EVIDENCE OF PRIORITIZATION TOWARDS HEALTH FINANCE: A MICROECONOMIC PERSPECTIVE

Motika S Rymbai* Darishisha ** W. Thangkhiew***

1. Introduction

The novel coronavirus pandemic has hatched numerous dishevelled health care crises that expose and compound deep underlying problems in the health care system of India. The health care system failed too quickly soon the pandemic emerged and posed serious threats to population, economy and trade in small states but did not spare the big and wealthy states. The common strategy which states have adopted during this pandemic was to increase public health care spendingKhan et.al (2020). That explains the fact that public health care spending is pivotal for effective, efficient and adequate health system WHO (2020). Therefore, the question which arises from the above argument is that what determine the health care spending.

Clearly, the establishment of cause-and-effect relationship is a part of positive economics which merely frames no value presuppositions. The available literature suggests that macroeconomic variables are the key determinants of health care spending in developing countries including India following all alternative governments' functions: outlay pattern and macroeconomic policies[Tandon&Cashin (2010); Behera& Dash (2018)]. Each of the macroeconomic variables has its specific function that caters to different objectives for economic growth and development and for smooth function of an economy [Jena (2012);Khan, et.al (2016);Sharma (2018)]. However, studies aiming on factors of health care spending in North Eastern states of India remain relatively negligible. Studies suggest that every one of the macroeconomic variables are mutualised and their functions are economic- position based Newhouse (1977). The macro economic variables determine government functions positively or negatively; hence the interdependence exists [Mosca (2007); Momodu&Ogbole (2014)].In an exceedingly explicit case as public health expenditure, though government expenditure is categorized into curative and preventive measures, it is probable that health expenditure is macroeconomic factor dependent [Behera and Dash (2017); Pakdaman

* Research Scholar, Department of Economics, North Eastern Hills University;

** Asst. Professor, Department of Economics, North Eastern Hill University;

*** Asst. Professor, Department of Economics, North Eastern Hill University;

et.al (2019); Tajudeen et.al (2018)]. Every macroeconomic variable has its own cost and benefits option. Therefore, with a prior notion of the common macroeconomic factors within the North Eastern States, the interest of the study is to seek out the degree of the macroeconomic variables that would determine the general public health spending.

In the Indian context, public health expenditure or the social services has been subjected to frequent fluctuations, decline, low ranked and instability Aggarwal (2011). There is a declining trend of public expenditure on social services post economic reform. Post-1991, the central's share on social services has increased largely but the disability occurred in the state's expenditure on social services which declined post - period Dev&Mooij (2002). Post economic reforms, the share of social expenditures to total development expenditure varied from 47-57 % in India. In addition, post liberalization has observed that the state governments have hidden behind the curtain of heavy fiscal rules and enforcement which has caused a decline in their health expenditure and healthcare provision. The reduction in healthcare expenditure was seen post Structural Adjustment policy.

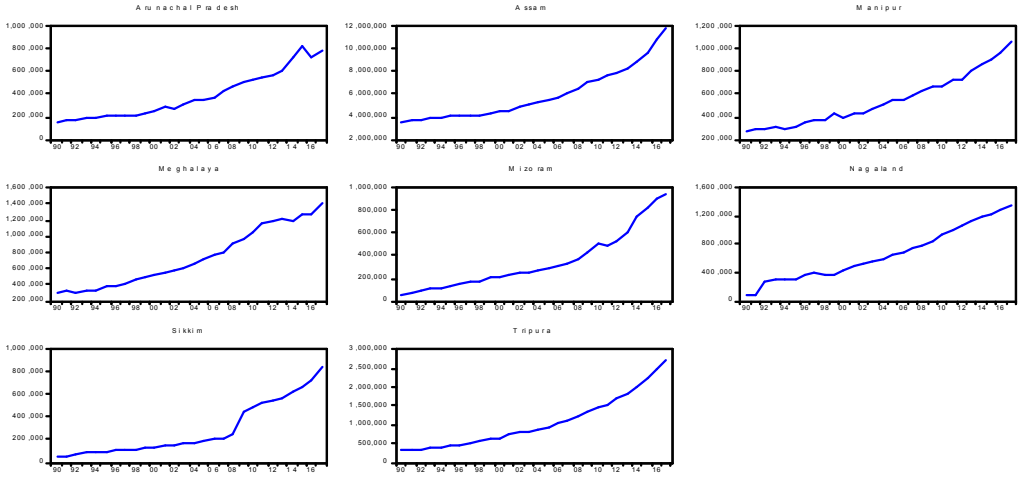
As the role of demand and supply mechanism is pivotal in the arena of macroeconomics. In case of India, the high populous and large rural inhabitants push the demand for various public goods which required effective fiscal management that would suffice the growth and development. However, the greater demand for those public goods often shattered the government's performance Jain (2004). Over the years since independence, there has been a continuing problem of excess demand of public goods which in terms results huge need of finances (both for economic and social expenses); this has led to a huge requirement by the government to resort to external borrowing Gopalkrishnan (1987); Pradhan, A. K &Hiremath, G. S (2020). Even at sub-national level, the fragile monetary capacity often deteriorates the fiscal management of the states and inability of states to meet their growing public demands. In case of North Eastern states, the states are classified under special category states given the economic competence and perpetual ominous fiscal set-up. These states often find it difficult to meet the growing public demands for economic as well as social services due to the inadequate fiscal capacity and poor economic conditions.

