Original Research Article

Inflation, Economic Growth and Government Expenditure in Bangladesh: An Empirical Analysis 2016 – 2020.

Abstract

The purpose of this study is establish to the effect of inflation and government expenditure on economic growth in Bangladesh. The study focused total of five (05) years in the period of (2015-2016) fiscal year to (2019-2020) fiscal year after major liberalization of trade took place in Bangladesh. In this paper, we want to look into the impact of Bangladesh government expenditure on growth of economic using time series data from 2016 to 2020 fiscal years. We used Secondary data and it was obtained from various sources like the Bangladesh Bureau of Statistics (BBS), Bangladesh Bank (BB) and Asian Development Bank (ADB), and World Development Indicators of the World Bank. Econometrics tools like ADF (Augmented Dickey-Fuller) unit root test, ECM (Error Correction Model) and Engel-Granger Cointegration test to estimate the short and long run association in the model are used to investigate such relationship. We use E-views 10 tools to calculate the above test. From the result of the study, we can say that a long-term relationship among the govt. expenditure, inflation and rate of economic growth. Also suggested that, when the association among economic growth and govt. expenditure is positive then economic growth and inflation are negative.

Keywords: *Economic growth, Inflation, government expenditure, ADF test, Unit root test.*

Introduction:

In accordance with to the fundamental concept of Inflation, Govt. Expenditure and Economic Growth have a close relationship and impact on growth of economic whereas, primarily an excess to supply of money and an increase in credit [7] have caused Inflation. Fiscal and Monetary policies initiated usually keep rising inflation. These increases are dominant because when people are allowed to offer more money for goods or the supply of goods cannot be balanced with the supply of money automatically raises the price of goods.

"Economic theory doesn't unquestionably generate strong ending about the effect of govt. expenditure on economic presentation. In fact, most economists would agree that there are circumstances in which lower levels of government spending would enhance economic growth

and other circumstances in which higher levels of government spending would be desirable. If government payout is 0, in all probability there will be few little economic growth because impose contracts, save property and developing a framework would be very hard. That is to say, some govt. spending is necessary for the victorious operation of the rule of law" [8]

The scale of govt. expenditure, the tendency of inflation, and its impact on the growth of economic in the developing economies have continued to dominate the literature recently. In Bangladesh, government expenditure increase in day by day because of the large receipts from production and the increased demand for public goods like roads, communication, Energy, Defiance, Education, and health. In addition, on that point an increasing have to provide both inner and outside security for the people and the country. Sad to say, this rising govt. expenditure has not change into meaningful development and growth, as according to Global finance the rank of Bangladesh is 140 among the richest countries over world. The rate of inflation within the economic structure kept expand and one awe whether the upsurge in govt. expenditure has nothing al all to do with the high rate of inflation and output level in the study period.

Chart 1. Trend Growth of Economic, Inflation, and Govt. Expenditure in Bangladesh, 2016-2020.

Year	Rate of Economic Growth	Rate of Inflation	Govt. Expenditure in (Billion) BDT
2016	7.11	5.51	1021.09
2017	7.28	5.7	1184.67
2018	7.86	5.54	1430.56
2019	8.15	5.59	1594.41
2020	2.38	5.69	1718.14

Source: Bangladesh Bureau of Statistics, Bangladesh Bank, Ministry of Finance and World Bank.

The function of Bangladeshi government in economic activities has grown enormously and the challenges that public policymakers face are increasing day by day. Public expenditures has been extend continuously over the years and further especially in the last ten years. The total of both capital and regular expenditure of the government grow irregularly from about billion in 2016 to about 2020.

Objectives

1. To measure the interrelation among the **Economic growth and the inflation** over the period 2016-2020.

2. To measure the interrelation among the **economic growth and the government expenditure** over the period 2016-2020
3. To establish the effect of **Inflation on Economic Growth** in Bangladesh over the period 2016-2020.

