Symbiosis Institute of Management Studies Annual Research Conference (SIMSARC13)

A STUDY ON PREDICTORS OF GDP: EARLY SIGNALS

K. Hema Divya[a] *, Dr. V. Rama Devi[b]

[a]*Assistant Professor, Koneru Lakshmaiah Educational Foundation (K L University)*
[b]*Professor, School of Management, Vignan University, Andhra Pradesh*

Abstract

Financial Architecture aims sustainability of an economy by ensuring consistent growth rate.GDP is an indicator of the growth of an economy. Higher GDP of an economy reflects robust growth of an economy and vice-versa and as such every country tries to maximise the growth rate of GDP .There are certain macro factors operating in the economic environment that will influence the GDP growth rate. The study makes an attempt to determine the influence of selected economic variables namely Inflation, Exchange rate, Foreign exchange reserves, FII's, Sensex, Balance of Payments and Current Fiscal Deficit on the GDP of an economy. The data is collected by using secondary sources relating to the selected Economic variables. The data is collected for a period of 15 years i.e. from 01-04-1997 to 31-03-2012 with annual intervals. The scope of the study is confined only to selected economic variables only. Correlation and ANOVA are used for analyzing the relationship between the GDP and selected economic variables. The study revealed that Exchange rate, Sensex and Balance of Payment reflected by current and capital account balances are the factors that significantly predict GDP of the economy.

 * Corresponding author. Tel.: +0-000-000-0000 ; fax: +0-000-000-0000 .
   E-mail address: divya10_mba@kluniversity.in

1. Introduction

Financial architecture broadly refers to the framework and series of measures that are considered necessary to prevent future economic crises and help manage these crises when they occur. It refers to the structures, practices and rules which are designed in order to overcome the influence of crisis on the economy. Financial Architecture aims sustainability of an economy by ensuring consistent growth rate. GDP is the main indicator of the growth of an economy. Higher GDP of an economy reflects a rosy picture as it indicates better position of the economy. Hence, every country tries to maximise the growth rate of GDP. There are certain macro factors operating in the economic environment that will influence the GDP growth rate. Financial crises are a disruption or sudden change in the activities of operating environment which have a significantly negative impact on economic developments. Such negative impact of crisis can be reduced to certain extent by identifying the factors and by analysing the early warm signals of identified and various factors operating in the environment.

2. Review of Literature

Ayyoub, et al., (2011) in their study determined the impact of inflation on economic growth of Pakistan. Annual time-series data for the period 1972-73 to 2009-10 have been taken and analysis was made by employing the method of Ordinary Least Squares. It was found that there is a significantly negative relation between inflation and economic growth in Pakistan.

Mallik and Chowdhury (2001), sought to examine the relationship between inflation and GDP growth for four South Asian countries (Bangladesh, India, Pakistan and Sri Lanka). By using the cointegration and error correction models it was evident that there is a long-run positive relationship between GDP growth rate and inflation for all four countries.

Malayendu (2009) studied the participation of FII's and other financial institutions in India and their impact on performance of Indian Stock market. Liquidity support from FII's, buoyant growth and strong corporate profitability provided support to domestic stock market. There was a positive correlation between net investment by FIIs and market movements. Three times rise in Sensex was driven by inflows from FII's in the Indian stock market.

Tahir Khan. (2013) conducted the co integration test and pointed out that there is long run relationship between foreign exchange reserves and Exchange rate. The study took annual data from 1983 to 2009 and found that foreign exchange reserves and inflation have a negative relationship.

Orabi.(2013) made an attempt to study the impact of interest rate, inflation and GDP on real economic growth in Jordan over the period 2000-2010. The study revealed that interest rate is influenced by inflation rate and remaining all other variables are independent of each other.

Srikanth and Kishore (2012) undertook a study for the period April 2003–March 2011, which revealed that there is a cause and effect relationship between FII flows and BSE Sensex. FII inflows had a positive impact on the Indian stock market and foreign exchange reserves. It also revealed that growth in the Index of Industrial Production improved market sentiment and increased net FII flows into India.

Agrawal and Agarawal (2013) in a research study analysed the impact of global capital flows on GDP growth rate, inflation, exchange rate on the quarterly data of India from 1948 to 2010.The findings of the study indicated that the GDP is statistically significant in determining the capital flows. A higher GDP will boost the confidence of the foreign investors and will raise the rating of the economy as an investment destination.

3. Objectives and Hypothesis of the Study

Objectives: The main objectives of the study are:
1. To identify the relationship between selected economic variables and GDP of Indian Economy.
2. To analyse the impact of selected economic variables on GDP of Indian Economy.

Hypothesis of the Study:
1. H0: Null Hypothesis-There is no significant relationship between GDP and selected economic variables of Indian Economy.
   Ha: Alternate Hypothesis-There is a significant relationship between GDP and selected economic variables of Indian Economy.
2. H0: Null Hypothesis: GDP is independent of economic variables of Indian economy.
   Ha: Alternate Hypothesis: GDP is dependent on economic variables.

