

# **Economic Growth, Corruption, Political Stability and Trade Openness Interaction in BRICS: A Panel ARDL Approach**

**Ashmita Kesar<sup>1</sup>, Pabitra Kumar Jena<sup>2</sup> & B. Kamaiah<sup>3</sup>**

## **Abstract**

The aim of investigation is to scrutinize the impact of corruption, political stability and trade openness on economic growth in BRICS from the period 2002-2018. For this we have employed the Augmented Solow Model and empirically we have used the Panel Autoregressive Distributed Lag Model (ARDL) model. Stationarity is checked by using unit root test and cointegration test was employed to check the long-run relationship among the variables. The results of our model show that political stability and trade openness improves economic growth. However, the inverted U-shaped relationship between corruption and economic growth shows that corruption increases economic growth in the long run to a certain level after that it downbeat economic growth. Conversely, the results of the granger causality approach showed a uni-directional causality from CORR1 and lnGDP, CORR2 and lnGDP, CORR2 and CORR1, and CORR1 and TO and bi-directional causality from CORR2 and TO. Based on our empirical scrutiny, some policy implications are suggested. This paper contributes a new insight to the relationship between corruption and economic growth.

Keywords: Gross Domestic Product; Corruption; Political stability; Trade Openness.

JEL Classification: D73; F18; F21; F59.

## **1. Introduction**

The emerging economies are of paramount importance to world, representing as an important force for the global economy. There are many macroeconomic variables that impede and facilitate the economic growth of the emerging economies. Corruption being one of the essential variable that affect the economic growth and its effect has been studied by many researchers (Huang, 2016; Swaleheen, 2011; Shittu, Hassan, & Nawaz, 2018; Mobolaji and Omoteso, 2014; and Mallik & Saha, 2016). Some studies have empirically firmed the detrimental effect of corruption on economic growth (Mauro, 1995; Mo, 2001; Gyimah-Brempong, 2002; Ugur, 2014; Mallik and Saha, 2016; and Hakimi and Hamdi, 2017). A cross-country study conducted by (Mauro, 1995) showed that corruption is negatively affiliated with investment as well as growth, which is notable both in the economic and statistical sense. The study of (Gyimah-Brempong, 2002) showed that corruption brings down the per capita income directly by reducing

---

<sup>1</sup> Research Scholar, School of Economics, Shri Mata Vaishno Devi University, Katra, Jammu and Kashmir, India. Corresponding Author Email Id: [ashmitakesar@gmail.com](mailto:ashmitakesar@gmail.com), Ph no: 7006558571

<sup>2</sup> Assistant Professor, School of Economics, Shri Mata Vaishno Devi University, Katra, Jammu and Kashmir, India. Email Id: [pabitrakumarjena@gmail.com](mailto:pabitrakumarjena@gmail.com), Ph no:7889858100

<sup>3</sup> Professor and Dean, Central University of Andhra Pradesh, India, Email Id: [kamaiahbandi@gmail.com](mailto:kamaiahbandi@gmail.com).

productivity and indirectly by lowering the investment. The results of (Gyimah-Brempong & Camacho, 2006) advocate “sands the wheels” of corruption hypothesis. A 10 percent reduction in corruption will escalate the growth rate nearly by 1.7 percent in the OECD and Asian countries, 2.6 percent in the Latin American and 2.8 percent in the African countries. The effect of corruption on the investment and economic growth rate in 15 Middle East and North African (MENA) countries by using PVECM model shows that both for the long and short period corruption has a considerable impact on per capita GDP. The result also shows that corruption harms economic growth in MEMA region directly and indirectly (Hakimi and Hamdi, 2017).

Similarly, there are few studies substantiating that corruption positively affects economic growth (Leff, 1964; Lui, 1985; Meon and Weill, 2010; Swaleheen, 2011; Huang, 2016; and Shittu, Hassan, and Nawaz, 2018). A study of (Wedeman, 1997) revealed that despite being corrupt some countries enjoy rapid economic growth. The study of (Paksha Paul, 2010) makes it visible that corruption has not only fostered growth but has also greased the wheels of commerce in Bangladesh. Also, (Huang, 2016) showed that greasing hypothesis was held true in case of South-Korea; the result was harmonious with that of (Wedeman, 1997). The study conducted by (Shittu, Hassan, and Nawaz, 2018) showed positive association between level of corruption and economy’s growth, also there was unidirectional causality from economic growth and corruption. However, there is still a dilemma that corruption is lubricating or hampering economic growth (Bardhan, 1997; Pande, 2008).

