AN EMPIRICAL INVESTIGATION OF THE IMPACT OF FDI, EXPORT AND GROSS DOMESTIC SAVINGS ON THE ECONOMIC GROWTH IN BANGLADESH

Md. Mamun Miah\textsuperscript{1}
Shapan Chandra Majumder\textsuperscript{1,2}
\textsuperscript{1}Department of Economics, Comilla University, Comilla, Bangladesh.
\textsuperscript{1}Email: mamunmiah09@gmail.com Tel: +88-01969833810
\textsuperscript{2}Email: smajumder71@yahoo.com Tel: +88-01720875139

\textsuperscript{1} Corresponding author

ABSTRACT

Bangladesh is a developing country with a huge population. So it is necessary to ensure better economic performance of Bangladesh. The purpose of the paper is to empirically investigate the impact of FDI, export, and gross domestic savings on the economic growth of Bangladesh and also tries to show the impact of inflation, industry value-added, and population growth on economic growth. We conduct the research with data covering the year from 1972 to 2017. Autoregressive Distributed Lag Bound Testing (ARDL BT) and Error Correction Model (ECM) are applied. The result of the ARDL model shows that the coefficient of FDI is 0.05 indicating that if FDI rises 1% then growth of the GDP will rise 0.05%. The coefficient of one year lag FDI is negative but insignificant. Again 1% rise in exports leads 0.03% rise in growth. Gross domestic savings positively affect GDP growth but statistically not significant. Inflation negatively affect the economic growth of Bangladesh. If inflation decreases by 1% then GDP growth will increase by 0.04%. Industry value added has positive effects on growth, a 1% increase in Industry value-added leads to a significant increasing in growth by 8.68%. Population growth negatively impacts economic growth. If the growth of the population decreases by 1% then 1.88% will increase the growth. Long run relation of the variables is ensured by the bound test and ECM-1 is significantly negative and indicating that adjustment is corrected by 145%. Hypotheses testing ensure except export other variables are short-run determinants of growth.

Contribution/Originality: This study contributes to the existing literature by showing the empirical contribution of Export, FDI, Gross Domestic Savings, inflation, industry value-added, and population growth on the Economic Growth in Bangladesh using ARDL ECM approach and also be beneficial for policymakers to take necessary steps.

1. INTRODUCTION

Bangladesh is a country with a huge population in the world that fails to achieve its goals of development due to political instability, corruption, lack of good governance. Bangladesh is a small country with an emerging economy. After the liberation, the situation of this country was a beggar description. Besides, this country has to fight natural calamities. As economic growth is made up of various factors, it’s not possible to cover all of the factors. Table 1 exposes the GDP growth in Bangladesh from 2010 to 2017. In 2010 it was 5.57% and continuously increases. In 2015 it was 6.55% and in 2016 and 2017 it was respectively 7.11% and 7.28%.
From **Figure 1** we see that from 2010 to 2012 there was an increasing trend in exports but after then exports decreases. In 2015 it was 17.34% and in 2017 it was 15.04% shown by the blue line. Whereas Gross Domestic Savings continuously increases are shown by the red line.

![Graph showing trend in exports and gross domestic savings](image)

**Figure-1.** The trend for exports and gross domestic savings in Bangladesh from 2010 to 2017.

**Table 2** shows the data for the inflation rate and population growth in Bangladesh. In 2010 the inflation rate was 7.144%. It has an increasing trend till 2012 after then decreases and in 2017 it was 6.27%. Population growth in Bangladesh is approximately stable from 2010 to 2014 then decreases in 2017 and it was 1.05%.

**Table 3** shows the FDI (Foreign direct investment) inflows in Bangladesh from the fiscal year 2010 to 2018. In 2010 it was 913.09 million USD and gradually increases. But in 2014 it was decreasing compared to 2013. In 2015, 2016, 2017 and 2018 FDI inflows were $1833.87, $2003.53, $2454.81 and $2580.44 million.
Table 3. FDI Inflows from the fiscal year 2005 to 2018.

| Fiscal year | FDI Inflows (in million USD) |
|-------------|-----------------------------|
| 2010        | 913.09                      |
| 2011        | 779.04                      |
| 2012        | 1194.88                     |
| 2013        | 1730.69                     |
| 2014        | 1498.49                     |
| 2015        | 1833.87                     |
| 2016        | 2003.53                     |
| 2017        | 2454.81                     |
| 2018        | 2580.44                     |

Source: Bangladesh bank.

