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GOVERNMENT EXPENDITURE AND ITS IMPACT ON ECONOMIC GROWTH: A CASE STUDY OF NAGALAND STATE

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ABSTRACT

This paper investigates the growth effects of government expenditure in Nagaland state over a period from 1980-81 to 2009-10, with a particular focus on sectoral expenditures. We disentangled governmental expenditures and used a multivariate co-integration analysis and Vector Error Correction Model (VECM) to examine the effect of each sector on economic growth, both in long and short runs. Seven sectors have been taken into account: Administrative Services, Education, Health, Agriculture, Transport and Communication, Rural Development and Power. Our findings reveal that in the long-run, expenditure variables are found significant to explain the dependent variable, i.e, economic growth (GSDP). In the short-run, expenditure on education is found to be positively significant and expenditure on agriculture shows a negative relationship with the economic growth. However, expenditure on health, administration, transport and communication and rural development are not significant. Accordingly, the allocation of government resources towards education sector should be favoured in order to enhance growth.

KEY WORDS: *Public Expenditure, Gross State Domestic Product, Education*

1.INTRODUCTION

Economic growth is fundamental for sustainable development. It is not possible, for a developing country, to ameliorate the quality of life of its growing population without economic growth. This latter is mainly enhanced by the expansion of infrastructure, the improvement of education and health services, the encouragement of foreign and local investments, low cost housing, environmental protection, and the strengthening of the agricultural sector. Dealing with these issues will result in a great amount of money spending by the government and certainly lead to sustainable budget deficits. However, this would generate a large number of socially useful jobs and business opportunities. In Nagaland state, economic growth over interrupted periods of time has been seen along with political and social upheavals. Economic growth in Nagaland is currently receiving the attention of government, business, labour, and the different sectors of the economy after the signing of the Ceased Fire Agreement between the Central Government and Insurgent Groups (Also called Naga Political Groups) of the state in 1997, although insurgency still persists. This issue is one of the most important challenges facing the state that usually do not provide a stable platform for sustainable economic and employment growth.

Economically speaking, during the study period from 1980-81 – 2009-10, the state government has been facing a range of challenges in building the foundation

for sustainable growth, including lack of infrastructure, weak education and health systems, high unemployment, weak governance systems. However, in the last decades, the state has witnessed an expansion in construction activities such as roads, bridges, houses, and other facilities.

On the effect of the size of government expenditure on long-run economic growth, some researchers highlighted the importance of human capital, and focused on the role of education as a determinant of economic growth. Others pointed out that continual capital formation is essential for encouraging productive enterprises. The support of long-term productive projects in agriculture sector would offer opportunities to unskilled and semiskilled unemployed workers. Moreover, expenditure on infrastructure and health, among other variables, can stimulate economic progress and have an impact on the quantity and efficiency of the factors of production.

The objective of this paper is to investigate the growth effects of public expenditure sector-wise in Nagaland state. Thus, we examine the importance of government expenditure on human capital (e.i. education, administration, and health) and agriculture, and we explore their impacts on economic growth. To do so, we will use cointegration analysis and vector error correction model (VECM) for annual data from 1980-81 to 2009-10.

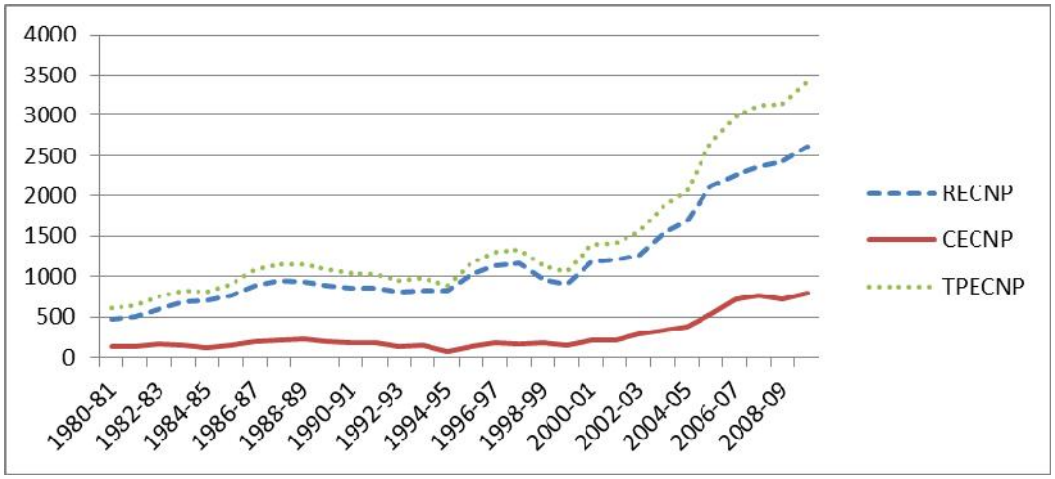
The rest of the paper is organized as follows: section II presents an overview of trends of public expenditure and economic performance in Nagaland, and section III explores the theoretical and empirical evidence related to this subject. While section IV presents the methodology used in this study and section V the data description. Empirical results are discussed in section VI. The last section is dedicated to summary and conclusion.

