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PUBLIC EXPENDITURE AND ECONOMIC GROWTH IN NAGALAND: A TIME SERIES ANALYSIS

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Abstract:

There have been various studies in the field of the causal effect relationship between public expenditure and economic growth. Several explanatory variables have been used by many authors in determining the nexus between public expenditure and economic growth with different sets of models. The results emanating out of the empirical verification of the relationship done elsewhere are not convergent. Similar attempt has been made in the current context to make an empirical study of the relationship between expenditures of the Government of Nagaland at disaggregated level and Gross State Domestic Product (GSDP) during a thirty-year time period (1980-81 to 2009-10). Tools from time-series econometrics like Granger's causality, Augmented Dickey-Fuller Test for Unit-root, Co-integration Test and Error-Correction Models have been used. While the causality from GSDP to public expenditure is shown to be weak, the causality from public expenditure to GSDP is strong.

Key Words: Public Expenditure, Gross State Domestic Product, Social Services

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1. Introduction

Over the years the economic activities of the government vis-à-vis public expenditure have grown both relatively and absolutely in all the states of the Indian union. A predominant objective of public expenditure policy is sustained and equitable economic growth. Public expenditures have played an important role in physical and human capital formation over a period of time. Appropriate public expenditures can also be effective in boosting economic growth even in the short run. Therefore, the effect of public expenditure on economic growth may be a comprehensive indicator of public expenditure productivity. The two components of such an indicator should be measureable: the contribution of public expenditures to economic growth, and the efficiency with which these expenditures yield their output.

In a socialistic and welfare characterized state, governments directly intervene in achieving an efficient allocation of resources, in achieving an equitable distribution of income and finally in maintaining economic stability in the economy. Therefore, the economic and social progress demands the use of public expenditure as an instrument to achieve efficiency and equity so as to achieve the end objective of rapid economic development. Public expenditure programmes of the government raise the quality and sustainability of development programmes and help to inject a greater degree of purchasing power, by way of a greater impetus not only to the gross state domestic product (GSDP), but also to the per capita income. It is pertinent to mention that economists often tend to use the two terms economic development and economic growth interchangeably, as they appear to be synonymous with each other. Economic growth refers to a rise in a country's real level of national output or real per capita income which can be caused by an increase in quality as well as quantity of resources, improvement in technology, or in another way an increase in the real value of goods and services produced by every sector of the economy. Whereas, economic development is more of a vague measure usually incorporating social measures such as literacy rates or life expectancy which affect productivity and could lead to economic growth. Economic Development also leads to the creation of more opportunities, thereby leading to an increase in per capita income of every citizen. Economic development is a qualitative measure, while economic growth is a quantitative measure. As an operational measure, we shall be referring to economic growth in our study.

In working out the developmental plan which implicitly takes into account the public expenditure ratio, a systematic analysis of public expenditure and its effect on economic growth may be illuminating for ascertaining the extent to which the rate of economic growth explains the rate of growth of public expenditure and to examine the inherent nexus between them.

2. Literature Review

This section discusses relevant literature and theoretical framework on the linkage between public expenditure and economic growth. The available literature on the cause - effect relationship between the growth of public expenditure and the growth of the economy suggests the emergence of two schools of thought that claims two opposing views to this intricate relationship: On the one hand, following the Keynesian approach which vehemently argues government spending as an important policy tool to be used to ensure a reasonable level of economic activity; correct short-term cyclical fluctuations in aggregate expenditure [47] and secure an increase in productive investment, thus providing a socially optimal direction for growth and development [44]. The empirical works that substantiate the above findings relate to the works of [2], [3],[10], [27], [50] and many others. The opposite view suggests that excessive state intervention in economic life affects growth performance in a negative way for two reasons: first, because government operations are often conducted inefficiently, hence they reduce the overall productivity of the economic system; and second because excessive government expenditure (usually accompanied by low taxation levels) distorts economic incentives and results in suboptimal economic decisions (see e.g. [6], [31], [16], [46], [26], [9], [28], [8], [17], [35], [41]). The two opposing views are indicative of the fact that for designing economic policy, one has to address the question as to whether the rate of economic growth can be taken as a product of the government's conscious efforts of increasing the quantum of public expenditure programs.

Wagner's law and the Keynesian theory also present two opposite perceptions in terms of the causal-effect relationship between public expenditure and economic growth. While according to Wagner's approach causality runs from growth in community output to public expenditure, the Keynesian approach assumes that causality runs from public expenditure to growth in community output [5]. Though the views of Wagner and Keynes collide with each other in

respect of direction of causality between public expenditure and growth, they are not generally and directly comparable. While Wagner's hypothesis applies to an expanding industrial economy, Keynes's prescription applies only when the economy is rolling on the recessionary phase of the trade cycle [29]. In both the mechanism, as according to Wagner as well as Keynes, there cannot be any direct link. There exists a network of hidden layers such as efficiency, externalities, alienation, accountability, government effectiveness, etc., which modify the causal-effect relationship, that is, affecting the response of the dependent to the independent factors. Thus to Keynes and Keynesians, fiscal expenditure acts as a stimulus to growth with stability. Outside Keynes writing, one can also presuppose the hypothesis that public expenditure causes growth during normalcy, particularly in underdeveloped regions [30].

In the Keynesian model, increase in public expenditure (on infrastructures) leads to higher economic growth. Contrary to this view, the neo-classical growth models argue that government fiscal policy does not have any effect on the growth of national output. However, it has been argued that government fiscal policy (intervention) helps to improve failure that might arise from the inefficiencies of the market. The seminal work of [6] opened new ground for the investigation of the impact of fiscal policy (public expenditure) on economic growth. In line with this, [7], [19] and [12], emphasized that government activity influences the direction of economic growth. Similarly, [15] pointed out that in the endogenous growth models, fiscal policy is very crucial in predicting future economic growth.

Several other researchers have attempted to examine the effect of public expenditure on economic growth. For instance, [34] examined the effect of public (consumption) expenditure on economic growth for a sample of 96 countries, and discovered a negative effect of public expenditure on growth of real output. [32] examined the association between government expenditures and economic growth in Thailand, by employing the Granger causality test. The results revealed that government expenditures and economic growth are not co-integrated. Moreover, the results indicated a unidirectional relationship, as causality runs from government expenditures to growth. [42] investigated the relationships between government expenditure and economic growth for a group of 30 OECD countries during the period 1970-2005. The regression results showed the existence of a long-run relationship between government

expenditure and economic growth. In addition, the authors observed a unidirectional causality from government expenditure to growth for 16 out of the countries, thus supporting the Keynesian hypothesis. However, causality runs from economic growth to government expenditure in 10 out of the countries, confirming the Wagner's law. Finally, the authors found the existence of feedback relationship between government expenditure and economic growth for a group of four countries.

In their paper, [22] studied the relationship between public expenditure and economic growth for a sample of wealthy countries for 1970-95 period, using various econometric methods. The authors submitted that more meaningful (robust) results are generated, as econometric problems are addressed. [4] indicated that government spending has a positive relationship with economic growth in Saudi Arabia. On his part, [4] studied the linkage between government expenditure and economic growth for a group of 115 countries during the period 1950-1980. The author used both cross section, time series data in his analysis, and confirmed a positive influence of government expenditure on economic growth.

[13] used an econometric model that takes public expenditure and quality by governance into consideration, in a cross-sectional study that included 71 countries. The results revealed that both the size and quality of the government are associated with economic growth. [2] employed multivariate co-integration and variance decomposition approach to examine the causal relationship between government expenditures and economic growth for Egypt, Israel, and Syria. In the bivariate framework, the authors observed a bi-directional (feedback) and long run negative relationships between government spending and economic growth. Moreover, the causality test within the trivariate framework (that include share of government civilian expenditures in GDP, military burden, and economic growth) illustrated that military burden has a negative impact on economic growth in all the countries. Furthermore, civilian government expenditures have positive effect on economic growth for both Israel and Egypt.

[36] examined the causal relationship between GDP and public expenditure for the US data during the period 1947- 2002. The causality results revealed that total government expenditure causes growth of GDP. On the other hand, growth of GDP does not cause expansion of government expenditure. Moreover, the estimation results indicated that public expenditure

raises the US economic growth. The authors concluded that, judging from the causality test Keynesian hypothesis exerts more influence than the Wagner's law in US. [37] employed the trivariate causality test to examine the relationship between government expenditure and economic growth, using data set on Greece, United Kingdom and Ireland. The authors found that government size granger causes economic growth in all the countries they studied. The finding was true for Ireland and the United Kingdom both in the long run and short run. The results also indicated that economic growth granger causes public expenditure for Greece and United Kingdom, when inflation is included.

[25] used the heterogeneous panel to investigate the impact of public expenditure on economic growth. The authors employed the GMM technique, and discovered that countries with large public expenditure tend to experience higher growth, but the effect varies from one country to another. [1] analyzed the relationship between government expenditure and economic growth in Saudi Arabia. The author reported that the size of government is very important in the performance of economy. He advised that government should increase its spending on infrastructure, social and economic activities. In addition, government should encourage and support the private sector to accelerate economic growth. [18] investigated the differential effects of various forms of expenditures on economic growth for a sample of 58 countries. Their findings indicated that government expenditures on education and defence have positive influence on economic growth, while expenditure on welfare has insignificant negative impact on economic growth.

[40] used a disaggregated approach to investigate the impact of public expenditure on economic growth for 30 developing countries in 1970s and 1980s. The authors confirmed that government capital expenditure in GDP has a significant positive association with economic growth, but the share of government current expenditure in GDP was shown to be insignificant in explaining economic growth. At the sectoral level, government investment and expenditure on education are the only variables that had significant effect on economic growth, especially when budget constraint and omitted variables are included. [21] examined the relationship between government expenditure and economic growth, by proposing a new framework for New Zealand.

The empirical results showed that higher government expenditure does not hurt consumption, but instead raises private investment that in turn accelerates economic growth.

[38] argued that the American public expenditure has grown too much in the last couple of years and has contributed to the negative growth. The author suggested that government should cut its spending, particularly on projects/programmes that generate least benefits or impose highest costs. In Sweden, [43] examined the effects of government expenditure on economic growth during 1960-2001 period. The author emphasized that government spends too much and it might slowdown economic growth.

In India, many authors have also attempted to examine public expenditure-economic growth relationship. For example, [47] in their attempt to test the nature and direction of causality between public expenditure and national income in India for the period 1950-1981, utilized the Granger-Sims framework and the analysis has been carried out both at the aggregate and the disaggregate level. The empirical evidence reported in this paper upholds both the Wagnerian and the Keynesian notions of causality as far as expenditures on administration, social services and defence are concerned, while it reaffirms the Keynesian alone for debt servicing.

