



Exploring the Impact of Macro Economic Variables on GDP Growth of Pakistan

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Abstract

The main purpose of the study is to investigate the impact of macroeconomic variables (interest rate, exchange rate, inflation and FDI) on GDP growth of Pakistan by using annual data over the period of 1980 to 2013. To achieve objective, correlation coefficient, regression analysis and Granger causality test are used. From the result of correlation coefficient, the inflation and interest rate have negative and significant association with GDP growth. The result of Granger causality test indicated that the interest rate and inflation have a unidirectional causality and exchange rate and FDI have also unidirectional causality. From the regression analysis result it indicates that inflation, interest rate, exchange rate and FDI demonstrate significant impact on GDP growth. The results of the study recommended that SBP should adopt strict monetary policy to reduce inflation which has a negative significant impact on GDP growth. Further, high rate of interest rate should be removed in order to attract FDI ultimately it does improve the Pakistan GDP growth.

Keywords: Inflation, Interest Rate, Exchange Rates, FDI, GDP growth of Pakistan **JEL Classification:** E31, E43, F31, O43.

Introduction

Background of the Study: The economic growth in Pakistan is not satisfactory. Various factors are liable for this insufficient GDP: the mounting growth rate of imports, thin array of exports, high inflation rate, imperfect banking system with growing interest rate, increasing population growth and political insecurity. The economic growth is supportive to raise the income of humanity and help the country to bring unemployment.

From the empirical result it indicates that there is negative relation between inflation and GDP. When inflation is on increase, it reduces the investment which has bad effect on the economic growth. FDI is chief source for economic development the high inflation and low investment is major dilemma for economy of Pakistan. The exchange rate volatility lowers the exports. The exchange rate appreciation would be decrease exports and encourage imports. The rising in volatility of exchange rate has significant and risky effect on export requirement. The volatility in exchange rate has an effect on the decision of policy creator. If the exchange rate is appropriately valued it does not influence the macroeconomic variables and macroeconomic performance of the country. The volatility in exchange rate causes decline in trade by produce improbability about the expected return from the exports.

Economic growth enhances the income of society and obtains unemployment at small level. Over the last few decades the

relationship between the economic growth and macroeconomic variables become severe issue among researcher. Foreign direct investment (FDI) is a chief source of increasing economic growth which fills up the lack of technology in growing countries. GDP growth is increased by attracting foreign investment.

The interest rate and GDP have inverse relation. On the condition of loan interest rate is charged by central bank from the commercial bank. The interest rate volatility is strongly connected with inflation. The major reason of high interest rate is high inflation. When the atmosphere is favorable the low interest rate is due to low inflation and it is better for economic growth. If the interest rate is higher it decreases the economic growth. The relationship between interest rate and growth rate is mutually dependent.

If the literacy rate increases, it increase productivity and reduces the poverty, due to this economic growth would become high. Education provide as one of the important component of human capital like economic growth. Education is two ways development process in one side it reduce the poverty and in other side it boost up the economic growth. With the passage of time poverty has been raise and Pakistan has failed to maintain economic growth³.

The volatility in exchange rate causes uncertainty in environment for investment in that country. If the exchange rate

is appropriately valued it does not influence the macroeconomic variables and economic performance of a country. The instability in exchange rate can influence harmfully on the investment in that country, it create unfavorable environment for investment. The rising exchange reserves give satisfaction to investors and reconstruct their self-confidence. Almost 35 years the exchange rate in Pakistan was sustained through regime system, but now it is determined weighted average of Pakistani currency with the currency of trading partner. Moreover FDIs are made to get selection power in the development where foreign companies' stakes are involved.

It is not amazingly that inflation may be politically expensive for Government. Study has also told that inflation has been harmful for economic growth. Inflation has negative influence on GDP growth. Monetary authority in Pakistan use M2 as a middle target for control inflation. And for control inflation it is essential to recognize the factors that make inflation. For control inflation price stability is necessary, which is responsibility of state bank of Pakistan. From the co integrating analysis it is conclude that in long run inflation has positive relation with money supply and has negative relation with economic growth.