Therefore, given the above trends it is imperative to understand the individual characteristics of the macroeconomic variables of the states and their relative effect on government healthcare spending. A major the gap from literature was observed wherein there was least or rather absence of inclusion of the NES. Therefore, we intend to fill the gap by this attempt to find the macroeconomic effects on public health expenditure in the NES

1.1 Overview of the North Eastern States

A major complexity of the NES is the extremely unsatisfactory macroeconomic features. The states are characterised by high non-developmental expenditure, low developmental expenditures, high dependency on central assistance, high debt- GSDP ratio, fiscal deficits and therefore deteriorating fiscal structure [Mohan (2003); Dash&Tiwari (2011); Dutta&Dutta (2014); Hassan & Mishra (2018); Nayak&Rath (2021)].Dash &Rath (2016) finds the imbalance between the revenue expenditure and revenue receipts of the NES greatly demands for central assistance. The gap filling approach of central assistance especially in the case of NES is leading the states to high fiscal dependency and increasing non plan expenditure with unproductive spending mechanism. Dash &Rath (2016) finds the fiscal scenario of the NES clearly depicts the increasing deficit burden, increasing non-plan expenditure, unattainable revenue sufficiency that distorts revenue management and low development expenditure. The NES are rather stuck in a Tribal- Fiscal Dilemma (Hassan & Mishra 2018); due to various tax preferences and revenue advantages (tax exemption, subsidies and different centre-state allocation) the states are not able to improve their revenue generating capacity. Categorically, it is envisioned that the advantages of the states results in disinclination. In a particular case, the misbalance of the macroeconomic variables is expected to shackle public spending pattern.

Figure 1:Gross State Domestic Product of NES(1990-91 to 2017-18)



Source: Central Statistics Office series 1980-81, 1993-94, 1999-00, 2004-05 and 2011-12; GSDP (1990-91 to 2017-18) at constant 2004-05 prices

Clearly, the figure above depicts the GSDP of the NES. The trend depicts a slow growth over the period (1990-91 to 2017-18). Assam with the maximum service sector

(public and private), it is curtained to attain the highest GSDP. For instance, in the year 2017-18, the GSDP of Assam is Rs11803315 lakhs while Arunachal Pradesh on the other hand is Rs 794,166.91 lakhs. However, the growth of GSDP throughout the NES has undergone huge fluctuations with minimal positive growth.

1.2 State's Own Revenue

The principle of Maximum Social Advantage propounded by Dalton clearly states that public finance is the prerequisite for social welfare. In this theory, the government's expenditure correlates with the tax revenue of the country or states. The point of equilibrium lies at a point where marginal utility of benefits equals marginal sacrifice (sacrifice denotes the amount of taxation imposed on the citizens). In this context, an increasing state's own revenue would ease fiscal constraints; however, the pattern of raising revenue could cause difficulty to the states. In states such as the special category states, majority of the NES consists of the scheduled tribes which has special tax exemption [Income Tax Act, 1961, section 10(26)]. Therefore, it is crystal clear that the main source of revenue generation will be non-existent and the states' revenue will be acquired from other non-tax sources and indirect taxes.

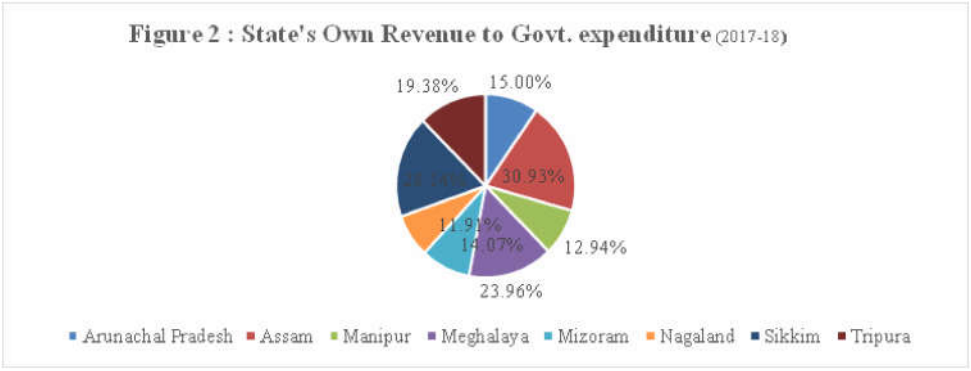
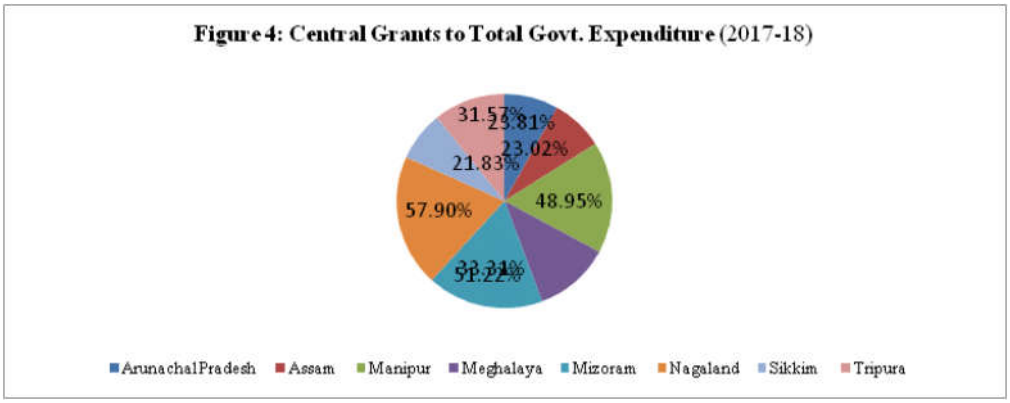


