AN EVALUATION OF THE GOVERNMENT REVENUE AND EXPENDITURE PATTERN IN PUNJAB STATE OF INDIA

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The article investigates the effect of state government budget on economic growth in case of Punjab state of India. The main objective of this study was to examine the causal relationship between government receipts and government expenditures for the state of Punjab over the period of 23 years i.e. 1990 to 2012 using annual data set. The paper tests whether government revenue causes government expenditure or whether the causality runs from government expenditure to government revenue, and if there is bidirectional causality. Developed time series techniques are used namely Augmented Dickey-Fuller (ADF) for unit root test, Phillips perron unit root test and KPSS unit root tests are performed on the levels, first differences and second differences of the variables. KPSS has the null hypothesis of stationarity and the ADF & PP has the null hypothesis of non-stationarity. The Johnson co-integration test is applied to examine the long-run relationship between the variables i.e. receipts and expenditures and VAR Granger Causality test is applied to examine the direction of causality between the variables i.e. receipts and expenditures. Moreover, the granger causality test results revealed the presence of uni-directional and bi-directional causality from the receipts to expenditures and expenditures to receipts. The findings of the study showed that there is a positive relationship between the receipts and expenditures in the long run. The results of the study suggest that the government should focus on economic policies to increase the receipts and expenditures as a potential source of economic growth in Punjab state of India.

Key words: Government budget, receipts and expenditures, unit root test, co-integration and granger causality etc.

INTRODUCTION

Economic and Statistical Organization acts as the data bank and caters to the statistical

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needs of the State as well as Central Government, policy makers and research institutions and individual researchers. The Organization collects primary as well as secondary data at the state, district, block and village level. The data thus collected is compiled, analyzed, interpreted and disseminated through various departmental publications. This Organization also coordinates statistical activities within the State and keeps proper liaison with the Central Statistical Organization, Government of India. "Statistical Abstract of Punjab" and "Economic Survey of Punjab" are two widely known annual publications of this Organization, which contain comprehensive data-based information on various socioeconomic aspects in the State. Both of these publications are Budget Documents.

Government expenditure and government revenue are two of the major instruments of economic policy. In recent years, the relation between public outlays and public receipts has been one of the fundamental issues of applied economics. The relationship between government revenue and expenditure is a major concern for economists and policy makers alike. This controversial issue has been the subject of extensive theoretical and empirical research for decades. This research became more important and relevant since governments have been incurring continuous budget deficit in both developed and developing countries. Understanding this relationship is an important element for an effective fiscal policy. Therefore, the causal relationship between government expenditure and government revenues comes to be an empirical one. The purpose of this paper is to investigate the causal relationship between government expenditure and revenues over the period 1990 to 2012 in Punjab state of India. The dynamic relationship between government revenues and expenditure has been widely discussed and analyzed during the last decade. There are at least two major reasons for this; the rather dramatic public sector growth in most developed countries since World War II and the growing budget deficits of central and local governments. The conducted research has, almost exclusively, been directed towards the central government level, a concentration that might be explained by the fact that local governments constitute a relatively unimportant component in public decision-making in many countries. In the developing countries, on the other hand, local governments play a major role in the public sector.

Government budget deficits have significant impact on the economy. Such fiscal imbalance tends to reduce national savings and economic growth. Therefore, the decrease of the fiscal deficit by reducing government expenditure and/or raising

revenues would stimulate economic growth. However, one of the most studied topics in macroeconomics is the testing of the relationship between government expenditures and its revenues. Determination of the interdependence direction between these two macroeconomic variables would assist policy makers to recognize the source of any fiscal imbalances that might exist. Consequently, this would facilitate efforts to develop a suitable strategy for fiscal reforms. Hence, the analyzing of relationship between government expenditure and government revenue has attracted significant interest.

Ecological Funds

Ecological funds are earmarked financing mechanisms that may support a variety of ecological expenditures. Ecological funds are increasingly popular environmental financing mechanism in developing economies. The failure of governments to tackle environmental problems by putting in place environmental regulations and enforcement mechanisms, as well as the failure of the financial and capital markets to provide access to financing at reasonable terms, are the typically underlying reasons why special environmental financing mechanisms are established. (World bank group July 1998, pollution prevention and abatement handbook)

Environmental funds provide financing for a broad range of environmental needs. There are several funds that now have years of experience, and others that have been created or are still in the process of establishment. Most environmental funds include in their governing bodies representative of the national government as well as non-government organizations, and are managed by professional staff knowledgeable about the national conservation situations and about the mechanisms of conservation finance. Some of the programs and activities financed by these funds are the recurrent expenses of national parks and protected areas, biodiversity conservation and sustainable use of natural resources and strengthening of local conservation institutions. The variety of available funding mechanisms in EFs assure that each fund can adapt to the context of its national laws and conditions. (Oleas Reyna)

Although the government funding for environmental up gradation has grown significantly in Punjab state of India, green researchers have not paid much attention to the empirical assessment of the contributions of the environmental sector to Punjab economy. The present study however, attempts to address two empirical issues:

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First, is there any long equilibrium relationship between receipts and expenditures in Punjab state of India?

