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Nexus between Export Instability, Exchange Rate Volatility and Economic Growth in Selected Developing Countries

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Abstract

Export Instability (EI) and Exchange Rate (ER) fluctuations adversely affect economic growth. In this regard, SAARC countries have experienced more EI and ER fluctuations than ASEAN countries, which has negatively impacted their economic growth. This study explores the influence of EI and ER volatility on economic growth in selected SAARC and ASEAN countries for the time period 1995-2017. It incorporates these variables in the Augmented Solow growth model to observe their effects on the economic growth of these countries. System Generalized Methods of Moment (GMM) is used to meet the objectives of the current study. The results indicate that the variables of interest (EI and ER) have a negative and significant influence on GDP per capita in SAARC countries. Similarly, EI harms economic growth in ASEAN countries, whereas ER has a positive influence on economic growth in these countries. Furthermore, control variables including trade openness, secondary school enrollment, capital formation, and government spending positively and significantly correlate with GDP per capita growth. Whereas, inflation and population growth negatively and significantly correlate with GDP per capita growth in both groups of countries.

Keywords: economic growth, exchange rate (ER), export instability (EI), human capital, panel data

JEL Classifications: F43, F31, I29, C33

Introduction

The basic focus of developing countries is to have high and/remains on rapid but sustainable growth. Various factors are involved in inducing economic growth in developing countries, such as human capital

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development, physical capital, low inflation rate, trade policies, technological changes, and the agriculture sector (Dewan & Hussein, 2001; Lucas, 1988; Barro, 2003).

Export Instability (EI) is defined as the variation between the actual and predicted value of exports as a proportion of the mean value of exports. Previous studies on the connection between EI and economic growth have yielded miscellaneous results. For instance, some studies have reported a negative relationship between EI and economic growth (Hesse, 2007; Lim, 1976; Rashid et al., 2012). The negative relationship is based on a set of associations which posit that when EI increases, the foreign exchange reserves of the country decrease. Hence, the country needs to import the capital needed for the production process. Consequently, the amount of available or accessible capital decreases, investment squeezes, and thereby income also decreases. However, other studies have revealed a positive relationship between EI and economic growth based on the premise that an upsurge in export volatility tends to reduce consumption and increase savings for preventive demand motives. Hence, there is an increase in investment and economic growth (Sinha, 2007; Abu-Lila et al., 2021). Many countries that have/offer a narrow basket of export goods often face EI arising from inelastic and unstable global demand (Hesse, 2007). EI is prevalent in SAARC countries and it has a deleterious impact on their economic growth (Rashid et al., 2012).

The theory of comparative advantage specifies that developing nations export raw materials, stones, and food items to developed countries and import manufactured goods from them. It results in deteriorating terms of trade and a deficit in the balance of payment for developing countries. Therefore, vigorous benefits of industry and trade are accrued by developed nations, whereas developing nations get poorer. However, this traditional theory is considered as static and extraneous to the process of economic expansion because it involves adjustment to existing conditions, while development necessarily entails changes in prevailing conditions (Aditya & Acharrya, 2013).

Export prices of primary commodities frequently fluctuate in developing countries. The demand for various primary goods in developing nations is price inelastic because people in developing countries spend a small share of their earnings on such goods, for instance, tea, wheat, and sugar. When the prices of these goods change, individuals do not

significantly alter their consumption of these goods owing to price inelastic demand. On the other hand, the demand for minerals and other similar products is price elastic because of the availability of alternate goods. At the same time, the demand for the export of primary goods in developing economies is unstable due to business cycle fluctuations. The supply of the exports of developing countries is price inelastic because of the obstinacies in resources used in these countries (Rashid et al. 2012).

Moreover, the demand for food and raw materials is limited due to numerous reasons. These include: 1) income elasticity of demand in industrial nations for many of the foodstuff and farming raw material exports of developing nations is less than 1. So, as income increases in industrial nations, their demand for the farming/agricultural exports of developing nations increases proportionately less than the increasing income, 2) the expansion of synthetic substitution, 3) technological progression, 4) the fact that the productivity of services has grown faster than the productivity of commodities in developed nations, and 5) developed nations face trade restrictions on many exports. On the supply side, the reasons are: 1) most of the developing countries are overpopulated, 2) worldwide flow of capital to most developing nations today is limited, and 3) developing nations face an outflow of accomplished labor rather than its inflow (Caimcross, 1962).

Exchange Rate (ER) policies are usually sensitive and inconsistent in developing nations owing to structural transformation. Basirat et al. (2014) have suggested that when financial structures are developed then ER fluctuations do not hurt economic growth; otherwise, ER fluctuates and impedes economic growth as it happens in developing nations.

The effects of real ER or RER on economic growth of developing countries are different from that of the developed countries. The positive association between RER undervaluation and economic growth is stronger for developing countries than developed countries (Rodrik, 2008; Rapetti, 2011).

