

# Effect of Macroeconomic Factors on Economic Growth: A Case Study of Bangladesh

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## Abstract

Macroeconomic factors strongly influence the economy. It affects countries and businesses equally. The relationship between different macroeconomic factors is an area of widespread study for policymakers and economists. The ultimate purpose of this study is to assess the impact of macroeconomic factors on the economic growth. This research has taken GDP as a substitute variable for the development of the economy as well as endogenous (dependent) variable and FDI, inflation (INF), money supply (M2), public and private domestic investment (DINVEST), and foreign exchange reserve (FExR) as independent variables. Moreover, this study used time series secondary data starting from 2005-06 to 2022-23 for all econometric analysis. On the other side, we utilized the ADF (Augmented Dickey-Fuller) test to study the unit root (stationary property) of data, the Durbin Watson (DW) statistic technique to verify the autocorrelation of variables, the VIF test technique to examine the multicollinearity among independent variables and multiple linear regression to scrutinize the overall effect of macroeconomic factors on growth of the economy. Study findings show that DINVEST and FDI positively affect the growth of the economy. i.e., if macroeconomic variables- DINVEST and FDI are increased by 1 unit, they increase economic growth by 2.96 units and 0.62 units, respectively. However, inflation, money supply, and foreign exchange reserves have a positive effect on economic growth, but it is statistically insignificant. The study implies that economists, researchers, academicians, and policymakers can use the findings of the study for future research and decision-making regarding the effect of macroeconomic factors on economic growth.

**Keywords:** Macroeconomic Factors, Economic Growth, Economy of Bangladesh

## Introduction

Macroeconomic factors are trends, situations, or events that affect major portions of the economy rather than isolated groups. It strongly influences economies. Moreover, a macroeconomic factor affects countries and businesses equally. The relationship between different macroeconomic factors and economic growth is an area of extensive study for policymakers and economists. Typical macro-economic variables include GDP, inflations, broad money (M2), foreign direct investment, domestic investment, public and private consumption, government expenditure, government revenue, export, import, the balance of trade, the balance of payments- current account, foreign currency reserve, etc. (Smigel, 2023). GDP is the sum of the monetary price of an economy's goods and services produced in a fixed time frame, typically annually/quarterly. It encompasses all end goods and services originating from economic entities within the nation irrespective of ownership and excludes any items that

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are resold in their original form. It is considered the main measure of output and economic activity throughout the world (Bondarenko, 2024). Moreover, GDP is regarded as an indicator of economic growth.

Economic growth or growth of the economy is the rise in the competence of an economy to generate goods and services from one year to another (Ali & Hossain, 2017). The growth can be calculated by Gross Domestic Product (GDP).