Second, if a long-run relationship exists, what is the direction of a causal relationship between the two variables?

The remainder of this paper is organized into four sections as follows: section **one** provides an introduction of Punjab state government budget and public funds; section **two** details about the objective and the need of the study, section **three** discusses data base and research design, section **four** discusses the results and analysis and section **five** concludes the study with the summary of the main points and discusses the research outcomes.

OBJECTIVE AND NEED OF THE STUDY

From the review of the existing literature it has been found that most of the researches are based on the reasons for climate change; air pollution; water pollution; global warming, etc. No major research activity is undertaken especially in Punjab state of India focusing on the pattern of government revenues and government expenditures. Thus the present study is based on the following objectives'

- To analyze the pattern of receipts and expenditures of public funds by the government of Punjab.

The paper attempts to examine the pattern of expenditure and receipts of the government of Punjab to judge whether the priority sector is getting due attention and the funds are being optimally used. Further, while studing the pattern of expenditures and receipts it has been evaluated whether Punjab government is spending sufficiently for upgrading ecological environment because the forest cover of Punjab is less than any other state of India including Rajasthan. Another major concern is the industrialization of the agragarian state of Punjab which is also known as the food bowl of India i.e. the expenditure on the establishment and growth of large industry, small scale industry and cottage industry. An attempt has also been made to critically evaluate the rate of growth of the state and the welfare of its subjects.

DATA BASE AND RESEARCH DESIGN

In this paper, we use annual data from the periods of 1990 to 2012; two main variables used in the study are government expenditures and government receipts; and will test it by the time series technique, Johnson Co integration is used to find out the existence of long run relationship between these variables and VAR Granger Causality test is used to identify whether there is a unidirectional or bidirectional causal relation between receipts and expenditures in the case of Punjab state of India. The causality test relationship between government expenditure and revenues requires three steps. First, the time series would be analyzed in order to determine the order of integration. Second, investigating the long run equilibrium relationship between government expenditure and revenues. Finally, the short run as well as the long run causality relationship between government expenditure and revenues would be investigated.

Thus, the first step, in our methodology, is to determine whether the variables we use are stationary or non-stationary. If a series non-stationary, then all the usual regression results suffer from spurious regression problem, thereby leading to biased and meaningless results. Although we expect that in growing economics, such as Punjab, economic time series data are likely non-stationary or exhibit a unit root in their levels.

Unit Root Test

One of the most widely used unit root test is the Augmented Dickey-Fuller (ADF) unit root test (Dickey and Fuller, 1979, 1981). Alternatively, Phillips-Perron (PP) (1988) and KPSS Unit Root Tests are performed both the levels and the first differences of the variables. In order to test for the existence of unit roots and to determine the order of differencing necessary to convert non stationary series into stationary series, Augmented Dicky-fuller (ADF) and Phillip Perron test (PP) tests have been applied. Therefore, prior to applying econometrical procedures, if the both variable receipts as well as expenditures are found to be non stationary, these will be differenced to convert these into stationary series. Table 3 reports the unit root test which suggests that receipts and expenditures are non stationary at levels, whereas, their log first difference is stationary.

Cointegration Test

If the time series data of each variable is found to be non-stationary at level, then there may exist a long run relationship between variables. Co integration is a powerful concept, because it helps to study the stationary relationship among two or more time series, each of which is individually non-stationary. A series is said to be integrated if it accumulates some past effects, such a series is non-stationary because its future path depends upon all such past influences. To examine the Co integration relationship between receipts and expenditures, present study adopted the procedure developed by Johansen (1988, 1991). The Johansen procedure proposed two test statistics for testing the number of Co integrating vectors, a trace test (Tr) and a Max-Eigen value test (MAX) statistics. Table no. V reports the results of Johansen test, based on Max Eigenvalue and Trace statistic test. It depicts that the null hypothesis of no Co integration was rejected at the 5% level of significance.

Causality Test

To test whether government revenue Granger causes government expenditure, this paper applies the causality test developed by Granger (1969). The granger causality test is applied in order to analyze the lead and lag relationship. The null hypothesis of Granger Causality methodology is that there is no causal relationship between two variables; however, rejection of the null hypothesis suggests that there is a significant relationship between receipts and expenditures and it may be unidirectional or may be bidirectional subject to the conditions in which these two series interact. This causality can be concluded from the p-value. If a p-value found to be more than 5% level of significance than there is no causal relationship between receipts and expenditures.

RESULTS AND ANALYSIS

Series has a unit root problem and the series is a non-stationary series. Although we expect that in growing economics such as India, economic time series data are likely non-stationary or exhibit a unit root in their levels. The Augmented dickey fuller test (ADF), Phillips perron unit root test and KPSS unit root tests are performed on the levels, first differences and second differences of the variables. KPSS has the null hypothesis of stationarity and the ADF & PP has the null hypothesis of non-stationarity. Results of ADF, PP and KPSS tests for stationarity are reported in table-1. All variables are stationary at first difference with 95% level of confidence in table-1 except receipts of social services which are stationarity at second difference (with trend and intercept).