[45] examined the effect of government development expenditure on economic growth during the period 1950-2007 in India. The authors discovered a significant positive impact of government expenditure on economic growth. They also reported the existence of cointegration among the variables.

[46] in their attempt to examine the validity of Wagner's Law in India over the period 1950-51 to 2007-08 has estimated the six versions of Wagner's hypothesis given by different economists with the help of Engle- Granger approach of cointegration and ECM. In their analysis two structural breaks have also been given to test the impact of structural changes in Indian economy on the growth of public expenditure. It has been found that the first structural break given for mild-liberalization period causes insignificant changes in the growth elasticity of public expenditure. However, the observed change in the elasticity due to the second phase of intensive liberalization is statistically significant. It is evident from the empirics that the public expenditure

is growing more rapidly than the income of the economy and hence validates Wagner's law in case of India. The observed increase in the share of public expenditure to GDP is the result of continued growth in the revenue expenditure on subsidies, interest payments, administrative and defence services which are non-developmental in effect.

To accomplish an econometric analysis of the relationship between public expenditure and growth during a twenty-year time period from 1990-91 to 2009-10, in Orissa State, [39] made an empirical study based on causality, stationarity and error-correction modelling. The results of the error-correction mechanism revealed that there is strong uni-directional causality from GSDP of Orissa to public expenditure and weak reverse causality between them. Accordingly, growth augmenting public expenditure or size of the government is stronger than its reverse causality and hence, the applicability of Wagner's law in the context of Orissa cannot be excluded.

In a similar study, [45] investigated the causal nexus between public expenditure and economic growth in India over the period from 1973 to 2012 using Cointegration approach and Vector Error Correction Model (VECM). The result confirms the existence of long-run equilibrium relationship between public expenditure and economic growth in India. The empirical results based on the error-correction model estimate indicate one-way causality runs from economic growth to public expenditure in the short-run and long-run, supporting Wagner's law of public expenditure.Analyzing the impact of public expenditure on economic growth in India was also done in another similar study by [10] covering the period from 1998 to 2012. Their study too includes annual data of total public expenditure (TPE) and Gross Domestic Product (GDP) per capita as indicator of economic growth. 'The ADF Unit Root Test, Cointegration Test and Granger Causality Test' techniques have been applied. The results of their study confirmed the existence of long run equilibrium relationship between public expenditure and economic growth as revealed by the linear stationarity in both the variables and there is a positive impact of public expenditure on economic growth. That is, GDP responds positively to a shock in TPE as confirmed by Impulse Response Function (IRF) results. The Granger Causality test also supported the result of IRF that there is a unidirectional relationship from TPE to GDP and not the other way. Thus, according to their finding, an increase in public expenditure encourages economic growth.

Against this background, the present work is an attempt to shed some further empirical light on the issue of public expenditure's ability to promote economic growth by focusing on the experience of an under developed economy of the Indian federation, namely the state of Nagaland where no such studies have been carried out in this pressing area of the nexus between public expenditure and economic growth. This particularly is an interesting case study because of the fact that Nagaland has been included under special category states and it is not financially sound, but there has been continuous significant increase in public expenditure. The additional spending undertaken by Nagaland government has been partly financed through internal resource mobilization (taxation) which is relatively low and the major part is through grants – in –aid from the central government and through increased government borrowing.

This trend has resulted in a recorded significant increase in state government's budget deficit, fiscal deficit and public debt. The fiscal deficit in absolute term has continuously increased from Rs. 19.17 crore in 1981-82 to Rs. 105.03 crore in 1991-92 and further increased to Rs. 521.56 crore in 2009-10. In terms of percentage to GSDP, fiscal deficit as a percentage of GSDP which stood at 13.02 percent in 1981-82 has remained almost the same at 13.36 percent in the year 1991-92. It has gradually declined to 5.08 percent in 2009-10. Similarly, the public debt in absolute term has continuously increased over the years from Rs. 65.59 crore in 1980-81 to Rs. 459.28 crore in 1990-91 and by the year 2009-10 it has skyrocketed to Rs. 4623.51 crore. Public debt as a percentage of GSDP has increased from 55.13 percent in 1980-81 to 70.11 percent in 1990-91. After 1992-93 public debt as a percentage of GSDP has been contained in between 40 – 50 percent which stood at 45.01 percent in 2009-10. All these shows the extra government spending that the state government has been carrying out over the years but could not provide enough stimuli to the growth of state's income. A major chunk (80 percent of non-plan revenue expenditure during 2007-08) is been spend on three components – salaries, pensions and interest payments. The salary expenditure alone hovers around 55 percent of total revenue expenditure net of interest and pension as against the norm of 35 percent adopted by the 13th Finance Commission. The total quantum of public expenditure on servicing of public debt (i.e. interest payment) has been mounting up over the years. These figures are depicted in Appendix Table – 1.1 through Table – 1.5.

The culminating issues are: failure to contain wasteful expenditures and reluctance to raise additional resources, competitive populism practiced by different political parties aspiring for power, growing need for increased financial assistance from the centre and increasing dependence on high cost borrowings; all which have further worsened the state's financial position. Hence, the issue of state government's fiscal developments thus requires thorough investigation.

The present study intends to inquire into the output effects of these fiscal developments through the examination of the existence and nature of long-run relationships between Nagaland state's income and the categories of public expenditure carried out by the state government over the years. An empirical study of the postulated relationships seems imperative in the context of Nagaland state. The long run pattern of growth and public expenditure in Nagaland provide a clear indication for government action in certain fields. During the ten years period from 1980-81 to 1990-91 and 1990-91 to 2000-01, while Gross Domestic Product (GDP) of India exhibited an annual average growth rate of 14.54 per cent and 14.17 per cent, Gross State Domestic Product (GSDP) of Nagaland increased on an average by 18.60 per cent and 19.65 per cent respectively. Also during the 30 years of study period, increased in GSDP of Nagaland has shown an increase by nearly double the figure of GDP which is 85.35 times and 43.64 times respectively. Although the rate of increase of GSDP of Nagaland over the periods has shown to be more than that of GDP of the country, the rate of increase in total public expenditure of Nagaland state is again lesser as compared with the rates of increase of the central Government and all states Combined total public expenditures. These figures are depicted in Table – 1.6 and

Table – 1.7

Table – 1.6

Growth Rates of GDP of India and GSDP of Nagaland at Current Prices

(1980-81 to 2009-10)

Period	No. of	GDP		GSDP	
		Annual Average	No. of times increased	Annual Average	No. of times increased

	Years	Growth Rates (%)	during the Period	Growth Rates (%)	during the Period
1980-81 to 1990-91	10	14.54	2.886	18.60	4.5062
1990-91 to 2000-01	10	14.17	2.762	19.65	5.0146
2000-01 to 2009-10	10	11.81	2.053	10.06	1.6073
1980-81 to 2009-10	30	13.50	43.643	16.02	85.3485

Source: CSO, RBI and Report of the Comptroller and Auditor General of India, Government of Nagaland and Epitome of C & A.G'S Report and Finance Accounts of the Government of Nagaland. 1980-81 to 2009-10.

Table – 1.7

Public Expenditure: A comparison at Current Prices

(1980-81 to 2009-10)

Category	Expenditure component	Average Annual Growth Rates (%) during the period				No. of times increased during the period			
		1980-81 1990-91	1990-91 2000-01	2000-01 2000-01	1980-81 2009-10	1980-81 1990-91	1990-91 2000-01	2000-01 2000-01	1980-81 2009-10
Central (India)	Rev. Exp.	17.70	14.22	12.62	14.83	10.17	2.78	2.28	62.28
	Cap. Exp.	14.29	04.16	08.96	09.06	2.80	0.50	1.36	12.48
	Dev. Exp.	15.97	09.04	14.25	13.05	3.40	1.38	2.79	38.64
	N-Dev. Exp.	17.47	14.87	10.04	14.09	4.01	3.01	1.60	51.10
	Total Exp.	16.55	10.97	11.48	12.97	3.62	1.83	1.97	37.82

All States Combined	Rev. Exp.	17.10	14.90	10.75	14.22	3.85	3.01	1.78	52.97
	Cap. Exp.	09.41	10.41	15.31	11.68	1.46	1.69	3.16	26.52
	Dev. Exp.	14.78	12.76	11.72	13.08	2.97	2.32	2.03	38.96
	N-Dev. Exp.	18.08	18.06	09.97	15.31	4.27	4.26	1.59	70.71
	Total Exp.	14.92	14.32	11.33	13.51	3.02	2.81	1.92	43.80
Nagaland	Rev. Exp.	16.46	11.87	09.69	12.64	3.59	2.07	1.52	34.53
	Cap. Exp.	12.96	09.94	16.00	12.94	2.38	1.58	3.41	37.50
	Dev. Exp.	16.69	08.26	11.07	11.95	3.68	1.21	1.86	28.59
	N-Dev. Exp.	16.22	15.61	10.55	14.10	3.50	3.27	1.73	51.30
	Total Exp.	15.77	11.56	10.85	12.71	3.33	1.99	1.80	35.18

Source: CSO, RBI and Report of the Comptroller and Auditor General of India, Government of Nagaland and Epitome of C & A.G'S Report and Finance Accounts of the Government of Nagaland. 1980-81 to 2009-10.

The increasing fiscal liabilities accompanied by a 'nil' return on Government investments and inadequate interest cost recoveries on loans and advances pose a serious unsustainable fiscal situation in medium to long term unless suitable measures are initiated to compress the non-plan revenue expenditure and to mobilize additional resources both through the tax and non-tax sources in the ensuing years (Comptroller and Auditor General of India (CAGI) 2008). The neglect of the manufacturing sector over the years has resulted in backwardness manifested in the form of social tension and unrests. Further, an unabated growth of revenue expenditure in relation to capital expenditure in the state exhibits the fact that the state could not build up all these years the capital base considered necessary for maximizing long term growth and development objectives. Thus, the present study is an attempt on causal analysis between the growth of public expenditure and economic growth.