For any country, the policymakers should know very well for the possible factors of economic growth as they are associated with the development of the country because if they know the possible factors they can respond and can take initiative to boost countries well being. A developing country like Bangladesh it's also crucial to know the potential determinants that have an impact on growth.

Many of the researcher's works with determinants of economic growth in Bangladesh like Ahamed and Tanin (2010) explored that FDI is an important determinant of economic growth for Bangladesh. Sultan (2008) shows export, import, and industry value added are important factors for growth. In this study we try to show the impact of FDI, export, gross domestic savings, inflation, industry value added and population growth on economic growth and also have a purpose for finding long and short-run determinants of economic growth among the variables.

Based on the data's nature we used the ARDL model for conducting this research. Where the result shows FDI, exports, industry value added and population growth are important for GDP growth. And also found that long-run determinants of GDP growth are exports where the rest of the variables are short-run determinants so it is important to remove government ineffectiveness to increase FDI, exports, and industry value-added.

The paper consists of the following sections, where part 2 gives the problem statement of the study, section 3 contains the literature review, and the objectives of the paper are revealed in section 4. Significance of the study, methodology, empirical results, and discussions, and finally conclusions and recommendations are described through sections 5, 6, 7, and 8 respectively.

2. PROBLEM STATEMENT

With a huge population, Bangladesh is a developing country. So it is necessary to ensure better economic performance for this country. For this, it is a prerequisite to know about the impact FDI, export and gross domestic savings, inflation, industry value added, and population growth on economic growth. And it's also important to empirically investigate the long and short-run determinants of economic growth.

3. LITERATURE REVIEW

There are enormous theoretical and empirical investigations on the topic and some of those are including in table 4. We detect economic growth's determinants of various countries, where several determinants are selected. In this paper, we try to find the potential impact of FDI, export, gross saving, inflation, industry value-added, and population growth on economic growth in Bangladesh.
## Table 4. Summary of Literature Review

| Author(s)                      | Country and Sample                                                                 | Methodology                                                                 | Findings                                                                                                                                                                                                 |
|--------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chirwa and Odhiambo (2016)     | Both developing and developed countries                                            | Various econometric methods                                                | For both developing and developed countries, the important determinants of economic growth are fiscal policy, trade, human capital, demographics, and monetary policy.                                              |
| Sultan (2008)                  | Bangladesh; 1965–2004                                                              | OLS Regression; Multivariate and Variate Cointegration Test; Causality Test | Industry value added has long-run impacts on GDP.                                                                                                                                                        |
| Kasidi and Mwakanemela (2013)  | Tanzania; 1990–2011                                                               | The linear regression equation and Cointegration test                       | Inflation negatively affects economic growth and no cointegration is found between them.                                                                                                                  |
| Chowdhury and Hossain (2018)   | Bangladesh; 1979–2017                                                             | Using different preventive checks                                          | Inverse relation exists with economic development and population growth.                                                                                                                                 |
| Klasen and Lawson (2007)       | Uganda                                                                             | Panel Data Analysis                                                        | Growth of population paused per capita growth.                                                                                                                                                           |
| Anaman (2004)                  | Brunei, 1971–2001                                                                 | ARDL Model                                                                  | Growth of export and size of government influence long-run growth rates.                                                                                                                                 |
| Behname (2012)                 | Southern Asia; 1977–2009                                                          | Panel Data Analysis                                                        | FDI is a crucial determinant of growth where human capital, capital formation, and infrastructure are positively related to economic growth and population, technology gap and inflation are negatively in Southern Asia. |
| Sun and Heshmati (2010)        | China; 2002 to 2007                                                                | Non-parametric Approach                                                     | Trade volume and Trade structure positively accelerate regional productivity.                                                                                                                             |
| Baiashvili and Gattini (2020)  | 111 countries of low-, middle- and high income countries                          | Panel GMM Technique                                                         | Income levels and FDI have a U shaped relationship.                                                                                                                                                      |
| Majumder and Rana (2016)       | Bangladesh                                                                         | OLS                                                                        | Export and GDP per capita are mostly influenced components of economic growth in the country.                                                                                                             |
| Fetahi-Vehapi, Sadiku, and Petkovski (2015) | European countries(South East); 1996 to 2012                                      | Panel GMM Technique                                                         | Trade openness, FDI, and Human capital positively influence economic growth.                                                                                                                             |
| Fitzová and Zídek (2015)       | Czech and Slovak Republics                                                        | Cointegration, VECM, and Granger Causalities                                | Exports and economic growth are positively related.                                                                                                                                                      |
| Moudatsou (2003)               | European Union (EU) countries                                                     | Panel Data Analysis                                                        | FDI is a positive determinant of growth rate.                                                                                                                                                           |
| Anyanwu (2014)                 | Africa; 1996 to 2010                                                               | Two-step Least ²SLS and Two-stage Efficient Generalized Method of Moments. | Openness does not have a positive impact on growth.                                                                                                                                                     |
| Har, Teo, and Yee (2008)       | Malaysia                                                                           | OLS Regressions                                                            | Economic growth and FDI inflows have a significant relationship and                                                                                                                                       |
### 4. OBJECTIVES OF THE STUDY

