

# Discrimination in Ethnically Fragmented Localities

## A Study on Public Good Provision in West Bengal

*This paper presents an empirical investigation that examines the role of ethnicity along with the caste dimension in influencing local government spending on public goods like education, lighting, drainage, health and public works in municipalities in West Bengal. The study suggests that higher ethnic diversity is associated with lower local government spending on all types of public goods under both cross sectional and panel data analysis. Though the role of higher ethnicity is not robust for lower local government spending on all types of public goods, such an ethnic differentiation based on caste lines might lead to greater inequality in status and opportunities, deeper tensions and rivalries, more social conflict and political instability between different caste groups in the region in the future, which, in turn, may be a strong impediment to economic development and growth.*

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**T**he assessment of the claims of equality appears with the existence of pervasive human diversity [Sen 1995:1]. In addition to the differences in external characteristics (e.g., in inherited features in the national and social environment in which we live), we also differ from each other in our personal characteristics (e.g., age, sex, race, colour, religion, caste, physical, and mental abilities) and these are important for assessing inequality (ibid: 20). It is said that the discrimination may occur in a market where individuals face terms of trade that are determined by, among others, personal characteristics which do not appear directly relevant to the transaction [Mueser 1989:24]. Against this discrimination, the International Labour Organisation's (ILO) discrimination (Employment and Occupation) convention, 1958 (No 111) calls for a national policy to eliminate discrimination on the basis of race, colour, sex, religion, political opinion, national extraction or social origin. But neither men and women, nor white and non-white, nor dalit and non-dalit are treated equally in employment and/or distributed equally across occupation. Moreover, the way a person is viewed in a society with racial disparity may be deeply influenced by his or her visible racial characteristics, which can act as a barrier to functioning possibilities in many circumstances. Similarly, distinctions of caste have influences of their own. Race or caste can be a factor with far-reaching influence on many aspects of day-to-day living (op cit: 121-22). Even economic development scholars have recognised the important role of non-economic variables like race, religion and caste to the economic development viability of developing countries.

The enactment of discriminating laws and provision of unequal public services has often represented the exploitation of group with some political power in history. It is argued that all discrimination by race or ethnic group can be traced to such a dynamic in which group mobilise political and economic resources to further their material interests. The goal of such action exclude the competing group from the labour market or, failing

this, the creation of caste system providing the dominant group with preferential treatment [Bonacich 1972; cited in Mueser 1989: 26-27]. The government often has a central role in furthering dominant group interest. Since the civil war, the history of governmental action regarding blacks in America is replete with examples of policies designed to benefit whites with political power at the expense of the blacks.

In the west, skin colour has become a plausible factor for ethnic conflict among the blacks and the whites. In south and central American countries like Colombia, Brazil, Mestizo, Bolivia, Uruguay, Peru, Ecuador and Paraguay, ethnic diversity is primarily based on race [Barrett, Kurian and Johnson 2001]. Although ethnicity in the sub-Saharan Africa is expressed in linguistic forms, members of ethnic group have also markers that identify them, such as, tribal marks, skin complexion, height and other physical features. Ethiopia is an ethnically heterogeneous country comprised of about 70 languages, which serve to distinguish different ethnic groups. In addition to that, ethnicity in Ethiopia has had a religious dimension. Keller (1988) presents that 30-year war between Eritrea and Ethiopia can be traced back to the Eritrean resistance to Ethiopia's ethno-religious hegemony. Other sub-Saharan African countries, such as Liberia, Uganda and Sierra-Leone are fragmented culturally, linguistically and in their forms of political and legal organisation.

In Europe, ethnic differentiation generally manifests in linguistic, religious and racial fragmentation. Based primarily on the religious differences between Catholic and Protestants, the northern Ireland is a classic example of ethnic fragmentation [Geertz 1963]. The west Asia presents a complex study on ethnic fragmentation. In the west Asia, most of the countries are ethnically and linguistically heterogeneous and are predominantly Islamic. Sunni and shias are the main sects of the Islamic religion practised in this region. Conflicts in the west Asia mainly exist along ethnic and religious lines, including the persecution of the Kurds by Iraqis and prolonged conflict between Israel and Palestinians

provoked by anti-Jewish sentiments among the Arabs and conflicts between sunnis and shias in Iraq.

South Asia and south-east Asia exhibit another complex study on ethnic fragmentation. Most south-east Asian countries are religiously, linguistically and ethnically heterogeneous. In Indonesia, the recent conflict after the overthrow of president Suharto was along ethno-religious lines, mainly between Muslims and Christians in places such as Makasar in south Sulawesi and Ambon. But in India, the most populated country in south Asia, the current upper versus lower castes or Hindu versus Muslim conflicts is, in a significant sense, a variant of the modern problem of ethnicity or race; but it is seldom entertained in discussions in the western media [Chakravorty 1995:3374]. Although India is ethnically fragmented along religious, cultural and linguistic lines, the caste system further convolutes ethnic fragmentation by creating a pecking order or pyramid within the society. From the 1890s onward, ethnic strife in India has spilled blood in large amount at different points in history. The upper and lower castes, Hindus and Muslims in India, both during and after British rule, have become competitive block of ethnicity in the public sphere and political lives (ibid: 3377). Recent problems in Kashmir, north-eastern India, Bihar, Uttar Pradesh and other parts of India have been particularly glaring. Whatever the cause of partition of our country, ethnic conflict is there [Engineer 1997: 2108]. The rise of Hinduvta in Indian politics has further intensified religious conflicts. Political analysts dealing with elections have opined that India is a caste-ridden society and the voters tend to vote on caste lines [Chakravorty 2000: 3805]. The goal of such action usually provides the dominant group with preferential treatment. In a society where population is heterogeneous along caste dimensions, it may not be realistic to assume a government as benevolent social planner. Social heterogeneity may encourage governments in interest group politics leading to an increase in targeted and patronage spending relative to spending on pure public goods. Hence public good provisions may reduce as ethnic diversity increases.