The prime objective of this research is to determine the effect of macro-economic factors on the economic growth of Bangladesh. Literature review indicates that local and international researchers, together with Akram et al. (2011), Enu et al. (2013), Biswas and Saha (2014), Ismaila and Imoughele (2015), Ali et al. (2015), Wadud (2017), Koteswara and Sera (2017), Simionescu et al. (2017), Anik and Biplob (2019), Haque (2020), Oyebowale and Algarhi (2020), Ghimire et al., (2020), Jannat et al. (2020), Jacob et al. (2021), Mukit (2021), Hassan et al. (2022), Ajmair and Tahir, (2022) and many other studies carried out extensive study to express the effect of macroeconomic indicators on various economies. Although all of the abovementioned research scholars use GDP as a substitute for economic growth, their independent variables and research findings vary greatly from economy to economy and researcher to researcher. Among various macroeconomic indicators, inflation shows a positive relationship (Enu et al., 2013; Ali et al., 2015, Jacob et al., 2021; Haque, 2020; Mukit, 2021) negative relationship (Akram et al., 2011; Biswas & Saha, 2014; Tien, 2021, Hassan et al., 2022; Ajmair & Tahir, 2022) and insignificant relationship (Ghimire et al., 2020, Wadud, 2017; Adu-Gyamfi et al., 2020) with economic growth. Moreover, export has a positive relationship (Biswas & Saha, 2014; Hassan et al., 2022; Oyebowale & Algarhi, 2020) as well as a negative relationship (Jannat et al., 2020) and an insignificant relationship (Wadud, 2017; Haque, 2020; Mukit, 2021) with economic growth. However, imports express a positive relationship (Ghimire et al., 2020; Hassan et al., 2022), a negative relationship (Jannat et al., 2020), and an insignificant relationship (Wadud, 2017; Haque, 2020; Mukit, 2021) with economic growth. In addition, FDI also indicates positive relationship (Enu et al., 2013; Biswas & Saha, 2014; Ismaila & Imoughele, 2015; Ali et al., 2015; Simionescu et al., 2017), negative relationship (Akram et al., 2011, Louzi & Abadi; 2011; Saqib et al., 2013; Nath et al., 2022; Ajmair & Tahir, 2022 in Pakistan) and insignificant relationship (Wadud, 2017; Ghimire et al., 2020; Jacob et al., 2021; Ajmair & Tahir, 2022) (in Bangladesh) with economic growth. On the other hand, money supply (Biswas & Saha; 2014; Anik & Biplob, 2017), govt. expenditure (Enu et al., 2013; Ismaila & Imoughele; 2015; Koteswara & Sera, 2017; Rahman et al., 2023) have a positive association with economic growth. However, public and private domestic investment has a positive relationship (Akram et al., 2011; Haque, 2013; Wadud, 2017; Ajmair & Tahir, 2022) and a negative relationship (Kutasi & Marton, 2020) with economic growth. Therefore, it is said that there is a scope for further study. Hence, this study has taken to find out which macro-economic factors affect the growth of the economy of Bangladesh.

## Literature Review

Oyebowale and Algarhi (2020) examined the macroeconomic determinants of economic growth among 21 African economies using the Pooled Mean Group on the panel data for the period 2017-2020. They used RGDP as an endogenous variable and broad money, exports, and general govt. Final consumption expenditure (GGFCE) and gross domestic capital formation (GDCF) as independent variables and found a long-run favorable association between RGDP and exports, GGFCE, and GDCF.

Koteswara and Sera (2017) analyzed macroeconomic determinants of economic growth in Ethiopia by applying the Johansen multivariate analysis and Vector Error Correction model for the period 1980-2014. They used real GDP as the dependent variable, and exports, govt. Expenditure on agriculture, government expenditure on mining and energy, population, gross

domestic capital formation, and budget deficit as independent variables. They have shown that social welfare expenditures significantly affect the economic growth of Ethiopia. However, gross domestic capital formation is adversely affected.

Wadud (2017) analytically observed the macro-economic factors of economic growth of the World Bank categorized lower-middle-income countries and explored the association between macroeconomic indicators like FDI, current account balance (CAB), exports, imports, total investment, inflation, unemployment rate, interest rate, life expectancy, foreign exchange reserve, population, and economic growth. He found a statistically significant relationship between CAB, investments, population, expectancy of life, foreign exchange reserve & economic development. On the other side, exports, imports, FDI, unemployment rate, interest rate, and inflation showed a statistically insignificant relationship with economic growth.

Simionescu et al. (2017) conducted research to find out the factors of economic growth of the Republic of Czech, the Republic of Slovakia, the Republic of Hungary, the Republic of Poland, and Rumania for the period of 2003-2016 using Bayesian Generalized Ridge Regression. They used real GDP growth as the dependent variable and inflation rate, foreign direct investment inflows, employment rate, govt. Expenditure on education (% of GDP), spending on R&D, and workforce with secondary and tertiary education as an exclamatory variable. Their study results showed that FDI inflow influences economic growth in all five sample countries except the Republic of Slovakia—Moreover, govt. Expenditure on education showed a positive impact in the Republic of Czech only, while the R&D expenditure showed positive effects in Romania, Hungary, and the Czech Republic.