Another important variable that effects the economic growth is political stability and its positive impact is felt by many researchers in their study (Huynh and Jacho-Cha’ vez, 2009; Fayissa and Nsiah, 2013; Gani, 2011; Omoteso et al., 2014; Bashir, 2014). The study of (Gani, 2011) found government effectiveness and political stability are positively related to economic growth. Also, (Omoteso et al., 2014) revealed that political stability along with regulatory quality enhances the economic growth. The panel study of (Cebula, 2011) on ten precise forms of economic freedom and political stability found that political stability successfully promotes economic growth. Also, certain studies have found that the governance acts as a positive influencer towards economic growth (Zhao, Kim, and Du, 2003; Akcay, 2006; and Brito-Bigott et al., 2008) Also, there are studies that have found instability in the political system impedes economic growth (Fosu, 1992; Aisen et al., 2013; Jong-a-Pin, 2009) and that political stability act as a vital determinant in finding economic growth. There are many different reasons as to why political instability affects economic growth of the country. The negative effect of political instability is visible on economic growth in the form of lower investment, unemployment and inflation (Rodrik, 1991). Furthermore, the politically unstable economies will lay foundation for corruption and other unethical activates. The study of (Jong-a-Pin, 2009) found that political instability had detrimental effect on economic growth, with respect to investment. In one of the recent study of (Aisen and Veiga, 2013) found that political instability affects economic growth negatively by bringing down the physical and human capital accumulation and also it found that larger degree of growth productivity was affected by political instability. Also, there are studies that show that

high propensity of government collapse lowers the GDP growth (Mauro; 1995; Rodrik; 1992 and Alesina and Perotti; 1996).

Trade being an substantial component for the economic growth has long been the subject of interest for many researchers and also there are a lot of studies in this vein explaining that openness of trade can lead or lag economic growth (Dollar and Kraay, 2002; Irwin and Tervio, 2000; Rodrik and Rodriguez, 2001). There are studies showing trade openness positive association with economic growth (Rodriguez and Rodrik, 2000; Karras, 2003; Dollar and Kraay, 2004; Das and Paul, 2011; and Nowbutsing, 2014). Contrarily, there are some who saw trade openness as an impediment for economic growth (Vlastou, 2010; Lawal et al., 2016; Musila & Yiheyis, 2015; Ulasan, 2015; Polat et al., 2015). Apart from this, there are studies that have cast some doubt (Easterly, 1993; Rodrik & Rodriguez, 2000).

The aim of investigation is to scrutinize the impact of corruption, political stability and trade openness on economic growth in BRICS from the period 2002-2018. The study has employed augmented Solow model and empirically has applied ARDL model and has used granger causality test. The remnants of the paper are as follows: the following section describes the theoretical background. Section third presents the data source and methodology. Section four discusses the empirical findings. Section five highlights some policy recommendations and finally the study ends with the concluding remarks.

## **2. Theoretical Background**

Solow's model, developed in 1956, is one of the most influential models in economics and is used as a basis by many modern economic models as a result. In our study we modify the Augmented Solow Model proposed in 1956 and embraced from Coupet (2003), to scrutinize the impact of corruption on economy's growth rate. The classical elements of growth model are output, labour and capital, in our study; we integrate corruption and study its impact on economic growth. It is suggested that output along with growth are subjective to corruption level. The Cobb-Douglas production function can be defined as:

Where,  $Y$  represents the aggregate amount of real income;  $K$  is the level of physical capital and human capital, respectively;  $A$  exhibit multifactor productivity;  $L$  denotes the total labour employed and  $C$  is the amount of corruption.

This condition confirms that the production function shows constant and diminishing return to factors. If corruption is removed from the model, we will arrive at the neoclassical results. The output growth rate per worker escalates with increase in investment in the physical capital and de-escalates with decrease in the population escalation, reduction in the capital rate, together with the original level of output per worker. The equations of steady state are given as:

Where,  $\alpha$  are the exogenous parameters, showing percentage of income invested in human and physical capital, and  $\beta$  reduction in rates of human as well as physical capital, respectively. Population is determined exogenously; as  $L$  and it is constant overtime, i.e.  $\dot{L} = 0$ . This implies that labour force is growing at the rate of  $n$ . If  $A$  shows the multifactor productivity of the economy, then;

Corruption is assumed exogenous in this model and it decreases input productivity. The corruption parameters together have the effects of corruption (on multifactor productivity. Here,  $\gamma$  signifies the overall corruption and  $\delta$  determine the sensitivity of corruption towards production function.