This paper attempts to examine the role of ethnicity along caste dimension in influencing local government spending on public goods like education, electricity, drainage, health and public works in West Bengal municipalities. This is structured as follows: Section I is a literature review. Section II deals with the empirical evidence: this section focuses on two aspects – the data and methodology of the paper and the results of empirical evidence. Section III represents our concluding observations.

## I Literature Review

A significant body of empirical literature establishes that ethnically fragmented societies have uniquely significant problems in achieving in socio-economic development outcomes [Wilson 1987, 1996; Easterly and Levine 1997; Luttmer 1997; Mauro 1995; Annett 1999; Shleifer and Vishny 1993; LaPorta et al 1998; Ake 1993; Cutler and Glaeser 1995; Barro 1999; Svensson 1998; Ritzen, Easterly and Woolcock 2001; Alesina et al 1999; Alesina and La Ferrara 2000; Alesina et al 2003; Ottaviano and Peri 2004; Montalvo and Querol 2005; Alesina and Ferrara 2005; Bahry et al 2005]. Alesina Baqir, Easterly (1999) studies the effect of ethnic diversity on local government spending. They demonstrate that increased diversity leads to more variation in preference for public goods, leading, in turn, to less

public spending. They also suggest that more ethnic diversity will increase “interest group” politics, which leads to larger increase in patronage spending relative to spending on non-excludable public goods. Using data at different levels of aggregation (cities, metropolitan areas and counties) and after controlling the influence of other important variables such as income per capita, population size, educational attainment, income inequality, which are also important determinants of individual preference over public goods, they find that greater ethnic diversity leads to a smaller share of government spending on education, roads, sewerage, and trash pick up and higher share of police spending. The negative correlation between ethnic diversity and indicators of public goods is mainly due to the fact that voters choose lower public goods when a significant fraction of tax revenue collected on one ethnic group are used to provide public goods shared with other ethnic groups; voters increase their support for welfare spending if a larger fraction of welfare recipients in their area belongs to their own racial groups. Interest group politics leads to larger increase in patronage spending relative to spending on non-excludable public goods. Alesina, Baqir and Easterly (1999) also find that Prince George’s (PG) county, a Maryland county next to Washington DC, used to have large white majority; but PG county was much more diverse after the influence of a large black middle class during the late 1970s, although the whites were still in the majority. In 1978, PG voters passed a legal law called TRIMS which was a legal ceiling on the property tax rate, a binding constraint on the main source of revenue for school financing, as a result of which TRIMS acts as one of the main reasons for poor schools in PG county [Alesina et al 1999: 1244]. But Montgomery, next door to PG county and also a DC suburbs, has a much larger white majority and less ethnically diverse than PG. Montgomery is regionally (and even nationally) famous for the quality of public school and Montgomery voters have decisively rejected tax limitation laws on several occasions. While Montgomery residents are richer than PG residents, on average, the disparity in public schools appears to be greater than can be explained by the income difference (ibid: 1244). Recently Alesina and Ferrara (2005) also find an overwhelming evidence supporting that public good provisions are lower in fragmented societies based on their studies on committees of different sizes and organisational structure such as counties, cities in developed countries, and villages and groups in developing countries.

Cutler et al (1993) empirically find that people have “discriminatory community preferences” where they only care about the welfare of others within their own ethnic community. Luttmer (1997) also finds that individuals increase their support for welfare spending if the larger fraction of welfare recipients belongs to their own racial group. Alesina (1994) suggests that ethnically divided societies are more prone to polarisation and social conflict. The adverse effect of ethnic fragmentation on economic growth may yield from the war of attrition between interest groups, which can postpone macroeconomic stabilisation. An increase in ethnic diversity has a negative effect on important economic phenomena like investment, growth or the quality of government [Alesina et al 2003; LaPorta et al 1999]. Montalvo and Regal Querol (2005) confirm that ethno-linguistic fractionalisation has a direct negative effect on growth, probably due to its impact on the transmission of ideas, and indirect negative effect on growth, because it increases the incidence of civil wars and public corruption and reduces the rate of investment.