The study covers a period of thirty years from 1980-81 to 2009-10 commencing with the year of mild economic reforms introduced in India in 1980. The 30 years study period from 1980-81 – 2009-10 has been considered for the reasons that, during the first 10 years period (1980-81 to 1990-91), there were mild economic reforms in the country, the middle 10 years period (1990-91 to 1999-2000) was considered the period of intensive economic reforms with the introduction of

New Economic Policy at the national level and the last 10 years period (2000-01 to 2009-10), we have considered to be post-intensive reforms period. This is the period during which the state has been alternately ruled by three opposing political parties – the regional Naga People's Council (NPC) Party in the first part, the Congress Party in the middle part and latter and continuing part by the Naga People's Front (NPF) led Democratic Alliance of Nagaland (DAN) Government. During this period the state has witnessed substantial changes in expenditure policies due to favourable relations with the centre and some recurrent social tensions in the state.

The remaining part of the paper has the following sections: Section III deals on the description and specification of variables and data sources. Section IV discuses the trends of public expenditure in Nagaland. In Section V, the methodology is discussed. The empirical results derived from estimation are covered in section VI. Finally, section VII provides some conclusions.

3. Description and Specification of Variables and Data Sources

To accomplish our analysis of the relationship between public expenditure and economic growth in Nagaland, we take the Gross State Domestic Product (GSDP) as an indicator of economic growth at current prices, during a 30- years time period from 1980-81 to 2009-10. The public expenditure data includes annual data of Total Public Expenditure (TPE) in both revenue and capital account. To make the results of the experimentation more reliable and exhaustive, public expenditure in its several components has been admitted. These components comprise (i) Total Public Expenditure (TPE) (both revenue and capital account), (ii) Developmental Expenditure (DE) (both revenue and capital account), (iii) Total Public Expenditure net of Interest Payments (IP), Debt Services (DS) and Repayments of Principal (RP) (TPE-ISR) and (iv) Public Expenditure on Social Services (PE-SS), (v) Public Expenditure on Economic Services (PE-ES) and (vi) public expenditure on General Services (PE-GS), all on both revenue and capital accounts. As the public expenditure data collected from several budget papers of the Government of Nagaland are used in their actual magnitudes in the study, the GSDP has also been taken at current prices to strike compatibility between the two sets of data. Time-series data on public expenditure have been collected from (i) Finance Accounts, (ii) Accounts At a Glance, (iii)

Demand for Grants and (iv) Reports of the 'Comptroller and Auditor General of India' Government of Nagaland. (1980-81 to 2009-10). Data on GSDP and other related variables have been collected from (i) Estimates of State Domestic Product of Nagaland, Directorate of Economics and Statistics, Government of Nagaland, (ii) several issues of Economic Survey, Government of Nagaland and (iii) Domestic Product of States in India:1980-81 to 2009-10, CSO and EPW Research Foundation.

Table 1: Descriptive Statistics of the Variables.

Statistics	GSDP	TPE	DE	TPE-ISR	PE-SS	PE-GS	PE-ES
Mean	2729.22	1243.66	754.63	985.54	346.77	489.53	405.52
Median	1704.87	790.40	504.80	642.96	232.75	308.09	276.06
Maxi.	10526.77	4241.96	2464.40	3391.12	1058.62	1777.55	1405.78
Mini.	119.73	117.25	83.29	110.10	37.35	33.99	45.92
Std.Dev.	2932.34	1155.48	677.05	909.29	304.36	479.33	376.92
Sum	81876.80	37309.88	22638.92	29566.29	10403.24	14686.00	12165.73
Obs.	30	30	30	30	30	30	30

Source: Various Reports

Table 1 gives the description of variables used in the estimation. They are all expressed in Rupees crore at current prices during the period 1980-81 to 2009-10. The GSDP averages 2729.22 crore and varies from 119.73 to 10526.77 with a standard deviation of 2932.34. Total public expenditure (TPE) averages 1243.66 and ranges from 117.25 to 4241.96 crore. Development expenditure (DE) averages 754.63 crore and goes from 83.29 to 2464.40 crore. Total public expenditure net of interest payment,servicing of debt and repayment of principal (TPE-ISR), with a mean of 985.54 crore, also varies from a minimum of 110.10 to a maximum of 3391.12 crore. The mean of social services spending (PE-SS) is 346.77 crore. It varies from a minimum of 37.35 to a maximum of 1058.62 crore. Expenditure on general services (PE-GS) varies from a minimum of 33.99 to a maximum of 1777.55 with an average of 489.53. Finally, the mean of expenditure on economic services (PE-ES) is 405.52 crore. It varies from a minimum of 45.92 to a maximum of 1405.78 crore with a standard deviation of 376.92 crore.

4. Trends of Public Expenditure in Nagaland

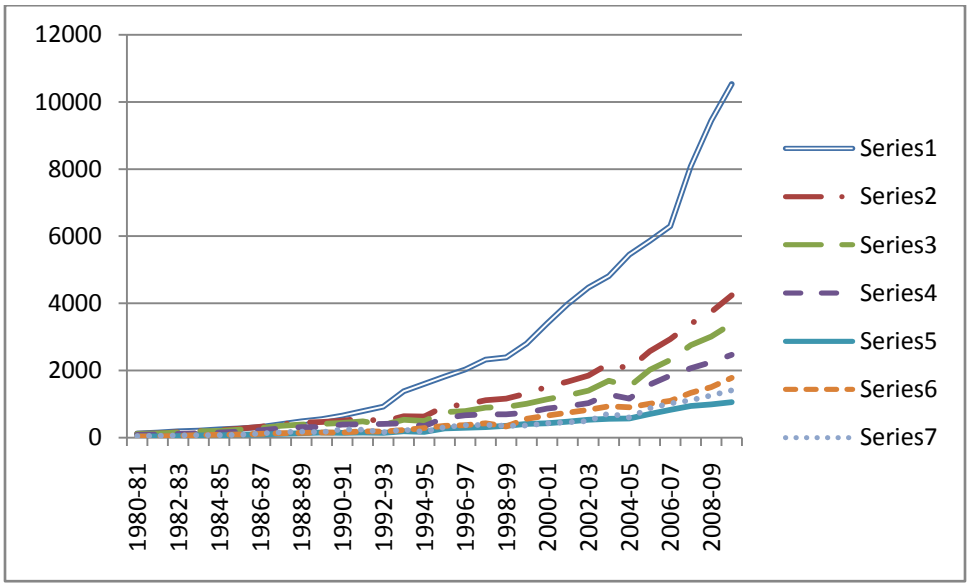
The magnitude of public expenditure is a measure of the size of the government. Since public bodies normally adjust revenue to their expenditure, the magnitude of public expenditure of the government of Nagaland can shed some light on its revenue raising capacity. During the study period 1980-81 – 2009-10, the gross state domestic product (GSDP) has increased on an average by 16.09 percent. While total voted expenditure of the Government of Nagaland (TPE) has increased on an average by 12.71 per cent per annum against total expenditure net of interest payment, servicing of debt and repayment of principal (TPE-ISR) by 12.10 per cent and development expenditure (DE) by 11.95 per cent. While expenditure on social services (PE-SS) increased on an average by 11.79 per cent, expenditure on general services (PE-GS) and expenditure on economic services (PE-ES) has increased by 14.10 per cent and 12.08 per cent respectively during the same period. The expenditure on the aggregate interest payment (IP) has increased by 17.17 per cent, debt services (DS) by 17.20 per cent and repayment of principal (RP) by 17.33 per cent per annum. During this period, GSDP at current prices has increased on an average by 16.09 per cent per annum. These trends are depicted in Table – 1 and Figure 1.

Table – 1: Average Annual Growth Rate (in %)

Year (Period)	GSDP	TPE	TPE-ISR	DE	PE-SS	PE-GS	PE-ES	IP	DS	RP
1980-81 to 1989-90	18.52	15.77	14.82	16.69	14.64	16.22	18.16	24.19	24.43	24.32
1990-91 to 1999-00	15.64	10.04	08.68	06.57	10.78	13.80	03.87	18.08	18.58	03.71
2000-01 to 2009-10	14.15	12.38	12.89	12.83	10.02	12.32	14.71	09.71	09.12	25.30
1980-81 to 2009-10	16.09	12.71	12.10	11.95	11.79	14.10	12.08	17.17	17.20	17.33

Source: Compiled from the statistics published in the 'Report of the Comptroller and Auditor General of India, Government of Nagaland and Epitome of C & A.G's Report, 'Finance Accounts', 'Accounts at a Glance' and Demand for Grants, Government of Nagaland. 1980-81 to 2009-10. Statistics released by: CSO as on 26.11.99;23.02.06;12.04.10(ON90);01.03.12(ON251).

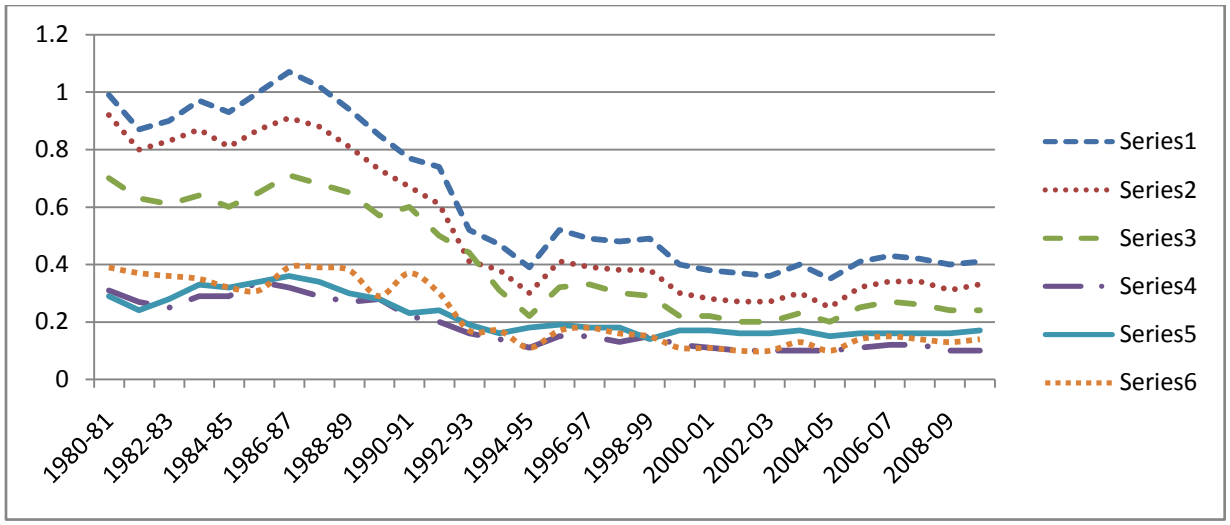
Figure – 1



Series-1:GSDP; Series-2:TPE; Series-3:TPE-IRS; Series-4:DE; Series-5:PE-SS; Seires-6:PE-GS; Seires-7:PE-ES.