Table 1: Unit root test

Sectors	Time series variable		ADF Unit Test			Philip Peron Test			KPSS LM Test	
			None	With Intercept	With trend & Intercept	None	With Intercept	With trend & Intercept	With Intercept	With trend & Intercept
Agriculture & allied services	Receipts	At Level	1.807 (0.979)	1.078 (0.995)	-3.153 (0.119)	0.203 (.735)	-1.717 (.409)	-3.153 (.119)	7.297 (.000)	1.243 (.227)
		At 1 diff.	-7.103 (.000)	-7.430 (.000)	-8.017 (.000)	-7.119 (.000)	-7.430 (.000)	-8.493 (.000)	0.632 (.533)	-0.123 (.902)
	Expenditure	At Level	-0.057 (.652)	-0.919 (.761)	-2.221 (.454)	-2.412 (.018)	-4.203 (.003)	-5.368 (.001)	6.337 (.000)	2.064 (.051)
		At 1 diff.	-4.262 (.000)	-4.578 (.001)	-9.735 (.000)	-9.274 (.000)	-9.123 (.000)	-9.735 (.000)	-0.343 (.734)	-0.614 (.545)
Rural development	Receipts	At Level	6.202 (1.000)	4.277 (1.000)	1.546 (1.000)	10.149 (1.000)	7.182 (1.000)	1.973 (1.000)	4.399 (0.000)	-2.514 (.020)
		At 1 diff.	-1.475 (0.127)	-2.143 (0.231)	-3.813 (0.036)	-1.164 (.214)	-1.969 (.296)	-3.810 (0.036)	3.172 (0.004)	-1.360 (.188)
		At 2 diff.	-7.352 (0.000)	-7.370 (0.000)	-7.291 (0.000)	-8.724 (0.000)	-9.900 (0.000)	-17.208 (0.000)	0.452 (0.655)	-0.441 (0.663)
	Expenditure	At Level	-3.170 (0.003)	-3.478 (0.020)	-4.200 (0.019)	-1.367 (0.154)	-1.939 (0.309)	-2.536 (0.309)	3.677 (0.001)	-1.031 (0.313)
		At 1 diff.	-2.869 (0.006)	-2.960 (0.059)	-2.885 (0.190)	-6.549 (0.000)	-6.515 (0.000)	-6.304 (0.000)	0.131 (0.896)	0.442 (0.662)
		At 2 diff.	-7.205 (0.000)	-7.155 (0.000)	-7.685 (0.000)	-19.146 (0.000)	-19.933 (0.000)	-33.846 (0.000)	-0.081 (0.935)	0.078 (0.938)
Special area programme	Receipts	At Level	-1.377 (0.151)	-1.905 (0.323)	-1.882 (0.629)	-1.377 (0.151)	-1.833 (0.355)	-1.782 (0.678)	4.643 (0.000)	2.628 (0.015)
		At 1 diff.	-5.921 (0.000)	-5.776 (0.000)	-5.849 (0.000)	-5.921 (0.000)	-5.776 (0.000)	-5.849 (0.000)	-0.099 (0.921)	0.586 (0.564)
	Expenditure	At Level	-1.270 (0.181)	-1.730 (0.403)	-1.745 (0.695)	-1.270 (0.181)	-1.751 (0.392)	-1.739 (0.689)	4.708 (0.000)	2.799 (0.010)
		At 1 diff.	-5.000 (0.000)	-4.878 (0.009)	-4.919 (0.004)	-5.000 (0.000)	-4.878 (0.000)	-4.920 (0.004)	-0.116 (0.908)	0.622 (0.540)
Irrigation & flood control	Receipts	At Level	3.243 (0.999)	1.921 (0.999)	0.440 (0.998)-	2.588 (0.996)	1.380 (0.998)	-0.162 (0.989)	7.373 (0.000)	0.931 (.362)
		At 1 diff.	-2.108	-2.615	-3.068	-1.939	-2.533	-3.023	2.417	-0.578