In a cross-country empirical analysis, Mauro (1995) and Annett (1999) find that greater ethnic diversity is significantly related to poor bureaucratic performance and political instability, which retards economic development. LaPorta et al (1998) show that ethnic diversity predicts poor quality of government services. The study of Shleifer and Vishny (1993) suggests that more ethnically diverse societies have higher rates of corruption in relation to the ethnically homogeneous societies. Barro (1999) argues that ethnic diversity makes it more difficult to sustain a democracy due to ethnic competition for control over limited resources. The ultimate effect of such competition is an ethnic conflict, which may become more violent into civil war. Svensson (1998) suggests that a possible consequence of ethnic polarisation is to cause governments to under-invest in the legal infrastructure. The study of Ritzen et al (2001) shows that highly fractionalised societies will have a worse record of the rule of law. Alesina and La Ferrara (2000) find that trust, one of the determinants of social cohesion, is negatively correlated with ethnic diversity. Bahry et al (2005) find high trust in inter-groups and little to none in out-groups leading to greater confidence across ethnic lines. Lower trust levels make more difficult to develop social networks that promote growth by disseminating advanced technology and economically useful knowledge [Easterly 2001].

A recent study of Ottaviano and Peri (2004) shows that the wage of white individuals, after controlling for various other determinants, are higher in more diverse cities where diversity is measured with indices based on main languages spoke at home [cited in Alesina et al 2005]. Some studies [Wilson 1987, 1996] reveal that poor minorities in highly segregated cities have low public good provision because of ethnic conflict; they need good public school to improve their skills, but the relative skill level of minorities in ghettos does not improve. Their poverty level and unemployment increases, ethnic conflicts become more acute; the implication of this fact is a vicious circle. One of the main causes of Africa's poor economic growth is ethnic diversity [Easterly and Levine 1997: 1205]. Conflicts among nationalities, ethnic groups and communal and interest groups that broke out after the independence of African nations was so absorbing that everything else, including development, was marginalised [Ake 1993]. Ethnic diversity alone accounts for about 28 per cent of the growth differential between the countries of Africa and east Asia after controlling for the effect of ethnic diversity on education, political stability, financial depth, black market premiums, fiscal policy and infrastructure development (op cit: 1207). The implications of both theoretical and empirical discussions however suggest that ethnically fragmented societies have significant problems in achieving development patterns, because the disparity that exists for poor public goods outcomes in more segregated caste or religious areas in relation to the areas belonging to caste or religious homogeneity might increase poverty, unemployment, political instability and make an adverse effect in other socio-economic factors to the former areas, perpetuating a vicious cycle.

Based on these implications this paper tries to find out whether per capita local government spending on public goods is a negative function of ethnic fragmentation based on caste dimension and whether ethnicity is more important determinant of per capita local government spending on public goods after controlling other determining variables affecting individual preferences over public goods.

## II The Empirical Evidence

*Data and Methodology:* Recent empirical studies on public goods and ethnic divisions show that statistical data were mainly collected in urban localities. This is mainly because individual consciousness and awareness over public goods, incentives of local fiscal policies are more pronounced in urban localities than in rural areas. In keeping with this, we made an effort to collect data at a cross sectional study of West Bengal municipalities that had a 2001 population of one lakh or more, which covers 28 municipalities, based on the census report of West Bengal 2001. The panel study was conducted in four municipalities, two being most ethnically diverse municipalities (the highest ethnic fractionalisation index and the following one)<sup>1</sup> and two, most ethnically homogenous municipalities (lowest ethnic fragmentation index and the preceding one)<sup>2</sup> for 30 years from 1974 to 2003.<sup>3</sup>

To measure ethno-linguistic diversity of the world population, the Ethno-Linguistic Fractionalisation (ELF) was developed in 1964 by Soviet social scientists. Subsequently, Taylor and Hudson (1972) computed an ELF index, which has been employed as a standard measure of ethnic diversity. The ELF measures the probability that two randomly selected persons in a country belong to different ethno-linguistic groups. As a tool for measuring ethnic diversity, Mauro (1995) first introduced ELF (or ethnic fractionalisation index, ETHNIC) to economic literature. We use ETHNIC as a measure of ethnic fragmentation based on municipalities with a 2001 population of one lakh or more, which covers 28 municipalities in West Bengal. Following Taylor and Hudson (1972) caste based fractionalisation index; ETHNIC, measures the probability that two randomly selected individuals will belong to different caste groups. It is defined as follows:

$$\text{ETHNIC} = 1 - \frac{\sum_{i=1}^I n_i^2}{N^2}$$

$i = 1 \dots I$ , where  $n_i$  is the number of people in the  $i$ th group,  $N$  is the population, and  $I$  is the number of caste based groups in the municipalities. Here  $i =$  (scheduled caste, scheduled tribe, others). We follow the above classification used by the Indian census. According to the census of India, population is divided into three caste groups, viz, scheduled caste, scheduled tribe and others. For the cross section analysis, this study considers the latest data of 28 municipalities for the year 2003 available from municipal statistics (2003) published by the government of West Bengal. So, in constructing the caste-based indices in 2003 based on 2001 population, we assume that population total and population under different ethnic groups grow at constant rates using simple interpolation. The interpolation framework was also used in the panel study for population during all years except 1981, 1991 and 2001, because the census report is published at an interval of every 10 years, and for municipal statistics of West Bengal (Consolidated Statistical Table for Municipalities of West Bengal, 1974-94; Municipal Statistics, 1994-95 to 2000-01) during all years except 1980, 1984, 1987, 1990, 1995-96, 2001-02, 2002-03, when the municipal statistics did not come out.

