

## Public expenditure and economic development: New evidence from the BRICS-SAARC-ASEAN region

**Mohd Arshad ANSARI**

University of Hyderabad, India

16seph17@uohyd.ac.in

**Faraz KHAN**

Aligarh Muslim University, UP. India

frzk20@gmail.com

**Manish Kumar SINGH**

Banaras Hindu University, India

rathourmani92@gmail.com

**Abstract.** *Regardless of theoretical backgrounds that assumed a positive association between public expenditure and economic development, the present study on this linkage is inconclusive. This empirical work re-investigates the effect of government expenditure on GDP growth employing more recent dataset spanning the period 1991-2019 in the region of Brazil, Russia, India, China, South Africa (BRICS), Association of South East Asian Nations (ASEAN), and South Asian Association for Regional Cooperation (SAARC). Considering the issues of cross sectional dependence, the estimated findings show long run relationship between government size, inflation, human capital, employment, unemployment, export, and economic growth. The fully modified OLS estimates reveal that government spending has a positive influence on economic development. Further, the analysis indicates that human capital, employment, and export increases economic growth. However, unemployment and inflation have a detrimental effect on economic development. Our result confirms the unidirectional causality between public spending and economic growth, suggesting Keynesian view of public spending in stimulating economic development. The sensitivity of the results have been checked with the help of dynamic OLS estimator.*

**Keywords:** Government expenditure; Economic development; Human capital; Keynesian macroeconomic theory; Dumitrescu-Hurlin panel causality; Asian economies.

**JEL Classification:** C10, E24, H50, O10.

## 1. Introduction

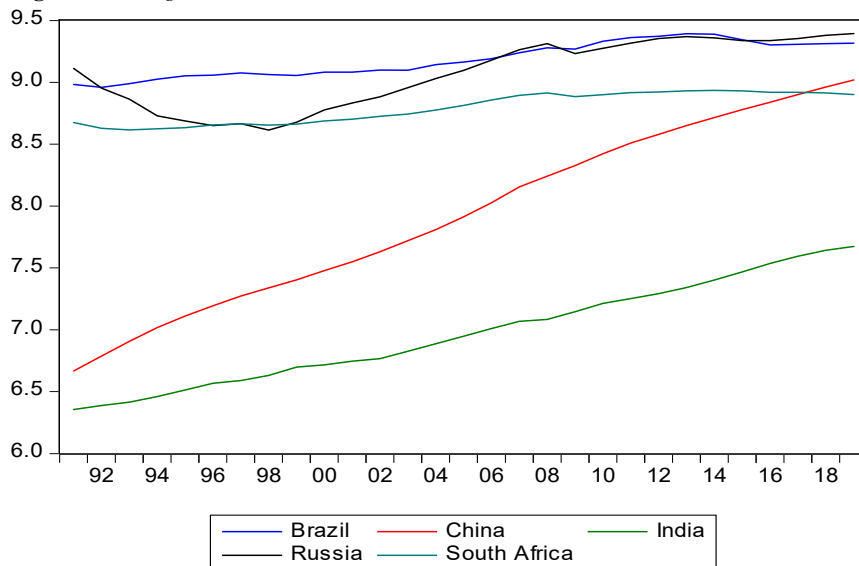
Public expenditure is an important element of economic policy to stimulate strong and sustainable economic growth, used by the government as an effective tool. It directs at increasing country's growth via budgetary development that will enhance the spending of the private sector as well as bringing growth via multiplier effect. Nevertheless, public spending is a double-edged sword (Ahmed and Loganathan, 2015). While high economic growth could results, but through crowding-out effects the overall economic growth might get hampered. Thus, increasing the government expenditure at the cost of higher borrowing and taxes could impact the consumer's permanent income affecting their consumption.

The fundamental aspect behind the economic growth and government expenditure relationship has been the subject of intense research both for academicians and policymakers over the last many years. Essentially there has been two important directions of exploration at theoretical level: Keynesian macroeconomics and Wagner's law theory. Keynesian perspective of economic growth overstates the importance of public spending that regulates the rate of economic progress and assert that government spending have positive effect on economies growth. Conversely, Wagner's law hypothesis postulates economic growth as foremost determinants of increase in government spending. This would provide an opportunity to collect more tax for revenue purposes making available more space for subsidies and government disbursement (Wagner, 1958).

In the literature, economic growth has been measured a high level issue both as macro and micro issues, such as employment, unemployment, education, inflation, tax, and health respectively (Reyes and Useche, 2019). However, numerous empirical papers have examined the influencing determinants that would help to enhance country's growth. Solow (1956) revealed that capital and labour are the significant factors of economic development. Since then the Solow model has been extended by employing urbanization, industrialization, foreign direct investment and taxes, education, and income etc. (Ahmed et al., 2019). These empirical studies confirmed the presence of numerous factors encompassing market structures, economic systems, geographical differences, demographics and time period (Tvaronaviciene et al., 2018; Musibau et al., 2019). There remains no consensus regarding the significant determinants for economic development, despite the large number of studies.