			(0.036)	(0.105)	(0.138)	(0.051)	(0.122)	(0.149)	(0.024)	(.569)
		At 2 diff.	-7.186 (0.000)	-5.267 (0.000)	-5.390 (0.001)	-8.077 (0.000)	-8.683 (0.000)	-17.071 (0.000)	0.395 (0.696)	-0.221 (0.827)
	Expenditure	At Level	1.673 (.972)	-1.364 (.580)	-3.088 (0.133)	0.863 (0.889)	-1.061 (0.711)	-3.048 (0.142)	-8.464 (0.000)	1.838 (0.080)
		At 1 diff.	-5.038 (0.000)	-5.645 (0.000)	-5.676 (0.001)	-5.492 (0.000)	-10.561 (0.000)	-10.587 (0.000)	0.893 (0.381)	0.129 (0.898)
		At 2 diff.	-5.617 (0.000)	-5.444 (0.000)	-5.235 (0.002)	-12.089 (0.000)	-11.601 (0.000)	-10.945 (0.000)	0.128 (0.899)	-0.012 (0.990)
Energy	Receipts	At Level	2.101 (0.988)	0.685 (0.988)	-1.476 (0.805)	2.101 (0.988)	0.685 (0.988)	-0.790 (.951)	6.381 (0.000)	0.057 (0.955)
		At 1 diff.	-2.726 (0.008)	-3.038 (0.047)	-3.168 (0.117)	-2.741 (0.008)	-3.016 (0.049)	-3.031 (0.147)	2.086 (0.049)	-0.319 (0.752)
		At 2 diff.	-5.546 (0.000)	-5.402 (0.000)	-5.253 (0.002)	-9.238 (0.000)	-8.426 (0.000)	-7.984 (0.000)	-0.031 (0.975)	0.215 (0.831)
	Expenditure	At Level	0.508 (0.816)	-0.824 (0.790)	-2.306 (0.412)	0.111 (0.707)	-1.518 (0.505)	-2.983 (0.158)	8.421 (0.000)	1.915 (0.069)
		At 1 diff.	-1.956 (0.050)	-2.186 (0.216)	-2.228 (0.450)	-7.106 (0.000)	-7.409 (0.000)	-7.357 (0.000)	0.662 (0.514)	0.184 (0.855)
		At 2 diff.	-14.940 (0.000)	-14.539 (0.000)	-14.021 (0.000)	-14.940 (0.000)	-14.539 (0.000)	-14.021 (0.000)	-0.225 (0.823)	0.249 (0.805)
Industry & minerals	Receipts	At Level	-1.627 (0.096)	-1.839 (0.353)	-3.667 (0.046)	-1.048 (0.256)	-1.857 (0.344)	-3.661 (0.047)	6.061 (0.000)	7.955 (0.000)
		At 1 diff.	-5.136 (0.000)	-5.391 (0.000)	-5.256 (0.002)	-6.660 (0.000)	-9.798 (0.000)	-9.369 (0.000)	-0.188 (0.852)	0.464 (0.647)
	Expenditure	At Level	-1.942 (0.051)	-2.884 (0.063)	-3.393 (0.078)	-1.846 (0.062)	-2.884 (0.063)	-3.393 (0.078)	4.944 (0.000)	4.483 (0.000)
		At 1 diff.	-6.240 (0.000)	-6.111 (0.000)	-5.947 (0.000)	-7.800 (0.000)	-8.482 (0.000)	-8.307 (0.000)	-0.153 (0.879)	0.219 (0.828)
Transport	Receipts	At Level	3.735 (0.999)	3.238 (1.000)	0.226 (0.996)	0.296 (0.762)	-0.969 (0.745)	-4.224 (0.015)	4.121 (0.000)	-2.257 (0.034)
		At 1 diff.	0.785 (0.873)	-0.381 (0.892)	-10.122 (0.000)	-9.489 (0.000)	-11.348 (0.000)	-14.679 (0.000)	0.745 (0.464)	-0.103 (0.918)
		At 2 diff.	-8.962 (0.000)	-9.298 (0.000)	-8.212 (0.000)	-15.671 (0.000)	-15.182 (0.000)	-14.485 (0.000)	0.180 (0.858)	-0.151 (0.880)
	Expenditure	At Level	6.348 (1.000)	5.842 (1.000)	4.121 (1.000)	1.784 (0.978)	1.316 (0.997)	-1.369 (0.841)	3.705 (0.001)	-2.583 (0.017)
		At 1 diff.	1.780 (0.976)	0.968 (0.993)	-3.766 (0.043)	-5.060 (0.000)	-5.656 (0.000)	-15.107 (0.000)	1.457 (0.159)	-0.497 (0.624)