Figure 2displays the percentage of state's own revenue to total government expenditure of the NES 2017-18. Firstly, the ability of the state's own revenue to meet the state's expenditure in majority of the NES (Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura) ranges from 4- 24%. In the case of Assam, the share ranges from 18-40% and Sikkim from 17-72%. Nonetheless, the lack of states' own revenue generation is clearly evident as the share of state's own revenue to government's expenditure has undergone huge fluctuations over the years. Taking a reference year 2017-18, the highest share was observed in Assam with 30.93% due to obvious economic structure of the state; following Sikkim with 28.14%, Meghalaya with 23.96%, Tripura with 19.38%, Arunachal Pradesh with 15%, Mizoram with 14.07%, Manipur with 12.94% and Nagaland with 11.91%. This

thus violates the principle of marginal social advantage and its inappropriateness in the NES.

1.3 Grants (2017-18)

Figure 4: Central Grants to Total Govt. Expenditure (2017-18)



The NES are privileged with a considerably high central assistance given the low revenue generating capacity of the states. The figure below depicts the share of grants to total government spending in the NES. Clearly, in the reference year 2017-18, the share in Mizoram is the highest with 51.22% and the lowest share is found in Sikkim with 21.83%. Given the share of grants, it is absorbing to explore to what level central assistance determines public healthcare spending.

2. Review of Literature

State's capacity to finance expenditure is highly dependent on income. In this case, GSDP is taken as an important determinant of state's expenditure. Through GSDP, the states decide on prioritizing the sectors (economic and social). However, for many states or the country as well, there is a high dependence on external borrowings due to the high demand and requirements. In the case of Indian states, there is a growing importance of the centrally sponsored schemes for uplifting the resource requirements (Jena 2012). Nonetheless, the GSDP of the states and public health expenditure are co-integrated. Malick (2015) &Mukherjee (2018) have tested the significance of healthcare expenditure for economic growth and development in India. The studies find a co-integration between health expenditure and economic growth.At the sub-national level as well, the relationship was examined. The co-integration between the variables (public health expenditure and economic growth) is also found in Tamil Nadu, Kerala, Madhya Pradesh, Orissa and Haryana [Rajeshkumar&Nalraj (2014)]. Although at national level, a bidirectional relationship was observed; at sub-national level, the direction of relationship differs for different states

The increase in GSDP of a state does not necessarily improve public health expenditure. Asif& Sultan (2013) found no co-integration between per capita health expenditure and per capita income. Therefore, health expenditure may be determined by other socio-economic factors. Haldar& Malik (2010) found the scenario of the Indian economy is not positive as even with increasing GSDP, the increase is not diverted to important social sectors (health and education). The country has been able to fight and achieve certain health outcomes such as; increase in life expectancy, lowering of infant mortality, control of communicable diseases, immunization, and these gains in health has brought possible economic growth and development. However, the country continues to face certain drawbacks with inconsistent, inadequate and unsatisfactory investments towards the education and health sectors. Guruswamy, et.al (2008) found a huge gap between the economically developed and less developed states of India. While the difference in per capita health expenditure among the less developed states is low, there is huge gap between the economically developed states. There is also a huge gap was observed between revenue and capital expenditure wherein the capital expenditure has reduced to less than 10% over the years (Mohanty 2015).The insignificant effect of GSDP on public health expenditure is due to other socio-economic factors such as accessibility to safe water, sanitation, proper waste disposal, culture and caste (Menon (2017).

Even at the cross-country level the relationship between public health expenditure and economic growth was examined. Ali, et.al (2017) has found an insignificant impact of health expenditure on GDP in China, India, Pakistan and Bangladesh. Mishra and Newhouse (2009) finds a long run relationship between health expenditure and growth in Iran. The long run estimates show a 1% increase in health expenditure would increase GDP by 0.06% which depicts a very low impact of health expenditure on economic growth. Chaabouni&Abednnadher (2014) also finds the variables (real GSDP, population ageing, and environment quality) are significant determinants of health expenditure in Tunisia. Similarly, other authors have also examine the co-integration between the variables using other econometric models [Dao (2012); Zuven (2014); Sharma (2018); Yun &Yusoff (2015); Dincer&Yuksel (2018); Kraipornsak (2017); Yun &Yusoff (2018)].