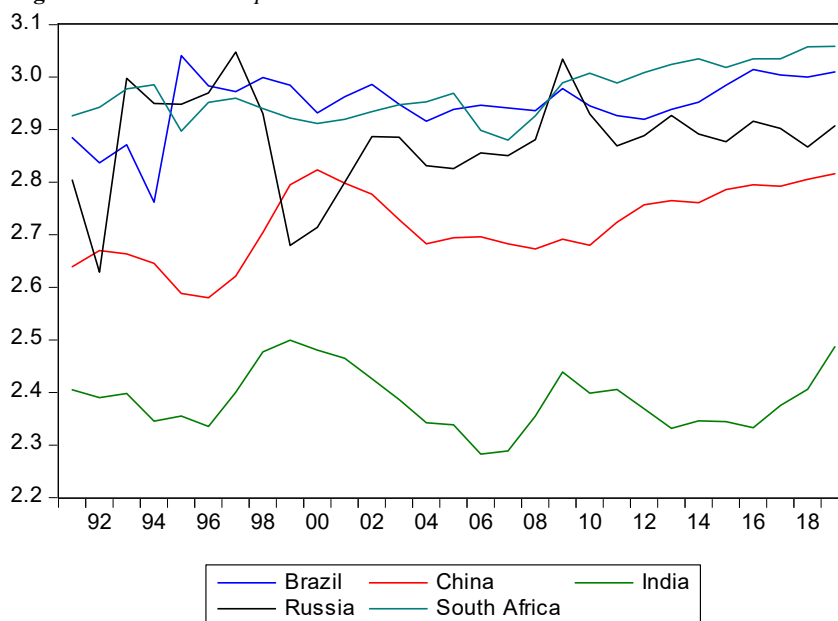
In this respect, it is vital for the government to increase its expenditure to stimulate economic growth. Evidence reveals that public expenditure enhance the development of an economy (Ahuja and Pandit, 2020). For instance, according to the International monetary fund (IMF), the countries with the highest level of public spending as percentage of GDP are predominantly with Western Europe and other developed countries, while lowest government expenditure tend to be in developing countries. Despite the importance of government spending in developing nations like Brazil, Russia, India, China, South Africa (BRICS), Association for South East Asian Nations (ASEAN), and South Asian Association for Regional Cooperation (SAARC) in the government budget is still under represented due to fiscal imbalance (IMF, 2018).

**Figure 1.** GDP growth rate in BRICS



Source: World Bank (2019).

**Figure 2.** Government expenditure in BRICS

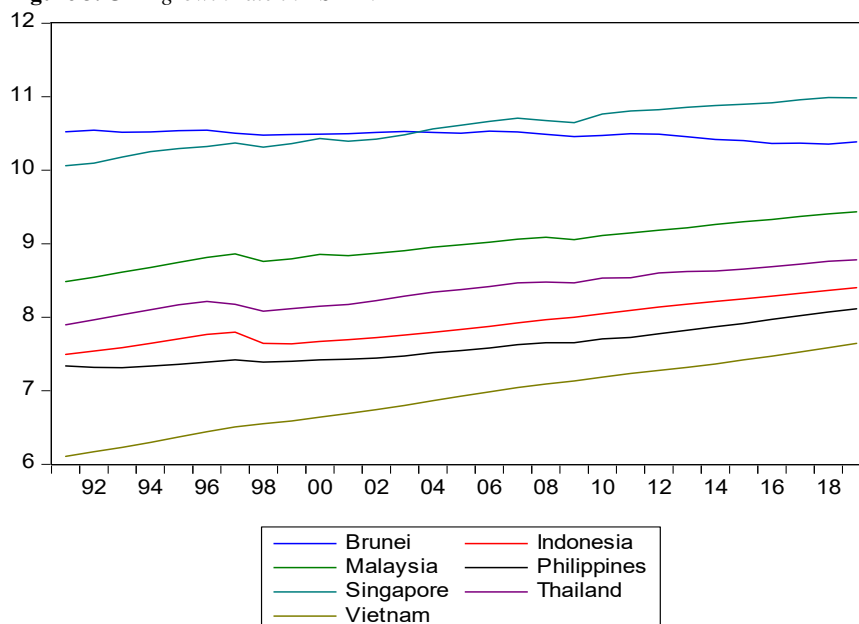


Source: World Bank (2019).

Based on expected trajectories and data provided by the IMF (2018) and the World Bank (2019), Asia's fastest growing economy used as a model for other developing nations; the economic growth of BRICS region was 25.7% in 2015 and their share expected rise to 40% in the next two decades (IMF 2018). The government expenditure as percentage of GDP

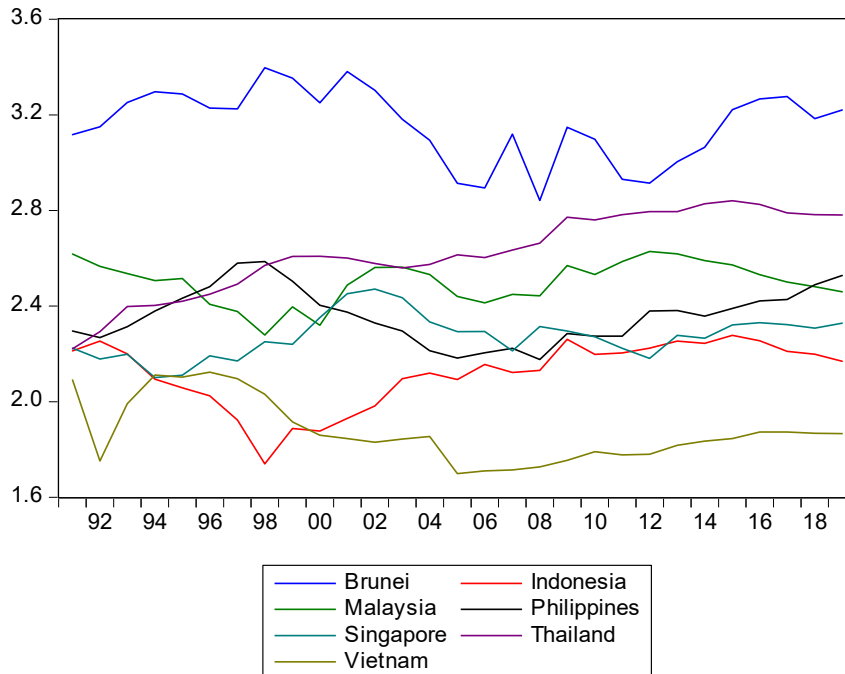
was highest in Brazil with 38.4% whereas lowest was in India with 26.1% as percentage of GDP. The GDP growth of ASEAN countries was 4.9% in 2019 driven mostly by investment and strong domestic demand. The economic growth of Singapore, according to World Bank (2019) was highest followed by Brunei, Malaysia, Thailand, Indonesia, Philippines, and Vietnam while the government expenditure in Brunei, Thailand, Malaysia, Philippines, Singapore, Indonesia, and Vietnam is gradually increasing. Finally, the GDP growth rate of SAARC region was 7.2% in 2018 (ADB 2018). Through consumer spending, government initiatives, and increased private expenditure lead to rise in growth rate of GDP to 7.6% in 2018. The economic progression of Sri Lanka, India, Pakistan, and Bangladesh in particular are good listen for other developing countries to benefit from these countries. India's construction and manufacturing sectors plays a significant role in GDP growth that accounted for 6.9% during the financial year 2018-19. In terms of garment industry, Bangladesh has an economic progression which contributed about 6.9% country's GDP in 2017. Pakistan's growth rate was 5.2% which linked to security purposes. The economic progression of Nepal was 5.4% in 2018. Nepal is still on the way to revive its economic growth due to its recovering the earthquake that took the lives of 9,000 and injured 23,000 people approximately in 2019. On the other hand government expenditure was lowest in Bangladesh while highest was in Nepal in 2019. These data indicates a gradual rise in GDP growth rate as well as government expenditure over time (see Fig. 1-6). Thus, we can say that government expenditure is an effective policy to sustain economic growth. In the narrowest sense, the government's involvement in the economy would help to correct situations and market failures which stabilizes economy.

