Consideration of the nexus between Institutions and Outreach

-The study of the caste discrimination in India -

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1. Introduction

Recently, Capacity Development (CD) approach is one of the main paradigms in the debates over the role of development AIDs. One of the important differences of CD from the other approaches is to take account of the sustainability of the effect of the AID project. The donors have to consider how the situation would be changed or unchanged after the project has completed. In other words, most important thing to secure the sustainability of the project is that recipients and the society have the capacity to take over the results of the project that have been achieved. In this sense, it is not difficult to understand that the society faces with the change in their traditional customs and rules as institutional changes occur caused through the project. Thus, it is necessary to discuss CD in view of institutional changes.

First of all, I would like to show the approach to directly explore the change and generation of institutions through the implementation of the project of CD. There has been rapid accumulation of the researches associated with CD; most of them are conducted by JICA, UNDP and the other aid agencies to validate the efficiency of CD approach. Although there are broad ranges of institutions from the local customs at the village level to the legal and political structures at the country level, target institution of aid program tend to be relatively small because the geographic coverage of aid project is normally regional or sub-regional level. For example, when an aid agency proceed a project, such as several constructions of village hospitals or clinics in the province, they might have to concern about the local tradition, kinship, hierarchic structure, social capital, and the others. In this case, it looks very similar to the anthropologic research. Thus, most important things in this approach are to observe the institutional change in ongoing project, and to evaluate the implication on the achievement of the project with CD.

Although capability approach[1] by Amartya Sen doesn't directly deal with the relationship between CD and institution, it might be considered as a different example of this approach. Recently, work is proceeding with the development of the tool to evaluate the impact of the aid project using capability approach. Alkire (2000) insists the usability of cost-benefit analysis to assess the project

[1] Refer to Sen (1999), Comim (2008).

with capability approach[2].

In any cases, important thing for this approach is to have the knowledge about the social and economic structure of the target society; otherwise it is almost impossible to make analysis following this approach.

Excluding these case studies, there are not large accumulations of previous studies related to the relationship between CD and institutions. In addition, it might be possible to think that CD approach is not purely the objective of academic research, but just the instrument to conduct the aid project. I partially agrees with this viewpoint. However, researchers have to express understanding for the necessity to deepen the discussion about this issue. Thus, it is necessary to take a preliminary step to deal with this issue. I think it is almost impossible to directly discuss this issue; however, there are a lot of previous studies analyzing the relationship between economic growth and institution, or between economic growth and aid. One of the purposes of this paper is to make a basis for further discussion with the help of these previous studies.

For that purpose, I would like to show an analysis in this paper; it is to analyze the relationship between caste institution and their income in India using household micro data. In macro empirical studies, institutions, which are targeted in the analysis, is mainly discuss about the relationship between economic growth and political institution, such as democratic condition, governance, corruption, legal system, financial system, and the others[3]. However, the coverage of aid project is normally at the regional or provincial level within a country. Thus, micro empirical studies are suitable for the discussion of the relationship between the CD and institution. Recent studies indicate that the discrimination caused by the caste system reduces. Thus, the purpose of second analysis is to examine the transition of discrimination related to the wage difference between Scheduled Castes (SCs)/Scheduled Tribes (STs) and the others in 17 years, 1983 to 1999, using National Sample Survey micro data. In particular, I focus on the effect of the reinforcement of the reservation policy on the wage difference over the whole wage distribution. This analysis of the relationship between policy change (reinforcement of the reservation policy) and welfare (the transition of wage distribution) help us to challenge this difficult topic.

2. wage difference between caste classes in 1983-2000

2.1 Background

The caste system in India is the traditional, hereditary system of social restriction and social stratification, enforced by law or common practice, based on endogamy, occupation, economic status,

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2 For more detail and recent discussions, refer to Comim (2008).