The data set for our study consists of annual observations on variety of subjects for municipalities. They are divided into three categories: (1) expenditure per capita of five public goods:<sup>4</sup> lighting; drainage; schools and colleges; hospitals, dispensaries,

vaccination and other sanitary requirements; public works (2) a few control variables – per capita municipal income, literacy rate and rate of industrial workers as a proportion of total workers which are also the determinants of individual preferences over public goods along with an ethnic fractionalisation index. It is relevant to mention that while exploring the impact of ethnicity, Bates (2000) controlled for the impact of urbanisation (identified by the proportion of population affecting the same), education and per capita income (p 133). Our first control is per capita municipal income since more developed, richer municipalities (or cities) may have more public goods [Alesina, Baqir and Easterly 1999: 1257]. Educational attainment might be another important control variable in our model, with more educated municipalities choosing better municipal policies, demanding more education for their children, or monitoring the provision of their public goods. For educational attainment, we use literacy rate. The provision of public goods in a municipality is also affected by the magnitude of industrial workers. If the percentage of industrial workers to total workers increases in a municipality which promotes urbanisation, the local government has an extending provision to increase her income by imposing local taxes on the one hand, she has also to increase the quantitative as well as qualitative facilities for public goods like roads, electricity, education, health, sanitation, etc, on the other. Moreover, the higher political consciousness of industrial workers in relation to agricultural workers has had some direct effects on the expenditure of public goods by the local government in a democratic process.<sup>5</sup> (3) Ethnic fragmentation index (ETHNIC) as measure of ethnic diversity. We consider all variables in log forms because of their widely varying absolute values.<sup>6</sup>

Population data were obtained from the census of India. But the data of other variables were obtained from municipal statistics published by the government of West Bengal. We present results of different local government expenditure on public good variables regressed on ETHNIC and control variables. More relevant, the proportions spent on different kinds of public goods for municipality-wise in an average are: 3.62 per cent, 7.49 per cent, 5.51 per cent, 4.29 per cent, and 14.5 per cent for lighting, drainage, hospitals, schools and colleges and public works,

respectively. For each public good variable, primary regression is run on ETHNIC. Afterwards, for each regression and for each public good variable in addition to ETHNIC, we include control variables gradually one by one. We have used the econometric package LIMDEP for our cross section analysis of 28 municipalities of West Bengal and have run each regression using Generalised Least Square after removing heteroskedasticity problem. For panel study in the four municipality of West Bengal we have used econometric package STATA and have run regression with both fixed effect and random effect models. All the regression models in our study are estimated in linear form with constant terms. We also check the problem of multicollinearity to each of the regression models. It is said that whether multicollinearity is a problem or not for making inferences on the parameters of a regression model depends on  $R^2$  (squared multiple correlation coefficient between dependent and the explanatory variables),  $R_1^2$  (squared multiple correlation coefficient between each explanatory variable and the other explanatory variables), the standard errors and t-ratios of each estimated regression coefficient [Maddala 2001: 268-71].<sup>7</sup> As regards the important limitations of the data are concerned, the other main local government spending on public goods like debt, distribution of income, which are also usually expected to be influenced by ETHNIC and other control variables of the study, were not available from the secondary source. Within these limitations this paper attempts to study whether per capita expenditure on public goods is an inverse function of ethnic diversity (ETHNIC) on caste dimension and whether ethnicity is more important determinant of per capita local government spending on public goods after controlling for other determinants of individual preference for public goods – per capita municipal income, literacy rate and proportion of industrial workers in total workers.

*Results:* Table 1 presents descriptive statistics (in absolute values) for cross section data of 28 municipalities in West Bengal that had a 2001 population of one lakh or more. The values of descriptive statistics, viz, mean, median, standard deviation and range (maximum and minimum) for each of the variables considered in our analysis are given without parentheses in Table 1. It shows the index of ethnic fragmentation, ETHNIC, along caste line based on

**Table 1: Descriptive Statistics of Municipalities (In Absolute Values)**

	Mean	Median	Minimum	Maximum	Std Dev	No of Obs
ETHNIC	0.295015 (0.2)	0.291147 (0.111671)	0.065044 (0.061)	0.378538 (0.386522)	0.050226 (0.129821)	28 (120)
INC	0.004991 (128.881)	0.004903 (85.13264)	0.001799 (0.841617)	0.01001 (530.3322)	0.00174 (116.0146)	28 (120)
EDPC	0.0003 (12.11001)	0.0003 (4.49535)	1.17E-05 (0.007852)	0.0009 (79.72233)	0.0002 (18.53556)	28 (120)
ESPC	0.0002 (9.789279)	7.12E-05 (4.630575)	.00001 (1E-07)	0.0013 (63.09164)	0.0003 (10.83689)	28 (120)
EHPC	0.0003 (3.05939)	0.0003 (0.996993)	.000003 (0.010984)	0.0006 (22.243)	0.0002 (4.924636)	28 (120)
ELPC	0.0002 (7.738633)	0.0001 (1.824131)	3.85E-05 (0.1954)	0.1172 (265.3516)	0.0347 (26.60351)	28 (120)
EPWPC	0.0009 (25.2967)	0.0005 (11.18021)	.0000024 (0.090732)	0.0047 (698.7903)	0.001 (68.90646)	28 (120)
LIT	71.6595 (0.684645)	73.77022 (0.735387)	9.808991 (0.452417)	83.70594 (0.812983)	13.66747 (0.100837)	28 (120)
WORK	81.20324 (0.692029)	91.04556 (0.856131)	8.808918 (0.05654)	95.86922 (0.989753)	25.47253 (0.307415)	28 (120)

where, ETHNIC = Caste-based ethnic fractionalisation index. INC = Per capita income of municipality. EDPC = Expenditure on drainage per capita. ESPC = Expenditure on schools and colleges per capita. EHPC = Expenditure on hospitals, dispensaries, vaccination and other sanitary requirements per capita. ELPC = Expenditure on lighting per capita. EPWPC = Expenditure on public works per capita. LIT = Literacy rate. WORK = Proportion of industrial workers in total workers.

