Empirical Analysis of Factors Affecting Economic Growth in Pakistan

Kewal H. Talreja[1], Zulfiqar Ali Shaikh[2], Muhammad Saleem Rahpoto[3] & Naveed Ahmed Shaikh[4]

Abstract: *The paper estimates the major factors affecting economic growth in Pakistan over the period of (1985-2011).The Time series properties of variables are tested using backward stepwise regression method by employing SPSS. The secondary World Bank data has been used for analysis purpose. The results of multiple regression indicate that one-dollar increase in the amount of service value added, agriculture value added, industrial value added, gross domestic savings and external debt causes GDP to increase by 1.124, 0.897, 0.702, 0.411 and 0.213 million US dollars respectively that accelerate the growth process. However, one-dollar rise in the amount of exports, FDI and gross fixed capital formation rise the GDP by 0.004, 0.003 and 0.001 million US $ that indicates the positive but insignificant association with GDP. The paper thus focuses on reforms and policies with immediately effect to boost FDI, exports and gross fixed capital formation to remove the barriers of economic growth in Pakistan.*

Key Words: *GDP, FDI, Gross, domestic savings, External debt,*
                Exports, Economic growth.

1.0   Introduction

Potential increase in output level is central for all developing countries to meet diverse challenges like easing the balance of payments problem, embracing wave of global integration to resolve domestic issues like unemployment and inflation. The developing and emerging countries including china, South Korea, Japan, Taiwan and others have been rigorously using their intellectual capabilities and resources to improve performance in economic growth since last couple of decades. These are the countries with exception of Japan who started economic pursuits with Pakistan but had their niche in the global output far beyond that of Pakistan. Several bottlenecks have been identified in case of Pakistan like political instability, lack of foreign direct investment and under performance in international trade. This paper is intended to pursue and analyze those bottlenecks the Pakistan's path of growth and development and to explore empirically the factors responsible for sluggish growth in the economy.

The GDP is used as a proxy to measure the national economic growth showing the score card of the economy. To identify the most important factors affecting

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[1] Lecturer in Economics, Govt. Islamia Arts & Commerce College, Sukkur
ufrsuk0003@yahoo.com (correspondent author)

[2] Assistant Director, Postgraduate Studies, Shah Abdul Latif University, Khairpur
zulfiqar.shaikh@salu.edu.pk

[3] Professor & Chairman, Department of Economics, Shah Abdul Latif University, Khairpur
cp.eco@salu.edu.pk

[4] Professor Shaheed Zulfiqar Ali Bhutto Institute of Science & Technology (SZABIST) Dubai Campus

GDP growth of the country, nominal GDP is taken as dependent variable and eight independent variables that are service value added, agriculture value added, industrial value added, gross domestic savings and external debt, exports, FDI, gross fixed capital formation in million US $ are nominated as the independent variables. Since it various studies have identified different factors, present study has used stepwise regression to freshly identify the most important variables affecting the most the economic growth of the country. To reach a final conclusion to ascertain the elements affecting economic growth of Pakistan an extensive literature survey is conducted. Moreover, quality data, methodology, econometric equations, models and the multiple regressions has been performed to reach each parameter estimate to detect significant determinants affecting economic growth in Pakistan.

The prognosticators that service value added, agriculture value added, industrial value added, gross domestic savings and external debt, exports, FDI and gross fixed capital formation are following the rising trend towards economic growth. Finally, the conclusion, findings and policy recommendations have been presented.

1.1   Research Problem

Although, it is generally believed that high inflation rates, increasing fiscal deficits, weak law and order control, uncertain weather conditions, political unrest, are being attributed for the slack growth in Pakistan. Yet there are only a few studies that present a comprehensive analysis of the whole set of economic sectors and their relative contribution to the economic growth of the economy as a whole. Present study is an attempt to resolve the policy issue of selecting the sectors which are significantly more important than others for overall growth of the country.

1.2   Research question

Keeping in view the concern of policy makers to achieve sustainable and rapid growth it becomes imperative to statistically estimate the most important factors affecting the growth rate in Pakistan. The study is an attempt to draw attention of the policy makers towards most important sectors in the economy with most potential to accelerate economic growth.

1.3   Significance of the Study

This research study is significant enough because it also enables us to know the macroeconomic factors responsible for sluggish growth in Pakistan that have not been studied yet as per our comprehension. This research study will be helpful to achieve sustained economic growth by making investments in physical and human capital that would also induce the service sector to extract more revenue and produce at lower marginal cost. As a result, the Per capita income will increase that would lead towards augmentation in saving. This research will help the government policy makers to utilize such savings in export promotion sectors to improve the trade and welcome foreign reserves. Consequently, the overall

economy will develop.

