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Occupational Gender Segregation and the Regional Gap in Poverty: A Decomposition Analysis

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Abstract: The paper seeks to look into the phenomenon of occupational segregation across gender from the perspective of economic well-being. Accordingly it analyzes the variations in the levels of living across regions differentiated in terms of occupational segregation scores. It has been found that the region with a higher incidence of segregation has also a higher intensity of poverty and the poverty gap is statistically significant. The regional poverty gap is then decomposed into a characteristics effect and a coefficients effect using the familiar Oaxaca decomposition methodology and the results are interpreted in light of some recent developments in the literature. It turns out that quantitative and qualitative expansions in terms of human capital and some of the labor market characteristics are needed to remove the poverty gap.

Keywords: Efficiency Effect, Oaxaca Decomposition, Occupational Segregation, Poverty, Resource Effect

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I. INTRODUCTION

Gender refers to the social roles ascribed to men and women in a particular historical and cultural context. For several years now, the issue of gender has become a top agenda in international arena[1]. Historically it is observed that there remains a gender division of labor all over the world. The magnitude, determinants and consequences of this gender disparity (segregation) in occupational structure have important socio-economic and political implications which have drawn the attention of global researchers and policy makers. The division of labor, *per se* though not inevitable, is certainly persistent and gender segregation is regarded as pervasive and resistant to change at least in the short run [2].

Formally *Segregation* (by gender) means that women and men to a certain extent work in different occupations or in different sectors or under different contractual terms and conditions [3]. The levels of occupational segregation range in between perfect segregation and integration. The case of perfect segregation arises in case any given occupation employs only one group in contrast to the situation where each group holds the same proportion of positions in an occupation as it holds in the labor force. The latter case signifies a situation of perfect integration.

By identifying the underlying labor market structures and modeling about how these structures cause the gender division of labor, significant progress has been made in measuring gender stratification. Whether segregation is a phenomenon that can be looked upon as an inevitable consequence of the intrinsic differences in the gender-specific skills or it is a fall out of the discriminatory tendencies on part of the employers in the job market is a much debated topic of research[2]. Whatever may be the reasons behind; it is much more pertinent to look into the consequences, i.e., the possible socio-economic impact of this gender disparity. The economic cost of segregation may be measured in terms of divergent levels of outcome to the extent it (segregation) interferes with an efficient functioning of the labor market. It must be mentioned here that while there has been plenty of studies which look into the causes of segregation in the labor market, fewer attempts have however been made

[1] One of the pillars of the "equality policy" of United Nations is "Gender Mainstreaming" which offers a pluralistic approach to development [1].

[2] Demand-side and supply-side factors have been identified to explain segregation. The former rests on the theories of structural barriers and gender discrimination [4], [5], [6] [7]. The supply side theories include Hakim's preference theory [8], 'gender essentialism' theory [9], [10], Human Capital (HC) theory [11], [12].

in studying the consequences of (occupational) segregation in terms any proper indicator of development (index of well-being)[3].

In the Indian context studies have been made by Swaminathan and Majumdar [16],Chattopadhyay et.al[17], Chakraborty [18] in measuring the extent of occupational segregation in the job market. Mukherjee and Majumder [19] find out that earning disparities are increasing since the last decade due to rising occupational disparity and wage differences, both at spatial and inter-personal levels. But none of these studies have looked into the developmental perspective of segregation.

The novelty of the present approach is that it looks into the phenomenon of segregation *vis-a-vis* an index of economic well-being (deprivation). The objective is to find out any interdependence between these two. Is the distributional heterogeneity across occupations contributing to regional disparities in the status of living? How does gender inequality correlate with the process of development?

The paper proceeds by exploring whether there is any significant variation in the levels of living (poverty) across regions which differ in their levels of segregation. Furthermore, what are the factors causing the regional gap in poverty? The core idea is to explain the disparity in the levels of living by a set of factors that vary systematically with socioeconomic status, viz., demographic, educational, labor market characteristics and wealth status.

Are the regions with a higher incidence of poverty deficient in resources in terms of the above mentioned characteristics or these are deficient in terms of efficiency in utilizing the available resources? Even if policy makers have managed to eliminate inequalities in some of these dimensions, inequalities between the poor and better-off may remain in others. The paper prescribes some important policy measures in this regard for prioritizing development policies so as to equalize the levels of living between regions characterized by gender-specific distributional heterogeneity across occupations.