4. Research Design & Research Methodology

Research Design: A research design is the specification of methods and procedures for acquiring the needed information. Exploratory research design is adopted in the present study. It basically seeks to extract information about the influence and relationship between GDP and selected economic variables of Indian Economy

Sources of Data: The data is collected by using secondary sources relating to the selected economic variables. Annual data is collected for a period of 15 years i.e. from 01-04-1997 to 31-03-2012.

Tools used in analysis: The present study attempts to study the relationship between GDP and selected variables of Indian economy by using Coefficient of correlation, Analysis of Variance and impact of economic variables on GDP with the help of Regression Analysis.

Multi collinearity Analysis: Multi collinearity is a statistical phenomenon in which two or more explanatory variables in a multiple regression model are highly correlated, meaning that one can be linearly predicted from the others with a non-trivial degree of accuracy. In this situation the coefficient estimates may change erratically in response to small changes in the model or the data. One of the remedy for multi collinearity is to drop one of the variables. An explanatory variable may be dropped to produce a model with significant coefficients. Omission of a relevant variable results in biased coefficient estimates for the remaining explanatory variables. The present study used this remedy for multi collinearity by reducing two variables namely foreign Exchange Reserves (FER) and Fiscal Deficit (FD) as they have significant relationship with all other variables.

Need of the study: The main purpose of this study is to find relationship and impact of selected economic variables on GDP of Indian economy. This study helps in identifying the relationship between GDP and selected economic variables which helps the analyst to beware of these factors which provide early signals regarding growth of the economy.

Scope of the study: The study is confined only to selected economic variables as independent variable and "Gross Domestic Product (GDP)" as dependent variable. Seven independent variables are selected to determine how they affect GDP of Indian Economy.

The selected variables are:

1. Inflation
2. Exchange rate
3. Foreign exchange reserves
4. FII's
5. Sensex
6. Balance of Payments and
7. Fiscal Deficit

Model: In this study regression model was used for data analysis. The model is presented as follows:

GDP = β_0 + β_1 (IF) + β_2(ER)+ β_3(FER) + β_4(FII)+ β_5(SEN)+ β_6(BOP)+ β_7(FD)

β_0 = constant

$\beta_1, 2\ldots3$ = coefficients of predictors

IF = Inflation rate

ER = Exchange rate

FER = Foreign Exchange reserves

FII = Foreign Institutional Investors

SEN= Sensex

BOP=Balance of Payments

FD = Fiscal Deficit

5. Empirical Analysis

Table 1. CORRELATION ANALYSIS

		GDP	IF	ER	FER	FII	SEN	BOP	FD
		Correlations							
GDP	Pearson Correlation	1	.635[*]	.639[*]	.955[**]	.691[**]	.850[**]	-.125	.923[**]
	Sig. (2-tailed)		**.011**	**.010**	**.000**	**.004**	**.000**	.656	**.000**
	N	15	15	15	15	15	15	15	15
IF	Pearson Correlation	.635[*]	1	.366	.567[*]	.271	.429	-.304	.559[*]
	Sig. (2-tailed)	.011		.180	**.028**	.329	.110	.271	**.030**
	N	15	15	15	15	15	15	15	15
ER	Pearson Correlation	.639[*]	.366	1	.525[*]	.326	.323	-.295	.681[**]
	Sig. (2-tailed)	.010	.180		**.044**	.235	.240	.286	**.005**
	N	15	15	15	15	15	15	15	15
FER	Pearson Correlation	.955[**]	.567[*]	.525[*]	1	.612[*]	.900[**]	.058	.818[**]
	Sig. (2-tailed)	.000	.028	.044		**.015**	**.000**	.838	**.000**
	N	15	15	15	15	15	15	15	15
FII	Pearson Correlation	.691[**]	.271	.326	.612[*]	1	.767[**]	.240	.587[*]
	Sig. (2-tailed)	.004	.329	.235	.015		**.001**	.390	**.021**
	N	15	15	15	15	15	15	15	15
SEN	Pearson Correlation	.850[**]	.429	.323	.900[**]	.767[**]	1	.340	.633[*]
	Sig. (2-tailed)	.000	.110	.240	.000	.001		.216	**.011**
	N	15	15	15	15	15	15	15	15
BOP	Pearson Correlation	-.125	-.304	-.295	.058	.240	.340	1	-.428
	Sig. (2-tailed)	.656	.271	.286	.838	.390	.216		.111
	N	15	15	15	15	15	15	15	15
FD	Pearson Correlation	.923[**]	.559[*]	.681[**]	.818[**]	.587[*]	.633[*]	-.428	1
	Sig. (2-tailed)	**.000**	**.030**	**.005**	**.000**	**.021**	**.011**	.111	
	N	15	15	15	15	15	15	15	15
*. Correlation is significant at 0.05 level (2-tailed).									
**. Correlation is significant at 0.01 level (2-tailed).									