Thus during the study period, there has been an increase in both GSDP and public expenditure of the government of Nagaland. Though the size of the government has expanded in absolute terms, its share in GSDP has diminished. This is evidenced from the ratios of public expenditure to GSDP. The ratio of total public expenditure to GSDP (TPE/GSDP) has reduced from 0.99 in 1980-81 to 0.41 in 2009-10. The ratios of total public expenditure net of interest payment, debt services and repayment of principal to GSDP (TPE-ISR/GSDP) and development expenditure to GSDP (DE/GSDP) have declined from 0.92 and 0.70 in 1980-81 to 0.33 and 0.24 in 2009-10 respectively. Likewise, the ratios of public expenditure on social services (PE-SS), on general services (PE-GS) and on economic services (PE-ES) have reduced from 0.31, 0.29 and 0.39 in 1980-81 to 0.10, 0.17 and 0.14 in 2009-10 respectively. This has been portrayed in Figure 2

Figure 2



Series-1:GSDP; Series-2:TPE; Series-3:TPE-IRS; Series-4:DE; Series-5:PE-SS; Seires-6:PE-GS; Seires-7:PE-ES.

5. Methodology

In order to get a settled conclusion in respect of the relationship between long-memory series in public expenditure and economic growth in the context of Nagaland state, we make use of the following tests: (i) Causality, (ii) Stationarity, (iii) Cointegration and Error-Correction model.

Causality test is a technique to ascertain whether one time-series would be useful in predicting another. In 'spectral' analysis, when one time-series is causing other(s), 'cross-spectral methods provide a useful way of describing the relationship between two (or more) variables. According to [24], in many realistic economic situations, one suspects that feedback is occurring. However, if so, conventional method of classical regression would not be a dependable instrument in such case. All the 'white noise assumptions under the classical regression do not necessarily hold for the long-memory series. The assumption of autoregression is unavoidable in long-memory series as the variance of the disturbance depends on past information. One of the short comings of the causality test for feedbacks between variables is that true and contemporaneous causality may not be implied even if Granger causality outcomes are statistically significant. Granger himself warned that if both the time-series variables (say X and Y) are driven by a common third process (say Z), the result could still be statistically significant, generating a false impression for the

presence of feedbacks. This feedback is attributed to the third variable Z, not X causing Y and Y causing X. This in-built deficiency in the Granger causality test, according to [50] is avoided if it is designed to handle pairs of variables at a time. Accordingly, in our analysis, only one pair of variables at a time has been put into Granger's causality test. In addition to this in-built deficiency in Granger's causality, another criticism comes from the advocates of Error-Correction Model (ECM) like [40] and [49]. In their opinion, if two or more time-series are co-integrated, at least in one situation, a temporal causality between them is inevitable and hence presence of causality cannot be shown independent of co-integration. In econometric study of times-series, the presence of co-integrated variables is a normal phenomenon[49]. [25] in their seminal work have shown how regression of one independent non-stationary series on the other, particularly 'random walks', would generate 'spurious' results detected by the significant 't' and the presence of strong autocorrelation among the residuals of the estimated equation. This phenomenon in empirical economics has been referred to as the problem of co-integration.

Most time-series data on macroeconomic variables are characterised by 'random walk' and therefore, non-stationary and thus have a unit-root problems. The presence of unit-root in the series concerned produces spurious outcomes and hence the forecasting power of the series seems suspect and erroneous. Even if the initial series is non stationary due to the presence of unit- root and is unavoidable to drop from the analysis for some reasons or other, by following the Box-Jenkins (1970) methodology, the series can be converted into a stationary series by adequate number of differencing. The number of differencing should be chosen in a manner that would not generate degrees of freedom problem as there exists a trade- off relationship between the number of differencing and the degrees of freedom, given the number of observations. For unit-root check for stationarity, though several methods are available, the Augmented Dickey-Fuller (ADF) test will be used in our analysis. It is a static formal test for ascertaining long-run equilibrium relationship between time-series variables.

Traditional causality test due to Granger has no validity if it is not accompanied with Error-Correction Mechanism (ECM). Error-Correction Mechanism is a dynamic technique which will be used in our analysis to do away with the failure of Granger's causality to offer the role of bringing long-run equilibria between two time-series variables. Even though two time series

exhibit a long-run equilibrium relationship, in the short-run they may be in disequilibrium. The error terms that appear in the causality regressions for these two variables may be called 'equilibrium error'. Hence, error correction is essential to see whether the time series under reference would capture the adjustment towards long-run equilibrium even though they are in disequilibrium in the short run. And also, ECM is more a scientific tool to be used for locating power of causality from Granger's results. The error- correction methodology used in our analysis is due to [21]. If Granger's causality confirms feedback (X↔Y) between two variables, say X and Y, there will follow two ECM linear regressions. If the error-correction terms corresponding to X=f(Y) and Y=g(X), each captures adjustments towards short-run equilibrium between X and Y measured in terms of significant F and at the same time the t-statistic corresponding to error-correction term in ECM equation is also significant, then only the 'strength of direction' from X→Y and Y→X would be the same. If in the presence of feedback, one error-correction term captures towards short-run equilibrium measured by significant F while the corresponding t-statistic for error-correction term is not significant, causality is said to be 'weak' in the long run. Reversely, it is 'strong' in the long run. This has been due to the decision rules as shown in the Table No. 3 below:

Table – 3: Decision Rules

F	t	Inference (in the long-run)
Significant	Significant	Both- way strong Granger causality
Significant	Not Significant	Weak Granger causality
Not Significant	Significant	strong Granger causality
Not Significant	Not Significant	Granger non-causality

Source: Narayan and Smyth (2004) p. 31

6. Econometric Results

A definite sequence in the use of time-series econometric methods has been followed in the current study which approximates [15] and [40].

Causality

Granger's causality test in its conventional design has been used to locate the type of feedback between the variables. The following are the causality equations from growth (GSDP) to public expenditure in its several divisions and vice versa:

$$TPE_t = \sum_{i=1}^{m} \alpha_i GSDP_{t-i} + \sum_{j=1}^{m} \beta_j TPE_{t-j} + u_{1t} \quad \text{..... (1)} \qquad \text{for (GSDP} \rightarrow \text{TPE)}$$

$$GSDP_t = \sum_{i=1}^{m} \chi_i TPE_{t-i} + \sum_{j=1}^{m} \delta_j GSDP_{t-j} + u_{2t} \quad \text{..... (2)} \qquad \text{for (TPE} \rightarrow \text{GSDP)}$$

$$DE_t = \sum_{i=1}^{m} \alpha_i GSDP_{t-i} + \sum_{j=1}^{m} \beta_j DE_{t-j} + u_{3t} \quad \text{..... (3)} \qquad \text{for (GSDP} \rightarrow \text{DE)}$$

$$GSDP_t = \sum_{i=1}^{m} \chi_i DE_{t-i} + \sum_{j=1}^{m} \delta_j GSDP_{t-j} + u_{4t} \quad \text{..... (4)} \qquad \text{for (DE} \rightarrow \text{GSDP)}$$

Likewise, other pairs of equations follow the pattern, one pair for GSDP→TPE-ISR and TPE-ISR→GSDP, GSDP→PE-SS and PE-SS →GSDP, GSDP→PE-ES and PE-ES→GSDP, GSDP→PE-GS and PE-GS→GSDP, till equation (12) for the seven variables. The estimated statistics are given in Table 4. The efficacy of Granger's results depends on the lag length and hence, the number of lags admitted in the analysis are i,j = 1,2,3. The choice of the number of lags depends on the number of observations as there exists a trade-off relationship between lag length and degrees of freedom, given the number of observations. It is true that the success of Granger's causality depends on the lag length. In spite of this, if lag length is made unduly large with a view to idealising Granger's results, the number of observations remaining the same, it would reduce degrees of freedom and hence would have adverse implications for inference building.

Table – 4

Results from Causality

Pairwise Granger Causality Tests

Sample: 1980 2009

Model	Lag	Null Hypothesis	Obs.	F-Statistics	Prob.	Decision
1	1	TPE does not Granger Cause GSDP	29	9.79035	0.00429	To be rejected
1	2	TPE does not Granger Cause GSDP	28	8.52209	0.00170	To be rejected
1	3	TPE does not Granger Cause GSDP	27	7.52645	0.00146	To be rejected
2	1	GSDP does not Granger Cause TPE	29	8.43633	0.00741	To be rejected
2	2	GSDP does not Granger Cause TPE	28	1.32154	0.28623	**To be accepted**
2	3	GSDP does not Granger Cause TPE	27	0.95197	0.43445	**To be accepted**
3	1	DE does not Granger Cause GSDP	29	13.4004	0.00113	To be rejected
3	2	DE does not Granger Cause GSDP	28	8.92033	0.00136	To be rejected
3	3	DE does not Granger Cause GSDP	27	5.44118	0.00669	To be rejected
4	1	GSDP does not Granger Cause DE	29	8.10253	0.00851	To be rejected
4	2	GSDP does not Granger Cause DE	28	2.95307	0.07219	**To be accepted**
4	3	GSDP does not Granger Cause DE	27	1.96777	0.15132	**To be accepted**
5	1	TPE-ISR does not Granger Cause GSDP	29	9.87749	0.00415	To be rejected
5	2	TPE-ISR does not Granger Cause	28	7.43374		To be rejected

		GSDP			0.00323	
5	3	TPE-ISR does not Granger Cause GSDP	27	6.94482	0.00219	To be rejected
6	1	GSDP does not Granger Cause TPE-ISR	29	7.82318	0.00958	To be rejected
6	2	GSDP does not Granger Cause TPE-ISR	28	1.11153	0.34609	**To be accepted**
6	3	GSDP does not Granger Cause TPE-ISR	27	1.01750	0.40578	**To be accepted**
7	1	PE-SS does not Granger Cause GSDP	29	13.8696	0.00096	To be rejected
7	2	PE-SS does not Granger Cause GSDP	28	8.22309	0.00202	To be rejected
7	3	PE-SS does not Granger Cause GSDP	27	6.49651	0.00302	To be rejected
8	1	GSDP does not Granger Cause PE-SS	29	0.88965	0.35425	**To be accepted**
8	2	GSDP does not Granger Cause PE-SS	28	4.37087	0.02461	To be rejected
8	3	GSDP does not Granger Cause PE-SS	27	3.18010	0.04632	To be rejected
9	1	PE-ES does not Granger Cause GSDP	29	6.23568	0.01918	To be rejected
9	2	PE-ES does not Granger Cause GSDP	28	5.03148	0.01540	To be rejected
9	3	PE-ES does not Granger Cause GSDP	27	2.75689	0.06919	To be accepted
10	1	GSDP does not Granger Cause PE-ES	29	14.7850	0.00070	To be rejected
10	2	GSDP does not Granger Cause	28	3.22174		**To be**