**Figure 3.** GDP growth rate in ASEAN



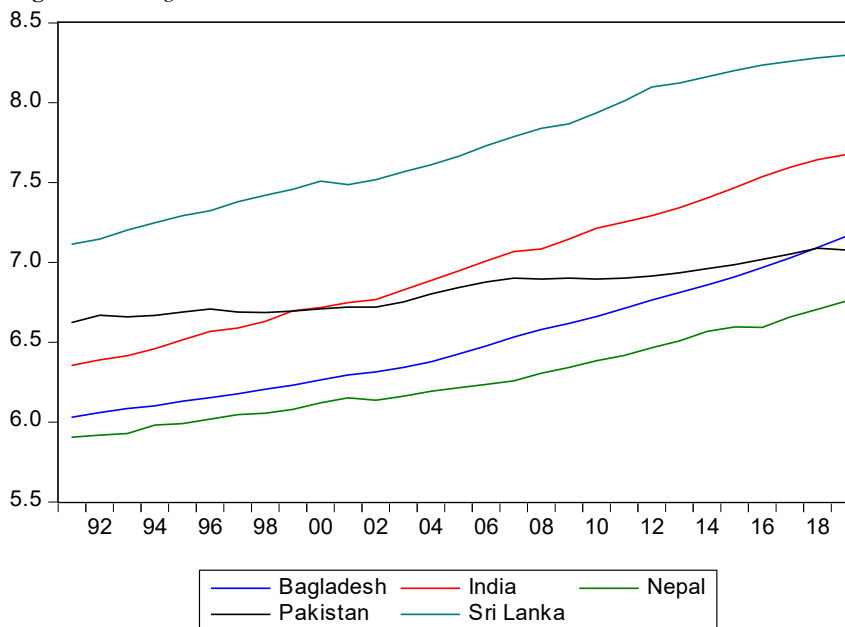
Source: World Bank (2019).

**Figure 4.** Government expenditure in ASEAN

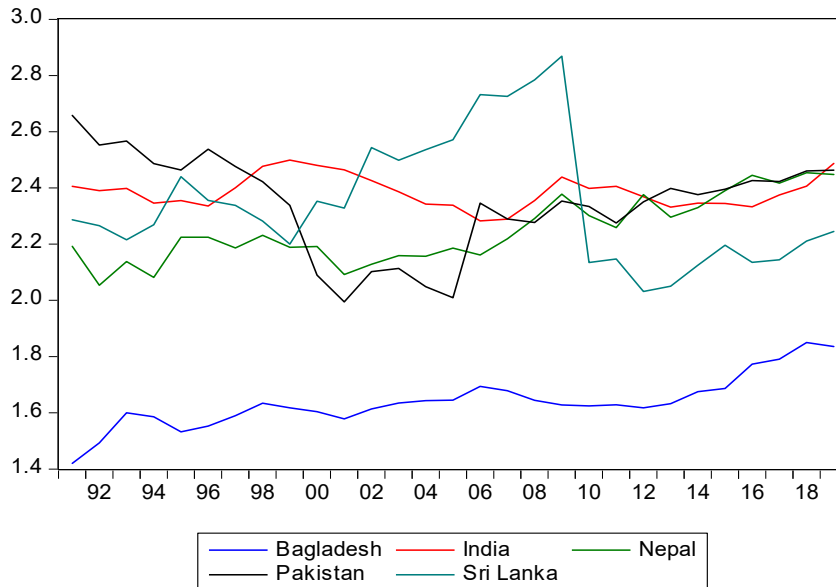


Source: World Bank (2019).

**Figure 5.** GDP growth rate in SAARC



Source: World Bank (2019).

**Figure 6.** Government expenditure in SAARC

Source: World Bank (2019).

Hence, realizing the significance of government expenditure and its addition to the country's economy, academicians and researchers have started investigating the relationship between public expenditure and economic development for last many years. However, large number of empirical papers are from single country cases, for instance, Bagdigen and Cetintas (2004) for Turkey, Hussain and Zafar (2017) for Pakistan, Abomaye-Nimenibo and Samuel (2020) for Nigeria, Barlas (2020) for Afghanistan, but such empirical studies on panel country cases are limited. Furthermore, to the best understanding of authors there is no such study has been yet conducted in the Regional organizations in Asia such as BRICS-ASEAN-SAARC member countries together using macro data. The purpose of selecting these panel countries is because they have common objective to stimulate economic growth among the member group countries Moreover, recently there have been a significant change in the pattern of government expenditure and economic growth in these regional groups. Hence there is a need of close examination of the association between government expenditure, its macroeconomic factors and economic growth to design nuance expenditure-growth policy.