28 municipalities ranges from .378538 (maximum value) to .065044 (minimum value) and the value of standard deviation ranges from maximum value of 25.47 (proportion of industrial workers in total workers, WORK) to minimum value of .0002 (expenditure on drainage per capita, EDPC/expenditure on hospitals, dispensaries, vaccinations and other sanitary requirements per capita, EHPC). Table 1 also presents the descriptive statistics for panel data of four municipalities, each for 30 years. The descriptive statistics of panel data, given in parentheses, shows that the value of ETHNIC ranges from 0.061 to .386522; the value of standard deviation ranges from maximum value of 116.0146 (per capita municipal income, INC) to minimum value of 0.100837 (literacy rate, LIT). The higher value of standard deviation of expenditure variables in panel data shows a high fluctuating trend of expenditure per capita over the years in municipalities.

**Table 2: Dependent Variable: Expenditure on Schools and Colleges Per Capita (ESPC)**

RHS Variable	1	2	3	4
ETHNIC	-6.71 (-9.19)***	-6.77 (-9.65)***	-6.74 (-9.65)***	-6.79 (-9.73)***
INC		2.23 (1.41)	2.21 (1.42)	2.34 (1.41)
LIT			0.54 (2.10)*	0.52 (2.0)*
WORK				-0.17 (-0.41)
Adj R <sup>2</sup>	0.72	0.72	0.72	0.71
No of Obs	3.47	3.25	3.34	3.47
	28	28	28	28

Heteroskedasticity corrected t-statistics are in parentheses. \*\*\*, \*\* and \* indicate that t-values are significant at 1 per cent, 5 per cent and 10 per cent level, respectively.

**Table 3: Dependent Variable: Expenditure on Drainage Per Capita (EDPC)**

RHS Variable	1	2	3	4
ETHNIC	-0.34 (-0.07)	-0.24 (-0.05)	-0.25 (-0.05)	-0.12 (-0.03)
INC		-3.79 (-1.03)	-3.79 (-1.03)	-4.12 (-1.07)
LIT			-0.73E-01 (-0.29)	-0.21 (-0.08)
WORK				0.44 (1.46)
Adj R <sup>2</sup>	-0.04	-0.04	-0.09	-0.12
No of Obs	13.22	13.39	13.95	14.45
	28	28	28	28

Heteroskedasticity corrected t-statistics are in parentheses.

**Table 4: Dependent Variable: Expenditure on Lighting Per Capita (ELPC)**

RHS Variable	1	2	3	4
ETHNIC	-6.17 (-7.46)***	-6.14 (-7.34)***	-6.14 (-7.29)***	-6.07 (-6.80)***
INC		-0.20 (-0.08)	-0.23 (-0.09)	-0.42 (-0.15)
LIT			0.62 (2.32)*	0.65 (2.21)*
WORK				0.25 (0.54)
Adj.R <sup>2</sup>	0.63	0.62	0.61	0.59
No of Obs	4.22	4.39	4.51	4.67
	28	28	28	28

Heteroskedasticity corrected t-statistics are in parentheses. \*\*\*, \*\* and \* indicate that t-values are significant at 1 per cent, 5 per cent and 10 per cent level, respectively.

Based on the cross section data of 28 municipalities, Table 2 first presents four-regression models- 1, 2, 3 and 4-where per capita expenditure of schools and colleges (ESPC) is considered as dependent variable and the ethnic fractionalisation index and three control variables are considered as independent variables. In the primary regression model (model 1), ETHNIC is the only independent variable. Afterwards, we gradually increase the number of independent variable along with ETHNIC. Table 2 shows that the coefficients of ETHNIC are of negative sign as expected (per capita expenditure on schools and colleges decreases with higher ethnic diversity)<sup>8</sup> and becomes significant at 1 per cent level in all regression models – without control variables (model 1) and with control variables (models 2, 3 and 4). As regards adjusted R<sup>2</sup> is concerned, the value of adjusted R<sup>2</sup>- in models 1, 2, 3 and 4 of Table 2 are high and lies between 0.71 and 0.72. Moreover, there is no serious multicollinearity problem in models 2, 3, 4 and 5. This suggests that higher ethnic diversity based on caste line is an important, and more important, determinant for lower local per capita government spending on schools and colleges in West Bengal municipalities.