		PE-ES			0.05841	**accepted**
10	3	GSDP does not Granger Cause PE-ES	27	1.56182	0.22979	**To be accepted**
11	1	PE-GS does not Granger Cause GSDP	29	0.11042	0.74233	**To be accepted**
11	2	PE-GS does not Granger Cause GSDP	28	0.35864	0.70246	**To be accepted**
11	3	PE-GS does not Granger Cause GSDP	27	3.16072	0.04716	To be rejected
12	1	GSDP does not Granger Cause PE-GS	29	14.7144	0.00072	To be rejected
12	2	GSDP does not Granger Cause PE-GS	28	6.05436	0.00772	To be rejected
12	3	GSDP does not Granger Cause PE-GS	27	5.10554	0.00873	To be rejected

Source: Author's calculation

Granger's causality test produces the inference that (i) bilateral causality exists between growth (GSDP and total public expenditure (TPE) at lag 1. However, causality is unidirectional from TPE to GSDP at lags 2 and 3. That is, at lags 2 and 3, GSDP does not Granger cause TPE, (ii) bilateral causality exists between growth (GSDP) and developmental expenditure (DE) at lag 1. It is unidirectional from DE to GSDP at lags 2 and 3, i.e., at lags 2 and 3, GSDP does not Granger cause DE, (iii) bilateral causality exists between growth and total public expenditure net of interest payment, service of debt and repayment of principal (TPE-ISR) at lag 1 but unidirectional from TPE-ISR to GSDP at lags 2 and 3. i(v) bilateral causality exists between growth and public expenditure on social services (PE-SS) at lags 2 and 3 but unidirectional from PE-SS to GSDP because GSDP does not Granger Cause PE-SS at lag 1. (v) bilateral causality exists between growth and public expenditure on economic services (PE-ES) at lag 1 but unidirectional from PE-ES to GSDP because GSDP does not Granger Cause PE-ES at lags 2 and 3. (vi) bilateral causality exists between growth and public expenditure on general services (PE-GS) at lag 3 but unidirectional from GSDP to PE-GS, i.e., GSDP Granger cause PE-GS but not

vice-versa at lags 1 and 2. Thus in general, feedbacks exist between growth and public expenditure.

In order to strengthen the analysis, each time-series needs to be examined for its stationarity. If all or some series are determinately non-stationary or disequilibrium series, the conclusion received from causality will not be trustworthy. Moreover, only the indication of direction of causality from Granger's test statistics will not be adequate to finally conclude. Even though feedbacks exist, it remains to be seen whether such feedbacks are strong or weak.

Stationarity

The check for stationarity of each time-series has been made by the application of Augmented Dickey-Fuller (ADF) test for unit root. ADF test procedure assumes that initially all macroeconomic time-series are non-stationary. For GSDP series, the following is the ADF model:

$$\Delta GSDP_t = \alpha + \beta_t + \delta GSDP_{t-1} + \mu_i \sum_{i=1}^{m} GSDP_{t-i} + u_t \quad \text{..... (5) for GSDP variable}$$

$$\Delta TPE_t = \alpha + \beta_t + \delta TPE_{t-1} + \mu_i \sum_{i=1}^{m} TPE_{t-i} + u_t \quad \text{..... (6) for TPE variable and}$$

$$\Delta DE_t = \alpha + \beta_t + \delta DE_{t-1} + \mu_i \sum_{i=1}^{m} DE_{t-i} + u_t \quad \text{..... (7) for DE variable.}$$

where Δ is the first difference of the series, *m* is the lag order, α is constant, *t* is the time, δ and β_t are parameters and μ_t denotes stochastic error term. The practical rule for establishing the value m (lag order) is that it should be relatively small in order to save degrees of freedom, but large enough not to allow for the existence of autocorrelation in the residual μ_t. For example, if for (m)=1 the Durbin-Watson autocorrelation statistic is low, indicating first order autocorrelation, it would be sensible to increase m with the hope that such autocorrelation will disappear. μ_t represents a sequence of uncorrelated stationary error terms with zero mean and constant variance. Having determined the appropriate value of significance, we test the null hypothesis H_0: $\delta = 0$ versus alternative hypothesis H_1: $\delta \neq 0$. If $\delta = 0$, then the series is said to have a unit

root and is non-stationary. Hence, if the hypothesis, $\delta = 0$, is rejected for the above equation it can be concluded that the time series does not have a unit root and is integrated of order zero, i.e., it has stationarity properties.

Likewise, other four equations for the remaining four variables (TPE-ISR, PE-SS, PE-ES and PE-GS) follow whose estimated statistics are given in Table 5.

Table – 5

Stationarity Test-ADF Results

Sl. No.	Time-series	At Level			First Difference			Remark
		t-statistics	5% CV	Prob.	t-statistics	5% CV	Prob.	
1	GSDP	11.60429	-1.952910	1.0000	-5.521638	-1.954414	0.0000	Stationary I(1)
2	TPE	8.343840	-1.953381	1.0000	-6.696714	-3.580623	0.0000	Stationary I(1)
3	DE	5.523450	-1.953381	1.0000	-6.569581	-3.580623	0.0000	Stationary I(1)
4	TPE-ISR	5.909077	-2.971853	1.0000	-6.821355	-3.580623	0.0000	Stationary I(1)
5	PE-SS	0.378094	-3.574244	0.9982	-3.443110	-2.971853	0.0178	Stationary I(1)
6	PE-ES	4.072787	-2.971853	1.0000	-5.068800	-3.580623	0.0018	Stationary I(1)
7	PE-GS	7.253493	-1.952910	1.0000	-8.675433	-1.954414	0.0000	Stationary I(1)

Source: Author's Calculation

The outcomes of the application of the ADF test are presented as (i) unit root could not be ruled out from all the seven variables (series) at level irrespective of the number of lags given,

(ii) all the series being integrated of order I(1) at lags 1,2 and 3 excludes the possibility of the presence of unit root and hence determinately stationary after first difference.

Cointegration

Since all the variables under study are integrated of the same order, i.e., I(1), as given in Table–5, we can apply the Johansen-Juselius Maximum Likelihood Method of Cointegration (in short Johansen Cointegration) to obtain the number of cointegrating equations. The model is:

$$\Delta X_t = \sum_{J=1}^{m} \Gamma_j \Delta X_{t-i} + \prod X_{t-1} + e_t \quad \text{..... (8)}$$

Where, X_t is the 2x1 vector (i.e., GSDP and TPE) respectively. Δ (delta) is a symbol of difference operator, e_t is a 2x1 vector of residuals. The VECM model has information about the short-run and long-run adjustments to changes in X_t via the estimated parameters, Γ_j and $\prod$, respectively. The expression, $\prod X_{t-1}$ is the error correction and parameter $\prod$ can be factored into two separate matrices α and β, such as $\prod = \alpha\beta'$, where β' denotes the vector of cointegrating parameters while α is the vector of error-correction coefficient measuring the speed of convergence to the long run steady state.

If we found the variables are cointegrated after Johansen test then the variables have long run associationship. Also, if the variables are found to be cointegrated, we can specify an error correction model and estimate it using standard methods and diagnostic test. That is, when the variables are found to be cointegrated then error correction term should be there.

Table – 6 Cointegration Results

Test – 1

Series: GSDP TPE DE TPE-ISR

Lags interval (in first differences): 1 to 3

Unrestricted Cointegration Rank Test

Hypothesized	Trace	5 Percent	1 Percent

No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.983227	149.2826	47.21	54.46
At most 1 **	0.650994	42.99430	29.68	35.65
At most 2 *	0.447434	15.62496	15.41	20.04
At most 3	0.007747	0.202207	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level

Trace test indicates 3 cointegrating equation(s) at the 5% level

Trace test indicates 2 cointegrating equation(s) at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.983227	106.2883	27.07	32.24
At most 1 **	0.650994	27.36934	20.97	25.52
At most 2 *	0.447434	15.42276	14.07	18.63
At most 3	0.007747	0.202207	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level

Max-eigenvalue test indicates 3 cointegrating equation(s) at the 5% level

Max-eigenvalue test indicates 2 cointegrating equation(s) at the 1% level

Test – 2

Series: GSDPCP TSSCP TGSCP TESCP

Lags interval (in first differences): 1 to 3

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.814447	90.44840	47.21	54.46
At most 1 **	0.672297	46.65357	29.68	35.65
At most 2 *	0.449969	17.64675	15.41	20.04
At most 3	0.077752	2.104471	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level

Trace test indicates 3 cointegrating equation(s) at the 5% level

Trace test indicates 2 cointegrating equation(s) at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.814447	43.79483	27.07	32.24
At most 1 **	0.672297	29.00682	20.97	25.52
At most 2 *	0.449969	15.54228	14.07	18.63
At most 3	0.077752	2.104471	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level

Max-eigenvalue test indicates 3 cointegrating equation(s) at the 5% level

Max-eigenvalue test indicates 2 cointegrating equation(s) at the 1% level

In cointegration test, if test statistics (Trace test and Max-eigenvalue test) is more than critical value then we reject Null Hypothesis (H_0), and if test statistics is smaller than critical value, we cannot reject H_0, rather we accept H_0. In both Test – 1 and Test – 2 Trace test and Max-eigenvalue test indicates 3 cointegrating equations and 2 cointegrating equations at the 5% and

1% level respectively. That is, the variables under study have long run associationship or in other words, they move together in the long run.

Cointegration indicates that causality exists between the variables but it fails to show the causal direction. Engle and Granger suggest that if cointegration exists between two or more variables in the long run, then there must be unidirectional or bi-directional causality between these variables. Engle and Granger illustrates that the cointegrating variables can be represented by an ECM representation. In other words, according to Engle and Granger, if there is evidence of cointegration between two or more variables, than a valid error correction model should exist between the variables.

