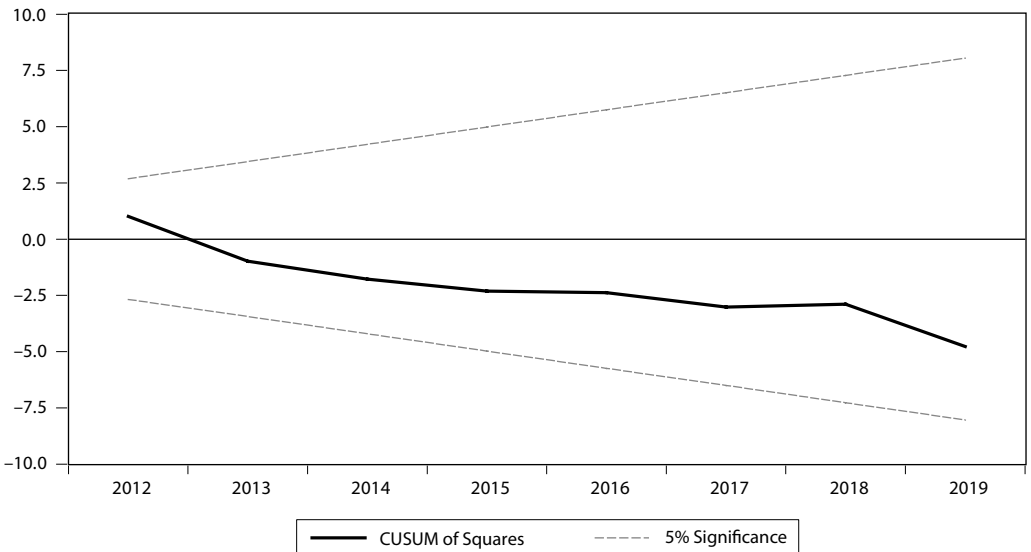
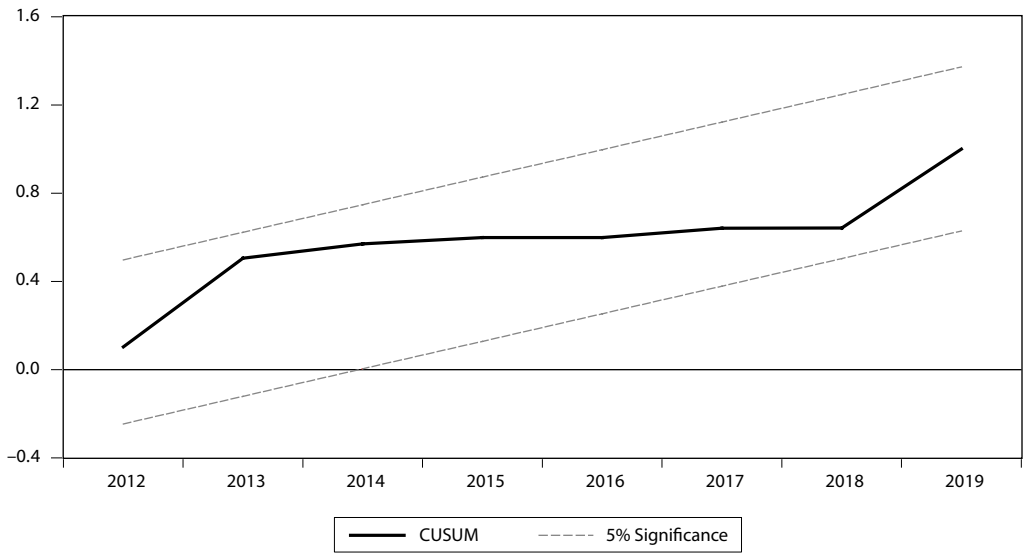
APPENDIX

Figure A1 CUSUM and CUSUMSQ (Specification 1)