Literature Review:

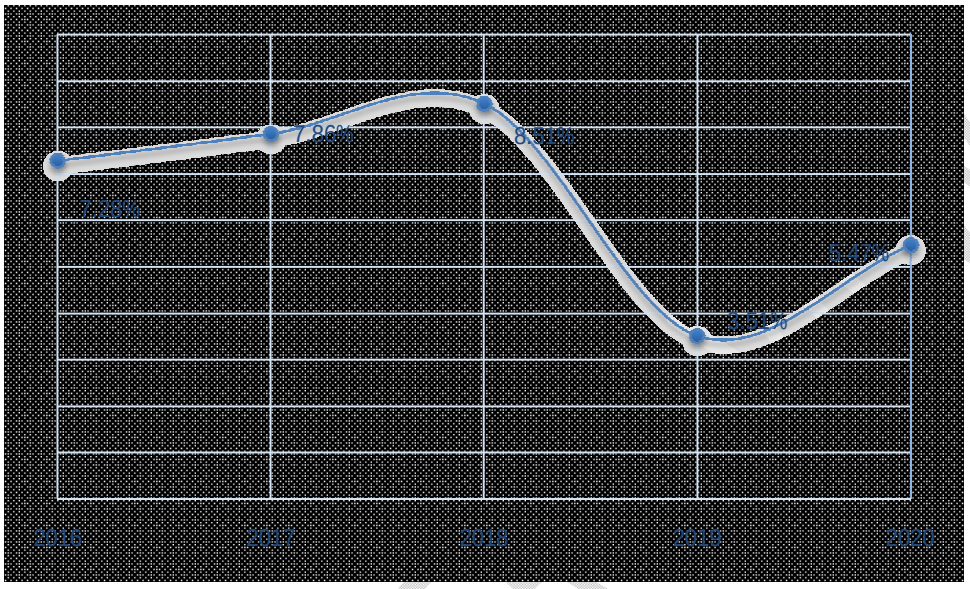
Published studies had evaluate the relationship among the rate of economic growth, inflation and govt. expenditure in developing and developed countries [4]. "These studies were mainly based on strong macroeconomic background on the interrelation among inflation and economic growth. The interrelation among inflation and economic growth has been the subject of huge research over the past of few years" [2]. According of this paper "the relationship between inflation and economic growth has been the subject of extensive research over the past of few decades".
[3] Are among the supporters of positive relationships among the two variables. "To reach this conclusion they used co-integration and error correction framework to analyze data collected from four south Asian countries (Sirlanka, Bangladesh, Pakistan and India) and found a long- run positive relationship between inflation and economic growth. They assume that moderate inflation is helpful to speedy the rate of economic growth".
Therefore according to Wagner's law increase in government expenditure is describe by the fact that the government wants to maximize its utility functions which consists of 16 public service delivery. The law suggests that besides a unidirectional causality there exist equilibrium between expenditures and the rate of economic growth.
[1] Has measured "the constructive correlation among the area of public sector and real GDP per capita. The results proposed that govt. expenditure causes actual income both in short and long-run. In case of Roman, the growth in output causes growth in general expenditure".
[5] Examine separately "the interrelation among economic growth and inflation for developing and industrial countries. The terminal level of inflation above which inflation significantly slows growth is estimated at 1% -3 % for industrial countries and 11%-12% for developing countries. The non-positive and significant interrelation among economic growth and inflation, for inflation above the terminal level, is quite strong with respect to the estimation method, perturbations in the location of the terminal level, the exclusion of high rate of inflation observations, data frequency, and alternative specifications".

Historical movement of Inflation and the rate of Economic Growth:

Bangladesh is a small country in the world. The Bangladeshi economy is a quickly developing market based on economy. Its per-capita income in 2015 was Bangladesh 1544 US dollars [9]. According to World Development Indicators Database and IMF (International Monetary Fund), Bangladesh ranked as the 44th in the world economy in the last 2015. Following the launching

of a sequence of comprehensive stabilization measures, the economy of Bangladesh mostly restored both strong economic growth and macro-economic stability in early 1990s from the background of deep macro-economic disorder of the period since independence [6].