Objectives of the Study: The main objective of the study is to investigate the impact of macroeconomics variables on GDP growth of Pakistan. Moreover the following objectives will also find out: i. To check the relationship of inflation with GDP growth of Pakistan. ii. To check the relationship of interest rate and exchange rate with GDP of Pakistan. iii. To estimate the relationship of FDI with GDP growth of Pakistan.

Literature Review: The Gross domestic product (GDP) any country affected by different macroeconomic variables. In this research the economic growth of several states has different relation with the macroeconomic variables. Some general macroeconomic variables are inflation, FDI inflows, exchange rate and interest rate.

Sabir and Tahir examine the impact of macroeconomic variables on GDP growth by using multiple regression technique. For this purpose data is taken from 1981-2010. They conclude that Government should bring consistency in macroeconomic variable which reduce poverty increase agriculture growth and decrease inflation. The GDP, per capita income, major crops, and minor crops have negative impact on poverty. Inflation has negative influence with GDP while investment has positive impact on economic growth¹.

Qayyum examines the impact of macroeconomic variables on GDP growth. The annual data is used from 1960-2005. From the correlation analysis he concludes that the inflation adversely affects the overall growth. There is negative relation between economic growth and inflation².

Jilan, Cheema and Asim also find out the impact of macroeconomic variable on GDP growth by using regression

analysis, coefficient analysis and econometric technique. Annual data is used from 1980-2011. From their study they concludes that if interest rate low it enhances the investment and its effect on the economic growth is positive and if the interest is high it affects negatively on the economic growth⁴.

Enu, Obeng and Hagan, demonstrated the relationship between the GDP growth and inflation as negative and significant and the relationship between GDP growth and interest rate is negative and significant⁵.

Shahzad and Al-Swidi evaluate the effect of macroeconomic variables on GDP. The data is used from the period 1991-2011. By applying the unit root test and regression analysis they conclude that economic growth rate, exports, imports, have significant positive influence on foreign direct investment inflow. Inflation and BOP have significant and negative influence on FDI inflows. The political stability has positive relation with economic growth⁶.

Khan and Senhadji also examine the impact of macroeconomic variable on GDP by using econometric technique and ordinary least square method (OLS). The annual data is used from 1960-1998. They conclude that inflation puts forth negative and significant effect on growth⁷.

Research Methodology

In this research the Gross domestic product is dependent variable but interest rate, exchange rate, FDI inflows and inflation are independent variables.

Data: In this research secondary data is used. In this paper 33 years data is collected from the period of 1980-2013. The data of GDP growth, inflation and interest rate are collected from the World Bank website. The data of FDI inflows is taken from international financial statistics and exchange rate is taken from the open door website. E-Views 7 software is used for this analysis.

Variables Explanation: Dependent Variable: GDP Growth: Gross Domestic product is dependent variable. In economics GDP is defined as total market rate of all finish products and services created in countryside in a given year. Gross Domestic Product is calculated with this method. The total market rate of all end products and services created in a country in a certain year, equivalent to the whole purchaser, investment and Government expenditure + the value of exports – the value of imports. For historical assessment Gross Domestic Product is very helpful.

Independent Variables: The interest rate is defined as the amount which is charged by lender from borrower for use of asset. In other words interest rate is bank lending rate. Interest rate is one of the macroeconomic growth factors; it's up and down volatility is strongly related with inflation rates. Its high

or low rates also impact the economic report (high GDP) and extending to influence economic growth rate. In business fields, it is very important to correctly calculate interest rate trends.

Inflation refers to continual rise in general price level or the rate at which regularly prices of goods and services increase and purchasing power of people is low. Inflation affects the distribution of income. The increase in price variability causes high inflation. The Inflation influences the economy positively or negatively. In case of increasing inflation the investors feel hesitation to invest the money. This high inflation shows the way to improbability. The inflation has become a severe dilemma in Pakistan and it has significant impact on economic growth.

The investment that is made by one country in another (normally by companies rather than by government) that launches operation or gets hold of tangible asset is known as foreign direct investment. Foreign aid is a voluntary transfer of resources from one country to another, given at least partly with the aim of advantage the receipts country.