Error-Correction

In our context as growth (GSDP) and public expenditure in its several divisions are cointegrated, a VECM representation could have the following form: (for cointegrated variables between GSDP and TPE, a VECM representation could be as)

$$\Delta GSDP_t = \sum_{i=1}^{m} \beta_i \Delta GSDP_{t-i} + \sum_{i=1}^{m} \alpha_i \Delta TPE_{t-i} + Z1EC1_{t-1} + e_{1t} \quad \text{..... (9)}$$

$$\Delta TPE_t = \sum_{i=1}^{m} M_i \Delta GSDP_{t-i} + \sum_{i=1}^{m} N_i \Delta TPE_{t-i} + Z2EC2_{t-2} + e_{2t} \quad \text{..... (10)}$$

For cointegrated variables between GSDP and DE, a VECM representation could be as:

$$\Delta GSDP_t = \sum_{i=1}^{m} \beta_i \Delta GSDP_{t-i} + \sum_{i=1}^{m} \alpha_i \Delta DE_{t-i} + Z1EC1_{t-1} + e_{1t} \quad \text{..... (11)}$$

$$\Delta DE_t = \sum_{i=1}^{m} M_i \Delta GSDP_{t-i} + \sum_{i=1}^{m} N_i \Delta DE_{t-i} + Z2EC2_{t-2} + e_{2t} \quad \text{..... (12)}$$

Likewise, other equations follow the pattern for each pair of cointegrated variables. Here, β_i, α_i, M_i and N_i are the short run coefficients. EC1and EC2 are the error correction terms. e_{1t} and e_{2t}

are the residuals in the equations. $EC1_{t-1}$ is the lagged value of the residuals derived from the cointegrating regression of GSDP on TPE (equation (9)) and $EC2_{t-2}$ is the lagged value of the residuals derived from the cointegrating regression of TPE on GSDP (equation (10). A unidirectional causality from TPE to GSDP (i.e., TPE Granger cause GSDP) will occur in equation (9) if the set of estimated coefficient on the lagged TPE 'α_i' coefficient are non zero (short run causality), that means if 'α_i' is non zero then TPE cause GSDP in the short run. If an error-correction coefficient which is Z1 of $EC1_{t-1}$ is significant then TPE granger causes GSDP in the long run. That is, in other words, 'α_i' and $EC1_{t-1}$ are the short and long run coefficient respectively. Similarly, unidirectional causality from GSDP to TPE will occur in equation (10) if the set of estimated coefficients on the lagged GSDP 'M_i' coefficients are non zero in the short run. And in the long run, if the error-correction coefficients Z2 of $EC2_{t-2}$ is significant then there is a long run causality from GSDP to TPE. An error-correction term has long run information as it is derived from the long run cointegrating relationship. If all the coefficients are non zero, then it is called feedback relationship or bi-directional associationship between the variables. The ECM outcomes are given in Table – 6.

Table – 6: ECM Results

Direction	θ	Std. Error	t-Statistic	Prob.	R^2	DW	Wald Test	F
GSDP →TPE	0.306	0.236	1.298	0.2088	0.994	2.015	2.855	0.951*
TPE → GSDP	0.833	0.198	4.192*	0.0004	0.997	1.287	22.579*	7.526*
GSDP →DE	0.377	0.221	1.708*	0.0030	0.986	2.037	5.903	1.967*
DE → GSDP	0.899	0.208	4.308	0.0843	0.996	1.555	16.323*	5.441*
GSDP →TPE-ISR	0.424	0.229	1.851	0.0789	0.989	1.999	3.052	1.017*
TPE-ISR →GSDP	0.873	0.203	4.300*	0.0003	0.997	1.283	20.834*	6.944*
GSDP →PE-SS	0.683	0.234	2.913*	0.0086	0.992	2.120	9.540*	3.180*
PE-SS → GSDP	0.858	0.199	4.307*	0.0003	0.997	1.666	19.490*	6.496*
GSDP →PE-GS	0.216	0.265	0.816	0.4236	0.991	1.961	15.315*	5.105*
PE-GS→ GSDP	1.023	0.229	4.464*	0.0002	0.996	1.747	9.481*	3.160*
GSDP →PE-ES	0.220	0.220	0.999	0.3295	0.974	1.944	4.685	1.561*
PE-ES → GSDP	0.996	0.218	4.551*	0.0002	0.996	1.711	8.270*	2.756*

Source: Author's calculation

*Significant at 5% level. θ Long run coefficients, Wald test= the Chi-square value for the short run causality.

The error-correction mechanism (ECM) produces the outcomes which are presented as (i) the error correction terms capture the adjustment towards long run equilibrium measured by significant-t from TPE→GSDP, GSDP→DE, TPE-ISR→GSDP, GSDP→PE-SS, PE-SS→GSDP, PE-GS→GSDP, PE-ES→GSDP, (ii) the error-correction terms do not capture the adjustments towards long-run equilibrium measured by significant-F from GSDP→TPE, DE→GSDP, GSDP→TPE-ISR, GSDP→PE-GS, GSDP→PE-ES and (iii) these in combination along with the outcomes of Granger's causality test (Table – 4) produce the evidence of strong causality from TPE→GSDP, GSDP→DE, TPE-ISR→GSDP, GSDP→PE-SS, PE-SS→ GSDP, PE-GS→GSDP and PE-ES→GSDP and weak causality from GSDP→TPE, DE→GSDP, GSDP→TPE-ISR, GSDP→PE-GS and GSDP→PE-ES as per the Decision Rules in Table 3. Thus, in Nagaland during the study period of 30 years from 1980-81 to 2009-10, there exists strong causality from TPE to GSDP but weak causality from GSDP to TPE. Accordingly, growth augmenting public expenditure or size of the government is stronger than its reverse causality and hence, the applicability of Keynesian hypothesis in the context of Nagaland cannot be excluded. The results also suggests that there is both way strong causality only between growth (GSDP) and public expenditure on social services (PE-SS) in the long run and amongst the expenditure components there is only one way strong causality from GSDP to developmental expenditure (DE) in the long run.

Economic common sense would argue in favour of developmental expenditure (DE) causing GSDP keeping aside the other variants of public expenditure that current study admits. Development expenditure of a government is normally long-term investment expenditure which is intended to increase or result in acquisition of productive capacity of the economy. However, in Nagaland it might have happened that development expenditure of the government might have contained a gigantic amount of unsystematic expenditure that has caused leakages in the flow. Once the extend of such random expenditure is located, the inference so reached from data analysis could be comfortably upheld. By definition, development expenditure is the sum of disbursements to social and economic services under revenue and capital accounts of the budget

and hence there is the presence of a visible revenue component in the aggregate developmental expenditure. Revenue expenditure is equivalently stated as day-to-day management expenditure which is treated as good as consumption expenditure of the government. Since these are expended on repairs, maintenance and government consumption, they neither have the capacity to increase the life of the asset nor enhance the productive capacity of the asset. That is, they are growth neutral. While the revenue component of development expenditure is meant to meet everyday expenses for maintaining the physical assets of the economy, like roads, bridges, dams, communication and power transmission systems etc., the capital component of developmental expenditure is exclusively meant to increase productive capacity of the economy in the long run. If the revenue component of the aggregate development expenditure is vast, undeniably it would have no impact or very insignificant impact on the production of GSDP. In this case, it seems logical to support the view that development expenditure may not Granger cause GSDP. This logic has been upheld for Nagaland by empirical verification of the relevant budget data. Table – 7 below is a substantive attestation of why development expenditure in Nagaland has failed to leave a mark on the production of GSDP of the state.

Table – 7

Developmental Expenditure of the Government of Nagaland

(1980-81 to 2009-10)

(Rs. in crore)

Year	Develomental Revenue Expenditure	Develomental Capital Expenditure	Total Develomental Expenditure	Ratio of 2/4	Ratio of 3/GSDP
(1)	(2)	(3)	(4)	(5)	(6)
1980-81	58.50	24.77	83.29	0.70	0.21
1981-82	66.49	26.63	93.12	0.71	0.18
1982-83	76.93	32.53	109.46	0.70	0.18
1983-84	100.43	33.67	134.10	0.75	0.16
1984-85	118.84	26.69	145.53	0.82	0.11
1985-86	139.23	39.50	178.73	0.78	0.14
1986-87	165.65	52.08	217.73	0.76	0.17

1987-88	204.03	65.49	269.52	0.76	0.17
1988-89	234.18	75.24	309.42	0.76	0.16
1989-90	235.93	77.23	313.16	0.75	0.14
1990-91	276.49	77.93	390.01	0.71	0.12
1991-92	307.26	86.48	393.74	0.78	0.11
1992-93	338.31	64.09	402.40	0.84	0.07
1993-94	334.64	87.09	421.73	0.79	0.06
1994-95	304.00	40.89	344.89	0.88	0.03
1995-96	498.40	89.47	587.87	0.85	0.05
1996-97	543.93	121.47	665.40	0.82	0.06
1997-98	570.22	123.80	694.02	0.82	0.05
1998-99	551.99	145.16	697.15	0.79	0.06
1999-00	596.21	167.55	736.76	0.81	0.06
2000-01	666.90	195.89	862.79	0.77	0.06
2001-02	703.23	224.47	927.70	0.76	0.06
2002-03	708.61	315.91	1024.52	0.69	0.07
2003-04	938.07	341.07	1279.14	0.73	0.07
2004-05	826.68	336.64	1163.32	0.71	0.06
2005-06	1120.63	456.03	1576.66	0.71	0.08
2006-07	1201.83	643.32	1845.15	0.65	0.10
2007-08	1378.83	683.76	2062.59	0.67	0.08
2008-09	1540.69	703.93	2244.62	0.69	0.07
2009-10	1668.45	795.95	2464.40	0.68	0.08

Source: Source: Compiled from, “Accounts At A Glance” and “Finance Accounts”, statistics published by Sr. Deputy Accountant General (Accounts And Entitlements), Government of Nagaland.1980-81 to 2009-10. EPW Research Foundation.