The main objective of this research is the empirical investigation of the impact of FDI, Export and Gross Domestic Savings on the Economic Growth in Bangladesh.

Where specific objectives are the following:

i. To find out the current situation of FDI inflows, Export, Inflation, Growth of population, and gross domestic savings in Bangladesh.

ii. To reveal the long and short-run determinants of growth in Bangladesh.

### 5. SIGNIFICANCE OF THE STUDY

Detecting all of the determinants that have an impact on economic growth is not easy as it consists of various factors. Here we try to briefly discuss some of them. This study helps in finding the influence of selected variables on growth by the Autoregressive Distributed Lag Bound Testing (ARDL BT) approach and also helps in finding both short and long-run determinants of growth in Bangladesh. This paper may be helpful for existing literature.

| Author(s)                     | Country/Region                          | Methodology                                                                 | Note                                                                 |
|-------------------------------|-----------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------|
| Dinh, Vo, and Nguyen (2019)   | Developing Countries; 2000–2014          | VECM and FMOLS                                                              | FDI accelerates growth both for the long run short-run and money supply, domestic investment and Domestic credit are important long-run economic determinant. |
| Dao (2012)                    | Forty-three Developing Economies        | Multivariate linear regression                                              | Population growth influenced GDP Per capita.                        |
| Saaed (2007)                  | Kuwait; 1985 to 2005                     | Co-integration and ECM                                                      | Inflation and economic growth have negative relation.               |
| Majumder (2016)               | Bangladesh, 1975–2013                    | VECM Approach                                                               | Inflation and economic growth have positive long-run relation.      |
| Ahamed and Tanin (2010)       | Bangladesh; 1975–2006                    | 2SLS Procedure                                                             | FDI positively impacts the growth of the economy.                    |
| Ali and Saif (2017)           | Pakistan; 1976–2015                      | Maximum Likelihood Estimation Approach; VECM; Granger Causality            | Agriculture, energy consumption, trade liberalization, and FDI have a positive influence on GDP. |
| Chizonde (2016)               | Zambia                                   | ARDL Approach                                                               | Physical capital, Exchange rate, inflation, price of crude oil is long-run economic determinants. |
| Darko (2015)                  | Ghana; 1975-2013                         | Vector Autoregressive Model                                                 | GDP per capita depends on export, oil, and mineral rents.           |
| Ghazanchyan, Stotsky, and Zhang (2015) | Asian countries; 1980 to 2012 | Panel Data Analysis                                                        | Private and Public investments strongly influence growth but the exchange rate does not. |
| Qadri and Waheed (2011)       | Pakistan; 1978 to 2007                   | The Standard Cobb                                                          | Human capital positively influences economic growth.               |
| Majumder and Donghui (2016)   | Bangladesh, 1975–2013                    | Douglas Production Function, Sensitivity Analysis ARDL Model                | There is a long-run significant relationship between remittances and economic growth in the country. |
| Simionescu, Lazanyi, Sopkova, Dobeš, and Balcerzak (2017) | V4 Countries; 2003-2016 | Bayesian Generalized Ridge Regression                                       | FDI promotes economic growth. The expenditure on education generates economic growth. |
| Tridico (2008)                | Emerging and Transition Economies; 1999–2005 | OLS Regression Analysis                                                    | Human capital and Export capacity are important for economic growth. |
6. METHODOLOGY
6.1. Data and Sample
We conduct this research with the data covering the year from 1972 to 2017 where the secondary data is collected from WDI (World Bank, 2019).

