INCOME INEQUALITY AND OTHER FORMS OF INEQUALITY

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WHAT IS INEQUALITY

Inequality is multidimensional, if expressed between individuals, it is the fundamental disparity that permits one individual certain material choices, while denying another individual those very same choices.

These choices and the factors that allow/deny them are multidimensional.

It covers *both inequality in opportunities and inequality in outcomes*. It can have time dimension as well.

CONCEPT OF INEQUALITY

•The theoretical approach of classical economists (starting from Adam Smith in his 'Wealth of Nation (1776) to John Stuart Mill) for the study of distribution of income focused mainly on the functional distribution of income among three main factors of production namely labour, capital and land whose incomes were wages, profit and rent respectively.

•The functional distribution of income represented the main class division of society into workers, capitalists and landowners. The functional distribution was an important component for the understanding of distribution of income between persons.

•For classical economist the concept of personal distribution was restricted to the framework of wage differential. For non-labour income, their analysis was limited by absence theory of the distribution of ownership of land and capital. The common conception seemed to be that ownership of land and capital was determined by historical process and lie beyond the study of economics.

CONCEPT OF INEQUALITY

•Kuznets (1955) based on empirical evidence conceptualisation of Inverted U.

•Fields (2001) questioned it and stated that it is not growth but nature of economic growth that gives rise to inequality.

•Stiglitz (2012) reversed the causation relation between growth and inequality and argued that economic inequality affects the pace and the nature of economic growth.

• Broad concept of Piketty (2014) - if growth of per capita asset is more than growth of per capita income over time it would substantially increase income inequality through greater unequal assets holding over time.

•Operates through two channels:

i) the wealthy are likely to accumulate more and more wealth as proportion to GDP because the return from existing wealth is higher than the growth of output.

ii) Even when capital's share of income remains constant, wealth and income distribution can get more skewed if the rate of return earned by the wealthy is an increasing function of initial wealth

•In addition, inheritance of wealth often leads to inter-generational concentration of wealth.

IS INEQUALITY A PROBLEM?

Studies of Economic Commission for Latin America and Caribbean (ECLAC) in 1960s identified for the first time that inequality is a problem.

Highly unequal Latin American social structure is major impediments to growth and they hindered social mobility. Such society generated excessive consumption by upper classes that constituted high proportion of imported goods and did not translate into stronger capital accumulation.

It had little impact on domestic growth and employment. It can be contrasted with precarious condition of the masses. It did not lead to sustainable process of industrialization.

MEASUREMENT OF INCOME INEQUALITY

Income inequality in a country, region or population group across distribution of income or consumption is measured by various methods. These are several types of inequality measures. The most commonly used measures of inequality are :

(i) Gini-Coefficient
(ii) Pseudo Gini

(iIi) Quintile and Decile Dispersion Ratios

(iv) Share of Income/Consumption of Poorest Group

(v) Palma Ratio

(vi) Generalized Entropy Measures

(vii) Decomposition of Inequality: Field

(viii) Kernel Density Graph

GINI COEFFICIENT

The Gini coefficient is the most widely used measure of inequality.

It is exactly one-half of relative mean difference. Relative mean difference is the arithmetic average of absolute value of differences between all pairs of income.

The coefficient varies between 0 (complete equality) and 1 (complete inequality).

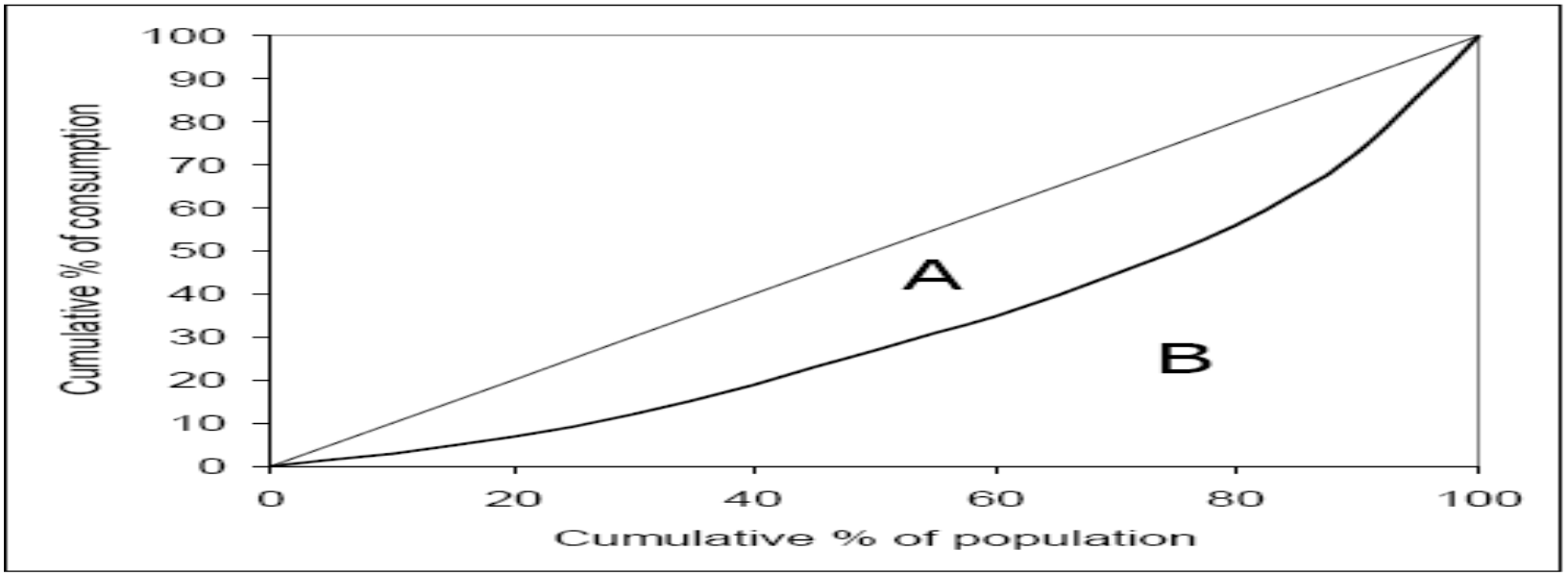
It is based on Lorenz curve, a cumulative frequency curve that compare the distribution of income/consumption with the uniform distribution that represent equality.

