

Analysis of GDP and Macroeconomic Variables on Economic Growth of Pakistan

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Abstract

GDP represents the economic growth of a country. Higher GDP growth is translated as higher economic growth. In case of Pakistan, the GDP is continuously going down due to some macroeconomic factors. This is an alarming situation for the Pakistani government. The main ambition of this study is to interrogate the four selected independent variables which impact on the GDP of a country and verify if the relation holds in Pakistan. This study expects to ascertain the effects on GDP performance in short or long run of inflation, unemployment, foreign direct investment and import prices of goods and services. It utilizes the data of the last 30 years for the Pakistani Economy i.e. the period of 1983 to 2012. Several statistical techniques have been applied. Five SEM models were used to estimate causal relationships. The outcome of this research suggests that the government needs to pay attention (1) to the control of inflation through effective and efficient monetary policy, (2) to increase employment chances by the supporting and establishing new industries and (3) advancing infrastructure. Government of Pakistan should also support Pakistani export in order to decrease heavy import prices and always encourage foreign direct investments. These outcomes will be helpful in managing the economic growth rate of Pakistan.

Keywords: *Gross Domestic Product, Unemployment, Foreign Direct Investment, Import/Export, Inflation.*

Introduction

Gross Domestic Product (GDP) indicates the economic growth of a country. GDP is the total market value of all final goods and services produced in the economy during a specified period measured in monetary terms. There are three approaches to measuring GDP (1) the expenditure approach, (2) the product

approach and (3) the income approach. Normally non productive transactions are excluded from the GDP. The country's economy shows positive or negative fluctuation all the time. Through GDP, one can easily analyze the economy by the rate at which it is growing or declining compared to the previous years. Also, GDP growth is compared with the GDP

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growth of different countries.

In case of Pakistan, the GDP rate in year 2004 – 2006 reached 8.96%, but after 2006, it has been continuously decreasing due to various macroeconomic factors. The current position of the Pakistani economic growth rate is around 3% to 4%, which is the worst and the most alarming than it has been for a while. Basically, Pakistan is an agrarian economy and the rural areas and the agriculture sector has always made a more pronounced impact on the economic growth as compared to the other sectors. Agriculture sector plays a dominant role in the Pakistani economy. According to the Economic Survey of Pakistan 2012-13, agriculture sector contributed 21.4% in the GDP growth of Pakistan. Agriculture sector provides approximately 45% labor force to other sectors of the economy. Important crops like cotton and rice declined by 10% and 4.2% respectively in this period. Furthermore, this sector helps the Country in earning maximum foreign exchange as well. In short, agriculture growth rate is positively related to the GDP of Pakistani economy. If a 1% increase is experienced in agriculture, this increases the whole GDP by 0.34% (Ministry of Finance, Government of Pakistan, 2013).

To increase Pakistani economic growth, strategies like (1) adopting new technologies and ideas, (2) controlling high inflation, (3) checking unemployment rates and (4) controlling import bill are vital. The major causes of slacking economic growth are high inflation and high unemployment. Inflation is the chief hurdle in Pakistani economic development. Unemployment and inflation always negatively hurt the economic growth

of a country (Wajid & Kalim, 2013). Inflation significantly affects unemployment in the long run. Unemployment and economic growth have a negative relationship because a country's level of output is totally based on the numbers of labor. Okun's law "is intended to tell us how much of a country's GDP may be lost when the unemployment rate is above its natural rate" (Fuhrmann, 2015).

The key reasons for the poor economic performance in Pakistan, during the past six to seven years, have been (1) high inflation rate, (2) unemployment rate, (3) import goods and services rate, (4) increasing foreign debt burden, (5) low earning from foreign exchange and (6) the use of obsolete technology.

(Koukouritakis, 2004) sees a substantial impact of balance of trade on the economic growth of a country. Similarly, (Irandoost & Ericsson, 2004) have declared that there is a long-run relation between balance of trade and economic growth. (Iqbal & Zahid, 1998) states that in case of Pakistan, FDI is the major component in the foreign investment basket. In 2006-07, Pakistani investments increased by 332% against 2001-02. According to them, a unidirectional causality exists from imports to FDI and GDP. Hence, FDI is generating a permanent effect on the economic growth of Pakistan.

Calling up the above relationship of macroeconomic variables with GDP growth rate, the current study investigates the effect of various independent variables on the dependent variable - GDP Growth Rate. This research tries to justify the causal relationships through the use of statistical tests and models. E-Views has been used for modeling and

analysis. While, there are numerous factors which effect economic growth, this study only focuses on four important predictor variables: (1) inflation, (2) import prices of goods and services, (3) unemployment, and (4) foreign direct investment.

