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An Analysis of Composition of Public Expenditure and Economic Growth of Punjab State: A VAR Model

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Abstract-
The study investigates the relationship between Government Capital and Current Expenditure and Economic Growth for the State of Punjab, India with the use of annual time series data from 1980 to2025. The study applied Unit Root test Johanson test of integration, Vector Autoregressive model, Impulse Response Function and Variance Decomposition Method to analyse the causal relation between the variables. The study found that all the variables are integrated of order one and no cointegration found between the variables. The VAR analysis found that only capital expenditure has impact on its own with lag 1 and 2. Impulse response analysis showed that response of gross state domestic to shock in revenue expenditure is negative and response of gross domestic product to shock in capital expenditure is negative and its decline and after period 2 it increases and have positive response. The Forecast Error Variance Decomposition analysis shows that variance in capital expenditure is explained by gross domestic product is 4.93 %. Variance of Revenue expenditure explained by Gross domestic Product is 6.08%. The variance in gross domestic product is explained by Capital expenditure is 1.35% and revenue expenditure is 14.43%. The study concludes that capital expenditure is more affected by its own lag of 2 and revenue expenditure is affected by the gross domestic product. The state government of Punjab more emphasizes on Revenue expenditure although the share of capital expenditure to total expenditure increased from last decades but government should more focus on capital expenditure as ithas multiplier effect on growth of state as well as cause to increase in the capital expenditure of successive years.

Key Word:-Capital Expenditure, Current Expenditure, Economic Growth, Cointegration, VAR model.

JEL Classification:-O13; Q33; Q38

I. Introduction

The main role of government in an economy is to provide the basic amenities' to people along with the development of economy and also sustain growth. Government fiscal policy is the main instrument to achieve the objectives of the government. Government focus is to maintain and sustain the growth and also improve the wellbeing of their people with the increase the expenditure. Government expenditure is trigger to the development of the economy. Government expenditure increase every year as the population and others needs of the government also increases over time. Government has to expends every year to maintain the balance in the economy or revenue expenditure which has minor contribution to the growth of the economy such as salaries, subsidies etc. On the other side the capital expenditure such as expenditure to maintain and build the infrastructure, roads etc., which accelerate theeconomic growth and has long impact on economic growth. Every stategovernment has their own priorities to make the expenditure. The present study emphases on the classification of government expenditure of state government of Punjab and also analyse the relationship and causality between the revenue expenditure and capital expenditure and economic growth for the state of Punjab for the period of 1980 to 2025. The study also analysed the trends and pattern of state government expenditure during study period.The figure shows the trends of total government expenditure, revenue expenditure and capital expenditure as percentage of gross state Domestic Product of Punjab state of India from period 1980 to 2025. The figure showed that there was increasing trend in the share of total government expenditure and capital and revenue expenditure till the period of 2006in the gross state domestic product. From 2006- 2015 share of capital expenditure in the gross state domestic product stagnant whereas the share of total and revenue expenditure was increasing trend during the same duration. In the year 2016 there was a sharp increase in the share of capital expenditure and total

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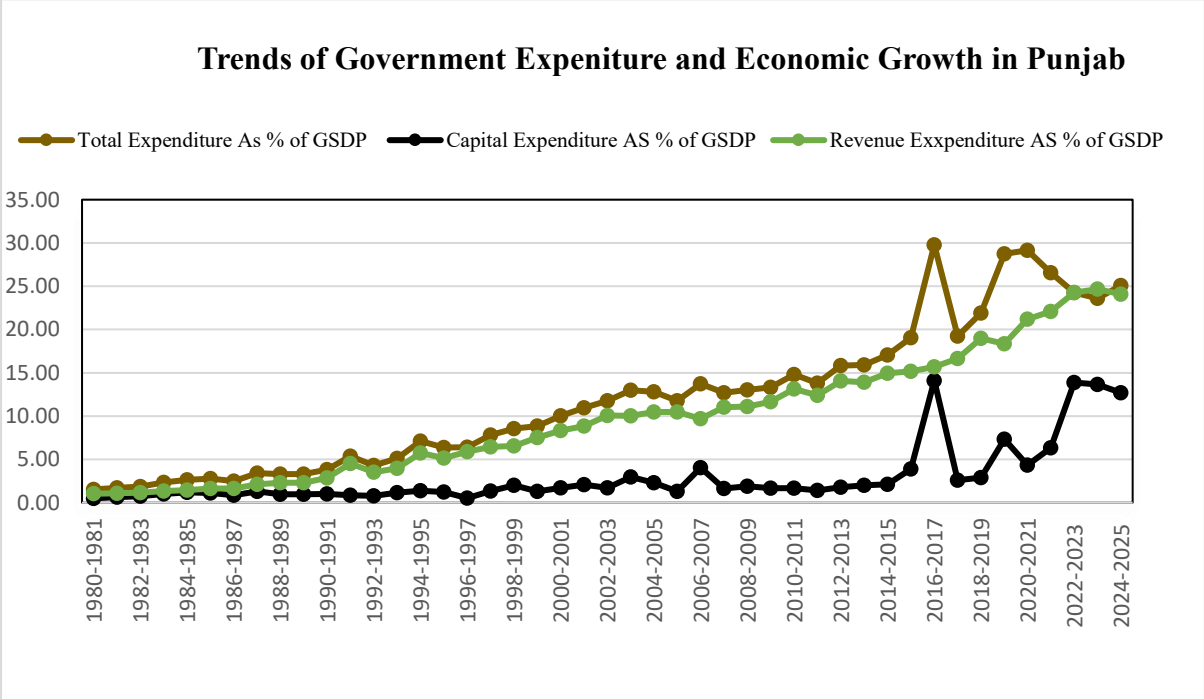
expenditure of state in the gross state domestic product and the revenue expenditure has the same share as before. Capital expenditure and total expenditure share has sharply declined in year 2017-18. The revenue expenditure maintained the constant share during the entire period.

Figure 1. Trends of Government Expenditure and Economic Growth in Punjab



Source: Computed by author with data from Study of State Finance, RBI.

The figure 2 showed the share of capital and revenue expenditure in the total state government expenditure during the period 1980 to 2025. It is shown in the figures that from year 1985 to 2010 the share of revenue expenditure in the total expenditure was increasing from 59.25% to 88.97%. In the year 2015-16 the share of revenue expenditure has declined from 88.97% to 79.57% and again it increased to83.05 % in year 2020-21. The figure showed that there is again sharp decline in the share of revenue expenditure to total expenditure in year 2024-25 it remains only 65.45 % which is lowest from the entire period of the study.The share of capital expenditure to total state government expenditure of state government of Punjab was found continuously declining from 1985 to 2005 from 40.75% to10.97 %. Share of capital expenditure found increasing trend from year 2010-20115-16. In the year 2020-21 the share of capital expenditure was found decline from 20.43 % to 16.95 percent due to the huge expenditure of state government on COVID relief as revenue expenditure and during that period the capital expenditure got stuck. After the COVID periodagain there is increase in the share of capital expenditure to total expenditure in the state of Punjab which is 34.55 % in 2024-25.