$A$  is the conventional multifactor productivity which is presumed to be exogenous and it is growing at a rate  $g$ ; signifying that: while  $\dot{A} = gA$ . When there is no corruption (such that,  $\gamma = 0$ ; and equation (4) regress to the Traditional Solow Growth Model (MRW, 1992). Whereas,  $\delta$  is a non-negative real number enclosed by 0 and 1, if the value of  $\delta$  is positive it reduces multifactor productivity. Again, if  $\delta$  is negative it will improve the level of multifactor productivity, as the value and signs of  $\delta$  are influential in finding the net effect of corruption in total or multifactor productivity.

### 3. Data Source and Methodology

The variables used in this study includes economic growth which is measured as GDP per capita, corruption which is measured as control of corruption <sup>4</sup>(CORR1), corruption square (CORR2), political stability<sup>5</sup> (POL), and trade openness as a percentage of GDP (TO), all data is taken from World Bank's World Governance Indicator (2019) and World Development Indicator (2019). The data is panel and spanning from 2002-2018 for BRICS. In our study we focus on BRICS (Brazil, Russia, India, China and South Africa) as the main countries of interest for our empirical analysis they are the chief emerging economies (as they make 40% of the world's population, 27% of the world's land surface, with access to abundant natural resources, and about 32% of the world GDP (PPP)) and the political powers at the regional and international level..

To investigate the relationship and causation issue we have employed panel unit root approach, panel cointegration approach, and Panel Autoregressive Distributed Lag model and panel granger causality analysis. The functional form of our testing model is as follows:

---

<sup>4</sup> Percentile rank where 0 correspond to least corrupt and 100 to most corrupt

<sup>5</sup> Political stability and absence of violence/terrorism measures the perception of likelihood of political stability where 0 represent the lowest rank and 100 highest rank

## The model

Where,  $\alpha_i$  represents the intercept and slope coefficients,  $\epsilon_{it}$  is the stochastic error term,  $i$  represents the cross-section (countries) and  $t$  represents the time period. To check the stationarity we performed panel unit root analysis. In the panel studies Levin, Lin and Chu, 2002 and Breitung, 2000 (contains common unit root as their null hypothesis) and Im, Pesaran and Shin, 2003 (having discrete unit root processes) and is based on the Dickey-Fuller Procedure are used extensively. The equation of LLC is as follows:

Where  $\alpha_i$  represent the deterministic component and  $\epsilon_{it}$  shows the stationarity process. The LLC test allow for heterogeneity in intercept term whereas, IPS allows for it both in the intercept and slope terms. The test for IPS can be specified as:

Where,  $\alpha_i$  symbolizes each of GDP, CORR1, CORR2, POL, and TO and there test for stationarity becomes essential for the least square estimates to be consistent, unbiased and valid inference. The test for co-integration is employed as given by Pedroni (1999) and Kao (1999) cointegration after the order of integration is specified. The long-run relationship is based on the following regression:

Where,  $T$  implies the total number of observations in the given time and  $N$  stands for the number of cross sections.  $\alpha_i$  and  $\epsilon_{it}$  signifies the fixed effect parameter and deterministic component, the slope coefficients.

The objective is to scrutinize the long term together with short term relationship among the variables and this is a relevant approach because it is capable of testing the long term relationships regardless of variables order of integration, whether  $I(1)$  or mutually integrated ( $I(1)$  and  $I(0)$ ). But, this method is inappropriate if the series is integrated of order ( $I(2)$ ). The long-term relationship among the variables in the ARDL model is arranged as follows:

(10)

Here,  $\Delta$  represents the first difference and  $\epsilon_{it}$  representing the error term. The choice of lags is based either on Akaike Information Criterion (AIC) or the Schwarz Bayesian Criterion (SBC). After the analysis of long-run we have estimated the short-run model.

In the above equation  $\alpha$  represents the parameters indicating the speed of adjustment, and  $\mu$  represents the lagged error correction term.

### 3.1. Panel Granger Causality Approach

To view the direction of causality among macroeconomic variables, we have employed Granger causality test. The study has used two step procedures given by Engle and Granger (1987). The Granger Causality approach estimates the following equations:

are assumed to be uncorrelated.

## 4. Empirical Scrutiny

### 4.1 Panel Unit Root Approach

The stationarity of the data is checked using the variety of panel unit root test. We have particularly used Levin et al. (2002), Im et al. (2003) and Breitung (2000). The results show the unit root for the individual intercept and with the individual intercept and trend. From, table 1 and 2 we can see that GDP, POL are stationary at level, integrated for order 0 ( $I(0)$ ). However, greater part of test becomes stationary following to the first difference 1, ( $I(1)$ ). Therefore, from the deduced result we could use the panel ARDL model.