Fig 1: **Bangladesh Annual Growth Rate of GDP**



Source: Economic Review of Bangladesh 2021

The growth rate of Bangladesh Economic has achieved GDP growth at more than 6 % on an average during the last few years. In the Fig 1 we can see that the growth of GDP 7.28 percent in 2016-17 fiscal year, 7.86 percent in 2017-18 fiscal year and 8.15 percent in 2018-19 fiscal year. In fiscal year 2019-20 the growth of GDP stood at 3.51 percent. The GDP growth is 5.47 percent in fiscal year 2020-21 and that is the lowest since fiscal year 2008-09, this situation has been created mainly because of the outbreak of COVID-19 pandemic.

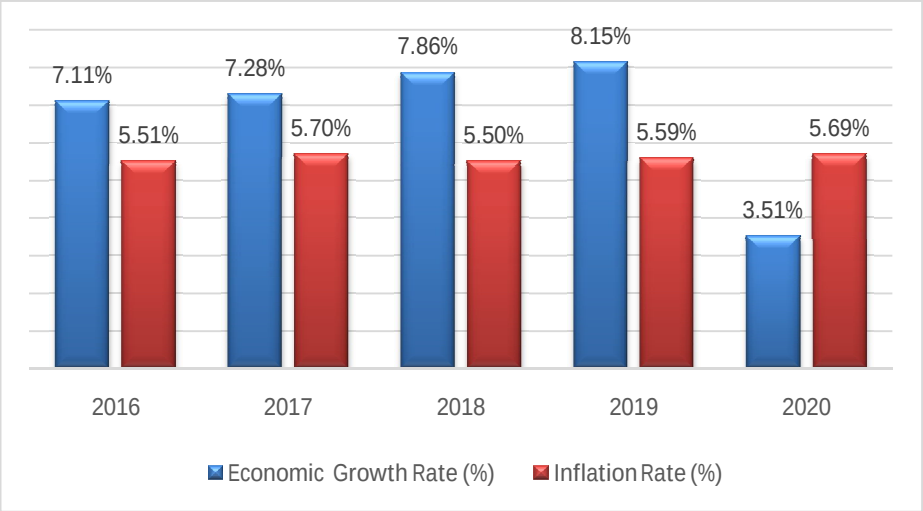
Table 1. GDP, Per-Capita GDP at Current Market Prices

Item	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**
GDP (In Crore Tk.)	1975815	2250479	2542483	2739332	3011065
GDP (In Billion US$.)	221.4	249.7	274	302.6	324.2
Per-Capita GDP (In Tk.)	122152	137518	15358	163611	177843
Per-Capita GDP (In US$)	1544	1675	1828	1930	2097

Source: Bangladesh Bureau of Statistics (BBS)

From the Table 1. The present market prices Bangladesh of GDP is Tk. 30, 11,065 crore in fiscal year 2020-21, up by 9.91% of the past fiscal year. The per capita GDP increased to Tk. 1, 77,843 in fiscal year 2020-21 which was Tk. 1, 63,611 in past fiscal year.

Fig 2: **The rate of Economic Growth and Inflation of Bangladesh**



Source: The World Bank

In the Fig 2 display that, the highest growth of economic in Bangladesh was 8.15% in the year of 2019, the 2nd highest was 7.86 in the year of 2018 whish was descries 0.29% from year of 2019 and the lowest economic growth is 5.69% and inflation is 3.51% in the year of 2020.

