THE RELATIONSHIP BETWEEN ETHNIC DIVERSITY AND PUBLIC GOOD PROVISION IN THE STATES OF INDIA: AN EMPIRICAL INVESTIGATION

Dissertation submitted to the Jawaharlal Nehru University in partial fulfilment of the requirements for the award of the Degree of

MASTER OF PHILOSOPHY

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2002

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CERTIFICATE

This is to certify that the dissertation entitled **"THE RELATIONSHIP BETWEEN ETHNIC DIVERSITY AND PUBLIC GOOD PROVISION IN THE STATES OF INDIA: AN EMPIRICAL INVESTIGATION"** submitted by **JHUMUR SENGUPTA** in partial fulfilment of the requirements for the award of the Degree of **MASTER OF PHILOSOPHY**, has not been previously submitted for any degree of this or any other university and this is her own work.

We recommend that dissertation may be placed before the examiners for evaluation.

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Acknowledgement

I owe my gratitude to my Supervisor Dr. Sugato Dasgupta for his guidance and encouragement throughout the project.

This work could not have been completed without the invaluable support of Kakali and Shilpy and other friends who helped me at various stages.

Primarily, I am thankful to Ma, Baba and Dada whose support and encouragement has given me confidence to complete this work.

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1. Introduction

What determines public good provision of a government? In public finance textbooks, the government is frequently modelled as a benevolent social planner. Given the nature of public goods, namely that such goods are lumpy and are consumed in equal amounts by all, it is impossible to apply the exclusion principle in respect of such goods. The optimality condition for the provision of public good is that the sum of marginal benefits must be equal to the cost of provision of such good.

Instead of assuming government as a benevolent social planner, let me deviate from this ideal situation. In a society where the population is heterogeneous along caste, language, and religion lines, it may not be realistic to assume a government as benevolent social planner. Social heterogeneity encourages governments in interest group politics and targeted transfers.

Alesina, Baqir, and Easterly [1999] argue that ethnic diversity increases preference polarization and impedes agreement about provision of public goods. The theoretical prediction developed in that paper illustrates how preference polarization is prone to conflict among different interest groups. They argue that social heterogeneity increases group targeted spending. The theory is based on two assumptions:

1) Different ethnic groups have different preferences for public goods.
2) Each ethnic group's utility level is reduced if other groups also use it.

In this situation governments choose to divert more resources to private patronage due to difference in preference patterns over public goods. Hence public good provision reduces as ethnic diversity increases.

To address the basic argument in the theory, the relationship between ethnic diversity and public good provision in the states of India is identified using three measures of ethnic diversity along caste, language and religion lines. The main conclusion of my empirical analysis is that ethnic diversity *is* associated with public good provision. But the nature of association is *mixed.* Greater homogeneity leads to a greater supply of public goods in 18 out of 27 cases; thus the theory mispredicts in 9 out of 27 cases.

The rest of the paper is structured as follows: section 2 provides a brief literature review of the empirical and theoretical determinants of public good provision. The data used in my study are described in section 3. Section 4 contains the empirical results while section 5 concludes.

2. Literature survey

An increasing number of studies have suggested that ethnic divisions may be important determinants of economic outcomes. Alesina, Baqir and Easterly [1999] study the effect of ethnic diversity on local government spending. They demonstrate that increased diversity leads to more variation in preferences for public goods, leading in turn to less public spending. They also suggest that more ethnic diversity will increase "interest group" politics. Transfers and patronage spending will be favored, as opposed to "productive" local public goods. Using data at different levels of aggregation (cities, metropolitan areas, and countries), they find that greater ethnic diversity leads to a smaller share of government spending on education, roads, sewerage and trash pick up and a higher share on police spending. They also find that

high levels of ethnic diversity are associated with up to twenty-five percent lower local spending for schools in U.S. municipalities.

Easterly and Levine [1997] conclude that ethnic diversity is a principal cause for slow economic growth in Africa during the post -colonial period. They have assembled a diverse set of measures of ethnic diversity and examined whether cross country differences in ethnic diversity explain a substantial part of the cross country differences in public policies, political instability and other economic factors associated with long run growth. They report a strong negative correlation between ethnic diversity (as measured by language) and indicators of public goods, such as numbers of telephones, percentage of roads paved, efficiency of the electricity network, and years of schooling, across countries. They conclude that ethnic diversity is instrumental in explaining Africa's poor economic growth.