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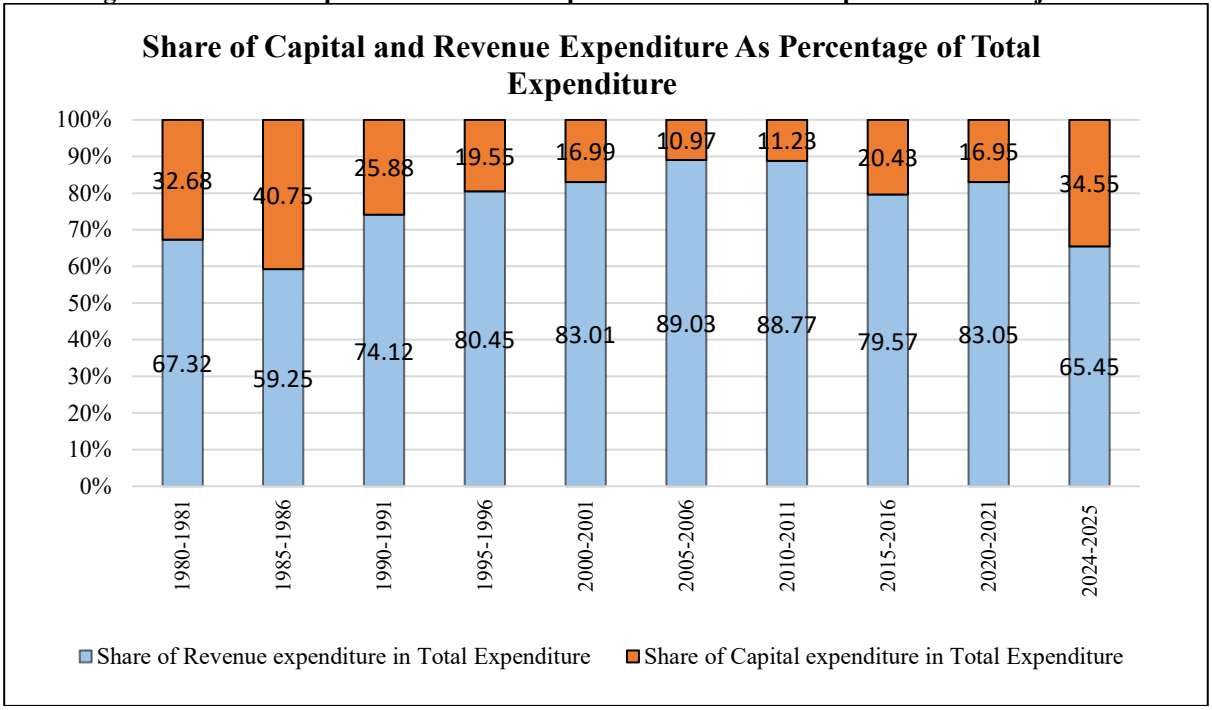
Figure 2. Share of Capital and Revenue Expenditure as of Total Expenditure of Punjab state



Source: Computed by author with data from Study of State Finance, RBI.

II. Review of literature

There are number of study available on the relationship between government expenditure and economic growth. Some studies are based on group of countries and some are based on particular country. Different studies used different variable to study the relationship between the government expenditure and economic growth. Different studies found different results such as Aregbeyen (2007) found a significant and positive correlation between government capital and public investment and economic growth and negative impact of consumption expenditures and growth. Laudau (1983) studied the effect of government recurrent expenditure on economic growth with the sample of 96 nations and concluded that there is a negative effect of government expenditure on real output growth. Kormain and Brahmasrene (2007) employed the Granger causality tests to study the impact of government expenditure on economic growth of Thailand and concluded that there is significant positive effect of government spending on economic growth and found no cointegration between government expenditures and economic growth and the direction of causality found from government expenditure to economic growth. Gregorious and Ghosh (2007) utilised panel data set to study the impact of government expenditure on economic growth and found that there is positive correlation between government expenditure and economic growth. Ojonugwa et al. (2016) studiedthegovernment expenditure and economic growth relation for Nigeria economy with 40 years annual data and concluded that capital expenditure and recurrent expenditure has a positive and significant impact on economic growth in the long run. Current expenditure found to be a positive and significant relationship with economic growth in the short run and capital expenditure had a negative but significant relationship with Economic Growth in Short run. Devarajan et al. (1996)analyse the 20 years data of current and capital expenditure for 43 countries and found that current expenditure has positive impact on economic growth whereas the capital expenditure has negative impact on economic growth. Ogbokor (2015) empirically analysed the relationship between government expenditure and economic growth for Namibia with the use of annual time series data from 1990 to 2013 the study concluded that there is cointegration and unidirectional causality between economic growth and government expenditure. Adewara and Oloni (2012) conducted a time seriesstudy for period of 1980-2011for Nigeria to analyse the effect of government expenditure in economic growth. With the utilization of Vector Autoregressive (VAR) model and concluded, that government expenditure on agriculture and transportation had positive and

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significant impact on economic growth and health, education, defence, investment, and water expenditures had negative and significant impact on economic growth.Ghali (1997) empirically analyse the government expenditure and economic growth relation with the time series statistical too such as VAR model and Granger causality test and concluded that there is no relationship between both the variables of the study. Gushibet and Tsenba (2016),Taken aggregate government revenue, aggregate government expenditure, recurrent expenditure, capital expenditure, public debt and corruption as the explanatory variables along the GDP as the endogenous variable to study the relationship. The findings of the study revealed that government revenue has positive but insignificant impact on economic growth. On the other side, total government expenditure had a positive and significant impact on economic growth of Nigeria. The study found that while recurrent expenditure had a negative and weak significant impact on economic growth whereas the capital expenditure had a positive but insignificant impact on economic growth and public debt has a positive and insignificant impact on economic growth.

III. Data and Methodology

The study employed the secondary data for the period 1980 to 2025 of total expenditure, revenue expenditure and capital expenditure and gross state domestic product of state of Punjab India. All the data series taken from various issues of Handbook of Indian economy and A study of State Finances, published by Reserve Bank of India. The study converts all the series into logarithm to overcome the problem of serial correlation. The study used the followed model specification for the a analysis of objective of the study-

Model 1- ln(GSDP)=f(lnTGEXP).....(1)
Model 2- ln(GSDP)=f(lnREXP).....(2)
Model 3- ln(GSDP)=f(lnCAPEXP).....(3)
Where,
ln(GSDP): Logarithm value of Gross Domestic Product
lnTGEXP: Log Value of Total Government Expenditure
lnREXP: Log Value of Revenue Expenditure
lnCAPEXP: Log Value of Capital Expenditure.

Methodology-
For the empirical analysis of the study we employed the following techniques-

Unit Root Test-
To test the time series properties of the time series data the study employed the unit root test whether the series are stationary[1] or not. There are several tests for of unit root in econometrics like ADF Test, PP test and KPSS test. The present study employed the ADF Test and PP Test of Unit root to test the stationary properties of the data and the following equation has been estimated –
With Drift-

$$\Delta lnGSDP = \gamma_0 + \gamma_1 lnGSDP_{t-1} + \sum_{i=1}^{i=m} \alpha_1 lnGSDP_{t-1} + \varepsilon_t \quad (4)$$

With Drift and Trend-

$$\Delta lnGSDP = \gamma_0 + \gamma_1 lnGSDP_{t-1} + \gamma_2 t \sum_{i=1}^{i=m} \alpha_1 lnGSDP_{t-1} + \varepsilon_i \quad (5)$$

Without Drift and Trend-

$$\Delta lnGSDP = \gamma_1 lnGSDP_{t-1} + \sum_{i=1}^{i=m} \alpha_1 lnGSDP_{t-1} + \varepsilon_i \quad (6)$$

[1] When the mean and variance of the series is constant then it is considered as stationary series.