Literature Review

Many studies have been exposing the relationship of macroeconomic variables with GDP growth rate of a country. A review of previous national and international research on this issues are mentioned below:

Analyzing the importance of economic growth at national and international level studies have highlighted on determining the relationship between rising prices and economic growth. (Iqbal & Zahid, 1998) used regression and OLS analysis to determine the relation of human or physical capital, budget deficit, foreign debt and trade, and income on economic growth or per capita real income. The outcome showed that macroeconomic factors have a bigger effect on GDP or per capita real income. Moreover, research also found a significant negative correlation between GDP and budget deficit and GDP and foreign debt. It also ascertained significant positive correlation between GDP and export earnings and GDP and human or physical capital.

(Wajid & Kalim, 2013) state that unemployment is one of the most major macroeconomic problems. This factor causes economic and social norms to deteriorate significantly in an economy. In case of Pakistan, the rate of unemployment has been continuously increasing and had reached

5.34% in 2010. They used five variables and determined the impact of other independent variables on unemployment a Pakistani scenario. They co-integration test, VECM and lag selection criteria to ascertain that inflation significantly increased unemployment rate in the long run. The study also revealed that the positive and insignificant effect of trade openness on unemployment in the long run, but in the short run it has significant impact on unemployment.

Similarly, (Liu, 2008) also found the differential outcomes of inflation on employed or unemployed workers. The study was based on two sub periods. Sub period I highlighted the structure of the labor market (LM) and decentralized good marketing (DM). Sub period II defined the structure of the centralized goods market (CM), where trading takes place with or without money. The negative relationship between the inflation and unemployment exists in the long run, when the economy faces high inflation rate or interest rates as a result of reduced the consumption of decentralized good market transactions.

From a different perspective, (Sarel, 1996) elucidated that nonlinear effect of the inflation rate of economic growth of a country. His result showed that inflation has a slightly positive effect on GDP rate when it is below 8%. (Mallik & Chowdhury, 2001) estimated that the positive impact of moderate inflation on GDP growth rate. Moreover, it is found that moderate inflation is helpful for faster economic growth with the help of co-integration test and VECM test which were applied on data of four Asian countries.

(Borensztein, et al., 1998) evaluated the issue of Foreign Direct Investment (FDI) on economic growth of a country by selecting a sample data from 69 countries over the last two decades. According to them, FDI plays a tremendous role in the economic growth through this variable easily transfers the advance and modern technology from one country to another country. Similarly, (Levine & Renelt, 1992) determined the robust relationship between economic growth, FDI and Human capital.

On the other hand, (Nonnemberg & de Mendonca, 2004) explained the importance of FDI and economic growth in the scenario of China. According to them, it is not necessary that the inflow of FDI always leads to economic growth of a country. In some places, strong GDP rate can encourage FDI. They developed an econometric model for China's growth; they use a lagged dependent variable to include the market response to the changes in the economy. They found that the lag response is significant regarding FDI and growth. Similarly, (Seetanah & Khadaroo, 2007) also declared that the FDI has a small effect on economic growth as compared to other growth factors. FDI also follows the level of productivity of a country.

(Craigwell, 2006) studied the empirical evidence on the relationship between employment and FDI. Using 20 English & Dutch speaking Caribbean Countries for the period of 1990 to 2000. In these countries, FDI plays a one-to-one role to increase employment.

(Shaari, et al., 2012) attempted to explain the impact of Foreign Direct Investment on unemployment rate and economic growth

of a country. Using OLS method, the study found that through FDI countries could reduce unemployment rate, raise the GDP rate and create more domestic jobs as well. According to them, if FDI increased by 1%, unemployment decreased by 0.009% and economic growth increased 1.2% approximately. Lastly, the OLS method analysis found that FDI is negatively related to unemployment. However, it is positively related with the level of productivity of a country. Similarly, (Nucu, 2011) found that FDI inflows have a positive effect on balance of payment. It can help to accelerate the generation of new jobs and act as a catalyst for country's economic growth especially in case of Central and Eastern countries' economies. The study also deduced that the FDI has a direct link with the level of productivity and indirect link with the unemployment rate.

On the contrary, majority of previous researches has justified that FDI is not the key in bringing down unemployment. (Prilleltensky, 2012) evaluated that FDI could create an unfavorable situation for a country through FDI. Countries introduced modern technology for producing goods and services which replaced manpower with machinepower and, hence, increased unemployment. Similarly, (Alfaro, 2003) investigated the FDI negative impact on economic growth. He justified that imposing government restrictions are the main hurdles in the promotion of FDI, due to this high taxes and tariff should not be implemented.