The motivation of this work lies in two points (i) the available studies does not include human capital variable within their analysis to examine the relationship between government expenditure and economic development; (ii) the existing articles mostly ignored the issue of cross sectional dependence and heterogeneity which may lead to inefficient, inconsistent and bias results.

The potential contribution of this empirical work are (a) the present study aims to examine the impact of government expenditure on economic development by using a more recent data set covering the period 1991-2019. (b) this paper employs other important determinants of economic growth such as human capital, inflation, employment,

unemployment, export of goods and services as control variables to observe its impact on economic development<sup>(1)</sup>. (c) According to the Asian Development Bank (2019), Asian economies is one of the fastest growing countries as well as the largest continental economy by both public-private partnership and GDP nominal, therefore comparative analysis among Regional organization such as BRICS-ASEAN-SAARC panel countries would be an important aspect to analyze in terms of economic growth performance<sup>(2)</sup> (d) the examination of the BRICS-ASEAN-SAARC region is of interest of researchers and policy makers since government expenditure over the last few years have declined<sup>(3)</sup>, hence it would be imperative to suggest some suitable policy implication on expenditure-GDP nexus, and results can be generalized. (e) Lastly, to overcome the problem associated with cross sectional dependence and heterogeneity, this study used econometric approaches like fully modified OLS and dynamic OLS for long run estimates and for granger causality Dumitrescu-Hurlin panel causality have been tested.

## 2. Literature Review

Various theoretical arguments and empirical evidence have been presented in the existing literature over the linkage between public expenditure and economic growth. According to the Keynesian economists, increasing government expenditure, boosts domestic demand, especially during economic downturns, when the powers of the free market struggle to sustain equilibrium due to labour market rigidity. In 1876, Adolph Wagner endorsed the "Law of increasing expansion of public and particularly state activities" known as the "law of increasing expansion of fiscal requirements". The law indicates that, as economic growth continues, the share of the public sector in the economy will increase due to the intensification of existing operations and the expansion of new activities. Therefore, in Wagner's opinion, government expenditure is a significant factor of economic development, and not vice versa. But, one may wonder, is it empirically true that countries with higher government spending rates have lower economic growth, and vice versa? Then we find various empirical studies with the conflicting conclusion.

The United Kingdom based empirical analysis offered an explanation for fluctuations in public spending over time (Peacock & Wiseman, 1961). The hypothesis put forward is that, due to revenue increases, public spending rises. Rubinson, (1977) inferred that by reducing "dependence", specifically in poorer developing countries, a bigger government size, demonstrated by the share of government revenue in GNP, stimulates economic growth. This was refuted by the findings of a later study by Marsden, (1984). Landau, (1983, 1987) also claims that per capita growth was depressed by the greater size of the government. Ram, (1986), however, used a sample of 115 developed and developing countries and concluded, using a production function approach, that the effect of government size on growth is positive in almost all cases, with a stronger relationship for countries with lower incomes. Interestingly, a simultaneous equation model was used by Grossman, (1988) to allow for a nonlinear relationship between government growth and overall economic growth. A weak positive effect was found in this model, which would have been lacking in the equivalent linear model.

The association between government expenditure and GDP for Sudan was investigated by Ebaidalla, (2013) and the result supported the Keynesian hypothesis, where causation was found between government expenditure and economic development. In India, between 1998 and 2012, Gangal & Gupta, (2013) discovered a unilateral linkage between government spending and economic growth. Over the period of 1929-1996, Islam, (2001) analyzed the relation between spending and economic progress in the USA. The findings were consistent with Wagner's legislation. In a case study in Greece, (Loizides & Vamvoukas, 2005) find that the Wagnerian hypothesis concurs with trivariate and bivariate models. In the case of Turkey, Bayrakdar et al., (2015) tested the validity of Wagner's law and found public spending to be a significant instrument for boosting economic development. Several studies (Dritsakis & Adamopoulos, 2004; Huang, 2006; Wu et al., 2010) use various econometric approaches to support both views, i.e. the theory of Keynes and the rule of Wagner. This means that between government expenditure and economic growth, there is bidirectional causality.

Along with the above many Studies (Blankenau et al., 2007; Ebaidalla, 2013; Govindaraju & Rao, 2011; Loizides & Vamvoukas, 2005; Dogan & Tang, 2006;) stand in the favor of one way causality from government expenditure to GDP growth rate. Several studies (Akitoby et al., 2006; Samudram et al., 2009; Srinivasan, 2013; Thabane & Labina, 2016) have been favor of unidirectional causality from GDP to government spending. And some studies (Abu-Eideh, 2015; Cheng & Lai, 1997; Singh & Sahni, 1984; Tang, 2009) stand in the Favor of two way causality between government spending and GDP per capita.

From the existing literature, it is clear that no definitive proof has been given for any of the hypotheses. This is because, in different cases, not only are different factors at stake, but because the essence of the economies being studied is often different. Therefore aims of the present study is to we examine the effect of government expenditure, human capital, employment, unemployment, inflation, and export on economic growth covering recent dataset over the period 1991-2019

### 3. Data and Methodology

The present empirical work employed panel data for BRICS including Brazil, Russia, India, China, and South Africa, SAARC countries such as Nepal, Bangladesh, India, Sri Lanka, and Pakistan, ASEAN countries includes Indonesia, Malaysia, Thailand, Singapore, Philippines, Vietnam, and Brunei spanning the period 1991-2019 to examine the nexus between public expenditure, inflation, employment, human capital, unemployment, and export on economic growth. The selection of these panel member countries based on the low government expenditure in these regions. All the variables under consideration have been collected from the World Development Indicators except data on human capital and employment were retrieved from the Penn World Tables. The details description of variables, and its measurements is given in Table 1.