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Where $\varepsilon_{t\ is}$ the erroe term, m is lag γ is constant $lnGSDP_{t-1}$ is the lag one value of log series of GSDP. The Null hypothesis of Unit Root Test is that the series is non-stationary or has unit root. Rejection of null hypothesis implies that series is stationary. The present study employed PP test and KPSS test of unit root to verify the stationary properties of the variables used in the study.

Johansen and Juselius Test of Co-integration—

The present study employed the Johansen and Juselius Test of cointegration to test the cointegration between (1) total government expenditure and Economic growth, (2) Revenue Expenditure and Economic Growth and (3) Capital Expenditure and Economic Growth for the state of Punjab. Lag length selection for the cointegration is decided because of average of LR, FPE, AIC, SC and HQ Criterion.

VAR Model

The study utilised the Vector Auto Regressive (VAR) Model to analyse the relationship between the variables of the study. The VAR model includes the 2variable one endogenous and one exogenous variable in each of 3 specification of the study. In each specification, dependent variable is regressed with the lagged value of independent variable along with its own lag values. The following equation estimated for VAR Specification of all the three models of the study-

$$\Delta lnGSDP_{1t} = \alpha_0 + \sum_j^m \alpha_0\ \Delta lnGSDP_{t-1} + \sum_j^m \alpha_0\ \Delta lnTGExp_{t-1} + \cup_{1t} \quad (7)$$

$$\Delta lnTGExp_{1t} = \alpha_0 + \sum_j^m \alpha_0\ \Delta lnGSDP_{t-1} + \sum_j^m \alpha_0\ \Delta lnTGExp_{t-1} + \cup_{1t} \quad (8)$$

$$\Delta lnGSDP_{1t} = \alpha_0 + \sum_j^m \alpha_0\ \Delta lnGSDP_{t-1} + \sum_j^m \alpha_0\ \Delta lnRExp_{t-1} + \cup_{1t} \quad (9)$$

$$\Delta lnRExp_{1t} = \alpha_0 + \sum_j^m \alpha_0\ \Delta lnGSDP_{t-1} + \sum_j^m \alpha_0\ \Delta lnRExp_{t-1} + \cup_{1t} \quad (10)$$

$$\Delta lnCapExp_{1t} = \alpha_0 + \sum_j^m \alpha_0\ \Delta lnGSDP_{t-1} + \sum_j^m \alpha_0\ \Delta lnCapExp_{t-1} + \cup_{1t} \quad (11)$$

$$\Delta lnCapExp_{1t} = \alpha_0 + \sum_j^m \alpha_0\ \Delta lnGSDP_{t-1} + \sum_j^m \alpha_0\ \Delta lnCapExp_{t-1} + \cup_{1t} \quad (12)$$

The above VAR model is to specify to test the short run causality between the variable of all 3 specifications of the study. If the Coefficient of exogenous variable is found statistically significant it implies that there is short run causality from exogenous variable to endogenous variables. The study also utilized the Impulse Response function and Variance Decomposition method to analyse the relation between government expenditure and economic growth for the state of Punjab.

Empirical Findings

Unit Root Test-

The study employed the Augmented Dickey fuller test to test the stationary properties of all the variables used in the study. The results of unit root test are reported below Table 1.

Table 1. Unit root test results for the variables of study.

	ADF TEST				Order of Integration
	Level		First Diff.		
	C	C& T	C	C& T	
lnGSDP	0.56	-1.53	-6.10*	-6.19*	I(1)
lnTGEXP	-2.78	-3.38	-8.15*	-9.17*	I(1)
lnREXP	-3.99	-1.55	-7.86*	-9.83*	I(1)
lnCAPEXP	0.82	-4.294	-9.05*	-9.14*	I(1)

Source: Computed by author with the use of E-view Software.* indicates the significant at 5 percent level.

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Table 1. Show that all the variables were non-stationary at their level as the null hypothesis of Augmented Dickey Fuller test is accept at 5 percent level. The study again takes the first difference of the all variables to make the variables stationary. Augmented Dickey Fuller test for unit root again applied on the first difference series of all the variables and found that all the variables are stationary at their first level as the null hypothesis of non-stationary variable is rejected at 5 percent level of significance and the calculated value is greater than the critical values. This implies that all the variables under study are integrated of order one.

Tale 2. Johansen and Juselius Test of Co-integrationresults

Model	Test	Hypothesized No.of CE(s)	Eignvalue	Trace Statistics	0.05 Critical value	Prob.
Model 1	Trace Test	r=0	0.171	8.094	15.494	0.455
		r=1	6.431	0.002	3.841	0.955
	Max. Test	r=0	0.171	0.809	14.364	0.369
		r=1	0.641	0.002	3.841	0.955
Model 2	Trace Test	r=0	0.174	8.258	15.494	0.438
		r=1	0.000	0.006	3.841	0.933
	Max. Test	r=0	0.174	8.251	14.264	0.353
		r=1	0.000	0.006	3.841	0.933
Model 3	Trace Test	r=0	0.221	12.116	15.494	0.151
		r=1	0.031	1.354	3.841	0.244
	Max. Test	r=0	0.221	10.762	14.264	0.166
		r=1	0.031	1.354	3.841	0.244

Source: Computed by author with the use of E-view Software.

Table 2.Showed the results of Johanson test of cointegration for model specification 1, 2 and 3. The results reveals that there is no cointegration between the variables of all the 3 specifications of model as the null hypothesis of no cointegation is accepted in all the 3 model specification in both the test –Trace test and Maximum Eigen value test. As there is no cointegration between the variables of all the model it states that there is no long run relationship between the variables. But it is possible that there may be short run cointegration or causality between the variables of all the 3 specification of models. The study employed VAR model to test the short run relationship between the variables of the 3 specification of models.

Table 3. VAR Model lag length test Results

Model 1- (ΔlnGSDP)=f(ΔlnTGEXP) Endogenous variables: ΔlnGSDP and ΔlnTGEXP						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	116.8362	NA	1.10E-05	-5.74181	-5.657365*	-5.71128
1	122.4153	10.32142	1.02E-05	-5.82077	-5.56743	-5.72917
2	128.9556	11.44547	8.98E-06	-5.94778	-5.52556	-5.795118*
3	129.722	1.26461	1.06E-05	-5.7861	-5.19499	-5.57238
4	137.3736	11.85999*	8.91e-06*	-5.968681*	-5.20869	-5.69389
Model 2- (ΔlnGSDP)=f(ΔlnREXP) Endogenous variables: ΔlnGSDP and ΔlnREXP						
0	128.6218	NA*	6.10E-06	-6.33109	-6.246648*	-6.300560*
1	133.2447	8.55235	5.92E-06	-6.36224	-6.10891	-6.27064
2	137.3912	7.256317	5.89E-06	-6.36956	-5.94734	-6.2169
3	142.2331	7.989208	5.67e-06*	-6.411657*	-5.82055	-6.19793
4	145.325	4.792341	5.98E-06	-6.36625	-5.60625	-6.09146
Model 3- (ΔlnGSDP)=f(ΔlnCAPEXP)						

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Endogenous variables: ΔlnGSDP and ΔlnCAPEXP						
0	64.429	NA	0.000	-3.201	-3.116183*	-3.171
1	68.151	6.871	0.000	-3.187	-2.931	-3.095
2	75.012	11.96252*	0.000123*	-3.333939*	-2.907	-3.180895*
3	76.949	3.179	0.000	-3.228	-2.631	-3.014
4	78.930	3.048	0.000	-3.125	-2.357	-2.849
Notes: 1. * indicates lag order selected by the criterion;						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion HQ: Hannan-Quinn information criterion						

Source: Computed by author with the use of E-view Software.

