

Measuring the Social and Political Diversity and their Impact on Income Inequality

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Abstract

This paper studies the impact of social diversity and political structure on the income inequality of an economy. Paper studies the various measurements of political and social diversity by forming the indices for political coalition and social diversity. Effective number of political party index is constructed by forming the HHI (Herfindahl-Hirschman Index). Effective number of party shows the degree of government coalition. Fractionalization and polarization indices are constructed to measure the social diversity and polarization. This paper discusses the impact of growth of various sectors on income inequality. Gini coefficient is used to measure the income inequality. Finally, Prais-Winsten method of regression is used to find the impact of social and political diversity and economic growth on income inequality. It is found that social diversity has a statistically significant positive impact on income inequality in short run while in long run it is negative. Social polarization has a negative impact on inequality but it is in short run, in long run, this impact is positive. Effective numbers of parties has short run negative significant impact on income inequality. The value added in agricultural sector, industrial sector and service sector are also important factors which influence the income inequality.

JEL Classification: O11; Z12; O53; D72; D63; R11

Keywords: *Effective Number of Political Parties, Social Diversity, Polarization index, Fractionalization index, Gini Coefficient.*

Introduction

India is considered as the rapidly growing economy. This mixed economy has vast culture with different type of languages, races and ethnicities. With cultural diversity, India is a world's largest democracy with various ideologies and political parties. In short, India is a place where there is a coexistence of social and political diversity.

Social and political diversity can affect the income inequality directly and indirectly. Political and social

diversity affect the inequality directly through the endowments and indirectly by affecting the growth and per capita GDP. Political system and social polarization is important as far fairness of the economy and society is concerned. Political system and institutions are important as far as social conflicts are concerned (Montalvo, J. G., & Reynal-Querol, M., (2005)). Authors express concern about high levels of corruption due to diversity.

■ Hindu share ■ Muslim share ■ Christian share ■ Sikh share
 ■ Buddhist share ■ Jain share ■ Others share

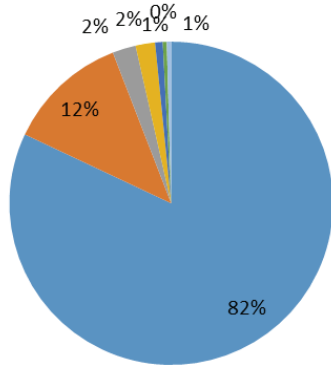


Figure 1: Population division-1991 census

■ Hindu share ■ Muslim share ■ Christian share ■ Sikh share
 ■ Buddhist share ■ Jain share ■ Others share

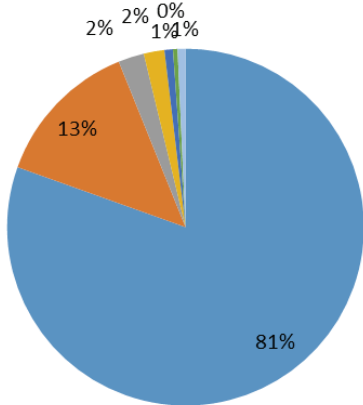


Figure 2: Population division-2001 census

■ Hindu share ■ Muslim share ■ Christian share ■ Sikh share
 ■ Buddhist share ■ Jain share ■ Others share

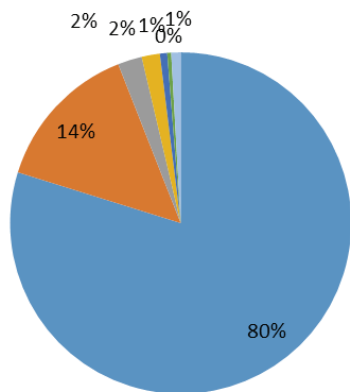


Figure 3: Population division-2011 census

Data source: The census of India 1991, 2001 and 2011

According to these pie charts, share of the religions in India is more or less same while share of Muslims community has been increased by small margin.

Table 1: Fractionalization and polarization index from the year 1993-2013

Year	Fractionalization index	Polarization Index	Year	Fractionalization index	Polarization Index
1993	0.316367	0.867208	2003	0.335153	0.890880
1994	0.318581	0.870180	2004	0.335919	0.891768
1995	0.320779	0.873082	2005	0.336680	0.892644
1996	0.322960	0.875916	2006	0.337438	0.893508
1997	0.325124	0.878681	2007	0.338191	0.894361
1998	0.327271	0.881378	2008	0.338939	0.895201
1999	0.329401	0.884009	2009	0.339684	0.896031
2000	0.331514	0.886572	2010	0.340424	0.896848
2001	0.333609	0.889070	2011	0.341159	0.897654
2002	0.334383	0.889981	2012	0.341891	0.898449
			2013	0.342617	0.899232

Source- Census, India.

This table 1 gives appropriate picture of social diversity in India. The fractionalization index¹ shows the social diversity. More the fractionalization index, more are the number of ethnicities in India. Given figures are moderate as it suggests that the fractionalization index is around 35% in India. Easterly and Levine (1997) find the existence of an inverse relation between per capita GDP growth and ethnolinguistic fractionalization. The conflicts and fractionalization index are positively correlated which implies the high probability of conflict in highly diversified society (Montalvo, J. G., & Reynal-Querol, M., 2005).