The revenue component in the total development expenditure, on an average, is more than 70 per cent of the latter (Column 5 of Table 7). Hardly less than 30 per cent of the allocation is left for developmental purposes in true sense of the term which is used by the Government of Nagaland to increase the productive capacity of the economy. Moreover, the ratio of

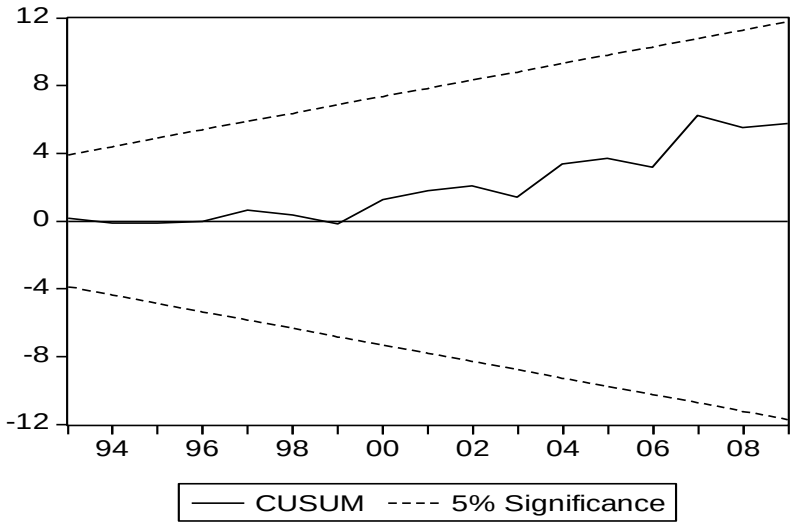
developmental capital expenditure to GSDP of Nagaland is seen to have around 10 per cent (Column 6 of Table 7. The ratio is truly insignificant to determine an ideal combination.

We also conducted diagnostic checking to ensure statistical efficiency or viability of our model. As given in Table – 8 below, the R^2 and adjusted R-squared are high at 0.733201 and 0.620864 respectively meaning that 73.32 percent and 62.08 percent respectively of change in GSDP is explained by the components of expenditure under consideration. The value of Durbin-Watson (DW) statistic, which test for whether there is first order serial correlation present in our data or not, is 2.39 which is desirable because the thump rule for DW test is that the value should lie between 1.5 to 2.5. Also, the test for efficiency or specification of the model passes the standard tests as there is no serial correlation and no ARCH effect except that residuals are not normally distributed. But still we can accept the model because our model reasonably fits the data as also indicated by CUSUM test as shown below:

Table – 8: Diagnostic Tests

Sl.No	Efficiency	Value	Prob.	Remark
1.	Breusch-Godfrey Serial Correlation LM Test Obs*R-squared	3.082510	0.079138	There is no Serial Correlation
2.	Heteroskedasticity (ARCH Test) Obs*R-squared	0.155455	0.693376	There is no ARCH effect
3.	Normality Test Jarque-Bera	24.19260	0.000006	Residuals are not Normally distributed
4.	R^2	0.733201		Desirable
5.	Adjusted R-squared	0.620864		Desirable
6.	Durbin-Watson stat	2.390474		Desirable

Source: Author's calculation.



7. Conclusion:

The study tested causal relationship between the size of a sub-national government (Nagaland State) measured in terms of its disbursements both in revenue and capital accounts and its gross state domestic product (GSDP) during a period of 30 years (1980-81 – 2009-10) commencing with the year of mild economic reforms introduced in India (1980-810) and culminating with the year of intensive economic reforms (2009-10) in the country. Public expenditure in its several divisions has been admitted for drawing causal relationship with GSDP. These divisions comprise (i) total voted disbursements on revenue and capital accounts, (ii) total voted disbursements on revenue and capital accounts net of the aggregate of interest payments, debt services and repayment of principal each is a committed expenditure of the government, it is to be met irrespective of the magnitude of GSDP and hence intuitively there can be no relation between these two variables. Tools from time-series econometrics, like Granger's conventional causality test, unit-root test for stationarity in ADF version, cointegration test and error-correction, have been used to draw inference. Though the causality test proves for the presence of feedbacks from GSDP to public expenditures in its several divisions admitted, ECM confirms that there is both way strong causality only between growth (GSDP) and public expenditure on social services (PE-SS) in the long run and amongst the expenditure components the only strong uni-directional causality is from GSDP to developmental expenditure (DE) in the long run. This relationship may be attributed to the increased demand of public for quality services from the

government sector with the opening of the national economy. Stated elsewhere in the study, the examination of causality between expenditure of the government of Nagaland and GSDP would shed some light on that type of public expenditure which would be conducive to long-run growth of the state. Undoubtedly, developmental expenditure could be a major source of growth. But the relationship between developmental expenditure of the government of Nagaland and GSDP in the framework of causality and error-correction is seen to be weak. This inference rivals the economic common sense that developmental expenditure ought to be a source of long-run growth. But it is a matter of reality in Nagaland. A scrutiny of the composition and behaviour of developmental expenditure of the government of Nagaland shows that revenue component in developmental expenditure is outsized and hence most part of this is maintenance expenditure leaving insignificantly small amount for the creation of physical capital at the economy level. The Government of Nagaland (2010) has admitted that one of the main factors contributing to the underdeveloped status of the Nagaland economy has been the 'low level of investment'. In order to increase the network of physical infrastructure, it is desirable that the revenue component in developmental expenditure is kept to the minimum; then only developmental expenditure could be a major source of growth in Nagaland. This requires strong commitment of the government followed by matching public actions.

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Appendix Table

Table – 1.1

Budget Deficit, Fiscal Deficit and Public Debt as a Percentage to GSDP in Nagaland (1980-81 to 2009-10)

(Rs. in crore)

Year	GSDP	Budget Deficit (BD)	Fiscal Deficit (FD)	Public Debt (PD)	% of BD to GSDP	% of FD to GSDP	% of PD to GSDP
1980-81	118.97	64.82	26.44	65.59	54.48	22.22	55.13
1981-82	147.23	13.90	-19.17	81.05	9.44	-13.02	55.05
1982-83	180.11	63.46	-27.96	121.94	35.23	-18.96	67.70
1983-84	208.65	92.40	-39.55	154.12	44.28	-18.96	73.87
1984-85	243.46	141.57	-14.88	175.37	58.15	-6.11	72.03
1985-86	273.40	115.39	26.80	215.94	42.21	9.80	78.98
1986-87	307.97	51.07	-21.96	263.12	16.58	-7.13	85.44
1987-88	395.19	14.40	-32.09	286.75	3.64	-8.12	72.56
1988-89	477.26	8.43	-49.52	312.92	1.77	-10.38	65.57
1989-90	545.26	99.83	-123.87	388.86	18.31	-22.72	71.32
1990-91	655.07	53.49	-88.85	459.28	8.17	-13.56	70.11
1991-92	785.93	163.20	-105.03	499.11	20.77	-13.36	63.51
1992-93	917.73	695.69	32.58	559.60	75.81	3.55	60.98
1993-94	1374.63	188.51	-48.56	559.94	13.71	-3.53	40.73
1994-95	1595.98	220.89	-4.87	659.41	13.84	-0.31	41.32
1995-96	1813.76	-81.55	-193.53	819.52	-4.50	-10.67	45.18
1996-97	2024.10	-10.45	-122.74	930.36	-0.52	-6.06	45.96
1997-98	2323.83	669.50	-256.42	1169.03	28.81	-11.03	50.31
1998-99	2385.23	558.34	-165.63	1383.25	23.41	-6.94	57.99
1999-00	3309.05	86.13	-182.91	1519.00	2.60	-5.53	45.90

2000-01	3939.97	12.53	-271.44	1835.40	0.32	-6.89	46.58
2001-02	4561.52	-70.96	-336.96	2133.41	-1.56	-7.39	46.77
2002-03	5109.63	1199.95	-494.98	2558.24	23.48	-9.69	50.07
2003-04	5511.88	198.73	157.40	2402.04	3.61	2.86	43.58
2004-05	5895.17	0	-218.38	2645.67	0.00	-3.70	44.88
2005-06	6245.97	0	-306.41	3067.57	0.00	-4.91	49.11
2006-07	6804.56	0	-156.03	3341.14	0.00	-2.29	49.10
2007-08	8074.95	0	-397.28	3593.28	0.00	-4.92	44.50
2008-09	9436.07	0	-340.63	4069.77	0.00	-3.61	43.13
2009-10	10272.88	0	-521.56	4623.51	0.00	-5.08	45.01

Source: Compiled from the statistics published in the 'Report of the Comptroller and Auditor General of India, Government of Nagaland and Epitome of C & A.G's Report, 'Finance Accounts', 'Accounts at a Glance' and Demand for Grants, Government of Nagaland. 1980-81 to 2009-10. Statistics released by: CSO as on 26.11.99;23.02.06;12.04.10(ON90);01.03.12(ON251).

Table – 1.2

Expenditure on Pension Payments and as a Per cent of GSDP, Revenue Receipt and Revenue Expenditure in Nagaland (1980-81 to 2009-10)

Rs. in crore

Year	Pension Payments	As a % of GSDP	As a % of Revenue Receipt	As a % of Revenue Expenditure
1980-81	0.64	0.54	0.45	0.70
1981-82	1.00	o.68	0.92	0.99
1982-83	1.13	0.63	0.84	0.88
1983-84	1.07	0.51	0.66	0.65
1984-85	1.74	0.71	0.83	0.90
1985-86	2.31	0.84	0.78	1.01
1986-87	3.41	1.11	1.13	1.27

1987-88	7.40	1.87	2.03	2.25
1988-89	8.18	1.71	2.07	2.24
1989-90	7.99	1.46	2.26	2.10
1990-91	10.15	1.55	2.47	2.41
1991-92	11.52	1.46	2.47	2.39
1992-93	16.43	1.79	3.24	4.09
1993-94	16.99	0.01	2.88	3.10
1994-95	27.62	1.73	4.46	4.72
1995-96	30.90	1.70	4.21	3.70
1996-97	36.35	1.80	4.25	4.29
1997-98	44.39	1.91	5.15	4.49
1998-99	49.95	2.09	5.05	4.93
1999-00	58.84	1.78	5.20	5.16
2000-01	87.56	2.22	6.98	6.79
2001-02	112.26	2.41	8.48	7.87
2002-03	133.38	2.81	9.90	8.85
2003-04	140.81	2.69	5.97	7.77
2004-05	133.83	2.32	7.28	7.94
2005-06	179.42	2.81	7.91	8.71
2006-07	201.74	2.90	2.78	9.08
2007-08	259.73	3.62	8.67	10.10
2008-09	228.96	3.03	6.73	7.93
2009-10	279.06	3.29	7.50	8.58

Source: Compiled from the statistics published in the 'Report of the Comptroller and Auditor General of India, Government of Nagaland and Epitome of C & A.G's Report, 'Finance Accounts', 'Accounts at a Glance' and Demand for Grants, Government of Nagaland. 1980-81 to 2009-10. Statistics released by: CSO as on 26.11.99;23.02.06;12.04.10(ON90);01.03.12(ON251).