Lorenz curve, map the cumulative percentage of income/consumption on the vertical axis and the cumulative percentage of the population or households (from poor to rich) on the horizontal axis.

GINI COEFFICIENT

The diagonal line represents perfect inequality.

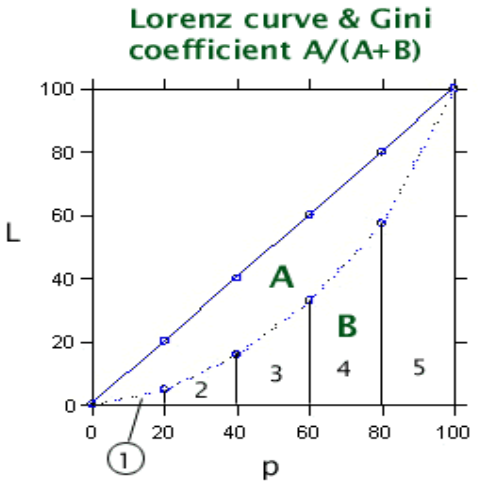
The Gini Coefficient is defined as A/(A+B), where A and B are the area shown in the figure.



If each individual has the same income or total equality (A=0), Lorenz curve and line of equality would merge and Gini-coefficient becomes 0. If one individual gets all income (B=0), Gini coefficient becomes 1 means perfect inequality.

GINI COEFFICIENT CALCULATION

Income Category	Total Income	Population	Income
Top 20%	42.7	100	100
4th 20%	24.4	80	57.3
3rd 20%	17.1	60	32.9
2nd 20%	11.1	40	15.8
Lowest 20%	4.7	20	4.7
Total	100		



Area A + Area B	100*100/2 =	**5000**
Area 1	20*4.7/2 =	47
Area 2	20*(4.7+15.8)/2 =	205
Area 3	20*(15.8+32.9)/2 =	487
Area 4	20*(32.9+57.3)/2 =	902
Area 5	20*(57.3+100)/2 =	1573
Total Area B		**3214**
Area A	5000 - 3214 =	**1786**
Gini Coefficient	1786/5000 =	**0.36** or **36%**

GINI Coefficient of per Capita Consumption Expenditure

Areas	Bangladesh		India		Pakistan		Sri Lanka	
	2005	2010	2004/5	2011/12	2005	2009/10	2005/6	2010/11
All	0.33	0.32	0.38	0.37	0.31	0.30	---	0.38
Rural	---	---	0.32	0.31	0.25	0.25	---	0.37
Urban	---	---	0.39	0.39	0.33	0.33	---	0.41

•Inequality was considerably high in Sri Lanka and India and somewhat low in Bangladesh and Pakistan.

•Inequality as measured by Gini showed marginal decline in Bangladesh, India and Pakistan.

PSEUDO-GINI

Pseudo Gini measures inequality in terms of the household welfare.

Contribution to inequality of households by broad sector

Sector of activity	1983	1993-94	2004-05	2011-12
Primary	0.16	0.17	0.17	0.14
Secondary	0.46	0.45	0.33	0.25
Tertiary	0.55	0.56	0.53	0.46

- Tertiary sector is by far the highest of the three sectors.

- As the share of income originating from this sector has been increasing (IHD ICSSR paper).

- Hence, the contribution of the tertiary sector to over-all inequality is substantially higher than others.

DECILES AND QUINTILE DISPERSION RATIOS

The dispersion ratios measure the “distance ” between two groups in the distribution of expenditure/income. Typically, they measure the average expenditure/income of the richest x% divided by the average expenditure/income of the poorest x%.

There are different alternatives, the most frequently used are for deciles and quintiles.

- Deciles is a group containing 10% of the total population.
- Quintiles is a group containing 20% of the population.

Dispersion Ratios: Average income of top group i/average income of bottom group j.

[where i and j can be defined as deciles or quintiles]

DISPERSION RATIOS:DECILES OR QUINTILE RATIOS INDIA

Quintile	Value		Dispersion Ratios	Ratio	
	2004-05	2011-12		2004-05	2011-12
Q1	293	600	Q5/Q1	5.1	5.6
Q2	409	872	Q5/Q2	3.7	3.9
Q3	521	1144	Q5/Q3	2.9	3.0
Q4	689	1577	Q5/Q4	2.2	2.1
Q5	1497	3379	Q5/Q5	1.0	1.0

Deciles	Value		Dispersion Ratios	Ratio	
	2004-05	2011-12		2004-05	2011-12
D1	254	511	D10/D1	8.0	8.8
D2	332	688	D10/D2	6.1	6.5
D3	384	811	D10/D3	5.3	5.6
D4	435	933	D10/D4	4.7	4.8
D5	489	1065	D10/D5	4.1	4.2
D6	552	1223	D10/D6	3.7	3.7
D7	631	1428	D10/D7	3.2	3.2
D8	748	1727	D10/D8	2.7	2.6
D9	970	2252	D10/D9	2.1	2.0
D10	2025	4506	D10/D10	1.0	1.0

SHARE OF INCOME/CONSUMPTION OF POOREST GROUP

This measure presents the total income or consumption of the poorest group, as a share of total income or consumption in the population. (assuming 20 and 30% poor).