(Akhtar & Malik, 2000) define the consequence of bilateral price and income on Pakistani trade performance with its major trading partners including USA, UK, Germany

and Japan. They used quarterly data and found the relationship by the Three Stages Least squares technique (3SLS). According to them, when the income of the trading partner's increased by 1%, consequently, our export also increased under the range of 1.4% and 5.7 %. It is also found that if Pakistani GDP rate increases by 1%, as a result the size of imports of Pakistani trade partners also increases.

(Siddiqui & Iqbal, 2005) calculated the positive significant relationship between GDP and investment and the positive insignificant relationship between GDP and trade. Whereas, negative relationship between trade growth and GDP growth was also observed. Researchers took GDP as a dependent variable. Trade growth, fixed investment growth and Population growth were taken as independent variables. (Sinha & Sinha, 2002) narrated the effect of openness, growth and investment growth on GDP. They built a research model in which 15 Asian countries were included. They used auto-regressive model to explain the positive effect of openness on growth and domestic investments as well.

Conceptual Framework and Model Formation

The work consists of the following research model which is based on the above studies of literature review:

Where,

FDI = Foreign Direct Investment

INF = Inflation

IMP = Import prices of goods and services

UNE = Unemployment

GDP = Gross Domestic Product

Figure 6.1



In this model, GDP is the dependent variable. Foreign Direct Investment (FDI), Inflation (INF), Import prices of goods and services (IMP) and Unemployment (UNE) are the independent variables.

Equation 6.1

$$Y(\text{GDP}) = \beta_0 + \beta_1(\text{GDI}) - \beta_2(\text{INF}) - \beta_3(\text{UNE}) - \beta_4(\text{IMP}) + \varepsilon$$

Statements of Hypotheses:

H_A: Labor force causes economic growth

H_B: FDI causes economic growth

H_C: Import of goods and services causes economic growth

H_D: Inflation causes economic growth

Research Methodology

Essentially, this work is based on secondary data which is collected from the State Bank of Pakistan, World Bank and Pakistan Economic Survey (2010-2011) for the period of 1983-2012. Different statistical tools were applied on time series data for data analysis. This study employs quantitative research design. All findings, results or recommendations are based on various statistical tools which have been applied using e-Views software.

This study has chosen Pakistan as a sample from the list of all developing countries; here we can articulate that all developing states are included in the population. Judgement sampling has been used for the selection of 30 years' data. To identify the major or significant variables which have a higher impact on economic growth of any developing economy the list of chosen countries is also presented in this study.

The following tests were employed:

- Augmented Dickey Fuller Test (ADF)
- Corellogram Test
- Co-integration Test
- Vector Error Correction Model (VECM)
- Residual diagnostic techniques like histogram normality test, serial correlation LM test, and Brusch Pagan Godfrey test

Results

According to Unit Root Test analysis all independent variables are stationary at first difference not at the level but only GDP data is stationary at level. At level all variables result shows greater than 0.05 except GDP. See table 6.1.

According to Correlogram analysis all independent variables are stationary at first difference not at the level but only GDP data is stationary at level. At level all variables result shows lesser than 0.05 except GDP. See table 6.2.

Unrestricted Cointegration Rank Test (Trace) showed that there was co-integration between independent variables

both at none and most. See table table 6.3.

Five models were developed using Vector Error Correction Model (VECM):

Model 1: shows long term causality of Inflation, Import, FDI and unemployment on GDP, because C1 is negative -0.675 and it has significant value which is 0.0349.

Model 2: prescribed that there is no long run causality among the variables because 13th coefficient is positive 0.89 and it has insignificant P- value 0.49.

Model 3: presented that C25 is negative coefficient -1.53 and it has significant P-value 0.0012 which is highlighted the long run causality of Inflation, Unemployment, GDP and FDI on Import.

Model 4: The coefficient value of 37 is -0.34 explained the long run causality in model 4. The value of R-square is 0.648 which present average correlation between dependent or independent variables. However, F-statistic value is 0.049 which is lesser than 0.05 it means that model 4 is acceptable.

Model 5: The results of the estimated model 5, which narrated that our model 5 performed not well, because its first coefficient is not in negative form 0.32 and there is no significant P-value 0.288. R-square is 0.48 which is shows below average correlation between dependent and independent variables. F value (1.277) which is not significant it means that model is not fit. See table 6.4.