The table 3 reports the results of Vector Autoregressive model for the lag length criteria selection of3 specifications of the study. The results shows that in model specification 1 where the Gross state domestic product was dependent variable and total state government expenditure of Punjab state was independent variable has the optimal lag length of 4 suggested by LR, FPE,AIC criterion. The optimal lag length is 3for model 2 on the bases of FPE and AIC criterion. On the other hand in case of model 3 where Gross State Domestic Product was dependent variable and Capital expenditure was independent variable, the results found that the optimal lag length 2on the bases of LR, FPE AIC and HQ criterion. The present study uses the lag length 4, 3 and 2 for model 1 2 and 3.

Model 1

Table 4. Results of Var Model For Specification Of Model 1.

Model 1 (ΔlnGSDP=f(ΔlnTGExp)				
DLNGSDP = C(1)*DLNGSDP(-1) + C(2)*DLNGSDP(-2) + C(3)*DLNGSDP(-3) + C(4)*DLNGSDP(-4) + C(5)*DLNTGEXP(-1) + C(6)*DLNTGEXP(-2) + C(7)*DLNTGEXP(-3) + C(8)*DLNTGEXP(-4) + C(9)				
Independent Variables	Coefficient	Std. Error	t-Statistic	Prob.
$\Delta lnGSDP_{t-1}$	0.139	0.162	0.858	0.397
$\Delta lnGSDP_{t-2}$	0.126	0.167	-0.754	0.456
$\Delta lnGSDP_{t-3}$	0.060	0.167	-0.356	0.724
$\Delta lnGSDP_{t-4}$	0.177	0.161	1.104	0.278
$\Delta lnTGExp_{t-1}$	-0.040	0.027	-1.499	0.144
$\Delta lnTGExp_{t-2}$	-0.037	0.033	-1.140	0.263
$\Delta lnTGExp_{t-3}$	-0.050	0.032	-1.534	0.135
$\Delta lnTGExp_{t-4}$	-0.064	0.028	-2.318	0.027*
Constant	0.068	0.021	3.199	0.003*
R-squared	0.2416	Mean dependent var		0.0522
Adjusted R-squared	0.0459	S.D. dependent var		0.0205
S.E. of regression	0.0200	Akaike info criterion		-4.7926
Sum squared resid	0.0124	Schwarz criterion		-4.4126
Log likelihood	104.8523	Hannan-Quinn criter.		-4.6552
F-statistic	1.2343	Durbin-Watson stat		1.9751
Prob(F-statistic)	0.000000			
Model 1 (ΔlnGSDP=f(ΔlnTGExp)				

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DLNTGEXP = C(10)*DLNNSDP(-1) + C(11)*DLNNSDP(-2) + C(12)*DLNNSDP(-3) + C(13)*DLNNSDP(-4) + C(14)*DLNTGEXP(-1) + C(15)*DLNTGEXP(-2) + C(16)*DLNTGEXP(-3) + C(17)*DLNTGEXP(-4) + C(18)				
Independent Variables	Coefficient	Std. Error	t-Statistic	Prob.
ΔlnGSDPt-1	1.775	0.993	-1.788	0.084
ΔlnGSDPt-2	0.565	1.021	0.554	0.584
ΔlnGSDPt-3	1.825	1.023	1.784	0.084
ΔlnGSDPt-4	0.106	0.982	0.108	0.915
ΔlnTGExpt-1	-0.605	0.164	-3.687	0.001*
ΔlnTGExpt-2	-0.258	0.201	-1.283	0.209
ΔlnTGExpt-3	0.268	0.198	1.355	0.185
ΔlnTGExpt-4	0.447	0.169	2.647	0.013*
Constant	0.084	0.130	0.644	0.524
R-squared	0.5265	Mean dependent var		0.1085
Adjusted R-squared	0.4043	S.D. dependent var		0.1583
S.E. of regression	0.1222	Akaike info criterion		-1.1718
Sum squared resid	0.4626	Schwarz criterion		-0.7918
Log likelihood	32.4362	Hannan-Quinn criter.		-1.0344
F-statistic	4.3089	Durbin-Watson stat		1.9154
Prob(F-statistic)	0.0014			

Source: Computed by author with the use of E-view Software.* indicates the significant at 5 percent level.

Table 4 presented the results of Vector Autoregressive Model (VAR) for Model 1 for lags 4. The VAR model applied on the first difference series of the variables. The tables showed that GSDP has positive coefficient of the same for lag 1, 2, 3 and 4 but none of the lag coefficient found statistically significant. The GSDP has negative impact of Government Expenditure for lag 1, 2, 3 and 4 but all the lags impact found insignificant.The second part of the table shows the results of VAR Model for the dependent variable of Government Expenditure and GSDP as independent variable. The resultfound that Government Expenditure positively affected from the GSDP of lag 1, 2, 3 and 4 but none of the lag found statistically significant. Government expenditure has negatively affected by its own lag for lag period 1 and 2and lag 2 found statistically significant. Government expenditure has positively affected by its own lag for period 4 found statistically significant.

Model 2

Table 5. Results of VAR Model For Specification Of Model 2.

Model 2 {ΔlnGSDP=f(ΔlnRExp)}				
DLNGSDP = C(1)*DLNGSDP(-1) + C(2)*DLNGSDP(-2) + C(3)*DLNGSDP(-3) + C(4)*DLNREXP(-1) + C(5)*DLNREXP(-2) + C(6)*DLNREXP(-3) + C(7)				
Independent Variables	Coefficient	Std. Error	t-Statistic	Prob.
ΔlnGSDPt-1	0.092	0.157	0.586	0.562
ΔlnGSDPt-2	-0.203	0.156	-1.299	0.203
ΔlnGSDPt-3	0.043	0.152	0.282	0.780
ΔlnRExpt-1	-0.051	0.034	-1.522	0.137
ΔlnRExpt-2	-0.049	0.037	-1.326	0.194
ΔlnRExpt-3	-0.080	0.034	-2.389	0.023*
Constant	0.079	0.020	4.010	0.000*
R-squared	0.1763	Mean dependent var		0.0526

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Adjusted R-squared	0.0309	S.D. dependent var		0.0204
S.E. of regression	0.0201	Akaike info criterion		-4.8225
Sum squared resid	0.0137	Schwarz criterion		-4.5299
Log likelihood	105.8611	Hannan-Quinn criter.		-4.7160
F-statistic	1.2127	Durbin-Watson stat		2.0962
Prob(F-statistic)	0.3238			
Model 2 {ΔlnGSDP=f(ΔlnRExp)}				
DLNREXP = C(8)*DLNGSDP(-1) + C(9)*DLNGSDP(-2) + C(10)*DLNGSDP(-3) + C(11)*DLNREXP(-1) + C(12)*DLNREXP(-2) + C(13)*DLNREXP(-3) + C(14)				
Independent Variables	Coefficient	Std. Error	t-Statistic	Prob.
ΔlnGSDPt-1	0.963	0.773	-1.246	0.221
ΔlnGSDPt-2	0.483	0.771	0.626	0.535
ΔlnGSDPt-3	0.107	0.750	0.142	0.888
ΔlnRExpt-1	-0.462	0.167	-2.773	0.009
ΔlnRExpt-2	-0.230	0.181	-1.268	0.213
ΔlnRExpt-3	0.307	0.166	1.855	0.072
Constant	0.192	0.097	1.977	0.056*
R-squared	0.3876	Mean dependent var		0.1230
Adjusted R-squared	0.2795	S.D. dependent var		0.1167
S.E. of regression	0.0991	Akaike info criterion		-1.6318
Sum squared resid	0.3337	Schwarz criterion		-1.3392
Log likelihood	40.4519	Hannan-Quinn criter.		-1.5253
F-statistic	3.5859	Durbin-Watson stat		2.1301
Prob(F-statistic)	0.0073			

Source: Computed by author with the use of E-view Software.* indicates the significant at 5 percent level.