Share of Consumption by Deciles (India)

Deciles	Consumption share		Poverty	Ratio	
	2004-05	2011-12		2004-05	2011-12
D1	3.7%	3.4%			
D2	4.9%	4.5%	20.0%	8.6%	7.9%
D3	5.6%	5.4%	30.0%	14.2%	13.3%
D4	6.4%	6.2%			
D5	7.2%	7.0%			
D6	8.1%	8.1%			
D7	9.3%	9.4%			
D8	11.0%	11.4%			
D9	14.2%	14.9%			
D10	29.7%	29.7%			
Total	100.0%	100.0%			

PALMA RATIO

Chilean economist Gabriel Palma who found that middle class incomes almost always represent about half of gross national income while the other half is split between the richest 10% and poorest 40%, two groups varies considerably across countries . This ratio of richest 10% and poorest 40% population share of income is called Palma ratio.

Palma ratio (India)

Deciles	Consumption share		Palma Ratio	
	2004-05	2011-12	2004-05	2011-12
D1	3.7%	3.4%		
D2	4.9%	4.5%		
D3	5.6%	5.4%		
D4	6.4%	6.2%	1.44	1.53
D5	7.2%	7.0%		
D6	8.1%	8.1%		
D7	9.3%	9.4%		
D8	11.0%	11.4%		
D9	14.2%	14.9%		
D10	29.7%	29.7%		
Total	100.0%	100.0%		

The top 10 percent (rich) is grabbing one and half times the income of the bottom 40 percent.

Various Inequality Measurement of per capita Consumption

Characteristics	Bangladesh	Nepal	Pakistan	Sri Lanka	India
	2010	2010/ 11	2009/ 10	2009/ 10	2011/ 12
D5/D1	1.73	2.18	---	2.16	1.83
D9/D1	3.40	4.89	---	4.88	4.30
D9/D5	1.97	2.24	---	2.26	2.35
Palma Ratio	1.22	1.58	1.30	1.61	1.31

•.Overall inequality (D9/D1) was high in both Nepal and Sri Lanka. Bangladesh had relatively low inequality and India fell in the middle.

•India experienced high inequality in the top half (D9/D5) that was higher than even both Nepal and Sri Lanka (countries with higher overall inequality) .

•Palma ratio of Sri Lanka and Nepal was quite high compared to others.

GENERALIZED ENTROPY INDEX

The Generalized Entropy (GE) Index, which are derived from the notion of entropy in information theory.

Entropy is an expected information content calculated as a weighted average of the information content of each observation.

$$GE(0) = \frac{1}{n}\sum_{i=1}^{n}\log\frac{\bar{y}}{y_i}\ ,\quad GE(1) = \frac{1}{n}\sum_{i=1}^{n}\frac{y_i}{\bar{y}}\log\frac{y_i}{\bar{y}}\ \text{and}\ GE(2) = \frac{1}{2n\bar{y}^2}\sum_{i=1}^{n}(y_i-\bar{y})^2$$

The values of GE vary between 0 and infinity, with 0 representing an equal distribution and higher values representing higher levels of inequality. GE classes of measurement varies from 0 to 2 and different weights are assigned to various level of distribution.

GE(0), or mean log deviation, sensitive to observation at lower end of income distribution.

GE(1), or Theil index, sensitive to observation at middle end of income distribution.

GE(2), or ½ the squared coefficient of variation, CV, sensitive to observation at upper end of income distribution.

GENERALIZED ENTROPY INDEX FOR INDIA

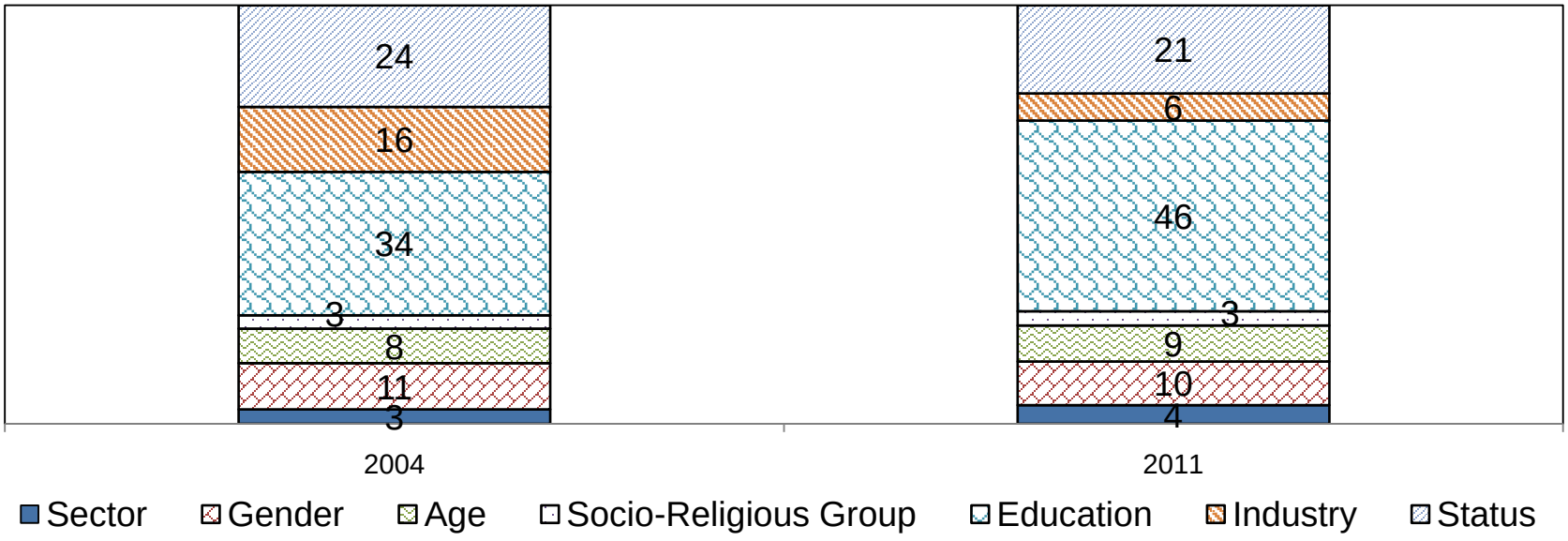
Period	GE(0)	GE(1)	GE(2)
Rural			
1983	0.169	0.195	0.324
1993	0.148	0.184	0.454
2004	0.172	0.223	0.531
2009	0.161	0.201	0.377
Urban			
1983	0.223	0.249	0.422
1993	0.209	0.239	0.417
2004	0.250	0.290	0.534
2009	0.272	0.315	0.547
Total			
1983	0.188	0.217	0.369
1993	0.197	0.239	0.504
2004	0.233	0.292	0.625
2009	0.254	0.317	0.623

The growing importance of high incomes can be seen in both sectors—and particularly in the urban --- in the perceptible rate of increase of the GE index as we move up from GE(0) to GE(2).