In a cross-country empirical analysis, Mauro [1995] finds that greater ethnic diversity is significantly related to poor bureaucratic performance and political instability. Mauro uses a newly assembled data set, consisting of the *Business International* indices on corruption, red tape, and the efficiency of judicial system for the period 1980-1983. Mauro uses ethno-linguistic fractionalization index as an instrument for corruption while arguing that corruption causes slower growth and investment. The paper suggests that ethnically diverse societies may be prone to corruption, political instability and slow economic growth.

Alesina and La Ferrara [2000] present a theory of ethnic diversity and community group formation in which individuals dislike mixing across ethnic lines. This taste for homogeneity drives the principal theoretical prediction of the paper that diverse areas exhibit lower participation in community activities. The theory implies

that all individuals would opt to sort into ethnically homogeneous groups to avoid the costs of mixing with individuals from other ethnic groups. Using data on U.S. obtained from General Social Survey for the years 1974-1994, they find that participation in social activities is less in more ethnically diverse localities.

Cutler and Glaeser [1997] show that black outcomes in cities marked by higher black-white fragmentation are worse than black outcomes in less fragmented cities. They argue that higher black-white fragmentation is harmful to blacks. As fragmentation increases, blacks will have less access to high quality public goods (for example, schools) since they do not have enough income to contribute for the provision of high quality public goods.

Howard Chernick [1998] argues that ethnic diversity within a political jurisdiction can increase the availability of fiscal resources and quality of public services to minority neighborhoods through income mixing. Ethnic minorities have lower incomes than whites. But, since all the residents under the same jurisdiction contribute for the provision of public services, income mixing can offset the low levels of resources of the minorities.

Mwangi S. Kimenyi in the paper "Institutions of governance and ethnic conflict in Africa: A positive view of ethnic governments." points out the failure of political institutions to fulfil diverse interests of different ethnic groups in African countries. The paper suggests decentralization of central government's administrative, fiscal and political functions to lower-level governments for effective provision of public services. The theoretical argument for decentralization is that it promotes allocative efficiency by allowing greater differentiation of resource allocations across jurisdictions according to the demand in each locality. Sub-national governments are

argued to be in a better position than the central government to ensure that services delivered matching the preferences and circumstances in the jurisdiction.

In my empirical work, I examine the relationship between ethnic diversity and public good provision using state level data on India. I relate my results to the growing literature on ethnic diversity and public good provision. My findings are not always matching up with the standard theoretical prediction that social heterogeneity of the population with respect to caste, language and religion reduces the efficiency of resource allocation and public service delivery.

3. The Data

The data set for my study consists of annual observations. It spans approximately twenty financial years and covers all of the fifteen major states of India. India comprises twenty-five states and seven union territories. In the financial year1995-96, the aforementioned fifteen states accounted for approximately 85 percent of India's land area, 95 percent of her population and 92.6 percent of the net domestic product.

After controlling for other influences, my paper studies whether state government' public good supply is causally related to state specific heterogeneity (variously measured). Hence, the variables in my data set partition into three categories: (1) several public good variables (2) measures of state heterogeneity, and (3) a few control variables.

3.1 Public Good Variables

In my analysis, I include nine public good variables. These are highways, project roads, irrigation of cropped land, power capacity installed, percentage of villages

electrified, post offices, beds in government hospitals, government schools, and law and order.

The sources and definitions of all the variables are reported in the Data Appendix section.

3.2 Heterogeneity Measures

To compute the ethnic diversity, I have constructed fractionalization index according to the following formula:

$$\text{Index}= 1-\sum_{i=1}^{K}\left(\frac{n_{ist}}{N_{st}}\right)^2$$

where i represents an ethnic group, n_{ist} is the number of people in group i in the state s during the financial year t, and N_{st} is the total population for the given state-year. The population is assumed to be divided into k groups.