**Table 1.** Description of the Variables

Variables	Symbol	Description	Unit	Source
Economic growth	EG	Gross domestic product per capita	Constant 2010 US dollar	World Development Indicator
Public expenditure	PE	Government expenditure	Percentage of GDP	World Development Indicator
Inflation	INF	Change in the consumer price index	Annual percentage	World Development Indicator
Employment	EMP	Number of persons engaged	In million	Penn World Table
Unemployment	UEMP	Unemployment refers to the share of the labor force that is without work but available for and seeking employment.	Percentage of total labor force	World Development Indicator
Human capital	HC	Based on years of schooling and returns to education	Enrollment rates	Penn World Table
Export	EX	Exports of goods and services	Percentage of GDP	World Development Indicator

In this study, we follow Pradhan and Bagchi (2012), Dudzeviciute et al. (2018), and Ahuja and Pandit (2020), to analyze the impact of public expenditure and other macroeconomics variables on economic growth. Therefore, our baseline model can be given as follows.

$$EG = f(PE, HC, INF, EMP, UEMP, EX) \quad (1)$$

All the variables are converted into their natural log form. Bhat (2018) state that the findings derived from natural logarithmic model provide more efficient and consistent results. Hence, Equation (1) is written in log form as

$$\ln EG_{it} = \alpha_0 + \alpha_1 \ln PE_{i,t} + \alpha_2 \ln HC_{i,t} + \alpha_3 \ln INF_{i,t} + \alpha_4 \ln EMP_{i,t} + \alpha_5 \ln UEMP_{i,t} + \alpha_6 \ln EX_{i,t} + \mu_{i,t} \quad (2)$$

Where,  $\ln EG$  is the natural log of economic growth,  $\ln PE$  is the natural log of public expenditure (government expenditure),  $\ln HC$  is the natural log of Human capital,  $\ln INF$  is the natural log of inflation,  $\ln EX$  is the natural log of export,  $\ln EMP$  and  $\ln UEMP$  is the natural log of employment and unemployment respectively. Moreover, the vector  $i, t$ ,  $\alpha$  and  $\mu$  represents the country, time, parameters of long run estimates, and the white noise error term respectively.

In order to analyze the stationarity of the considered variables, this work employed the most popular method of unit root tests, including IPS unit root test proposed by Pesaran (2007) and LCC proposed by Levin et al. (2002). The Im-Pesaran-Shin tests assumes individual unit root procedures and have null hypothesis of non-stationary (unit root) against the alternate hypothesis of no unit root (stationary). It process with heterogeneous adjustment. LCC test assumes the common unit root procedures.

Both these tests assumes the first order autoregressive coefficient across the countries where in LCC it found to be constant suggesting that it varies across the regions. Furthermore, numerous researchers have argued that IPS unit root have more power and are superior to any other test in analyzing the long run association in panel data and consider the issues of cross sectional dependence.

The next step in the empirical analysis is to check the long run relationship among the variables, for this purpose there are several cointegration tests such as Kao (2001), Pedroni

(1999), and a Johansen fisher type cointegration test. Unfortunately a great majority of empirical studies have employed Pedroni and Kao cointegration to examine the long run relationship. Therefore in this work we only use Fisher cointegration test developed by Maddala and Wu (1999) to examine the long run relationship among economic growth, human capital, employment, Inflation, unemployment, export. This test is the combined Johansen test based on probability values indicating individual maximum eigenvalues and trace statistics<sup>(4)</sup>.

For robustness of the empirical work, the study applied the fully modified ordinary least square (FMOLS) developed by Pedroni (2000) and Dynamic ordinary least square (DOLS) developed by Stock and Watson (1993) techniques to obtain the efficient consistent estimates. These methods are useful in overcoming the issue related to serial correlation and endogeneity problem. This study further applied recently developed Dumitrescu Hurlin panel granger causality test proposed by Dumitrescu and Hurlin (2012). Unlike traditional Granger causality tests, this test provides efficient and consistent outcomes in the presence of heterogeneity and cross sectional dependence.

#### 4. Empirical Results and Analysis

The summary statistics for BRICS, SAARC, and ASEAN panel countries are shown in Table 2. The economic growth has a higher mean average value i.e. 8.3, followed by employment, export, public expenditure, inflation, unemployment, human capital. The paper reveals the highest variance is for inflation (1.43), followed by employment (1.42), economic growth (0.92), unemployment (0.70). For SAARC region, the highest mean value is for economic growth (6.85), followed by employment, export, public expenditure, inflation, unemployment, human capital.

Considering the variance of data, employment is highest and lowest variance are observed in human capital. The highest mean value and variance in ASEAN countries found in economic growth.

**Table 2.** Summary statistics

	Variables	Mean	Median	Max.	Min.	Std Dev.	Obs.
BRICS	lnEG	8.389	8.775	9.393	6.355	0.925	145
	lnPE	2.780	2.877	3.058	2.282	0.226	145
	lnHC	0.859	0.832	1.233	0.411	0.213	145
	lnINF	2.097	1.852	7.638	-1.056	1.437	145
	lnEMP	4.817	4.498	6.675	2.433	1.427	145
	lnUEMP	2.096	1.829	3.510	0.863	0.700	145
	lnEX	3.003	3.083	4.132	1.906	0.446	145
SAARC	lnEG	6.855	6.752	8.296	5.905	0.590	145
	lnPE	2.192	2.288	2.868	1.419	0.316	145
	lnHC	0.622	0.577	1.064	0.275	0.237	145
	lnINF	1.906	2.007	3.116	0.696	0.513	145
	lnEMP	3.630	3.625	6.317	1.598	1.479	145
	lnUEMP	1.066	1.377	2.685	-0.921	0.862	145
	lnEX	2.790	2.782	3.663	1.896	0.405	145
ASEAN	lnEG	8.689	8.400	10.986	6.108	1.337	145

	Variables	Mean	Median	Max.	Min.	Std Dev.	Obs.
	lnPE	2.415	2.357	3.396	1.698	0.400	145
	lnHC	0.915	0.931	1.455	0.543	0.146	145
	lnINF	0.954	1.177	4.068	-4.091	1.223	145
	lnEMP	3.130	3.451	4.849	0.391	1.123	145
	lnUEMP	1.153	1.264	2.231	-0.715	0.597	145
	lnEX	4.124	4.171	5.433	2.912	0.622	145

Table 3 shows the result of IPS and LLC unit root tests at level and at first difference for panel countries. It indicates that the variable suffers from a unit root problem at the level, but after the first difference, the variable becomes stationary. This implies that null hypothesis of unit root is rejected at 1%, 5%, and 10% significance level. Hence we can sum up that all the variables are I(1) or integration of order one.