		At 2 diff.	-4.554 (0.000)	-5.090 (0.000)	-6.965 (0.000)	-15.913 (0.000)	-18.080 (0.000)	-18.796 (0.000)	-0.031 (0.975)	0.160 (0.873)
Science, technology & environment	Receipts	At Level	-1.117 (0.231)	-1.627 (0.452)	-2.738 (0.232)	-0.846 (0.337)	-1.496 (0.516)	-2.711 (0.241)	2.924 (0.007)	-1.724 (0.099)
		At 1 diff.	-5.961 (0.000)	-5.910 (0.000)	-5.796 (0.000)	-6.303 (0.000)	-6.841 (0.000)	-8.516 (0.000)	0.535 (0.597)	-0.086 (0.932)
	Expenditure	At Level	-4.322 (0.000)	-5.211 (0.000)	-4.649 (0.008)	-1.423 (0.139)	-1.735 (0.400)	-2.131 (0.501)	2.730 (0.012)	-1.465 (0.157)
		At 1 diff.	-4.194 (0.000)	-4.086 (0.005)	-3.977 (0.026)	-4.177 (0.000)	-4.064 (0.005)	-3.953 (0.027)	0.164 (0.871)	0.310 (0.759)
General economic services	Receipts	At Level	-1.327 (0.165)	-2.277 (0.187)	-3.812 (0.036)	-1.133 (0.225)	-2.290 (0.183)	-2.665 (0.258)	4.123 (0.000)	-0.103 (0.918)
		At 1 diff.	-4.267 (0.000)	-4.195 (0.004)	-3.443 (0.078)	-4.795 (0.000)	-5.198 (0.000)	-5.095 (0.002)	0.483 (0.633)	-0.086 (0.932)
	Expenditure	At Level	-2.680 (0.009)	-3.170 (0.035)	-3.481 (0.066)	-2.680 (0.009)	-3.189 (0.034)	-3.453 (0.069)	2.446 (0.022)	-0.300 (0.766)
		At 1 diff.	-5.841 (0.000)	-5.697 (0.000)	-3.797 (0.043)	-9.039 (0.000)	-9.020 (0.000)	-8.641 (0.000)	0.132 (0.895)	0.092 (0.927)
Social services	Receipts	At Level	4.515 (1.000)	3.131 (1.000)	1.425 (0.999)	4.515 (1.000)	4.056 (1.000)	1.711 (1.000)	5.896 (0.000)	-0.812 (0.425)
		At 1 diff.	1.948 (0.983)	1.278 (0.997)	0.296 (0.996)	-2.097 (0.037)	-2.989 (0.052)	-4.018 (0.024)	2.724 (0.012)	-0.938 (0.359)
		At 2 diff.	-0.902 (0.311)	-1.199 (0.650)	-7.615 (0.000)	-10.050 (0.000)	-10.625 (0.000)	-25.496 (0.000)	0.433 (0.669)	-0.139 (0.890)
	Expenditure	At Level	3.118 (0.998)	1.946 (0.999)	0.091 (.994)	3.356 (0.999)	1.506 (.998)	-1.445 (0.817)	5.404 (0.000)	-1.018 (0.320)
		At 1 diff.	-0.671 (0.412)	-1.261 (0.624)	-8.031 (0.000)	-5.894 (0.000)	-6.937 (0.000)	-8.584 (0.000)	1.543 (0.137)	-0.443 (0.662)
		At 2 diff.	-8.551 (0.000)	-8.372 (0.000)	-8.094 (0.000)	-20.911 (0.000)	-24.385 (0.000)	-31.910 (0.000)	0.084 (0.933)	-0.026 (0.978)
General services	Receipts	At Level	-3.616 (0.001)	-4.562 (0.001)	-4.692 (0.005)	-3.597 (0.001)	-4.562 (0.001)	-4.692 (0.005)	2.586 (.016)	0.360 (0.722)
		At 1 diff.	-7.801 (0.000)	-7.617 (0.000)	-7.414 (0.000)	-3.597 (0.001)	-4.562 (0.001)	-4.692 (0.005)	2.586 (0.016)	0.360 (0.722)
		At 2 diff.	-4.985 (0.000)	-4.816 (0.001)	-4.642 (0.008)	-27.394 (0.000)	-26.534 (0.000)	-25.655 (0.000)	-0.009 (0.992)	0.017 (0.986)
	Expenditure	At Level	1.310 (0.946)	1.770 (0.999)	1.027 (0.999)	1.310 (.946)	0.591 (0.986)	-0.601 (0.968)	4.730 (0.000)	-0.437 (0.666)
		At 1 diff.	0.233	-0.155	-0.857	-4.065	-4.421	-4.975	1.467	-0.594
			(0.743)	(0.929)	(0.941)	(0.003)	(0.002)	(0.003)	(0.157)	(0.559)
		At 2 diff.	-9.189 (0.000)	-9.152 (0.000)	-9.321 (0.000)	-9.189 (0.000)	-9.449 (0.000)	-13.518 (0.000)	-0.175 (0.862)	0.417 (0.681)