3 For more details, refer to Mauro (1995), Knack and Keefer (1995), Perotti (1996), Acemoglu, Johnson and Robinson (2001), Kosac (2003). Especially, Acemoglu, Johnson and Robinson (2006) summarizes the points of the recent development at this approach.

race, ethnicity for a long period of time. To alleviate it, Indian government has constituted the affirmative action plan and reservation policy in education and public job, where 22.5 % of university places and government jobs have been "reserved" for Scheduled Castes (SCs) and Scheduled Tribes (STs) since 1979. Recently, India's Congress-led government has told companies to hire more SCs, STs and Other Backward Classes (OBSs). *Manmohan Singh, the prime minister, has given warning that "strong measures" will be taken if companies do not comply* (Economist [2007]). That is to say, government has reinforced the affirmative action. In response to this, despite some problems related to reservation policy, many companies and organizations launch their own affirmative-action schemes.

According to Kijima (2006), the difference of log per capita expenditure between SCs/STs and the others decrease from 0.315 (between STs and others), 0.228 (between SCs and others) in 1983 to 0.267, 0.191 in 1999, respectively.

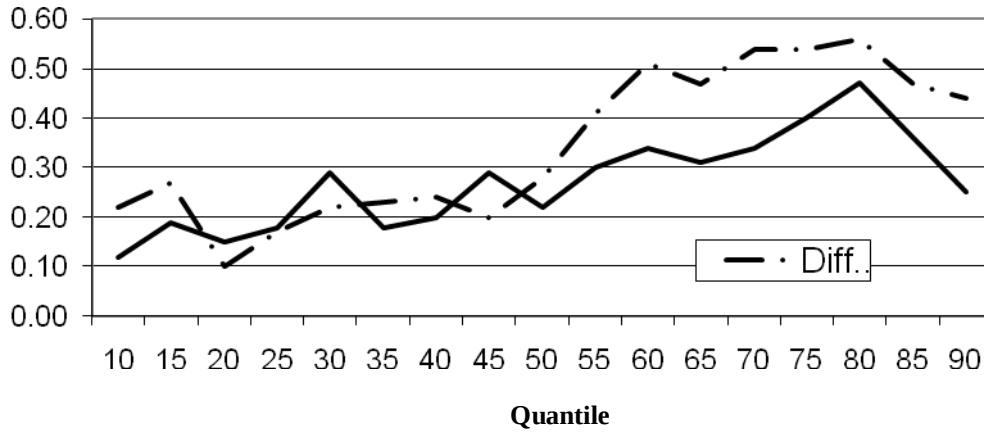
Table1. Transition of the difference of log wage

Year	SCs/STs	Others	Difference
1983	4.92	5.20	0.28
1987	5.16	5.52	0.36
1993	5.37	5.68	0.31
1999	5.41	5.63	0.22

In addition, table1 shows the difference of log wage between SCs/STs and the others decrease from 1983 to 1999. It is said that the discrimination due to the caste system is not as severe as it used to be.

Since 1991, embarking on full-fledged economic reform, macro economic performance in India has been very remarkable. Especially, the demand for high-skilled labor is increasing.

Figure1 Difference of log wage between SCs/STs and the others



On the other hand, there have not been remarkable changes in the unskilled labor and low-skilled labor. Figure1 shows the difference of log wage between SCs/STs and the others in 1983 and 1999 following their wage quantiles. It is obvious that there are large differences in terms of the ratio to improve the wage difference according to their wage quantiles. It indicates that the reservation policy in private company and the increase of labor demand in high-value added sectors like IT sector lead to increase relative wage of SCs/STs to the others at the higher quantile. Even benefits of economic booming are not equally distributed all over SCs and STs.

Thus, the purpose of this paper is to examine the reason of transition of wage difference between SCs/STs and the others in 17 years, 1983 to 1999, using National Sample Survey micro data. In particular, I focus on the effect of the reservation policy on the wage difference between SCs/STs and the others. In general, it is believed that the implement of reservation policy makes the discrimination and wage difference between groups reduce. It is obvious that it has positive effect on Indian situation, but I would like to point out the other effects of the reservation policy on them.