Table 5.Showed theresults of VAR model for the specification of 2, where Government Revenue Expenditure and GSDP has been used for the VAR System. The result reveals that the GSDP positively affect by its own lag for period 1, and 3 and negatively from lag 2but none of the lag found statistically significant. On the other side, the Revenue Expenditure has negative effect on GSDP lag 1, 2 and 3 but only lag 3 coefficientfoundlag significant. The Revenue Expenditure has positively affected by GSDP for lag period 1 2 and 3 and none of the coefficient found statistically significant. The Revenue Expenditure found statistically significant impact from its own lag period 3.

Table 6. Results of VAR Model For Specification of Model 3.

Model 3 {ΔlnGSDP=f(ΔlnCAPExp)}				
DLNGSDP = C(1)*DLNGSDP(-1) + C(2)*DLNGSDP(-2) + C(3)*DLNCAPEXP(-1) + C(4)*DLNCAPEXP(-2) + C(5)				
Independent Variables	Coefficient	Std. Error	t-Statistic	Prob.
ΔlnGSDPt-1	0.145	0.159	0.912	0.368
ΔlnGSDPt-2	0.182	0.155	-1.171	0.249
ΔlnCAPExpt-1	0.003	0.007	-0.411	0.683
ΔlnCAPExpt-2	0.003	0.007	0.448	0.657
Constant	0.054	0.012	4.673	0.000*
R-squared	0.5921	Mean dependent var		0.0519
Adjusted R-squared	0.0425	S.D. dependent var		0.0207
S.E. of regression	0.0211	Akaike info criterion		-4.7641
Sum squared resid	0.0165	Schwarz criterion		-4.5572
Log likelihood	105.0451	Hannan-Quinn criter.		-4.6882

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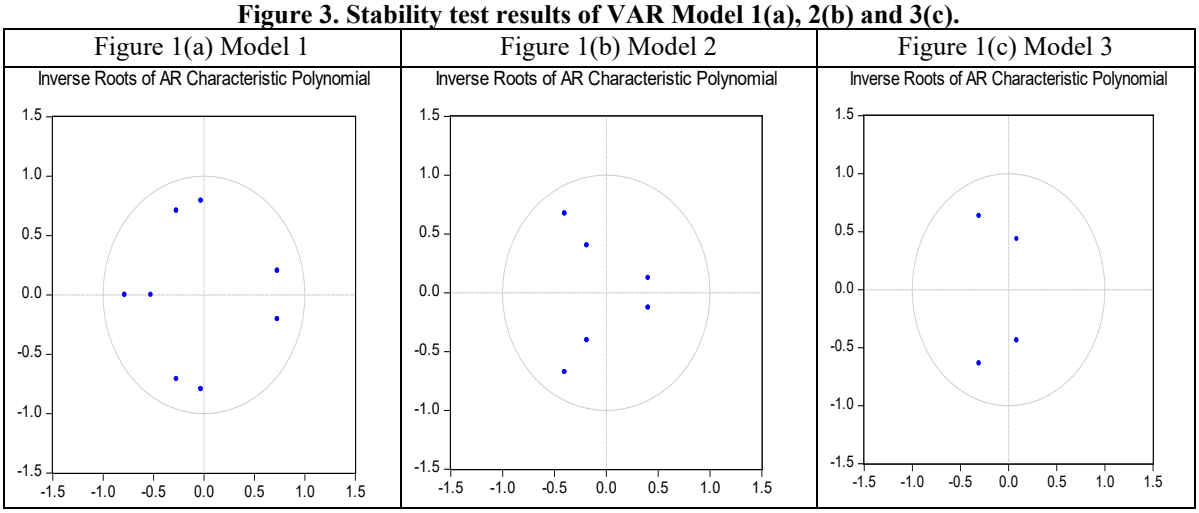
F-statistic	0.5824	Durbin-Watson stat		2.0361
Prob(F-statistic)	0.6773			
Model 3 {ΔlnGSDP=f(ΔlnCAPExp)}				
DLNCAPEXP = C(6)*DLNGSDP(-1) + C(7)*DLNGSDP(-2) + C(8)*DLNCAPEXP(-1) + C(9)*DLNCAPEXP(-2) + C(10)				
Independent Variables	Coefficient	Std. Error	t-Statistic	Prob.
ΔlnGSDPt-1	3.015	3.406	-0.885	0.382
ΔlnGSDPt-2	2.497	3.324	-0.751	0.457
ΔlnCAPExpt-1	0.585	0.141	-4.165	0.000*
ΔlnCAPExpt-2	0.501	0.140	-3.581	0.001*
Constant	0.542	0.246	2.198	0.034
R-squared	0.3875	Mean dependent var		0.1198
Adjusted R-squared	0.6213	S.D. dependent var		0.5489
S.E. of regression	0.4522	Akaike info criterion		1.3620
Sum squared resid	7.5663	Schwarz criterion		1.5689
Log likelihood	-23.6022	Hannan-Quinn criter.		1.4378
F-statistic	5.8526	Durbin-Watson stat		2.0006
Prob(F-statistic)	0.0009			

Source: Computed by author with the use of E-view Software.* indicates the significant at 5 percent level.

The results of VAR analysis for model 3 is presents in Table 6. The results showed that the GSDP has positive affected by capital expenditure and its own lag period 1 and 2 but none found significant. Capital Expenditure found positive impact of the GSDP and Capital expenditure for lag period 1 and 2 but only lag period of its own coefficient found statistically significant. This implies that Capital Expenditure of state government of Punjab has positive of its own for last 2 period lag.

Figure 3. Stability test results of VAR Model 1(a), 2(b) and 3(c).



Source: Computed by author with the use of E-view Software.

The dynamically stability of VAR Model is tested by Root of Characteristic Polynomial, Describe the behaviour of VAR model over Time. If all the Eigen Values fall inside the circle then VAR stratify Stability condition. Then graph shows the real components on X-axis and complex

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components on Y-axis. The graph as shown in figures 1 (a), (b) and (c) shows the stability test results for the study for specification of model 1, 2 and 3. This can concluded from the graph that all of 3 models satisfy the stability condition of VAR model.

Table 7. Diagnostic test of VAR Model For Specification of Model 1,2 and 3.