Apart from the obvious relationship of examining public health expenditure and GSDP, other macroeconomic variables have also been examined. Tandon&Cashin (2010) assessed the public health spending through fiscal space perspective of six countries namely Cambodia, India, Indonesia, Rwanda, Tonga, Uganda and Ukraine; using the Marquette for MDG Stimulation (MAMS) model. The study has clearly identified the possible macroeconomic variables that influenced health spending in these countries that includes

GSDP, own revenue, grants and debt ratio. The low fiscal capacity and medium institutional capacity of India makes the country more prone to fiscal crisis and unable to combat with contemporary crisis. High dependency on external financial assistance of most countries often causes problems in diversifying their expenditures given the limited fiscal space

Guruswamy et.al (2008) has used certain indicators , GDP growth, inflation, tax revenue to GDP, fiscal deficit ratio to GDP, Debt to GDP and health expenditure to GDP and found that India as a whole have not flourished significantly towards reprioritizing health sector. Given that India has not performed well in the majority of the macroeconomic parameters, this has caused an adverse effect on health spending.

Behera& Dash (2017) has examined the long run relationship effect of GSDP and tax revenue on public health expenditure in major states of India. The panel co-integration test found a long run relationship between real per capita health expenditure and real per capita GSDP and real per capita tax revenue. Per capita GSDP and Per capita tax revenue positively affects per capita health expenditure in the long run. The VECM granger causality shows a unidirectional relationship running from PCGSDP to PCPHE; however, tax revenue positively affects growth of per capita health expenditure in the short as well as long run. However, the reverse causality from PCPHE to PCGSDP and tax revenue was not found. Behera& Dash (2018) have examined the impact of macroeconomic variables (economic growth, domestic debt, fiscal balance, central government transfer, and revenue growth (tax revenue, direct tax, and indirect tax) on public health expenditure. A positive short run impact of state's own revenue capacity, central fiscal transfer and fiscal balance on the growth of health expenditure was found. Other variables such as tax revenue, non-tax revenue, indirect tax, central transfer, domestic debt and per capita GSDP have a long run positive effect on the growth of PHE. Pakdaman et.al (2019) has used macroeconomics variables such as GDP, liquidity rate, inflation rate, budget deficit to determine public health expenditure using VAR and Granger causality methods. Public health expenditure is found to have a positive relationship with GDP, GNP, NI and NC; however a negative relationship to liquidity rate, inflation rate and budget deficit.

3. Data and Methodology

The study is primarily based on balanced penal time series data on 8 North eastern states from 1990-91 to 2017-18 (T=28). Given that the NES takes long years to establish in which the latest state Mizoram became a full-fledged state in 1987; the present analysis has taken into account the period from 1990-91 to 2017-18 due to the availability of data for all states post-1990-91. Deliberately, the analysis is entirely dependent on secondary source and the Reserve Bank of India is the most reliable source. The data on

macroeconomic variable and on public health care expenditure has been collected from Reserve Bank of India State Finance Reports 1992-93 to 2019-20. The GSDP current data has been taken from the series 1980-81, 1993-94, 1999-00, 2004-05, and 2011-12 of the Central Statistics Office. For a significant and precise analysis, converting the current data into a constant data is required; therefore, a deflator was constructed using the current and constant GSDP data for each state. Lastly, population data was extracted from census reports of 1981, 1991, 2001, and 2011.

Table 1. Descriptive statistics of the variables

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Variables	**Mean**	**Standard deviation**	**Maximum**	**Minimum**	**Correlation**
Public Health expenditure	**19791.14**	**24588.11**	**187791.5**	**1790.012**	
Total government expenditure	**379740.1**	**420656.9**	**2952697**	**31640.67**	**0.97531**
Gross states domestic product	**1245238**	**1999370**	**11803315**	**41460.92**	**0.93030**
State's Non-tax revenue	**37309.94**	**49433.22**	**205934.1**	**2685.545**	**0.55139**
State's Tax-revenue	**56914.91**	**106569.5**	**644715.7**	**529.9134**	**0.88406**
Gross fiscal deficit	**30728.54**	**57315.04**	**387331.6**	**-184299**	**0.47678**
Revenue deficit	**-13655.5**	**54561.44**	**197398.7**	**-302812**	**-0.24509**
Grants	**168076.4**	**121054.5**	**635852.4**	**17072.46**	**0.81503**

Source: RBI State Finance Reports, 1992-93 to 2019-20; at constant 2004-05 prices

The economic condition of the NES and the sources of revenue contributed towards the selection of variables. Clearly, the standard deviation among the cross sections reveals huge disparities.

