



Analyzing the External Debt and Exports-Led Growth Hypothesis in Selected Asian Countries

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ABSTRACT

This study analyzes external debt and exports-led growth hypothesis in selected Asian countries using the panel dataset from 2003 to 2020. For data estimation, unit root analysis, Pedroni test of cointegration, and panel ARDL model are used. The outcomes reveal that external debt, exports, gross capital formation, and labor force are directly associated to the economic growth, while debt servicing is adversely and significantly related to the economic growth in Asian countries. The variable inflation rate turns out to be negative but statistically insignificant. Granger causality analysis found a unidirectional causality between external debt and economic growth and a unidirectional causality between gross capital formation and economic growth. It is concluded that external debt and exports are substantially impacting the economic growth of Asian countries; therefore, it is suggested that external debt should be utilized to improve national well-being and export promotion techniques should be encouraged, such as export subsidies and tax-free business zones to promote production.



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INTRODUCTION

High and sustainable growth of the economy is considered as the foremost goal of every economy (Chirwa & Odhiambo, 2017). To achieve high economic growth, governments,

therefore, implement different strategies to promote savings, stimulate investment, and increase domestic production (Ribaj & Mexhuani, 2021). Governments borrow from internal and external sources to encourage economic growth to fill the gap between savings and investment. External debt is one of the important external sources from which the government borrows. External debt is the amount of debt borrowers repay foreigners (Matthew & Mordecai, 2016; Chimezie et al., 2020). It is acknowledged that foreign debt benefits borrowing economies only when it is effectively invested in development and investment initiatives that yield higher project returns. The government borrows money from outside sources at high-interest rates to fund its projects and close the savings and investment gap. However, because of a decrease in domestic investment, public projects and businesses do not continue to be more profitable. Reduced investment results in slower economic growth (Okoye et al., 2020). According to Ciftcioglu and Sokhanvar (2018), developing countries only benefit from external debt if the returns on their investments and development initiatives outweigh the loan's costs (Adam & Bevan, 2005). In contrast, a country is classified as a heavily indebted poor country if its external debt exceeds the debt ceiling; therefore, the economies face different issues, such as the debt overhand issue and crowding-out effect and the underlying assumptions of this debate are that repaying the public debt requires significant domestic savings (Arnove et al., 2005). Additionally, compared to the supply of savings, the demand for saving for investments grew (Senadza et al., 2017).

On the contrary, exports are viewed as a catalyst for social and economic development (Bakari & Mabrouki, 2017). The export-led growth hypothesis (ELGH) posits that export progress is fundamental for assessing the economy's growth. It is advocated that nations attain comprehensive development through augmenting domestic investments and workforce and enhancing exports (Saaed & Hussain, 2015; Hameed et al., 2012). Export growth raises a nation's output demand, expands economies of scale and growing exports can accelerate economic growth (Ahmad et al., 2017). Romer (1986) in the endogenous growth model, highlighted the advantages of a competitive export sector and projected that advancements in more adaptable market technologies would result in higher returns to scale (Sala-i-Martin & Barro, 1995; Mishra, 2011).

An increase in exports enables a rise in the demand for imported capital goods, increasing the rate of capital formation growth and, in turn, driving growth. Significant scale effects and externalities for GDP growth were produced because most investment activities occurred in businesses focused on exports (Ahmed et al., 2000). The causal association between growth of the economy and exports growth needs to be empirically reassessed, considering the function of foreign debt. Many Asian countries rely on external debt or borrowing from outside sources and cannot handle issues related to servicing their EXDT. The issue of EXDT and the servicing of such debt are evident and understandable in the context of the previous debate. Thus, this study's primary objective is to determine the influence of external debt and exports on the economic growth of Asian countries. The outcomes of the paper may help the strategy makers in Asian countries in planning policies to regulate external debt and exports to promote economic growth.

LITERATURE REVIEW

At the empirical level, different studies examined the association between external debt, exports, and economic growth. Some of the studies are presented in this section.