There have been already quite a few researches in terms of wage difference and discrimination based on the caste system. Most of them are based on the decomposition approaches, which are pioneered by Oaxaca (1973) and Blinder (1974). Although this decomposition method is very simple and easy to interpret, there are some criticisms in terms of the methodological problem (Cahuc and Zylberberg (2004)). Therefore, to adopt the quantile regression decomposition technique, which is proposed by Machado and Mata (2006), I would like to solve these problems and shed the new light on it.

I explain about the Machado and Mata decomposition method (MMD) in section2 and the NSS data and empirical model in section3. I discuss the empirical results in section4 and conclude in last section5.

3.2. Quantile regression decomposition method

In general, for the analysis of the difference between groups, most previous literatures have adopted the decomposition method based on the results from OLS, which are pioneered by Oaxaca (1973) and Blinder (1974). In simple terms, Blinder-Oaxaca decomposition divides the difference of wage in two portions, one is the contribution of characteristics to the difference (ex. schooling years, experiment, and so forth) between groups, and the other one is the contribution of the evaluation (coefficients) to the difference. Although this decomposition method is very simple and easy to interpret, there are some criticisms in terms of the methodological problem (Cahuc and Zylberberg (2004)). One is that this decomposition method needs the information of only the average of the income distribution (or wage, consumption, etc.). Given the information in terms of entire income distribution, using these information make us get the more fruitful results compared to Blinder-Oaxaca decomposition. It is the decomposition based on quantile regression results (Mueller (1998), Garcia et al (2001)).

Given X_i, the conditional distribution of y_i at quantile θ is below,

$$Quant_\theta(y_i \mid X_i) = X_i\beta_\theta,\ \theta \in (0,1). \quad \ldots(1)$$

It is decomposed into two components

$$Q_\theta(y^A) - Q_\theta(y^B) = (\overline{X}^A - \overline{X}^B)\hat{\beta}_\theta^B + \overline{X}^A(\hat{\beta}_\theta^A - \hat{\beta}_\theta^B) + residual \quad \ldots(2)$$

where superscripts A and B means each group, and also $Q_\theta(y^i)$ is the empirical distribution function of income y_i. The first term and second term in right hand of equation (2) are consistent with the contribution of the characteristics and the contribution of the evaluation in Blinder-Oaxaca decomposition method, respectively.

However, there is still the problem in terms of the possibility to compare into two groups at all quantiles. If the standard deviation of the distribution of group A is different from that in group B, it might be difficult to compare two distributions at the various points of the distribution. Machado and Mata (2006) propose the alternative decomposition procedure, which combines quantile regression[4] and a bootstrap approach to alleviate this problem.

Melly (2005) put all the important points of this approach into a few sentences. It is summarized as follows: If U is uniformly distributed on [0,1], then $F^{-1}(U)$has distribution F. Thus, for a given X_i, and a random $\theta \sim U[0,1]$, $X_i\beta_\theta$ has the same distribution as $(y_i \mid X_i)$. If, instead of keeping X_i, fixed, we draw a random X from the population, $X\beta_\theta$ has the same distribution as y. Formally, the estimation procedure involves 7 steps:

1. Generate random sample of size m from a $U[0,1]$: $u_1,\ldots,u_m$,
2. Estimate for each group m different quantile regression coefficients: $(\hat{\beta}_{u_i}^{SCs/STs}, \hat{\beta}_{u_i}^{Others}; i = 1,\ldots,m)$
3. Generate for each group a random sample of size m with replacement from the independent variables of X, denoted by $\left\{\tilde{X}_i^{SCs/STs}\right\}_{i=1}^m, \left\{\tilde{X}_i^{Others}\right\}_{i=1}^m$ (using bootstrap method)
4. $\left\{\tilde{y}_i^{SCs/STs} = \tilde{X}_i^{SCs/STs}\hat{\beta}_i^{SCs/STs}\right\}_{i=1}^m, \left\{\tilde{y}_i^{Others} = \tilde{X}_i^{Others}\hat{\beta}_i^{Others}\right\}_{i=1}^m$ are random sample of size m from

[4] The presence of heteroskedasticity can be accounted for by estimating quintile regressions following Deaton (1997), Koenker and Bassett (1978, 1982), and Koenker (2005).

the marginal wage distribution of *y* consistent with the linear model.