The index measures the probability that two randomly drawn individuals from a given state-year belong to different ethnic groups. Hence, as the value of the index increases, heterogeneity rises.

I restrict my analysis to three indicators of ethnic diversity. First, a caste-based measure of heterogeneity is constructed where the population for a given state-year is divided into three groups. Second, ethno-religious fractionalisation index is constructed according to the aforementioned formula. Six ethno-religious groups have been considered for constructing this index. Third, ethno-linguistic fractionalisation index is computed by the same formula. Here, the population for a given state-year has been aggregated into fourteen ethno-linguistic groups.

The sources and the categories under different ethnic groups are reported in the Data Appendix section.

3.3 Control Variables

In my analysis, I include four control variables to capture the possible omitted variable bias. These are state domestic product, male literacy, female literacy, and proportion of state population that is rural.

The sources and names of all the control variables are mentioned in the Data Appendix section.

4. Empirical Results

I present the empirical results in two parts. In section 4.1, I establish that all the public good variables of state governments are non-stationary. Section 4.2 presents the empirical methodology. Using the Hodrick–Prescott filter, I first decompose each public good variable into its trend and cyclical components. Thereafter using panel regressions, I determine whether ethnic diversity with respect to caste, religion and language can account for the cyclical component of public good provision. Finally, section 4.3 contains the regression findings.

4.1 Unit Root Tests

My data set consists of S (=15) states. Let y_{st} denote a particular public good supplied by the government (e.g. length of highways per 100 square kilometer) supplied by the government in state s during financial year t. For each state s, public good series $\{y_{st}\}$ was observed over T time periods.[1] To check whether the public good series is non-stationary, an augmented Dickey-Fuller (henceforth, ADF) regression was estimated:

[1] Depending on the public good variable considered, T equals either 20 or 21 or 23 (refer to table 2).

$$\Delta y_{st} = \alpha_s + \delta_s t + \beta_s y_{s,t-1} + \sum_{j=1}^{k(s)} \gamma_{sj} \Delta y_{s,t-j} + \varepsilon_{st} \qquad (1)$$

Equation 1 tests for the null hypothesis of a random walk with drift against a trend stationary alternative. If the estimate of β_s is not significantly different from zero, then the null hypothesis cannot be rejected. On the other hand, if the estimate of β_s is significantly less than zero, the alternative hypothesis is accepted. The k_s additional regressors, $\Delta P_{s,t-j}$, eliminate possible nuisance-parameter dependencies in the asymptotic distribution of the test statistic caused by serial correlation in the error terms. In order to select k_s, I followed the method suggested by Campbell and Perron (1991).

The results of the ADF tests are summarized in table 2. Table 2 is read as follows. Consider the variable, "length of highways per 100 square kilometers". Column 2 shows that for each of the fifteen states the infrastructure variable consists of 21 observations. Columns 3 and 4 indicate that the null hypothesis of nonstationarity is not ruled out in any of the 15 states at 0.01 and 0.05 significance levels, respectively. Table 2 presents a uniform picture: every public good variable in virtually every state can be modeled as being non-stationary.

4.2 Empirical Methodology

Section 4.1 demonstrated that, without exception, public good variables possess unit roots. Using the Hodrick-Prescott filter, I therefore decompose each state-specific public good variable into its trend and cyclical components. The Hodrick-Prescott filter works as follows. Let y_{st} denote a particular public good in state s during

financial year t. Let τ_{st} and $(y_{st} - \tau_{st})$ denote, respectively, the trend and cyclical components of y_{st}. For $t = 1, \ldots T$ and $s = 1, \ldots S$, $\{\tau_{st}\}$ solves the following problem.[2]

$$\text{Minimize} \sum_{t=1}^{T}(y_{st} - \tau_{st})^2 + \mu \sum_{t=2}^{T-1}[(\tau_{s,t+1} - \tau_{st}) - (\tau_{st} - \tau_{s,t-1})]^2 \qquad (2)$$

In the above formulation, the parameter μ penalizes the variability in trend. Hence, as the value of μ is raised, the extracted trend becomes increasingly smooth. Since my data are annual in frequency, I follow common practice and fix μ at 100.