Methodology

The aim of this study is the relationship among economic growth, inflation, government expenditure and the Inflation effect on Growth of Economic in Bangladesh over the session of 2016-2020. In this connection all the time series data are obtained from the session period of 2016-2020 in the Bangladesh Bureau of Statistics, Bangladesh Bank, Finance Ministry, and the World Bank. This study constructs on the project of [10] by considering the Bangladesh perspective and we follow the alike function. This article also explores the same interrelation between the real GDP, the rate of inflation, and the govt. expenditure.

$$\ln Y_t = f(\Delta \ln P_t, \ln GE_t) \quad \text{..... (1)}$$

$$\ln Y_t = \beta_0 + \beta_1 t + \beta_2 \ln P_t + \beta_3 \ln G_t + \mu_t \quad \text{..... (2)}$$

Where, Y_t respectively represent the real GDP, P_t is Inflation and GE_t is the govt. expenditures, β_0 and β_1 are respectively drift and trend components β_2 and β_3 are the associate coefficient to

each explanatory variable, μ_t is the error of the regression; and *ln* is the natural logarithm operator.

$$\ln Y_t = \beta_0 + \beta_1 \Delta \ln P_t + \beta_2 \ln GCE_t + \mu_t \quad \text{..... (Model eq. 1)}$$

$$\ln Y_t = \beta_0 + \beta_1 \Delta \ln P_t + \beta_2 \ln GDE_t + \mu_t \quad \text{..... (Model eq. 2)}$$

$$\ln Y_t = \beta_0 + \beta_1 \Delta \ln P_t + \beta_2 \ln GCE_t + \beta_2 \ln GDE_t + \mu_t \quad \text{..... (Model eq. 3)}$$

We divided the Govt. Expenditures (GE) in two parts. Firstly, govt. current expenditures (GCE) and 2nd one is govt. development expenditures (GDE). At First, we tested the individual result of both expenditures. Secondly, the combined result of both expenditures have been taken by using the similar equation (1).

In this paper we use the Augmented Dickey Fuller (ADF) unit root test for testing technique. We use this model in this paper for the measure the interrelation between the variables of economic which is contain some different steps like as to verify the entity of unit root for every variable, estimate the best lag orders basis of every equation, evaluate the coefficients twain in long and short-run, measure the long-run relationship between the variables by applying Wald test and also use test of diagnostic and stability.

To avoid misspecification and biased estimates in the regression, firstly, this study employs Augmented Dickey-Fuller unit root test to identify stationary of the variables. The constant includes this test with no trend at level *I(0)*, and 1st difference *I(1)* of variables.

Table 2. Summary of Variables

Variable	Indicator	Notation	Data Source
Economic Growth	Annual growth of Gross Domestic Product	Y_t	Bangladesh Bureau of Statistics
Inflation		P_t	Bangladesh Bank
Total Government Expenditure	Annual overall government expenditure	GE_t	Directorate of Fiscal Balance, Ministry of Finance
Government current expenditures	Annual Government expenditure	GCE	Directorate of Fiscal Balance, Ministry of Finance
Government Development Expenditure	Annual development expenditure	GDE	Directorate of Fiscal Balance, Ministry of Finance

Result and Discussion

At first, we use Augmented Dickey-Fuller Unit Root test to identify whether the variables of economic are stationary. The ADF test cover constant with MacKinnon P-Values at the level

I(0), and MacKinnon P-Values 1st difference *I*(1) of variables. K indicates lag differences which are picked according to the Schwarz-Info Criterion (SIC).

Table 3. Test Statistic of ADF Unit Root

Variables	MacKinnon P-Values I (0)	K	MacKinnon P-Values I(1)	K
lnY_t	0.9515	0	0.000	0
$lnGE_t$	.09524	0	0.000	0
P_t	0.0005	0	0.000	0

Source: Own data, estimated with E-views 10

From Table 3 we can see that GDP, Government expenditure are non-stationary at level (0). It also see that the Inflation, GDP, and Govt. expenditure are stationary at the 1st difference 1 percent significance level in case of Bangladesh. In These results are related to the data's is appropriate association with the long-run estimate in the model.

In table 4 shows the summary of the result and Diagnostic test. It includes with Breusch-Godfrey Serial Correlation LM, Breusch-Pagan-Godfrey, and J-B Normality test. This result expressed that, there are no evidence of serial interrelation and diverseness in the entire model and also shows that, the terms of

Table 4. Result of Diagnostic Test

Diagnostic Tests Indicator	Model eq.1	Model eq.2	Model eq.3
Breusch-Godfrey Serial Correlation LM Test	0.895	0.783	0.743
Breusch-Pagan-Godfrey Test	0.863	0.292	0.811
J-B Normality Test	0.614	0.631	0.674

Source: Own data, estimated with E-views 10.