Table 1: Panel Unit Root Approach: Series in Level

	lnGDP		CORR1		CORR2		POL		TO	
	Intercept (I)	Intercept +Trend (I+T)								
LLC	-4.68 (0.00)	-0.09 (0.46)	-1.15 (0.12)	0.42 (0.66)	-0.15 (0.43)	0.28 (0.61)	-2.12 (0.01)	-2.35 (0.00)	-1.52 (0.06)	-1.08 (0.13)

IPS	-3.90 (0.00)	1.68 (0.95)	-0.46 (0.32)	0.99 (0.84)	0.81 (0.79)	0.38 (0.65)	-2.57 (0.00)	-1.46 (0.07)	-1.08 (0.13)	0.57 (0.7)
Breitung	.....	2.65 (0.99)	.....	-1.56 (0.05)	.....	0.07 (0.52)	.....	-0.72 (0.23)	.....	-1.8 (0.0)

Note: Table 1 demonstrates the statistics of panel unit root test. The values in the brackets are the corresponding values.

Table 2: Panel Unit Root Approach: Series in First Difference

	lnGDP		CORR1		CORR2		POL		TO	
	Intercept (I)	Intercept +Trend (I+T)								
LLC	-4.42 (0.00)	-4.93 (0.00)	-7.25 (0.00)	-8.08 (0.00)	-6.63 (0.00)	-8.28 (0.00)	-8.29 (0.00)	-4.00 (0.00)	-6.42 (0.00)	-4.95 (0.00)
IPS	-2.74 (0.00)	-2.71 (0.00)	-5.76 (0.00)	-6.26 (0.00)	-5.60 (0.00)	-6.27 (0.00)	-7.10 (0.00)	-4.42 (0.00)	-5.58 (0.00)	-3.98 (0.00)
Breitung	.....	-2.11 (0.01)	.....	-2.29 (0.01)	..... ..	-2.32 (0.01)	..... ..	-2.41 (0.00)	.....	-2.90 (0.00)

Note: Table 2 demonstrates the statistics of panel unit root test. The values in the brackets are the corresponding values.

#### 4.2. Panel Cointegration Approach

To know the actual long-run association among economic growth and its determinants, we have employed cointegration test techniques proposed by Pedroni (1999), Kao (1999) and Fisher test. The techniques proposed by Pedroni (1999) has employed two test for cointegration namely within and between dimension. The results of the test clearly indicate that the null hypothesis of no co-integration is discarded. It is rejected at 1% level by the panel-V, PP and ADF statistics also the group-PP and ADF is rejected at 1% level. For Kao (1999) test it is again rejected at 1% level of significance. The Fisher (Maddala and Wu 1999) test results support the result of Pedroni and Kao test thus rejecting the null hypothesis at 1% level. Therefore, we can conclude that there is long-run cointegration among the variables in our five countries.

Table 3: Result of Panel Cointegration Approach

Pedroni Test	Null Hypothesis: No Cointegration			
	Statistic	Prob Value	Weighted Statistic	Prob Value
Panel v	3.55***	0.00	3.34***	0.00
Panel rho	1.22	0.89	1.13	0.87
Panel PP	-2.85***	0.00	-3.39***	0.00
Panel ADF	-2.77***	0.00	-3.26***	0.00
	Statistic	P value		
Group rho	2.11	0.98		
Group PP	-3.86***	0.00		
Group ADF	-3.12***	0.00		
Kao Test	Null Hypothesis: No Cointegration			
	t statistic	Prob Value		
ADF	-3.85***	0.00		
Fisher Test				
Number of coint.	Trace	Prob Value	Max. eigenvalue	Prob Value
None	75.07***	0.00	75.07***	0.00
At most 1	165.9***	0.00	119.2***	0.00
At most 2	68.63***	0.00	34.11***	0.00
At most 3	47.04***	0.00	38.08***	0.00
At most 4	28.11***	0.00	28.11***	0.00

Note: \*\*\* and \*\* imply significance levels at the 1 and 5% levels, respectively.

### 4.3. Panel ARDL Approach

We can infer from Table 4 that there is substantial evidence that the variables corruption (CORR1), corruption square (CORR2), political stability (POL) and trade openness (TO) has

long run influence on economic growth and the positive sign of corruption, political stability and trade openness shows that these variables promotes economic growth.