From table 1, it is evident that GDP is positively related with inflation rate and exchange rate at 0.05 level of significance, where as it is positively related with foreign exchange reserves, FIIs and Sensex at 0.01 level of significance. It is not significantly related with Balance of Payments.

Table 2. REGRESSION ANALYSIS

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.982[a]	.965	.945	5038.81256	.965	49.400	5	9	.000
a. Predictors: (Constant), IF,ER,FII,SEN,BOP									

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6271276339.787	5	1254255267.957	49.400	.000[b]
	Residual	228506687.970	9	25389631.997		
	Total	6499783027.758	14			
a. Dependent Variable: GDP						
b. Predictors: (Constant), IF,ER,FII,SEN,BOP						

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-58424.627	21042.069		-2.777	.022		
	IF	1078.096	889.282	.100	1.212	.256	.574	1.742
	ER	1491.867	466.842	.239	3.196	**.011**	.697	1.434
	FII	.020	.040	.049	.498	.630	.396	2.526
	SEN	2.664	.400	.795	6.656	**.000**	.274	3.656
	BOP	-6.124	1.695	-.307	-3.612	**.006**	.542	1.844
a. Dependent Variable: GDP								

The table specifies the regression equation as

GDP= -58424.627+0.100(IF) +0.239(ER) +0.049(FII) +0.795(SEN)-0.307(BOP)

From table 2, it is observed that R Square is 0.96, which indicates that if there is 100 percent change in given variables, there will be 96% in the GDP of the Economy. The analysis shows that F is significant at 0.05 level. Hence null hypothesis is rejected. It means that GDP is significantly affected by changes in selected economic variables. From the table, it is clear that exchange rate, Sensex and balance of payments beta values are highly significant at 0.05 level.

6. Findings of the Study

Inflation is highly correlated with GDP but it is not significantly influencing GDP of Economy. Exchange rate is one of the important factors that influence the GDP of an economy. A depreciation in currency can cause importers to pay more amount of rupees and an appreciation in currency can encourage the exporters to export more there by it can increase the foreign currency reserves. Exchange rate and foreign currency reserves are highly correlated which influence the GDP. The finding is in consonance with another study conducted by Akpan and Atan (2012). Their research provided empirical estimates of the relation between exchange rate and economic growth in Nigeria. The results suggested that there is a statistically significant direct relationship between the two variables. Sensex is another important factor influencing GDP as revealed by the current study. According to Lazear (2013), Market indexes are better predictors of GDP growth. The market is a better and timelier forecaster of future GDP, perhaps because the market has a financial stake in getting it right. The study also revealed a negative relationship between GDP and Balance of Payments figures (Current account balance + Capital account balance).

7. Conclusion

The policy makers have to respond when early signals about the economy are received before reaching a critical situation and it becomes very difficult to address the problem. The present study revealed that Exchange rate, Sensex and Balance of Payments are better predictors of growth of an economy. Decline in the value of rupee, slump in Sensex and India's Balance of Payments problems are hampering the growth of Indian economy. We are leading to a crisis situation which may shatter our dreams of becoming one of the super powers in future unless we react with good policy decisions that will put back the economy on the track of growth.

References

Ayyoub, Sharif Chaudhary, Farooq. (2011). Does inflation affect economic growth? The case of Pakistan. *Pakistan Journal of social sciences*, 31(1), 51-64.

Edward P.Lazear (2013), The Stock Market Beats GDP as an Economic Bellwether. Wall Street Journal.

Eme O. Akpan and Johnson A. Atan. Effects of Exchange Rate Movements
 On Economic Growth in Nigeria. *CBN Journal of Applied Statistics.* 2 (2) , 1-14.

Girija sankar Mallik and Anis Chowdhury (2001). Inflation and economic growth: evidence from four south Asian countries. *Asia-Pacific Development Journal*,8(1),123-135

Maram srikanth, Braj kishore.(2012). Net FII Flows into India: A Cause and Effect Study. *ASCI Journal of Management*, 41 (2), 107–120.

Malayendu (2009). Stock Market in India and FII's: An Appraisal .*Journal of Business and Economics issues*, 1(1), 1-15.

Muhammad Tahir Khan. (2013).Exchange rate as a determinant of fluctuation in foreign exchange reserves: Evidence from economy of Pakistan. *Academic Research International*, 4(2), 459-471.

RahulAgrawal and Tarunika J. Agarawal. (2013). Global Capital Flows and its Impact on Macroeconomic Variables – Evidence from India. *The Macrotheme Review: A multidisciplinary journal of global macro trends*,2(4),66-86

Saymeh, Orabi. (2013).The effect of interest rate, inflation rate, GDP, on real economic growth rate in Jordan. *Asian Economic and Financial Review*, 3(3), 341-353.

Redesigning India's Financial Architecture, http://www.weforum.org/sessions/summary/redesigning-indias-financial-architecture

RBI Monetary Bulletin.