EI and ER have not been investigated together as independent variables in any study. Moreover, their impact on economic growth of both SAARC and ASEAN countries over the time period 1995-2017 also needs to be analyzed. Hence, this study fills the gap in the literature in two different ways. Firstly, it extends the Augmented Solow growth model of Mankiw et

al. (1992) by incorporating EI and ER variability into it. Secondly, it empirically estimates the impact of the aforementioned variables on the economic growth of selected developing economies. The objective of this study is to find out the nexus between EI, ER, and economic growth in selected SAARC and ASEAN countries. To estimate the long-run and short-run coefficients of the variables, system GMM of Arellano and Bover (1995) is employed.

This study comprises six sections. Section 2 consists of literature review and Section 3 represents the theoretical framework. Section 4 is devoted to data and methodology, while Section 5 displays the results and discussion. Section 6 manifests conclusions and policy implications.

Literature Review

This section provides the review of selected theoretical and empirical studies on EI, ER, and GDP per capita. Barro (1995) carried out a study to find the association between inflation and economic growth for 100 countries for the period 1960-1990. He found that a rise in prices decreases aggregate demand. Consequently, investment declines. Furthermore, he found a decreasing relationship between inflation and economic growth. Fischer (1993) also found a negative link/association/relationship between inflation and economic efficiency. There is a two-way causation between inflation and economic growth. In the short-run, inflation affects economic growth; however, economic growth also affects general price levels in the long-run (Datta & Mukhopadhyay, 2011).

Dewan and Hussein (2001) investigated the determinants of economic growth in developing nations. Presumably, investment in human and physical capital, low inflation, dismantling of trade barriers, and adaptation of technological changes are required for economic growth. Moreover, higher exports, longer life expectancy, plentiful natural resources, and high investment rates are factors that spur economic growth in developing countries (Upreti, 2015). For developing and developed countries, human capital accumulation is a vital element of economic growth. For instance, an index of human capital was constructed over the years 1977-97 for Spain. It raised substantially over the past two decades and the contribution of human capital in the next decade remained larger than the past two decades (Fernandaz & Mauro, 2000).

Santos-Paulino (2000) examined the impact of trade liberalization on export growth for selected developing countries. Using the export demand function, he found that trade liberalization is an important determinant of export growth, while export duties negatively affect export growth. An increase in relative prices negatively affects exports, whereas world income growth has a positive effect on export growth. The effect of export concentration is strongly nonlinear in developing countries earning from diversification of their exports contrary to richer countries that have a diversified basket of export goods (Hesse, 2007).

Basirat et al. (2014) examined the influence of ER variations on economic growth controlled with financial market development in selected developing countries over the period 1986-2010. They found that coefficients of financial development and RER volatility impacted economic growth negatively. However, the coefficient of the interactive term of financial development and ER fluctuation turned out to be positive and statistically significant for economic growth. This finding indicates that decreasing barriers to trade have a positive effect on economic growth. Rashid et al. (2012) examined the effects of EI on economic growth in SAARC countries using Augmented Dickey-Fuller (ADF) and Johansson Cointegration tests to determine the stationarity of all variables and cointegration, respectively. The results showed that EI has a negative effect on economic growth in SAARC countries.

Dependence on oil increases the susceptibility of Algeria to external shocks, which adversely affect investment decisions and growth. Oil revenues comprise a large proportion of government revenues. So, the surge and decline of oil prices also affects fiscal balance and increases the burden of debts. Also, any reduction in trade protection depreciates the RER which, in turn, improves the competitiveness of non-oil exports. Therefore, trade protection remains an important factor that determines RER in Algeria (Sorsa, 1999).

In Malaysia, the prices of crude palm oil (CPOP) and soyabean oil (PSBO), ER, production of crude palm oil (CPORP), export volume, and GDP are the key determinants of earning instability. Therefore, CPOP, PSBO, CPO production, ER, and export volume each exhibit a significant positive relationship with export earnings (Abdullah, 2011). Export diversification is a process/source of economic development through structural transformation, that is, from producing primary products to

manufactured products/goods. This can be achieved by changing the current basket of goods through the adaptation of new technology. For both SAARC and ASEAN regions, FDI, GFC, competitiveness, industrial sector, financial development, and institutional strength have led to export diversification (Noureen & Mahmood, 2014).

Arize et al. (2000) inspected the effect of the volatility of RER on the flow of exports for developing countries including Bangladesh, Pakistan, and Sri Lanka. They used Johenson's multivariate technique for long-run analysis and the error correction technique for short-run analysis. They found that mounting ER volatility has a deleterious but significant effect on the demand for exports in both short-run and long-run analyses for 13 countries. The relationship between RER depreciation and economic growth is sturdier and significant in developing countries than in developed countries (Rapetti, 2011; Rodrik, 2008). Fixed ER is certainly correlated with economic growth. Investors and traders ardently manage business in a country with a stable currency (Jakob, 2016).

