INTER-LINKAGES OF PUBLIC INVESTMENT AND ECONOMIC GROWTH IN PAKISTAN: AN ECONOMETRIC ANALYSIS

Abdul Qayyum Khan

Assistant Professor,
COMSATS Institute of Information Technology, Wah Cantt
PAKISTAN
qayyum_72@yahoo.com

ABSTRACT

This paper critically evaluates the effects of economic growth on public investment in Pakistan. Annual secondary data for the period ranging from 1960 to 2005 are used, taken from Economic Survey of Pakistan (various issues) and International Financial Statistics (various issues). Linear regression model followed by Two Stage Least Squares (2SLS) techniques is used for the analysis. The study revealed that expansion in out put and reserves has favorable impacts on public investment. Based on the finding of the study it is recommended that long term private/public investment policies of government, can gain better results in economic growth which ultimately enhance public investment and will ensure increasing employment opportunities and reduce poverty. Export sector needs more attention in term of quality, prices and marketing strategies for growth enhancement.

Keywords: Economic Growth, Public Investment, Employment Opportunities, and Poverty Reduction

INTRODUCTION

Since independence Pakistan could not find true path for sustaining desirable level of economic growth. A continues interruption has been seen in government formation, which not only weakened the economic position internally, but out-side country image has also been affected badly, which further worsen the economic status of Pakistan. Real GDP growth decreased from 6.26 percent (1960-73) to about 5 per cent in (1973-77) again increased to 6.6 per cent in (1978-88). This acceleration in the GDP growth was induced to some extent by increased in investment. The gross fixed capital formation as a percentage of the GDP increased from 15.5 per cent in (1973-1977) to 16.8 per cent in (1977-88). Average gross fixed capital formations private and public during 1960-1973 were 8.21 and 7.26 percent of GDP respectively. The situation become worsens in 1990s. GDP growth declined to 3.1 percent from 4.3 percent in 1998. Following nuclear tests in late May 1998, economic sanctions imposed by G7 countries seriously affected the economy. Economic growth declined steeply as investors lost confidence, private capital flows virtually ceased, and the new official development assistance was suspended. Private and public investment decreased to 8.10 and 5.21 percent respectively during 1999-2000.Budget deficit was 5.5 percent of GDP in 1960, and increased to 7.4 percent of GDP in 1989-1990. Total expenditure continuously decreasing from financial year 2000-01. Rise in revenue and reduction in expenditure reduce the gap between revenue and expenditure and fiscal deficit reduced to 3.8 percent of GDP in 2005 (Economic Survey of Pakistan various issues).

The empirical evidence regarding the affect of economic growth on public investment is not conclusive. Roubini and Sachs (1989) observed that slower growth and higher unemployment after 1973, and higher real interest rates in 1980s decrease public investment of industrialized countries. Nelson and Singh (1994) observed that the growth variable exercised little or no impact of any statistical significance on public investment in LDCs during the 1970s and 1980s. Burney and Akhtar

(1992) observed that budget deficits have significant positive impact on the real exchange rate directly as well as indirectly through the price level. Chaudhary and Shabbir (2005) observed that increase in government budget deficit, partially due to an income inelastic revenue structure, create excessive supply of money over demand and lead to foreign reserves outflow. The present study will analyze the inter-linkages of economic growth and public investment by taking period from 1960 to 2005.

OBJECTIVE OF THE STUDY

The main objective of this study is to investigate the mechanism through which the economic growth affects is transmitted to public investment.

MATERIALS AND METHODS

Time series data for the sample period 1960-2005, which are taken from Economic survey of Pakistan, and International Financial Statistics, is used. Linear regression model with 2SLS method is used for analysis. More specifically, the following linear regression model is used for estimation:

$$PUINV = f(EG, RES, r) \tag{1}$$

Where PUNIV is public Investment, RES is the foreign exchange reserve (balance of payment), and r is real interest rate.

The Economic growth, Balance of Trade and foreign exchange reserve (balance of payments) equation are defined as:

$$EG = \Delta y / y \tag{2}$$

$$BT = Export-Import \tag{3}$$

$$RES = RES_{(-1)} + BT + fB \tag{4}$$

Where BT is the trade balance, fB is the net foreign borrowing, EG is economic growth, Δy change in real out put.

The linear model in log form can be written as

$$\ln(PUINV) = e_0 + e_1 \ln(EG) + e_2 \ln(RES) + e_3 \ln(r) + \mu_1 \tag{5}$$

Endogenous variables is: PUINV

Exogenous variables are: RES fB, r, and BT.