5. Generate a random sample of the counterfactual distribution. { $C\left\{\tilde{y}_i^{cf} = \tilde{X}_i^{Others}\hat{\beta}_i^{SCs/STs}\right\}_{i=1}^{m}$ is a random sample from the wage distribution that would have prevailed in *SCs/STs* if all independent variables had been distributed as in *Others*.

6. In order to decompose the difference in the wage distribution into differences in the coefficients and characteristics differential, we follow the equation below,

$$Q_\theta(y^{Others}) - Q_\theta(y^{SCs/STs}) = [Q_\theta(\tilde{y}^{Others}) - Q_\theta(\tilde{y}^{count})] + [Q_\theta(\tilde{y}^{count}) - Q_\theta(\tilde{y}^{SCs/STs})] + residual$$

In right hand, the first term is the contribution of the evaluation (coefficients) and the second term is the contribution of the characteristics.

7. To repeat this procedure in each year, we can draw the dynamics of caste wage inequality in India in 1983 and 1999.

3.3. Data and Model

The data sources for India are *National Sample Surveys* (NSS). The National Sample Survey (NSS), initiated in the year 1950, is a nation-wide, large-scale, continuous survey operation conducted in the form of successive rounds.

In this paper, I use the employment and unemployment surveys in 1983 and 1999/2000, which surveyed with detailed questionnaire on household demography, individual's age, education attainment, employment status, and social status, covering approximately 100,000 households and 500,000 individuals.

I divide datasets into subgroups defined by caste, SCs/STs and the others. Following the definition of activity status in NSS, I define that the individuals, who were employed into Indian datasets, are the people, work as (1) *regular wage/salary worker*, (2) *casual wage public worker*, and (3) *other casual wage worker*.

Based on some literatures, we adopt age, age square, sex dummy (female is the reference group), educational dummy (low, middle , and high: low is the reference group), occupation dummy ("Professional", "Administrative", "Clerical", "Sales", "Service", "Agricultural", and "others": others is the reference group.), sector dummy(urban and rural: rural is the reference group), and region dummy as the independents variables. Dependent variable is log of real monthly wage. Please see the Table2 in detail of the variables.

Table 2 The Summary of variables

	Others				SCs/STs				Total			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
Log of wage	5.24	1.00	-2.62	10.40	4.90	0.89	-3.31	10.14	5.14	0.98	-3.31	10.40
Age	34.66	11.45	16.00	70.00	33.92	11.80	16.00	70.00	34.45	11.56	16.00	70.00

Education	Others	SCs/STs	Total
Low	47.41	79.81	57.83
Middle	42.60	19.07	35.03
High	9.99	1.12	7.14
Total	100.00	100.00	100.00

Occupation	Others	SCs/STs	Total
Professional	11.47	2.45	8.57
Administrative	1.34	0.31	1.01
Clerical	14.13	4.01	10.88
Sales	2.94	0.65	2.20
Service	6.49	6.98	6.65
Agricultural	34.35	64.41	44.02
Others	29.28	21.19	26.67
Total	100.00	100.00	100.00

Sector	Others	SCs/STs	Total
Rural	59.24	80.49	63.36
Urban	40.76	19.51	36.64
Total	100.00	100.00	100

Sex	Others	SCs/STs	Total
Male	79.44	70.75	76.64
Female	20.56	29.25	23.36
Total	100.00	100.00	100

Number of Samples

	Others	SCs/STs	Total
	64.8%	35.2%	85,193

	Others				SCs/STs				Total			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
Log of Wage	5.69	1.01	1.03	12.58	5.45	0.91	1.72	9.36	5.61	0.98	1.03	12.58
Age	35.40	11.84	16.00	70.00	35.04	11.86	16.00	70.00	35.27	11.85	16.00	70.00

Education	Others	SCs/STs	Total
Low	45.89	70.00	55.21
Middle	44.59	26.63	37.65
High	9.52	3.37	7.14
Total	100.00	100.00	100.00