Table no. 1 gives the information about polarization index. This index shows the separation among the various religions in society. Higher the polarization index, more will be the separation among the various groups in the society, as observed in the case of India.

Montalvo, J. G., & Reynal-Querol, M. (2005) suggest that polarization index might be low at high level of fractionalization index. Authors find that growth is directly affected by ethnolinguistic fractionalization while it is indirectly negatively affected by ethnic polarization² as it increases the incidences of civil war and conflicts. Quality of policy and institutions is adversely affected by ethnic conflict that's why ethnic fractionalization has negative impact on growth (Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., Wacziarg, R., 2002). The paper also talks about how ethnically fragmented societies lead to inefficient provision of public goods, lower level of

trust and participation in social activities, and decreased economic growth. Additionally, governments find it harder to reach a consensus on redistribution to the needy when the society is fractionalized. Easterly and Levine (1997) also find the negative correlation between ethnic fractionalization and schooling, fiscal surplus, financial depth, and the log of telephones per worker.

With social diversity, political diversity affects the income inequality directly through redistribution and indirectly through policies and decision which affect the economic growth and other indicators. ENP (Effective number of parties) is developed by Laakso and Taagepera(1979). ENP helps to measure the coalition in the political system. Laakso and Taagepera conclude the ENP might not be correlated with government instability but ENP might be helpful to measure the instability in the party system.

Table 2: HHI and ENP from the year 1993-2013

Year	HHI	ENP	Year	HHI	ENP
1993	0.0402	24.8901	2004	0.0915	10.9297
1994	0.0402	24.8901	2005	0.0743	13.4616
1995	0.0402	24.8901	2006	0.0743	13.4616
1996	0.2387	4.1892	2007	0.0743	13.4616
1997	0.0802	12.4748	2008	0.0743	13.4616
1998	0.1052	9.5033	2009	0.0743	13.4619
1999	0.1143	8.7522	2010	0.0743	13.4622
2000	0.1156	8.6516	2011	0.0743	13.4622
2001	0.1156	8.6516	2012	0.0743	13.4622
2002	0.1156	8.6516	2013	0.0743	13.4622
2003	0.1156	8.6516			

Source-ENP, HHI, Winning parties and seats from Election Commission of India

The above table shows the parties in power in India from 1993 to 2013. Apart from ENP, the HHI (Herfindahl-Hirschman index)³ has been used (1/ENP) to indicate whether the government in power is a one-party government or a coalition. Sasmal, J. (2011) suggests that the interest of government might be different than the maximizing the economic growth but government might be interested in the political gain. Banerjee & Newman (1993) and Galor&Zeira (1993)

The recent literature on our topic is not available which motivated for further study. In this paper, we try to analyze the impact of the fractionalization index, polarization index, ENP and value added in agriculture, manufacture and service sector on gini coefficient. We have taken the value added in agriculture, industrial and services sectors from the World Bank. The polarization index and the fractionalization index is formulated

from the data collected from the Census of India. ENP is constructed from the data extracted from the Election Commission of India. The data related to Gini-coefficient is taken from World WID- World Wealth & Income Database, The Chartbook of Economic Inequality, Pikkety's database, Emanuel Saez's database from Centre for Equitable Growth and World Bank. Time period for our research is 1993-2013.

Methodology

Fractionalization index is used to measure the social diversity

$$\text{Fractionalization index} = 1 - \sum_{i=1}^n (\text{Share of } i^{\text{th}} \text{ religion in total population})^2$$

More the fractionalization index more will be the diversity in the society.

Polarization index is used to measure the polarization that is separation in the society.

Polarization index

$$= 1 - \sum_{i=1}^n \left(\left(\frac{0.5 - \text{Share of } i^{\text{th}} \text{ religion in total population}}{0.5} \right)^2 \right) \times \left(\text{Share of } i^{\text{th}} \text{ religion in total population} \right)$$

Polarization index is developed by Montalvo, J. G., & Reynal-Querol, M. (2005) and given by Esteban, J. M., & Ray, D. (1994). Higher the polarization index, higher will be the polarization in the society.

Both indices lie between 0 and 1.

Effective numbers of political parties is formulated by constructing the Herfindahl-Hirschman Index (HHI).

$$\text{HHI} = \sum_{i=1}^n \left(\frac{\text{Seats won by } i^{\text{th}} \text{ political party in coalition}}{\text{Total seats in Loksabha}} \right)^2$$

$$\text{ENP} = \frac{1}{\text{HHI}}$$

High ENP reflects the higher number of political parties in the government which shows the high degree of coalition.

Prais-winsten⁴ time series regression is used to the impact of ENP, fractionalization index, polarization index, value added in agriculture, industrial and service sector on gini coefficient. Lag of one year of all independent variables is also considered.

