

# Effects of Government Expenditure on Private Investment: Evidence from Pakistan

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*Received: September 16, 2014*

*Accepted: January 16, 2015*

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## ABSTRACT

This study has examined the impact of different components of government expenditures on private investment in Pakistan over the period of 1974 to 2010. The Johansen and Juselius co-integration approach along with VECM are applied in order to check the direction of long and short-run liaison for Pakistan. Results indicate that the real impact of government expenditure depends upon on the type of expenditure under consideration. The government expenditures on agriculture, health and transport & communication along with inflation show a crowding-in (positive) impact on private investment in the long-run while community servicing and debt servicing expenditures show a crowding out (negative) impact on private investment. Outlays on education (positive) and defence (negative) were insignificantly related with private investment. The analysis suggests that more priorities should be given to those expenditures which have complimentary impact on private investment rather than spending on expenditures that are substituting (hindering) private investment.

**KEY WORDS:** Government expenditures, private investment, inflation, crowded in, crowded out.

**Jel Classification:** C22, E62

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## INTRODUCTION

Investment is a well-established fact for economic development and growth in any developing country. It is the devotion of money for a certain period of time in order to get future benefits. It is a common opinion of the economists that investment has a favorable impact on economic growth. Still, it is vague that which investment (public or private) bear superior influence on economic development. Private investment has been recommended as more fertile and superior determinant of economic growth by financial and empirical evidences from around the globe [1].

Private investment (PI) is the gross fixed capital formation of the private sector, where gross fixed capital formation is spending on acquirement of fixed assets which includes spending on equipment, building construction, machinery and similar goods like constructions of dams, tunnels, drainage, roads, harbors and ports, transport and communication equipment. It also incorporates the capital maintenances while abstracts the sale of fixed assets [2]. Public investment on the other hand, refers to Government investment i.e. Government expenditures or spending, which are carried out by Central, State and Local governments of any country in order to satisfy the mutual and social wants of the people of the country.

The problem of whether or not government expenditure crowded out or crowded in private sector investment (PSI) has brought considerable attention within the financial literature. From a theoretical point of view, a rise in government expenditure might have two consequences on PI. First, the increase regarding government expenditure has to be financed that might imply a lot more taxation or perhaps inflict a greater demand for capital from the government in the capital market, as a result triggering interest rates to increase. This will reduce the amount of financial savings available for private investors and also decrease the expected rate regarding the return of private capital leading to a substitutory effect on private expense. Secondly, government expenditure can create a favorable impact on private investment, for instance, by spending or perhaps investing in related infrastructure like streets, highways, sewage methods, harbors or perhaps international airports will reduce cost of transportation and hence facilitate an environment for private investment. Thus the existence of infrastructure facilities may raise the productivity of the private sector, which can then benefit from better overall infrastructures and also potentially improved business environment. This will lead to enhance (crowds-in) private investment.

### Background of Investment Policies in Pakistan

After getting independence in 1947, the new government of Pakistan was lacking the necessary institutions, workforces and resources in order to develop the economy. The role of government was limited to only four basic

industries (that were arms and ammunition, generation of hydroelectric power and infrastructure, i.e. manufacturing of railway wagons, telegraph lines, telephones and wireless apparatus) and the remaining industries were remaining open for private investors.

The disturbances initiated by petition, the termination of trade with India, the overvalued exchange rate and the strong control of imports necessitated the motivation of private sector investment. In early 1950s, in order to promote private investment Pakistan industrial development corporation (PIDC) was established to invest in those industries which require heavy initial investment. By taking this incentive the environment was pushed for investment. During the nineties (1990's) a vital and essential achievement of the time was beginning of privatization policy as well as deregulation of public industrial sectors that truly supported to recover the self-confidence of the private investors. During 2000's, even though numerous additional benefits have been provided by the government, however the environment was not pleasant for investment simply because of terrorism and blasts in numerous areas of the state as well as internationally there was clearly the recession throughout the economy. But still there is a hope that all the problems will be vanished in near future and we will be one of the prominent nations of the globe. This discussion is based on the studies of [1], [2], [3], [4], along with Policy developments since independence.