Occupation	Others	SCs/STs	Total
Professional	6.00	2.20	4.53
Administrative	0.79	0.19	0.56
Clerical	8.14	3.26	6.25
Sales	3.92	0.88	2.75
Service	6.56	5.47	6.14
Agricultural	39.84	64.66	49.44
Others	34.76	23.35	30.34
Total	100.00	100.00	100.00

Sector	Others	SCs/STs	Total
Rural	62.86	82.44	70.43
Urban	37.14	17.56	29.57
Total	100.00	100.00	100

Sex	Others	SCs/STs	Total
Male	77.26	68.08	73.71
Female	22.74	31.92	26.29
Total	100.00	100.00	100

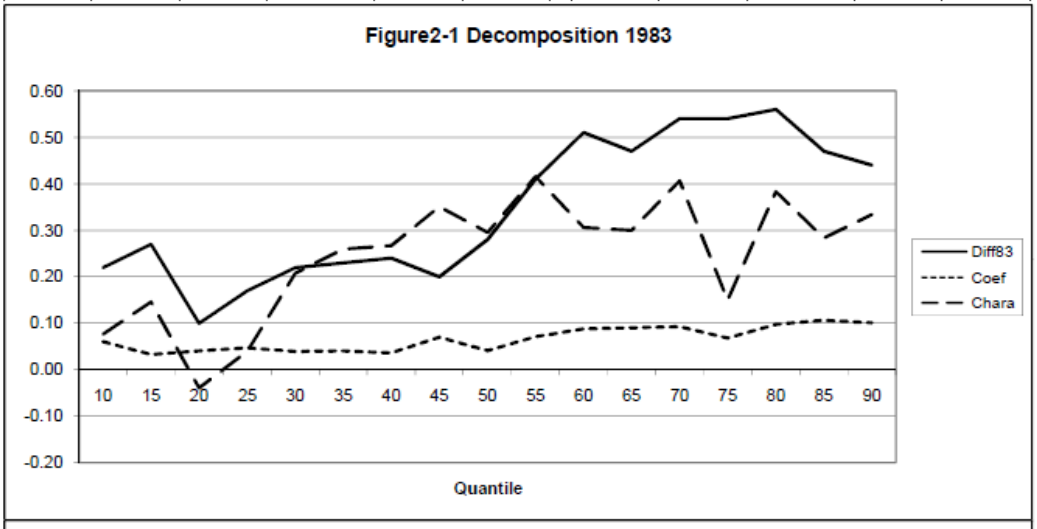
Number of Samples

	Others	SCs/STs	Total
	67.8%	32.2%	99,683

3.4. Results

Table 3 The results of Decomposition

in 1983						in 1999				
Quantile	Log wage		Difference83	Decomposition		Log wage		Difference99	Decomposition	
	SCs&STs	Others		Coeff	Chara	SCs&STs	Others		Coeff	Chara
10	3.78	4.00	0.22	0.060	0.076	4.31	4.43	0.12	-0.102	-0.035
15	4.02	4.29	0.27	0.033	0.146	4.53	4.72	0.19	-0.052	0.033
20	4.24	4.34	0.10	0.040	-0.039	4.72	4.87	0.15	-0.057	0.085
25	4.34	4.51	0.17	0.047	0.040	4.87	5.05	0.18	-0.059	0.089
30	4.47	4.69	0.22	0.039	0.208	4.94	5.23	0.29	0.000	0.239
35	4.62	4.85	0.23	0.040	0.260	5.09	5.27	0.18	0.002	0.207
40	4.69	4.93	0.24	0.036	0.267	5.23	5.43	0.20	0.008	0.298
45	4.85	5.05	0.20	0.070	0.351	5.27	5.56	0.29	0.042	0.158
50	4.92	5.20	0.28	0.041	0.295	5.41	5.63	0.22	0.041	0.213
55	4.98	5.39	0.41	0.071	0.416	5.49	5.79	0.30	0.036	0.306
60	5.03	5.54	0.51	0.087	0.306	5.58	5.92	0.34	0.029	0.207
65	5.18	5.65	0.47	0.090	0.300	5.73	6.04	0.31	0.069	0.380
70	5.32	5.86	0.54	0.092	0.407	5.80	6.14	0.34	0.057	0.427
75	5.47	6.01	0.54	0.068	0.149	5.97	6.37	0.40	0.058	0.278
80	5.61	6.17	0.56	0.098	0.383	6.14	6.61	0.47	0.082	0.236
85	5.86	6.33	0.47	0.106	0.283	6.48	6.84	0.36	0.069	0.365
90	6.08	6.52	0.44	0.101	0.334	6.82	7.07	0.25	0.060	0.364