FIELD DECOMPOSITION

Decomposition analysis of inequality is important for understanding the main determinants of inequality. Field (2003) developed a new approach focusing the use of regression that helps us to get the contribution of different factors (explanatory variables) of income or earnings inequality. The relative importance of the different groups of factors to the explanation of earnings inequality can be estimated by using a semi-logarithmic Mincerian (standard or augmented) wage/earning function:

Contribution of Various Factors to Income /earning Inequality in India

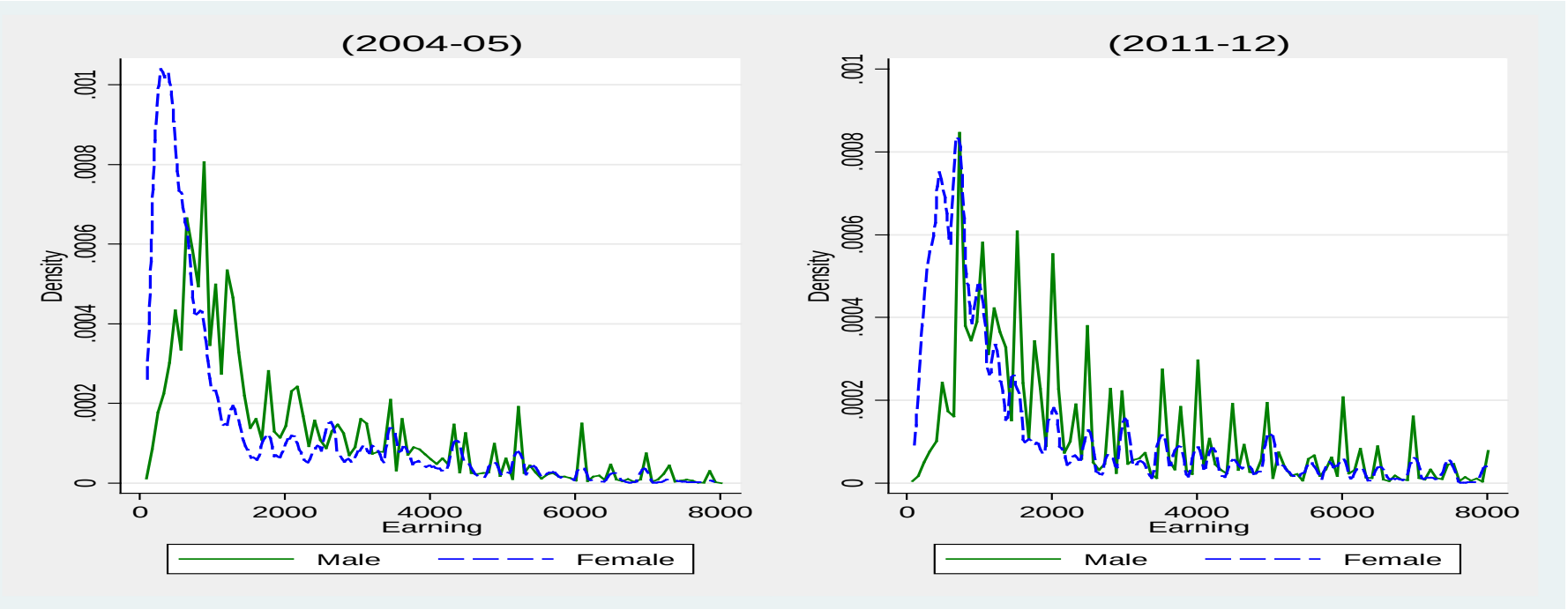


KERNEL DENSITY ESTIMATION GRAPH

This type of graph gives a visual idea and features of the distribution about the nature of inequality.

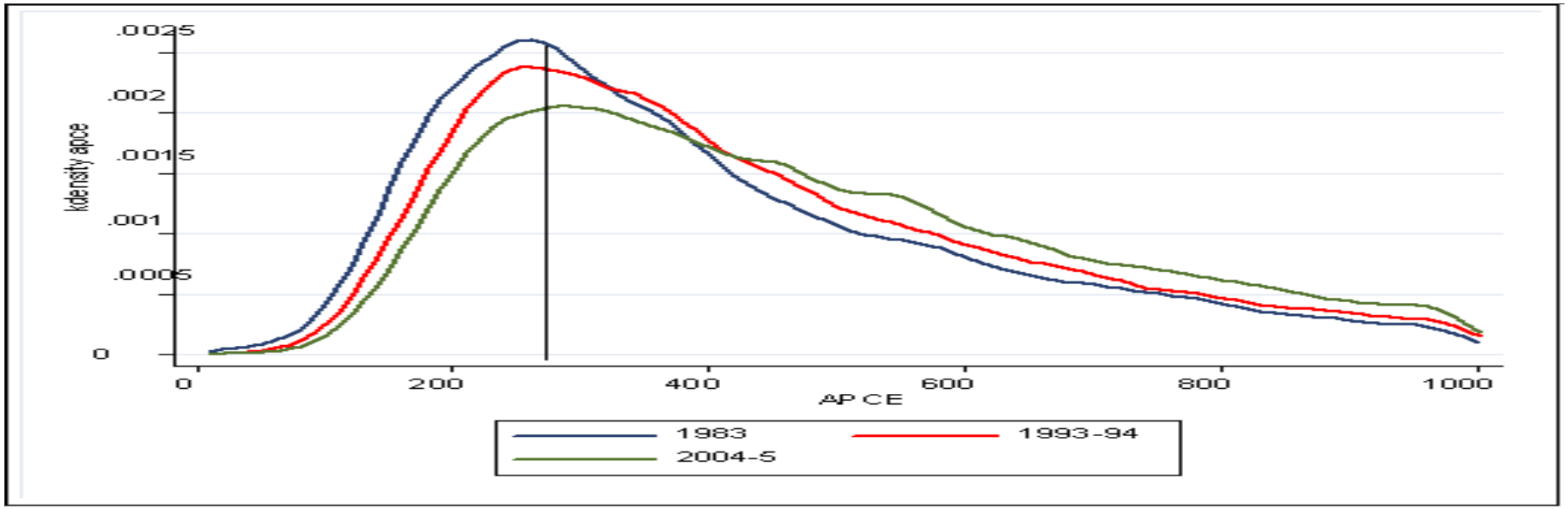
Over the years, the peak at the lower level of earnings reduced and more spikes at middle and top earnings shows increasing presence of female workers at middle and top income regular jobs.