In the similar way as illustrated in Table 2, we present cross section data of 28 municipalities regarding the nature and influence of relationship of ETHNIC and other control variables on expenditure regarding drainage per capita (EDPC); lighting per capita (ELPC); hospitals, dispensaries, vaccination and other sanitary requirements per capita (EHPC) and public works per capita (EPWPC) in Tables 3, 4, 5 and 6, respectively. The

**Table 5: Dependent Variable: Expenditure on Hospitals, Dispensaries, Vaccination and Other Sanitary Requirement Per Capita (EHPC)**

RHS Variable	1	2	3	4
ETHNIC	-6.42 (-11.8)***	-6.42 (-12.84)***	-6.45 (-12.20)***	-6.45 (-12.08)***
INC		0.96 (0.75)	0.94 (0.73)	1.04 (0.81)
LIT			0.61 (3.08)***	-0.13 (-0.56)
WORK				-0.13 (-0.56)
Adj R <sup>2</sup>	0.85	0.85	0.85	0.84
No of Obs	1.42	1.45	1.44	1.50
	28	28	28	28

Heteroskedasticity corrected t-statistics are in parentheses. \*\*\*, \*\* and \* indicate that t-values are significant at 1 per cent, 5 per cent and 10 per cent level, respectively.

**Table 6: Dependent Variable: Expenditure on Public Works Per Capita (EPWPC)**

RHS Variable	1	2	3	4
ETHNIC	-5.83 (-9.88)***	-5.92 (-10.82)***	-5.93 (-10.80)***	-5.93 (-10.48)***
INC		3.38 (2.64)**	3.34 (2.64)**	3.37 (2.61)**
LIT			-0.19 (-1.17)	-0.19 (-1.08)
WORK				0.23 (0.12)
Adj R <sup>2</sup>	0.73	0.76	0.75	0.74
No of Obs	2.39	2.11	2.19	2.29
	28	28	28	28

Heteroskedasticity corrected t-statistics are in parentheses. \*\*\*, \*\* and \* indicate that t-values are significant at 1 per cent, 5 per cent and 10 per cent level, respectively.

coefficients of ETHNIC are of expected (negative) sign in all tables (Tables 3, 4, 5 and 6) for all regression models – without control and with control variables. Moreover, all coefficients of ETHNIC are significant at 1 per cent level for regression models with and without control variables, when the dependent variables are EHPC (Table 5), ELPC (Table 4) and EPWPC (Table 6). But when the dependent variable is drainage per capita (Table 3), the coefficients of ETHNIC are not significant both with control and without control variables although the coefficients are of expected sign. If we allow the level of significance at 20 per cent level, then all values of the coefficient of ETHNIC of Table 3 would be significant both with control and without control variables. As regards the problem of multicollinearity is concerned, there is no serious multicollinearity problem in regression models presented in Tables 3, 4, 5 and 6. However, most of the regression equations given in Tables 2-6 have only one significant explanatory variable ETHNIC. Neither literacy, nor proportion of industrial workers, nor even municipal income (in all tables

except Table 6) is statistically significant. This means that variation of expenditure on any given type of public good across municipalities is explained by variation in ethnicity only, and by nothing else and such regression equations have very high  $R^2$  in all cases (except those in Table 3). But in empirical analysis the examples are relatively common in which none of the coefficients is significantly different from zero while  $R^2$  (or  $F$ ) is significant; the problem is that the interaction among the variables may serve to obscure their individual contribution to the fit of the regression, whereas the joint effect may still be significant [Greene 2003: 55]. It is not unusual in empirical analysis to obtain a very high  $R^2$  but find that some of the regression coefficients either are statistically insignificant or have signs that are contrary to a priori expectation. If we obtain a high  $R^2$  in this process well and good; if  $R^2$  is low on the other, it does not mean the model is increasingly bad. In order to measure the predictive success (or rather failure) of the model, then (expected squared forecast error) might suffice [Goldberger 1991: 177-78; Gujarati 2003: 222].

**Table 7: Dependent Variable: Expenditure on Drainage Per Capita (EDPC)**

RHS Variable	Fixed Effects				Random Effects			
	1	2	3	4	1	2	3	4
ETHNIC	-9.14 (-0.25)	-167.14 (-4.14)***	-162.39 (-3.63)***	-172.15 (-3.68)***	-17.02 (-0.51)	-155.12 (-4.08)***	-56.24 (-3.14)***	-63.96 (-2.87)***
INC		12.21 (6.71)***	11.80 (4.61)***	12.26 (5.52)***		11.81 (6.16)***	8.47 (4.53)***	8.56 (4.55)***
LIT			4.72 (0.25)	-11.87 (-0.62)			19.38 (1.41)	17.18 (1.20)
WORK				-1.95 (-0.71)				-2.12 (-0.58)
No of Obs	120	120	120	120	120	120	120	120

Heteroskedasticity corrected t-statistics are in parentheses.

\*\*\* Indicates that t-values are significant at 1 per cent level.

**Table 8: Dependent Variable: Expenditure on Lighting Per Capita (ELPC)**

RHS Variable	Fixed Effects				Random Effects			
	1	2	3	4	1	2	3	4
ETHNIC	-7.85 (-1.00)	-39.70 (-4.37)***	-36.30 (-3.62)***	-36.46 (-3.47)***	-8.96 (-1.28)	-35.09 (-4.22)***	-13.67 (-3.62)***	-13.71 (-2.91)**
INC			2.17 (3.78)***	2.17 (3.72)***		2.30 (5.40)***	1.52 (3.86)***	1.52 (3.86)***
LIT			3.38 (0.81)	3.31 (0.76)			0.20 (0.07)	0.19 (0.06)
WORK				-0.03 (-0.05)				-0.01 (-0.02)
No of Obs	120	120	120	120	120	120	120	120

Heteroskedasticity corrected t-statistics are in parentheses.