2.AN OVERVIEW OF PUBLIC EXPENDITURE PATTERN AND ECONOMIC GROWTH IN NAGALAND

In Nagaland, after the attainment of statehood in 1963, the successive governments have played a major role for well being of the public as well as for the economic development. Human development was considered as an important policy indicator and all the successive governments have invested more on public health and education. Eradication of poverty too was considered as one of the major tasks of the government.

Government expenditure can be typically categorized into two components: revenue expenditure and capital expenditure. Revenue expenditure is further divided into plan and non plan revenue expenditure. Plan revenue expenditure pertains to central plan and central assistance for states and union territory plans. Non plan revenue expenditure covers a wide variety of general, social and economic services of the government. The major items of non-plan revenue expenditure are interest payments, defence services and subsidies. While those expenditures of government which lead to the creation of physical or financial assets or reduction in recurring financial liabilities fall under the category of capital expenditure, such expenditures pertain to payments on acquisition of assets like land, buildings, machinery, equipment, etc.

Figure 1: Public Expenditure Trends in Nagaland

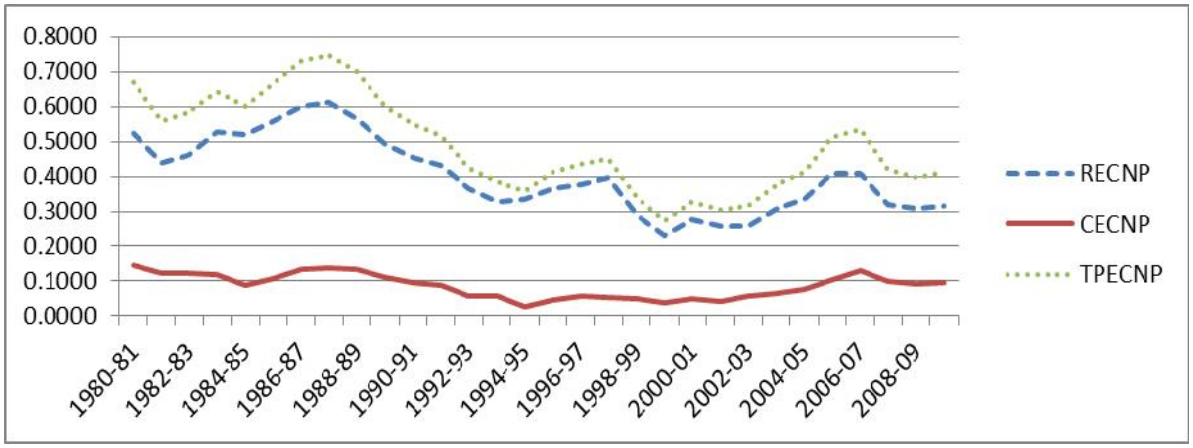


Note: Vertical axis measures government expenditure in Rs. crore and horizontal axis indicates year.

Figure 1 shows the pattern of the government expenditure at constant prices. As shown in the figure, over the period of study, total government expenditure has steeply increased after the year 2001-02, while government revenue expenditure has also increased about fourth fold. The increase in both revenue and capital expenditure, however, has not been consistent up to the year 1999-2000.

The size of any government depends on several factors. However, in many countries, the size of government depends on political factors rather than market forces. Figure 2 shows the size of government in term of government expenditure as a percentage of GSDP in Nagaland state.

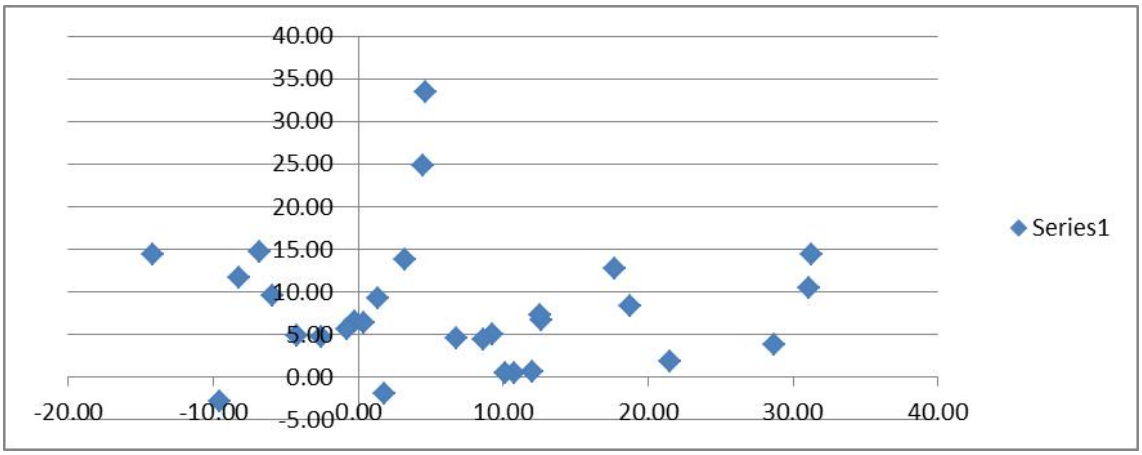
Figure 2: Public Expenditure as a Percentage of GSDP in Nagaland



Note: Vertical axis measures expenditure as % of GSDP and horizontal axis indicates year.