I want to see whether state specific heterogeneity shocks can account for the cyclical component, $(y_{st} - \tau_{st})$ of the public good variable y_{st}. To this end, I estimate an error-components model of the form:

$$(y_{st} - \tau_{st}) = \alpha_s + \delta_t + \theta x_{st} + \gamma h_{st} + \varepsilon_{st} \quad (s = 1, \ldots, S; t = 1, \ldots T) \qquad (3)$$

where α_s is a state fixed effects, δ_t is a year effects, x_{st} is a $(k \times 1)$ vector of time varying explanatory variables that capture economic and demographic characteristics of state s, h_{st} is a variable that ranges from 0 to 1 and measures the heterogeneity in state s during year t, and ε_{st} is the error term, presumed to be orthogonal to all of the regressors. The estimation of equation 3 permits AR(1) auto correlation in the error term with state-specific coefficient of the AR(1) process. The political theory that I test deals exclusively with the significance, sign and magnitude of the estimate of γ. The estimate of γ indicates the amount by which the dependent variable would change

[2] In my data set, S equals 15. Depending on the public good variable considered, T equals 20, 21 or 23 (refer to table 2).

going from complete ethnic homogeneity ($h_{st} = 0$) to complete ethnic heterogeneity ($h_{st} = 1$).

The variable vector x_{st} in equation 3 controls for economic and demographic characteristics of state s in financial year t. Four variables are included in x_{st}:(1) the cyclical component of the per-capita net state domestic product of state s in financial year t (normalized to 1960-61 prices), (2) the proportion of the population of state s in financial year t that is rural, (3) the male literacy rate of state s in financial year t, and (4) the female literacy rate of state s in financial year t. In the regression results reported in section 4.3, these four variables are called *State Domestic Product, Rural Population, Male Literacy, and Female Literacy,* respectively.

4.3 Regression Findings

The regression findings are presented in four parts. I study the relationship between public good provision and heterogeneity using three different dimensions of heterogeneity, namely, caste-based, religion-based, and language-based heterogeneity. The results obtained for the three heterogeneity measures are given in three separate subsections. A final subsection summarizes the findings.

4.3.1 Effect of Caste-Based Heterogeneity on Public Good Provision

In this subsection, I discuss the empirical association between state governments' public good provision and a caste-based measure of heterogeneity. The regression results for equation 3 are given in table 3.

Table 3 shows that ethnic diversity is negatively associated with the provision of five public goods: highways, villages electrified, power capacity installed, irrigation of cropped land, and government schools. However, contrary to theory, provision of projects roads, post offices, and beds in government hospital *increases* with heterogeneity.

4.3.2 Effect of Ethno-religious Heterogeneity on Public Good Provision

This subsection discusses the relationship between state governments' public good provision and religion-based heterogeneity. Table 4 reports the regression results for equation 3.

My findings are twofold. First, religious diversity is negatively associated with the provision of five public goods: highways, irrigation of cropped land, post offices, law and order (inversely related to the murder rate), and number of beds in government hospitals. Second, contrary to the theoretical predictions, the proportion of villages with electricity, power capacity installed and number of government schools increase with religious diversity.

4.3.3 Effect of Ethno-linguistic Heterogeneity on Public Good Provision

This subsection reports the regression results (equation 3) for state governments' provision of public goods using ethno-linguistic fractionalization index as a measure of heterogeneity.

Table 5 makes two points. First ethnic diversity is negatively associated with the provision of six public goods: highways, project roads, beds in government hospitals, post offices, irrigation of cropped land, and law and order (inversely related to the murder rate). Second, ethnic diversity is incorrectly signed and significant for three public goods: the proportion of villages with electricity, power capacity installed and government schools.

4.3.4. Summary of the Empirical Results

The theoretical prediction of the paper is that heterogeneity among population increases the preference polarization among different ethnic groups. Hence, public good provision decreases as the ethnic diversity increases. My findings do not always match up with the theory. For eighteen out of twenty seven (nine public good categories X three heterogeneity measures) cases, coefficients are correctly signed. Except for the law and order variable (inversely related to the murder rate), if I consider each of the public good variables, then in none of the cases, the coefficients of the ethnic diversity indices give correct signs at a time. Moreover, considering any single measure of ethnic diversity, neither of the measures generates correct signs for all the public good variables. Therefore, my findings cannot provide considerable support for the theory.