A study claimed that ER volatility is a necessary element for developing countries that are mostly dependent on trade (Srinivasan & Kalaivani, 2012). Export growth is determined by ER volatility, GDP, and foreign economic activity. ER volatility has a substantial adverse influence on export growth both in the short- and long-run. Moreover, both RER and GDP have a negative short-run impact but a positive and significant long-run impact on export growth. However, foreign economic activity has a negative impact on export growth in the short-run but a positive effect on export growth in the long-run.

Okonkwo and Douglas (2016) explored the determinants of EI in Nigeria. They noted that fluctuations in export volume and price of exports have an adverse influence on the balance of payments, national growth, investment, and economic growth. Using the ordinary least squares (OLS) method, they found that there exists a rising relationship between oil EI and economic growth in Nigeria. Tariq and Najeeb (1995) examined the instability of export revenues in case of Pakistan for the years 1969-1970 to 1990-1991. According to them, the causes of export earnings instability included the commodity concentration of exports, the geographical concentration of goods, the ratio of primary goods and raw materials in total exports, food ratio, and export quantities. The results revealed that there existed a strong relationship between commodity concentration and

instability, although these two were not correlated. Based on the finding, calculating the ratio of primary products and raw material in exports is considered necessary to explain instability in less developed countries but not in the case of Pakistan.

Ribeiro et al. (2017) contributed to the strand of studies available on RER and growth. Their study investigated the relationship between income distribution, level of technological capabilities, and growth in developing countries over the period 1990-2010. The dynamic model of panel data was used and its parameters were estimated via the system GMM. They found that RER indirectly affects growth through the distribution of income and the level of technological capabilities. The indirect effect of the undervaluation of currency on growth in developing countries was found to be negative and statistically insignificant.

ER volatility affects exports either negatively or positively, depending on the behavior of the representatives of the market (Ramli & Podivinsky, 2011). There are significant results for miraculous Asian economies, except for Indonesia. Kemal (2005) identified that ER is very important and fluctuations in it play a vibrant role in the verification of trade. If there is devaluation in ER, then imports are negatively affected and exports are positively affected. However, it is not good always/the benefits of devaluation are subject to the economic situation because instability is occasionally caused by excess devaluation of ER.

McLeod and Mileva (2011) explored the connection between RER and productivity growth. Devaluing the RER increases productivity growth because employees move from non-traded goods (low productive sector) to trade good (high productive sector) through learning by doing (Matsuyama, 1992).

Pigka-Balanika (2013) documented that trade liberalization is also a reason for an increase in economic growth. He used a sample of 71 emerging countries covering the time period 1990-2005. He showed that there is a robust positive association between trade openness and economic growth, although no such connection exists for Sub-Saharan African countries due to their dependence on primary goods, low level of technology, and poor conditions of institutions. Huchet-Bourdon et al. (2018) explored the relationship between trade ingenuousness and economic growth. They found that the value and range of trade affect a

country's economic growth. Their results showed that trade openness impacts growth because it ameliorates state technology. Moreover, the exporter country exports higher value products and if the country concentrates on low-quality goods, then the impact of trade on economic growth is negative.

Haseeb et al. (2014) investigated the correlation between economic growth and economic variablesincluding FDI and exports. They found that FDI-led economic growth (FLG) is based on the advancement of physical capital. They concluded that FDI and exports are the backbone of Malaysia's economic growth.

Sinha (1999) inspected the association between export variability, investment, and economic growth in selected Asian countries. Their study also included a developed country (Japan) for comparison with developing countries. Data for exports was collected for both goods and services. For India, the study found mixed results regarding the association between EI and economic growth. For Sri Lanka, Japan, Malaysia, and the Philippines, the study found a negative association between EI and economic growth. While, a positive relationship was found between EI and economic growth for Pakistan, Thailand, Myanmar, and Korea.

Hua (2011) analyzed the economic and social effects of ER on the economic growth of 29 Chinese provinces for the time period 1987-2008. The author found a negative impact of RER appreciation on economic growth through three different channels including technological progress, export volume, and efficiency.

Habib et al. (2016) explored the association between RER and economic growth for 150 developing countries for the time period 1970-2010. Instrumental variables were employed to predict the effects of RER on economic growth. The authors found that RER affects economic growth in developing countries but considerably less so in developed countries. McPherson and Rakovski (2000) conducted a study that showed the association between real and nominal ER and economic growth in Kenya. The outcomes of the study disclosed the absence of a direct connection between real and nominal ER and economic growth, although there was found an indirect relationship between these variables. It was determined that Kenya's economic growth is directly affected by monetary and fiscal rules.