According to Residual test, model GDP, INF, IMP and FDI are the best model because of being free from serial correlation,

homoscedasticity and error terms. See table 6.5.

The value of Chi-Square is 0.0726, which is greater than 0.05. This result encourages accepting Null hypothesis of third test of residual tool. It means data of model 5 is homoscedastic. Analyzing the all three results of best regression model 5, it is not the best model because, histogram normality test rejected null hypothesis.

Conclusion

In Model 1, the first coefficient is negative with a significant p-value. It means that GDP shows a long-run relationship with inflation, unemployment, FDI and import. However, the short-run import (lag 1), inflation (lag1), unemployment (lag 1) and FDI (lag 1) have an impact on GDP.

Model 2 explains that there is no long-run causality of GDP, import, unemployment and FDI on inflation. However, in short-run, FDI (lag 2) and import (lag 1) have an impact on inflation. The results of this model are the closest to a previous study of (Abbas, et.al., 2011) According to them, inflation and GDP have a minor or no relationship, they declared this result on the basis of calculation on SAARC countries.

Model 3 explains the import relationship with other variables. In the short-run, GDP (lag 1), inflation (lag 1), inflation (lag 2), and unemployment (lag 2) have an impact on import. However, Import has a long-run causality with inflation, unemployment, GDP and FDI because the first coefficient of this model is negative and significant.

Model 4 estimated that positive relationship between FDI and other independent variables exist in the long-run. This outcome is matched with previous researches such as, (Yousaf, et al., 2008), described that in Pakistan; FDI is a source of funding. However, Saleem et al. has also identified positive link of GDP and FDI.

The outcome of Model 5 indicates that there is no long-run relation of unemployment with GDP, inflation, unemployment and import. Whilst, in short-run causality of inflation (lag1) on unemployment. According to the best regression model features, it is not useful model.

Recommendations

- Government should adopt some steps to moderate inflation rate.
- Government of Pakistan should concentrate on industrial infrastructure.
- Increase or promote FDI in order to decrease unemployment.
- Retirement period should reduce from 60 years to 55 years and introduce new talent for increasing the level of productivity.
- Macroeconomic stability should be maintained by the government.
- Firms do not invest in those developing countries where they are required to pay a high corporate tax rate. So, the Government should fix a lower corporate tax rate.
- Promote cottage industries.

- Country labors must be skilled. Special attention should be paid to vocational training.
- Government of Pakistan should adopt export friendly policies.
- Focus on import substitution industrialization.
- Ethanol may be used as a substitute for oil in automobiles. This alone will save US\$500 million.

Table 6.1: Unit Root Test Analysis

Variables	Figures at level	Result	Figures at First Difference	Result
Unemployment	0.5645	Non Stationary	0.028	Stationary
FDI	0.083	Non Stationary	0.0064	Stationary
Import	0.1485	Non Stationary	0.000	Stationary
Inflation	0.139	Non Stationary	0.000	Stationary
GDP	0.012	Stationary		

Table 6.2: Corellogram Test Analysis

Variables	Figures at level	Result	Figures at First Difference	Result
Unemployment	0.000	Non Stationary	0.065	Stationary
FDI	0.000	Non Stationary	0.07	Stationary
Import	0.000	Non Stationary	0.233	Stationary
Inflation	0.000	Non Stationary	0.131	Stationary
GDP	0.063	Stationary		

Table 6.3: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.588376	50.17760	47.85613	0.0298
At most 1	0.440265	25.32356	29.79707	0.1502
At most 2	0.213513	9.075374	15.49471	0.3585
At most 3	0.080515	2.350349	3.841466	0.1253

Table 6.4: Vector Error Correction Model Analysis

Model	Coefficient	Relationship	P-Value
GDP	C1	Long run	Significant
INF	C13	No long run	Insignificant
IMP	C25	Long run	Significant
FDI	C37	Long run	Significant
UNE	C49	No long run	Insignificant

Table 6.5: Best Regression Model Analysis

Model	Histogram Normality Test	Serial Correlation LM Test	Heteroscedasticity Test	Best/ Not Best
GDP	Residual Distributed	No Serial Correlation	Homoscedasticity	Best
INF	Residual Distributed	No Serial Correlation	Homoscedasticity	Best
IMP	Residual Distributed	No Serial Correlation	Homoscedasticity	Best
FDI	Residual Distributed	No Serial Correlation	Homoscedasticity	Best
UNE	Residual not Distributed	No Serial Correlation	Homoscedasticity	Not Best

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