Akram et al. (2011) used a simple OLS regression technique to investigate the determinants that influenced SAARC country's economic growth from 1971 to 2009. They used RGDP growth rate as the endogenous variable and FDI, debt, gross domestic investments (GDI), and inflation rate as control variables. The study results revealed that FDI and inflation negatively affect the economic growth of the sample countries, while GDI and debt have a significant positive impact.

Ismaila and Imoughele (2015) used the ADF test and Johansen's test to evaluate the macroeconomic determinants of the economic growth of Nigeria. They used gross domestic product as endogenous variables and FDI, gross fixed capital, labor force, trade openness, government expenditure, and inflation rate as independent variables. The study results revealed that the FDI, gross fixed capital, and govt. Expenditures are statically strong indicators of the economic growth of Nigeria.

Ghimire et al. (2020) tried to finds out an in-depth association between macroeconomic factors and their effect on the economic growth of Nepal using twenty-seven years of time series data starting from 1990 to 2016. They used RGDP (real GDP) as an endogenous variable, while exchange rate, exports, foreign direct investments, gross fixed capital formation (GFCF), imports, and inflations as independent variables. The study results revealed that exchange rate, GFCF, and imports have statistically significant positive effects, while exports, FDI net flow, and inflation are statically insignificant determinants of the economic growth of Nepal. On the other hand, Joshi (2022) showed a long-run association between RGDP and the rate of exchange, exports, imports, gross capital formation, foreign currency reserves, and supply of money (M2). Moreover, the researcher also showed that exchange rates, exports, imports, gross capital formation, foreign currency reserves, and M2 are determinants of economic growth in Nepal.

Biswas and Saha (2014) employed Johansen and Juselius multivariate co-integration test and VEC model to evaluate macroeconomic determinants of economic growth of India starting from 1980-81 to 2010-11. They used GDP growth as the dependent variable and exports, employment, gross domestic capital formation, FDI, inflation, fiscal deficit, and M2 (money supply) as a control variable. Findings demonstrated that exports, employment, gross domestic

capital formation, FDI, and money supply have a significant positive influence on GDP growth in India. In contrast, inflation and fiscal deficit have a significant negative impact.

Enu et al. (2013) conducted a study to find out the macroeconomic factors of the economic growth of Ghana for the period 1970 to 2011 using Johansen's Co-Integration approach. They used real GDP per capita as dependent variables and capital, labor forces, FDI, foreign aids, inflations, govt. expenditures and military rule as control variables. Study results showed that capital, labor forces, FDI, foreign aid, inflation, govt. expenditures and military rule have a long-run relationship with per capita real gross domestic product in Ghana.

Ali et al. (2015) applied the VAR model to test out the effect of macroeconomic factors on the economic growth of Bangladesh using secondary data starting from 1988 to 2012. They used GDP as endogenous variable and market capitalization, FDI, and inflation as response variables. Study findings confirmed that market capitalization, FDI, and inflation have only a long-run impact on the economic growth of Bangladesh. In addition, Jacob et al., 2021 used the ARDL model to evaluate the effect of the main macroeconomic factors on the economic growth of Bangladesh from 1990 to 2020. They used GDP as the dependent variable and trade openness, FDI, inflations, and rate of exchange as the independent variable. Study findings revealed that trade openness, inflations, and rate of exchange have a strong positive effect on the economic growth of Bangladesh. However, FDI showed an insignificant effect on economic growth.

Haque (2020) conducted an econometric analysis to find out the impact of macroeconomic determinants on the gross domestic product (GDP) in Bangladesh, applying the VAR model for the period 1982-2019. The researcher used gross domestic product as an endogenous variable, while export, import, and inflation as response variables. The results of this study proved that only inflation has a statistically strong favorable effect on GDP in Bangladesh, while imports and exports showed an insignificant relationship.

