Economic Determinants of Conflict - A proposal for North Eastern States of India

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Economic Determinants of Conflict:
An Empirical study of North East Indian States

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1. Introduction

The North Eastern region of India has been adversely affected by ethnic clashes, insurgency and counter insurgency since independence. It is generally agreed among theoreticians (Hirschman, 1978; Bhattacharjee, 1989; Verghese, 1996; Hazarika, 2004) that the underdevelopment of northeast Indian states has been a serious matter of concern for years now. Existing literature and newspaper reports mention ethnic nationalism, xenophobia, illegal migration, conflict over natural resources/ property rights and poor governance and delivery of public goods resulting in unequal distribution across various ethnic groups as some of the most important drivers of conflict in North East India[1][2][3][4][5]. Various insurgent outfits have been indulging in armed conflict for decades in most of the north eastern states on these grounds. History shows that ethnic conflict in the north-east has social and cultural roots. The turmoil has more to do with ethnic political aspirations and the effort to protect local territories and resources.(Shimray,2004)et al.

Conflict is multi-causal and multi-dimensional and can result from a combination of the following factors[6]:

- *Political and institutional factors*: Weak public institutions, political exclusion, breakdown in social contract, corruption and identity politics/ xenophobia.
- *Socioeconomic factors:* inequality, exclusion and marginalisation, absence or weakening of social cohesion, poverty, multi-ethnic groups with varying access to resources and public goods.
- *Resource and environmental factors*: scarcity of national resources often due to population growth leading to environmental insecurity, resource exploitation

   Olson,(1965); Smith, D(2004), Hoeffler, A., (2012) et al. suggest that each of these factors may cause or be an impact of a conflict.

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[1] Mander, H, *Nellie: India's forgotten massacre*, *The Hindu, December 14, 2008* :
http://www.thehindu.com/todays-paper/tp-features/tp-sundaymagazine/article1437892.ece
[2] Ashirwad A, et al. *Targeting the Other,* Frontline, 26th December, 2014 http://www.frontline.in/cover-story/targeting-the-other/article6672263.ece
[3]Langer, A, *Northeasts's reverse racism,*
http://archive.tehelka.com/story_main53.asp?filename=Ne210712Northeast.asp
[4] Oinam B, Patterns of Ethnic Conflict in the North-East: A Study on Manipur, Economic and Political Weekly Vol. 38, No. 21 (May 24-30, 2003), pp. 2031-2037
[5] *Ethnic Clashes And Bomb Blasts Have Killed Over 1000 In Assam in the last 15 Years*, India Times, march 2015, http://www.indiatimes.com/news/india/ethnic-clashes-and-bomb-blasts-have-killed-over-1000-in-assam-in-the-last-15-years-230927.html
[6] *Understanding violent conflict,* GSDRC
http://www.gsdrc.org/go/conflict/chapter-1-understanding-violent-conflict/the-causes-of-conflict-part-1-

2. Literature Review

While the Marxian argument that income inequality is one of the main causes for social conflict may hold true in some instances (Ray et al., 2011), other factors like cultural, biological, educational, occupational, lingual, racial, historical and socio- political differences also play equally important role. Existing literature suggests that racial and linguistic diversity plays a crucial role in triggering social conflict. An ethnically diverse society may be more prone to conflicts (Braubaker and Laitin 1998; Fearon and Laitin 2003a; Esteban and Ray, 2011 et al). Do and Iyer (2010) found evidence that greater caste diversity is associated with higher level of conflict. Ethnic Conflict may be a factor of low economic growth (Easterly and Levene 1997; Montalvo and Reynal-Querol 2005b), high corruption (Mauro1995), low social adherence and participation (Alesina and La Ferrara 2000), low contribution to local public goods(Alesina et al. 1999; Alesina and La Ferrara 2005; Bossert et al. (2011) and reduced literacy and schooling (Alesina et al. 2003).

The literature on the subject also suggests that the incidence of conflict is negatively correlated with quality of governance (La Porta et. al. 1999), size of government social expenditure (Alesina et al. 2001) or social capital (Collier and Gunning, 2000).

Esteban and Ray (2011) describe a theory of conflict incidence where distributional measures are important factors. They introduce three indices which according to them explain conflict. The three related concepts are discussed below.