Source: Authors' own computation

		At 2 diff.	-4.554 (0.000)	-5.090 (0.000)	-6.965 (0.000)	-15.913 (0.000)	-18.080 (0.000)	-18.796 (0.000)	-0.031 (0.975)	0.160 (0.873)
Science, technology & environment	Receipts	At Level	-1.117 (0.231)	-1.627 (0.452)	-2.738 (0.232)	-0.846 (0.337)	-1.496 (0.516)	-2.711 (0.241)	2.924 (0.007)	-1.724 (0.099)
		At 1 diff.	-5.961 (0.000)	-5.910 (0.000)	-5.796 (0.000)	-6.303 (0.000)	-6.841 (0.000)	-8.516 (0.000)	0.535 (0.597)	-0.086 (0.932)
	Expenditure	At Level	-4.322 (0.000)	-5.211 (0.000)	-4.649 (0.008)	-1.423 (0.139)	-1.735 (0.400)	-2.131 (0.501)	2.730 (0.012)	-1.465 (0.157)
		At 1 diff.	-4.194 (0.000)	-4.086 (0.005)	-3.977 (0.026)	-4.177 (0.000)	-4.064 (0.005)	-3.953 (0.027)	0.164 (0.871)	0.310 (0.759)
General economic services	Receipts	At Level	-1.327 (0.165)	-2.277 (0.187)	-3.812 (0.036)	-1.133 (0.225)	-2.290 (0.183)	-2.665 (0.258)	4.123 (0.000)	-0.103 (0.918)
		At 1 diff.	-4.267 (0.000)	-4.195 (0.004)	-3.443 (0.078)	-4.795 (0.000)	-5.198 (0.000)	-5.095 (0.002)	0.483 (0.633)	-0.086 (0.932)
	Expenditure	At Level	-2.680 (0.009)	-3.170 (0.035)	-3.481 (0.066)	-2.680 (0.009)	-3.189 (0.034)	-3.453 (0.069)	2.446 (0.022)	-0.300 (0.766)
		At 1 diff.	-5.841 (0.000)	-5.697 (0.000)	-3.797 (0.043)	-9.039 (0.000)	-9.020 (0.000)	-8.641 (0.000)	0.132 (0.895)	0.092 (0.927)
Social services	Receipts	At Level	4.515 (1.000)	3.131 (1.000)	1.425 (0.999)	4.515 (1.000)	4.056 (1.000)	1.711 (1.000)	5.896 (0.000)	-0.812 (0.425)
		At 1 diff.	1.948 (0.983)	1.278 (0.997)	0.296 (0.996)	-2.097 (0.037)	-2.989 (0.052)	-4.018 (0.024)	2.724 (0.012)	-0.938 (0.359)
		At 2 diff.	-0.902 (0.311)	-1.199 (0.650)	-7.615 (0.000)	-10.050 (0.000)	-10.625 (0.000)	-25.496 (0.000)	0.433 (0.669)	-0.139 (0.890)
	Expenditure	At Level	3.118 (0.998)	1.946 (0.999)	0.091 (.994)	3.356 (0.999)	1.506 (.998)	-1.445 (0.817)	5.404 (0.000)	-1.018 (0.320)
		At 1 diff.	-0.671 (0.412)	-1.261 (0.624)	-8.031 (0.000)	-5.894 (0.000)	-6.937 (0.000)	-8.584 (0.000)	1.543 (0.137)	-0.443 (0.662)
		At 2 diff.	-8.551 (0.000)	-8.372 (0.000)	-8.094 (0.000)	-20.911 (0.000)	-24.385 (0.000)	-31.910 (0.000)	0.084 (0.933)	-0.026 (0.978)
General services	Receipts	At Level	-3.616 (0.001)	-4.562 (0.001)	-4.692 (0.005)	-3.597 (0.001)	-4.562 (0.001)	-4.692 (0.005)	2.586 (.016)	0.360 (0.722)
		At 1 diff.	-7.801 (0.000)	-7.617 (0.000)	-7.414 (0.000)	-3.597 (0.001)	-4.562 (0.001)	-4.692 (0.005)	2.586 (0.016)	0.360 (0.722)
		At 2 diff.	-4.985 (0.000)	-4.816 (0.001)	-4.642 (0.008)	-27.394 (0.000)	-26.534 (0.000)	-25.655 (0.000)	-0.009 (0.992)	0.017 (0.986)
	Expenditure	At Level	1.310 (0.946)	1.770 (0.999)	1.027 (0.999)	1.310 (.946)	0.591 (0.986)	-0.601 (0.968)	4.730 (0.000)	-0.437 (0.666)
		At 1 diff.	0.233	-0.155	-0.857	-4.065	-4.421	-4.975	1.467	-0.594
			(0.743)	(0.929)	(0.941)	(0.003)	(0.002)	(0.003)	(0.157)	(0.559)
		At 2 diff.	-9.189 (0.000)	-9.152 (0.000)	-9.321 (0.000)	-9.189 (0.000)	-9.449 (0.000)	-13.518 (0.000)	-0.175 (0.862)	0.417 (0.681)

Source: Authors' own computation

Sectors	Co-integration test results of receipts and expenditures				
Agriculture & allied services	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.609622	21.70346	15.49471	0.0051
	r≤1	0.088677	1.950023	3.841466	0.1626
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.609622	19.75344	14.26460	0.0061
	r≤1	0.088677	1.950023	3.841466	0.1626
Rural development	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.455401	12.86726	15.49471	0.1198
	r≤1	0.005008	0.105431	3.841466	0.7454
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.455401	12.76183	14.26460	0.0852
	r≤1	0.005008	0.105431	3.841466	0.7454
Special area programme	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.296860	8.719343	15.49471	0.3920
	r≤1	0.175320	3.084160	3.841466	0.0791
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.296860	5.635183	14.26460	0.6604
	r≤1	0.175320	3.084160	3.841466	0.0791
Irrigation & flood control	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**

	r=0	0.423563	13.64229	15.49471	0.0933
	r≤1	0.094025	2.073622	3.841466	0.1499
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.423563	11.56867	14.26460	0.1279
	r≤1	0.094025	2.073622	3.841466	0.1499
Energy	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.342383	8.836881	15.49471	0.3807
	r≤1	0.001670	0.035103	3.841466	0.8513
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.342383	8.801778	14.26460	0.3030
	r≤1	0.001670	0.035103	3.841466	0.8513
Industry & minerals	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.437372	13.65453	15.49471	0.0929
	r≤1	0.072331	1.576675	3.841466	0.2092
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.437372	12.07785	14.26460	0.1078
	r≤1	0.072331	1.576675	3.841466	0.2092
Transport	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.632755	23.32677	15.49471	0.0027
	r≤1	0.103334	2.290517	3.841466	0.1302
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.632755	21.03626	14.26460	0.0037