The neoclassical school (Smith, Marshall and others) assumes full employment and argues that government expenditure have an adverse (crowding out) impact on private investment. Increased government expenditures whether they are financed with debt or taxes, decreases saving and hence the purchasing power for goods and services, driving up the rate of interest, makes the loanable funds further expensive for private sector and in this way hindering (crowding out) private sector investment.

The Keynesian theory assumes economy's resources un-employed or underemployed and argues that any increase in government expenditure will encourage economic activity and hence crowds in private investment. According to this theory, the government should interfere by investing in those projects that will encourage the employment. The money received by these employees will raise their buying power that enhances consumption and lead to extension of business expansion and hence private investment [5].

The Ricardo's Equivalence theory argues that it does not matter whether a government finances its expenditures by debt or by tax, there will be no change in demand. This is because the general public will tend to save its surplus money to pay increased future tax that will be originated to pay off debt. In other words, expectations for future tax enhancement consumer will tend to save rather than spend the income earned from the tax cut and the decline in tax leads to an equivalent rise in savings. Thus there will be no change of government expenditures on private investment.

Numerous empirical studies with mixed results have been conducted in response to the stated theoretical discussions. For instance, studies by [6], [7], [8], [9], [10], [11], [12] supported the substitutability hypothesis whereas those by [13], [14], [15], [16], [17], [18], [19], [20] provided evidence in favor of complementarity hypothesis. Some empirical studies [21], [22] show no evidence for complimentary or substitutary effects. Other studies [23], [24] provided evidence in support of substitutary effects in some countries while complementary relation in others.

The literature gap can be divided into two parts. First, with few exceptions that have analyzed the country situation, generally cross-country data has been remained the main focus of the empirical studies on this specific issue. In case of Pakistan, the research done on this specific issue is limited and also with mixed results. The public expenditure has positive impact on private investment and thus complimented with each other [3], [19], [25], [26] while public investment affects private investment adversely [27]. Thus relationship between the two in Pakistan is controversial. Second, as suggested [28] that it is not merely enough to consider the aggregate level of government expenditures when evaluating the effects of public spending; but relatively it is also essential to differentiate between various categories of public expenditure. The present study intends to analyze the impact of government expenditure in various categories upon private investment in Pakistan using annual time series data from 1974 to 2010. The outcomes of this study are anticipated to add new Pakistani evidence on this specific issue given that studies conducted for Pakistan [19], [26], [27] mainly focused on aggregate effects of public investment for private investment.

### **Research Questions**

This study will deal with the following issues:

- Is private investment is affected by government expenditure on?
- Which components of government expenditure /spending play a role in stimulating/hindering private investment?

### **Objectives of the Study**

The focal objective of this study is to inspect the impact of government expenditure on private investment. The specific intentions of the study are as under.

- To analyze the impact of agriculture expenditures on private investment
- To investigate the impact of Defense expenditures on private investment.
- To inspect the impact of transport and communication expenditures on private investment
- To investigate the impact of education expenditures on private investment
- To analyze the impact of health expenditures on private investment
- To inquire the impact of debt charges expenditures on private investment
- To inspect the impact of social welfare expenditures on private investment

### **Significance of the Study**

The key problem of Pakistani economy since last decade is that, it is facing a steadily falling in private outlay and the rate of economic development. A comprehensive analysis of the effects of government expenditures on private investment in various components of the economy may be fairly supportive to design a revival strategy for the economy.

The present study is trying to make an effort to analyze the relationship among private investment and government expenditures in various components. The scope of the study is to extend the literature regarding Pakistani context. In the light of growing private investment in Pakistan, it is the basic requirement of the time to formulate an appropriate policy which will help to reduce possible threats and to maximize the benefits of private investment to improve financial and economic development. Therefore there is a need to investigate the effects of government expenditures in various components on private investment in Pakistan.