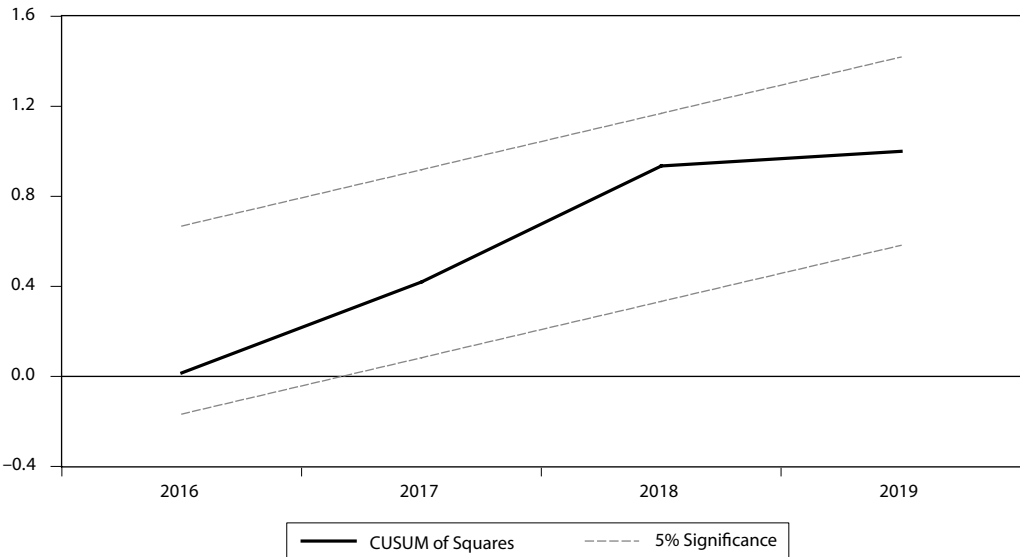
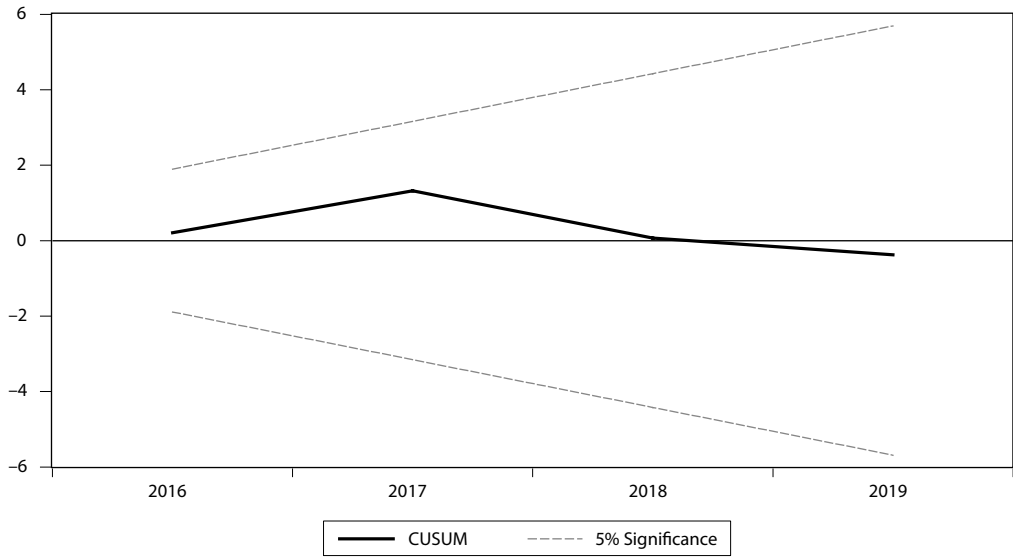
Source: Author's calculation

Figure A2 CUSUM and CUSUMSQ (Specification 2)