Bashayreh et al. (2019) observed the influence of export volatility on economic growth for a sample of MENA countries for the period 1990-2016. For this purpose, they used the Augmented Dickey-Fuller test. The results for Jordan and Egypt showed a constant long-run relationship between EI and economic growth. On the other hand, the results for KSA and Algeria showed a positive impact of export volatility on economic growth. Bostan et al. (2019) conducted a study regarding the influence of ER on global trade competitiveness of Romania. They concluded that ER is an important factor of competitiveness, although the influence of uncertainty on exports and imports is different/varied. Similarly, a negative relationship was observed between export volatility and GDP per capita for Nigeria (Oladipo, 2017) owing to commodity and geographical concentration (Eida, 2016).

Barguellil et al. (2018) conducted a study on the relationship between ER volatility and economic growth for 45 developing and emerging economies for the years 1985-2015. The results displayed that ER volatility had a negative impact on economic growth during the study period. Ribeiro et al. (2019) empirically examined the association between RER and economic growth for 54 developing nations. The results showed that the impact of devaluation on economic growth in developing economies is negative.

An extensive review of literature regarding the association between export variability and economic growth, as well as the association between ER and economic growth, has been carried out in this section. Some studies provided/argued for a positive influence of EI on economic growth, while other studies analyzed the negative influence of export fluctuation on economic growth. Therefore, miscellaneous results are obtained. To the best of our knowledge, there is hardly any/no study available that uses both EI and ER together as independent variables and covers both SAARC and ASEAN countries, simultaneously. Therefore, this study investigates the relationship between ER, EI, and economic growth for SAARC and ASEAN countries taken together.

Theoretical Framework

The Augmented Solow growth model is extended in this study by incorporating EI and ER.

Model Specialization: Extended Solow Growth Model

Solow (1956) focused on three factors of production namely labor, capital, and technology.

$$Y = f\ (K_{it,}\mathrm{A}L_{it}) \tag{1}$$

where K_{it} represents capital for country 'i' at a time 't', AL_{it} enters into the production function multiplicatively and represents effective labor, and A is for technology. Its Cobb-Douglas form at the time 't' is specified as follows:

$$Y_{it=}(A_{it}L_{it})^{\beta}K_{it}^{\alpha} \qquad \text{given that } (\alpha\ +\ \beta)1 \tag{2}$$

where 'α' represents the output elasticity of capital, 'β' represents the output elasticity of labor, and 'A' represents total factor productivity constitutes technological progress and knowledge. According to Solow, growth is determined by exogenous factors and exhibits constant return to scale in aggregate form. Lucas (1988) introduced human capital in the production function. Moreover, the person with a higher level of education gains extra knowledge and skills and is also responsible for technological change (Romer, 1993).

$$Y_{it=}K^{\alpha}H_{it}^{\beta}(A_{it}L_{it})^{1-\alpha-\beta} \tag{3}$$

where 'H' represents human capital, 'β' represents the output elasticity of human capital, while 'α' and (1-α-β) show the output elasticity of both capital and labor. They used the production function, however, instead of making the Solow-Swan assumptions (that the overall gross saving rate is constant and exogenous), they assumed that the investment rates in the two forms of capital are constant and exogenous. Output per effective unit of labor is given below.

$$y = k^{\alpha}h^{\beta} \tag{4}$$

Change of physical capital is specified as follows:

$$\dot{k} = s_k y - (\sigma + n + g) \tag{5}$$

where σ is the rate of depreciation. This equation infers/depicts that 'k' converges to/with the equilibrium position where the growth rate of the variable is zero. Human capital per effective unit of worker is given below.

$$\dot{h} = s_h y - (\sigma + n + g)h \tag{6}$$

In steady-state $\dot{k} = \dot{h} = 0$. So, putting/substituting the value of y in equations (5) and (6)

$$\dot{k} = s_k k^{\alpha} h^{\beta} - (\sigma + n + g)k = 0 \quad (7)$$

$$\dot{h} = s_h k^{\alpha} h^{\beta} - (\sigma + n + g)h = 0 \quad (8)$$

Dividing equation (7) by k and equation (8) by h

$$\frac{\dot{k}}{k} = s_k k^{\alpha-1} h^{\beta} - (\sigma + n + g) = 0 \quad (9)$$

$\frac{\dot{k}}{k}$ depicts the growth rate of physical capital in steady state. Similarly, the growth rate of human capital in steady-state is given below.

$$\frac{\dot{h}}{h} = s_h k^{\alpha} h^{\beta-1} - (\sigma + n + g) = 0 \quad (10)$$

By solving the equations (10) and (9) simultaneously, we get the value of k and h as follows:

$$h^* = \left[\frac{s_h^{1-\alpha} s_k^{\alpha}}{\sigma+n+g}\right]^{\frac{1}{1-\alpha-\beta}} \quad (11)$$

$$k^* = \left[\frac{s_k^{1-\beta} s_h^{\beta}}{\sigma+n+g}\right]^{\frac{1}{1-\alpha-\beta}} \quad (12)$$