Over the time period under consideration, as depicted in figure 2, the government expenditure as a percentage of GSDP has gone down. The average government total expenditure as a percentage of GSDP was 48.86 percent during the period under consideration, which is relatively high. During the same period the average government revenue expenditure as a percentage of GSDP was also high at 40.21 percent but the average government capital expenditure as a percentage of GSDP was relatively low at 08.66 percent only. Figure 3 illustrates the relationship between growth of the size of government and economic growth. (Total government expenditure as a share of GSDP is used to measure the size of government). As displayed in Figure 3, there is no clear relationship between the growth of the size of government and economic growth.

Figure 3: Growth of Public Expenditure and Economic Growth

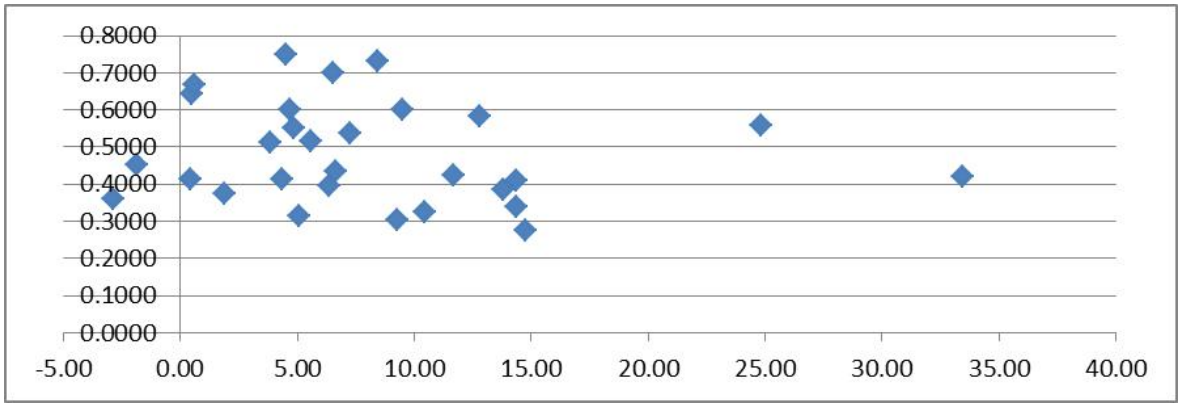


Note: Vertical axis measures growth of public expenditure and horizontal axis indicates growth of real GSDP.

Apart from examining the relationship between growth of the size of government and economic growth, we also examine relationship between size of government (in term of government total expenditure as a percentage of GSDP) and economic growth. In general, when a small government fails to focus on real issues and efficiently provide core functions such as protection of persons and property, a legal system, infrastructure, etc., there is no

reason to believe that it promotes economic growth. Hence, governments- including those that are small- can be expected to register slow rates of economic growth when these core functions are poorly performed (Gwartney *et al* 1998). Nevertheless, as illustrated in Figure 4, there is also no clear trade-off between size of government and economic growth in Nagaland state.

Figure 4: Government Spending and Economic Growth



Note: Vertical axis measures growth of real GSDP and horizontal axis measures public expenditure as % of GSDP

This evidence indicates that size of government is not a driving factor for economic growth. Nevertheless, one cannot ignore the role of government in economic growth for several reasons. First, as noted by Gwartney *et al* (1998), unless proper adjustment is made for how well the core functions are performed, the empirical relationship between size of government and economic growth is likely to be a loose one. Secondly, different categories of government expenditures might play a different role in economic development. An in-depth analysis employing such disaggregated data will deepen our understanding of the relationship between government expenditure and economic growth. As such, an attempt will be made in this study to look into the intricacies of the relationship between the growth of public expenditure in its several categories vis-à-vis the rate of economic growth measured in terms of GSDP of Nagaland state.

During the 30 years of study period, per capita GSDP in Nagaland has risen from Rs. 11,803 in 1980-81 to Rs. 28,179 in 2009-10, at constant 2004-05 prices. Such improvement can be attributed to the expansion of infrastructure, increased number of government employees and the encouragement of business and entrepreneurship. However, the succession of political events and insurgent problems have caused an unstable situation for rapid economic growth and hampered relatively the development process that started since the attainment of statehood in 1963. Nagaland state is suffering from the burden of accumulated debt that is accompanied by sustainable budget deficits. If the government spending is used to finance investments in roads, education, health, agriculture, and other areas, these investments will have direct social and economic beneficial effects on the state. By providing new opportunities and expanding the capabilities of people, this spending play an important role in ensuring a sustainable economic growth. The size and role of the public sector in the Nagaland economy has changed over time. Although total government expenditure as percentage of GSDP has decreased from 66.85 % in 1980-81 to 41.29 % in 2009-10, this was mainly used to cover salaries paid to government employees, and interest payments on the public debt, while the budgetary capital expenditure as percentage of GSDP declined from 14.65% in 1980-81 to 09.63 % in 2009-10. Despite the huge spending on electricity, roads, transport and communications, among others, we notice that there has been a slow recovery of the government's revenue generation capacity and the state still rely much on centre's grant-in-aid for developmental purposes. Agriculture sector in Nagaland has not been sufficiently enhanced by the government. Agriculture productivity is relatively low in percentage of GSDP. The percentage of primary sector products which comprises mainly of agriculture and allied activities to GSDP, has hardly increased from 20.09 in 1980-81 to 28.25 in 2009-10. The need to commercialize the agriculture goods, to provide financial support through loans and subsidies, and to modernize the tools and techniques used in this sector have been among the most pressing issues.