6.2. Model Specification
The final econometric model is provided below by the equation (2),

\[ GDP \text{ Growth} = f (FDI, \text{Exports}, \text{Inflation}, \text{Gross Domestic Savings}, \text{industry Value Added}, \text{Population growth}) \] ............ (1)

By taking natural logarithm the final econometric model is

\[ \ln GDP t = \alpha + \beta_1 \ln GDP_{t-1} + \beta_2 \ln FDI_t + \beta_3 \ln FDI_{t-1} + \beta_4 \ln Exp_t + \beta_5 \ln GDS_t + \beta_6 \ln Inf_t \\
+ \beta_7 \ln Inf_{t-1} + \beta_8 \ln IVA_t + \beta_9 \ln IVA_{t-1} + \beta_10 \ln PG_t + \beta_11 \ln PG_{t-1} + \mu_t \] ............ (2)

Here, \( GDP_t \) =GDP growth (annual %), \( GDP_{t-1} \) = GDP growth(One year lag), \( FDI_t \)=FDI, net inflows (current US$), \( FDI_{t-1} \)= FDI(One year lag), \( Exp_t \)=Exports of goods and services (% of GDP), \( GDS_t \)=Gross domestic savings (%of GDP), \( Inf_t \)=Inflation,(annual %), \( Inf_{t-1} \)= One year lag of inflation, \( IVA_t \)=Industry value added (constant 2010 US$), \( IVA_{t-1} \)= One year lag of Industry value-added, \( PG_t \)=Population growth, \( PG_{t-1} \)= One year lag of Population growth.

6.3. Hypotheses of the Study
\( H_1 \): FDI positively affects economic growth.
\( H_2 \): Exports positively affects economic growth.
\( H_3 \): Gross domestic savings positively affects economic growth.
\( H_4 \): Inflation negatively affects economic growth.
\( H_5 \): Industry value added positively affects economic growth.
\( H_6 \): Population growth negatively affects economic growth.

7. EMPIRICAL RESULTS AND DISCUSSION
7.1. Unit Root Test

| Variable | Level | 1st difference | Decision |
|----------|-------|----------------|----------|
| \( \ln GDP \) | t-statistics | -4.291117*** | -2.666190* | I(0) |
| \( \ln FDI \) | t-statistics | -6.170034*** | -5.163381*** | I(0) |
| \( \ln Exp \) | t-statistics | -3.566072** | -7.497741*** | I(0) |
| \( \ln Inf \) | t-statistics | -3.112398** | -9.870831*** | I(0) |
| \( \ln GDS \) | t-statistics | -0.8559094 | -8.430113*** | I(1) |
| \( \ln IVA \) | t-statistics | 2.362661 | -10.07564*** | I(1) |
| \( \ln PG \) | t-statistics | -1.854644* | -2.695684* | I(0) |

Note: 10%, 5%, and 1% level of significance are denoted with *, **, ***.
Augmented Dickey-Fuller test is used to test the stationarity. The results are presented below in table 5 where lnGDPG, lnFDI, lnExp, lnInf, lnPG is stationary at I(0); whereas the data of lnGDS and lnIVA is stationary at I(1) at 1, 5 and 10 percent significance level.

7.2. Lag-Length Criteria

As all of our data is stationary at mixed order we can apply Autoregressive Distributed Lag Model for the study developed by Pesaran and Shin (1999). From automatic lag selection criteria by SIC, we found appropriate lag 2 which are presented in Appendix Table 1.

7.3. Top of Form Bottom of Form ARDL Model

Table 6 shows the ARDL Model, where the negative coefficient of one-year lag GDP growth is significant. The coefficient of FDI is 0.05 refers to a 1% increase in it then growth will increase by 0.05%. The coefficient of one year lag FDI is negative but insignificant.

Exports positively affect GDP growth. From the model 1% increases in exports leads 0.03% increase in GDP growth. Gross domestic savings also positively affect GDP growth but statistically not significant. Inflation negatively affects the economic growth of Bangladesh. If inflation goes down by 1% then GDP growth will increase by 0.04%.

Industry value added positively affects economic growth. 1% increase in IVA leads to an 8.68% increase in GDP growth and significant at 1 percent level. Population growth negatively accelerates the growth of the economy; a 1% decrease in it then GDP growth will increase by 1.88%.