Studies of the Relationship between Exports and Economic Growth

Different studies examined the association between exports and EG. For example, Nguyen (2020) investigated the connections between different variables, including exports, foreign aid, FDI, and economic growth (EG) in Vietnam from 1997 to 2018. The findings demonstrated the positive correlation between FDI, aid, exports, and GDP. Nguyen (2020) investigated how Vietnam's economic growth from 2000 to 2018 was impacted by trade and FDI. The findings demonstrated that FDI and exports positively and significantly affect Vietnam's EG whereas imports were adversely but insignificantly linked to the EG. Khan & Emirullah (2019) analyzed how exports affected India's and Pakistan's EG between 1990 and 2016. The results revealed that exports significantly and favorably influenced both countries' economies. Furthermore, the empirical findings showed that human capital and FDI favorably and considerably influence EG. Using data from 1972 to 2014, Ahmad et al., (2017) discovered the influence of exports on Pakistan's EG. The outcomes showed that imports, inflation, and terms of trade harmed EG, whereas exports had an optimistic influence on EG. Saaed & Hussain (2015) discovered the association between imports, exports and EG in Tunisia from 1977 to 2012. It was discovered that exports led to imports and that economic growth led to imports. The findings demonstrated the unidirectional causal link between imports, exports and EG. Saleem & Sial (2015) employed data from 1973 to 2013 to estimate the connection between Pakistan's exports and EG. The findings directly related to economic growth, exports, human capital, and capital formation. Utilizing data from 1975 to 2009, Usman et al., (2012) scrutinized the effects of exports, government expenditures and educational expenditures on Luxembourg's EG. The outcomes exhibited an optimistic relation between EG and exports, government expenditures, and educational spending. Elbeydi et al., (2010) used data from 1980 to 2007 to estimate the connection between Libya's exports and EG. This study discovered a direct correlation between exports and EG. The findings also exhibited that encouraging exports through export-oriented policies will support Libya's economic expansion. Therefore, keeping in view the literature review, the developed hypothesis is given as follows:

H₁: Exports of goods and services are positively and significantly linked to the economic growth of Asian countries

Studies of the Relationship between External Debt and Economic Growth

Different studies examined the association between external debt (EXDT) and economic growth (EG). Ale et al. (2023) used data from South Asian countries from 1980 to 2020 to inspect the influence of external debt on EG. They found a negative correlation between EXDT and EG in

South Asia. The research suggested that these economies must encourage investment to reduce the dependency on EXDT, as an increase in EXDT is linked to a slower rate of EG. Similarly, employing data from 2000 to 2018, Mohsin et al., (2021) examined the link between economic growth and EXDT in South Asia. The study showed that EXDT has an adverse influence on EG. The results exhibited that GCF and trade positively impacted EG. In the case of Bangladesh, Dey & Tareque (2020) employed data from 1980 to 2017 to explore the link between EXDT and EG. The study's findings showed that secondary school enrollment was favorably correlated with EG, whereas external debt and trade openness adversely influenced GDP growth. Using data from 1970 to 2014, Onafowora et al., (2017) explored the influence of foreign debt shocks on Nigeria's EG. The results showed that the investment shocks considerably boosted EG whereas EXDT had a detrimental influence on investment and output growth. In the case of developing countries, Chaudhry et al., (2017) explored the link between FDI, EXDT and EG by employing data from 1990 to 2014. The findings revealed an optimistic relation between EG, EXDT and foreign direct investment. It was also noted that gross domestic saving had a large beneficial influence on EG. Another study in developing countries was conducted by Siddique et al., (2016) to inspect the effect of EXDT on EG by utilizing data from 1970 to 2007. The results confirmed a substantial influence of EXDT, and capital on GDP. Ramzan et al., (2014) explored the association between EG and EXDT in Pakistan using data from 1970 to 2009. The outcomes demonstrated the inverse link between external debt, EXDT servicing and EG. The study also showed an adverse correlation between inflation and EG. In the case of Pakistan was investigated by Ali & Mustafa (2012) to explore the impact of EXDT on the EG, recruiting data spanning from 1970 to 2010. The results indicated that human capital had a beneficial influence on EG while external debt and labor force adversely influenced EG. Therefore, considering the literature review, the following hypothesis is established:

H₂: External debt significantly related to the economic growth of Asian countries