The results of this research can be used as references by the government of Pakistan to know the direction of private investment in the country. By reviewing the results of this study the government of Pakistan will be able to make the right decision regarding private investment. The government can know that which component of government expenditures affect the private investment favorably and which component is affecting PI un-favorably.

This paper is organized as follows. The second part will present comprehensive review of literature. The third part will describe the data and methodology. The fourth part will discuss empirical results. The fifth part will discuss conclusions and recommendations.

## **LITERATURE REVIEW**

The literature provides a number of studies of different researchers who have examined the relationship between government expenditure and private investments. The relationship among government expenditures and private investment is studied for the period of 1953 to 1985 in US [28]. The study illustrated that the accurate effect depends on the type of government expenditure being considered. The study reveal that certain categories of government spending complement or crowd-in private investment while others crowd out private investment.

A study is carried out that decomposes public expenditures into social services expenditure (transport and communication, agriculture, health and education expenditures) that does not compete with private investment and real sector investment expenditure like manufacturing and construction which compete with private investment. By using the ordinary least square's method the analysis show that social services expenditure crowded within private investment. While real sector expenditure on manufacturing and construction crowded out private investment. Thus the author concluded that the government should provide the social services whereas manufacturing and construction sector should be remain open to private sector [29].

A study undertaken to examine data of 39 countries (both developed and developing) from the year 1975 to 1984. By applying fixed- and random-effect methods the results show that expenditures on transport and communication encouraged crowding-in effect in developing countries while government expenditure on social security and welfare shrinks private investment in both developing and developed countries [2].

For Canada the literature has been extended for the period 1960-2000. By using co-integration and error-correction model, he found that Government expenditure on protection of persons and property, debt charges and expenditure on social services have no significant impact on private investment. While expenditures on education and health has a positive (crowding-in) effect on private investment. On the other hand, government expenditure on capital and infra-structure has crowding-out (negative) relationship with private investment [30].

From China a study uses three categories of government expenditures that were government investment, government consumption and government transfer. By applying co-integration and error-correction framework they study shows that in the short-run private investment is crowding out by government investment expenditure whereas in the long-run private investment is crowded in by government investment. The government transfer expenditure and government consumption expenditure crowd out private investment, but the effect is not significance [31].

By using a panel data for the period of 1976–2006 a study reveal that public investment has positive effect on private investment in transportation & communication, industry & trade and construction sectors, whereas investment in agriculture sector has negative effect on private investment in Malaysia [32]. By using multiple regression and co-integration a study reveal that Government expenditure on administration has crowding-in impact on private investment while economic services spending, spending on social and community services have insignificant crowded out impact on private investment [11].

The stated relationship for Pakistan is studied by using VAR and Granger causality [33]. On the basis of their results the author concluded that investment in the agriculture sector encourages (crowding in) private investment. While manufacturing sector investment has a negative (crowding out) impact on private investment. However no significant impact is found for the overall economy. Public Capital Formation in Manufacturing has discouraged Private investment [25]. When public investment is disaggregated, infrastructural investment show a significant positive sign while non-infrastructural investment show a negative but statistically insignificant sign for private investment [34].

The real and financial crowding-out is analyzed for period 1970 to 2003 in India. Using asymmetric VAR model, the study reveal that there is no sign of direct crowding-out of public investment (particularly in infrastructure) on private capital formation [35]. For Fiji a study shows that though government investment in infrastructure sector has a crowding-out effect on private sector investment but no robust implication can be drawn [36]. A study has established a direct link between government policy variables and private capital by estimating an investment model. This study captured the crowding in infrastructural component of public investment by its time trend whereas the crowding out effect is captured by the deviation from this trend. A significant positive coefficient is found on the former and a significant negative coefficient is found on the latter, suggesting that non-infrastructural components of government investment have crowding out effect [13].

A study is undertaken to examine the dynamic link between transportation capital and private investment in Mauritius. In this study transport capital and private investment are complemented to each other and thus private investment is crowding-in by transport capital in both short and long run [37].