Moreover, Anik and Biplob (2019) used the ADF test, Philips Perron test, Johansen co-integration test, VEC (vector error correction) model, and Wald tests to measure the effect of some macroeconomic variables on the economic growth of Bangladesh from 198 to -2017. They took the gross domestic product as the dependent variable and the real rate of interest, the real rate of exchange, broad money (M2), and total trade as independent variables. The results demonstrated that the real rate of exchange, M2, and trade openness have statistically significant positive long-run associations with GDP in Bangladesh. In contrast, M2 and total trade showed a significant short-term relationship.

Mukit (2021) used the ADF test, Johansen co-integration test, and VAR model analysis techniques to measure the effect of macroeconomic factors on the gross domestic product of Bangladesh from 1982 to 2019. They took the gross domestic product as the dependent variable and exports, imports, and inflation as independent variables. Results displayed that exports have a statistically insignificant positive association and imports have an insignificant negative association with gross domestic product in Bangladesh, while inflation showed a positive significant relationship.

Jannat et al. (2020) conducted a study to express the factors that influenced the growth of the economy of Bangladesh from 2000 to 2015. They used GDP as X-variable and foreign direct investment (FDI), gross national income (GNI), total population, outward remittance, inward remittance, exports, and imports as Y-variables. Study findings showed that GNI has a significant positive relation, while inward remittances, exports, and imports have a strong negative association with gross domestic product in Bangladesh.

Hassan et al. (2022) carried out a study using a multiple regression model to measure the effect of macroeconomic indicators on the GDP from 2010 to 2020. They used gross domestic product growth as the X-variable and inflation rate, export and import as the Y-variable, and

they showed that export and import positively and inflation negatively influenced gross domestic product in Bangladesh.

Ajmair and Tahir (2022) employed the ARDL technique to find out the indicators of economic growth in Pakistan and Bangladesh for the period 1990-2019. They used GDP as an endogenous variable and FDI, domestic investments, govt expenditure, inflation, and foreign trade as independent variables. The study results showed that FDI inversely affected Pakistan, while no association was found between GDP growth and FDI in Bangladesh. On the other side, domestic investments have a strong positive effect in Pakistan and Bangladesh. Although inflation shows a positive significant impact in Pakistan, it is insignificant in Bangladesh.

Rahman et al. (2023) evaluated the effect of govt. expenditures on SAARC country's economic growth and showed that govt. expenditures have a strong favorable impact on GDP in SAARC countries. However, Kutasi and Marton (2020) showed that public expenditure on social protection and general public spending has a negative significant impact on GDP growth in different EU countries. On the other side, Adu-Gyamfi et al. (2020) showed that inflation had a statistically insignificant impact on gross domestic product growth when they used a fixed effect regression model, whereas Tien (2021) showed that inflation has a statistically significant adverse impact on gross domestic product growth.

## Methodology

This study uses time series secondary data starting from 2005-06 to 2022-23. The ultimate source of data is Bangladesh Economic Review-2023 conducted by Finance Division, Ministry of Finance, Government of the People's Republic of Bangladesh.

This research has taken GDP as substitute of growth of the economy as well as endogenous (dependent) variable and FDI, inflation (INF), money supply (M2), public and private domestic investment (DINVEST) and foreign exchange reserve (FExR) as independent variables.

This study employed ADF (Augmented Dickey Fuller) test to check the unit root property of the variables. Following hypothesis and empirical model are used to check to unit root property:

$H_0: \theta = 0$  (i. e. variables have unit root and it requires to take difference of the variables)  
 $H_1: \theta < 0$  (i. e. variables have no unit root and it does not require to take difference of the variables)

$$\Delta D_t = \alpha_0 + \theta D_{t-1} + \alpha_1 \Delta D_{t-1} + \alpha_2 \Delta D_{t-2} + \dots + \alpha_p \Delta D_{t-p} + \alpha_p$$

Here,  $\Delta$  = difference,  $\theta$  = coefficient of difference,  $t$  = time period,  $p$  = lags

After doing Augmented Dickey Fuller (ADF) test, Durbin Watson (DW) statistic technique is applied to verify autocorrelation of variables. In case of Durbin Watson test, following hypotheses and formula are used:

$H_0$  = No first order autocorrelation in the sample.