3. LITERATURE REVIEW

According to the Keynesian macroeconomic thought, public spending can contribute positively to economic growth. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on

aggregate demand. As a result, government spending augments the aggregate demand, which provokes an increased output depending on expenditure multipliers. The opponents of this approach stipulate that government consumption crowds out private investment, hampers economic growth in the short run and diminishes capital accumulation in the long run (Diamond, 1989). Moreover, Barro and Sala-i-Martin (1992) classify expenditures as productive and unproductive and assume that productive expenditures have a direct impact on the rate of economic growth and the unproductive expenditures have an indirect or no effect.

However, government spending on basic infrastructure plays a crucial role in economic growth. Having, for instance, an efficient road network could reduce the time and the cost to move goods and services across the country. It also felicitates the connection among the different parts of the country and enhances their interaction. In addition, the production of electricity and the establishment of efficient projects for energy will reduce costs and have positive impact on economic growth (see Barro, 1990, 1994: Barro and Sali-i-Martin, 1995, 1999). Moreover, the quality of human resources has a significant impact on economic growth. This stems from the fact that the quality and quantity of labour determine the level of production since it is a factor of production. Hence, improving the quality of the labour force will be reflected by a positively significant impact on investment, innovation among others (Roux, 1994 and Okojie, 1995).

The definition of nation's wealth has been extended to contain not only physical capital, but also human capital as an independent factor of production essential to achieve high and sustainable economic growth rates. Hence, developing countries have attempted to stimulate the accumulation of human capital through public education expenditure as well as government spending on health and other social services. Education is one of the important factors that determine the quality of human capital. Moreover, Hartshorne (1985) suggests that formal education plays an important positive role in the economic growth. Consequently, the human capital with physical capital, are key elements of the nation's wealth. The former is considered to be an independent factor of production that is indispensable to achieve high and sustainable economic growth rates.

Accordingly, developing countries have attempted to enhance the human capital through public education expenditure as well as government spending on health and other social services. Many researchers also assume that education, training, health care, and all investments in social services enhance and improve the human capacity and consequently the economic growth. Moreover, Ni and Wang (1994), Beauchemin (2001), and Blankenau and Simpson (2004) have provided models that take into account the public spending in the process of human formation and its influence on economic growth. They provided an empirical evidence of the positive correlation between educational spending of the government and economic growth. Most developing countries suffer from poor expenditure on health care. The majority of public expenditure on health care is on hospitals and expensive medical care that benefits a small minority of the population living in the cities. A high proportion of the poor is far from this service especially those living in rural areas. They usually rely on home remedies and traditional medicine (Griffin and McKinley, 1992).

According to Griffin and McKinley (1992), human capital development is essential for growth and contributes to the improvement of well being of people in the short-run. They believe that the government should implement strategies that encompass a change in the composition of its spending. The budget devoted to activities that do not contribute to development should be reduced to a minimum. They referred to spending on the military and internal security among others. Some studies found that the increased defence spending in developing countries has a negative implication on socioeconomic development programs such as education and health (see Fosu, 2001,; Adebiyi, 2003). The empirical studies concerning the impact of government spending on defence have led to inconclusive results. Some studies argued that military spending has a negative impact on economic growth such as Arora and Bayoumi (1994). However, others found a positive relationship between them such as Whynes (1979) and Diamomd (1990).

Several researchers have also attempted to examine public expenditure-economic growth relationship in the context of the Indian economy. For example, Singh and Sahni (1984) 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 and development, and defence are concerned, while it reaffirms the Keynesian one for debt servicing.

Ranjan and Sharma (2008) examined the effect of government development expenditure on economic growth during the period 1950-2007. The authors discovered a significant positive impact of government expenditure on economic growth. They also reported the existence of cointegration among the variables.

Verma and Arora (2010) in their attempt to examine the validity of Wagner's Law in India over the period 1950-51 to 2007-08, have 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, Mohanty (2011) 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 Orisa 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, Srinivasan (2013) 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 indicates that 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 Gangal and Gupta (2013) 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 done in the past on this pressing area of the nexus between public expenditure and economic growth.

4. METHODOLOGY

a. Stationarity and Unit Root Tests:-

The effects of the components of government expenditure on economic growth will be estimated with a macroeconomic model which is based on endogenous growth. Government expenditures on education, administrative services, health, agriculture, transport and communication, rural development and power are regressed in an attempt to estimate their impact on economic growth in Nagaland. Since the majority of economic variables are non stationary, we first check the presence of unit roots for each variable before estimating the model. If unit roots exist in any variable, then the corresponding series is considered to be non- stationary. Estimation based on non-stationary series may lead to spurious regressions (Granger 1969). All the variables in model (2) are tested at levels for stationarity using the Augmented Dickey-Fuller (ADF) test. The ADF test is conducted using regression (1) which includes constant and time trend:

$$\Delta X_t = \alpha + \beta_t + \rho X_{t-1} + \sum_{i=1} \Delta X_{t-i} + \mu_t \qquad (1)$$

where ΔX_t is the first difference of the series X, k is the lag order, α is constant, t is the time, ρ and β_t are parameters and μ_t denotes stochastic error term. The practical rule for establishing the value k (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 (k)=2 the Durbin-Watson autocorrelation statistic is low, indicating first order autocorrelation, it would be sensible to increase k 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: $\rho = 0$ versus alternative hypothesis H_1: ρ ‘“ 0. If $\rho = 0$, then the series is said to have a unit root and is non-stationary. Hence, if the hypothesis, $\rho = 0$, 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.