DATA AND METHODOLOGY

In this study, the panel dataset of fifteen Asian developing countries from the period of 2003 to 2020 is used and the data of all variables collected from World Development Indicators (WDI). The countries were selected based on data availability. This analysis adopts a Neo classical growth model which demonstrates that both labor and capital are the imperative sources of production:

$$EG = f(\text{Labor}, \text{Capital})$$

However, exports are also considered an engine of EG, while EXDT is also essential to fill the gap between savings and investment. Therefore, we incorporate exports, EXDT and EXDT servicing in the Neo-Classical model. The equation of the model can be written as:

$$EG_{it} = \beta_0 + \beta_1 LFP_{it} + \beta_2 GCF_{it} + \beta_3 EXP_{it} + \beta_4 EXDT_{it} + \beta_5 DSE_{it} + \beta_6 INF_{it} + u_{it}$$

Where EG represents economic growth as proxied using growth rate of GDP, LFP indicates labor force participation rate, GCF is gross capital formation (percentage of GDP), EXP represents exports of goods and services (percentage of GDP), EXDT indicates external debt stocks (percentage of GNI), DSE demonstrates debt servicing, INF represents inflation rate (consumer price index), and u_{it} indicates error term.

We have applied different panel unit root tests such as ADF test, Philips-Peron Test, Levin, Lin and Chu test for data analysis. Similarly, we have applied the panel ARDL model for the long-run estimation of parameters. This estimation technique is utilized when the variables have a mixed integration order. The panel ARDL model also provides short-run error correction form to analyze the speed of adjustment in case of disturbances. Lastly, we have applied pairwise Granger causality to analyze the causation between any pair of variables. This test is used to analyze the causality between variables as one-way causality, two-way causality, and no-causality between the variables.

Empirical Analysis

Different econometric approaches are used to analyze the external debt and exports-led growth hypothesis in Asian countries. The analyses are presented as follows:

Descriptive Statistics

Table 1 displays information that consists of the mean value, maximum value of data, minimum value, skewness, kurtosis and Jarque-Bera test. The mean GDP growth rate found in the data is 6.182, the largest value is 21.391, the lowest growth rate is -7.445, SD is 3.371, the skewness value is 0.277, and the kurtosis value is 6.412. The descriptive statistics of all other variables can be observed in Table 1.

Table 1: Descriptive Statistics

| Variables | Mean | Max. | Min. | S.D. | Skew. | Kurt. | J.B. | Prob. |
|------------------|-------------|-------------|-------------|-------------|--------------|--------------|-------------|--------------|
| GDPGR | 6.182 | 21.391 | -7.445 | 3.371 | 0.377 | 6.412 | 114.462 | 0.000 |
| EXTD | 32.393 | 113.804 | -2.576 | 21.666 | 1.118 | 4.429 | 66.001 | 0.000 |
| EXP | 23.885 | 28.532 | 16.798 | 2.726 | -0.599 | 2.550 | 15.347 | 0.000 |
| DSE | 10.499 | 41.529 | -15.720 | 9.976 | 1.126 | 3.882 | 54.839 | 0.000 |
| INF | 7.318 | 39.266 | -18.109 | 6.631 | 1.672 | 9.296 | 476.391 | 0.000 |
| GCF | 24.199 | 29.305 | 18.644 | 2.320 | -0.129 | 2.484 | 3.120 | 0.210 |
| LFP | 64.458 | 87.193 | 43.652 | 10.729 | 0.223 | 2.338 | 5.969 | 0.051 |

Source: Author's Estimations

Correlation Analysis

This analysis is imperative in determining the extent of association between two variables. Table 2 explores that GDPGR is positively correlated with external debt (0.062), labor force participation rate (0.118), and negatively correlated to the value of exports (-0.189), debt servicing (-0.141), inflation (-0.101), and value of gross capital formation (-0.097).