2.0   Literature Review

Adequate literature has been surveyed extensively to resolve a provocative issue to determine statistically the factors affecting economic growth. Diverse research works have applied the cross section and panel data approaches, but here times series properties of variables are tested using backward stepwise regression method.

Zaheer, Khattak, and Khanzaib (2014) detected long term significant positive impact of export and import on GDP growth rate in Pakistan using regression method and Johansson co integration technique over time series data for the period ranging from 2000 to 2010.

Farooq et al. (2013) examined the causal factors of GDP in Pakistan for the period defined 1975-2011 by employing ADF unit root test, VAR co integration approach and log linear model on time series data found that agricultural output, industrial production, services, trade openness and exchange rate would lead to rise in the real, GDP.

Shaheen, Ali, and Kauser (2013) results reveal the significant positive impact of trade liberalization and gross fixed capital formation and negative effect of FDI and inflation on economic growth of Pakistan for the period defined 1975-2010 by applying co integration approach using time series data.

Ullah and Rauf (2013) did research work on six Asian countries panel data including Pakistan made three clusters used fixed and random effect models over the period (1990-2010) observed the impact of different macroeconomic variables that FDI and savings rate have a direct relationship with economic growth while, exports significantly negatively correlate with economic growth and, labor force and tax rate have no impact on economic growth.

Sheikh (2012)found an agricultural sector as a backbone and source of input to manufacturing sector for developing economy like Pakistan and also achieve determinant of GDP in both the long run and short run economic periods. Furthermore, he performed ADF test to check stationary properties of information and used Johansson's co integration techniques to explore a number of co integration equations, to know regarding coefficients for selected error correction model. Finally, they detected the significant positive link between agriculture sector, GDP and economic growth of Pakistan using annual time series data over the period of 1980-2010.

Ellahi, Ahmed, and Mahmood (2011) for the period between (1975-2009) by applying unit root test and OLS methodology inferred positive relationship between industrial value added, exports, imports and economic growth in Pakistan.

Azam (2011) by applying tabulation, figure, and percentage methodology on NWFP of secondary data detected after agricultural sector the industrial sector is the second most important sector towards GDP. Industrial demand helps to boost agricultural productivity, create employment opportunities, as a result national income increase, living standard improves and also trade and government revenue

increases. Insufficient capital, non-provision of fiscal support, irregular electric supply, lack of infrastructure facilities, illegal inflow of goods and political conflicts are causes of retrograde of industrial sector.

Sajid and Sarfaraz (2008) statistical evidence on quarterly data for Pakistan over the period 1973-2003 using cointegration and error correction techniques observed two way causal long run relationship between savings and production stage. Furthermore, their empirical results suggest that in the long run savings cause economic growth while in the short run savings depend upon the point of production.

Iqbal and Zahid (1998) using Growth in per capita real income and real GDP as the proxy for economic growth for time series data over the period of 1960-1997 by employing multiple regression methods found primary education an important prerequisite for accelerating growth and openness of Pakistan economy is positively correlated with economic growth, while non development expenditure by government and external debt negatively correlate with economic growth.

2.1   Hypotheses
It is to be discovered on the basis of literature study and empirical evidences that support the subject matter to focus on investigating the following hypotheses in the context of Pakistan by running regression method using SPSS.

2.1.1   Hypothesis in case of detecting factors affecting Economic Growth
H_0 = The model is the most excellent fit. $P < 0.05$

H_1 = The model is not the most excellent fit. $P > 0.05$

2.1.2   Null Hypothesis regarding the regression coefficients of eight independent variables affecting Economic Growth.
$H_0 1 =$ Service Value Added has an effect on GDP.

$H_0 2 =$ Agriculture Value Added has an effect on GDP.

$H_0 3 =$ Industry Value Added has an effect on GDP.

$H_0 4 =$ Gross Domestic Savings has an effect on GD.

$H_0 5 =$ External Debt has an effect on GDP.

$H_0 6 =$ Exports have an effect on GDP.

$H_0 7 =$ FDI has an effect on GDP.

$H_0 8 =$ Gross Fixed Capital Formation has an effect on GDP.