Table – 1.3

Expenditure on Interest Payments and as a Per cent of GSDP, Revenue Receipt and Revenue Expenditure in Nagaland 1980-81 to 2009-10

Rs. in crore

Year	Interest Payments	As a % of GSDP	As a % of Revenue Receipt	As a % of Revenue Expenditure
1980-81	3.31	2.78	2.32	3.62
1981-82	4.53	3.08	4.18	4.51
1982-83	5.55	3.08	4.15	4.33
1983-84	7.97	3.82	4.92	4.82
1984-85	12.67	5.20	6.05	6.55
1985-86	15.96	5.84	5.37	7.00
1986-87	20.22	6.56	6.72	7.52
1987-88	23.83	6.03	6.53	7.24
1988-89	28.89	6.05	7.33	7.91
1989-90	28.89	5.30	8.17	7.59
1990-91	30.90	4.72	7.52	7.35
1991-92	43.93	5.59	9.42	9.11
1992-93	44.07	4.80	8.70	10.98
1993-94	55.19	4.01	9.37	10.06
1994-95	67.21	4.21	10.85	11.50
1995-96	85.11	4.69	11.60	10.20
1996-97	90.20	4.46	10.55	10.65
1997-98	112.62	4.85	13.08	11.40
1998-99	134.83	5.65	13.63	13.32
1999-00	152.28	4.60	13.46	13.35
2000-01	177.09	5.28	14.12	13.73
2001-02	200.47	5.29	15.14	14.05
2002-03	214.58	5.01	15.93	14.25
2003-04	234.74	4.48	9.95	12.95

2004-05	249.62	4.32	13.57	14.82
2005-06	253.89	3.98	11.20	12.32
2006-07	279.69	4.02	10.09	12.59
2007-08	270.46	3.77	9.03	10.51
2008-09	313.99	4.16	9.23	18.87
2009-10	362.51	4.28	9.75	11.15

Source: Compiled from the statistics published in the 'Report of the Comptroller and Auditor General of India, Government of Nagaland and Epitome of C & A.G's Report, 'Finance Accounts', 'Accounts at a Glance' and Demand for Grants, Government of Nagaland. 1980-81 to 2009-10. Statistics released by: CSO as on 26.11.99;23.02.06;12.04.10(ON90);01.03.12(ON251).

Table – 1.4

Expenditure on Salaries & Wages and as a Per cent of GSDP, Revenue Receipt and Revenue Expenditure in Nagaland 1980-81 to 2009-10

Rs. in crore

Year	Salaries & Wages	As a % of GSDP	As a % of Revenue Receipt	As a % of Revenue Expenditure
1999-00	522.28	17.60	46.16	45.78
2000-01	678.46	20.23	54.10	52.58
2001-02	712.09	18.79	53.76	49.90
2002-03	695.52	16.24	51.64	46.17
2003-04	768.19	15.88	32.55	42.37
2004-05	824.78	15.08	44.84	48.96
2005-06	953.71	14.96	42.07	46.28
2006-07	1020.08	14.66	36.79	45.90
2007-08	1143.25	15.95	38.16	44.44
2008-09	1249.39	16.54	36.74	53.24
2009-10	1442.85	17.03	38.79	55.26

Source: Compiled from the statistics published in the 'Report of the Comptroller and Auditor General of India, Government of Nagaland and Epitome of C & A.G's Report, 'Finance Accounts', 'Accounts at a Glance' and Demand for Grants, Government of Nagaland. 1980-81 to 2009-10. Statistics released by: CSO as on 26.11.99;23.02.06;12.04.10(ON90);01.03.12(ON251).

Table – 1.5

Total Revenue, Total Expenditure, Total Public Debt and Total Development Expenditure as a Percentage to GSDP at Current Prices in Nagaland (1980-81 – 2009-10)

Rs. in crore

Year	GSDP	Total Revenue (TR)	% of TR to GSDP	Total Debt (TD)	% of TD to GSDP	Total Expdt. (TE)	% of TE to GSDP	Dev. Expdt (DE)	% of DE to GSDP
1980-81	118.97	142.91	120.12	65.59	55.13	117.25	98.55	83.29	70.00
1981-82	147.23	108.39	73.62	81.05	55.04	128.47	87.25	93.12	63.24
1982-83	180.11	133.82	74.30	121.94	67.70	162.62	90.28	109.46	60.77
1983-84	208.65	161.88	77.58	154.12	73.86	202.29	96.95	134.10	64.27
1984-85	243.46	209.47	86.034	175.37	72.03	222.44	91.36	145.53	59.77
1985-86	273.40	297.34	108.75	215.94	78.98	272.54	99.68	178.73	65.37
1986-87	307.97	300.65	97.62	263.12	85.43	328.28	106.59	217.73	70.69
1987-88	395.19	365.11	92.39	286.75	72.56	403.24	102.03	269.52	68.20
1988-	477.26	394.15	82.58	312.92	65.56	450.67	94.42	309.42	64.83

89									
1989-90	545.26	353.40	64.81	388.86	71.31	465.95	85.45	313.16	57.43
1990-91	655.07	410.94	62.73	459.28	70.11	507.22	77.42	390.01	59.53
1991-92	785.93	466.54	59.36	499.11	63.50	578.80	73.64	393.74	50.09
1992-93	917.73	506.65	55.20	559.60	60.97	580.60	63.26	402.40	43.84
1993-94	1374.63	589.06	42.85	559.94	40.73	644.91	46.91	421.73	30.67
1994-95	1595.98	619.18	38.79	659.41	41.31	628.69	39.39	344.89	21.60
1995-96	1813.76	733.79	40.45	819.52	45.18	936.40	51.62	587.87	32.41
1996-97	2024.10	855.13	42.24	930.36	45.96	1034.43	51.10	665.40	32.87
1997-98	2323.83	860.99	37.05	1169.03	50.30	1121.50	48.26	694.02	29.86
1998-99	2385.23	989.38	41.47	1383.25	57.99	1029.52	43.16	697.15	29.22
1999-00	3309.05	1131.46	34.19	1519.00	45.90	1320.13	39.89	736.76	22.26
2000-01	3939.97	1254.10	31.83	1835.40	46.58	1514.63	38.44	862.79	21.89
2001-02	4561.52	1324.53	29.03	2133.41	46.76	1665.83	36.51	927.70	20.33
2002-03	5109.63	1346.90	26.36	2558.24	50.06	1847.98	36.16	1024.52	20.05
2003-	5511.88	2359.79	42.81	2402.04	43.57	2204.12	39.98	1279.14	23.20

04									
2004-05	5895.17	1839.52	31.20	2645.67	44.87	2064.07	35.01	1163.32	19.73
2005-06	6245.97	2267.20	36.29	3067.57	49.11	2578.40	41.28	1576.66	25.24
2006-07	6804.56	2772.51	40.74	3341.14	49.10	2932.62	43.09	1845.15	27.11
2007-08	8074.95	2996.02	37.10	3593.28	44.49	3393.74	42.02	2062.59	25.54
2008-09	9436.07	3400.89	36.04	4069.77	43.12	3742.61	39.66	2244.62	23.78
2009-10	10272.88	3719.76	36.20	4623.51	45.00	4241.96	41.29	2464.40	23.98

Source: Compiled from the statistics published in the 'Report of the Comptroller and Auditor General of India, Government of Nagaland and Epitome of C & A.G's Report, 'Finance Accounts', 'Accounts at a Glance' and Demand for Grants, Government of Nagaland. 1980-81 to 2009-10. Statistics released by: CSO as on 26.11.99;23.02.06;12.04.10(ON90);01.03.12(ON251).

Table – 1.6

Growth Rates of GDP of India and GSDP of Nagaland at Current Prices

(1980-81 to 2009-10)

Period	No. of Years	GDP		GSDP	
		Annual Average Growth Rates (%)	No. of times increased during the Period	Annual Average Growth Rates (%)	No. of times increased during the Period
1980-81 to 1990-91	10	14.54	2.886	18.60	4.5062

1990-91 to 2000-01	10	14.17	2.762	19.65	5.0146
2000-01 to 2009-10	10	11.81	2.053	10.06	1.6073
1980-81 to 2009-10	30	13.50	43.643	16.02	85.3485

Source: CSO, RBI and Report of the Comptroller and Auditor General of India, Government of Nagaland and Epitome of C & A.G'S Report and Finance Accounts of the Government of Nagaland. 1980-81 to 2009-10.

Table – 1.7

Public Expenditure: A comparison at Current Prices

(1980-81 to 2009-10)

Category	Expenditure component	Average Annual Growth Rates (%) during the period				No. of times increased during the period			
		1980-81 1990-91	1990-91 2000-01	2000-01 2000-01	1980-81 2009-10	1980-81 1990-91	1990-91 2000-01	2000-01 2000-01	1980-81 2009-10
Central (India)	Rev. Exp.	17.70	14.22	12.62	14.83	10.17	2.78	2.28	62.28
	Cap. Exp.	14.29	04.16	08.96	09.06	2.80	0.50	1.36	12.48
	Dev. Exp.	15.97	09.04	14.25	13.05	3.40	1.38	2.79	38.64
	N-Dev. Exp.	17.47	14.87	10.04	14.09	4.01	3.01	1.60	51.10
	Total Exp.	16.55	10.97	11.48	12.97	3.62	1.83	1.97	37.82
All States Combined	Rev. Exp.	17.10	14.90	10.75	14.22	3.85	3.01	1.78	52.97
	Cap. Exp.	09.41	10.41	15.31	11.68	1.46	1.69	3.16	26.52
	Dev. Exp.	14.78	12.76	11.72	13.08	2.97	2.32	2.03	38.96

	N-Dev. Exp.	18.08	18.06	09.97	15.31	4.27	4.26	1.59	70.71
	Total Exp.	14.92	14.32	11.33	13.51	3.02	2.81	1.92	43.80
Nagaland	Rev. Exp.	16.46	11.87	09.69	12.64	3.59	2.07	1.52	34.53
	Cap. Exp.	12.96	09.94	16.00	12.94	2.38	1.58	3.41	37.50
	Dev. Exp.	16.69	08.26	11.07	11.95	3.68	1.21	1.86	28.59
	N-Dev. Exp.	16.22	15.61	10.55	14.10	3.50	3.27	1.73	51.30
	Total Exp.	15.77	11.56	10.85	12.71	3.33	1.99	1.80	35.18

Source: CSO, RBI and Report of the Comptroller and Auditor General of India, Government of Nagaland and Epitome of C & A.G'S Report and Finance Accounts of the Government of Nagaland. 1980-81 to 2009-10.