b. Cointegration Test:-

There are two alternative techniques for running cointegration tests: the Engle-Granger (1987) two step test and the maximum likelihood method developed by Johansen (1988) and Johansen and Juselius (1990). Less error is involved in the Johansen technique because only one step is involved rather than the two steps required in the Engle-Granger technique. In the Johansen technique for cointegration, we test for r (the maximum number of cointegration relationships) using the maximum eigenvalue statistics (λmax) and trace statistics.

The Johansen procedure establishes a VAR model which can be defined by the following Error-Correction Model:

$$\Delta Y_{t-1} = \Gamma_0 + \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + \ldots + \Gamma_{k-1} \Delta Y_{t-k} + \prod Y_{t-k} + \alpha Z_t + e_t \qquad (2)$$
$$t = 1,2, \ldots, T$$

where Δ (delta) is the first difference operator, Y_t is a $p \times 1$ vector of non stationary variables (in levels), Γ_0 is the deterministic element of the VAR model, Z_t is a dummy variable that takes value 1 if there is peace and 0 otherwise, allowing to have a structural break in the impact of the independent variables on the dependent variable, and e_t is the vector of random errors that are normally distributed with mean zero and constant variance. The coefficient matrix Π encompasses the error correction terms (ECT) and provides information about the long-run properties of the VAR model (2).

5. DATA DESCRIPTION

We use in this study, annual time series covering the period from 1980-81 to 2009-10. The variables under consideration are Gross State Domestic Product (GSDP), administrative spending, education expenditure, health expenditure, and agriculture expenditure, expenditure on transport and communication, rural development expenditure and expenditure on power . GSDP is a dependent variable, whereas, the other variables are determinant factors of GSDP. The data by sector (e.g., administration, education, health, agriculture, transport and communication, rural development and power) are constructed by consulting number of annual bulletins of the “Reports of Comptroller and Auditor General of India: Government of Nagaland”, such as Finance Accounts, Accounts At a Glance, Epitome of C & AG, Demand for Grants and Budget Documents of the Government of Nagaland. The annual values of the Gross State Domestic Product(GSDP) are drawn from several issues of Economic Survey of the state government of Nagaland and Domestic Product of States in India: by CSO and EPW Research Foundation. To neutralize the impact of increase or decrease in prices, all variables are measured in real terms, deflated by using GDP (GSDP) deflator and are all expressed in logarithm form. Table 1 provides the statistical description of the variables under study.

Table 1: Descriptive Statistics of the Variables.

Statistics	GSDP	Education	Admn. Services	Health	Agri.	Transport & Communication	Rural Dev.	Power
Mean	3304.78	194.45	343.37	89.93	140.65	123.75	76.15	110.24
Median	2673.45	177.13	325.75	86.09	133.84	128.31	64.47	101.63
Maxi.	8262.15	410.46	682.11	191.81	237.70	303.48	169.30	219.02
Mini.	914.64	99.56	197.72	44.13	67.14	50.20	26.70	110.24
Std.Dev.	2095.82	81.38	108.12	30.67	41.83	59.32	36.92	41.73
Sum	99143.40	5833.69	10301.24	2697.94	4219.70	3712.72	2284.78	3307.20
Obs.	30	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 constant 2004-05 prices during the period 1980-81 to 2009-10. The GSDP averages Rs 3304.78 crore and varies from Rs 914.64 to Rs 8262.15 with a standard deviation of Rs 2095.82. Education expenditure averages Rs 194.45 and ranges from Rs 99.56 to Rs 410.46 crore. Administrative service expenditure averages Rs 343.37 and goes from Rs 197.72 to Rs 682.11. Health expenditure, with a mean of Rs 89.93 crore, also varies from a minimum of Rs 44.13 to a maximum of Rs 191.81 crore. The mean of agriculture spending is 140.65 crore. It varies from a minimum of Rs 67.14 to a maximum of Rs 237.70 crore. Expenditure on transport and communication varies from a minimum of Rs 50.20 to a maximum of 303.48 with an average of Rs 123.75; rural development expenditure with an average of Rs76.15 varies from Rs 26.70 to 169.30. Finally the mean of expenditure on power is Rs 110.24 crore. It varies from a minimum of Rs 110.24 to a maximum of Rs 219.02 crore with a standard deviation of Rs 41.73.

6. EMPIRICAL RESULTS

The objective of this study is to examine the growth effects of public expenditure by sector for Nagaland state. By focusing attention exclusively on education, administrative services, health, agriculture, transport and communication, rural development and power expenditures, we will pin down which specific components of government expenditure have significant impact on economic growth. To estimate our model we used annual data for Nagaland for the period 1980-81 – 2009-10. Our series are first tested for stationarity, and then a cointegration error-correction analysis is undertaken using Johansen procedure. This technique will allow us to identify the linkages between these sectors and economic growth.