5. Conclusion

This paper reports impact of heterogeneity among population on public good provision using state level data on India.

I find that there is a strong association between ethnic diversity and public good supply but the nature of association does not always match up with the theory.

Data Appendix

1. Public good variables

- Length of highways per 100 square kilometer

  Length of highways

  Source: Statistical Abstract India, CSO, Department of Statistics, Ministry of Planning, Government of India.

  Areas in square kilometers

  Source: Census 1971,1981,1991 and 2001, Census of India, Registrar General and Census Commissioner, Government of India.

  Area assumed to grow at a constant (compound) rate derived from the respective area totals for interpolation

- Length of project roads per 100 square kilometer

  Length of project roads

  Source: Statistical Abstract India, CSO, Department of Statistics, Ministry of Planning, Government of India.

- Gross irrigated area per total cropped area

  Gross irrigated area

  Source: Statistical Abstract India, CSO, Department of Statistics, Ministry of Planning, Government of India

  Total cropped area

  Source: Statistical Abstract India, CSO, Department of Statistics, Ministry of Planning, Government of India.

- Total installed capacity per 100 square-kilometer area.

  Total installed capacity

  Source: Statistical Abstract India, CSO, Department of Statistics,Ministry of Planning, Government of India.

- Percentage of villages electrified

  Percentage of villages electrified

Source: Statistical Abstract India, CSO, Department of Statistics, Ministry of Planning, Government of India.

- Area under one post office

  Number of post offices

  Source: Statistical Abstract India, CSO, Department of Statistics, Ministry of Planning, Government of India.

- Number of beds in government hospitals per capita

  Number of beds in government hospitals

  Source: Statistical Abstract India, CSO, Department of Statistics, Ministry of Planning, Government of India.

  State population

  Source: Census 1971, 1981, 1991 and 2001, Census of India, Registrar General and Census Commissioner, Government of India

  State populations assumed to grow at a constant (compound) rate derived from the respective population totals for interpolation.

- Number of government schools for general education per capita

  Number of government schools for general education

  Source: Statistical Abstract India, CSO, Department of Statistics, Ministry of Planning, Government of India.

- Number of murders per one lakh population.

  Number of murders

  Source: Crime in India, National Crime Records Bureau, Ministry of Home Affairs.

2. Heterogeneity Variables

- Ethno-linguistic fractionalization index

Defined as $1-\sum_{i=1}^{14}(\frac{n_i}{N})^2$ where n_i is the number of people in ethno-linguistic group i and N is the population of the state.

Fourteen ethno-linguistic group have been considered for constructing the index.These are Assamese, Bengali, Gujrati, Hindi, Kannada, Malayalam, Marathi, Oriya, Punjabi, Sanskrit, Tamil, Telegu, Urdu and others.

Source: Census 1971, 1981 and 1991, Census of India, Registrar General and Census Commissioner, Government of India.

State populations and populations under different ethno-linguistic groups assumed to grow at constant (compound) rates derived from the respective population totals for interpolation.

- Ethno-religious fractionalization index

Defined as $1-\sum_{i=1}^{6}(\frac{n_i}{N})^2$ where n_i is the number of people in ethno-religious group i and N is the population of the state.

Six ethno-religious group have been considered for constructing this index. These are Hindu, Muslim, Christian, Sikh, Buddhist and others.

Source: Census 1971, 1981 and 1991, Census of India, Registrar General and Census Commissioner, Government of India.

State populations and populations under different ethno-religious groups assumed to grow at constant (compound) rates derived from the respective population totals for interpolation.

- Caste-based heterogeneity in population index

Defined as $1-\sum_{i=1}^{3}(\frac{n_i}{N})^2$ where n_i is the number of people in caste group i and. N is population of the state.

Three caste groups have been considered for constructing this index. These are scheduled castes, scheduled tribes, and others.

