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Impact of Foreign Exchange Rate and Inflation Rate on the Economic Growth of India

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Abstract: ***This paper tries to investigate the impact of foreign exchange rate and inflation rate on the economic progress of India. In this study the economic progress has been measured by annual GDP (Gross Domestic Product) growth in India. Correlation analysis and multiple regression model have been designed to explore the relationship among the mentioned three variables. The annual GDP growth of India has been considered as the dependent variable and the other two macroeconomic variables (Foreign exchange rate and inflation rate) have been considered as the independent variables. Secondary sources of data have been gathered to arrive at a logical conclusion. The results show a positive correlation between GDP growth rate and the foreign exchange rate and a negative correlation between the GDP growth rate and the inflation rate. Results from the linear regression analysis show that inflation rate has a strong influence or impact on the GDP growth rate than the foreign exchange rate. It is expected that the present study will help the policy makers and the researchers to understand the impact of foreign exchange rate and inflation rate on the GDP growth in India,***

Key Words : Exchange , Inflation , GDP ,regression.

I. INTRODUCTION

The economic stability of a country depends upon the performance of the macroeconomic variables. Foreign exchange rate is one of the important variables , influencing the economic progress of a country. Foreign exchange rate can be defined as the rate at which the currency of one country is exchanged with the currency of another country. Foreign exchange rate is often regarded as an index of international competitiveness. Theoretically speaking a positive correlation is found between high exchange rate and economic growth of a country.

In simple terminology inflation is the persistent rise in the general price level which decreases the purchasing power of the people. The role of inflation and deflation on the economic growth , productivity and output has been one of the widely discussed issues in the macroeconomic context.

Gross Domestic Product is one of the primary indicators used to estimate the economic performance of a country. In tracking the financial health of an economy GDP has a key role. GDP is influenced by a number of macroeconomic variables. Among these variables two variables , Foreign Exchange Rate and Annual Inflation Rate are considered considered for our analysis.

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II. OBJECTIVES :

1. To study the trend of foreign exchange rate, inflation rate and GDP growth of India in the recent decade.
2. To study the impact of foreign exchange rate of India on the GDP growth of India.
3. To study the impact of foreign exchange rate on the GDP growth of India.

III. RESEARCH METHODOLOGY:

The present study has used on mainly secondary sources of data. Data have been collected from the Union Budget of India , Economic surveys of India , the Reserve bank of India bulletin , The World bank data , various published journals etc.

Correlation analysis and multiple linear regression have been designed to test the impact of foreign exchange rate and inflation rate on the annual GDP growth of India by considering GDP growth rate as the dependent variable and the other two variables as the independent variables.

IV. ANALYSIS

Table 1: GDP growth rate , foreign exchange rate and inflation rate of India from 2005 to 2015

Year	GDP Growth Rate (in percentage)	Foreign exchange rate	Inflation rate (in percentage)
2005	7.9	44.93	4.2
2006	8.0	44.27	5.3
2007	7.6	45.28	6.4
2008	3.0	40.24	8.3
2009	7.8	44.91	10.9
2010	8.4	47.41	11.7
2011	5.2	51.16	8.9
2012	5.4	54.38	9.9
2013	6.3	60.14	10.4
2014	7.4	61.14	10.9
2015	7.9	64.83	11.3

Source: RBI Bulletin

Table 2 : GDP growth rate , foreign exchange rate and their correlation coefficient.

GDP growth rate	Foreign exchange rate	Correlation coefficient
7.9	44.93	**.1629**
8.0	44.27	
7.6	45.28	

3.0	40.24	
7.8	44.91	
8.4	47.41	
5.2	51.16	
5.4	54.38	
6.3	60.14	
7.4	61.14	
7.9	64.83	

Table 3: GDP growth rate and inflation rate of India and correlation coefficient.

GDP growth rate	Inflation rate	Correlation Coefficient
7.9	4.2	
8.0	5.3	
7.6	6.4	
3.0	8.3	
7.8	10.9	**-.02**
8.4	11.7	
5.2	8.9	
5.4	9.9	
6.3	10.4	
7.4	10.9	
7.9	11.3	

First column of the table 1 shows the growth rate of Gross Domestic Product (GDP) from the year 2005-06 to the financial year 2015-16. By the term Gross Domestic Product , we mean the total market value of all final goods and services produced within the domestic territory of a country during a particular period of time. That is why GDP growth of an economy can be regarded as a key indicator of economic development of that particular economy. The GDP growth rate in 2005 was 7.9 percent and in the financial year 2015-16 this growth rate stood at 7.9 percent. Under the study period (2005-2015) the highest growth rate of GDP was found in the year 2006 (8.4%) and it was the lowest in the financial year 2008-09 (3%).