$H_1$  = First order autocorrelation exists in the sample.

$$DW = \sum_{t=2}^T (e_t - e_{t-1})^2 / e_t^2$$

Where, DW is Durbin Watson statistic which lies between 0 and 4,  $e^t$  are residuals of multiple regression,  $e_{t-1}$  are first order differences of residuals. When DW statistic fall between  $dU < DW < 4-dU$ , it is considered that there is no autocorrelation.

Moreover, to examine the multicollinearity among independent variables we apply following VIF test technique:

For each individual independent variable, VIF calculation formula is given below:

$$VIF (X_{i-1}) = 1/(1-R^2)$$

Where, VIF = Variance inflation factor,  $X_{i-1}$  = first difference of independent variable 'i' and  $R^2$  = Regression square.

**Table 1: Hypotheses and regression models**

H <sub>0</sub> : INF does not significantly affect growth.	H <sub>1</sub> : INF significantly affects growth.
H <sub>0</sub> : DINVEST does not significantly affect growth.	H <sub>1</sub> : DINVEST significantly affects growth.
H <sub>0</sub> : FDI does not significantly affect growth.	H <sub>1</sub> : FDI significantly affects growth.
H <sub>0</sub> : FExR does not significantly affect growth.	H <sub>1</sub> : FExR significantly affects growth.
H <sub>0</sub> : M2 does not significantly affect growth.	H <sub>1</sub> : M2 significantly affects growth.
H <sub>0</sub> : Macroeconomic factors do not affect growth.	H <sub>1</sub> : Macroeconomic factors affect growth.

Finally, the above mentioned hypotheses and multiple regression model are developed to find out the effect of macro-economic factors on economic growth of Bangladesh.

Based on our dependent and independent variables we can develop following regression model:

$$GDP_t = \beta_0 + \beta_1 FDI_t + \beta_2 INF_t + \beta_3 M2_t + \beta_4 DINVEST_t + \beta_5 FExR_t + e_t$$

Where, 't' = Time series covering 2005-06 to 2022-23;  $\beta_0$  = constant of regression model;  $\beta_1, \beta_2, \dots, \beta_5$  = regression model coefficients;  $e_t$  = regression model errors.

## Results and Discussion

### Test of Autocorrelation

The autocorrelation test is conducted to examine the residual correlation between the period 't' and '(t-1)' by applying Durbin Watson (DW) test.

**Table 2: Autocorrelation results**

Sum Square of Diff. of residuals	69385.31
Sum Square of residuals	34418.03
DW statistic	2.08
Dl	0.71
Du	2.06
4-Dl	3.29
4-Du	1.94

(Authors own calculation through data analysis tool pack Microsoft Excel)

The upper value (dU) and lower value (dL) of DW statistic is 2.06 and 0.71 at (K<sub>9</sub>, N<sub>17</sub>) respectively. DW statistic range is 0 to 4. Considering these values, we calculate 4-dL and 4-dU. As the calculated DW statistic value, 2.08 is fall between  $dU < DW > 4-dU$ , therefore, it is said that there is no autocorrelation (details in Table 1).

### Test of Multicollinearity

We make VIF test to identify the strength of the correlation among various independent study variables. Cut off value of VIF is 10 (Ullah et al., 2020). VIF test results are shown in the table 3.