Source: Census 1971, 1981 and 1991, Census of India, Registrar General and Census Commissioner, Government of India.

State populations and populations under different castes assumed to grow at constant (compound) rates derived from the respective population totals for interpolation.

3.Control Variables

- Per capita net state domestic product at constant prices

  Source: Electronic data obtained from CSO, Department of Statistics, Government of India.

- Proportion of state population that is rural

  Source: Census of India 1971, 1981 and 1991, Census of India, Registrar General and Census Commissioner, Government of India.

  State populations and rural populations assumed to grow at constant (compound) rates derived from the respective population totals for interpolation.

- Male literacy

  Source: Census of India 1971, 1981 and 1991, Census of India, Registrar General and Census Commissioner, Government of India.

  Literacy rates assumed to grow at a constant (compound) rate derived from the respective rates for interpolation.

- Female literacy

  Source: Census of India 1971, 1981 and 1991, Census of India, Registrar General and Census Commissioner, Government of India.

  Literacy rates assumed to grow at a constant (compound) rate derived from the respective rates for interpolation.

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Table 1
Summary Statistics of Pure Public Good Variables

Variable	#obs	mean	std.dev
Length of highways per 100 square kilometers	21	69.63	75.35
Length of project roads per 100 square kilometers	21	6.98	5.32
Gross irrigated area per total cropped area	21	32.29	21.41
Total installed capacity per 100 square kilometers	21	1.6	1.28
Percentage of villages electrified	21	65.38	27.26
Area under one post office	21	20.4	10.83
Number of Beds in government hospitals per capita	23	0.02	0.04
Number of government schools for general education per capita	21	0.03	0.32
Number of murder per one lakh population	20	3.24	1.48

Notes: #obs" indicates the number of available state-specific observations for the relevant variable. "mean" ("std.dev.") computes the average (standard deviation) of the relevant variable over the sample state-years.

Table 2
Unit Root Tests of State Governments' Public Good Variables

Variable	No. obs for each state	#rejections of the null (significance level = 0.05)	# rejections of the null (significance level = 0.01)
Length of highways per 100 square kilometers	21	0	0
Length of project roads per 100 square kilometers	21	1	1
Gross irrigated area per total cropped area	21	2	1
Total installed capacity per 100 square kilometers	21	0	0
Percentage of villages electrified	21	2	1
Area under one post office	21	0	0
Number of Beds in government hospitals per capita	23	0	0
Number of government schools for general education per capita	21	0	0
Number of murder per one lakh population	20	1	0

Notes: Columns 3 and 4 summarize the results of univariate (Augmented Dickey-Fuller) unit root tests. The null hypothesis is the nonstationarity of the time series. The critical values for the univariate unit root tests are taken from the software programme, E-Views. For 23 observations, the critical values at the 0.01 and 0.05 levels of significance are – 4.5 and – 3.6591, respectively. For 21 observations, the critical values at the 0.01 and 0.05 levels of significance are – 4.6193 and – 3.7119, respectively. For 20 observations, the critical values at the 0.01 and 0.05 levels of significance are – 4.6712 and – 3.7347, respectively.

Table 3
Impact of Caste Based Heterogeneity on Public Good Provision

Independent Variables	Dependent Variable								
	highways	project roads	area Irrigated	capacity installed	percentage of villages electrified	post office area	hospitals beds per capita	schools per capita	murder per capita
heterogeneity (caste)	-0.08[a]	0.97	-3.59	-0.09	-2.13	0.13	-0.02	-0.33	0.71
	(-6.98)	(28.91)	(-11.58)	(-8.50)	(-6.82)	(2.73)	(-0.36)	(3.15)	(0.53)
state domestic product	-0.14	0.02	0.01	0.12	-0.02	0.01	-0.09	-0.13	0.05
	(-36.05)	(53.86)	(3.29)	(16.48)	(-6.82)	(9.25)	(-5.98)	(12.69)	(2.35)
male literacy	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00
	(-3.18)	(-1.19)	(- 2.13)	(-3.48)	(-2.85)	(-2.73)	(0.84)	(3.39)	(1.24)
female literacy	0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.01	-0.00
	(3.72)	(3.37)	(0.34)	(-3.96)	(-0.66)	(-0.80)	(3.32)	(-5.32)	(-0.06)
rural population	-0.00	-0.00	-0.00	-0.00	0.00	-.0.00	-0.01	-0.01	0.00
	(-6.05)	(-30.99)	(-1.33)	(-7.67)	(1.48)	(-0.04)	(-3.89)	(-7.41)	(0.44)
N	315	315	315	315	273	315	345	315	300