If there are m groups engaged in conflict, with N_i the number of individuals in group i, N the total population, and the distance across two groups i and j is given by d_{ij}, then

Polarization $P = \sum_{i=1}^{m} \sum_{j=1}^{m} n^2{}_i n_j \, d_{ij}$

Greenberg-Gini index $G = \sum_{i=1}^{m} \sum_{j=1}^{m} n_i n_j \, d_{ij}$

Ethnic fractionalization $F = \sum_{i=1}^{m} \sum_{j \neq 1}^{m} n_i n_j = \sum_{i=1}^{m} n_i (1 - n_i)$

Where, $n_i \equiv \frac{N_i}{N}$ is the population share of group i.

The following table lists some of the important studies carried out in this subject, along with their objective, methodology and variables and major conclusions

Table 1.1 Some important studies on Conflict: tools and methods

Study	Objective	Independent Variables	Method	Conclusion
Alberto Alesina and Eliana La Ferrara, 2005	Using the updated data set of Alesina, Arnaud Devleeschauwer, Easterly, Sergio Kurlat, and Wacziarg (2003), the study tests whether the negative correlation between ethnic fragmentation and growth holds irrespective of the level of economic development. Data relates to 215 countries and stretches over 40 years	Decade dummies for 1960's, 70's, 80's Dummy for Sub-Saharian Africa, Latin America and the Caribbean, Dummy for democracy, Log of initial income, Log of schooling, Assassinations, Financial Depth, Black Market premium, Fiscal Surplus/GDP, Log of telephones per worker.	Seemingly Unrelated Regression.	Public goods provisions are lower in fragmented societies. Productivity's relation to diversity varies according to the political and economic factors of a country
Javier Gardeazabal, (2011)	This paper investigates the relationship between linguistic fragmentation and conflict through a case study in the Basque Country	Assassinations, Conflict Index, Population, linguistic Polarization, Political Polarization, Number of votes, Fraction of Population with Higher Studies, Unemployment Rate, Employment over Population, Population of People born Abroad	Generalized Method of Moments estimates for a dynamic panel data.	Using data at the municipal level the study shows that linguistic polarization reduces the level of conflict and that A high level of the stock of human capital is beneficial for reducing conflict intensity. Political polarization does not affect conflict significantly
Hae S. Kim, 2006	The study aims at finding major determinants of conflict in less developed countries. A panel data based on both conflict-stricken and non-conflict stricken developing countries (140 countries in total), is used. The time span covered in the analysis is the 2000–2005	Population growth , Gini, GDP growth, HDI, Religious Heterogeneity, Ethnic homogeneity, dummy for type of political system	Econometric analysis (Logistic Regression)	The empirical analysis verifies that political system, ethnic and racial differences are significantly associated with armed conflict

	period.			
Joan Esteban, Laura Mayoral, and Debraj Ray(2012)	The study examines empirically the impact of ethnic divisions on conflict through three indices of ethnic distribution: Polarization (P), fractionalization (F), and (G/N), where G= the Gini-Greenberg index[7] and N the total population of a state. The study covers 138 countries over 1960–2008	Polarization (P), fractionalization (F), and (G/N), where G= the Gini-Greenberg index and N the total population of a state, Population, Per capita GDP, oil/diamond dummy, Mountainous region dummy, Democracy dummy, Non-contiguous states	Theoretical model and Econometric analysis (Probit Regression)	The empirical analysis verifies that these distributional measures are significant correlates of conflict. These effects persist as we introduce country specific measures of group cohesion and of the importance of public goods, and combine them with the distributional measures.
José G. Montalvo and Marta Reynal- Querol (2002)	This paper analyzes the role that different dimensions of ethnicity plays in the process of growth of a country using a and Barro (1991)	Real GDP per capita, real domestic investment (private plus public) to real GDP, Percentage of secondary school attained in the total population, Percentage of ``Primary school attained'' in the total population, number of assassinations, religious polarization.	Pooled Panel Regression	The main finding is that religious conflict, is an important factor in explaining low economic growth
José G. Montalvo and Marta Reynal-Querol (2005)	This paper analyses the relationship between ethnic polarization and the duration of civil Wars.	Log GDP, Log Population, primary exports, mountain, non-contiguous states, degree of democracy,	Logit Regression	The results show that ethnically polarized countries have to endure longer

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[7] If there are m groups engaged in conflict, with N_i the number of individuals in group i, N the total population, and the distance across two groups i and j given by $d_{ij} \equiv u_{ii} - u_{jj}$ then,