**Table 3: VIF calculations**

Variables	R <sup>2</sup>	1- R <sup>2</sup>	VIF (1/(1- R <sup>2</sup> ))	Cut off value	Decision
FExR	0.474	0.526	1.902	10	No multicollinearity
INF	0.722	0.278	3.596		
DINVEST	0.217	0.783	1.276		
FDI	0.127	0.873	1.145		
M2	0.514	0.486	2.058		

(Authors own calculation through data analysis tool pack Microsoft Excel)

Table 3 indicates that the highest (3.596) and lowest (1.145) value of VIF. As the highest (3.596) and lowest (1.145) value of VIF are far below from cut off value, therefore, it is said that there is no multicollinearity among various independent study variables.

### Unit Root Test

ADF (Augmented Dickey Fuller) test results are shown in the table 4. This result represents that study variables have no unit root, i.e. all the study variables are stationary at their first difference.

**Table 4: Augmented Dickey Fuller Test**

Variables	Cal. T-stat I(1)	Critical "t" (5% sig. level)	Decision
GDP	(3.60)		Null hypothesis( $H_0$ ) accepted
FDI	(3.64)		Null hypothesis( $H_0$ ) accepted
FE <sub>x</sub> R	(4.62)	3.59	Null hypothesis( $H_0$ ) accepted
INF	(3.63)		Null hypothesis( $H_0$ ) accepted
M2	(5.17)		Null hypothesis( $H_0$ ) accepted
DINVEST	(3.71)		Null hypothesis( $H_0$ ) accepted

(Authors own calculation through data analysis tool pack Microsoft Excel)

As the calculated T-stat (absolute values) is greater than critical value at 95% confidence interval, null hypotheses can be rejected, instead, we can be accepted the alternative hypotheses. Therefore, it is said that sample data have no unit root property.

### Test of Hypotheses

It is found from the table 5 that the calculated value of 'F' is 59.19 and tabulated value is 0.00. As the calculated value of 'F' is greater than table value [ $F_k, (n-k-1), \alpha = 0.00$ ] at 95% confidence interval, hence it is said that macroeconomic factors affect economic growth and model is appropriate. Details are shown in the table 5.

**Table 5: ANOVA Analysis**

	Df.	SS	MS	F	Sig. F
Regression	5	53379679.17	10675935.83	59.19	0.00
Residual	11	1983954.93	180359.54		
Total	16	55363634.09			

Moreover, regression calculation results show that the P value of FDI and DINVEST is almost 0.00 which is below 0.05 at 95% confidence interval. Therefore, we can reject the null hypotheses and instead, we can accept alternative hypotheses. That is, FDI and DINVEST have statistically significant effect on economic growth. However, Table 5 also indicates that P value of foreign exchange reserve (0.94), inflation (0.42) and money supply (0.84) is greater than 0.05 at 5% significance level. Hence, we can reject alternative hypotheses. Therefore, it is said that foreign exchange reserve, money supply and inflation have statistically insignificant effect on economic growth. Table 6 shows regression analysis results.

**Table 6: Accept/Reject hypothesis based multiple regression analysis**

Variables	P value	Level of significance	Calculated effect	Results
INF	0.42	Insignificant	Positive	H <sub>1</sub> rejected
DINVEST	0.00	Significant	Positive	H <sub>1</sub> accepted
FDI	0.02	Significant	Positive	H <sub>1</sub> accepted
FExR	0.94	Insignificant	Positive	H <sub>1</sub> rejected
M2	0.84	Insignificant	Positive	H <sub>1</sub> rejected

Regression analysis reveals that the value of correlation coefficient,  $R = 0.8819$  which indicates strong linear relationship between endogenous variable and control variable. Moreover, the R-Square value is 0.8642, which means that nearly 86.42% difference in the economic growth can be described by the control variable- FDI, inflations, money supply, public and private domestic investment, and foreign currency reserve.