	r≤1	0.103334	2.290517	3.841466	0.1302
Science, technology & environment	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.693354	28.51648	15.49471	0.0003
	r≤1	0.161269	3.693181	3.841466	0.0546
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.693354	24.82330	14.26460	0.0008
	r≤1	0.161269	3.693181	3.841466	0.0546
General economic services	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.466035	13.31710	15.49471	0.1037
	r≤1	0.006700	0.141178	3.841466	0.7071
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.466035	13.17592	14.26460	0.0737
	r≤1	0.006700	0.141178	3.841466	0.7071
Social services	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.523988	16.84397	15.49471	0.0311
	r≤1	0.058029	1.255393	3.841466	0.2625
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.523988	15.58857	14.26460	0.0307
	r≤1	0.058029	1.255393	3.841466	0.2625
General services	**Trace**				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.376022	13.05633	15.49471	0.1128
	r≤1	0.139369	3.151874	3.841466	0.0758
	Max-Eigen				
	Hypothesized No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	r=0	0.376022	9.904458	14.26460	0.2183
	r≤1	0.139369	3.151874	3.841466	0.0758

Notes: r stands for the number of cointegrating vectors. (*) Indicates significance at 5% level
Source: Authors' own computation

Table no. 2 reports the results of Johansen test, based on Max Eigen value and Trace statistic test. It depicts that null hypothesis of no co integration was accepted at 5% level of significance. Table no. 2 shows the absence of co integrating relationship between the variables of the study.

The concept of co integration was first introduced into the literature by Granger (1980). Co integration implies the existence of a long-run relationship between economic variables. The principle of testing for co integration is to test whether two or more integrated variables deviate significantly from a certain relationship (Abadir and Taylor, 1999). In other words, if the variables are co integrated, they move together over time so that short-term disturbances will be corrected in the long-term. This means that if, in the long-run, two or more series move closely together, the difference between them is constant. Otherwise, if two series are not co-integrated, they may wander arbitrarily far away from each other (Dickey et. al., 1991). Further, Granger (1981) showed that when the series becomes stationary only after being differenced once (integrated of order one), they might have linear combinations that are stationary without differencing. In the literature, such series are called "co integrated". If integration of order one is implied, the next step is to use co integration analysis in order to establish whether there exists a long-run relationship among the set of the integrated variables in question. Table no. 2 shows the absence of co integrating relationship between the variables of the study. Since all the variables are not co integrated, the standard granger causality test to determine short run causal relationship between the variables can be performed without including the error correction term.

In the research study the effort is done in order to analyze the lead and lag relationship between the receipts and the expenditures on the various sectors. The Granger's causality test is applied for the purpose. The Granger's causality test can be mathematically expressed as:

$$Receipts_t = \alpha + \sum_{i=1}^{n} \beta_i * Receipts_{t-1} + \sum_{j=1}^{n} \beta_j * Expenditure_{t-1} + \epsilon_t$$

$$Expenditure_t = \alpha + \sum_{i=1}^{n} \beta_i * Receipts_{t-1} + \sum_{j=1}^{n} \beta_j * Expenditure_{t-1} + \epsilon_t$$

The results of the Grangers Causality test are shown in table 3

Table 3: Granger causality test

VAR Granger Causality/Block Exogeneity Wald Tests			
Dependent variable: Growth rate of Receipts in agriculture & allied services			
Excluded	Chi-sq	df	Prob.
Growth rate of Expenditure	0.871663	2	0.6467
All	0.871663	2	0.6467
Dependent variable: Growth rate of Expenditure in agriculture & allied services			
Excluded	Chi-sq	df	Prob.
Growth rate of Receipts	0.686954	2	0.7093
All	0.686954	2	0.7093
Dependent variable: Growth rate of Receipts in rural development			
Excluded	Chi-sq	df	Prob.
Expenditure	7.921904	2	0.0190
All	7.921904	2	0.0190
Dependent variable: Growth rate of Expenditure in rural development			
Excluded	Chi-sq	df	Prob.
Growth rate of Receipts	1.202999	2	0.5480
All	1.202999	2	0.5480
Dependent variable: Growth rate of Receipts in Special Area Programme			
Excluded	Chi-sq	df	Prob.
Growth rate of Expenditure	0.076033	2	0.9627
All	0.076033	2	0.9627
Dependent variable: Growth rate of Expenditure in Special Area Programme			
Excluded	Chi-sq	df	Prob.
Growth rate of Receipts	1.408558	2	0.4945
All	1.408558	2	0.4945
Dependent variable: Growth rate of Receipts on Irrigation & Flood Control			
Excluded	Chi-sq	df	Prob.
Growth rate of Expenditure	1.818189	2	0.4029