2.2   Econometric Models
Following statistical model by employing backward stepwise regression method using the SPSS is believed to be the best fit models to detect the elements affecting economic growth.

$$GDP = \alpha_0 + \alpha_1 SER + \alpha_2 AGRI + \alpha_3 IND + \alpha_4 GDS + \alpha_5 OED + \alpha_6 EXP + \alpha_7 FDI + \alpha_8 GFCF + e - - - (1)$$

This model further holds

GDP	=	Gross Domestic Product (in million US $),
α_0	=	Intercept,
α	=	Slope or Regression Coefficients,
SER	=	Services Value Added (in million US $),
AGRI	=	Agriculture Value Added (in million US $),
IND	=	Industry Value Added (in million US $),
GDS	=	Gross Domestic Savings (in million US $)
OED	=	Outstanding External Debt (in million US $)
EXP	=	Exports (in million US $),
FDI	=	Foreign Direct Investment (in million US $),
GFCF	=	Gross Fixed Capital Formation (in million U
e	=	Error Term

3.0   Data and Methodology

The time series data over the period of 1985-2011 has been used in this study and the source of data is World Bank Data and Pakistan various economic survey. This data has been statistically analyzed by running multiple regressions by employing backward step wise method using SPSS.

4.0   Analysis and Results

The time series properties of macroeconomic variables have been empirically tested and the results are being shared as under.

Table 1:   Breakup of Variance Analysis

	Sum of Squares	Degree of freedom	Mean Square	F	Sig.
Regression	69979874735.005	5	13995974947.001	41497.768	.000
Residual	7082681.516	21	337270.548		
Total	69986957416.521	26			

The ANOVA's table indicates the breakup of variance of outcome variable GDP, the regression variance, the ratio of variance explained through model variables is $69979874735.005 million, regression residual $7082681.516 million, is the remaining variance or error term that has not been explained by 21 missing predictors. The total variance $ 69979874735.005 million represents the variance possible through all 26 estimated sources of variation as degrees of freedom indicate. The P value is linked to F statistics and examines the alpha level considering the various model independent variable coefficients equal to zero. The results are overall significant because the P value is less than 0.05 and model is an excellent fit and also we accept the null hypotheses relating to regression

coefficients of five independent variables that impact upon GDP.

Table 2:   Regression results and interpretation of each Parameter.

Model Included variables	Unstandaridized Coefficients β	Standardized Coefficients Beta	T
(Constant)	1910.146		3.690
Serv_Value_Added_MUS$	1.124	.617	32.897
Agri_Value_Added_MUS$	0.89 7	.207	12.676
Industry−value _Added_ MUS$	0.702	0.142	9.O71
Gross_Domestic_Saving_MUS$	0.411	.042	7.100
External_Debt_MUS$	0.213	0.009	3.692

After running regression following variables have been identified to have significant impact on economic growth.

$$GDP = \alpha_0 + \alpha_1 SER + \alpha_2 AGRI + \alpha_3 IND + \alpha_4 GDS + \alpha_5 OED + e --------(1)$$

The econometric equation is formed as under after putting α_0 and $\alpha_1, \alpha_2, \alpha_3 \ \alpha_4 and \alpha_5$ values.

$$GDP = 1910.146 + 1.124 SER + 0.897 AGR + 0.702 IND + 0.411 GDS + 0.213 OED + e$$

α_0 Intercept that carries a value of 1910.146 is unavoidable and significant. This is so because the change in GDP is not merely the outcome of the change in selected independent variables, but there are also other factors that systematically contribute towards change in the GDP. And α is the regression coefficient of independent variables and e is the error term. The service value added $\alpha_1 = 1.124$ measuring the slope line depicts that change in the amount of service value added by $ 1 causes the estimated GDP change on an average would be equal to 1.124 million $ considering the constant regression coefficient value of all other independent variables. The regression coefficient of agricultural value added, $\alpha_2 = 0.897$ representing a slope line that change in the amount of agricultural value added by 1 $ the predicted GDP value change would be equal to 0.897 keeping constant values of independent variables a slope coefficient. Likewise the regression coefficient of industry value added $\alpha_3 = 0.702$, gross domestic savings $\alpha_4 = 0.411$ and outstanding external debt $\alpha_5 = 0.213$ explain that $ 1 variation in the amount of industry value added, gross domestic savings and outstanding external debt cause the estimated GDP normally to change by 0.702, 0.411 and 0.213 million $ respectively considering constant other regression coefficient values. The parameter estimates included in the model are significant at <5%

chance of error and on that ground we accept the null hypothesis with 100% assurance that the model becomes most excellent fit.