**Table 3.** Results of Unit root tests

	Variables	IPS		LLC	
		Level	First	Level	First
BRICS	lnEG	2.646	-4.639***	-0.103	-4.149***
	lnPE	-3.319	-4.884***	-2.857	-6.956***
	lnHC	4.776	-2.671***	3.371	-2.709***
	lnINF	-2.371	-7.405***	-3.189	-7.640***
	lnEMP	-0.706	-4.279***	1.133	-2.313**
	lnUEMP	-1.211	-5.059***	-2.183	-6.196***
SAARC	lnEX	-3.258	-8.316***	-2.513	-4.469***
	lnEG	7.224	-4.586***	4.512	-3.310***
	lnPE	-0.729	-9.486***	-0.828	-9.481***
	lnHC	1.709	-1.736***	1.037	-1.829**
	lnINF	-3.822	-11.649***	-3.125	-12.015***
	lnEMP	1.048	-10.629***	-2.030	-9.124***
ASEAN	lnUEMP	0.289	-7.527***	-0.873	-8.112***
	lnEX	0.283	-7.618***	-1.422	-6.912***
	lnEG	5.436	-6.886***	0.524	-7.508***
	lnPE	-1.781	-11.532***	-2.447	-11.844***
	lnHC	0.987	-0.681*	-1.919	-1.708**
	lnINF	-5.17	-14.934***	-4.877	-15.068***
	lnEMP	0.175	-6.943***	-3.332	-4.278***
	lnUEMP	-0.210	-11.190***	-0.229	-11.167***
	lnEX	0.572	-11.347***	-0.646	-12.143***

**Note:** \*, \*\*, and \*\*\* denote level of significance at 1, 5 and 10% respectively.

Once we confirmed that the variables are at I(1), we can proceed for checking the long run relationship among the variables.

Therefore, the result of fisher cointegration test is presented in Table 4 show that null hypothesis of no cointegration is rejected at most 5 in all the panels at 1%, 5%, and 10% significance level. This indicates that there is a presence of long run relationship among economic growth, public expenditure, human capital, inflation, employment, unemployment, and export.

**Table 4.** Fisher co-integration

	Hypothesized	Fisher Stat.*		Fisher Stat.*	
	No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
BRICS	None	250.50	0.000***	141.40	0.000***
	At most 1	176.50	0.000***	84.49	0.000***
	At most 2	110.70	0.000***	63.64	0.000***
	At most 3	61.16	0.000***	29.90	0.000***
	At most 4	38.66	0.000***	23.98	0.007***
	At most 5	23.84	0.008***	21.09	0.020**
	At most 6	15.94	0.101	15.94	0.101
SAARC	None	234.20	0.000***	146.50	0.000***
	At most 1	145.40	0.000***	59.20	0.000***
	At most 2	95.07	0.000***	58.02	0.000***
	At most 3	47.87	0.000***	21.22	0.019**
	At most 4	32.78	0.000***	20.43	0.025**
	At most 5	21.29	0.019**	18.24	0.051*
	At most 6	15.49	0.115	15.49	0.115
ASEAN	None	338.60	0.000***	223.50	0.000***
	At most 1	198.00	0.000***	114.00	0.000***
	At most 2	103.10	0.000***	51.39	0.000***
	At most 3	60.15	0.000***	31.14	0.005***
	At most 4	38.04	0.000***	21.86	0.081*
	At most 5	28.38	0.012**	21.08	0.099*
	At most 6	31.29	0.005***	31.29	0.005***

**Note:** \*, \*\*, and \*\*\* denote level of significance at 1, 5 and 10% respectively.

The results of FMOLS and DOLS for BRICS panel are presented in Table 5 reveals that public expenditure is statistically significant and positive on economic growth. This implies that an increase in government expenditure will leads to enhance economic development in BRICS countries. In other words, a 1% rise in government expenditure will lead to increase the economic growth of a country by 0.45%. Our long run results suggests that government expenditure continues to contribute towards development of the economy in BRICS countries. This outcome is consistent with those of Usman et al. (2011), Mokoena et al. (2020), Ahuja and Pandit (2020), who also found the positive relationship between government expenditure and economic growth in Nigeria, South Africa and developing countries respectively.

**Table 5.** Results of BRICS countries panel

Variables	FMOLS			DOLS		
	Coefficient	Std Dev.	P-value	Coefficient	Std Dev.	P-value
lnPE	0.451	0.072	0.000***	0.555	0.724	0.444
lnHC	4.361	0.006	0.000***	4.388	0.841	0.000***
lnINF	0.131	0.054	0.016**	0.065	0.037	0.082*
lnEMP	2.575	0.025	0.000***	2.633	0.936	0.005***
lnUEMP	-0.232	0.039	0.000***	-0.255	0.229	0.266
lnEX	0.365	0.017	0.000***	0.307	0.220	0.165

**Note:** \*, \*\*, and \*\*\* denote level of significance at 1, 5 and 10% respectively.

Similarly, the demonstrable results of this work established that human capital has a positive impact on economic growth. A 1% increase in HC lead to increase economic

growth by 4.36%. This shows that both these variables have a strong correlation. Therefore, HC affects EG and can boost the economy by expanding the skills, ideas, and knowledge of its population. This can lead to increase the productivity of the workforce thereby influencing economic growth. This finding is consistent with Barlas (2020), Amin et al. (2020), and Sahoo et al. (2020). The results further indicate that Inflation causes economic growth to expand. This mean a 1% upsurge in inflation rate, will lead to boost its economy of about 0.13% in BRICS countries. The possible reason could be that stronger economic growth causes higher inflation. This happen because aggregate supply is less than aggregate demand, we could expect higher inflation rate. This suggest that if demand is greater than aggregate supply obviously prices will go up which will lead to higher inflation together with high economic growth in the country. This empirical result is in conformity with Amin et al. (2020) who also reported that higher inflation causes economic development.