The data set is investigated by estimating heterogeneous panel model with cross sectional data and comparing its three regression outcomes that include pooled Ordinary Least Square (POLS), Fixed Effects Model (FEM), and Random Effects Model (REM).The available for the period 1990-91 to 2017-18 for all 8 North-eastern states, which yields 224 observations. The data set consists of i = 1…,N cross sections (number of groups), and several points of time series for each group t = 1…,T(i), or a cross section of N time series

each of length T(i). Panel data analysis is divided into fixed effects and random effects models. FEM looks at the impact of country effects while REM investigates time effects. In other words, FEM explores the relationship between outcome variables within a country. In this model, each country has its own individual characteristics that may or may not influence the predictor variables (for example, government schemes and compulsory contribution health care financing schemes in a particular country could have some effect on health care spending). On the other hand, the rationale behind REM is that it considers the individual effects as a random component of the error term and that variation across entities is assumed to be uncorrelated with the predictor or independent variables included in the model.

The final selection of model depends upon the fact that even allowing for different state intercepts, there is considerable evidence, against the hypotheses of equal intercept (state specific effect) and effect of state unobserved characteristics on health expenditure. In response to this cross-section dependency test will be applied

3.2 Estimation procedure and models

On understanding the dependence of public health expenditure on the various macroeconomic variables, the basic linear equation follows

Government Health expedniture=f(GSDP,total government expenditure,state^' s own tax revenue,state^' s non-tax revenue,gross fiscal deficit,revenue deficit,grants)

$$Government\ Healt\ \ expedniture = f(GSDP, total\ government\ expenditure, state^{'} s\ own\ tax\ revenue, state^{'} s\ non\ tax\ revenue, gross\ fiscal\ deficit, revenue\ deficit, grants)$$

Through literature, we found the different macroeconomic instruments that significantly determine the government's activities; therefore we carry out the analysis by incorporating the few macroeconomic variables. Given the similar economic features of the NES, we intend to establish the common macroeconomic instruments that determine public health spending. The analysis followed the panel estimation procedure using three methods in a row; Pooled Least Square, Fixed Effect and Random Effect Model. On beginning with the Pooled Ordinary Least square regression the equation follows:

$$THE_{it} = \alpha_i + \beta X_{it} + \mu_i + \varepsilon_{it} \qquad \textbf{(1)}$$

From the Pooled Ordinary Least square regression model, ? indicates the dependent variable, i indicate the states and t indicates the time. X indicates the independent macroeconomic instruments taken for the analysis (total government expenditure, GSDP, non-tax revenue, own tax revenue, gross fiscal deficit, revenue deficit, grants).?thus indicates the coefficient of the variables. ? Indicate the unobserved individual state-specific effect. ?

Indicate error term or the white noise.Through equation1- POLS regression, certain assumptions are taken into account. Firstly, the intercept is identical for all cross sections. In other words, if there is no change or independent variables are zero (or no change), the effect on the dependent variable will be identical for all cross-sections. It also assumes no hetero scedasticity and no cross-section dependency. We then run the Breusch-Pagan LM (1980) and Pesaran (2004) to check for cross section dependency. On rejection of the null hypothesis that states no cross-section dependency or in other words the cross sections function independently irrespective of the other states; we then proceed towards the random effect and fixed effect model.

In order to obtain reliable estimates of Eq. 1, we apply the panel data methods (Fixed effect model and Random effect mode) to remove the effects of state unobserved characteristics. (?_(i)). Fixed effect model (FEM) permits analysis taking several explanatory variables. The main assumption of the FEM states that the effects of the explanatory variables are fixed between the cross sections. On the other hand, Random effect model (REM) assumes that the explanatory variables vary among the states such that the effects among the cross section are random. In this case the explanatory variables affect the particular state independent to the effects among the cross sections.

In order to determine the accuracy of the model (Fixed effect or Random effect model); the Hausman test (1978) was applied. The Hausman test thus checks if the individual state/ country specific intercept is correlated with the regressors or uncorrelated.

The analysis further is explained based on the FEM as the Hausman test rejects the null hypothesis of appliance of random effect. The One-way econometric specification of the FEM is as follows:

$$LnTHE_{it} = \alpha_{it} + \beta_1 LnTGE_{it} + \beta_2 Ln\ GSDP_{it} + \beta_3 Ln\ NTR_{it} + \beta_4 Ln\ OTR_{it} + \beta_5 Ln\ GFD_{it} + \beta_6 Ln\ RD_{it} + \beta_7 Ln\ GRS + \mu_i + \varepsilon_t$$

THE -Public health expenditure; TGE- Total government expenditure; GSDP- Gross state domestic product; NTR- Non-tax revenue; OTR- Own tax revenue; GFD- Gross fiscal deficit; RD- Revenue deficit; GRS- Grants. ?_1,?_2,?_3,?_4,?_5,?_(6,) ?_7- Coefficients of the parameters. ?_(i)- Individual state-specific effect. ?_t- Error term /disturbance term/ white noise

4. Empirical results and discussion

Macroeconomic factors certainly possess indications based on which government functions and certain policies are framed. In states such as the NES, the economic deficiencies in terms of income, high non-developmental expenditure, low developmental

expenditures, high dependency on central assistance, high debt- GSDP ratio, deteriorating or instable fiscal performance often pushes the states to employ back loading strategies. Back loading strategies clearly imply cutting down of expenditures from certain sectors and reallocating public expenditure on alternative sectors.