Table 2: Correlation Matrix

| Correlation | GDPGR | EXTD | EXP | DSE | INF | GCF | LFP |
|--------------------|--------------|-------------|------------|------------|------------|------------|------------|
| GDPGR | 1.000 | | | | | | |
| EXTD | 0.062 | 1.000 | | | | | |
| EXP | -0.189 | -0.341 | 1.000 | | | | |
| DSE | -0.141 | 0.299 | 0.168 | 1.000 | | | |
| INF | -0.101 | -0.157 | -0.222 | -0.048 | 1.000 | | |
| GCF | -0.097 | -0.483 | 0.909 | 0.120 | -0.120 | 1.000 | |
| LFP | 0.118 | 0.201 | -0.114 | -0.150 | -0.331 | -0.086 | 1.000 |

Source: Author's Calculations

Unit Root Analysis

This analysis is conducted to analyze the integration order of variables. Different panel unit root approaches are applied to data and their outcomes are displayed in Table 3. The outcomes display that the variables GDPGR, EXDT, the value of exports, and rate of inflation are stationary at a level while the variables debt servicing, GCF, and LFP are stationary at 1st difference. The varied order of integration implies that panel ARDL is a viable method for estimating variables over the long term.

Table 3: Unit Root Analysis

| Variables | Individual Intercept | | | | Intercept and Trend | | | | None | | | Results |
|--------------|----------------------|-------------------|--------------------------------|-------------------------------|---------------------|-------------------|--------------------------------|-------------------------------|-------------------|--------------------------------|-------------------------------|---------|
| | LLC | IPS | ADF-Fisher Chi ² | PP-Fisher Chi ² | LLC | IPS | ADF-Fisher Chi ² | PP-Fisher Chi ² | LLC | ADF-Fisher Chi ² | PP-Fisher Chi ² | |
| GDPGR | -5.308 (0.000) | -4.223 (0.000) | 71.129 (0.000) | 117.179 (0.000) | -6.168 (0.000) | -2.754 (0.003) | 53.985 (0.005) | 92.596 (0.000) | -1.999 (0.023) | 35.912 (0.211) | 58.494 (0.001) | I(0) |
| EXTD | -4.671 (0.000) | -1.434 (0.076) | 40.979 (0.087) | 44.853 (0.040) | -4.983 (0.000) | -2.532 (0.006) | 50.707 (0.011) | 57.165 (0.002) | -4.057 (0.000) | 73.602 (0.000) | 108.278 (0.000) | I(0) |
| DSE | -1.474 (0.070) | -0.679 (0.249) | 39.342 (0.118) | 59.100 (0.001) | 1.400 (0.919) | 1.500 (0.933) | 23.290 (0.803) | 56.028 (0.003) | -3.252 (0.001) | 47.282 (0.023) | 60.899 (0.001) | I(1) |
| EXP | -6.689 (0.000) | -2.550 (0.005) | 51.978 (0.008) | 170.308 (0.000) | -4.856 (0.000) | -0.002 (0.499) | 31.775 (0.378) | 46.718 (0.027) | 4.616 (1.000) | 5.164 (1.000) | 5.117 (1.000) | I(0) |
| INF | -7.390 (0.000) | -4.196 (0.000) | 71.485 (0.000) | 100.871 (0.000) | -6.998 (0.000) | -4.285 (0.000) | 71.562 (0.000) | 135.830 (0.000) | -2.029 (0.021) | 36.057 (0.206) | 60.328 (0.001) | I(0) |
| GCF | -1.580 (0.057) | -0.288 (0.387) | 34.952 (0.244) | 126.077 (0.000) | -2.177 (0.015) | 1.345 (0.911) | 20.681 (0.898) | 50.731 (0.010) | 6.449 (1.000) | 1.683 (1.000) | 0.478 (1.000) | I(1) |
| LFP | -3.665 (0.000) | -0.409 (0.341) | 34.024 (0.280) | 55.416 (0.003) | -4.106 (0.000) | 0.656 (0.744) | 28.873 (0.524) | 28.521 (0.543) | 0.140 (0.556) | 20.558 (0.901) | 60.085 (0.001) | I(1) |

Source: Author's Calculations

Note: The values in brackets are probability values

Panel Cointegration Analysis

Table 4 portrays the outcomes of the Pedroni test of cointegration. The outcomes show that Panel PP-Statistic and Panel ADF-Statistic within dimensions and Group PP-Statistic and Group ADF-Statistic in between dimensions have p-values less than 5 percent, suggesting that long-run cointegration existed among variables. Kao Residual cointegration Test also ensures the long-run cointegration among variables.