Residual is normally distributed. After that, we can take a decision that null hypothesis is rejected for the diagnostic test result.

Table 5. Result of Cointegration Test

Variable	(1)	(2)	(3)
RES (-1)	0.031	0.031	0.033
Note: The result provides the p-value provides Engel-Granger Cointegration test results on long run estimation.			

Source: Own data, estimated with E-views 10.

We use Engel-Granger Cointegration test for validate the long-run relationship among the variables in the model of regression. The Cointegration test result suggested that, the long-run relationship among the variables in the models are clear.

For regression model we estimated long-run and it is showed in the table 6. From the table we can see that, economic growth, government expenditure, and inflation are

Table 6. Long Run Estimate Results: Dependent variable is GDP (lnY_t)

Variables	Column 1	Column 2	Column 3
P_t	-0.0089*** (0.002)	-0.0089*** (0.004)	-0.0089*** (0.0004)
ln GE_t	1.09*** (0.044)	1.156*** (0.086)	-
R-squared	0.970	0.923	0.865
Note: The result provides long-run estimates on time series datasets. All regressions include a constant. Standard errors in parenthesis. *,**,*** is significant at 1%,5%, and 10%.			

Source: Own data, estimated with E-views 10

significant along with others, it shown in column 1.When inflation increase 1 percent it's lead to 0.0089 percent decrease of economic growth. When the growth of economic increase 1.09 then govt. expenditure increase by 1 percent. In Column 1 and Column 2 are shows the government expenditure, economic growth, and inflation are strongly correlative with each other's. Also show that, the economic growth and inflation is constant.

Table 7. Results of Short Run Estimated: Dependent variable is *(lnGDP)*

Variables	Column 1	Column 2	Column 3
D(P_t)	-0.001	-0.002*	-0.012*

	(0.075)	(0.644)	(0.082)
D(ln GE_t)	0.715*** (0.062)	0.715*** (0.426)	-
RES (-1)	-0.046*** (0.058)	-0.048*** (0.058)	-0.058*** (0.336)
R-squared	0.825	0.336	0.817
Note: The result provides run estimates on time series datasets. All regressions include a constant. Standard errors in parenthesis. *,**,*** is significant at 1%,5%, and 10%.			

Table 7 is represent the short-run estimated where dependent variable is *lnGDP*. It's strongly association among economic growth, inflation and govt. expenditure in Bangladesh. In this model the ECT (Error Correction Term) is -0.046, -0.048 and -0.058. The result of ECT expose that, imbalance in past period's collision will be adjusted in the running period's long run balance. From the table 6 we also show that the govt. expenditure and inflation are truly significant alignment with economic growth in Bangladesh. Finally, the short- run estimated coordination suggested that not more than 1 % of the imbalance will be adjusted in the running year's long run balanced. In conclusion the ECT suggested that, the long-run estimated are stable in this study and association among the variables.

Conclusion:

The purpose of this study is about the three issues of inflation, govt. expenditure and economic growth. In this paper we want to estimate the relationship among economic growth, govt. expenditure and inflation in the case of Bangladesh 2016-2020 fiscal year. Firstly, we use unit root test, unit root test result shows that, the data is stationary. This study also tries to estimate the short and long-run association among economic growth, govt. expenditure, and inflation in Bangladesh. ECM (Error Correction Model) and Engel-Granger Cointegration Test are used for estimate long and short-run association on selected variables. The test result show that, the variables are significantly associated in Bangladesh. The results also implies that, for both long and short run of economic growth the inflation tend to decrease and govt. expenditure tends to increase. Further, the result also concluded that short term or temporary adjustment is strong for estimating long run association in the regression models.

The rate of inflation in Bangladesh is increasing day by day. So in this study has a good contribution by showing the relationship among economic growth and inflation in Bangladesh.

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