| Variable   | Coefficients | Standard error | Probability |
|------------|--------------|----------------|-------------|
| lnGDPGt-1  | -0.448984    | 0.060153       | 0.0000      |
| lnFDIt     | 0.048847     | 0.020244       | 0.0242      |
| lnFDIt-1   | -0.033729    | 0.019976       | 0.1048      |
| lnExp      | 0.313499     | 0.133422       | 0.0277      |
| lnGDS      | 0.072598     | 0.125246       | 0.5678      |
| lnInf      | -0.036804    | 0.028102       | 0.2032      |
| lnInf2     | 0.047606     | 0.027926       | 0.1017      |
| lnIVA      | 8.680891     | 1.438476       | 0.0000      |
| lnIVA-1    | -8.821380    | 1.506027       | 0.0000      |
| lnPGt      | -1.879197    | 0.633603       | 0.0069      |
| lnPGt-1    | 1.527422     | 0.682103       | 0.0351      |
| Constant   | 1.677531     | 1.385177       | 0.2382      |

R square
Adjust R square
Durbin Watson value 0.927916
0.899441
1.551148

Table 7 shows the diagnostic tests of the ARDL model; ensures the normal distribution of data as the Jarque-Bera probability value is 0.725. No autocorrelation and heteroscedasticity are detected in the model as the p-value of serial correlation and heteroscedasticity tests are 0.218 and 0.11 respectively.

| Test                        | Test statistic | P-Value |
|-----------------------------|----------------|---------|
| Normality Test Jarque–Bera  | J-B=0.643      | 0.725   |
| Autocorrelation Breusch-Godfrey LM | F value=1.639  | 0.218   |
| Heteroskedasticity Breusch-Pagan-Godfrey LM test | F value=1.839 | 0.110   |
7.4. ARDL Bound Testing

From table 8, the value 86.62 of ARDL BT estimation result at a 1 percent significance level admits that there exists a long-run relationship among the selected variables.

| K | F-stat | Significant | Lower bound, I(0) | Upper bound, I(1) |
|---|---|---|---|---|
| 6 | 86.62 | 5% | 2.45 | 3.61 |
| 2.5% | 2.75 | 3.99 |
| 1% | 3.15 | 4.43 |

7.5. Cointegration form of ARDL Model

From table 9, the short-run analyses of the model we see that the coefficient of ΔlnFDI, Δ lnExp, Δ lnGDS, and Δ lnIVA are positively significant at 1% and 5% level, meaning that all of these variables positively accelerate the economic growth of Bangladesh in the short run. Where the coefficients of Δ lnInf and Δ lnPG are negative meaning that in the short-run these variables have a negative impact on economic growth.

ECM_{t-1} is negative and significant refers that adjustment is corrected by 14.5% from short to long run.

7.6. Long Run Coefficient of ARDL model

Table 10 shows the long-run coefficient of the ARDL model where FDI, Exports, Gross domestic savings; Inflation has a positive coefficient, and Industry value-added and Population growth have negative coefficients.

7.7. Determinants of Economic Growth

For finding the determinants of growth we notice Table 11, we see that hypothesis H1 is rejected; meaning that FDI isn't a long run rather a short run determinant and significant at a 5% level. Hypotheses H2 is accepted as both the t statistics are significant in both the short and long run at a 5% level. Where 1% increases in export will boost 0.22% of GDP growth in Bangladesh. This evidence is empirically proved by Fitzová and Zídek (2015).

As hypotheses, H3 is rejected for both two terms. H4 is also rejected in the same way. H5 shows that industry value added is a short run determinant rather than long run. H6 is also rejected where population growth is a short-run determinant.
Table 11. Determinants of economic growth.

| Hypotheses                                               | T statistics       | Decision    |
|---------------------------------------------------------|--------------------|-------------|
| H1: FDI positively affects Economic Growth              | 2.412908**         | Rejected H1 |
| H2: Exports positively affects Economic Growth          | 2.349689**         | Accepted H2 |
| H3: Gross domestic savings positively affect Economic   | 0.579642           | Rejected H3 |
| Growth                                                  | 0.576374           |             |
| H4: Inflation negatively affects Economic Growth        | -1.309655          | Rejected H4 |
| H5: Industry value added positively affects Economic    | 6.034783***        | Rejected H5 |
| Growth                                                  | -0.948416          |             |
| H6: Population growth negatively affects Economic Growth | -2.965892***       | Rejected H6 |
|                                                        | -1.327984          |             |

Note: 10%, 5%, and 1% significance level are denoted by *, **, ***.