Kernel Density Function Weekly Earning of Regular Workers by Gender in India(2004/5 and 2011/12)



KERNEL DENSITY ESTIMATION GRAPH

Distribution of Per Capita Expenditure (APCE) in Urban Areas



•Left side of KDF showed higher shift in the pre-reform period compared to post-reform period means households below the poverty line experienced higher APCE growth.

•Shift in poverty line at peak marginally lower in post reform showed higher decline in poverty in pre-reform period.

•Shift of the distribution to the right in the last two decades had not been uniform suggests that there had been substantial increase in the income and inequality in the upper half of the distribution.

OTHER DIMENSIONS OF INEQUALITY

Traditionally, the assessment of inequality is dominated by single- dimensional monetary indicators, represented by either income or consumption. Both monetary and nonmonetary indicators of well-being capture important dimensions of inequality in outcomes.

Different dimension of Inequality are:

- Income/consumption;
- Opportunity (access to education, employment, health etc);
- Assets (ownership of Land, house and other assets);
- Social Exclusion (gender and social groups/ethnicity);
- Regional /physical environment

Different dimensions of inequality are interlinked – inequality in earnings could be the major factor behind inequality in consumptions of workers, asset inequality may make substantial contribution to income inequality even over generations.

INEQUALITY: EDUCATION/SKILL

Recent work on India showed:

the return to primary education is significantly lower that post-primary education.

Reasons:

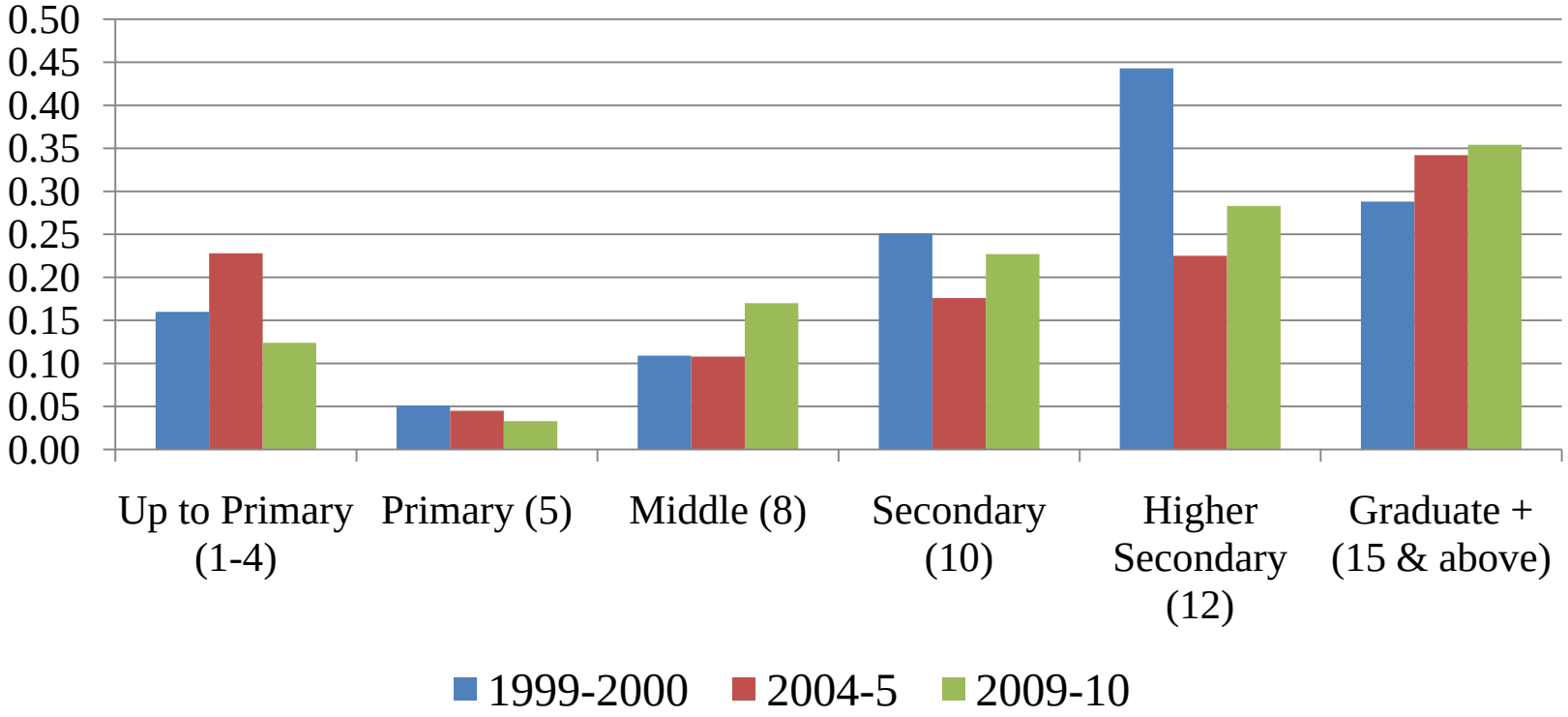
1.The supply of primary completers increased greatly in last two decades and the return to primary education likely to have fallen.