A study is undertaken on the crowding out effect of defense spending on private sector investment in UK. The results of the study indicate that private investment is negatively affected by increase in defense spending and thus it is crowded out [38]. The effects of military expenditure in France is studied over the period 1980-2010 within the Smith approach. The results of the study reveal that private investment is crowded-out by military expenditure [39]. A weak substitution effect of defense spending on private consumption in US [40].

A study is conducted on Spanish region to find the linkage between Public and Private Investment. The results indicate that public productive and social investment (especially in education) has a positive effect on private investment. While Public consumption and interest rate have negative effect on private capital accumulation [41].

Despite the research results provided by above empirical studies, it is not merely possible to draw clear-cut conclusions on the effects of government expenditure on private investment since the classification of government expenditure often differs which makes it ambiguous to form generalized conclusions, additionally the volume of studies in this domain is limited, hence the relationship between government expenditure and private investment remains an empirical issue.

### **Hypothesis**

*H1:* Agriculture expenditure has a significant positive impact on private investment.

*H2:* Community services expenditure has significant negative impact on private investment.

*H3:* Expenditure on Debt services has insignificant impact on private investment.

*H4:* Defence expenditure has significant negative impact on private investment.

*H5:* Education expenditure has a significant positive impact on private investment.

*H6:* Health expenditure has a significant and positive impact on private investment.

*H7:* Inflation rate has significant impact on private investment.

*H8:* Manufacturing expenditure has a significant and negative impact on private investment.

*H9:* Transport and communication expenditure has a significant positive impact on private investment.

## **DATA AND METHODOLOGY**

For this study, time series annual data from 1974 to 2010 is taken from Federal Bureau of statistics and world development indicator. The data is taken in order to identify key components of government expenditures that are affecting the private investment's flow in Pakistan. The list of key components of government expenditure includes following.

**Table (1) Description of the list of government expenditure variables & its measurement method**

Variable	categories included, their components and measurement method
PI	Private Investment (non government sector investment in fixed assets like equipment, machinery and buildings) (measured as “Real PI= PI at current market price/CPI”)
DEF	Defense Expenditure (includes armed forces, police force, regulatory authority and other defense agencies) (measured as “DEF = Govt expenditures on defense / CPI”)
TC	Transport and Communication Expenditure (road railways, airports and telecommunication) (measured as “TC= Govt expenditures on T & C / CPI”)
EDU	Education Expenditure (schools, universities and other public and private learning institutions) (measured as “EDU= Govt expenditures on Education / CPI”)
HEA	Health Expenditure (hospital care, medical care, preventive services, physician and other clinical services) (measured as “HEA= Govt expenditures on Health / CPI”)
DS	Debt Charges Expenditure (Loans and other debt charges) (measured as “DS =Govt expenditures on Debt charges / CPI”)
CS	Community Services Expenditure (Welfare programs, social security, financial assistance) (measured as “CS =Govt expenditures on Community services / CPI”)
INF	Inflation (rise in goods and services charges) (measured as “INF = ln (CPI <sub>t</sub> / CPI <sub>t-1</sub> )”)
AGR	Agriculture Expenditures (Irrigational & drainage systems, construction of flood control; crop inspection grading services)( measured as spending on agriculture)

### METHODOLOGY

To test the relationship between the various categories of government expenditures and private investment, the following model is applied

$$PI = f(AGR, CS, DEF, DS, EDU, HEA, INF, MFG, TC)$$

$$\ln PI_t = \alpha + \beta_1 \ln AGR_t + \beta_2 \ln CS_t + \beta_3 \ln DEF_t + \beta_4 \ln DS_t + \beta_5 \ln EDU_t + \beta_6 \ln HEA_t + \beta_7 \ln INF_t + \beta_8 \ln MFG_t + \beta_9 \ln TC_t + \varepsilon_t \quad (1)$$

Where “Ln” is the log of variables at Time “t”.  $\ln PI_t$  is real Private Investment,  $\ln AGR_t$  is agriculture expenditure,  $\ln CS_t$  is Community service expenditure,  $\ln DEF_t$  is Defense expenditure,  $\ln DS_t$  is Debt servicing expenditure,  $\ln EDU_t$  is Education expenditure,  $\ln HEA_t$  is Health expenditure,  $\ln INF_t$  is Inflation rate,  $\ln MFG_t$  is manufacturing expenditure,  $\ln TC_t$  is Transport and communication expenditure,  $\alpha$  is intercept and  $\varepsilon_t$  is error term.