Putting/Substituting equations (11) and (12) in equation (4)

$$y = \left[\frac{s_k^{1-\beta} s_h^{\beta}}{\sigma + n + g}\right]^{\frac{\alpha}{1-\alpha-\beta}} \left[\frac{s_h^{1-\alpha} s_k^{\alpha}}{\sigma + n + g}\right]^{\frac{\beta}{1-\alpha-\beta}}$$

The balanced growth path of a country can be written as follows:

$$y = \frac{Y}{L_t} = A_{(t)} . s_k^{\frac{\alpha}{1-\alpha-\beta}} s_h^{\frac{\beta}{1-\alpha-\beta}} \left[\frac{1}{n+\sigma+g}\right]^{\frac{\alpha+\beta}{1-\alpha-\beta}} \quad (13)$$

According to the neoclassical model, technology exponentially develops at the rate of 'g'

$$A = A_{\circ} e^{gt}$$

Literature shows that productivity is essential for sustainable economic growth. Here, the notion of productivity has a broader meaning that includes the proper use of resources, technological progress, and efficient management. Technological progress is an important part of total factor productivity (TFP), which is also called multifactor productivity. It depends

upon various factors, such as institutions, trade openness, human capital, and technology (Tebaldi, 2016). One such factor is EI that affects both TFP and economic growth adversely (Rashid et al., 2012; Lim, 1976). The negative relationship implicates that when EI increases, the foreign exchange reserves of a country decrease. Owing to the reduction in foreign exchange reserves, the country cannot import the capital required for the production process. So, it decreases capital formation which, in return, decreases investment. Due to a decrease in investment, TFP also decreases. It further results in decreasing national income. On the contrary, a positive relationship implicates that an increase in EI tends to reduce consumption and increases savings for preventive demand motives. As a result, there is a decrease in MPC and an increase in MPS, so investment increases. Owing to the increase in investment TFP also increases, resultantly economic growth increases (Sinha, 2007). In addition to EI, ER significantly affects TFP and economic growth. TFP and growth increase by depreciating RER because employees move from non-traded goods and industries to traded goods and industries (Mcleod & Mileva, 2011).

$$A(t) = A(0)e^{gt+\theta lnEI+\varphi lnER} \quad Where\ \theta > 0$$

where 'EI' stands for export instability and 'ER' stands for the exchange rate. Moreover, $\theta\ and\ \varphi$ represent the output elasticities of EI and ER. respectively.

$$y = A(0)e^{gt+\theta lnEI+\varphi lnER} s_k^{\frac{\alpha}{1-\alpha-\beta}} s_h^{\frac{\beta}{1-\alpha-\beta}} \left[\frac{1}{n+\sigma+g}\right]^{\frac{\alpha+\beta}{1-\alpha-\beta}}$$

By taking the natural log

$$lny = lnA(0) + gt + \theta lnEI + \varphi lnER + \frac{\alpha}{1-\alpha-\beta} lns_k + \frac{\beta}{1-\alpha-\beta} lns_h - \frac{\alpha+\beta}{1-\alpha-\beta} \ln(n+\sigma+g)$$

as ln e=1. It is assumed that technological progress (g) is constant for each country, ln $(A_O)+gt = \alpha_0 + \mu_{i,t}$ where $\alpha_0$is for intercept and $\mu_{i,t}$ is the error term.

$$lny = \alpha_0 + \theta lnEI_{it} + \varphi lnER_{it} + \alpha_1 lns_k + \alpha_2 lns_h - \alpha_3(n+\sigma+g) + \mu_{i,t} \quad (14)$$

Methodology and Data

This section describes the empirical framework, empirical models, sample size, data sources, and estimation technique used in the current study. The empirical model given in equation (14) is simplified as follows:

$$lny_{it} = \alpha_{\circ} + \beta lnX_{it} + \theta lnEI_{it} + \varphi lnER_{it} + \mu_{it} \quad (15)$$

Here, y_{it} represents the dependent variable 'economic growth' which is represented here through a proxy, that is, GDP per capita. EI_{it} stands for the independent variable 'export instability'. ER_{it} depicts the exchange rate and X_{it} represents the control variables, namely trade openness, secondary school enrollment, inflation, population growth, government spending, and gross fixed capital formation. Furthermore, μ_{it} stands for the error term and $\alpha_{\circ}, \beta, \theta \; and \; \varphi$ are the parameters to be estimated.