Price of one currency in comparison to another currency is referred to as exchange rate. The exchange rate of Pakistani rupee is set by state bank of Pakistan. While exchange rates volatility demonstrates that exchange rate is set on demand and supply of one country's currency, it may turn out greatest moving price of currency and get all the foreign capital in the country. The exchange rate volatility can affect the decision of policy maker.

Hypothesis Testing: H₁: The effect of inflation on economic growth is negative and significant. H₂: Effect of interest rate on economic growth is negative and significant. H₃: Effect of exchange rate on economic growth is positive and significant. H₄: Effect of FDI inflows on economic growth is positive and insignificant.

Model Specification: In order indicate the impact of macroeconomic variables on GDP growth in Pakistan following model is used.

$$GDP = \beta_1 + \beta_2 ER + \beta_3 IR + \beta_4 INF + \beta_5 FDI + \mu \quad (1)$$

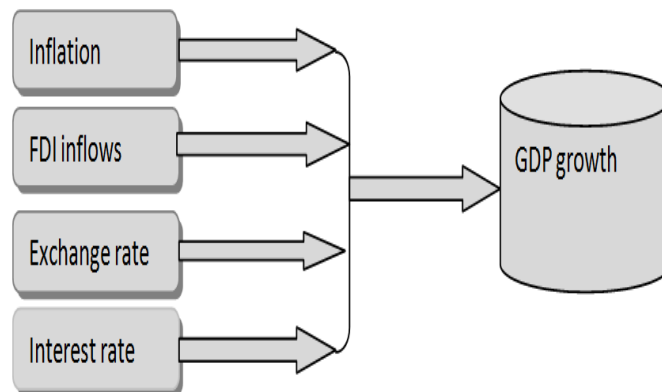


Figure-1
Conceptual Framework

In above figure, independent variables have effects on dependent variables (GDP growth) in Pakistan.

Results and Discussion

Graphical Representation: In figure 1 blue line of GDP growth percentage is recorded highest in 1980 at 10.2 while GDP growth was recorded minimum in 1997 at 1.0. From 1980 to 2001 it demonstrates fluctuation. Data series enclosed the period from 1980 to 2013 and is taken from the World Bank. GDP growth is used as dependent variable in designed model. Inflation recorded maximum trend in 2013 at 107.29 whereas the exchange rate trend was decreasing in 1980 at 2.25. The graph shows that there was increasing trend from 1980 to 2013. The interest rate in 2000 was highest at 4.9 and it was lowest in 1981 at -5.2. From the interest rate graph it is indicated that fluctuation in interest rate occurs in different years. The FDI is independent variable in the designed model. FDI inflows are measured in US dollar. The foreign direct investment inflows were highest in 2005 to 2009 at 22.0 and it was lowest in 1983 at 17.0 and fluctuation was happened in FDI inflows.

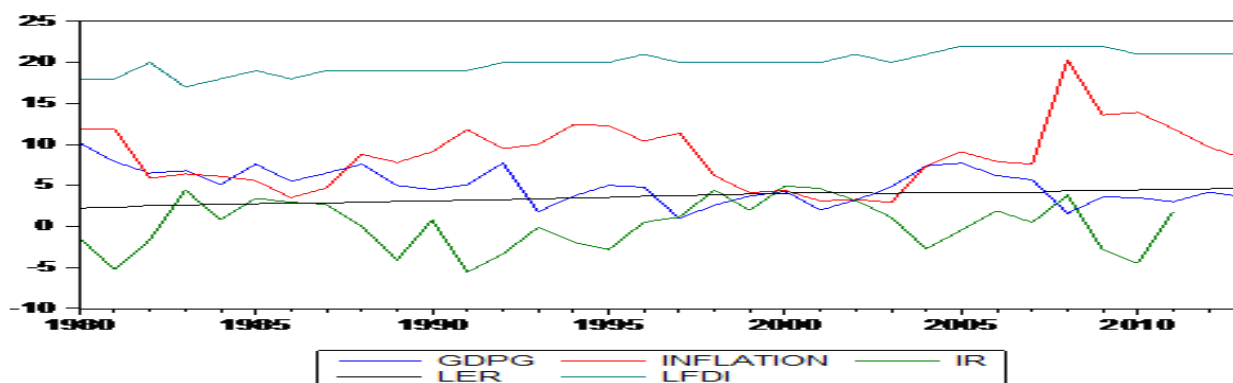


Figure-1
Behavior of the Macroeconomic Variables

Descriptive Statistics Analysis: The table of descriptive statistics analysis shows that the mean value of FDI 19.93750 is highest rate of changes among all variables whereas the mean value of interest rate 0.262188 have lowest rate of changes. The maximum value of standard deviation of inflation is 3.943390, which represents that it, is more at risk to turn as against the expected value. The minimum value of standard deviation is exchange rate is 0.677343.