Polarization $P = \sum_{i=1}^{m} \sum_{j=1}^{m} n^2{}_i n_j\, d_{ij}$

Greenberg-Gini index $G = \sum_{i=1}^{m} \sum_{j=1}^{m} n_i n_j\, d_{ij}$

Ethnic fractionalization $F = \sum_{i=1}^{m} \sum_{j \neq 1}^{m} n_i n_j = \sum_{i=1}^{m} n_i (1 - n_i)$

where $n_i \equiv \frac{N_i}{N}$ is the population share of group i.

		ethnic fractionalization, ethnic polarization, religious fractionalization, religious polarization		civil wars than ethnically less polarized societies.
Joseph Flavian Gomes (2011)	Using sub national data on 362 districts for 3 time periods the study to identify the causes of civil conflicts.	Income inequality, percentages of Scheduled Castes & Tribes, Distance from state capital, Barren-Rocky Dummy, proportion forest cover, log total area, consumption pc, land inequality, %Scheduled Castes, %Scheduled Tribes, Density, initial consumption pc, Prop. Non landlord, State and Time Dummies	Pooled Probit, Pooled Negative Binomial regression	The study finds evidence on how land inequality is extremely important for the Maoist conflict.
Krishna Chaitanya Vadlamannati (2011)	The study provides a quantitative test of whether deprivation and persistent economic and political discrimination affect the probability of armed conflict incidence across nine North-Eastern states of India during the period 1970–2007.	Poverty rate, Economic and Political discrimination, GDP, Population pressures, Ethnic affiliations, Forest area, State capacity, Availability of arable land, Neighbouring conflict events, and distance to New Delhi.	Econometric analysis (Probit Regression and system GMM)	Absolute Poverty, Relative poverty, economic and political discrimination of marginal groups in these regions are positively related to conflict outbreak

Source: Constructed through literature survey

The review of literature suggests that many empirical studies have used some economic variables like economic growth, population, public expenditure etc in past. This study attempts to introduce some new economic variables related to resource exploitation, illegal migration and size of ethnic majority to address sociological and political issues that are peculiar to North eastern region of India. While empirical models of conflict have become much popular in recent economic literature, very few studies have been done in India so far. Sub-national studies on India hitherto include (Gomes 2011, Remoe 2010, de Soysa and Vadlamannati 2010 and 2011, Urdal 2008 and 2007). Although these studies analyse the causes of conflicts, only one paid attention to the North-Eastern region of India. This study attempts to fill this gap.

3. Objective

The study will attempt to estimate the likelihood of armed conflict across the 8 north east Indian states, Assam, Meghalaya, Tripura, Mizoram, Manipur, Nagaland and Sikkim for a span of over 40 years (1972[8]-2014). It will also attempt to study the association between armed conflict and economic /socio-political/ policy variables; and suggest relevant policy measures.

4. Broad Research Questions

While analysing the literature several questions arise, some specific to North East Region in India.

1. What causes violent conflict? What are the major economic *determinants of violent conflict* in North East India?

2. Is there two -way causality between *economic growth* and *occurrence of violent conflict* in these states?

   The above research questions lead us to the following hypothesis

5. Hypotheses

H1 : Economic Growth is negatively associated with the probability of incidence of Conflict
H2 : Economic Inequality, poor delivery of public goods and poverty are positively associated with the probability of incidence of Conflict
H3: There is two way causality between growth and incidence of Conflict

6. Methodology

The research questions posed above will be dealt with theoretically and empirically. The theoretical foundations for social conflict have been provided by Ray et al. For the purpose of this study these models will be evaluated in the specific context of the selected states. Attempt will be made to modify or suggest modification to these models to incorporate the valid explanation of the determinants.
For empirical estimation-both time series analysis and a panel approach may be used. The analysis will be done using the data that would pertain to the eight north east Indian states viz. Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura and Sikkim for a span of over 40 years (1972[9]-2014) and will use economic, political, social and policy variables to estimate the likelihood of the occurrence of an armed conflict (As mentioned in the following section)

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[8] Since Meghalaya was the last state within the Northeastern region of India to attain full statehood in 1972, we chose our time span accordingly to incorporate data from all the eight independent states in the region.
[9] *ibid*

6.1 Empirical Analysis

A binary dependent variable model will be used with time fixed effects and standard errors clustered at state level which assumes that the observations are non-independent within states but independent across. This will help us to estimate the likelihood of the occurrence of a conflict among the 8 North East Indian states. The choice of the specific binary dependent variable model will depend on the distribution of the estimated dependent variable. If $\hat{Y}$ follows normal distribution, we will use a Probit estimator. We will attempt to estimate the relationship between occurrence of conflict and economic and socio-political factors that trigger it.