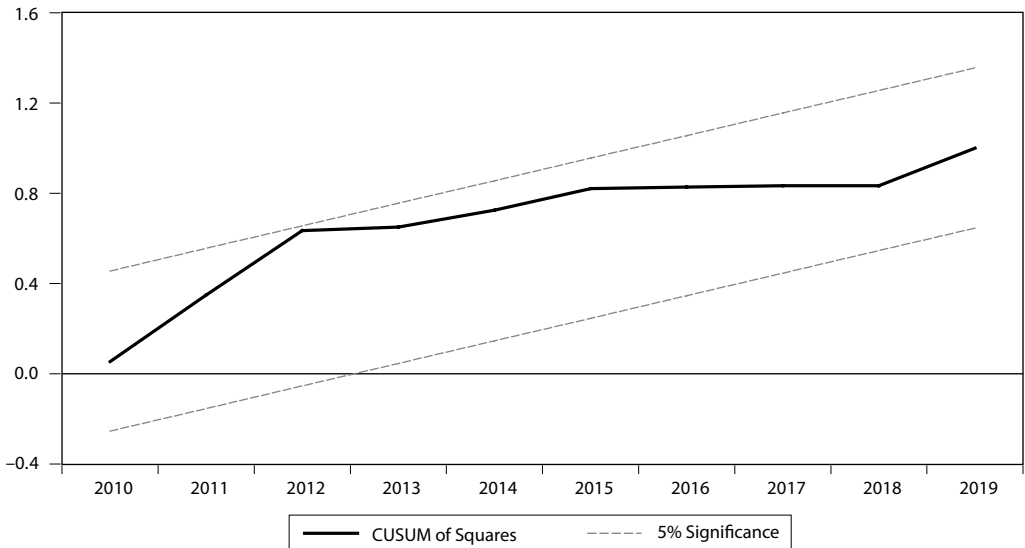
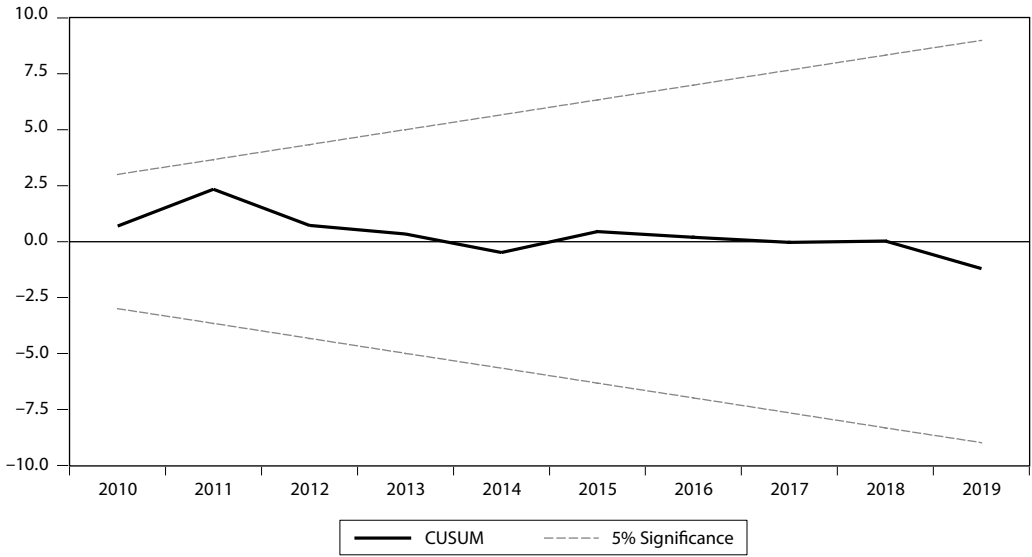
Source: Author's calculation

Figure A3 CUSUM and CUSUMSQ (Specification 3)



Source: Author's calculation

Figure A4 CUSUM and CUSUMSQ (Specification 4)



Source: Author's calculation