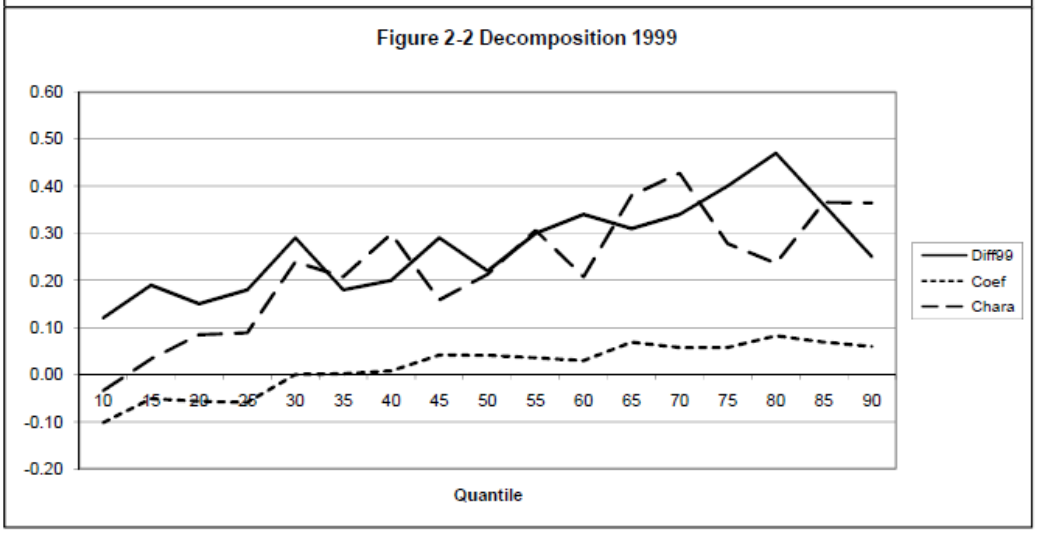


Table3 and Figure2 show and plot the ratio of each contribution. The contribution of characteristics is larger than the contribution of coefficient at any points of distribution in 1983 and

1999. At the same time, even if the wage difference decreases from 1983 to 1999 (Figure1), the compositions of contributions from each variable are not much different in 1983 and 1999 in most quantiles. Although the discrimination to SCs/STs in terms of evaluation on wage is reflected in the contribution of coefficient, it is relatively a small effect compared to the contribution of characteristics. The wage difference of 60 to 90% is explained by the contribution of characteristics, such as the difference of accumulation of human capital and the occupational structure between SCs/STs and the others. Especially, the contribution of education and occupation are relatively high about 20-30% and 20-50%, respectively (Table4).

Table 4: Contribution of Characteristics

The contribution of characteristics to the wage difference

Quantile	Year	Age	Sex	Education	Area	Occupation	Region	Total
p10	1983	1.2%	9.8%	20.4%	32.0%	48.9%	-7.7%	104.7%
p10	1999	19.8%	49.4%	99.3%	131.0%	201.9%	-38.3%	463.1%
p25	1983	0.4%	6.9%	17.5%	20.5%	22.8%	-6.3%	61.9%
p25	1999	2.9%	13.8%	19.2%	18.2%	33.5%	-1.4%	86.2%
p50	1983	1.3%	7.8%	24.5%	22.7%	22.0%	-8.3%	69.9%
p50	1999	0.6%	11.5%	17.9%	11.8%	33.8%	0.2%	75.8%
p75	1983	1.4%	8.9%	26.4%	15.3%	30.6%	-7.3%	75.2%
p75	1999	1.0%	8.3%	19.7%	10.9%	33.1%	-1.8%	71.4%
p90	1983	2.6%	8.4%	24.7%	10.7%	27.1%	-8.0%	65.6%
p90	1999	-2.7%	13.0%	30.7%	13.1%	45.6%	-3.3%	96.3%