\*\*\* Indicates that t-values are significant at 1 per cent level.

\*\* Indicates that t-values are significant at 5 per cent level.

**Table 9: Dependent Variable: Expenditure on Schools and Colleges Per Capita (ESPC)**

RHS Variable	Fixed Effects				Random Effects			
	1	2	3	4	1	2	3	4
ETHNIC	32.81 (1.77)	23.15 (0.96)	12.17 (0.46)	32.11 (1.19)	27.65 (1.64)	18.70 (0.88)	-0.06 (-0.01)	13.79 (1.19)
INC		0.75 (0.63)	1.69 (1.12)	1.10 (0.73)		0.93 (0.84)	2.60 (2.64)***	2.44 (2.50)**
LIT			-10.91 (-0.99)	-3.05 (-0.27)			-11.79 (-1.62)	-7.86 (-1.05)
WORK				4.19 (2.55)**				3.81 (2.01)**
No of Obs	120	120	120	120	120	120	120	120

Heteroskedasticity corrected t-statistics are in parentheses.

\*\*\* Indicates that t-values are significant at 1 per cent level.

\*\* Indicates that t-values are significant at 5 per cent level.

The set of values that gives minimum is also the set that maximises [Maddala 2001: 165]. However, we have calculated to all regression equations including those where ETHNIC is the only significant explanatory variable. We find that in all cases where are high, possesses minimum values. Interestingly, as may be seen in Tables 3 and 4, all values of income elasticities are of negative signs which are not significant. The negative income elasticities in Tables 3 and 4 may be judged by the fact that if per capita municipal income increases (decreases), local government expenditure on public goods other than lighting and drainage might increase (decrease) for the particular year (as it is a cross section data) for which expenditure on drainage/lighting per capita might decrease (increase). It may be also due to the fact that if per capita municipal income increases, the local government might spend a considerable proportion of municipal income for promoting dominant group interest (or patronage) without spending the same for drainage and lighting. Or, the local government might practise both acts simultaneously. Our cross section analysis based on data of 28 municipalities in the state of West Bengal, however, suggests that higher ethnic diversity based on caste dimension is an important, and more important, determinant for lower per capita government expenditure on school and colleges (ESPC), public works (EPWPC), hospitals (EHPC), lighting (ELPC).

We now present panel regression results of four municipalities regarding the nature and influence of relationship for ETHNIC and other control variables on EDPC, ELPC, ESPC, EHPC and EPWPC in Tables 7, 8, 9, 10 and 11, respectively in both fixed and random effect models. It shows that the coefficients of ETHNIC on EDPC, ELPC, EHPC and EPWPC are of expected sign (negative), when we run separate regression without control or with control variables in both fixed and random effect models. The coefficients of ETHNIC on ESPC are positive in some of the models when we run regressions without control variables in both random effect and fixed effect models. As regards EDPC

(Table 7) and ELPC (Table 8) are concerned, the coefficients of ETHNIC are not only of expected sign, but also significant, when we run separate regression with control variables in both random and fixed effect models; ETHNIC remains significant in case of EDPC (Table 7) and ELPC (Table 8) for separate regression models with all control variables. The coefficients of ETHNIC on EDPC and ELPC are of expected (negative) sign but are insignificant when we run separate regression without control variables in both random effect and fixed effect models. In the case of expenditure variables EHPC (Table 10) and EPWPC (Table 11), the coefficients of ETHNIC show correct sign (negative) but are insignificant for regression models both without control and with control variables under fixed and random effect models. Our panel study based on the data of four municipalities (two being most ethnically diverse municipalities and two, most ethnically homogeneous municipalities), however, suggests that higher ethnic diversity is one of the determinants, if not more important, for lower per capita government expenditure on hospitals (EHPC), public works (EPWPC), but more important determinants for lower per capita government expenditure on lighting (ELPC) and drainage (EDPC).

### III Concluding Observations

This paper presents an empirical investigation that examines the role of ethnicity along caste dimension in influencing local government spending on public goods like education, lighting, drainage, health and public works in West Bengal municipalities. The study suggests that higher ethnic diversity does matter for lower local government spending on all types of public goods under both cross sectional and panel data analysis but more important factor for lower government spending on all types of public goods (except drainage) in the cross sectional data and lighting and drainage in panel data analysis. Though the role of

**Table 10: Dependent Variable: Expenditure on Hospitals, Dispensaries, Vaccination and Other Sanitary Requirements Per Capita (EHPC)**

RHS Variable	Fixed Effects				Random Effects			
	1	2	3	4	1	2	3	4
ETHNIC	-0.31 (-0.12)	-0.78 (-0.24)	-1.64 (-0.45)	-1.53 (-0.40)	-0.05 (-0.05)	-0.06 (-0.06)	-0.17 (-0.15)	-0.02 (-0.01)
INC		0.04 (0.23)	0.11 (0.53)	0.11 (0.51)		0.01 (0.10)	0.02 (0.15)	0.02 (0.14)
LIT			-0.85 (-0.56)	-0.80 (-0.51)			-0.22 (-0.26)	-0.18 (-0.20)
WORK				0.02 (0.10)				0.04 (0.18)
No of Obs	120	120	120	120	120	120	120	120

Heteroskedasticity corrected t-statistics are in parentheses.