This study employs panel data to explore the impact of EI and ER on economic growth. We have used the Generalized Methods of Moments (GMM) which is of two types: 1) first difference GMM developed by Arellano and Bond (1991) and 2) system GMM developed by Arellano and Bover (1995). First difference GMM is instrumented with lagged level variables, while system GMM uses a combination of differenced equation and level equation. System GMM is more appropriate than the first difference GMM. Another reason for using system GMM is to avoid the problem of endogeneity by using internal instruments. The reliability of GMM estimators is conditioned on the validity of instruments used. To sort out this problem, the current study uses/employs two types of tests proposed by Arellano and Bover (1995). Sargan test is applied to test the validity of instruments and the higher p-value shows that the instruments are effective. Whereas, Arellano-Bond test for autocorrelation has/proves the null hypothesis which states that there is no autocorrelation. Mostly, AR (1) has a significant value that means/indicates the absence of autocorrelation, whereas AR(2) is important because it is insignificant and yields a high p-value which identifies the autocorrelation problem/shows the presence of autocorrelation problem.

Description of Variables

In this study, economic growth is a dependent variable measured with/by using GDP per capita. Several studies have used GDP per capita as a proxy for economic growth (Alatas & Cakir, 2016; Ali et al., 2018). EI is

defined as the year-to-year fluctuation in exports or as the difference between the actual and estimated value of exports (Devkota, 2004). It negatively affects economic growth in countries that export mainly primary goods or raw materials due to fluctuation in their prices in the international market (Oladipo, 2017; Hesse, 2007; Rashid et al., 2012). EI is measured using the instability index (Bilquess & Mukhtar, 2011; Kaushik et al., 2008). ER is the rate at which one currency is exchanged for/with another or it is the price of one currency concerning/in relation with another. The association between RER and economic growth in developing countries is different from that of developed countries (Rapetti, 2011; Rodrik, 2008). Trade openness is measured as the ratio of the sum of exports and imports to the GDP of a country. It is a channel through which foreign direct investment (FDI), capital input, goods, and services flow to host countries or regions (Pigka-Balanika, 2012). Trade openness impacts economic growth positively because it ameliorates state technology and allows the exporter country to export higher quality products or specialized high-quality goods; however, it impacts growth negatively if the exporting nation specializes in producing low-quality goods (Huchet-Bourdon et al., 2018). Education plays a vital role in economic growth. It is a significant means to reduce poverty and promote human capital. This study uses secondary school enrollment as a proxy of human capital as well as a control variable. A rise in the general price level or a fall in purchasing power is called/known as inflation. It negatively affects economic performance, whereas investment is the instrument through which inflation decreases economic growth (Barro, 1995; Fischer, 1993).

Government spending means government consumption expenditures that the government has done/reflects the expenditure on health, education, and development programs by the government (Moalusi, 2004). Government expenditure as the annual percentage of GDP is used as a control variable in this study. Population growth reflects the increase in the number of people that live in a country. Empirical studies previously showed mixed results; some showed negative while others showed positive results (Solow, 1956; Mankiw et al., 1992). In this study, population growth is used as a control variable. For economic development, every country needs capital formation or capital stock in order to invest in human and physical capital, research and development (R&D), and infrastructure, among others (Shuaib & Ndidi, 2015). We have used it as a control variable measured as the percentage of GDP.

Data and Data Sources

Data was taken/collected for the years 1995-2017 for selected SAARC and ASEAN countries. Data for ER was taken/collected from International Financial Statistics (IFS), whereas the data of all other variables was retrieved from the World Development Indicators (WDI).

Results and Discussion

The key objective of the current study is to evaluate the impact of EI and ER on economic growth for two groups of countries. In group one, selected SAARC countries including Bangladesh, India, Pakistan, Nepal, and Sri Lanka are included. While, in group two, selected ASEAN countries including Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, and Thailand are included. In this study, GDP per capita is the dependent variable, whereas EI and ER are dealt with as independent variables.

Empirical Estimation using System GMM

Equation (15) is estimated in three steps using system GMM. In step one, we estimate the impact of EI with other control variables on economic growth. In step two, we estimate the impact of ER with other control variables on economic growth. While, in the third step, we estimate the combined impact of EI and ER on economic growth.

Empirical Impact of EI and ER on Economic Growth in Selected ASEAN Countries

The estimated results for selected ASEAN countries are displayed in Table 1. It shows that most variables are positively correlated with real GDP per capita, while others are negatively correlated with real GDP per capita. The results of Model 1 of table 1 show that/It also shows the impact of EI on economic growth which is negative and significant in the case of ASEAN countries. EI occurs due to high reliance on the export of primary goods. However, the price of export goods fluctuates due to supply and demand shocks. Due to these shocks EI increases, while foreign exchange reserves decrease. When there is a decline in foreign exchange reserves, the country cannot import the physical capital which is useful/required for the development process.