Further, after a closer look at the standardized Beta coefficients, it may also be known that the Services Sector development has the highest explanatory power that brings about large amount of changes in GDP of the country (0.61) followed by Gross Domestic Savings (0.4) and Agriculture value added (0.207). This can be explained from the given development in services sector particularly in Telecom and banking sector in recent decades in the country. Financial sector development has led towards efficient allocation of resources in priority areas of the country along with improved communication and transportation services in the country. Agriculture sector has been the key source of export of cash crops of rice and wheat and agri-industrial textile products. Unfortunately, the provision of credit from international donors through bilateral and multilateral arrangements has not been instrumental in achieving the targeted growth in GDP. The lowest value of standardized beta coefficient of 0.009 is indicating the large possibility of misuse of borrowed funds and misallocation of resources. Further, the credit provided adds up additional costs on the national coffer making life difficult for coming generations.

Table 3: Model Excluded variables

Model Excluded variables	Unstandardized Coefficients β	Standardized Coefficients Beta	T
Gross_Fixed_Capital_Formation_MUS$	.001	.009	.013
Exports_MUS$	.004	.014	.090
FDI- MUS$	.003	.005	.165

At < 5% chance of error on account of large p values the insignificant parameter estimates have been excluded from model. The regression coefficient of gross fixed capital formation is .001, exports 0.004 and FDI .003 representing a slope line that change in the amount of gross fixed capital formation, exports and FDI by $ 1 made change in the predicted GDP value on an average equal to 0.001, 0.004 and 0.003 million US $ keeping constant values of model independent variables a slope coefficient.

The facts behind the insignificant impact of gross fixed capital formation, exports and FDI upon GDP are that during fiscal years 2002, 2008, 2009 government bad policies gas pipeline issue affected the output level and during the fiscal years 2002, 2003, 2009 and in 2010 despite of the increase in trade, but GDP did not increase due to political unrest, natural climate factors, corruption, weak law and order control. During the fiscal years 2008, 2009, 2010, 2011 and onwards FDI has decreased in Pakistan because of bomb blasts and political instability (Malick, 2010).

The above given reason are the facts while there also may be another reason like high wage rate, change in demand, insufficient raw material, high transportation

cost, increased competition, unfavorable tariff, goods and service price instability, nonproductive investment and so on that have not been considered in this research and in future research that can be explored by scholars to see their impact upon economic growth.

After removing the insignificant independent model variables, the most excellent fit model is sorted out as under.

$$GDP = \alpha_0 + \alpha_1 SER + \alpha_2 AGRI + \alpha_3 IND + \alpha_4 GDS + \alpha_5 OED + e --------(1)$$

Consequently, on the basis of standardized β value it is found that service value added with β value 0.617, the main determinant of GDP in Pakistan and the second most important determinant of GDP is agricultural value added with β value 0.207, the third component of economic growth is industrial value added with β value 0.142, gross domestic savings with β value 0.042 the fourth one is and fifth determinant of economic growth is outstanding external debt with β value 0.009.

5.0   Conclusion and Findings

To detect empirically factors affecting economic growth eight independent variables are selected to check their effects for the period ended 1985-2011. Multiple regressions is performed using SPSS soft ware by employing backward stepwise method.

The service value added, agricultural value added, industry value added, gross domestic savings, and outstanding external debt are found as significant determinants affecting economic growth in Pakistan. However, gross fixed capital formation, exports and FDI have insignificant impact over the economic growth.

5.1   Policy Recommendations

In the light of this research study findings, to achieve sustained economic growth and develop overall economy It is recommended that investment in human capital development projects like productive investment to be made in education, health, computer services, electricity, gas and water supply.

The market demand analysis is to be made through production of different commodities and the market gap to be filled by quickly provision of such goods at low cost will boost efficient allocation of resources that would lead the service sector to extract more revenue from the market.

Avoidance of misuse of land along with usage of improved seeds and fertilizers also advanced method of production at the same time will help to produce more at lower marginal cost, and as a result the- per capita income will increase.

The government design policies to motivate people to save money by offering high rate of interest and other incentives of prize bonds and such savings are to be invested in the export promotion sectors properly will improve trade and welcome foreign reserves.

The other factors like good governance, price stability, political stability, reduction in corruption and law and order control can encourage the FDI and Industrial sector as well as overall economy that would lead Pakistan towards

better social economic position.

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