7.8. Stability Test

The stability test of the model is proved through the CUSUM and CUSUM squares test and shows our ECM-ARDL model is stable. The results are given in figure 2(a) and 2(b); where the color of the blue line doesn’t cross the red line. So we can say in the long run this model is stable.
7.9. Granger Causality Test

Pairwise Granger Causality Test is presented in Appendix Table 2 shows no causal relation between lnGDPG and lnInf; lnFDI and lnGDS; lnFDI and lnInf; lnFDI and lnIVA; lnExp and lnGDS; lnGDS and lnInf; lnGDS and lnPG. Unidirectional causality is found between lnGDPG and lnFDI; lnPG and lnGDPG; lnFDI and lnPG; lnGDS and lnExp; lnInf and lnExp; lnIVA and lnGDS; lnInf and lnIVA; lnIVA and lnPG. A bidirectional causal relation is found between lnGDS and lnGDPG; lnExports and lnGDPG; lnIVA and lnGDPG; lnPG and lnGDPG.

8. CONCLUSION AND POLICY RECOMMENDATION

The empirical investigation for finding the influence of FDI, export, and gross domestic savings on economic growth is essential for any country. In this paper, we analyze that empirical investigation in Bangladesh covering the year 1972 to 2017. Secondary data is drawn from World Bank (2019).

We apply ARDL BT and ECM ARDL BT test. Our selected variables are GDP growth, FDI, Exports, Gross domestic savings, Inflation, Industry value-added, and Population growth.

The result of the ARDL model shows the negative coefficient of one-year lag GDP growth. The GDP growth will rise by 0.05% if FDI increases by 1%. The coefficient of one year lag FDI is negative but insignificant. Exports positively affect GDP growth. From the model, if the increase in exports is 1% then GDP growth will increase by 0.03%. Gross domestic savings also positively affect GDP growth but statistically not significant. Inflation negatively affects the economic growth of Bangladesh. If inflation goes down by 1% then GDP growth will increase by 0.04%. Industry value added positively affects economic growth. 1% increase in Industry value-added leads an 8.68% increase in GDP growth. The growth of the population has negative impacts on economic growth. If it decreases 1%, 1.88% will be GDP growth. Durbin Watson's value is 1.55.

ARDL bound testing approach shows a long-run association among variables. The ECM_{1,t-1} is negative and significant indicating that adjustment will be corrected by 145% from short to long run. Hypotheses testing ensure except exports other determinants are short-run determinants. Cusum and Cusum squares test ensures the stability of this ARDL model.

Industrial goods and technology importing may accelerate the growth of the industry in Bangladesh. As export is an important determinant in Bangladesh it is urgent to have a look at exporting. In this case, export policy and export incentives will be helpful.

As inflation negatively impacts growth, policymakers should focus on this is issue to maintaining a low rate of inflation. Population growth should be checked to boost economic growth. In this case, female education can contribute a lot. Besides they have to make self-sufficient.

Funding: This study received no specific financial support.
Competing Interests: The authors declare that they have no competing interests.
Acknowledgement: All authors contributed equally to the conception and design of the study.

REFERENCES

Ahamed, M. G., & Tanin, F. (2010). Determinants of, and the relationship between FDI and economic growth in Bangladesh (No. 01/2010). Bonn Econ Discussion Papers.
Ali, A., & Saif, S. (2017). Determinants of economic growth in Pakistan: A time series analysis (1976–2015). European Online Journal of Natural and Social Sciences, 6(4), 686-700.
Anaman, K. A. (2004). Determinants of economic growth in Brunei Darussalam. Journal of Asian Economics, 15(4), 777-796. Available at: https://doi.org/10.1016/j.asieco.2004.05.019.
Anyanwu, J. C. (2014). Factors affecting economic growth in Africa: Are there any lessons from China? African Development Review, 26(3), 468-493. Available at: https://doi.org/10.1111/1467-8268.12105.
Baiashvili, T., & Gattini, L. (2020). Impact of FDI on economic growth: The role of country income levels and institutional strength (No. 2020/02). EIB Working Papers.

Behname, M. (2012). Foreign direct investment and economic growth: Evidence from Southern Asia. *Atlantic Review of Economics, 2*(1), 2-14.

Chirwa, T. G., & Odhiambo, N. M. (2016). Macroeconomic determinants of economic growth: A review of international literature. *South East European Journal of Economics and Business, 11*(2), 33-47. Available at: https://doi.org/10.1515/jeb-2016-0009.

Chizonde, B. (2016). The macroeconomic determinants of economic growth in Zambia: Do copper prices matter? *Munich Personal RePEc Archive, 1*-71.

Chowdhury, M. N. M., & Hossain, M. (2018). Population growth and economic development in Bangladesh: Revisited Malthus. arXiv preprint arXiv:1812.09893.