*Education: Sum of the contriution of middle educational dummy and high educational dummy
**Occupation: Sum of the contribution of occupational dummy
***Region: Sum of the contribution of regional dummy

The share within the contribution of characteristics

Quantile	Year	Age	Sex	Education	Area	Occupation	Region	Total
p10	1983	1.2%	9.4%	19.5%	30.6%	46.7%	-7.4%	100.0%
p10	1999	4.3%	10.7%	21.4%	28.3%	43.6%	-8.3%	100.0%
p25	1983	0.7%	11.1%	28.3%	33.2%	36.9%	-10.2%	100.0%
p25	1999	3.4%	16.0%	22.3%	21.2%	38.8%	-1.6%	100.0%
p50	1983	1.9%	11.1%	35.0%	32.4%	31.5%	-11.9%	100.0%
p50	1999	0.8%	15.2%	23.6%	15.6%	44.5%	0.2%	100.0%
p75	1983	1.8%	11.8%	35.1%	20.4%	40.6%	-9.7%	100.0%
p75	1999	1.5%	11.7%	27.6%	15.3%	46.4%	-2.5%	100.0%
p90	1983	4.0%	12.9%	37.7%	16.4%	41.3%	-12.2%	100.0%
p90	1999	-2.8%	13.5%	31.9%	13.6%	47.3%	-3.4%	100.0%

Both the contribution of education and occupation occupy 65 to 80 % of all contribution of characteristics. That is to say, over 50 % of wage difference between SCs/STs and the others are explained by the contribution of characteristics related to education and occupation. It is obvious that there are large difference in terms of education and occupational structure between SCs/STs and the others in 1983 and 1999. Therefore, reservation policy related to the reservation of the positions in

advanced education for SCs/STs has the positive effect on reduction of educational inequality.

However, what is the effect of the reservation policy on the occupational structure? In fact, the results, on which the contribution of occupation has largest effect and time invariant, are consistent with the caste system, which is based on the functional classification. Thus there is little discrimination by caste system and difference of wage within an occupation, but there are large wage differences between occupations. This kind of phenomenon is nothing special. The most important thing is that it is related to caste system. Therefore, it is hard to change jobs for improvement of their welfare. Although it is indisputable fact that there are creations of new jobs, such as workers in IT sector and service sector, which do not belong to 'old' caste system, it is quite limited a number and its dimention. That is to say, there are two types of limitation: one is the limitation of the choice of the jobs, and the other is the labor demand limitation of new jobs. Therefore, the contribution of occupation has largest effect on the wage difference at all quantile.

There is more to it. If the purpose of the reservation policy and affirmative action is to eliminate the discrimination related to caste system and to relieve the poor SCs/STs, decreasing the difference at higher quantiles is not enough to achieve it. It should be accompanied by reducing the difference at the all quantiles or at the lower quantiles (pro-poor reduction of wage difference). Otherwise, reservation policy and affirmative action could lead to increase inequality within SCs/STs.