By the term inflation we generally mean the persistent rise in the general price level of goods and services of an economy. When price level rises the purchasing power of money falls. In other words the value of money falls. Out of various parameters inflation rate is one which determines the health of an economy. The statistic in the third column of the table 1 shows the annual inflation rate of India from 2005-06 to 2015-16. The annual inflation rate was 4.2% in the year 2005 . Under the study period the annual inflation rate was recorded the highest in the year 2010, that is 11.7% . A gradual increasing trend was seen from 2005 to 2015. In the year 2015-16 the rate was found to be 11.3%.

In Table 2 coefficient of correlation was analyzed between the two variables (GDP Growth and Foreign Exchange Rate). The coefficient of correlation was observed at .132 that is a positive correlation between the mentioned variables. Although it shows a positive correlation , it is a very weak correlation , which indicated that while both the variables move in the same direction, the relationship between them is not very strong.

Similarly the coefficient of correlation was analyzed between two variables , GDP growth rate and inflation rate in the table 3. The correlation coefficient was found to be -.02 . Both the variables move in different direction. We can conclude that higher the value of inflation rate lower will be the annual growth rate of GDP and lower the value of inflation rate , higher will be the annual growth rate of GDP.

Multiple regression analysis has been designed to study the impact of the independent or explanatory variables on the dependent variable. We have considered three variables GDP growth rate , Foreign exchange Rate and Inflation Rate for this regression analysis.

GDP growth rate (Y) : GDP growth rate is considered as an true indicator of economic development of a country. In this study this parameter has been used as the dependent variable.

Foreign Exchange Rate : Another macroeconomic variable influencing an economy is the foreign exchange rate. Here this variable has been considered as an independent variable.

Inflation rate : Inflation rate of India has been taken as another independent variable

The estimated regression equation

$$Y=\alpha+\beta_1X_1+\beta_2X_2+u$$

Where

Y= GDP growth rate

α = a constant term , indicating the value of dependent variable , when the values of all independent variables are zero.

$\beta_{1=}$ Regression coefficient which indicates the value at which the dependent variable changes when the predictor variable (X_1) changes.

β_2= Regression coefficient which indicates the extent at which the dependent variable changes when the predictor variable (X_2) changes.

u= random error which is the unpredictable variation in the dependent variable.

Table 4: Summary Output of Regression Statistics.

REGRESSION STATISTICS (SUMMARY OUTPUT 1)	
Multiple R	**7.07**
R Square	**.50**
Coefficient of Non Determination	**.50**
Adjusted R Square	**-.186**
Standard Error	**1.81**
Observation	**11**

Table 5: Summary Output of the regression coefficients

SUMMARY OUTPUT 2			
Parameters	**Coefficient**	**Standard Error**	**T Stat**
Intercept	**5.097**	**3.494**	**1.458**
Foreign Exchange	**.082**	**.082**	**.649**
Inflation rate	**.272**	**.272**	**-.419**

The now regression equation would be

GDP growth rate = 5.097+.082 Foreign Exchange Rate+.272 Inflation Rate.

The following results have been obtained :

- **Multiple R :** It is the coefficient of correlation. Multiple R is used to get the value of correlation coefficient for more than two variables. In our study this coefficient has been found as .225.

- **R Square :** The value of R square is called as the value of coefficient of determination.

$$\textbf{R Square} = \frac{EXPLAINED\ VARIANCE}{TOTAL\ VARIANCE}$$

- **Coefficient of Determination:** It tells us the percentage variation of the dependent variable due to the changes in the independent variables. In our analysis this value has been found as .50 . We can interpret that 50 % variation in the dependent variable is explained by the variations in the independent variables.
- **Coefficient of non Determination** : We get the value of coefficient of non determination by subtracting the value of coefficient of determi9nation from 1 . In our study we have found this value as .50. We can interpret that 50% variation of the dependent variable is not explained by the given independent variables.

Coefficient of non Determination
= 1-Coefficient of determination
$= 1-R^2$
$= \frac{Unexplained\ Variance}{Total\ Variance}$

- **Regression Coefficient** : In table 5 we have analyzed the regression coefficients. Out of two independent variables the regression coefficient has been found to be highest for the annual inflation rate. Therefore we can summarize that the impact of annual inflation rate on the GDP growth of India is stronger than the impact of foreign exchange rate on the GDP growth rate.

V. CONCLUSION

In our study we have analyzed the trend of foreign exchange rate , inflation rate and GDP growth rate of India in the recent decade. To study the type , degree and extent of relationship between the mentioned variables , correlation approach and multiple regression analysis have been utilized. We have got a positive correlation between the GDP growth and foreign exchange rate and an inverse relationship between the rate of inflation rate and the GDP growth. Inflation rate is found to exert stronger influence on the GDP growth rate that the foreign exchange rate. It can be suggested that for overall , inclusive and sustainable growth of our economy the Governments , RBI and the other concerned authorities should try to keep foreign exchange rate and inflation rate under control. In a conductive environment, the Government, the RBI the NGOs should join hands in shaping and formulating various policies and then only our country will grow significantly.

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