Dao, M. Q. (2012). Population and economic growth in developing countries. *International Journal of Academic Research in Business and Social Sciences, 2*(1), 2222-6990.

Darko, C. K. (2015). Determinants of economic growth in Ghana (pp. 1-22). Kiel and Hamburg: ZBW - German Central Library for Economics, Leibniz Information Center for Economics.

Dinh, T. T.-H., Vo, D. H., & Nguyen, T. C. (2019). Foreign direct investment and economic growth in the short run and long run: Empirical evidence from developing countries. *Journal of Risk and Financial Management, 12*(4), 1-11. Available at: https://doi.org/10.3390/jrfm12040176.

Fetahi-Vehapi, M., Sadiku, L., & Petkovski, M. (2015). Empirical analysis of the effects of trade openness on economic growth: An evidence for South East European countries. *Procedia Economics and Finance, 19*(2015), 17-26. Available at: https://doi.org/10.1016/s2212-5671(15)00004-0.

Fitzová, H., & Zídek, L. (2015). Impact of trade on economic growth in the Czech and Slovak Republics. *Economics & Sociology, 8*(2), 36-50. Available at: https://doi.org/10.1016/s2212-5671(15)00004-0.

Ghazanchyan, M. M., Stotsky, M. J. G., & Zhang, Q. (2015). A new look at the determinants of growth in Asian countries (No. 15-195). *International Monetary Fund, 15*(195), 1-33. Available at: https://doi.org/10.5089/9781515524535.001.

Har, W. M., Teo, K. L., & Yee, K. M. (2008). FDI and economic growth relationship: An empirical study on Malaysia. *International Business Research, 1*(2), 11-18.

Kasidi, F., & Mwakanemela, K. (2013). Impact of inflation on economic growth: A case study of Tanzania. *Asian Journal of Empirical Research, 3*(4), 363-380.

Klasen, S., & Lawson, D. (2007). The impact of population growth on economic growth and poverty reduction in Uganda. Contributions to the Discussion, NO.133, Georg-August University Göttingen, Economics Seminar, Göttingen.

Majumder, S. C., & Donghui, Z. (2016). Relationship between remittance and economic growth in Bangladesh: An autoregressive distributed lag model (ARDL). *European Researcher: Series A: International Journal of Social Sciences, 104*(3), 156 – 167. Available at: https://doi.org/10.13187/er.2016.104.156.

Majumder, S. C., & Rana, M. (2016). Trade liberalization and its effects on the economic growth of Bangladesh: An empirical analysis. *American Journal of Trade and Policy, 3*(1), 7-16.

Majumder, S. C. (2016). Inflation and its impacts on economic growth of Bangladesh. *American Journal of Marketing Research, 2*(1), 17-26.

Moudatsou, A. (2003). Foreign direct investment and economic growth in the European Union. *Journal of Economic Integration, 18*(4), 689-707.

Pesaran, M. H., & Shin, Y. (1999). *An autoregressive distributed lag modeling approach to cointegration analysis. in ström, s. (ed.), econometrics and economic theory in the 20th century: The ragnar frisch centennial symposium. Chapter 11. Cambridge: Cambridge University Press.

Qadri, F. S., & Waheed, A. (2011). Human capital and economic growth: Time series evidence from Pakistan (pp. 1-18). Munich Personal RePEc Archive.
Saaed, A. A. (2007). Inflation and economic growth in Kuwait: 1985-2005—Evidence from co-integration and error correction model. *Applied Econometrics and International Development, 7*(1), 31-43.

Simionescu, M., Lazanyi, K., Sopkova, G., Dobeš, K., & Balcerzak, A. P. (2017). Determinants of economic growth in V4 countries and Romania. *Journal of Competitiveness, 9*(1), 103-116. Available at: https://doi.org/10.7441/joc.2017.01.07.

Sultan, P. (2008). Trade, industry and economic growth in Bangladesh. *Journal of Economic cooperation, 29*(4), 71-92.

Sun, P., & Heshmati, A. (2010). International trade and its effects on economic growth in China. *IZA Discussion Paper No. 5151, 1-38.*

Tridico, P. (2008). The determinants of economic growth in emerging economies: A comparative analysis.

World Bank. (2019). *World development indicators.* Washington D C: World Bank.