**Table 11: Dependent Variable: Expenditure on Public Works Per Capita (EPWPC)**

RHS Variable	Fixed Effects				Random Effects			
	1	2	3	4	1	2	3	4
ETHNIC	-3.62 (-0.15)	-29.31 (-0.95)	-43.27 (-1.27)	-46.18 (-1.29)	-0.60 (-0.06)	-1.34 (-0.14)	-1.96 (-0.19)	-2.79 (-0.21)
INC		1.99 (1.31)	3.19 (1.63)	3.28 (1.65)		0.91 (0.86)	0.95 (0.87)	0.96 (0.87)
LIT			-13.87 (-0.98)	-15.02 (-1.01)			-1.30 (-0.16)	-1.54 (-0.18)
WORK				-0.61 (-0.28)				0.23 (0.11)
No of Obs	120	120	120	120	120	120	120	120

Heteroskedasticity corrected t-statistics are in parentheses.

higher ethnicity is not robust for lower local government spending on all types of public goods, because of the influence of other factors affecting the variability of local government spending on public goods, such an ethnic differentiation based on caste line might create a more unequal status and opportunities, higher tensions and rivalries, more social conflict and political instability between different caste groups in this region in future influencing a strong impediment to economic development and growth.

Economic development scholars today are increasingly sensitive to the role of ethnicity in influencing the potential to erupt into incessant social conflict, which continues to remain a strong retardation to economic development. Although the principle of equality has been generally endorsed in the ILO's discrimination convention No 111 – the elimination of discrimination in employment and choice of occupation based on personal characteristics of an individual – and the ethical theory of social arrangements leads to demand equality for all requiring equal treatment and opportunities to all individuals, practical evidence in many countries shows that members of discriminated groups are far from enjoying equal status and equal opportunities with members of dominant groups based on the personal characteristics of an individual such as ethnicity based on race, religion and caste dimensions. A successful economic development agenda today in many developing countries characterised by extreme ethnic fragmentation depends not only on identifying and stabilising traditional macroeconomic targets, they have also recognised the benefits of ethnic diversity in economic organisation and the threat that ethnic diversity can lead to the sustainability

of political and economic structures. Further, empirical investigation is required to quantify and identify accurately the different aspects of ethnic identity to give more evidence to results of empirical research regarding patterns of economic development and growth in developing and transitional economies and take more accurate policy measures to counter the problems in achieving economic development goals. **EPW**

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## Notes

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- 1 Ashoknagar-Kalyangar municipality has the highest ETHNIC value of 0.378538. The next ETHNIC value (0.371173) in order after the highest (Ashoknagar-Kalyangar) value of index is occupied by Purulia, if the indices are arranged in descending order. Since our study is based on three groups – like scheduled castes, scheduled tribes and others – the maximum that ETHNIC could theoretically reach to our framework is .6733, which would occur if each of the three caste groups accounted for 33 per cent of the population. The upper limit of ETHNIC in our cross section study is 0.378538. This value is greater than the half (that is, .33665) of the maximum value of ETHNIC.
- 2 Serampur municipality has the lowest value of ETHNIC (0.065044). The next value of ETHNIC after Serampur is occupied by Rishra (0.070645) if the indices are arranged in ascending order.

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- 3 Since our panel study relates to four municipalities over time, there should be heterogeneity in these units, which are usually related to variety of socio-economic aspect of municipalities, for their different indices of ethnicity. The techniques of panel data estimation take explicitly such heterogeneity into account by allowing individual specific variables. But as ethnic fractionalisation index within each municipality varies marginally over time, (i.e., ethnic fractionalisation index for each municipality is more or less homogeneous over time) in our estimation, the panel study seems to be more justified than individual time-series study for each municipality. As regards the selection of municipalities for our panel study is concerned, we consider four municipalities, mainly, because the extreme values of ETHNIC and the values very close to them might be helpful in presenting a robust picture regarding the nature and influence of relationship of ETHNIC and other control variables on the data of public good variables in the regression models resulting from widely differing values of all variables.
- 4 "Goods whose benefits cannot be withheld from those who do not pay and shared by large groups of consumers are referred to as public goods" [Hyman 1990: 135].
- 5 Delivering of public service to local governments in the democratic process depends on, among others, the relative levels of voters' awareness [Bardhan and Mookherjee 2000: 135].
- 6 The value ETHNIC, for example, ranges between .378538 and .065044. The highest value of ETHNIC (.378538) is about six times the lowest value of ETHNIC (.065044). Similarly, all other variable values have been taken in logarithm forms.
- 7 But Leamer (1983) argues that standard errors and t-ratios give us more information about how serious multicollinearity is rather than other determinants of multicollinearity [cited in Maddala 2001: 274].
- 8 The magnitude of the coefficient is the amount by which the dependent variable (in this case expenditure on hospitals per capita, EHPC) would change going from complete ethnic homogeneity (ETHNIC=0) to complete ethnic heterogeneity (ETHNIC=1). As the value of ETHNIC of this study lies between .378538 and .065044, so the amount the dependent variable would change is from the most ethnic homogeneity (ETHNIC= .065044) to the most ethnic heterogeneity (ETHNIC= .378538).

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