The standard co-efficient value of corruption is 0.05 with the p-value of 0.00, which is less than 0.05. This indicates that corruption favors the economic growth. The positive affiliation between corruption and growth is aligned with the work undertaken by (Leff, 1968; Coupet, 2011; Meon and Weill 2010; Huang, 2016; Shittu, Hassan, and Nawaz, 2018). The result of our study differ what the researchers have earlier found due to the fact that our study focuses only on the BRICs countries. The positive relationship shows that in many countries work and services are well extended when some incentives are given. The long- run elasticities of economic growth with regard to Corruption (CORR1 and CORR2) shows an inverted U- shape relation between corruption and economic growth, i.e., corruption increases up to a certain level as economic growth goes up; after that it decreases. Although a considerable part of research exhibit corruption as an impediment to economic growth (Mauro, 1995; Mo, 2001; Gyimah-Brempong, 2002; Ugur, 2014; Hakimi and Hamdi, 2017) but not much work has been done when we see the inverted U- shape relation between corruption and growth in the long-run.

The standard co-efficient of political stability is 0.06 with the p-value 0.00, less than 0.05. This shows that political stability pulls economic growth for BRICS countries. This indicates that political stability is an important indicator for the growth of these countries also there are studies that have shown the optimistic influence of political stability on economic growth (Gani, 2011; Omoteso et al., 2014; Bashir, 2014).

The trade openness standard co-efficient is 0.22 and its p-value is 0.00, which less than 0.05, thus indicating that trade openness has a positive spillover impact on economic growth in BRICS. Numerous studies carried out by researchers (Dollar and Kraay, 2004; Wang, Liu, and Wei, 2004; Das and Paul, 2011; and Nowbutsing, 2014) have proved empirically the beneficial impact of trade openness on economic growth.

Table 4 presents the short run analysis. The error correction term for the sample is -0.13 with the p-value as 0.06 which shows that it is statistically significant in all its specification and shows the model coverage towards equilibrium. This explains that any shock in economic growth is adjusted by almost 13% within first year and the system convergence to the long run will take approximately five years. Also the positive sign of corruption square reveal the positive impact on growth and has been empirically supported by many researchers (Meon and Weill 2010; Swaleheen, 2011; Huang, 2016; Shittu, Hassan, and Nawaz, 2018). The portion of studies supports that the impact of corruption on economic growth is positive and it increases the output and productivity. In our findings the short-run results shows that corruption square increases economic growth, the standard co-efficient is 0.00 with p-value 0.000, are showing that the result is significant at 1% level of significance.

The standard coefficient value is 0.00 with p-value 0.00 which is less than 0.05. The result shows a positive affiliation between political stability and economic growth in the short run also. The results were synchronized with the earlier studies carried by (Zhao, Kim, and Du, 2003; Akcay, 2006; and Brito-Bigott et al., 2008). The role of political stability plays an important role for the development of both developed and developing economies of the world.

The coefficient trade openness is statically significant at 10 percent level of significance, explaining a negative association between openness of trade and growth in the short run. The value of coefficient is -0.02 and the p-value is 0.06. The results are in line with the research of (Vlastou, 2010; Lawal et al., 2016; Musila & Yiheyis, 2015; and Ulasan, 2015).

*Table: 4 Panel ARDL Test Results:*

Variable	Coefficient	Prob
Long Run Relationship		
CORR	0.05***	0.00
CORR2	-0.04***	0.00
POL	0.06***	0.00
TO	0.22***	0.00
Short Run Equation		
Constant	3.59**	0.05
(CORR)	-0.00	0.75
(CORR2)	0.00*	0.08
(POL)	0.00	0.64
(TO)	-0.02*	0.06
(CORR(-1))	0.01	0.36
(CORR2(-1))	0.00	0.27
(POL(-1))	0.00***	0.00
(lnGDP(-1))	0.21	0.58
(TO(-1))	-0.02**	0.05
ECT(-1)	-0.13*	0.06

Note: \*\*\* and \*\* indicate significance levels at 1 and 5 %, respectively. lnGDsP (-1)

refers to . is the difference operator.