2. On demand side, demand for employees with low skills may have fallen due to changes in the skill composition of goods that are demanded and produced.

3. Cognitive skills learnt from a given number of years of schooling have become weaker.

The implication is that the falling return of primary education reduced poverty-mitigating or inequality reducing scope of primary education.

Incremental net additions to log earnings for successive levels of education for Regular Worker (Returns to Education)



•Over the years, only net addition to earnings of regular workers with graduate and above degree had been going up continuously.

INEQUALITY: GENDER

- Factors: Occupation and Income
- The Glass Ceiling
- Patriarchy/Social Factors
- Political participation

Occupation/Job-men still dominate at top level.

Income-evidence suggests women still paid less than men for the same job

Glass Ceiling – limits the extent to which women can make it to the top

Patriarchy/Social Factors –some countries actively discriminate against women and limits their mobility and participation in labour market and politics etc due to social factors.

INEQUALITY: GENDER

•The differential rates of participation of men and women in labour market.

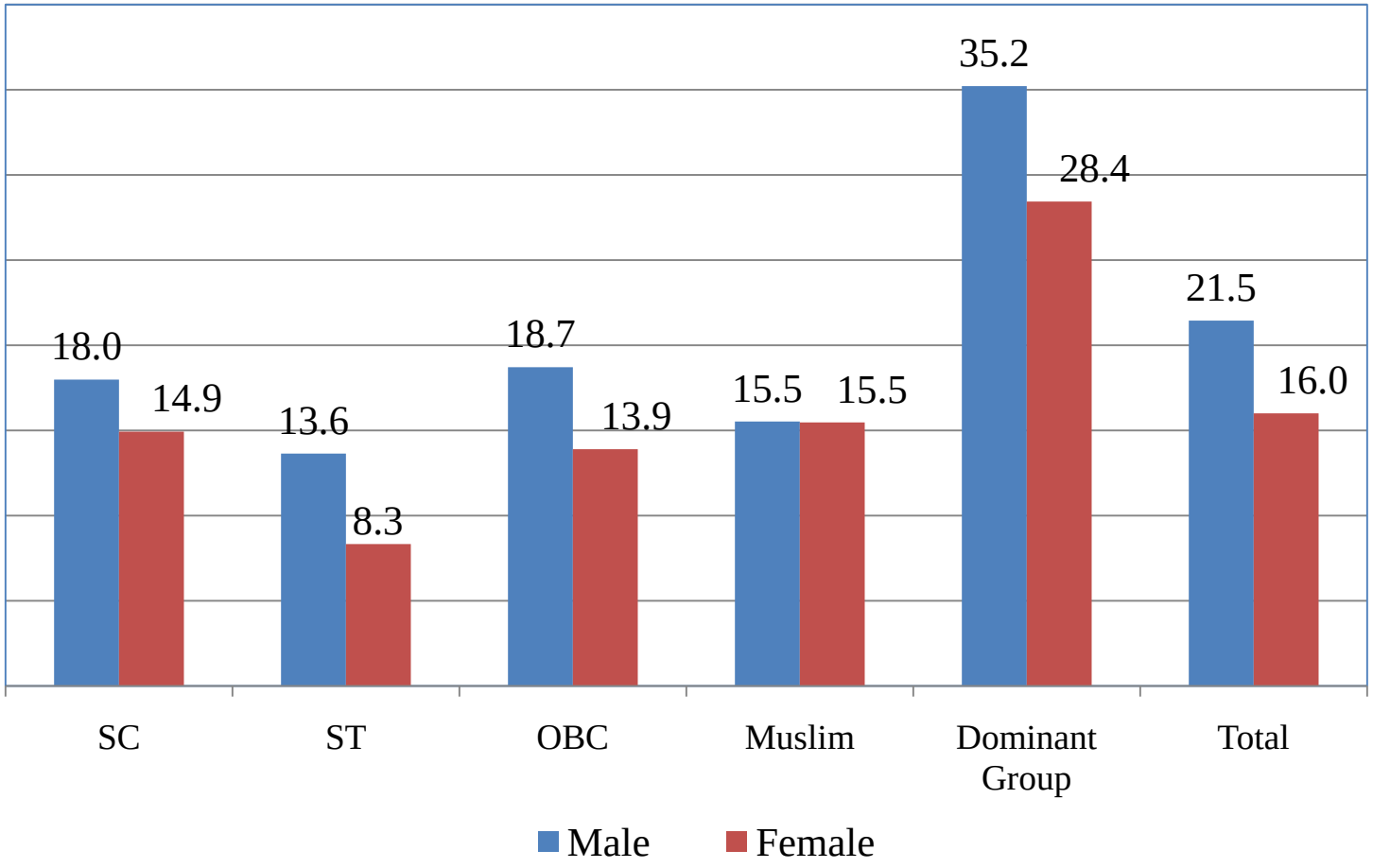
•On average, monthly income earned by males, who have formal jobs (Tk 1964 or $85.6) was three times higher than the income of their female (Tk 542 or $22.2) counterparts in Bangladesh.

•Women turnout during India's 2014 parliamentary general elections was 65.63 per cent, compared to 67.09 per cent turnout for men.

• In 16 out of 29 states of India, more women voted than men in April-May 2014 elections for India's parliament. But had only 11.2 per cent women elected representatives in the national parliament.