The stationarity is checked by two commonly used methods: Augmented Dickey Fuller (ADF) (1979) and Phillips-Perron (PP) (1988) test. In this study both tests have been applied for checking stationarity of variables. Augmented Dickey Fuller (1979) test is based on following regression model.

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha_i \sum_{i=1}^m \Delta Y_{t-1} + \mu_t \quad (2)$$

Where  $\Delta$  shows differences,  $\alpha$ ,  $\beta$  and  $\delta$  are coefficients and  $y$  is variable to be estimated. Phillips Perron (1988) test is based on first order auto regressive model on following equation.

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \mu_t \quad (3)$$

Where  $\Delta$  represents differences,  $\alpha$  is coefficients  $\beta$  is slope and  $y$  is variable to be estimated.

For estimating the long run relationship between the variables, Johansen and Juselius (1990) method is under taken. This test is based on two test Trace and maximum Eigen value test. Both tests are applying the procedure of maximum likelihood. The maximum eigenvalue test is based on the following equation

$$\lambda_{max} = -T \ln(1 - \lambda_r + 1) \quad (4)$$

Where  $T$  shows the observations and  $\lambda_{r+1}, \lambda_{r+2}, \dots, \lambda_n$  reveals the n-r smallest squared canonical correlations. The trace test uses the following equation

$$\lambda_{trace} = -T \sum \ln(1 - \lambda_i) \quad (5)$$

The short run dynamics between various components of government expenditure is tested by using error correction model. The model explains short-run disequilibrium i.e. deviation from the long-run relationship and its adjustment in time. The sign of the ECM may either be positive or negative. The positive sign indicates unstable equilibrium, whereas the negative sign indicates stable equilibrium. The error correction model is based on following equation

$$\Delta Z_t = a_0 + \sum_{j=1}^{k-1} \beta_j \Delta Z_{t-j} + \delta Z_{t-k} + \varepsilon \quad (6)$$

Where  $\delta = -1 + \sum_{i=j+1}^k \beta_j$  and  $\Delta Z_t$  is the first difference for the underlying variable.

**EMPIRICAL RESULTS**

Before estimating the long run relationship through cointegration analyses, it is necessary to check for the stationarity of all variable to be integrated of order  $I(1)$ . The stationarity is checked by using Augmented Dickey Fuller (ADF) (1979) and Philips-Perron (PP) (1988) test. Table (2) represents the analyses of unit root tests. The analyses reveal that all the variables are stationary at first difference. Both PP (1988) and ADF (1979) provides same results of integration of all variables at order  $I(1)$ . Hence we can test cointegration between these variables.

**Table (2) Unit root results**

Variables	ADF		PP	
	Level	1 <sup>st</sup> Diff.	Level	1 <sup>st</sup> Diff
Ln PI	-1.554429	-5.603518***	-1.616035	-5.580991***
Ln AGR	-0.079645	-6.797280***	0.074199	-8.248817***
Ln CS	0.733168	-6.444306***	0.843761	-6.444306***
Ln DS	0.578962	-8.094872***	0.033136	-7.938632***
Ln DEF	-2.151438	-3.131572***	-2.222994	-6.040608***
Ln EDU	1.366909	-3.818084***	1.677465	-3.616007***
Ln HEA	-1.757461	-5.095339***	-1.710403	-5.095339***
Ln INF	-2.519748	-6.472465***	-2.172140	-6.472465***
Ln MFG	-0.844597	-4.394455***	-0.124158	-4.437388***
Ln TC	-0.425326	-5.299588***	-0.425326	-5.299588***

Note: Critical values are (-3.626784)\*\*\* at 1%, (-2.945842)\*\* at 5% and (-2.611531)\* at 10%.