#### **4.4. Panel Granger Causality Approach**

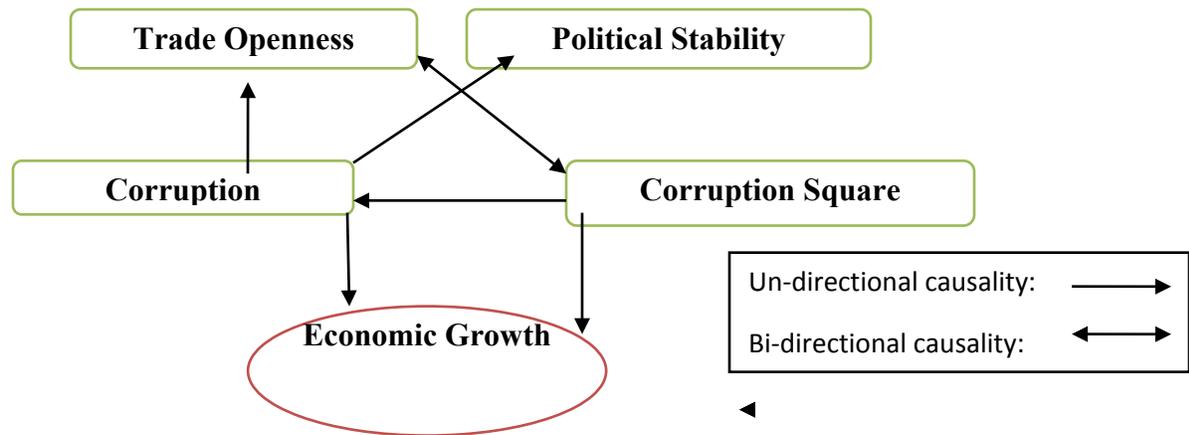
The Granger Causality results are used to investigate causality direction among the variables and it is evident in Table 5. The result indicates evidence of causality from CORR1 and lnGDP, CORR2 and lnGDP, CORR2 and CORR1, AND CORR1 and TO .There results shows that there

is uni-directional causality among these variables. There is also bi-directional causality running from CORR2 and TO.

Table 5: Pair Wise Granger Causality Results:

	lnGDP	CORR	CORR2	POL	TO
lnGDP	.....	0.34(0.55)	0.01(0.89)	0.14(0.700)	0.38(0.58)
CORR	4.02** (0.04)	.....	1.26(0.26)	2.92*** (0.09)	5.66** (0.01)
CORR2	4.20** (0.04)	3.87** (0.05)	.....	2.17(0.14)	3.73** (0.05)
POL	1.76(0.18)	1.96(0.16)	0.34(0.56)	.....	0.00(0.92)
TO	0.92(0.33)	0.03(0.85)	13.08* (0.00)	2.00(0.16)	.....

Notes: \*\*\*, \*\*and \* indicate significance levels at 1, 5 and 10%, respectively.



## 5. Policy Implications

The very notion of perfect world is a dream. One cannot create a world by just thinking well, there are a fair amount of imperfections that are ignored or just not taken into consideration. We draw important policy implications from our paper for policy makers. We cannot deny the fact that corruption is bad for economic growth and fighting corruption will be more meaningful when we have deeper knowledge about it, not just because it is against the rules will not be sufficient alone.

The result shows that in the long-term there is an inverted U-shaped affiliation between corruption and economic growth i.e., corruption does increases economic growth to a certain level than it starts showing its negative impact on economic growth. Now it becomes very important to design policies on simple and concrete indicators so that it is manageable and focus on the results and not on the abstract. Regular monitoring of the policies will enhance accountability and results. The technology can also be built and used to combat corruption. It

becomes difficult to remove it from the countries where it prevails and removing corruption requires long period of time and policies that don't harm the growth of the economy because a sudden shock to remove corruption at times can be harmful for the growth of the economy. At times it is wise to accept as it is an obstinate part of the developing economies.

For long-run growth stability in the system is of utmost importance. The stable government can make policies and can implement them to achieve the growth target. For a politically stable government the making and implementation of policy becomes easy and it is also seen that political stability attracts investment, productivity and trade. Trade among nations should be encouraged and the policy makers should make sure that the resources are not over utilized. The trade should not affect the domestic producers in fact the policies should be such that it benefits them and not just exploit them. When we make a policy we need to address the root cause of corruption, can make our policies and try to alleviate its effect on the design and implementation of the policies.

## **6. Conclusion**

This study is an attempt to explore the impact of corruption, corruption square, political stability and trade openness on economic growth in BRICS countries by using ARDL technique on a panel data from 2002-2018. The econometric analysis begins with checking the stationarity for which we have employed LLC; 2002, Breitung; 2000 and Im et al.; 2003. After checking for unit root we move on to check the cointegration and the results Pedroni; 1999, Kao; 1999 and Fisher; 1999 confirmed that there is long-run cointegration. To examine the relationship the panel ARDL approach is employed.

The results of the ARDL test show that the effect of corruption, political stability and trade openness is influencing economy's growth in the upward direction. The positive effect of corruption can be felt in these countries but we went beyond this and found that corruption square showing diminishing impact on the growth of the economy. We found an inverted U-shaped association between corruption and economic growth in BRICS countries. There was a positive impact of political stability on growth both in the long as well as short run as it is one of the essential factors that uphold economic growth. Whereas, there was a positive impact of trade openness on the economy's growth rate in the long-term and we see a downbeat impact of trade openness on the growth of the economy in the short-term. Conversely, the outcome of the granger causality approach showed a uni-directional causality from CORR1 and lnGDP, CORR2 and lnGDP, CORR2 and CORR1, and CORR1 and TO and bi-directional causality from CORR2 and TO.