**APPENDICES**

**Appendix Table 1: Optimum Lag Selection Model.**

| Lag | LogL     | LR       | FPE       | AIC       | SC        | HQ        |
|-----|----------|----------|-----------|-----------|-----------|-----------|
| 0   | 171.0979 | NA       | 8.29e-14  | -10.25612 | -9.935492 | -10.14984 |
| 1   | 421.1312 | 375.0498 | 3.12e-19  | -22.82070 | -20.25566 | -21.97046 |
| 2   | 516.9354 | 101.7920*| 2.71e-20* | -25.74596*| -20.93651*| -24.15176*|

Note: * indicates lag order selected by the criterion.
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion.

**Appendix Table 2: Results of granger causality tests.**

| Granger Causality Tests | Obs  | F-Statistic | Prob. |
|-------------------------|------|-------------|-------|
| LNFDI does not granger cause LNGDPG | 33   | 1.51946     | 0.2363 |
| LNGDPG does not granger cause LNFDI   |      | 2.57438     | 0.0941 |
| LNEXP does not granger cause LNGDPG  | 40   | 10.4701     | 0.0003 |
| LNGDPG does not granger cause LNEXP  | 2    | 2.28626     | 0.1166 |
| LNGDS does not granger Cause LNGDPG  | 39   | 7.41011     | 0.0021 |
| LNGDPG does not granger cause LNGDS  |      | 7.47371     | 0.0020 |
| LNINF does not granger cause LNGDPG  | 38   | 1.39379     | 0.2294 |
| LNGDPG does not granger cause LNINF  |      | 0.18895     | 0.8287 |
| LNIVA does not granger cause LNGDPG  | 40   | 12.2855     | 9.E-05 |
| LNGDPG does not granger cause LNIVA  |      | 5.60192     | 0.0078 |
| LNGPG does not granger cause LNGDPG  | 40   | 11.7673     | 0.0001 |
| LNGDPG does not granger cause LNGPG  |      | 0.50727     | 0.6065 |
| LNEXP does not granger cause LNFDI   | 37   | 3.09352     | 0.0591 |
| LNFDI does not granger cause LNEXP   |      | 3.19295     | 0.0544 |
| LNGDS does not granger cause LNFDI   | 33   | 0.32502     | 0.7252 |
| LNFDI does not granger cause LNGDS   |      | 2.08130     | 0.1436 |
| LNINF does not granger cause LNFDI   | 34   | 0.10134     | 0.9039 |
| LNFDI does not granger cause LNINF   |      | 0.55537     | 0.5798 |
| LNIVA does not granger cause LNFDI   | 37   | 2.07752     | 0.1418 |
| LNFDI does not granger cause LNIVA   |      | 1.25213     | 0.2995 |
| LNGPG does not granger cause LNFDI   | 37   | 1.29927     | 0.2867 |
| LNGFDI does not granger cause LNGPG  |      | 21.8609     | 1.E-06 |
| LNGDS does not granger cause LNEXP   | 40   | 2.42467     | 0.1032 |
| LNEXP does not granger cause LNGDS   |      | 1.87199     | 0.1689 |
| LNINF does not granger cause LNEXP   | 40   | 4.64471     | 0.0163 |
| LNEXP does not granger cause LNINF   |      | 0.90063     | 0.4155 |
| LNIVA does not granger cause LNEXP   | 44   | 13.8328     | 3.E-05 |
| LNEXP does not granger cause LNIVA   |      | 3.85900     | 0.0296 |
| LNGPG does not granger cause LNEXP   | 44   | 0.93162     | 0.4025 |
| LNEXP does not granger cause LNGPG   |      | 15.9085     | 9.E-06 |
| LNINF does not granger cause LNGDS   | 39   | 0.36631     | 0.6060 |
LNGDS does not granger cause LNINF | 2.26809 | 0.1190  
LNIVA does not granger cause LNGDS | 10.0985 | 0.0003  
LNGDS does not granger cause LNIVA | 1.38620 | 0.2634  
LNPG does not granger cause LNGDS | 1.43661 | 0.2514  
LNGDS does not granger cause LNPG | 2.02681 | 0.1469  
LNIVA does not granger cause LNINF | 2.32500 | 0.1127  
LNINF does not granger cause LNIVA | 5.61251 | 0.0077  
LNPG does not granger cause LNINF | 0.61634 | 0.5457  
LNINF does not granger cause LNPG | 4.53229 | 0.0177  
LNPG does not granger cause LNIVA | 0.10696 | 0.8988  
LNIVA does not granger cause LNPG | 47.9784 | 3.E-11

*Views and opinions expressed in this article are the views and opinions of the author(s), The Economics and Finance Letters shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.*