Correlation Analysis: Table 2 shows the result of correlation coefficient that indicates there is negative and significant relationship between the GDP growth and inflation. From the correlation result it is demonstrated that the relationship between exchange rate and GDP growth is positive and insignificant and the relationship between GDP growth and FDI is positive and insignificant.

Pair wise Granger Causality Test: The table 3 indicates the result of pair wise Granger causality test that shows the causal relationship among GDP growth, inflation, interest rate, exchange rate and FDI inflows. In Granger causality test all variables are independent with each other. From Granger causality test the inflation has unidirectional causal relationship with interest rate. It is also found that exchange rate has unidirectional causal linkage with FDI.

Regression Analysis: In the table 4 the Regression analysis results are shown. The GDP growth is dependent variables while the inflation, FDI inflows, exchange rate interest rate are independent variables. The co-efficient of inflation -0.178594 has negative and significant impact on GDP growth. There is inverse relationship between GDP growth and inflation. From the above regression model the co-efficient of interest rate and exchange rate has negative and significant impact on GDP growth. The resultant equation can be mathematically expressed as:

$$\text{GDP} = 0.226038t - 0.17 \text{ inflation} - 0.12 \text{ IR} - 0.69 \text{ LER} + 1.37 \text{ LFDI}$$

From the t-statistics value the inflation, interest rate and exchange rate have significant impact on GDP growth while the FDI t- statistics has insignificant effect on GDP growth.

In table R, express in coefficient of correlation which show the strength of linear relation among two variables. In table adjusted R² is 0.499416 which mean 46% deviation caused through descriptive variables on explain variable. By using Durbin wanton test, value 1.946867 which means that there is auto correlation between dependent variables and independent variables.

Table-1
Descriptive Statistics

	GDP	INFLATION	IR	LER	LFDI
Mean	5.050000	8.600000	0.262188	3.515291	19.93750
Median	5.000000	8.350000	0.635000	3.615192	20.00000
Maximum	10.20000	20.30000	4.930000	4.492449	22.00000
Minimum	1.000000	2.900000	-5.560000	2.251818	17.00000
Std. Dev.	2.180411	3.943390	3.054843	0.677343	1.342542
Skewness	0.140008	0.644099	-0.263521	-0.279699	-0.128880
Kurtosis	2.496800	3.540161	2.028616	1.811721	2.381139
Jarque-Bera	0.442159	2.601640	1.628481	2.299911	0.599239
Probability	0.801653	0.272308	0.442976	0.316651	0.741100
Sum	161.6000	275.2000	8.390000	112.4893	638.0000
Sum Sq. Dev.	147.3800	482.0600	289.2939	14.22261	55.87500
Observations	32	32	32	32	32

Table-2
Correlation Matrix

	GDP	INFLATION	IR	LER	LFDI
GDP	1.000000				
INFLATION	-0.143916	1.000000			
IR	-0.301385	-0.457972	1.000000		
LER	-0.596652	0.159567	0.175648	1.000000	
LFDI	-0.358142	0.288205	-0.000909	0.855215	1.000000