The plan of the paper is as follows. Section 2 describes the detailed methodology. Section 3 describes the data and results. Section 4 gives the Tables and finally, Section 5 concludes.

II. METHODOLOGY

2.1. Classification of Districts

Districts are categorized in two separate groups based on some *ad hoc* bench mark level. The bench mark is fixed to be the 50th percentile value of the district-level occupational segregation scores[4]. Group 1 (Region A) comprises of districts with estimated score greater than the bench mark while Group 2 (Region B) comprises of districts with lower value of the same. The characterization of regions in terms of segregation scores inherently links any subsequent economic analysis (viz., incidence of poverty) to the phenomenon of segregation[5].

2.2. Computation of Segregation Scores:

Let M and F be total number of male and female workers and M_i and F_i be the number of males and females in occupation i and let k be the total number of occupations. The occupational segregation score, given by the 'Dissimilarity Index" of Duncan, D is computed as:

$D = 0.5 \sum_{i=1}^{k} \left| \left({}^{M_i}/_{M} \right) - \left({}^{F_i}/_{F} \right) \right|$

The square root index of occupational segregation proposed by Hutchens is computed as:

$O(X) = 1 - \sum_{i=1}^{T} \sqrt{\left[\left({}^{X_{1i}}/_{N_1} \right) \left({}^{X_{2i}}/_{N_2} \right) \right]}$; T being the number of occupations,

X_{1i} and X_{2i} being respectively the shares of type-1 (men) and type-2 (women) workers in the i^{th} occupation, N_1 and N_2 being respectively the number of workers in type-1 and type-2 jobs respectively[6].

[3] Addressing a different variant of segregation, Quillian [13] has shown how (racial) segregation interacts with other spatial and demographic circumstances to produce concentrated poverty among minority groups. Massey [14] showed that rising rates of "Black poverty" combine with high levels of "Black segregation" to perpetuate poverty in certain areas and neighborhoods. Massey and Tannen [15] have attributed the sharp disparity in the levels of social and economic resources between the two groups to be the consequences of (residential) segregation of the African-Americans in the United States.

[4] Actually there is no *a priori* rule for fixation of the bench mark. The higher the mean level of segregation scores between the groups, the better the categorization subject to the availability of adequate sample size in each group to run valid regression subsequently (for estimation of poverty).

[5] Recently Chattopadhyay [20] implemented a similar analysis to classify the districts in terms of technical efficiency scores.

[6] See [21], [22], [23] for description of the measures. There are other measures of segregation, viz., Chakravarty and Silber index of segregation [24], "Gini" index of segregation etc. These however have not been used here to avoid complexity.

2.3 Estimating the Poverty Gap

Choosing consumption expenditure to be a measure of household welfare, a household is considered poor if its monthly per capita consumption expenditure falls below the poverty line. The poverty line is calculated (officially) as the minimum expenditure needed by an individual to fulfill his or her basic food and nonfood needs. Now, following the "World Bank Methodology", the probability of being poor for any particular household may be found by regressing its monthly per capita consumption expenditure on the associated set of socio-economic characteristics (poverty correlates).

The present study employs a variant of the "World Bank Methodology" developed by Chattopadhyay [25] for finding regional incidences of poverty:

$\left(\frac{y}{z}\right)_i^* = X_i\beta + \varepsilon_i\ ;\ i = 1, 2, \ldots\ldots, n\ ;\ var(\varepsilon_i) = \sigma^2$ (2.3.1)

Here $\left(\frac{y}{z}\right)_i^* = ln\left(\frac{y}{z}\right)_i$; y being the household per capita total consumption expenditure, X being the set of explanatory variables, β being the coefficient vector and *z* being the poverty line.

The probability of being poor for the i^{th} household is obtained as:

$p_i = \Phi(X_i\beta^*);\ \left[\beta^* = -\frac{\beta}{\sigma}\right]$; Φ being the cumulative distribution function of the standard normal distribution function.