Unit root tests:-

The variables involved in unit root tests are GSDP (LGSDP), education expenditure (LED), health expenditure (LH), agriculture expenditure (LAg), expenditure on administrative services (LAd), expenditure on transport and communication (LTC), rural development expenditure (LRD) and expenditure on power (energy) (LP) over the period 1980-81 – 2009-10. The existence of unit roots in a series denotes non-stationarity. A number of alternative tests are available for testing whether a series is stationary. In order to establish the order of integration of the variables in our data set, we employ the Augmented Dicker Fuller (ADF) test. The purpose of 'augmenting' the Dickey-Fuller (DF) regression is to get white noise errors. A series Y_t is said to be integrated of order d denoted by Yt~I(d) if it becomes stationary after differencing d times and thus Y_t contains d unit roots. The ADF test is based on the estimate of the regression as given in equation (1)

The results of ADF test is reported in table 2. The test indicate that at level all the variables are not stationary. However, they are stationary at first-order difference.

Table 2: Unit Roots Test Result

Variable	Level				First Difference				Remark
	Intercept		Intercept & trend		Intercept		Intercept & trend		
	t statistics	Prob.	t statistics	Prob.	t statistics	Prob.	t statistics	Prob.	
LGSDP	-0.232449 (*-2.9677*)	0.9234	-3.276711 (*-3.5806*)	0.0908	-5.499986 (*-2.9718*)	0.0001	-5.496444 (*-3.5806*)	0.0006	I(1)
LED	-0.339116 (*-2.9677*)	0.9070	-1.718338 (*-3.5742*)	0.7171	-5.475570 (*-2.9718*)	0.0001	-5.437475 (*-3.5806*)	0.0007	I(1)
LH	-1.761516 (*-2.9718*)	0.3909	-3.530201 (*-3.5742*)	0.0547	-7.599984 (*-2.9718*)	0.0000	-7.456439 (*-3.5806*)	0.0000	I(1)
LAd	-0.288468 (*-2.9677*)	0.9151	-1.214396 (*-3.5742*)	0.8886	-4.913957 (*-2.9718*)	0.0005	-4.863898 (*-3.5806*)	0.0028	I(1)
LAg	-1.150538 (*-2.9718*)	0.6810	-1.172954 (*-3.5806*)	0.8968	-8.069071 (*-2.9718*)	0.0000	-8.091839 (*-3.5806*)	0.0000	I(1)
LTC	-0.907436 (-2.9677)	0.7713	-0.631479 (-3.5742)	0.9691	-6.285219 (-2.9718)	0.0000	-6.792242 (-3.5806)	0.0000	I(1)
LRD	-1.089217 (-2.9677)	0.7063	-1.335594 (-3.5742)	0.8583	-5.345813 (-2.9718)	0.0002	-5.430124 -3.580623	0.0007	I(1)
LP	-2.929529 (-2.9677)	0.0542	-4.393771 (-3.5742)	0.0082	-8.325970 (-2.9718)	0.0000	-8.163849 (-3.5806)	0.0000	I(1)

Note: The ADF tests were performed using maximum lag length of 5, and from this maximum the appropriate lag length for each of the variable was chosen based on the Akaike Information Criteria (AIC) which was lag 3 for each variable. Critical values taken from Mackinnon (1996) at 5% level of significance are given in brackets.

Cointegration analysis:-

Since the order of integration of each variable in the model is equal to one, we will apply the cointegration tests developed by Johansen (1988) and Johansen and Juselius (1990) to investigate whether there is more than a single cointegration relationship. The number of lags used in the VAR is based on the evidence provided by the lag selection criteria as given in Table 3 below. The cointegration tests include the variables, GSDP (LGSDP), education expenditure (LED), health expenditure (LH), expenditure on Administrative services (LAd), agriculture expenditure (LAg), expenditure on transport and communication (LTC), rural development expenditure (LRD) and expenditure on power (energy) (LP) over the period 1980-81 to 200910. The number of lags used in the cointegration tests is one. Table 3 gives the result of the lag selection criteria.

Table 3: Lag Selection Result

VAR Lag Order Selection Criteria
Endogenous variables: LGSDP LEDU LAs LH L AGRI LTC LRD LP
Exogenous variables: C
Date: 10/20/15 Time: 13:28
Sample: 1980 2009
Included observations: 28

Lag	LogL	LR	FPE	AIC	SC	HQ
0	44.37362	NA	1.03E-11	-2.598116	-2.217486	-2.481753
1	186.1636	192.4292*	4.80E-14	-8.154542	-4.728873*	-7.107281
2	291.9052	83.08269	9.54E-15*	-11.13609*	-4.665378	-9.157926*

* indicates lag order selected by the criterion

As reported above, the sequential modified LR test statistic and Schwarz information criterion (SC) supported lag 1 while Final prediction error (FPE), Akaike Information Criterion (AIC) and Hannan-Quinn information criterion (HQ) supported lag 2. Since short lag is optimal for the system, we preferred lag 1 for our model. Table 4 reports the results of the trace statistics and maximum eigenvalue test which indicate that there is one cointegration relationship. The guideline is that if the test statistics is greater than the critical value we can reject the H_0, and in our test the Trace statistics at 83.26740 and Max-Eigen statistics at 43.56111, which are greater than the 5% critical values of 68.52 and 33.46 respectively.