It is important to note down that per capita income of majority of the NES is much better than the national level. For instance, in the year 2017-18, per capita income of Sikkim is 1, 27,505rupees which is the highest among the NES. On the other hand, Assam has a per capita income of 34,304rupees.Although Assam is the highest growing state among the NES; however population factor contributes to the low per capita income in the state. Sikkim on the other hand, with lesser population contributes greatly to the per capita income among the populous. Another important factor that is conspicuous about the health sector is the high private healthcare availability and usage. On the national level, per capita private in patient expenditure accounts for four times to a public healthcare; there is high preference of private healthcare and current proportion of private healthcare is more than 82% [Ellis, Alam& Gupta (2000);Selvaraj& Karan (2009); Sengupta&Nundy (2005)]. Public healthcare availability in the NES is also inadequate and there is a higher proportion of private healthcare. These two facts thus lay certain conjectures about the functioning of the government and their priorities towards provision of public healthcare.

The macroeconomic factors examine in the analysis clearly depicts how the state governments respond towards provision of public healthcare based on the various factors taken into account. The results obtained from the analysis are not satisfactory. We begin the analysis with POLS as depicted in Table 2. The results found that macroeconomic factors such as GSDP, non-tax revenue, tax revenue and total government expenditure have a significant effect on public health spending. For instance, a 1% increase in GSDP leads to a 22.69% increase in public health spending; a 1% increase in tax-revenue leads to 7.28%; a 1% increase in total government expenditure leads to a 66.56% increase in public health spending; however, a 1% increase in non-tax revenue leads a reduction in public health spending by -9.55%. The analysis of POLS was however rejected by Breusch-Pagan LM test and thus established that there is cross section dependency and thus the intercept is not identical among the cross sections.

The analysis further proceeds with the REM and the FEM. From the REM we were able to find that GSDP, non-tax revenue, tax revenue, revenue deficit and total expenditure significantly determine public health spending. Although the estimates of REM and FEM yields no large difference, yet, on using the Hausman test, we were able to reject the null hypothesis and thus the final results that could be considered accurate is the results of the

FEM. From the FEM, we are able to establish the macroeconomic factors that significantly determine public health spending are GSDP, non-tax revenue, tax revenue, grants and total government expenditure. Clearly, a 1% increase in GSDP leads to a 23.82% increase in public health spending; a 1% increase in non-tax revenue leads to a reduction in public health spending by -11.91%; a 1% increase in tax revenue leads to a 14.94% increase in public health spending and a 1% increase in total government expenditure leads to a 66.53% increase in health spending. All these effects are significant at 1% level of significance. Given the high central grants received by the NES, it is worth nothing that a 1% in grants leads to a reduction in public health spending by -10.02% which is significant at 10% level of significance. The elasticity of public health expenditure is also found to be 0.24% depicting that health is a necessity rather than a luxury in the NES, which clearly requires additional attention.

Table 2: Empirical results of														
Model 1: Pooled Ordinary Least Square					**Model 2: Random Effect**					**Model 3: Fixed Effect**				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GSDP	0.226856	0.046026	4.928854	0.0000	**GSDP**	0.226856	0.039931	5.681169	0.0000	**GSDP**	0.238153	0.054354	4.381475	0.0000
NTR	-0.09553	0.021272	-4.49085	0.0000	**NTR**	-0.09553	0.018455	-5.17631	0.0000	**NTR**	-0.11907	0.025834	-4.60927	0.0000
OTR	0.07279	0.023319	3.121543	0.0020	**OTR**	0.07279	0.020231	3.598	0.0004	**OTR**	0.149366	0.025279	5.908812	0.0000
GFD	-3.38E-07	8.27E-07	-0.40915	0.6828	**GFD**	-3.38E-07	7.18E-07	-0.47161	0.6377	**GFD**	-4.96E-07	7.42E-07	-0.66909	0.5042
RD	-6.98E-07	3.96E-07	-1.7618	0.0795	**RD**	-6.98E-07	3.44E-07	-2.03071	0.0435	**RD**	-5.67E-07	3.57E-07	-1.58833	0.1137
GRS	-0.02302	0.044564	-0.51662	0.6059	**GRS**	-0.02302	0.038663	-0.59548	0.5521	**GRS**	-0.10024	0.051729	-1.93779	0.054
TE	0.665615	0.072671	9.159241	0.0000	**TE**	0.665615	0.063048	10.55726	0.0000	**TE**	0.665309	0.067007	9.928974	0.0000
C	-1.35963	0.334976	-4.05887	0.0001	**C**	-1.35963	0.290618	-4.67839	0.0000	**C**	-1.10172	0.408491	-2.69705	0.0076
R2	0.947793				**R2**	0.947793				**R2**	0.961978			
Total number of Cross sections			8					8					8	
Total Panel (balanced) observations			224					224					224	
Breusch- Pagan LM				0.000	Hausman Test				0.0000					