Notes: the dependent and independent variables have been described in the text. The z statistics are in parentheses; a= significance at 0.01 level.

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Table 4

Impact of Religion Based Heterogeneity on Public Good Provision

Independent Variables	Dependent Variables								
	highways	project roads	area irrigated	capacity installed	percentage of villages electrified	post office area	hospitals beds per capita	schools per capita	murder per capita
heterogeneity (relegion)	-1.22[a]	-0.85	-0.87	1.87	4.49	-5.9	-2.11	11.07	2.24
	(-6.11)	(-9.91)	(-6.30)	(3.57)	(5.91)	(-18.07)	(-7.22)	(2.77)	(0.84)
state domestic product	-0.14	0.02	0.01	-0.01	-0.02	0.04	-0.19	-0.31	0.07
	(-25.91)	(23.9)	(2.84)	(-3.86)	(-4.56)	(7.45)	(-17.89)	(-9.06)	(2.78)
male literacy	-0.00	-.0.00	0.00	-.0.00	-0.00	0.00	-0.00	0.04	0.00
	(-2.64)	(-2.11)	-4.3	(-3.23)	(-2.06)	-3.03	(-0.08)	(6.32)	(0.12)
female literacy	0.00	-0.00	-0.00	-0.01	-0.00	-0.00	0.00	0.01	0.00
	(4.59)	(16.13)	(-7.86)	(-8.01)	(-1.43)	(-2.77)	(1.44)	(3.44)	(0.41)
rural population	-0.00	0.00	-0.00	-0.01	-0.00	-0.00	-0.01	0.03	0.00
	(-8.23)	(26.53)	(-9.88)	(-3.27)	(-0.01)	(-1.23)	(-11.15)	(7.20)	(0.13)
N	315	315	315	315	273	315	345	315	300

Notes: the dependent and independent variables have been described in the text. The z statistics are in parentheses, a= significance at the 0.01 level.

Table 5
Impact of Ethno-Linguistic Diversity on Public Good Provision

Independent Variables	Dependent Variables								
	highways	project roads	area irrigated	capacity installed	percentage of villages electrified	post office area	hospitals beds per capita	schools per capita	murder per capita
heterogeneity (language)	0.16	-0.50[a]	0.65	-4.03	-6.39	-16.33	-1.63	9.03	21.39
	(0.35)	(-12.01)	(2.40)	(-13.39)	(-5.02)	(-22.22)	(-2.33)	(4.55)	(7.08)
state domestic product	-0.14	0.02	0.01	0.01	-0.04	0.02	-0.13	-0.30	0.06
	(-32.4)	(20.80)	(3.44)	(3.95)	(-6.37)	(7.51)	(-5.78)	(-9.83)	(2.34)
male literacy	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.05	0.01
	(-4.87)	(-1.95)	(-2.39)	(-4.36)	(-6.19)	(-4.77)	(-1.33)	(8.28)	(2.80)
female literacy	0.00	0.00	0.00	-0.00	0.00	-0.01	0.00	0.01	0.00
	(4.87)	(2.30)	(0.14)	(-4.52)	(1.92)	(-4.16)	(5.40)	(3.87)	(0.30)
rural population	-0.00	-0.01	-0.00	-0.01	0.00	-0.00	-0.01	0.04	0.01
	(-10.75)	(-14.35)	(-2.39)	(-1.60)	(2.69)	(-7.03)	(-3.25)	(8.81)	(1.10)
N	315	315	315	315	273	315	345	315	300

Notes: the dependent and independent variables have been described in the text. The z statistics are in parentheses;
a = significance at the 0.01 level