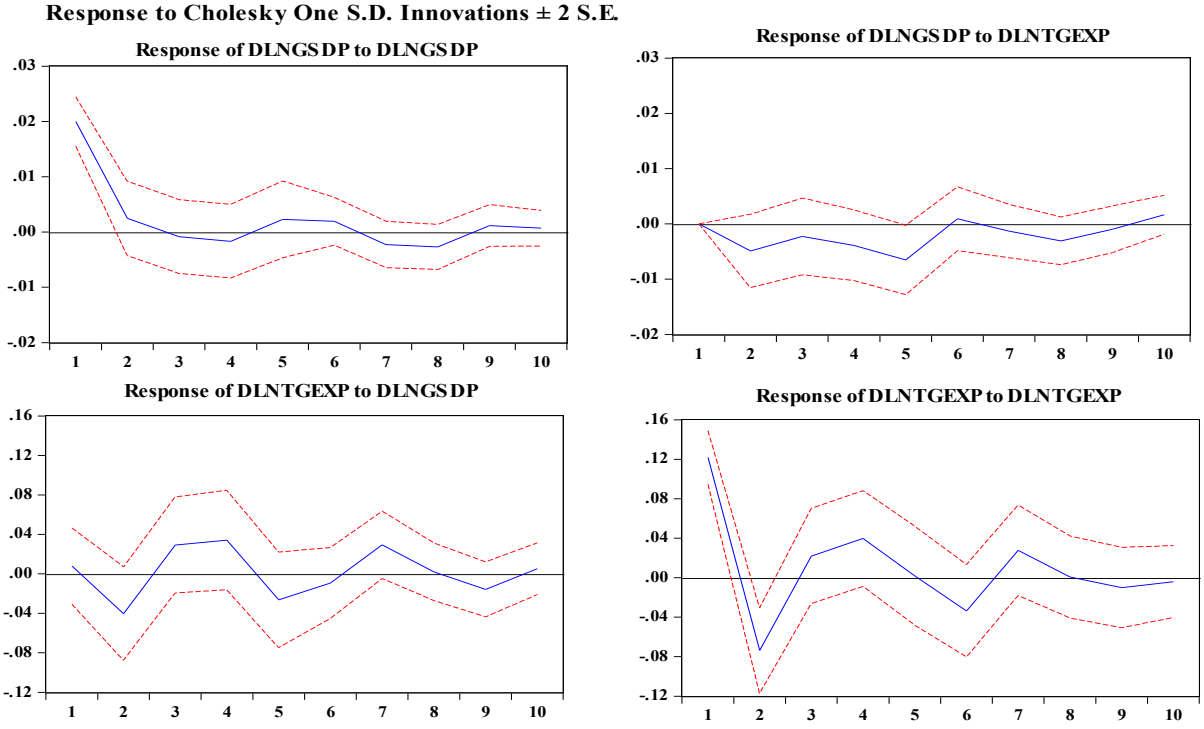
	Model 1		Model 2		Model 3	
Dependent Variable	ΔlnGSDP	ΔlnTGExp	ΔlnGSDP	ΔlnRExp	ΔlnGSDP	ΔlnCAPExp
Serial Cor. (LM Test)	2.40(0.663)	3.37(0.908)	2.32(0.508)	8.84(0.60)	5.11(0.07)	0.15(0.925)
Heteo. (ARCH)	5.10(0.746)	4.15(0.385)	2.56(0.861)	6.62(0.357)	1.51(0.824)	2.34(0.671)
Histo Nor.	34.13(0.568)	47.24(745)	46.31(0.641)	49.02(0.854)	41.78(0.982)	35.74(0.789)

Source: Computed by author with the use of E-view Software.* indicates the significant at 5 percent level.

Impulse Response Function-

Impulse response function is shock to the VAR Model it identify the responsiveness of Endogenous variable when a shock given to the exogenous variable. A unit shock is applied to each variable of the model and response of the other variables is shown in the figures 1 for model 1. Figure 3 shows that response of lnGSDP to lnGSDP, lnGSDP to lnTGEXP, lnTGEXP to lnGSDP and lnTGEXP to lnTGEXP. It can be seen from the figure that when one unit shock given to lnGSDP the response of lnGSDP is decreasing till the period 3 and after that there is fluctuation in the response and it remain constant and positive till the end of the period. When a unit shock given to lnTGEXP the response of lnGSDP is negative till period 6 and then remain stable for period 7 after that again its decline till the end of horizon. Response of lnGSDP to lnTGEXP and LnTGEXP to lnTGEXP is not stable during the entire time horizon of 10.

Figure 3.Impulse Response Function For Model 1.



Source: Computed by author with the use of E-view Software.

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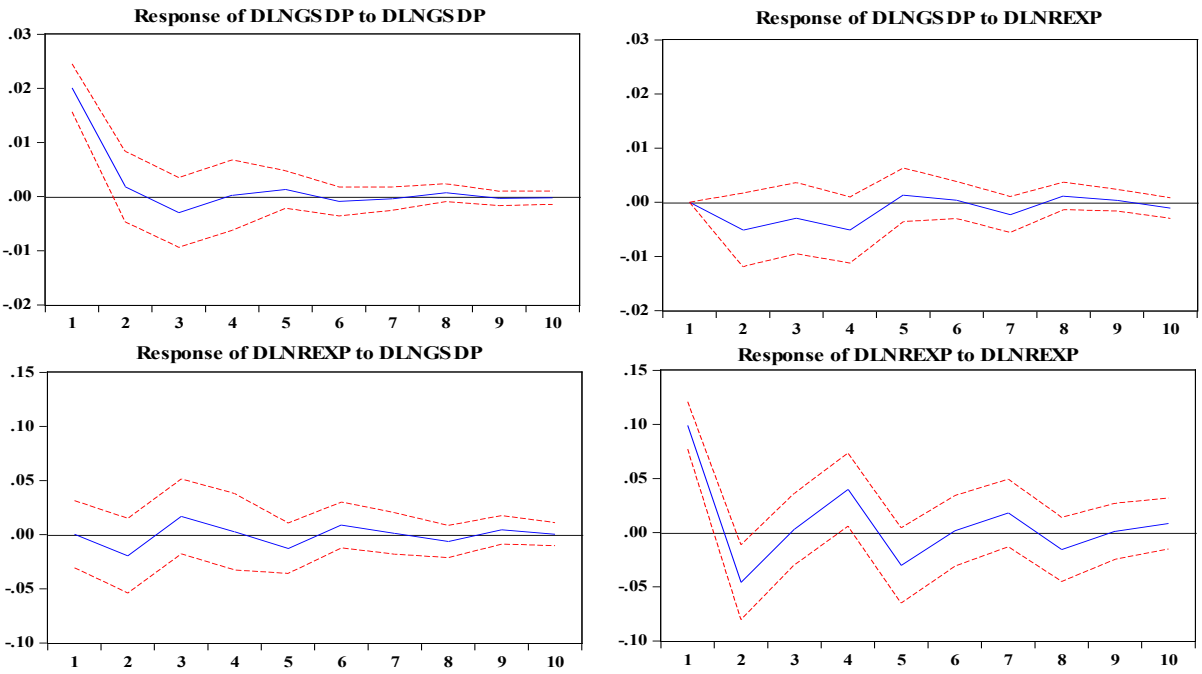
The figure 4 shows the impulse response function for model specification 2. Figures 4 show the response of lnGSDP to lnGSDP, lnGSDP to lnREXP, lnREXP to LNGSDP and lnREXP to lnREXP. Figure indicates that when one unit shock occurs in lnGSDP variables the response of lnGSDP is to first decrease initial the third period after that is start increasing and become stable until the 10th period. When one unit shock occurs in lnREXP the response of lnGSDP first decrease and become negative until the period 5 and after that it become positive and stable till period 10. On the other side, when the one unit shock given to lnGSDP, the response of lnREXP become negative and after that it will go stable until the period 10. The response of lnREXP to lnGSDP first negative for periods 2 and after that there is fluctuations in the responses and it become constant until end of the horizon.