Calculated by Authors

5. Conclusion

Using panel data for 8 NES for 28 years, the paper explores the effects of macroeconomic variables on health care spending in NES of India and their relative position. Instead of depending on cross-section regression methods, this study employs fixed-effects panel data model based on the estimation technique obtained from the Hausman Test. The empirical findings presented in this paper provide evidence that per capita GSDP, non-tax revenue, own tax revenue, grants and total expenditure play a key role in determining the health care spending in NES of India and that the coefficient estimate of all these macroeconomic instruments is lesser than one. The less than one coefficient of GSDP backs up the intuitive expectation of income elasticity to be less than unity, indicating that health care in NES is more a necessity than a luxury. This result is also comparable to Khan & Husain (2019); Pattnayak&Chadha (2016); Bhat& Jain (2006); Khan &Muhumud (2015) which clearly found that healthcare is a necessity in India as a whole and at the sub-national level.

The study shows that healthcare spending in NES is directly affected by macroeconomic indicators such as GSDP, non- tax Revenue, own- tax revenue and grants. Thus it shows that an increase in state's income would translate to effective government spending and health expenditure in particular However, the coefficients derived disclose a downcast priority towards health sector. Furthermore, towards improving public health spending; increasing the fiscal capacity of North Eastern states by widening the own tax base through the extension of the collection of the domestic tax revenue, controlling the unproductive expenditures and lowering the dependency for central assistance would lead the state to a an advantage position.

Therefore, in nutshell it can be argued that the macroeconomic factors of the NES are indisputably important to determine the health care spending. The states undergo various fluctuations on fiscal and macroeconomic front which makes the public health care spending very unattractive and inadequate. However, a debatable conclusion from the analysis could also be disinclination of the state governments to increase health spending due to the increasing per capita income and the huge availability of private healthcare.

References

1. Aggarwal, R. K. (2011). Social Sector Expenditure in India and Punjab: Trends during Pre-Reforms (1980-1991) and Post-Reforms (1991-2011) Periods. Retrieved from: https://www.researchgate.net/publication/283301974

2. Ali, M. A, Ullah, M. I &Asghar, M. A. (2017). Effect of Health Expenditure on GDP, a Panel Study Based on Pakistan, China, India and Bangladesh. International Journal of Health Economics and Policy, 2(2): 57-62.

3. Asif. M & Sultan. Z. A (2013). Health Care Expenditure and Inclusive Growth in India: A Co-Integration Approach. Online International Interdisciplinary Research Journal, ISSN2249-9598, III(V)

4. Behera, D. K & Dash, U. (2017). Impact of GDP and tax revenue on health care financing:

5. Behera, D. K & Dash, U. (2018). The impact of macroeconomic policies on the growth of public health expenditure: An empirical assessment from the Indian states. Cogent Economics & Finance, 6: 1435443

6. Chaabouni, S &Abednnadher, C. (2014). The determinants of health expenditures in Tunisia: AnARDL bounds testing approach. International Journal of Information in the Service Sector, 6(4): 1-14

7. Dao, M. Q. (2012). Government expenditure and growth in developing countries. Progress in Development Studies, 12(1): 77-82

8. Dash, A. K &Rath, S. S. (2016). A Study on Deficit and Debt Scenario of North Eastern States of India. Indian Journal of Applied Research; 6(3): ISSN - 2249-555X.

9. Dash, A. K &Tiwari, A. K. (2011). Is Inequality in Fiscal Performance Non-Linear Stationary in North Eastern States of India? International Journal of Development Research and Quantitative Techniques. 1(2): 56-66.

10. De, S. (2012). Fiscal Policy in India: Trends and Trajectory. Retrieved from:https://dea.gov.in/sites/default/files/FPI_trends_Trajectory.pdf

11. Dev, S. M &Mooij, J. (2002). Social Sector Expenditures in the 1990s Analysis of Central and State Budgets. Economic and Political, 37(9): 853-866

12. Dincer, H &Yuksel, S. (2018). Identifying the Causality Relationship between Health Expenditure and Economic Growth: An Application on E7 Countries. Journal of Health Systems and Policies (JHESP), 1(1): 10-38.

13. Dutta, P &Dutta, M. K (2014). Fiscal and Debt Sustainability in a Federal Structure: The Case of Assam in North East India. Romanian Journal of Fiscal Policy; 5, (1): 1-19.

14. Ellis, R. P, Alam, M & Gupta, I. (2000). Health Insurance in India- Prognosis and Prospectus. Economic and Political Weekly, 35(4), 207-217.

15. Ghuman, B. S & Mehta, A. (2009). Health Care Services in India: Problems and Prospects. Retrieved from: http://umdcipe.org/conferences/policy_exchanges/conf_papers/Papers/1551.pdf

16. Gopalakrishnan, L. (1987). Effect of Government Borrowing on Private Investment in India. National Institute of Public Finance and Policy, 26

17. Guruswamy, M, Mazumdar, S &Mazumdar, P. (2008). Public Financing of Health Services in Indian Analysis of Central and State Government Expenditure. Journal of Health Management., 10 (1): 49-85.