In the present study, we have taken BRICS countries and all these countries are developing countries. For further research, one can analyse the new data set and estimate the results for the individual countries. Thus, the reader would see the peculiarity between the individual and

countries as a whole in terms of relationship between corruption, political stability and trade openness on economic growth.

## References

- Aisen, A., & Veiga, F. J. (2013). How does political instability affect economic growth? *European Journal of Political Economy*, 29, 151-167.
- Akçay, S. (2006). Corruption and human development. *Cato J.*, 26, 29.
- Alesina, A., & Perotti, R. (1996). Income distribution, political instability, and investment. *European Economic Review*, 40(6), 1203-1228.
- Bardhan, P. (1997). Corruption and development: a review of issues. *Journal of Economic Literature*, 35(3), 1320-1346.
- Bashir, M. F., & Xu, C. (2014). Impact of political freedom, economic freedom and political stability on economic growth. *Journal of Economics and Sustainable Development*, 5(22), 59-67.
- Breitung, J., & Das, S. (2005). Panel unit root tests under cross-sectional dependence. *Statistica Neerlandica*, 59(4), 414-433.
- Brito-Bigott, O., Faria, H. J., Rodríguez, J. M., & Sánchez, A. (2008). Corruption and Complex Business Rules. *Journal of Private Enterprise*, 24(1).
- Cebula, R. J. (2011). Economic growth, ten forms of economic freedom, and political stability: An empirical study using panel data, 2003-2007. *Journal of Private Enterprise*, 26(2), 61.
- Coupet Jr, E. (2003). Corruption, investment and economic growth: theory and international evidence. *Journal of Business & Economics Research (JBER)*, 1(1).
- Dollar, D., & Kraay, A. (2002). Spreading the wealth. *Foreign Aff.*, 81, 120.
- Dollar, D., & Kraay, A. (2004). Trade. *Growth and Poverty. Economic Journal*, 114, 22-49.
- Easterly, W., & Rebelo, S. (1993). Fiscal policy and economic growth. *Journal of Monetary Economics*, 32(3), 417-458.
- Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: Journal of the Econometric Society*, 251-276.
- Fayissa, B., & Nsiah, C. (2013). The impact of governance on economic growth in Africa. *The Journal of Developing Areas*, 47(1), 91-108.
- Fosu, A. K. (2001). Political instability and economic growth in developing economies: some specification empirics. *Economics Letters*, 70(2), 289-294.

Frankel, J. A., & Romer, D. (1999). Does trade cause growth? *American Economic Review*, 89, 379.

Freund, C., & Bolaky, B. (2008). Trade, regulations, and income. *Journal of Development Economics*, 87, 309

Gani, A. (2011). Governance and growth in developing countries. *Journal of Economic Issues*, 45(1), 19-40.

Gyimah-Brempong, K. (2002). Corruption, economic growth, and income inequality in Africa. *Economics of Governance*, 3(3), 183-209.

Gyimah-Brempong, K., & de Gyimah-Brempong, S. M. (2006). Corruption, growth, and income distribution: Are there regional differences? *Economics of Governance*, 7(3), 245-269.

Hakimi, A., & Hamdi, H. (2017). Does corruption limit FDI and economic growth? Evidence from MENA countries. *International Journal of Emerging Markets*, 12(3), 550-571.

Huang, C. J. (2016). Is corruption bad for economic growth? Evidence from Asia-Pacific countries. *The North American Journal of Economics and Finance*, 35, 247-256.

Huynh, K. P., & Jacho-Chávez, D. T. (2009). A nonparametric quantile analysis of growth and governance. In *Nonparametric Econometric Methods* (pp. 193-221). Emerald Group Publishing Limited.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53-74.

Irwin, D. A., & Tervio, M. (2000). Does Trade Raise Income? Evidence from the.

Jong-A-Pin, R. (2009). On the measurement of political instability and its impact on economic growth. *European Journal of Political Economy*, 25(1), 15-29.

Kao, C., & Chiang, M. H. (2001). On the estimation and inference of a cointegrated regression in panel data. In *Nonstationary panels, panel cointegration, and dynamic panels* (pp. 179-222). Emerald Group Publishing Limited

Karras, G. (2003). Trade openness and economic growth: Can we estimate the precise effect? *Applied Econometrics and International Development*, 3, 7-24.