Table5 Transition of Gini soefficients

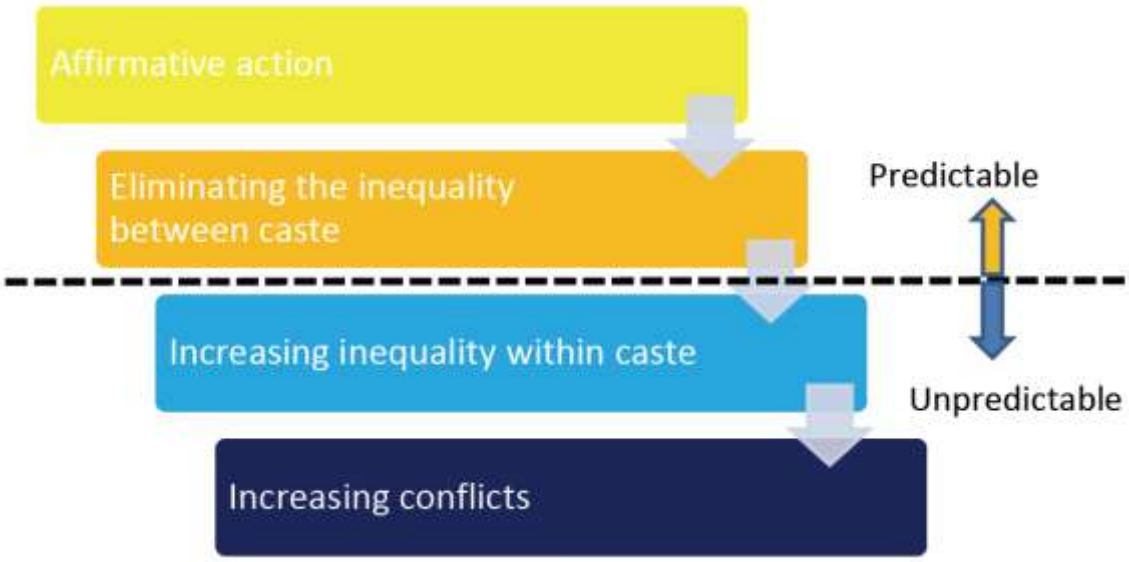
	1983	1999	Difference
SCs/STs	0.478	0.501	0.023
Others	0.518	0.524	0.006
Total	0.517	0.524	0.007

Table 5 shows the change of gini coefficients in 1983 and 1999. Both gini increase, but the rate of SCs/STs is larger than others. It might not be completely unrelated to the reinforcement of reservation policy. Although reservation policy has positive effect on the reduction of discrimination related to caste system, it has been also pointed out many problems in terms of it. It can be said that introduction of affirmative action plan after the WWII caused the deterioration of internal disparity in SCs/STs. In fact, there are two types of SCs/STs in India: one is the wealthy SCs/STs, who benefit from affirmative action, get the opportunity of the human capital accumulation and employment, whereas the other is the poorer SCs/STs (say, they are poorest), who have failed to take advantage of it and been stuck in poverty trap. The problem is that there is the possibility to consolidate the situation of differentiated SCs/STs by the resent economic booming. The wealthy SCs/STs can ride the wave of economic booming because of their higher human capital accumulation; on the other hand, the poorer SCs/STs remain poor despite the economic growth. Consequently, the inequality within SCs/STs might increase, and then, there might be the conflict within SCs/STs. In fact, it is said that there are a lot of conflicts related to the rating of SCs, STs, and OBCs.

3. Conclusion and Implication to the understanding of the relationship between CD and IC

It is summarized as follows that the reservation policy has the effect on the reduction of discrimination between SCs/STs and the others, but it has the negative effect on the disparity within SCs/STs. The wealthy SCs/STs grab the chance to increase their wage thanks to the economic booming since 1991 and reinforcement of reservation policy, which leads to reduce the wage difference between SCs/STs and the others at the higher quantiles. Therefore, although the average of wage difference has decreased, wage inequality within SCs/STs has expanded because the poorer SCs/STs have not benefited from economic booming. The most important thing in Indian situation is that the caste system and the reservation policy could strengthen the differentiated situation and make it be persistence in future. Therefore, Indian government should make effort not only to implement the reservation policy, but also to provide the chance to change people's well being. For example, to build the vocational training school with free tuition and scholarship for the poor leads to alleviate twist structure within SCs/STs.

Figure3 Structural understanding of the affirmative action policy in India



As Figure3 shows, the microeconometric analyses allow us to think about the relationship between individual behavior and policy or institutional change at the micro level. Through the accumulation of the microeconometric analyses, there has got to be a place to deepen the understanding of the relationship between CD and institutional change.

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