Table 4: Testing of Cointegration

Trace Statistics

Hypothesized No. of Cointegration Equations	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob.
None*	0.800786	83.26740	68.52	0.0054
At most 1	0.562929	39.70628	47.21	0.0967
At most 2	0.314980	17.35947	29.68	0.1035
At most 3	0.232512	7.145181	15.41	0.2678
At most 4	3.61E-06	9.74E-05	3.76	0.1876

**(**) denotes rejection of the hypothesis at the 5% level*
Trace test indicates 1 cointegrating equation(s) at 5% level

Max-eigenvalue Test

Hypothesized No. of Cointegration Equations	Eigenvalue	Max-Eigen Statistics	0.05 Critical Value	Prob.
None**	0.800786	43.56111	33.46	0.0487
At most 1	0.562929	22.34681	27.07	0.0736
At most 2	0.314980	10.21429	20.97	0.7362
At most 3	0.232512	7.145083	14.07	0.2325
At most 4	3.61E-06	9.74E-05	3.76	0.1274

**(**) denotes rejection of the hypothesis at the 5% level*
Max-eigenvalue test indicates 1 cointegrating equation(s) at 5% level

Both Trace and Max-Eigen statistics indicate that there is one cointegrating equation at 5% level, that is, our variables have long run associationship or they move together in the long run. After indicating the presence of the long-run cointegration relationship using the Johansen approach, the short-run dynamics of the long-run economic growth is examined by estimating an error-correction model. As variables under study are

cointegrated, an ECM representation could have the following form after incorporating dummy variable in equation (3)

$$\Delta LGSDP_t = \sum_{i=1}^{p-1} \beta_i \Delta LED_{t-i} + \sum_{i=1}^{p-1} \alpha_i \Delta LGSDP_{t-i} + \sum_{i=1}^{p-1} m_i \Delta LAd_{t-i} + \sum_{i=1}^{p-1} n_i \Delta LH_{t-i} + \sum_{i=1}^{p-1} w_i \Delta LAg_{t-i} + Z_1 EC1_{t-1} + Z_2 D + \varepsilon_{1t} \quad (3)$$

Where, β_i, α_i, m_i, n_i and w_i are the coefficients, $EC1_{t-1}$ is the error correction term, Z_2 is the coefficient of the dummy variable and ε_{1t} is residuals. The $EC1_{t-1}$ is the lagged value of the residuals derived from the cointegrating regression of GSDP on other variables. If Z_2, the coefficient of dummy variable is found positive and significant, meaning that the signing of the Ceased-Fire Agreement in 1997 between the Underground outfits and the Government of India has positive impact on our dependent variable, that is GSDP in equation (3). Here, we have taken lag one in our error correction model, i.e., lag_i=1. Here, dummy = 0, priorto the signing of the Ceased-Fire Agreement (i.e., from the period 1980-81 to 1996-97), while dummy = 1, after the signing of Ceased-Fire Agreement (i.e., from the period 1997-98 to 2009-10, under consideration).

Table 5 reports the results of the Johansen procedure that provides a long-run and a short-run relationship. The error correction term (ECT) captures the speed of adjustment towards equilibrium in the long run or shows about long run effects of the independent variables on dependent variable. The results reveal that the explanatory variables jointly account for approximately only 06.44 percentage changes in economic growth. The Durbin-Watson statistic (2.18) illustrates the absence of auto correlation.

Table 5: Johansen and Juselius Cointegration Results

Dependent Variable: D(LGSDP)
Method: Least Squares
Date: 10/20/15 Time: 19:05
Sample(adjusted): 1982 2009
Included observations: 28 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT	0.064374	0.029771	2.162307	0.0451
LGSDP(lag1)	0.054221	0.190389	0.284789	0.7792
LEDU	0.326776	0.125501	2.603771	0.0185
LAd	-0.098327	0.114086	-0.861871	0.4008
LH	-0.040766	0.069581	-0.585878	0.5657
LAg	-0.287827	0.099890	-2.881433	0.0104
LTC	0.093794	0.069359	1.352297	0.1940
LRD	-0.066724	0.051015	-1.307918	0.2083
LP	0.116609	0.065514	1.779903	0.0930
Intercept(Constant)	0.056989	0.021509	2.649552	0.0169
Z(Dummy)	0.000751	0.026892	0.027940	0.9780

R-squared	0.429774	Mean dependent var	0.070688
Adjusted R-squared	0.094346	S.D. dependent var	0.063107
S.E. of regression	0.060056	Akaike info criterion	-2.500351
Sum squared resid	0.061315	Schwarz criterion	-1.976985
Log likelihood	46.00492	Durbin-Watson stat	2.185903