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. *Cogent Economics and Finance*, 4, 1-15.

Leff, N. H. (1964). Economic development through bureaucratic corruption. *American Behavioral Scientist*, 8(3), 8-14.

- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of Econometrics*, 108(1), 1-24.
- Lui, F. T. (1985). An equilibrium queuing model of bribery. *Journal of Political Economy*, 93(4), 760-781.
- Mallik, G., & Saha, S. (2016). Corruption and growth: a complex relationship. *International Journal of Development Issues*, 15(2), 113-129.
- Marelli, E., & Signorelli, M. (2011). China and India: Openness, trade and effects on economic growth. *The European Journal of Comparative Economics*, 8, 129–154.
- Mauro, P. (1995). Corruption and growth. *The Quarterly Journal of Economics*, 110(3), 681-712.
- Méon, P. G., & Weill, L. (2010). Is corruption an efficient grease? *World development*, 38(3), 244-259.
- Mo, P. H. (2001). Corruption and economic growth. *Journal of Comparative Economics*, 29(1), 66-79.
- Musila, J. W., & Yiheyis, Z. (2015). The impact of trade openness on growth: The case of Kenya. *Journal of Policy Modeling*, 37, 342.
- Nowbutsing, B. M. (2014). The impact of openness on economic growth: Case of Indian Ocean rim countries. *Journal of Economics and Development Studies*, 2, 407–427.
- Omoteso, K., & Ishola Mobolaji, H. (2014). Corruption, governance and economic growth in Sub-Saharan Africa: a need for the prioritization of reform policies. *Social Responsibility Journal*, 10(2), 316-330.
- Omoteso, K., & Ishola Mobolaji, H. (2014). Corruption, governance and economic growth in Sub-Saharan Africa: a need for the prioritisation of reform policies. *Social Responsibility Journal*, 10(2), 316-330.
- Paksha Paul, B. (2010). Does corruption foster growth in Bangladesh? *International Journal of Development Issues*, 9(3), 246-262.
- Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and statistics*, 61(S1), 653-670.
- Polat, A., Shahbaz, M., Rehman, I. U., & Satti, S. L. (2015). Revisiting linkages between financial development, trade openness and economic growth in South Africa: Fresh evidence from combined cointegration test. *Quality and Quantity*, 49, 785–803.

- Rodriguez, F., & Rodrik, D. (2000). Trade policy and economic growth: a skeptic's guide to the cross-national evidence. *NBER Macroeconomics Annual*, 15, 261-325.
- Rodriguez, F., & Rodrik, D. (2000). Trade policy and economic growth: a skeptic's guide to the cross-national evidence. *NBER macroeconomics annual*, 15, 261-325.
- Rodríguez, F., & Rodrik, D. (2001). *NBER Macroeconomics Annual 2000*.
- Rodrik, D. (1991). Policy uncertainty and private investment in developing countries. *Journal of Development Economics*, 36(2), 229-242.
- Rodrik, D. (1992). *The rush to free trade in the developing world: Why so late? Why now? Will it last?* (No. w3947). National Bureau of Economic Research.
- Samuel, P. (1989). Huntington (1968). *Political order in changing societies*, 146.
- Shittu, W. O., Hassan, S., & Nawaz, M. A. (2018). The nexus between external debt, corruption and economic growth: evidence from five SSA countries. *African Journal of Economic and Management Studies*, 9(3), 319-334.
- Swaleheen, M. (2011). Economic growth with endogenous corruption: an empirical study. *Public Choice*, 146(1-2), 23-41.
- Ugur, M. (2014). Corruption's direct effects on per-capita income growth: a meta-analysis. *Journal of Economic Surveys*, 28(3), 472-490.
- Ulaşan, B. (2015). Trade openness and economic growth: Panel evidence. *Applied Economics Letters*, 22, 163.
- Vlastou, I. (2010). Forcing Africa to open up to trade: Is it worth it? *The Journal of Developing Areas*, 44, 25.
- Wang, C., Liu, X., & Wei, Y. (2004). Impact of openness on growth in different country groups. *The World Economy*, 27, 567-585.
- Wedeman, A. (1997). Looters, rent-scrappers, and dividend-collectors: Corruption and growth in Zaire, South Korea, and the Philippines. *Journal of Developing Areas*, 31, 457-478.
- Yanikkaya, H. (2003). Trade openness and economic growth: A cross-country empirical investigation. *Journal of Development Economics*, 72, 572
- Zhao, J. H., Kim, S. H., & Du, J. (2003). The impact of corruption and transparency on foreign direct investment: An empirical analysis. *Management International Review*, 43(1), 41.