Further, tests will be carried out to check if a two-way causality can be established between economic growth and incidence/ occurrence of conflict for every state. Appropriate tests of robustness will be carried out to validate the results.

We estimate the relationship using the following specification:

$$Y_{it} = \alpha + \beta_1(Y_{it-1}) + \beta_2(E_{it-1}) + \beta_3(P_{it-1}) + \beta_4 D_{it} + \omega_{it}$$

Where,

      Y_{it} =Occurrence or incidence of conflict at time t
      Y_{it-1} =Occurrence or incidence of conflict at time t-1
      E_{it-1} = Economic Variables at time t-1
      (P_{it-1})= Socio-Political variables at time t-1
      D_{it}= Dummies
      ω_{it}= Error term

- ***Dependent variable (it)***

1. *Occurrence or incidence of conflict(binary)*
   Codes 1 for a year if there is a conflict in which casualties are 25 and above and 0 otherwise.

- ***Economic Variables(it-1) include***

2. *Per capita Net State Domestic Product (log)*
   NSDP per capita is expected to be negatively associated with likelihood of incidence of conflict. However, in a region like North East India, where growth faces many developmental/ sustainability constraints, NSDP per capita may be observed to be positively associated with likelihood of the occurrence of a conflict in some cases.

3. *Fiscal Deficit*
4. *Public Debt by Net State Domestic Product*
5. *Own Tax Revenue by Population*

   Fiscal deficit, own tax revenue per capita and Debt to NSDP ratio are good indicators of a state's financial health. These variables are introduced to check if a state's financial behaviour is associated with conflict.

6. *Social Allocation Ratio*
   (State social expenditure/ Total expenditure by a state) is a good indicator of state's ability to create public goods. Public Expenditures on health, education and other social expenditures are expected to be negatively associated with the likelihood of the occurrence of a conflict.

7. *Share of mining and petroleum in Net State Domestic Product*
   This ratio measures the share of income generated in a state from its natural resources. In a mineral rich region like North East India it is expected to be positive, given that the mining areas are mostly inhabited by indigenous ethnic population across the 8 states.

8. *Forest area in Sq. Kms (log)*
   Forest area is expected to be negatively associated with conflict. States with high forest area in time *t* is expected to have faced less resource exploitation in time *t-1*

9. *Arable Land per head (log)*
10. *Population Density*

    Arable Land per head and density are indicators of population pressures on land. It is expected that these variables will be positively associated with likelihood of the occurrence of a conflict. Density could also be negatively associated with conflict if the conflict is predominantly a rural phenomenon where there is high incidence of conflict with low density.

11. *Poverty Rate*
12. *Relative Poverty Rate*
    Most conflict literature has flagged poverty to be an important determinant of likelihood of a conflict. Poverty rate and relative poverty rate is expected to be positively related with incidence of conflict.

13. *Gini co-efficient (Top ten percentile monthly per capita expenditure /Bottom ten percentile monthly per capita expenditure)*

    Income inequality has always been associated with incidences of conflict. States with high income inequality are also likely to be more susceptible to conflict.

- *Socio- Political Variables(it-1) include*

14. *Occurrence or incidence of conflict*

    A lagged dependent variable in included in the model. There are two reasons for the inclusion of a lagged dependent variable-First, to control for autocorrelation, and omitted variables (Beck and Katz 1995 and Neumayer 2005). Second, a theoretical reason based on '*violence begets violence*' theory (Kaufman 1996), that on-going conflict in a state tends to affect the conflicts in the next year (Collier and Hoeffler 1998 and Fearon and Laitin 2003). This is expected to be positively associated with the dependent variable. A favourable result may provide us with some evidences of vicious cycles of conflict and low rates of economic growth in these states.

15. *Percentage of largest indigenous group in total population*

    This variable will act as an indicator for the size of ethnic majority. Much of the recent violence in northeast has been on the lines of ethnic nationalism, xenophobia and illegal migration issues. It would be interesting to explore if the percentage of largest indigenous group in total population is associated with conflict.

16. *Police force per 100,000 people (log)*

    Though the literature on conflict is replete with instances where high *police force to people* ratio was negatively associated with the probability of occurrence of a conflict, in states like Manipur where legislations like the Armed Forces Special Powers Act[10] have had an adverse effect, the variable may be even be positively related to conflict.