Table 1
Empirical Findings for Selected ASEAN Countries

Variables	Model 1	Model 2	Model 3
Ln GDPPC	0.967***	0.989***	0.989***
	(0.000)	(0.000)	(0.000)
Ln (EI)	-0.001**	…..	-0.0004*
	(0.021)		(0.070)
Ln (ER)	…..	0.007**	0.012***
		(0.028)	(0.003)
Ln (Trade Openness)	0.0002***	0.002**	0.0003***
	(0.002)	(0.017)	(0.001)
INF	-0.0008**	-0.001**	-0.0003*
	(0.000)	(0.000)	(0.087)
Ln GFCF	0.0006*	0.001**	0.001***
	(0.080)	(0.054)	(0.000)
Ln SSE	0.0002**	0.002**	0.0003*
	(0.050)	(0.028)	(0.080)
Ln Govt. Spending	0.0007***	0.0004**	0.0003***
	(0.002)	(0.012)	(0.001)
Pop Growth	-0.147**	-0.004*	-0.005**
	(0.016)	(0.063)	(0.051)
Constant	0.289***	0.089**	0.084**
	(0.000)	(0.0240)	(0.050)
Sargan (*p*-value)	0.065	0.051	0.101
AR2 (*p*-value)	0.432	0.110	0.272
No. of Countries	7	7	7

*, ** and *** represent significance level at 10%, 5% and 1%, respectively.

Therefore/Resultantly, capital formation also decreases and economic growth declines/stagnates (Rashid et al., 2012; Bilquess & Mukhtar, 2011). Human capital is one of the main components/contributors of economic growth. When a country does not invest in human capital, it affects the quality of goods and services produced and subsequently, the demand for export decreases due to their low quality. As a result, there is instability in export earnings and low economic growth is achieved. Trade openness comes with a positive sign and significantly influences economic growth. Trade liberalization causes the flow of new and advanced technology in-country and also increases production capability which, in turn, increases the employment level. Consequently, economic growth enhances/increases. These results are supported by previous findings of Pigka-Balanika (2012).

In Model 1, inflation is negatively and significantly correlated with economic growth. Inflation is bad for savers, if there is high inflation it discourages the savers to save money. Then, investment decreases and it slows down economic growth (Barro, 2013). On the other hand, gross fixed capital formation (GFCF) is positively and significantly correlated with economic growth. The government invests in different projects which creates job opportunities, increases income, and also increases the demand for goods and services. To meet the demand, producers increase production which, in turn, increases economic growth (Shuaib & Ndidi, 2015). Secondary school enrolment has the expected positive sign which/and it is statistically significant. Education plays an important role in the development of any economy. It is a significant means to reduce poverty and increase the level of employment. As employment increases, income increases. Subsequently, demand increases which, in turn, increases production and economic growth. Government spending is positively and significantly correlated with economic growth. Government invests in social and other infrastructure, which improves the quality of life and also creates job opportunities (Barro, 1990; Moalusi, 2004). Population growth comes with the expected negative sign which/and it is statistically significant. Higher population growth leads to lower per capita income growth by lowering the steady-state value of capital per worker (Solow, 1956; Mankiw et al., 1992).

Column three (Model 2) presents/depicts the impact of ER on economic growth. Akin to Model 1, control variables have the expected signs and remain statistically significant. In Model 2, the variable of interest (ER) is

positively correlated with economic growth and remains statistically significant. The undervaluation of ER is a strong cause of higher economic growth in developing countries. This result is in line with the findings of Rapetti et al. (2011) and Rodrik (2008). Fixed ER results in higher investment and it increases the productivity of an economy.

Column four (Model 3) presents the combined impact of EI and ER on economic growth in selected ASEAN countries. In Model 3, similar to Model 1 and Model 2, control variables have the expected signs and remain statistically significant. The variables of interest (EI and ER) also have the expected signs and remain statistically significant , although the value of the coefficient of EI is -0.001 in Model 1 and in Model 3, it is -0.0004. The value of the coefficient of ER, which is our second variable of interest, is 0.007 in Model 2 and in Model 3, it is 0.012.

Empirical Impact of EI and ER on Economic Growth in Selected SAARC Countries

Column two (Model 1) presents the impact of EI on economic growth. EI is negatively and significantly correlated with economic growth in the case of selected SAARC countries. Instability in export earnings leads to instability in the volume of exports and the subsequent decline in growth. Due to fluctuations in exports, a country's income and government revenues are affected. Hence, economic growth is also affected. Fluctuations, while distorting the development plan, negatively affect economic growth (Oladipo, 2017; Abdullah, 2011). On the other hand, trade openness is positively and significantly correlated with economic growth. Table 2 shows the estimated results for selected SAARC countries. It shows that most of the variables are positively correlated with real GDP per capita growth, although some variables are also negatively correlated with it.