The workings of the models are as follows: When the government spend this borrowing (increase both in consumption and investment expenditure), means increase in out put, that in turn raises the public investment. The change in domestic price level depends on change in aggregate income or expenditure. If increase in aggregate spending is more than the volume of production then prices increases, if increase in volume of production of output is more than the increase in aggregate spending then prices will decreases, and if aggregate spending and volume of production of output is same then prices remain the same. The change in prices affects the supply of export and demand for import through relative prices of exports and imports. Changes in exports and imports affect the balance of trade (BT), which in turn affects the reserve. This will bring a corresponding change in output, which again affect public investment.

RESULTS AND DISCUSSIONS

The results in Table 1 and 2 of the unit root test indicate that all the three variables including economic growth, public investment and reserves are non-stationary at level whether trend is included or not.

Johansen Likelihood Ratio (LR) test is used to find out the co integration in the regressions used for analysis. The result of Likelihood Ratio (LR) test is depicted in table 3. The Likelihood Ratio (LR) test results point out that the assumption of no co integration has been rejected for public investment equation by Likelihood Ratio (LR) statistics. The test denotes the existence of two co integrating equations as the calculated values of Likelihood Ratio (LR) statistics are greater than the critical values at 5 percent as well as 1 percent. The test results show that the variables are co integrating and they have long-term relationships.

The results of the linear regression model reported in table 4. In general the results are logical because the explanatory power, R^2 is fairly high, and there is no serious autocorrelation problem as shown by Durbin Watson and H Statistics[1].

The result of public investment equation shows that 1% increase in out put and foreign reserve increase public investment by .94% and .11% respectively. The public investment relationship with real interest rate indicate that 1% increase in real interest rate reduce public investment by .003% but insignificant. The coefficient of out put and foreign reserve are significant at 1% and 5% respectively. The increase in foreign reserve leads to rise in public investment level, which enhances the productive capacity of the economy.

CONCLUSIONS AND RECOMMENDATIONS

The present study revealed that expansion in government capital expenditure in the long term has favorable impacts on public investment. Consumption expenditure, capital expenditures and balance of trade have favourable impact on output development. From the finding it is clear that in order to enhance reserve export will to encourage and import to discourage. For this purpose the export sector needs more attention in term of quality standard, price control, and internationally adopted marketing strategies. The empirical evidence leads to the conclusion that fiscal and monetary variables are important to determine the macroeconomic stability in Pakistan. If the government gives priority to long term and stable growth policies, it can gain better results in public investment.

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[1] When lagged value of dependent variable is used as an independent variable in regression equation then estimated DW statistic has no importance regarding the existence of autocorrelation. Thus, H test is used to check the presence of autocorrelation. If DH statistic is significant, then we reject the hypothesis that there is no serial auto correlation other wise accept it. For further detail see J. Durbin (1970)

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APPENDIX

Table 1: ADF Test for Stationarity (includes intercept but not a trend)

Variables	I(0)		I(1)		I(2)		Result
	Test statistics[1]	Critical value	Test statistics	Critical value	Test statistics	Critical value	
EG	0.3205[0]	-3.6422	-6.2061[0]	-3.6496			I(1)
PUINV	-1.7403[1]	-3.6496	-5.5255[1]	-3.6496			I(1)
RES	-2.8745[0]	-3.6422	-5.7169[0]	-3.6496			I(1)

[1] Figures in square brackets besides each statistics represent optimum lags, selected using the minimum AIC value. INF stands for inflation.

Table 2 : ADF Test for Stationary (includes intercept and a trend)

Variables	I(0)		I(1)		I(2)		Result
	Test statistics[1]	Critical value	Test statistics	Critical value	Test statistics	Critical value	
EG	-1.9760[0]	-4.2605	-6.3844[0]	-4.2712			I(1)
PUINV	-1.9677[0]	-4.2605	-4.8225[1]	-4.2826			I(1)
RES	-2.8357[0]	-4.2605	-5.5901[0]	-4.2712			I(1)

[1] Figures in square brackets besides each statistics represent optimum lags, selected using the minimum AIC value. INF stands for inflation.

Table 3. Johansen co integration test result with intercept (no trend) in CE and no intercept in VAR. (Variables included in the co integrating vector: PUINV, EG, RES and r).

Test assumption: No deterministic trend in the data. Lag interval is 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.5093	60.64	34.91	41.07	None **
0.3829	29.32	19.96	24.60	At most 1 **
0.1678	8.08	9.24	12.97	At most 2
0.0369	4.25	8.69	10.86	At most 3

Table 4. Result of Linear Regression

Public Investment Equation

PUINV = 0.998 + 0.943 EG + 0.113 RES - 0.00274 r + 0.772 LPUINV
s.e   0.2626   0.4475   0.0469   0.0045   0.0666
t.stat   (3.80)*   (2.11)**   (2.41)*   (-0.61)   (11.6)*
R-sq = 97.5%,   R-sq (adj) = 97.2%, S.E of regression = .1090, h- statistic = - .43

*Significant at 1%, **Significant at 5%, ***Significant at 10%, 2SLS is used for estimation