The results of Multivariate cointegration analyses are presented in Table (3). The analyses confirm the existence of 6 long run cointegrating equations. Both trace and Maximum eigen value test rejects the hypothesis of no cointegrating equations. Both tests represent same cointegrating equations. The results reveal the existence of the relationship between the various components of government expenditure, which implies the interlinkages in these variables in the long run.

**Table (3) Multivariate Johansen and Juselius cointegration test**

	Trace Statistics			Maximum Eigen stat.	
$r \leq 0$	451.308*	239.235	$r = 0$	109.136*	64.504
$r \leq 1$	342.171*	197.370	$r = 1$	92.619*	58.433
$r \leq 2$	249.551*	159.529	$r = 2$	58.132*	52.362
$r \leq 3$	191.419*	125.615	$r = 3$	55.041*	46.231
$r \leq 4$	136.377*	95.753	$r = 4$	51.803*	40.077
$r \leq 5$	84.574*	69.818	$r = 5$	40.678*	33.876
$r \leq 6$	43.896	47.856	$r = 6$	23.349	27.584

The critical values are obtained from Mackinnon-Haug-Michelis (1999). \* indicates significant values. The lag length is determined on minimum value of Schwarz criterion.

The effects of various components of government expenditure on private investment is represented in Table (4). The first normalized equation portrayed that in the long run government expenditure on agriculture, health and infrastructure like transport and communication have significant positive impact on private investment. The coefficients of these expenditures are positive and highly significant supporting the Keynesian argument that private investment is crowded in by government expenditure. Thus expenditures in these variables complement private investment in long-run. These results are in line with the empirical evidences of [29], [31], [33], [37]. While government expenditures on community services and debt charge servicing bear negative signs and affect private investment negatively and significantly and thus supporting the substitutory hypothesis of crowding out effect. These results are in line with results of [11]. On the other hand, expenditure on education has insignificant positive impact on private investment while defence and manufacturing expenditures have insignificant negative impact.

**Table (4) normalized cointegrating equation**

	$LnPI_t = \beta_1 lnAGR_t + \beta_2 lnCS_t + \beta_3 lnDEF_t + \beta_4 lnDS_t + \beta_5 lnEDU_t + \beta_6 lnHEA_t + \beta_7 lnINF_t + \beta_8 lnMFG_t + \beta_9 lnTC_t$					
$\beta_1$	4.517*	(0.37415)	$\beta_6$	0.834*	(0.15149)	
$\beta_2$	-3.64*	(0.20943)	$\beta_7$	0.290*	(0.03846)	
$\beta_3$	-0.609	(0.34713)	$\beta_8$	-0.015	(0.24705)	
$\beta_4$	-0.724	(0.08271)	$\beta_9$	1.020*	(0.14710)	
$\beta_5$	0.277	(0.17206)				

Standard error are shown in parenthesis, \* indicates  $p < .05$

Table (5) shows the results of VECM of private investment. The results of the VECM revealed that in the short run private investment has positively related to agriculture expenditure in Pakistan. The estimated coefficient of agricultural expenditure is .293 and it is significant. Government expenditures in debt charges servicing, health, manufacturing and transport and communication are also positively related to private investment, however their relationship was insignificant. The role of the community servicing, defense, and education expenditures towards the PI are found negative in the short-run. Their estimated coefficient is -0.224, -0.188 and -0.482 respectively, and their “t” are also significant. In the short-run rate of inflation affects private investment negatively and significantly. The negative sign of the coefficient indicates the disequilibrium adjustment in one period of time towards the long-run equilibrium. In the given table the estimated coefficient is -0.0385 and it revealed that 3.85% of the disequilibrium in the Private investment (PI) will be adjusted in one period of time.

To sum up PI, Agriculture, community servicing, defence, education expenditures and inflation are having short run relationship, while expenditures on debt servicing, health, manufacturing and transport and communication have no short run relationship.