The estimation results show that in the short run the variables education expenditure (LED) and agriculture expenditure (LAg) are statistically significant in explaining changes in economic growth. However, expenditure on other variables such as administrative services (Lad), health (LH), transport and communication (LTC) and rural development are not significant in explaining economic growth. The expenditure on education have a positive impact on economic growth, since it is statistically significant at 5%. For instance, 1 percentage increase in total education expenditure in the previous year causes economic growth to increase by 32.68 percentage. This result is in contradiction with previous findings of negative or insignificant positive effects of education expenditure on growth for less developed and developing countries (Landau 1986; and Devarajan et al. 1996. According to Landau (1986), government educational expenditures in less developed countries seems to be inefficient at generating actual education; that is actual education (measured by enrolment ratios) is strongly correlated with growth rates, but levels of government educational expenditure are not. Also in developing countries, expenditure including education, which is normally considered productive could become unproductive if there is an excessive amount of them rendering them unproductive at the margin. Devarajan et al. (1996). Similarly, a 1 percentage increase in agriculture in previous one year leads to 28.78 percentage decrease in economic growth. These findings are in line with the one reported by Landau (1986), Barro (1991), Engem and Skinner ((2001) and Folster and Henrekson (2001), that government expenditure may slowdown economic growth. The negative impact of agriculture may not be unconnected with mismanagement and diversion of public funds by government officials and political appointees. Furthermore, spending on administrative services (LAd) has a negative influence on economic growth. The result shows that a 1 percentage increase in expenditure on administrative services in previous oneyear results in the decrease of economic growth by 09.83 percentage. This is due to the fact that there is 100 percent revenue expenditure and no capital component of expenditure under administrative services. Studies ondeveloping countries have reported conflicting results regarding the association between administrative spending and growth. This association is sometimes found to be positive and significant (Benoit, 1978; Frederiksen and Looney, 1982) or negative and significant (Deger and Smith, 1982: Knight et al., 1996).

The results also indicate that a 1 percentage increase in heath expenditure (LH) leads to decrease in economic growth by 04.07 percentage. A negative correlation between economic growth and spending on health is in line with the results obtained by Fosu (2001, 1999,1996), Adebiyi (2003), and Tomori and Adebiyi (2002). Similarly expenditure on rural development (LRD) also shows that a 1 percentage increase in the previous year results to a 06.67 percentage decrease in economic growth. The negative impact of health and rural development expenditure on economic growth can be attributed to comparatively lesser capital components coupled with mismanagement and diversion of public funds. However, expenditure on power (LP) and transport and communication (LTC) have a positive impact on economic growth. Thus, higher government expenditure on power and transport and communication creates an enabling environment for business to strive through reduced cost of production.

The coefficient of dummy (Z) is positive but not significant, that is, the signing of cease-fire agreement between the underground outfits and the Central Government does not have any influence on economic growth in Nagaland. The coefficient of the ECT is an estimate of the speed of adjustment back to the long-run equilibrium relationship. The low magnitude of the coefficient suggests that the speed of adjusting to long-run changes is minimal.

The diagnostic tests of Table – 6 below, show the statistical viability of our model. The various statistical viability tests show that there is no Arch effect, there is no serial correlation and the residuals are normally distributed. Thus, the diagnostic statistics of our model pass the standard tests.

Table – 6: Diagnostic Tests

Sl.No	Efficiency	Value	Prob.	Remark
1.	Breusch-Godfrey Serial Correlation LM Test Obs*R-squared	1.831120	0.175995	There is no Serial Correlation
2.	Heteroskedasticity (ARCH Test) Obs*R-squared	0.337174	0.561465	There is no ARCH effect
3.	Normality Test Jarque-Bera	0.064097	0.968459	Residuals are Normally distributed

7. CONCLUDING REMARKS

The aim of this paper is to shed light on the effects of specific components of government expenditure on economic growth in Nagaland. Public expenditures have been undergoing some profound changes during this period. Government spending has increased steadily since 1980-81, the beginning year of mild liberalization phase initiated in the country. Expenditures on education, administration, health, and agriculture have been the major beneficiaries of the increase in economic allocations. To investigate from an econometric perspective the impact of these expenditures on the economic growth, we used an error correction model that encompasses the GSDP and expenditures on education, administration, health, agriculture, transport and communication, rural development and power. We applied cointegration analysis using Johansen procedure over the period 1980-81 to 2009-10. In the long-run, expenditures variables are found significant in explaining the dependent variable – economic growth (GSDP). In the short-run, expenditure on education was found to be positively significant and expenditures on agriculture show a negative relationship with the economic growth. However, expenditures on health, administration, transport and communication and rural development are not significant.

Our findings for the effect of public expenditure by individual sector on economic growth give rise to information that is particularly useful for a developing state like Nagaland, where the allocation of limited public resources between the sectors is an issue of paramount importance. In this regard, our main finding is that education is the key sector to which public expenditure should be directed in order to foster economic growth in the long-run. This result is in contradiction with some findings of negative or insignificant positive effects of education expenditure on growth for developing countries (Landau 1986; Devarajan et al. 1996). Finally, the dummy variable *Z* was introduced in the model to take into account, periods of conducive and not conducive atmosphere in the state . The coefficient of dummy (*Z*) is positive but not significant, that is, conducive atmosphere – the signing of ceased-fire agreement between the underground outfits and the Central Government, does not have any influence on economic growth in Nagaland.

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