**Table 7: Regression model summary**

Regression statistic						
Multiple R	0.8819					
R <sup>2</sup>	0.8642					
Adj. R <sup>2</sup>	0.8479					
Std. error	424.6876					
Observations	17					
	Coefficients	Std. error	t-stat	P-value	Lower 95%	Upper 95%
Intercept	-30.91	289.04	-0.11	0.92	-667.08	605.27
INF	46.46	55.59	0.84	0.42	-75.89	168.80
DINVEST	2.96	0.26	11.23	0.00	2.38	3.54
FDI	0.62	0.23	2.67	0.02	0.11	1.12
FExR	0.02	0.29	0.08	0.94	-0.62	0.66
M2	0.09	0.41	0.21	0.84	-0.83	1.00

(Authors own calculation through data analysis tool pack Microsoft Excel)

In addition, Table 6 also represents  $\beta$  coefficients of independent variables and P value.  $\beta$  coefficients of DINVEST (public and private domestic investment) and FDI is positive which indicates that 1-unit increase in DINVEST and FDI responsible for 2.96 unit 0.62 unit raise in economic growth respectively. However, foreign exchange reserve, inflation and money supply have statistically insignificant positive effect on economic growth as their P value is greater than 0.05 at 5% significance level.

## Discussion

The study results reveal a strong favorable relationship between FDI and economic growth in Bangladesh. This looks like the study result of Enu et al. (2013), Biswas and Saha (2014), Ismaila and Imoughele (2015), Ali et al. (2015), Simionescu et al. (2017) but contrast to the findings of Akram et al. (2011), Louzia and Abadi (2011), Saqib et al. (2013), Nath et al. (2022), Ajmair and Tahir (2022). Countries with sufficiently high levels of education or well-developed financial sectors show a positive association between foreign direct investment and economic growth. FDI may encourage economic growth when suitable local conditions like education, human capital, financial depth, etc., are in place (Benetrix et al., 2023). If a developing country is unable to maintain appropriate local conditions, then FDI may adversely affect the economy.



Moreover, public and private domestic investment shows a significant positive relationship with economic growth, which looks similar to the study result of Akram et al. (2011), Haque (2013), Wadud (2017), and Ajmair and Tahir (2022) but contrasts to the results of Kutasi and Marton (2020). It is rational because this public and private investment inserts new capital, which can be used for research, development, and technology. This is the pioneering attempt to introduce new goods and services to the market. Moreover, added or better-quality capital goods and machinery raise labor productivity by making companies more efficient and consequently increase economic growth (Ross, 2024).

Money supply contains currency in circulation, deposits in bank vaults, and liquid assets, which can be easily exchanged (Mora, n. d.). Study findings show a positive association between M2 (money supply) and economic growth. Still, it is statistically insignificant, which is partially similar to the findings of Biswas and Saha (2014) and Anik and Biplob (2017). Consumers and businesses get more funds for spending when the money supply increases in the market. Excess money in the market stimulates more goods and services, encouraging monetary action and increasing production.

Consequently, it raises the country's GDP. On the other hand, when the money supply increases, it leads to a decreased rate of interest. This lower interest rate may boost customer borrowing and investment and consequently stimulate economic activity and GDP growth (Mora, n.d.).

On the other side, foreign exchange reserves show a statistically insignificant positive relationship with economic growth, which is partially similar to Wadud (2017) and Nombulelo and Eliphaz (2021). Wadud (2017) and Nombulelo and Eliphaz (2021) showed that foreign currency reserves significantly influence the growth of the economy. Although study findings demonstrate an insignificant positive relationship, foreign exchange reserves are very important for the economy. Foreign exchange reserves help to maintain a stable exchange rate and sufficient liquidity during economic crises, meet the balance of payment deficit, appreciate local currency, meet foreign exchange needs and external debt obligations, and build a level of confidence in markets and investors. However, excess foreign currency reserves have substantial social costs. Therefore, it is important to maintain the ideal foreign currency reserves accumulation level in developing countries (Fukuda & Kon, 2010).

Moreover, inflation also shows positive insignificant association with economic growth, which is on the order of the study of Ghimire et al. (2020), Wadud (2017) and Adu-Gyamfi et al. (2020) but in contrast to Akram et al. (2011), Biswas and Saha (2014), Tien (2021), Hassan et al. (2022) and Ajmair and Tahir (2022). Although, globally, much research has been done regarding the inflation and GDP growth relationship, it is still a debated issue now. Because the inflation and GDP growth relationship is different from economy to economy.