17. *Neighbours' conflicts*

    Codes 1 for a year if there is a conflict in which casualties are 25 and above and 0 otherwise. Since many states in the region share each other's borders, negative externalities of conflict in neighbouring state may affect a state. This variable is expected to be positively associated with incidences of conflict.

18. *Length of international borders in Kms (log)*

    The illegal migration issue has been one of the major causes for conflict in northeast. Percentage of largest indigenous group in total population may be positively associated with conflict as it reflects polarisation.

19. *Economic Discrimination index*
20. *Political Discrimination index*

    Indices are macro coding related to the role of public policy and social practice in maintaining or redressing economic and political inequalities of minority groups. Indices are coded on a scale of 0 to 4 in which highest value represents higher

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[10] Debates on AFSPA, www.idsa.in/system/files/Monograph7.pdf

discrimination. These indices are expected to be positively associated with incidence of conflict in a state.

- ***Dummies(it) include,***
21. *A dummy for 6th schedule of Indian constitution*

The 6th schedule of Indian constitution provides special provisions for the indigenous population of North East Region in respect of property rights, self-governance, and mode of education etc.to safe guard. A dummy with a score of *1* for states under 6th schedule and *0* otherwise is expected to be positively related

22. *A dummy for agro climatic zones*
A dummy with a score of 1 for states with a high percentage of hilly area in a state and 0 otherwise is expected to be positively related to conflict as distribution of public goods are generally weak in hilly areas. States with weak distribution of public goods are expected to be prone to incidences conflict.

23. *A dummy for states with high percentage of disturbed areas under Armed Forces Special Powers Act (AFSPA),1958*
In states like Manipur where legislations like the Armed Forces Special Powers Act have had an adverse effect, the variable may be even positively related to conflict. A dummy with a score of 1 for states with a high percentage[11] of area under AFSPA and 0 otherwise is expected to be positively related.

6.2 Data sources

The following table details the data sources for each of the variables the study proposes to use.

Table 1.2 Select variables and their data sources

Variables	*Data sources*
Occurrence or incidence of Conflict	Constructed based on UCDP/PRIO dataset of Gleditsch, et al. (2002) Alt. sources : The Correlates of War data, Norwegian Social Science Data Services, Newspaper articles
Per capita NSDP	Central Statistical Organisation
Fiscal Deficit	Database on economic indicators, Reserve Bank of India
Public Debt by NSDP	Database on economic indicators, Reserve Bank of India and Central Statistical Organisation
Top percentile MPCE /Bottom percentile MPCE	Household Consumer Expenditure, National Sample Survey, various rounds/ Data Tables, Planning

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[11] A benchmark may be set to define high percentage of area under 6th Schedule / AFSPA

Variables	Data sources
	commission. The gaps in the series will be interpolated and missing values will be extrapolated.
Own Tax Revenue by Population	Database on economic indicators, Reserve Bank of India
Social Allocation Ratio	State Budgets, Various years
Share of mining and petroleum in NSDP	Central Statistical Organisation
Forest area in Sq. Kms (log)	Census of India, Various years
Arable Land per head (log)	Census of India, Various years
Poverty Rate	Constructed, based on the data from Planning Commission of India, Government of India. The gaps in the series will be interpolated and missing values will be extrapolated.
Relative Poverty Rate	Constructed, based on poverty rate data
Percentage of largest indigenous group in total population (log)	Census of India, Various years
Density	Census of India, Various years
Police force per 100,000 people (log)	Ministry of Home Affairs, Government of India: http://www.mha.nic.in/
Length of international borders a share shares (log)	Constructed using Maps of north-east Indian states / Google Maps
Economic Discrimination index	Minority At Risk (MAR) database: www.cidcm.umd.edu/mar/
Political Discrimination index	Minority At Risk (MAR) database: www.cidcm.umd.edu/mar/
Neighbours' conflicts	Constructed based on UCDP/PRIO dataset of Gleditsch et al. (2002)

Source: Constructed

7. Conclusion

By the end of the study we would be able to acquaint ourselves with the major determinants of violent conflict in North East India and the likelihood of its occurrence. Further we will be able to provide analyses of why economic / political discrimination may increase the risk of armed conflicts. The study will further look at two way causality between growth and incidence of conflict, interpret the results and list suitable policy suggestions for the region.

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