Gini Coefficient

$$= \alpha + \beta_0 * ENP_t + \beta_1 * FRAC_t + \beta_2 * POL_t + \beta_3 * Agri_t + \beta_4 * Indu_t + \beta_5 * Service_t + \beta_6 * ENP_{(t-1)} + \beta_7 * FRAC_{(t-1)} + \beta_8 * POL_{(t-1)} + \beta_9 * Agri_{(t-1)} + \beta_{10} * Indu_{(t-1)} + \beta_{11} * Service_{(t-1)} + \mu$$

Gini Coefficientn = Government Spending

ENP = Effective Number of political parties

FRAC = Fractionalization Index

POL = Polarization Index

Agri = Value added in Agriculture sector

Indu = Value added in Industrial sector

Service = Value added in Service sector

1. Result and conclusion

Table 3

Number of obs	19
F(12, 6)	5.43
Prob> F	0.0243
R-squared	0.9157
Adj R-squared	0.7472

Table 4

Gini Coefficient	Coef.	Std. Err.	t	P> t
Agri_t	0.00000	0.00000	-2.33 (.)	0.05900
indu_t	0.00000	0.00000	-1.49	0.18700
service_t	0.00000	0.00000	1.46	0.19400
ENP_t	-0.00084	0.00036	-2.3 (.)	0.06000
FRAC_t	66.74975	24.04613	2.78 (*)	0.03200
POL_t	-48.13584	17.91171	-2.69 (*)	0.03600
Agri_t-1	0.00000	0.00000	5.7 (***)	0.00100
Indu_t-1	0.00000	0.00000	-4.24 (**)	0.00500
Service_t-1	0.00000	0.00000	0.58	0.58500
ENP_t-1	-0.00037	0.00035	-1.07	0.32600
FRAC_t-1	-86.32081	21.07832	-4.1 (**)	0.00600
POL_t-1	59.74977	17.79729	3.36 (*)	0.01500
_Cons	-3.54931	9.47628	-0.37	0.72100
Durbin-Watson statistic (original)			1.603142	
Durbin-Watson statistic (transformed)			2.413653	

Results show that value added in agriculture, ENP and polarization index have statistically significant negative impact on gini coefficient in short run while fractionalization index has positive significant impact on gini coefficient. Lag of value added in agriculture

and polarization index have positive significant impact on gini coefficient while lag of value added in industrial sector and fractionalization index have significant negative impact on gini coefficient.

In short run, agriculture sector is improving the social fairness by reducing the income inequality. Majority of Indian population is still dependent on agriculture sector. Therefore the growth in agriculture sector will help to increase the income of majority population. ENP is reducing the income inequality in short run as ENP has negative significant impact on gini coefficient in short run. More the ENP more will be the parties in the government. Therefore more ENP represents the more number of representatives from various class, caste and communities in the government. Therefore it will generate the fairness policies which will reduce the income inequality in short run. Diversified society might face the violent incidences in short run which might reduce the income society. Fractionalization index has positive impact on gini coefficient in short run which suggest that the diversified society might suffer from high level of income inequality in short run. Highly polarized society might witness the rapid decision process in short run as one community can power and can take decision easily. Therefore in short run due to efficient decision system, polarization index is reducing the income inequality.

In long run, industrial sector is reducing the income inequality. Industrial sector is important as far as job creation is concerned. Therefore the growth of the industrial sector in long run will benefit the majority of population who are still waiting to get the benefits of economic growth. In this research, rural-urban migration and transmission of labor from one sector to another sector are not considered. Therefore results show that in long run, agricultural sector has positive impact on income inequality. This might be happening because in long run, majority of population is leaving the agriculture sector. In long run, fractionalization index has negative impact on income inequality. In long run, diversified society might convince the government for proper redistribution policies. In long run, polarization index has positive impact on income inequality. High polarization naturally represents the biasness in the decision system in long run as one community is more powerful than other communities. Therefore polarization will increase the income inequality in long run.

Recommendation, limitation and further discussion

Social and political diversity with sector-wise growth are the important factors as far as income inequality is concerned. Policies should be formed on the basis for the impact of social diversity, polarization, government

coalition and sector-wise growth in short run as well as long run. Migration and transmission of worker from one sector to another sector is not taken into consideration. These factors should be considered to identify the proper impact and proper channel through which income inequality is affected. In India, linguistic diversity is also an important factor. Linguistic diversity, social conflict and wars should be taken into consideration for further analysis.

Endnotes

1. The fractionalisation index measures the probability of two randomly chosen individual belonging to different groups. It does not include information on the extent of cultural or economic differences across groups. But it can be altered to incorporate information about group-based differences (Baldwin, K., & Huber, J. D. (2010)).
2. An ethnic polarization index is a measure of the extent to which individuals in a population are distributed across different ethnic groups. The index was developed by Esteban, J.M., & Ray, D. (1994).
3. HHI index is a commonly accepted measure of market concentration. It is calculated by squaring the market share of each firm competing in a market. Here it is used to measure the composition of the political party in power and whether it is a one party government or a coalition.
4. It is a joined effort of Sigbert Prais and Christopher Winsten (1954).

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