Table 4: Pedroni Cointegration Analysis

| Within-Dimension | | |
|--|------------------|--------------|
| Cointegration Test | Statistic | Prob. |
| Panel v-Statistic | -2.613773 | 0.9955 |
| Panel rho-Statistic | 2.777488 | 0.9973 |
| Panel PP-Statistic | -28.24001 | 0.0000 |
| Panel ADF-Statistic | -7.022605 | 0.0000 |
| Between-Dimension | | |
| Group rho-Statistic | 5.295456 | 1.0000 |
| Group PP-Statistic | -21.76706 | 0.0000 |
| Group ADF-Statistic | -6.965022 | 0.0000 |
| Kao Residual Cointegration Test | | |
| ADF | -2.7218 | 0.0032 |

Source: Author's Calculations

Panel ARDL Analysis

Panel long-run estimates of the nexus between exports, EXDT, and EG are shown in Table 5. The results display that EXDT is directly and substantially associated to the EG of Asian countries. The EXDT's coefficient displays that if it is augments by one percent, it improves economic growth by 0.0733 percent. It implies that EXDT improves the EG if it is invested in income-generating activities. This result is supported by Frimpong & Oteng-Abayie (2006), Sulaiman & Azeez (2012), Kasidi & Said (2013), and Chaudhry et al., (2017). In contrast, debt servicing is turn out to be adversely and significantly connected to the EG. The coefficient of debt servicing displays that if it enhances by one percent, it decreases the EG by -0.0538 percent. It advocates that excessive debt servicing in the form of paying high-interest rates and principal amounts to foreign lenders has a detrimental impact on EG. These outcomes were also confirmed by Jadoon et al., (2014); Akanbi et al., (2022). Considering the variable exports, it is originated that EXP are positively and significantly linked to the EG. The coefficient of exports displays that if the value of exports upsurges by one percent it leads to increases in economic growth by 3.3553 percent. The export-led growth hypothesis robustly verifies this positive association between exports and EG, which states that exports significantly boost a country's EG. These outcomes are in line with the findings of Awokuse (2007), Elbeydi (2010), Ali & Mustafa (2012). The variable gross capital formation and labor force participation are also directly and significantly related to the EG. The coefficients of GCF and LFP specify 0.3243 and 0.4277

percent increases in EG as both variables increase by a single unit, respectively. These findings are linked to the Neo-Classical growth theory that labor and capital are the two primary production components. These findings were also found by Ali (2015); Kargi, (2014); Koskei et al., (2013); Falki (2009). Lastly, the association between the inflation rate and EG is negative but statistically insignificant.

Table 5: Panel ARDL Long-Run Estimates (Pooled Mean Group)

| Dependent Variable: GDP Growth Rate | | | | |
|--|--------------------|-------------------|--------------------|---------------|
| Variables | Coefficient | Std. Error | t-Statistic | Prob.* |
| EXTD | 0.0733 | 0.0087 | 8.4260 | 0.0000 |
| DSE | -0.0538 | 0.0087 | -6.1489 | 0.0000 |
| EXP | 3.3553 | 0.3124 | 10.739 | 0.0000 |
| GCF | 0.3243 | 0.1503 | 2.1567 | 0.0334 |
| LFP | 0.4277 | 0.0849 | 5.0354 | 0.0000 |
| INF | -0.0174 | 0.0284 | -0.6115 | 0.5422 |

Source: Author's Estimations

Table 6 exhibits the outcomes of panel ARDL short-run error correction model. The ECM term displays the speed of adjustment. The value of the ECM term has a negative sign (-0.8180) and was also found to be statistically significant. It implies that at the rate of 81.80 percent the short-run errors become corrected in case of short-run disturbances if moving towards long-run equilibrium.