**Table (5) Results of error correction model**

$LnPI_t = \beta_1 \Delta AGR_{t-1} + \beta_2 \Delta CS_{t-1} + \beta_3 \Delta DEF_{t-1} + \beta_4 \Delta DS_{t-1} + \beta_5 \Delta EDU_{t-1} + \beta_6 \Delta HEA_{t-1} + \beta_7 \Delta INF_{t-1} + \beta_8 \Delta MFG_{t-1} + \beta_9 \Delta TC_{t-1}$					
<b>PI</b>	-0.038565	(0.21428)	$\beta_5$	-0.482608*	(0.14016)
<b><math>\beta_1</math></b>	0.293536*	(0.05747)	$\beta_6$	0.502229	(0.29081)
<b><math>\beta_2</math></b>	-0.224560*	(0.09971)	$\beta_7$	-5.319661*	(2.62992)
<b><math>\beta_3</math></b>	-0.188302*	(0.09301)	$\beta_8$	0.027424	(0.06569)
<b><math>\beta_4</math></b>	0.486293	(0.44292)	$\beta_9$	0.073331	(0.14776)

Standard error are shown in parenthesis, \* indicates  $p < .05$

### Conclusions

This study has examined the impact of the components of government expenditures on PI (private investment) in Pakistan for the period spanning 1974 to 2010. The government expenditures are decomposed into the components of agriculture, community servicing, defense, debt servicing, and education, health, manufacturing and transport & communication expenditures. The division of government expenditures into these categories is helped by Pakistani statistical yearbooks. In conducting the investigation, the Johansen and Juselius multivariate co-integration approach along with VECM are applied in order to check the direction of liaison in the long and short-run for Pakistan. The results confirmed that agriculture expenditure has highly significant and positive effect on PI both in short and long-run and thus PI is crowded-in by expenditure in agriculture. These results are in line with the results of [33] who also found a positive impact of agriculture expenditure on PI.

The results for health and transport & communication indicate that both are insignificantly related to private investment in the short run, however in long-run they are highly significant with positive signs thus crowding in private investment. These results confirmed the work of [29] who also found a crowding in effect of these components. Moreover, government expenditures on community services and debt charge servicing bear negative signs and affect private investment negatively and significantly and thus supporting the substitutary hypothesis of crowding out effect. These results are in line with results of [11].

Furthermore, negative association of defence expenditures are found with private investment both in long and short run whereas education expenditure is insignificantly and positively linked with private investment in long-run and significantly negatively linked in short-run. The impact of inflation rate is significant on private investment, however, in short, run private investment is crowded away, whereas in the long run it is crowded in by the inflation rate with a high significant value.

### Policy Recommendations

It can be concluded from results analysis that some categories of government expenditures were crowding in (complimentary) effects while some have crowded out (substitutability) effects on private investment. So it is suggested that more priorities should be given to those expenditures which have complimentary impact on private investment rather than spending on expenditures that are crowding out private investment. On the basis of this broad suggestion and results, the following recommendations are suggested.

Firstly, as our country is agriculture based and most of the population especially the rural one depends upon on agriculture for its livelihood as well as it generates 45 percent productive employment opportunities for the country’s labor force, the government should increase expenditures on this sector, whereas manufacturing sector should be remain open for private investment.

Secondly, the government should also increase expenditure on health, since it will enhance private investment through improved health status and labor productivity.

Thirdly, transportation and communication expenditures should also be increased because it makes an environment business friendly through reduce costs.

Lastly, educational expenditures should also be increased, however the government should make sure that allocated fund for this sector should be managed properly.

### **Future Research Direction**

All efforts have been made to evaluate the impact of various components of government expenditures on private investment, however there may be some other components like expenditures on administration, economic affairs, law and order etc. which may also affect the private investment, in future other researchers can include them as well in exploring this relationship further. Moreover, government expenditures are not the only factors which may affect the private investment; one can also include the impact of uncertainty and political situation to explore the crowding in and out phenomenon of private investment.

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