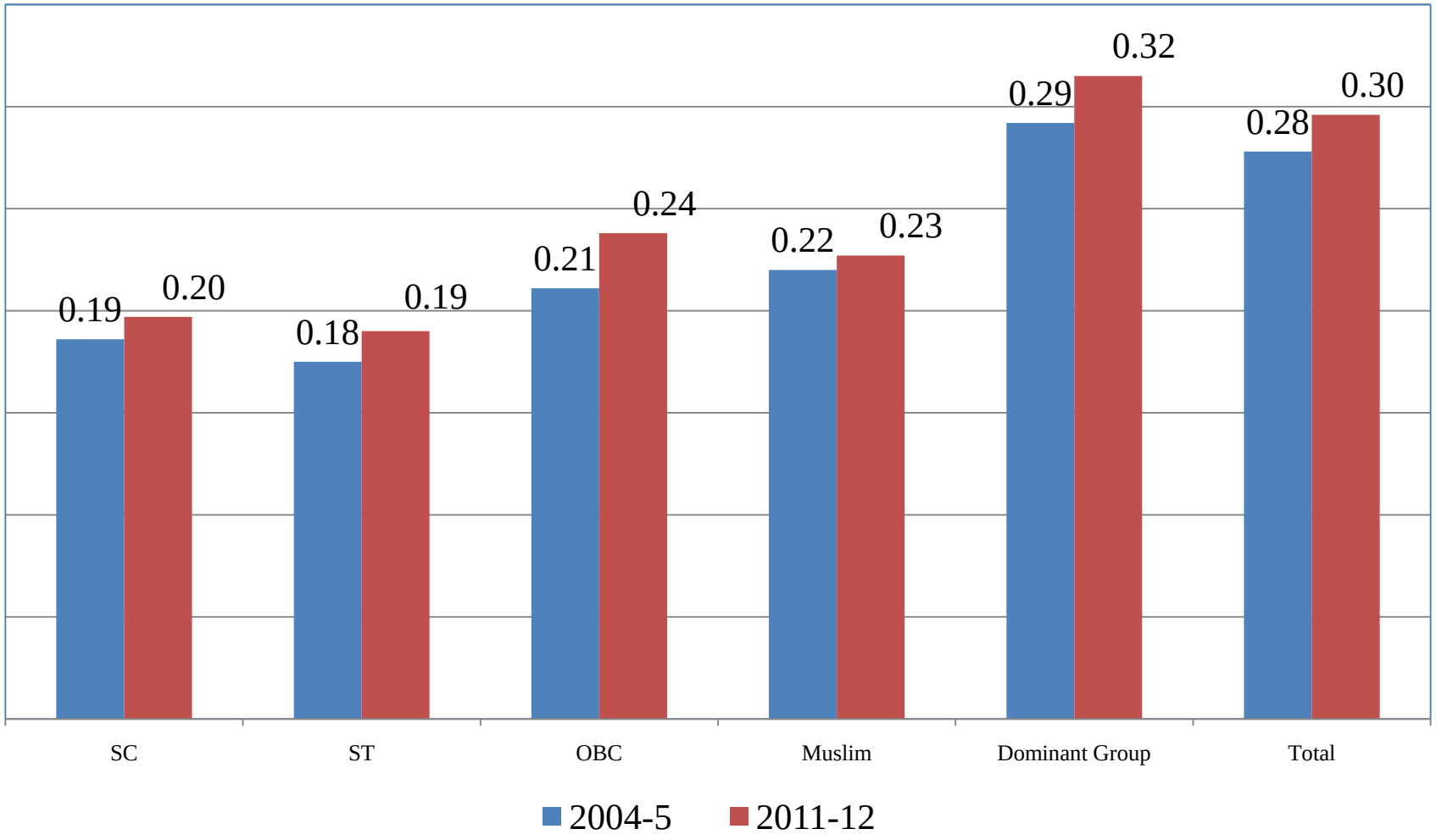
INEQUALITY: SOCIAL GROUPS/ETHNICITY

Share of Formal Employment in India by Social Groups, 2011-12



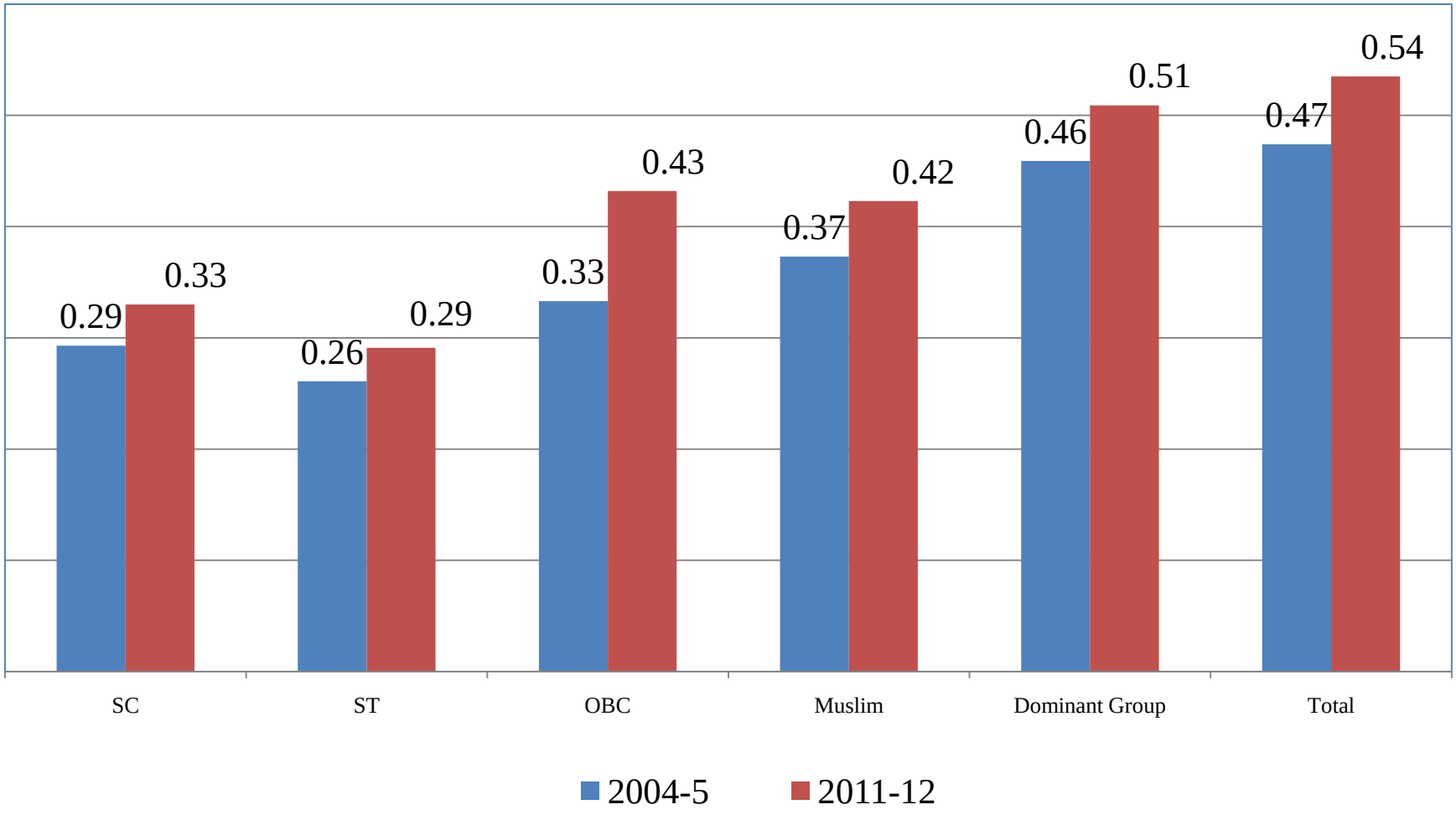
INEQUALITY: SOCIAL GROUPS/ETHNICITY

Degree of Inequality, GE(1)



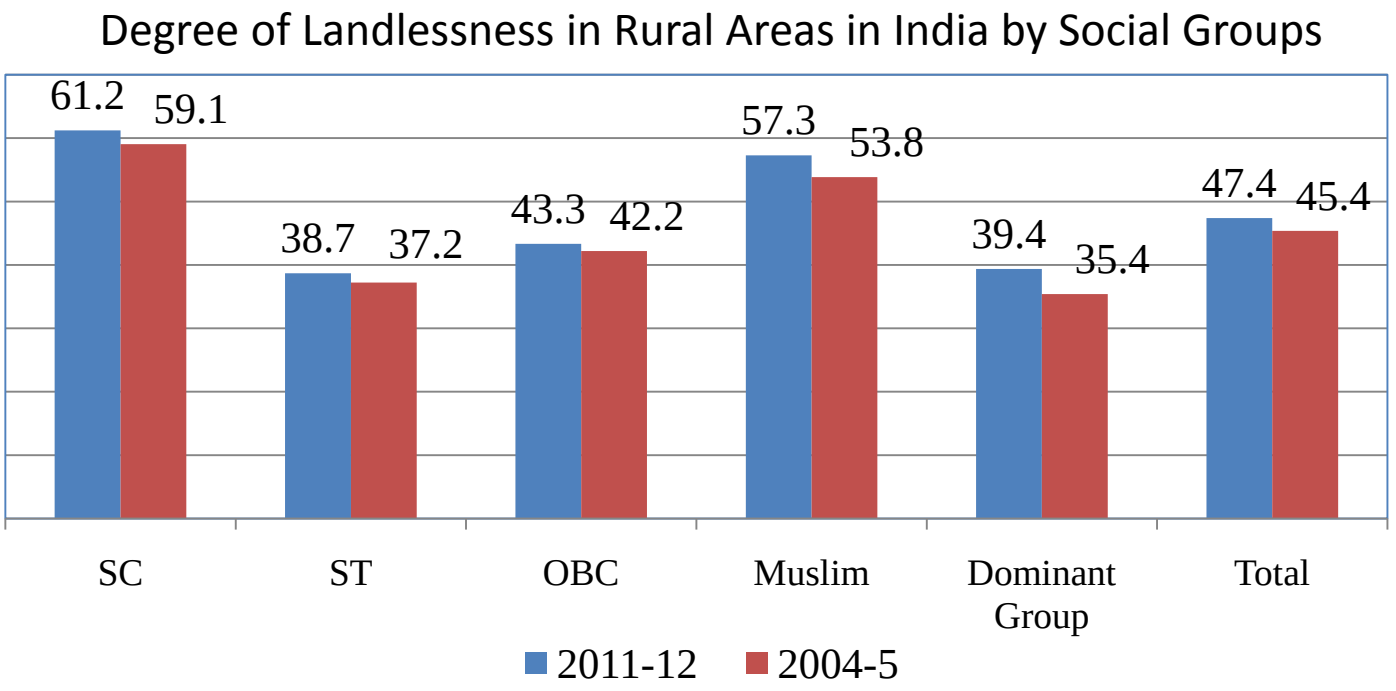
INEQUALITY: SOCIAL GROUPS/ETHNICITY

Degree of Inequality, GE(2)



INEQUALITY: ASSETS

- Factors: Raw Materials, Capital, Human Resources
- Not just the quantity but also the quality of assets can impact on inequality.
- Individuals – ownership of houses, land, other assets, etc.



INEQUALITY: REGIONAL/PHYSICAL ENVIRONMENT

Factors: Geography (Regional), Natural Resources and Climate

- Physical environment can include natural resources, raw materials and climate.
- Not only availability of natural resources but accessibility and ease with which they can be exploited.
- It is not enough to have natural resources available, there has to be sufficient capital equipment to be able to exploit them.
- Natural climatic factors are at the heart of a large amount of inequality – it is not coincidence that countries with an equitable climate report lower level of inequality.
- Natural climate and climate change tend to affect those countries least able to help themselves.
- Extremes of weather tend to impact most heavily on countries who have the lowest ability to cope with such extremes.