Figure 4.Impulse Response Function For Model 2.



Source: Computed by author with the use of E-view Software.

The figure 5 shows the impulse response function for model specification 1. Figures 5 show the response of lnGSDP to lnGSDP, lnGSDP to lnCAPEXP, lnCAPEXP to lnGSDP and lnCAPEXP to lnCAPEXP. Figure indicates that when one unit shock occurs in lnGSDP variables the response of lnGSDP is to first decrease for third period after that is start increasing and become stable until the 10th period. When one unit shock occurs in lnCAPEXP the response of lnGSDP found constant for the entire time horizon. On the other side, when the one unit shock given to lnGSDP, the response of lnCAPEXP become negative for first 2 time horizon and after that increase till 5th period and become stable after that at the end of the horizon. The response of lnCAPEXP to lnGSDP first negative for periods 2 and after that there is fluctuations in the responses and it become constant until end of the horizon.

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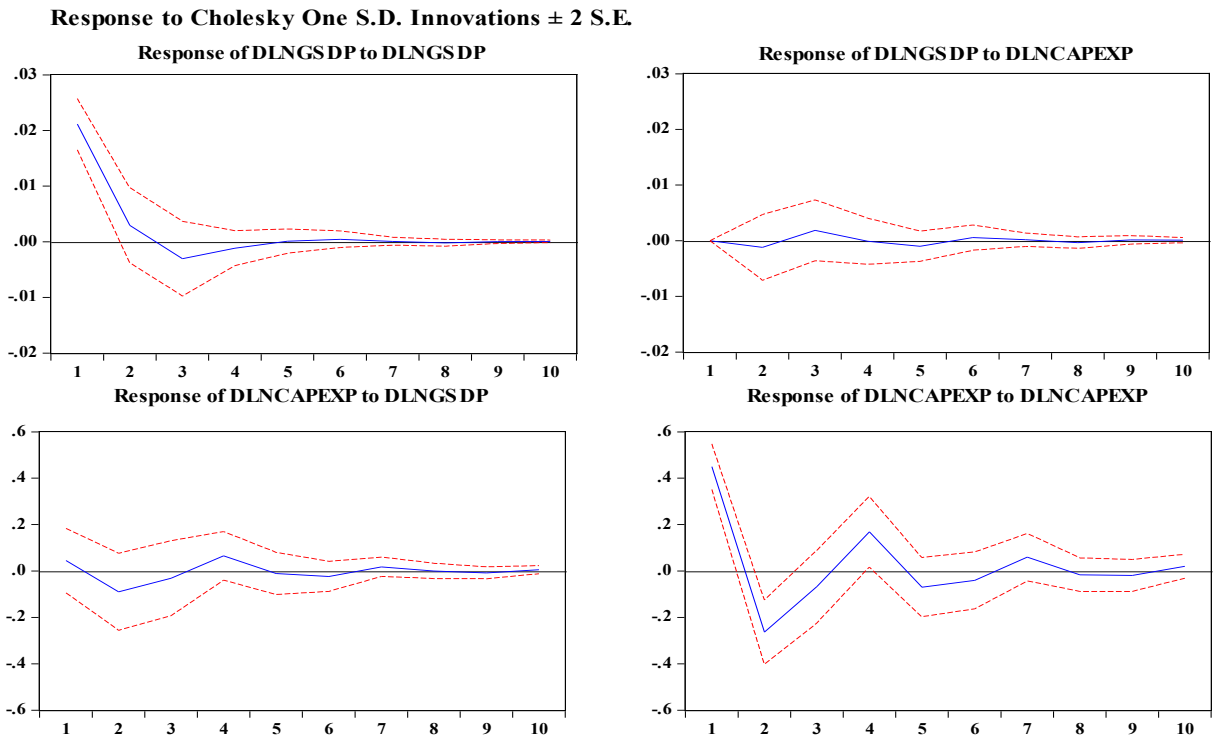
Figure 5.Impulse Response Function For Model 3.



Source: Computed by author with the use of E-view Software.

Forecast Error Variance Decomposition Analysis-

The results of variance decomposition are reported in table for model 1 2 and 3. The tables shows that in model one variance decomposition of ΔLNGSDP is mainly attributed by its own shock(100%) but shock gradually faded out and till the period 10 it became 80.81%. the variance explained by the Total expenditure is 0% for period 1 and gradually its increase to 19.18% in the 10 time horizon. The variance decomposition of total government expenditure shows that 99.57 % by its own shock and its decreases with the time horizon and reached 81.22% in 10 time horizon. On the other side, variance explained by the ΔGSDP in total expenditure is 0.42% in first time horizon and it's increased to 18.77% in 10 time horizon. For model 2 Variance Decomposition of ΔLNGSDP is by its own (100%) in period and its decreases after period 1 and become 85.56% at the end of time horizon, where the variance explained by ΔLNREXP was 0.00% for the first horizon and its increases after that and explained 14.43% at the end of time horizon. In case of model 2 the variance decomposition of ΔLNREXP IS explain by its self was 99.99% and variance explain by ΔLNGSDP was 0.099% only and become stable till the end of the horizon. Variance Decomposition of ΔLNGSDP was explained 100% by itself for period 1 and remains approximately 98% at the end of time horizon whereas the variance explained by ΔLNCAPEXP was 0.00% for period 1 and there is marginal increasing it till the end it reached only 1.35%. Lastly the Variance Decomposition of ΔLNCAPEXP was explained by itself 99.99% to 95% till the end wheresvariance explained by ΔLNGSDP was 0.97% at the start and there is increase in it and it became approximate 5% at the end of horizon (4.936%).

Table 8. Variance Decomposition analysis for model 1, 2,3 and 4.

	Model 1	Model 2	Model 3
Period	Variance Decomposition of ΔLNGSDP:	Variance Decomposition of ΔLNGSDP	Variance Decomposition of ΔLNGSDP:

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	S.E.	ΔlnGSDP	ΔlnTGEXP	S.E.	lnGSDP	lnREXP	S.E.	lnGSDP	lnCAPEXP
1	0.020	100.000	0.000	0.020	100.000	0.000	0.021	100.000	0.000
2	0.021	94.397	5.603	0.021	94.009	5.991	0.021	99.677	0.323
3	0.021	93.280	6.720	0.021	92.303	7.697	0.022	98.954	1.046
4	0.021	90.231	9.769	0.022	87.235	12.765	0.022	98.955	1.045
5	0.022	82.664	17.336	0.022	86.936	13.064	0.022	98.743	1.257
6	0.022	82.651	17.349	0.022	86.931	13.069	0.022	98.679	1.321
7	0.023	82.551	17.449	0.022	86.015	13.985	0.022	98.673	1.327
8	0.023	81.313	18.687	0.022	85.785	14.215	0.022	98.647	1.353
9	0.023	81.214	18.786	0.022	85.765	14.235	0.022	98.643	1.357
10	0.023	80.816	19.184	0.022	85.565	14.435	0.022	98.641	1.359
Period	Variance Decomposition of ΔLNTGEXP:			Variance Decomposition of ΔLNREXP:			Variance Decomposition of ΔLNCAPEXP:		
	S.E.	lnGSDP	lnTGEXP	S.E.	lnGSDP	LinREXP	S.E.	lnGSDP	lnCAPEXP
1	0.122	0.425	99.575	0.099	0.002	99.998	0.452	0.974	99.026
2	0.148	7.674	92.326	0.111	3.112	96.888	0.531	3.571	96.429
3	0.153	10.900	89.100	0.112	5.304	94.696	0.536	3.846	96.154
4	0.161	14.237	85.763	0.119	4.758	95.242	0.566	4.780	95.220
5	0.164	16.459	83.541	0.123	5.466	94.534	0.570	4.747	95.253
6	0.167	16.054	83.946	0.124	5.960	94.040	0.572	4.883	95.117
7	0.172	18.087	81.913	0.125	5.842	94.158	0.576	4.922	95.078
8	0.172	18.098	81.903	0.126	5.992	94.008	0.576	4.918	95.082
9	0.173	18.716	81.284	0.126	6.108	93.892	0.576	4.933	95.067
10	0.173	18.779	81.221	0.127	6.081	93.919	0.577	4.936	95.064
	Cholesky Ordering: ΔLNGSDP ΔLNTGEXP			Cholesky Ordering: ΔLNGSDP ΔLNREXP			Cholesky Ordering: ΔLNGSDP ΔLNCAPEXP		

Source: Computed by author with the use of E-view Software.

Summary Statistics-

Table 9. Descripitive Statistics of all the variables of the study.

	LNCAPEXP	LNGSDP	LNREXP	LNTGEXP
Mean	8.041001	12.00274	9.319637	9.572201
Median	7.854769	11.90120	9.604070	9.760598
Maximum	11.12744	13.17730	11.75300	11.79362
Minimum	5.587249	10.88116	6.309918	6.705639
Std. Dev.	1.473536	0.683964	1.627159	1.529204
Skewness	0.567488	0.108579	0.300671	0.209477
Kurtosis	2.517357	1.776958	1.944542	1.883339
Jarque-Bera	2.852089	2.893107	2.766757	2.667103

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Probability	0.240257	0.235380	0.250730	0.263540
Sum	361.8451	540.1231	419.3837	430.7490
Sum Sq. Dev.	95.53760	20.58348	116.4965	102.8925
Observations	45	45	45	45

Source: Computed by author with the use of E-view Software.

Table 9 shows the descriptive statistic of the variables used in the study. The value of Skegness for all the variables is approximately zero indicating that the variables satisfy the normality assumption of Classical linear Regression model. The value of Kurtosis is also less than 3 indicating the mesocratic distribution. All the variables of the study satisfy the condition of normality as the probability value of Jarque –Bera test is greater than 0.05 or accepted the null hypothesis of normal distribution.

IV. Conclusion

The study investigates the Relationship between Government Capital and Current Expenditure and Economic Growth for the Period of 1980 to 2025 for State of Punjab, India. With the use of time series analysis tools such as Unit Root test, Johanson test of integration, Vector Autoregressive model, Impulse Response Function and Variance Decomposition Method objective of the study is to test long run as well as short run relationship between government capital expenditure, Government Revenue Expenditure and Economic growth rate of state. The findings of the study indicates that all the variables used in study are integrated of order one and found no nocointegration or long run relationship between the variables as the null hypothesis of no cointegration of Johanson test is accepted at 5 percent level of significance. The VAR analysis employed to study the short run relationship between the variable and findings of the VAR model states that only capital expenditure has impact on its own with lag 1 and 2. Impulse response analysis showed that response of gross state domestic to shock in revenue expenditure is negative and response of gross domestic product to shock in capital expenditure is negative and its decline and after period 2 it increases and have positive response. The Forecast Error Variance Decomposition analysis shows that variance in capital expenditure is explained by gross domestic product is 4.93 %. Variance of Revenue expenditure explained by Gross domestic Product is 6.08%. The variance in gross domestic product is explained by Capital expenditure is 1.35% and revenue expenditure is 14.43%. The study concludes that capital expenditure is more affected by its own lag of 2 and revenue expenditure is affected by the gross domestic product. The state government of Punjab more emphasizes on Revenue expenditure although the share of capital expenditure to total expenditure increased from last decades but government should more focus on capital expenditure as it has multiplier effect on growth of state as well as cause to increase in the capital expenditure of successive years. The study suggests that state government of Punjab state should give the importance to capital expenditure rather than revenue expenditure. Capital expenditure such as infrastructure development road and other expenditure creates Multiplier effect on economic growth. Revenue expenditure such as salaries payment subsidies etc has no impact on economic growth.

References

[1]. Adewara, S. O., &Oloni, E. F. (2012). Composition of public expenditure and economic growth in Nigeria. *Journal of Emerging Trends in Economics and Management Sciences*, *3*(4), 403–407.

[2]. Alshahrani, S., &Alsadiq, A. J. (2014). *Economic growth and government spending in Saudi Arabia: An empirical investigation* (IMF Working Paper No. WP/14/3). International Monetary Fund. imf.org

[3]. Aregbeyen, O. (2007). Public expenditure and economic growth. *African Journal of Economic Policy*, *14*(1), 1–25.

[4]. Devarajan, S., Swaroop, V., & Zou, H.-F. (1996). The composition of public expenditure and economic growth. *Journal of Monetary Economics*, *37*(2), 313–344. doi.org

[5]. Ghali, K. H. (1997). Government spending and economic growth in Saudi Arabia. *Journal of Economic Development*, *22*(2), 165–172.

[6]. Gregoriou, A., & Ghosh, S. (2007). *The impact of government expenditure on growth: Empirical evidence from a heterogeneous panel* (Economics and Finance Working Paper No. 07-01). Brunel University.

[7]. Gujarati, D. N., Porter, D. C., &Gunasekar, S. (2012). *Basic econometrics* (5th ed.). McGraw Hill Education (India) Pvt. Ltd.
[8]. Gupta, S., Clements, B., Baldacci, E., &Mulas-Granados, C. (2005). Fiscal policy, expenditure composition, and growth in low-income countries. *Journal of International Money and Finance*, *24*(3), 441–463. doi.org
[9]. Gushibet, S. T., &Tsenba, W. S. B. (2016). Impact of public expenditure on economic growth: Evidence from Nigeria's data. *International Journal of Advanced Studies in Economics and Public Sector Management*, *4*(1), 84–101.
[10]. Koman, J., &Bratimasrene, T. (2007). The relationship between government expenditure and economic growth in Thailand. *Journal of Economic Education*, *14*, 234–246.
[11]. Landau, D. (1983). Government expenditure and economic growth: A cross-country study. *Southern Economic Journal*, *49*(3), 783–792. doi.org
[12]. Mann, A. J. (1980). Wagner's Law: An econometric test for Mexico 1925–1976. *National Tax Journal*, *33*(2), 189–201. doi.org
[13]. Ogbokor, C. A. (2015). Exploring co-integration and causality relationships between government expenditure and economic performance in Namibia. *Developing Country Studies*, *5*(9), 114–122.
[14]. Ojonugwa, U., Esther, A. A., &Hindatu, A. B. (2016). Government expenditure and economic growth in Nigeria: A cointegration and error correction modeling. *Scientific Research Journal*, *4*(4), 30–37.