Table-3
Pair wise Granger causality test

Null Hypothesis	Obs.	F-Statistics	Prob.	Type causality
Inflation does not Granger cause GDPG GDPG does not Granger cause Inflation	33	0.67604 0.43013	0.4174 0.5169	N.C
IR does not Granger cause GDPG GDPG does not Granger cause IR	31	0.05052 0.20854	0.8238 0.6514	N.C
LFDI does not Granger cause GDPG GDPG does not Granger cause LFDI	33	3.69032 0.21544	0.0643 0.6459	N.C
LER does not Granger cause GDPG GDPG does not Granger cause LER	33	2.83242 0.63288	0.1028 0.4326	N.C
IR does not Granger cause inflation Inflation does not Granger cause IR	31	1.09102 5.00248	0.3052 0.0335	U.D.C
LFDI does not Granger cause inflation Inflation does not Granger cause LFDI	33	2.42950 0.51581	0.1296 0.4782	N.C
LER does not Granger cause inflation Inflation does not Granger cause LER	33	0.33782 2.17430	0.5654 0.1508	N.C
LFDI does not Granger cause IR IR does not Granger cause LFDI	31	0.27146 0.30764	0.6064 0.5835	N.C
LER does not Granger cause IR IR does not Granger cause LER	31	0.31018 0.77952	0.5820 0.3848	N.C
LER does not Granger cause LFDI LFDI does not Granger cause LER	33	9.49251 0.26046	0.0044 0.6135	U.D.C

Table-4
Regression Analysis

Variables	Co-efficient	Std.Error	t- stat.	Prob.
@Trend	0.226038	0.117283	1.927286	0.0645
INFLATION	-0.178594	0.084946	-2.102440	0.0450
IR	-0.127294	0.109732	-1.160049	0.2562
LER	-6.936973	2.055465	-3.374892	0.0022
LFDI	1.378474	0.284257	4.849388	0.0000
R-squared	0.564008	Mean dependent variable		5.050000
Adjusted R-Squared	0.499416	S.D. dependent var.		2.180411
S.E of regression	1.542683	Akaike info criterion		3.847524
Sum of squared resid	64.25652	Schwarz criterion		4.076546
Log likelihood	-56.56039	Hannan- Quininnriter.		3.923438
Durbin- Watson stat	1.946867			

Conclusion

The empirical finding of this study is to observe the relationship of dependent variable with the independent variables over the period of 31 years data from 1989 to 2013. The Granger causality test and correlation and regression method are used to estimate long run and short run relationship. In current year the economic growth of Pakistan has stayed behind which becomes serious problem for policy maker and professionals. An unstable economic growth has been due to various factors. Continual growth of GDP is a considerable warning sign for any country economy. The persistent growth of GDP attracts the foreign investor to invest in concerned country. GDP is main variable for foreign direct investment. The GDP growth is affected by inflation and interest rate. From the empirical analysis Inflation,

interest rate has negative relation with GDP growth it indicates that the inflation and interest rate are going in reverse direction. While the exchange rate and FDI have positive relation with GDP growth. For sustain GDP growth the Government should adopted growth propensity policy by the support of fiscal policy and monetary policy. The inflation affects the economic growth so strict monitory policy should be adopted in country. Government should carry on direct foreign aid into program to make the public capital and develop the productivity that has positive effect on economic growth.

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References

1. Sabir M.H. and Tahir S.H., The impact of different macroeconomic variables on poverty in Pakistan, *Interdisciplinary Journal of Contemporary Research in Business*, **3(10)**, 790-799, (2012)
2. Qayyum A., Money, inflation and growth in Pakistan, *The Pakistan Development Review*, **45(2)**, 203-212, (2006)
3. Afzal M., Malik M.E., Begum I., Sarwar K. and Fatima H., Relationship among education, poverty and economic growth in Pakistan: an econometric analysis, *Journal of Elementary Education*, **22(1)**, 23-45, (2012)
4. Jilan S., Cheema F.E.A., and Asim M., exploring impact of macroeconomic variable on GDP of Pakistan, *Journal of Management and Social Science*, **6(2)**, 65-73, (2010)
5. Enu P., Obeng P.A. and Hagon E., The relationship between growth rate and inflationary rate in Ghana: an elementary statistical approach, *Academic Research International*, **4(5)**, 310-318, (2013)
6. Shahzad A. and Al-Swidi A.K., Effect of macroeconomic variables on the FDI inflows: The moderating role of political stability: Evidence from Pakistan, *Asian Social Science*, **9(9)**, 270-279, (2013)
7. Khan M.S. and Senhadji S.A., Threshold effects in the relationship between inflation and growth, *International Monetary Fund*, **48(1)**, 1-21, (2011)