Furthermore, Table 5 reveals that employment and unemployment is statistically positive and negative on economic development in BRICS region. This shows that a 1% hike in EMP and UEMP increases and decreases EG by around 2.57% and -0.23% respectively. The association between employment opportunity and economic development of the country have a strong relationship. This finding is conformity with many other studies like those of Amin et al (2020), and Bhat (2018). On the other hand, unemployment is an economic problem, recently most countries have shortage of jobs and employment opportunities. This situation can be explained with the help of Okun's law where he stated that percentage increase in UEMP causes a 2% fall in GDP per capita. The unemployment rate in Brazil, India, and China have recently increase to 12.08%, 6.1%, and 3.8% respectively according to World Bank (2019). This is because of rapidly rise in population growth and use of capital technique of production in these countries. Moreover, Table 5 indicates that export of goods and services increased the economic growth in the BRICS countries. Export play a significant role in these economies, influencing the level of employment opportunities and economic development.

**Table 6.** Results of SAARC countries panel

Variables	FMOLS			DOLS		
	Coefficient	Std Dev.	P-value	Coefficient	Std Dev.	P-value
lnPE	0.537	0.065	0.000***	1.867	0.157	0.000***
lnHC	0.457	0.016	0.000***	2.652	0.235	0.000***
lnINF	-0.063	0.084	0.456	-0.213	0.109	0.059*
lnEMP	1.557	0.023	0.000***	0.129	0.048	0.010**
lnUEMP	-0.448	0.040	0.000***	-0.160	0.090	0.086*
lnEX	0.460	0.031	0.000***	0.372	0.109	0.001***

**Note:** \*, \*\*, and \*\*\* denote level of significance at 1, 5 and 10% respectively.

Table 6 provides the result of SAARC region. The empirical findings from FMOLS show that public expenditure has a positive effect on economic growth. This shows that a 1% increase in government expenditure increases the GDP growth rate by about 0.53%. Educated workforce, skill and a healthy population can contribute to economic development of a country. This refer to our empirical findings which indicate that human capital positively affect the GDP per capita. In the similar way, Employment and export are positively related to economic growth. However, the impact of inflation and

unemployment on economic growth is significant and negative. This reveals that a 1% hike in INF and UEMP leads to -0.06% and -0.44% decrease in economic growth. This outcome is similar to the findings of Hussain and Zafar (2017) and Ahuja and Pandit (2020) who also reported a negative link between inflation and economic growth.

**Table 7.** Results of ASEAN countries panel

Variables	FMOLS			DOLS		
	Coefficient	Std Dev.	P-value	Coefficient	Std Dev.	P-value
lnPE	1.548	0.005	0.000***	1.487	0.183	0.000***
lnHC	1.765	0.006	0.000***	1.780	0.609	0.003***
lnINF	-0.057	0.008	0.000***	-0.050	0.066	0.455
lnEMP	0.165	0.003	0.000***	0.160	0.068	0.020**
lnUEMP	-0.646	0.002	0.000***	-0.594	0.114	0.000***
lnEX	0.788	0.008	0.000***	0.807	0.125	0.000***

**Note:** \*, \*\*, and \*\*\* denote level of significance at 1, 5 and 10% respectively.

Similar findings were also reported by the ASEAN panel reported in Table 7. One percent increase in PE and HC leads to 1.54% and 1.76% increase in economic growth respectively. Regarding the impact of employment and export, it is observed that a 1% increase in EMP and EX increases EG by a magnitude of about 0.16% and 0.78% respectively. However, the effect of inflation and unemployment on economic development is significant and negative. Increase in inflation rate affects the economic growth by changing the pattern of labor demand and supply which in turn reduces employment in the industrial sectors. This adversely impacts the volume of output produced because of the uncertainty in the rising costs of inputs and rising prices. This shows that rising inflation is an unavoidable part of economic development, this in turn reduces investment and hence growth in SAARC and ASEAN countries. This negative impact of INF and UEMP on economic growth was also supported by Ahuja and Pandit (2020), and Panigrahi et al. (2020).

The empirical study also employed the dynamic OLS estimator for the accuracy of the outcomes reported via FMOLS estimation. The findings reported in Table 5, 6, and 7 highlight the effect of PE, HC, INF, EMP, UEMP, and EX on EG is completely consistent with the FMOLS estimator. Although some variables are not statistically significant but the signs are the same and robust in all the panels.

Finally, the Dumitrescu Hurlin causality test performed in Table 8 shows that public expenditure causes economic growth in all panels. In other words, results yield the evidence of unidirectional causal link running from PE to EG. Moreover, bidirectional causality running from human capital to economic growth and vice versa. Thus, based on our results, we can conclude that government authorities should focus more on the public expenditure to boost economic growth in these regional organizations. Since it is found that expenditure causes growth which might help in enhancing the economic development in these regional group countries.