All	1.818189	2	0.4029
Dependent variable: Growth rate of Expenditure on Irrigation & Flood Control			
Excluded	Chi-sq	df	Prob.
Growth rate of Receipts	1.791550	2	0.4083
All	1.791550	2	0.4083
Dependent variable: Growth rate of Receipts on Energy			
Excluded	Chi-sq	df	Prob.
Growth rate of Exependiture	4.147510	2	0.1257
All	4.147510	2	0.1257
Dependent variable: Growth rate of Expenditure on Energy			
Excluded	Chi-sq	df	Prob.
Growth rate of Receipts	0.149837	2	0.9278
All	0.149837	2	0.9278
Dependent variable: Receipts on Industry & Minerals			
Excluded	Chi-sq	df	Prob.
Expenditure	2.635671	2	0.2677
All	2.635671	2	0.2677
Dependent variable: Expenditure on Industry & Minerals			
Excluded	Chi-sq	df	Prob.
Receipts	3.156898	2	0.2063
All	3.156898	2	0.2063
Dependent variable: Growth rate of Receipts on Transport			
Excluded	Chi-sq	df	Prob.
Growth rate of Expenditure	103.3551	2	0.0000
All	103.3551	2	0.0000
Dependent variable: Growth rate of Expenditure on Transport			
Excluded	Chi-sq	df	Prob.
Growth rate of Receipts	8.737611	2	0.0127
All	8.737611	2	0.0127
Dependent variable: Growth rate of receipts on Science, Technology & Environment			
Excluded	Chi-sq	df	Prob.
Expenditure	60.56197	2	0.0000

All	60.56197	2	0.0000
Dependent variable: Expenditure on Science, Technology & Environment			
Excluded	Chi-sq	df	Prob.
Growth rate of Receipts	0.860140	2	0.6505
All	0.860140	2	0.6505
Dependent variable: Receipts on General Economic Services			
Excluded	Chi-sq	df	Prob.
Expenditure	4.844067	2	0.0887
All	4.844067	2	0.0887
Dependent variable: Expenditure on General Economic Services			
Excluded	Chi-sq	df	Prob.
Receipts	5.302950	2	0.0705
All	5.302950	2	0.0705
Dependent variable: Growth rate of Receipts on Social Services			
Excluded	Chi-sq	df	Prob.
Growth rate of Expenditure	0.646534	2	0.7238
All	0.646534	2	0.7238
Dependent variable: Growth rate of Expenditure on Social Services			
Excluded	Chi-sq	df	Prob.
Growth rate of Receipts	24.05322	2	0.0000
All	24.05322	2	0.0000
Dependent variable: Growth rate of Receipts on General Services			
Excluded	Chi-sq	df	Prob.
Growth rate of Expenditure	0.206793	2	0.9018
All	0.206793	2	0.9018
Dependent variable: Growth rate of Expenditure on General Services			
Excluded	Chi-sq	df	Prob.
Growth rate of Receipts	0.043493	2	0.9785
All	0.043493	2	0.9785

Source: Authors' own computation

The table-3 indicates the results of granger causality test applied between receipts and expenditure on agriculture on all fourteen sectors. The result of the granger causality test from receipts to expenditure and from expenditure to receipts is shown in above table. It indicates that there does not exist any causality from receipts to the expenditure and from expenditure to receipts in agriculture and allied services, special area programme, irrigation and flood control, energy, industry and minerals, general economic services and general services. This no causality can be concluded from the p-value which is found to be more than 5% level of significance. It indicates that there exists uni-directional causality from receipts to the expenditure in rural development and science, technology & environment and uni-directional causality from expenditure to receipts in social services sector. In case of transport it indicates that there exists bi-directional causality from receipts to expenditure and from expenditure to receipts. This bi-directional causality can be concluded from the p-value which is found to be less than 5% level of significance.

CONCLUSION AND SUGGESTIONS

Care must be taken to ensure efficiency of utilization of public funds and to increase the productivity of public investment. The honest and concerted efforts of government and non-government organizations can ensure the best results for optimum utilization of public funds. The research outcome will also help the policy makers of India to adopt the appropriate policies with regard to financial development and provide a scope for policy debate. The following implications can be drawn based on these research outcomes: the Punjab government should introduce further financial assistance to improve the effectiveness and efficiency of the state government budget which is a prerequisite to achieve positive spillover of funds.

The present study employs with the relationship between receipts and expenditures using annual data for the period 1990-2012. The empirical analysis suggested that all variables that used in this study present a unit root. Apart from it, long run relationship between the variables has been verified through Johansen' co-integration test. The Granger causality test is then used to investigate the direction of causality between government receipts and government expenditure. The evidence however suggests long-run uni-directional causality and the causality runs from the receipts and expenditure. The results of the study suggest that the government should focus on economic policies to increase the receipts and expenditures as a potential source of

economic growth in Punjab state of India. The research outcomes will also help the policy makers of India to adopt the appropriate policies with regard to economic development and provide a scope for the policy debate.

This study focused on aggregated data to assess the fiscal response by the government to changes in aid flow. A more detailed breakdown of the sources of revenue and expenditure use by the public sector at sectoral level—e.g., transport, irrigation, energy, agriculture, rural development, science, technology & environment etc.—would shed more light on the understanding of how policy makers in the aid recipient country make their public sector decisions. Moreover, the research paper can be further expanded by comparing economic performance of Punjab with other state of India or the comparison of economic performance of India with the other Asian country. Further study can be conducted by taking more than two variables to check the causal relationship. It may be interesting to assess whether a distinction between bilateral and multilateral aid influences the budgetary process.

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