## Conclusion and Recommendations

Macroeconomic factors (such as GDP, inflation, broad money, FDI, domestic investment, public and private consumption, expenditure, revenue, export, import, balance of trade, balance of payment-current account, foreign currency reserve, etc.) strongly influence economies. Therefore, policymakers, researchers, and economists extensively study macroeconomic factors and their association with economic growth.

The main objective of the study is to evaluate the effect of macro-economic factors on the growth of the economy of Bangladesh. To obtain this objective, we use secondary data for 2005-06 to 2022-23. However, time series secondary data mostly show autocorrelation, multicollinearity, and unit root features. Therefore, we used the Durbin Watson (DW) test to check autocorrelation, the VIF test to examine multicollinearity among independent variables, and the ADF test to verify the stationary property of data. Finally, multiple linear regression is done to find out the overall effect of macroeconomic factors on economic growth.

Study results show that DINVEST (public and private domestic investment) and FDI significantly affect the economy's growth. If the macroeconomic variables DINVEST and FDI are increased by 1 unit, they increase economic growth by 2.96 units and 0.62 units, respectively.

A study showed that public and private domestic investment has both crowding-in (positive effect) and crowding-out (negative effect) effects on the economy's growth. Therefore, policymakers should consider both the crowding-in and crowding-out effects before selecting any public or private domestic investment project.

The effect of FDI on economic growth depends on the local condition of the economy, human capital, education, financial depth, etc. Globally, many research showed FDI has both favorable and dis favorable effects on economic growth. International organizations like the United Nations, World Bank, and IMF, which are working to promote the economy, always expect a positive impact of FDI. However, the negative impact of FDI on economic growth may raise anxiety among international organizations like the United Nations, World Bank, and IMF, which are working to promote the economy. It may be due to exporting goods and services needing to meet local demand, the monopoly nature of foreign investors, over-competition with local companies, capital flight, and excess profit repatriation by foreign investors (Nath et al., 2022). On the other hand, in the case of developing countries, public & private investments promote the growth of the economy without considering the effectiveness and ineffectiveness of the government. Moreover, developing countries have significantly benefited from investment regardless of their institutional quality levels (Turan et al., 20121).

However, foreign exchange reserves, inflation, and the money supply have a statistically insignificant impact on Bangladesh's economic growth.

Although foreign exchange reserves have many benefits, they also have considerable social costs. Suppose the yield on an economy's foreign exchange reserves asset and the cost of borrowing foreign exchange reserves are taken into consideration. In that case, the income loss of that economy amounts to one percent of GDP (Rodrik, 2006). Therefore, the economy needs to maintain an optimum level of foreign exchange reserves.

Moreover, the association between inflation and economic growth is a debated issue because many scholars found a positive association, and others found a negative relationship between these two variables. On the other hand, inflation has both positive and negative influences on consumers and the economy. Therefore, the government and the central bank should try to keep inflation in balance.

However, the money supply also has positive and negative impacts on the economy. Money supply change is considered a key factor in economic performance and business cycles. Moreover, an increase in the money supply generates more investment and stimulates consumer spending, while the opposite may occur if it falls.

We apply only multiple regression in this study. Hence, there is a scope for further research by using advanced econometric techniques like ARDL bound testing, ECM, etc. In addition, some important recommendations are given below:

- The regulatory bodies should keep inflation in balance by controlling the money supply in the economy.
- Respective regulatory authorities should take some policy measures and initiatives for expanding and diversifying exports in Bangladesh.
- To boost economic growth and foreign exchange reserves, small factories producing export products and skilled manpower development centers have to be developed in all corners of the country through public and private initiatives.
- To attract more FDI, the respective regulatory authority must ensure security, infrastructural facilities, and political stability in the country.

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