Table 6: Panel ARDL Short-Run ECM Model

| Variables | Coefficient | Std. Error | t-Statistic | Prob.* |
|------------------|--------------------|-------------------|--------------------|---------------|
| ECM(-1) | -0.8180 | 0.1100 | -7.4310 | 0.0000 |
| D(EXP) | 2.4957 | 2.5406 | 0.9823 | 0.3283 |
| D(GCF) | 4.5423 | 3.0250 | 1.5015 | 0.1364 |
| D(LFP) | -2.1573 | 1.0964 | -1.9675 | 0.0519 |
| D(EXTD) | -0.1570 | 0.0756 | -2.0763 | 0.0405 |
| D(INF) | -0.0178 | 0.0602 | -0.2955 | 0.7682 |
| D(DSE) | 0.5054 | 0.3223 | 1.5681 | 0.1200 |
| C | -79.533 | 10.382 | -7.6604 | 0.0000 |

Source: Author's Calculations

Panel Granger Causality Analysis

Table 7 shows that there is a one-way causality between and GDPGR, one-way causality between GCF and GDPGR, whereas no-causality is found between exports and GDP growth rate, no-causality between debt servicing and GDP growth rate, no-causality between LFP and GDPGR, and no-causality between inflation and GDP growth rate.

Table 7: Panel Granger Causality Analysis

| Null Hypothesis: | Obs | F-Statistic | Prob. | Outcomes |
|--------------------------|------------|--------------------|--------------|-----------------|
| EXTD \rightarrow GDPGR | 210 | 1.39613 | 0.2387 | Unidirectional |
| GDPGR \rightarrow EXTD | | 4.40711 | 0.0370 | |
| EXP \rightarrow GDPGR | 210 | 3.51782 | 0.0621 | No-Causality |
| GDPGR \rightarrow EXP | | 0.01499 | 0.9027 | |
| DSE \rightarrow GDPGR | 210 | 0.14528 | 0.7035 | No-Causality |
| GDPGR \rightarrow DSE | | 0.07691 | 0.7818 | |
| GCF \rightarrow GDPGR | 210 | 1.14791 | 0.2852 | Unidirectional |
| GDPGR \rightarrow GCF | | 15.4876 | 0.0001 | |
| LFP \rightarrow GDPGR | 210 | 1.89836 | 0.1697 | No-Causality |
| GDPGR \rightarrow LFP | | 2.92662 | 0.0886 | |
| INF \rightarrow GDPGR | 210 | 0.15916 | 0.6903 | No-Causality |
| GDPGR \rightarrow INF | | 1.41921 | 0.2349 | |

Source: Author's Estimations

CONCLUSIONS AND RECOMMENDATIONS

This study examines the effect of exports and external debt on economic growth in selected Asian countries from 2003 to 2020. Different tests of unit root, panel cointegration test, Panel ARDL, and Panel Granger causality test are performed to estimate the results. Unit root analysis shows that the variables GDP growth rate, EXDT, the value of exports, and inflation are stationary at a level, whereas the variables debt servicing, GCF, and LFP are stationary at 1st difference. Pedroni test of cointegration ensures the long-run cointegration between variables. The Panel ARDL outcomes display that the variables external debt, the value of exports, GCF, and LFP positively affect the EG while the variables debt servicing and inflation negatively affect the growth rate in Asian countries, however the influence of influence on GDPGR is statistically insignificant. Granger causality analysis shows that there is a one-way causality between external debt and GDPGR and one-way causality between GCF and GDPGR, while no-causality is found between exports and GDPGR, no-causality between debt servicing and GDP growth rate, no-causality between LFP and GDPGR, and no-causality between inflation and GDP growth rate. Based on study outcomes, it is proposed that exports and EXDT play an imperative role in boosting the EG of Asian countries. This study offers insight into the effective use of external debt by a few chosen Asian nations to boost GDP growth. A significant factor in certain Asian countries' increased economic growth is their external debt. By effectively using foreign borrowings or debt, the governments of a few chosen Asian nations should avoid the crowding out effect and heavy weight of debt or debt overhang. External borrowing should be used in development or production initiatives, and the profit from these projects should exceed their cost to have a favorable outcome for foreign debt. Instead of being used for political objectives or ineffective endeavors, the primary goal of taking on external debt should be to improve national well-being. Implementing export promotion techniques, such as tax-free business zones and export subsidies, is also recommended.

The study has some limitations. This paper observes the external debt and exports in Asian countries however, future studies can analyze this association in developing countries facing high external debt. The study only considers external debt and exports as core factors of economic growth, but other factors such as FDI, foreign aid, foreign portfolio investment and trade openness are ignored in a study that can be analyzed in the future as a factor of economic growth.

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