**Table 8.** *Pairwise Dumitrescu Hurlin panel causality tests*

Null Hypothesis:	BRICS		SAARC		ASEAN	
	W-Stat.	P-value	W-Stat.	P-value	W-Stat.	P-value
lnPE does not homogeneously cause lnEG	1.714	0.055*	3.683	0.072*	4.229	0.027**
lnEG does not homogeneously cause lnPE	8.812	1.000	3.329	0.299	3.211	0.271
lnHC does not homogeneously cause lnEG	4.361	0.046**	4.670	0.023**	5.082	0.001***
lnEG does not homogeneously cause lnHC	5.128	0.007***	4.634	0.025**	3.759	0.089*
lnINF does not homogeneously cause lnEG	5.208	0.005***	2.808	0.575	3.492	0.159
lnEG does not homogeneously cause lnINF	3.491	0.235	3.481	0.238	7.622	4.000
lnEMP does not homogeneously cause lnEG	5.813	0.000***	5.664	0.001***	4.418	0.015**
lnEG does not homogeneously cause lnEMP	3.766	0.149	4.658	0.023**	5.341	0.000***
lnUEMP does not homogeneously cause lnEG	4.206	0.065*	3.076	0.420	7.678	3.000
lnEG does not homogeneously cause lnUEMP	8.504	7.000	6.985	1.000	6.640	1.000
lnEX does not homogeneously cause lnEG	4.522	0.032**	3.157	0.378	1.869	0.719
lnEG does not homogeneously cause lnEX	5.640	0.001**	5.387	0.003***	4.603	0.008***

**Note:** \*, \*\*, and \*\*\* denote level of significance at 1, 5 and 10% respectively.

## 5. Conclusion and policy implications

Since the 19<sup>th</sup> century, the discussion and debate on the linkage between government size and per capita GDP has been a subject of intense research. While Keynes theory claims that government size promotes economic growth, the Wagner theory postulates that public expenditure rises with economic development. From the economist point of view, it becomes critical to work on the link between government expenditure and economic development. In this context, present article analyzed the association between public expenditure, human capital, employment, unemployment, inflation, export, and economic growth in the BRICS-ASEAN-SAARC region employing the latest dataset spanning the period 1991-2019. This work used IPS and LLC unit root tests to examine the stationarity properties of the series; further great majority of study employed Pedroni and Kao cointegration tests, hence we employed Johansen fisher cointegration tests to explore the long run link between the considered variables. The FMOLS and DOLS techniques was used to investigate the long run impact of public expenditure, human capital, inflation, employment, unemployment, export on economic growth. The regression findings of fisher cointegration reveals long run relationship among the variables in the regional organization in Asia. The results of this work showed that public expenditure positively impacted economic development. Similarly, human capital, employment and export increases economic growth in all panels. Conversely, unemployment and inflation negatively impacted economic development in ASEAN-SAARC region.

Moreover, the results also indicate that the linkage between public spending and GDP per capita is unidirectional where causality running from public expenditure to economic development. The study strongly supports the Keynesian view of macroeconomic, the theory suggesting any increase in public spending will lead to hike in the country's growth. This reveals that government expenditure in BRICS-ASEAN-SAARC region act as means of 'making the pie larger' by enhancing growth rate. This justification is underpin by the prosperity experienced by most of the developing nations during the financial crisis in

2008. The incentive measures not only bought fiscal policy for the mainstream of economic growth but also helped these regions to recover from the Asian financial crisis during 1997-1998. Accordingly, these empirical results serve as justification to the argument proposed by Keynes. The estimations results also documented the GDP growth rate is positively linked with the human capital, export, and employment. As for as inflation rate and unemployment variables is concerned it significantly reduces economic development with negative sign in the panel of regional Asia.

The findings impart significant policy implication for the government officials and academics. Since the emergence of Keynesian school of economic thought in 1930 was indicated as a paradigm shift which led emphasize on the demand-supply forces via self-correcting mechanism. An argument made by Keynes that involvement of government in stabilizing economy have a significant role through fiscal policy. Hence public spending in particular, could be used to enhance the economy that could function as a significant regulator. Our results supports the argument of Keynes of expansionary fiscal policy. The expenditure of government on public sector economy during bad and good times can be seen as important tool in establishing the economy on its way. Therefore, to identify the implications and likely effects of increased public spending on the economic progression, the authorities or policy makers can this use this information in boosting GDP per capita in BRICS-ASEAN-SAARC region.

Further, it is evident from the findings that inflation and unemployment in SAARC and ASEAN countries is still persist as challenging. The numerous macroeconomic policies by government have been unable to achieve sustained economic growth, reduction in unemployment, and sustain price stability. Therefore the essence of macroeconomic policy underlines the rationale for the policymakers in this direction. Moreover, the association between the reciprocal interactions of these variables and macroeconomic variables in an economy are crucial to policy implications. From the Keynesian point of view of Phillips curve, high unemployment rate with low inflation rate or low unemployment rate with high inflation rate, the choice can be made between the two combinations which could lead to reduction in either inflation or unemployment rate to some extent in these regions. Hence, policy makers and economist should take appropriate macro and microeconomic tools to improve economic growth.

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## Notes

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- (1) All these variables such as economic growth, employment, inflation, and government expenditure are inter related. Like increase in public expenditure will boost economic growth, thereby increases employment opportunities, and once there is increase in employment, unemployment will reduce and people's consuming power will increase hence more demand for goods and services which lead to rise in inflation. Therefore, the significance of choosing these determinants of economic development are in this direction.



- (2) Especially India (computer software, outsourcing destination, commodities) and China (FDI-leg growth, and manufacturing) are the two fastest growing economies in the world. While in ASEAN Vietnam is more powerful in term of GDP growth rate despite COVID-19
- (3) Like government spending in Brunei declined from 37.1% to 29.0% during 2015-2019. Similarly for Vietnam, Indonesia, Malaysia, Myanmar, Thailand, Vietnam also declined during the same period. India and other countries also showed declining trend.
- (4) We have employed only fisher cointegration test to save space. We can also perform Pedroni and Kao tests cointegration test for robustness purpose.

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