18. Haldar, S. K & Malik, G. (2010). Does Human Capital Cause Economic Growth? A Case Study of India. International Journal of Economic Sciences and Applied Research 3 (1): 7-25

19. Hassan, S. U & Mishra, B. (2018) Fiscal Tribal Dilemma: Imbalance in Protectionism and Optimum Resource Utilization Policies in North Eastern States of India. Economic Affairs, 63(3): 729-740.

20. Jain, R. B. (2004). Public Administration in India)- 21st Century Challenges for Good Governance. Deep & Deep publications Pvt LTD; ISSN: 81-7629-350-4.

21. Jena, P. R. (2012). Improving Public Financial Management in India: Opportunities to Move Forward. International Journal of Governmental Financial Management, XII (2): 10-15.

22. Khan, A, Khan, S & Khan, M. (2016). Factors effecting life expectancy in developed and developing countries of the world (An approach to available literature). International Journal of Yoga, Physiotherapy and Physical Education, 1(1): 1-4

23. Khan, J. R, Awan, N, Islam, M &Muurlink. O. (2020). Healthcare Capacity, Health Expenditure, and Civil Society as Predictors of COVID-19 Case Fatalities: A Global Analysis. Public Health, 8:347

24. Kraipornsak, P. (2017). Factors Determining Health Expenditure in the Asian and theOECD Countries. Economics World,5(5): 407-417

25. Malick, B, K. (2015). Linkages between Health and Economic Growth in India: An Econometric Analysis. Journal of Business & Social Sciences Research, 4(1), ISSN: 2319-5614.

26. Menon, N. (2017). Health Policy and Economic Growth in India: Lessons from International Growth Center Projects. S-35408-INC-2

27. Mishra, P & Newhouse, D. (2009). Does health aid matter? Journal of Health Economics, 28: 855-872.

28. Mohan, R (2003). Economic Development of the North East Region: Some Reflections. Reserve Bank of India Bulletin: 925-937

29. Mohanty, A. (2015). The Trend of Health Expenditure in India and Orissa and Its Relationship with Health Status. International Journal of Scientific Engineering and Research, 3(9), ISSN: 2347-3878.

30. Momodu, A. A &ogbole. O. F. 92014). Public Sector Spending and Macroeconomic Variables in Nigeria. European Journal of Business and Management, 6(18): 232- 243.

31. Mosca, I. 2007. Decentralization as a determinant of health care expenditure: empirical analysis for OECD countries. Applied Economics Letters, 14: 511-15.

32. Nayak, S. K &Rath, S. S. (2021). A Study on Debt Problem of the Special Category States. Retrieved from: https://rgu.ac.in/wp-content/uploads/2021/02/report19.pdf

33. Pakdamaet. al (2019). The effect of macroeconomic indicators on health-care expenditure in Iran. Journal of Education and Health Promotion, 8(123).

34. Pradhan, A. K &Hiremath, G. S. (2020). External commercial borrowings by the corporate sector in India. Journal of Public Affairs, 20(1). .

35. Rajeshkumar, N &Nalraj, P. (2014). Public Expenditure on Health and Economic Growth in Selected Indian States. International Journal of Science and Research, 3 (3), ISSN: 2319-7064.

36. Selvaraj, S & Karan, A. K. (2009). Deepening Health Insecurity in India: Evidence from National Sample Surveys since 1980s. Economic and Political Weekly, 44(40): 55-60

37. Sengupta, A &Nundy, S. (2005). The private health sector in India Is burgeoning, but at the cost of public health care. British Medical Journal, 331(7526): 1157-1158

38. Sharma, R. (2018). Health and economic growth: Evidence from dynamic panel data of 143 years. PLOS ONE, 13(10): 1-20

39. Tajudeen, O. S, Tajudeen, I. A &Dauda, R. O. (2018). Quantifying Impacts of Macroeconomic and Non-economic Factors on Public Health Expenditure: A Structural Time Series Model. African Development Review, 30(2): 200-2018.

40. Tandon, A &Cashin, C. (2010). Assessing Public Expenditure on Health from a Fiscal Space Perspective. Health, Nutrition and Population (HNP), Discussion Paper: 56053

41. Yun, W. S &Yusoff, R. (2015). An Empirical Study of Education Expenditure, Health Care Expenditure and Economic Growth in Malaysia using Granger Causality Approach. Malaysian Journal of Business and Economics,2(2): 1 - 10: ISSN 2289-6856.

42. Yun, W. S &Yusoff, R. (2018). An Empirical Analysis of Education Expenditure, Healthcare Expenditure and Economic Growth in Malaysia.Journal of the Asian Academy of Applied Business, 5: 1 - 11; ISSN 1675-9869.

43. Zuven. Z. (2014). Impact of Health Expenditure on Economic Growth: A Comparative Study of Developed and Developing Countries. Eastern Illinois University; The Keep. Retrieved from: http://thekeep.eiu.edu/theses/1197.