Table 2

Empirical Findings for Selected SAARC Countries

Variables	Model 1	Model 2	Model 3
Ln GDPPC	0.999***	0.966***	0.999***
	(0.000)	(0.000)	(0.000)
Ln (EI)	-0.010*	…..	-0.001**
	(0.067)		(0.053)

Variables	Model 1	Model 2	Model 3
Ln (ER)	…..	-0.014**	-0.004**
		(0.044)	(0.040)
Ln (Trade Openness)	0.0004**	0.0003**	0.0003*
	(0.017)	(0.053)	(0.092)
Inflation	-0.0001**	-0.001**	-0.0001**
	(0.023)	(0.050)	(0.023)
Ln GFCF	0.001**	0.0002**	0.001**
	(0.053)	(0.023)	(0.012)
Ln SSE	0.0003**	0.0004**	0.0001*
	(0.043)	(0.010)	(0.080)
Ln Govt. Spending	0.0005**	0.0003**	0.0005**
	(0.012)	(0.020)	(0.020)
Pop Growth	-0.007**	-0.006**	-0.120**
	(0.049)	(0.017)	(0.017)
Constant	0.022**	0.321**	0.048**
	(0.010)	(0.045)	(0.022)
Sargan (*p*-value)	0.091	0.110	0.170
AR2 (*p*-value)	0.176	0.114	0.101
No. of countries	5	5	5

*, ** and *** represent significance level at 10%, 5% and 1% respectively.

Countries import technology and invest in development projects, which expands economic growth. There is a negative and significant relationship between inflation and economic growth. This result is in line with Akinsola and Odhiambo (2017). Gross fixed capital formation (GFCF) has a positive and significant relationship with economic growth. Investment in different domestic development programs of a country and capital formation are positively and significantly correlated with economic growth (Ugochukwu, 2013). Secondary school enrollment comes with a positive sign as in Model

1. Education is very important for any economy. Investment in education means/translates into investment in human capital. Subsequently, there is knowledge spillover and resultantly, there is technological progress which expands economic growth (Solow, 1957; Romer, 1990; Abugamea, 2016).

Government spending is positively correlated with economic growth. This result is in line with the study of Loizides and Vamvoukas (2005). The underlying reason behind this positive association is that government expenditure on infrastructure creates employment which, in turn, creates demand. As a result, output and economic growth increase. Population growth enters the model with a negative sign and remains statistically significant. Population growth is harmful to economic growth because an increase in population reduces saving which, in turn, decreases investment. When there is a decrease in the investment of physical capital, economic growth decreases.

Column three (Model 2) of Table 2 shows the impact of ER instability on economic growth with other control variables. Akin to Model 1, control variables come with the expected positive/negative sign and are statistically significant. In Model 2, our variable of interest (ER) is negatively and significantly correlated with economic growth. A higher ER negatively affects exports which, in turn, decreases economic growth (Ribeiro et al., 2017; Srinivasan & Kalaivani, 2012).

Model 3 shows the combined impact of EI and ER on economic growth in selected SAARC countries. Both variables of interest come with a negative sign and are statistically significant. Aligned with Model 1 and Model 2, control variables come with the expected positive/negative sign and are statistically significant. The variables of interest (EI and ER) have expected positive/negative signs, although in Model 1 EI has a coefficient value of -0.010 and in Model 3, it has a value of 0.001. The second variable of interest (ER) comes with the coefficient magnitude of -0.014 in Model 2 and in Model 3, it comes with a coefficient size of -0.004.

Conclusion and Recommendations

The key objective of the current study is to analyze the impact of EI and ER on economic growth in selected SAARC and ASEAN countries over the period 1995-2017. To meet the said objective, we used system GMM to tackle the problem of endogeneity and to estimate the unknown parameters of the variables. For empirical analysis, this study considers trade openness,

secondary school enrollment, government spending, population growth, gross fixed capital formation, and inflation as control variables.

The major findings of the current study include that EI, measured via the instability index, has a negative and significant impact on real GDP per capita growth for selected ASEAN countries. On the contrary, ER has a positive and significant impact on these countries. Inflation and population growth are negatively and significantly correlated with economic growth, whereas trade openness, secondary school enrollment, government spending, and capital formation positively and significantly correlate with economic growth.

In the case of selected SAARC countries, both variables of interest (EI and ER) have a negative and statistically significant correlation with economic growth. Control variables, such as inflation and population growth, have a negative and significant impact. Whereas, trade openness, secondary school enrollment, government spending, and capital formation have a positive and significant impact on economic growth. The bottom line is that these countries should take measures to overcome EI in order to enhance/increase economic growth. Persistent and stable exchange rates also accommodate/influence economic growth.

Following policy recommendations are drawn from this analysis:

- Developing countries should reduce the volume of exports based on primary commodities or raw materials. Since these countries are highly dependent on primary goods and concentrate on their production, it negatively affects their economic growth.
- The countries should diversify their exports, rather than concentrate or re-concentration.
- ER should be sustained and stabilized to encourage greater ER stability. With a stable ER, an economy's real exports increase it incurs higher economic growth.

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