The incidences of poverty for Regions A and B may respectively be computed as:

$H_A = \frac{1}{n^A}\sum_{i=1}^{n^A} \Phi\left(X_{i_A}\widehat{\beta_A}^*\right)$ and $H_B = \frac{1}{n^B}\sum_{i=1}^{n^B} \Phi\left(X_{i_B}\widehat{\beta_B}^*\right)$; n^A and n^B being the number of households in Regions A and B respectively. (2.3.2)

It is to be noted here that the categorization of Regions as A/B is dependent on the fixation of the bench mark computed using formulae given in Section 2.2.

The gap in the incidences of poverty between the regions is thus,

$\delta = H_A - H_B$

$= \frac{1}{n^A}\sum_{i=1}^{n^A} \Phi\left(X_{i_A}\widehat{\beta_A}^*\right) - \frac{1}{n^B}\sum_{i=1}^{n^B} \Phi\left(X_{i_B}\widehat{\beta_B}^*\right)$

$= \overline{\Phi\left(X_A\widehat{\beta_A}^*\right)} - \overline{\Phi\left(X_B\widehat{\beta_B}^*\right)}$; (the over bar denotes sample average)

2.3.1 Testing the statistical significance of poverty gap (δ)

The variance of the poverty gap δ may be estimated using the "Delta Method"[7] as follows:

$\delta = \overline{\Phi\left(X_A\widehat{\beta_A}^*\right)} - \overline{\Phi\left(X_B\widehat{\beta_B}^*\right)} = f(\widehat{\beta_A}^*, \widehat{\beta_B}^*)$

$\Rightarrow variance(\delta), \sigma_\delta^2 = \left(\frac{\partial\delta}{\partial\widehat{\beta_A}^*}\right)(Asy\ var\ (\beta_A{}^*))\left(\frac{\partial\delta}{\partial\widehat{\beta_A}^*}\right)^T + \left(\frac{\partial\delta}{\partial\widehat{\beta_B}^*}\right)(Asy\ var(\beta_B{}^*))\left(\frac{\partial\delta}{\partial\widehat{\beta_B}^*}\right)^T$;

$Asy\ var(\beta_B{}^*)$ denoting the asymptotic variance of $\beta_A{}^*$.

Test statistic under the null hypothesis $(\delta = 0)$ is given by: $t = \frac{\delta}{\sigma_\delta}$, which is asymptotically normally distributed.

2.4 Decomposing the Poverty Gap, δ

Following (Oaxaca, 1973)[8], δ is further decomposed as**:**

$\delta = \left\{\overline{\Phi\left(X_A\widehat{\beta_A}^*\right)} - \overline{\Phi\left(X_B\widehat{\beta_A}^*\right)}\right\} + \left\{\overline{\Phi\left(X_B\widehat{\beta_A}^*\right)} - \overline{\Phi\left(X_B\widehat{\beta_B}^*\right)}\right\}$ (2.4.1)

The first part in bracket denotes the *characteristics effec*t or alternatively as "resource effect", C.

The second part in bracket denotes the *coefficients effect* or alternatively as "efficiency effect", D.

Here *C* explains the portion in δ that is due to the difference in the *characteristics* (*X*'s), given the coefficients (β's) and *D* explains the portion that is due to the difference in the *coefficients*, given the characteristics.

Note that C explains the effect of all the explanatory variables (X) in the poverty gap. The share of a particular factor (X^k) in C is $V_{\Delta X}^k = \frac{\left(\bar{X}_A^k - \bar{X}_B^k\right)\beta^{*k}_A}{(\bar{X}_A - \bar{X}_B)\,\beta^*{}_A}$

The characteristic effect for X^k is thus $C_k = V_{\Delta X}^k \times C$ (2.4.2)

Again, D explains the effect of the coefficient vector (β) in the poverty gap.

The share of a particular coefficient (β^k) in D is $V_{\Delta\beta}^k = \frac{\overline{X}_B^k\left(\widehat{\beta^*}^k_A - \widehat{\beta^*}^k_B\right)}{\overline{X}_B\ \left(\widehat{\beta^*}_A - \widehat{\beta^*}_B\right)}$

[7] See [26] for a discussion about the Delta Method.

[8] Oaxaca decomposition[27] is a statistical technique which explains the gap in the means of an outcome variable between two groups, viz. poor and non-poor. The gap is decomposed into two parts. The first part explains the portion that is due to group differences in the magnitudes of the determinants of the outcome in question. The second part explains the portion that is due to the group differences in the effects of these determinants.

The coefficient effect for β^k is thus $D_k = V_{\Delta\beta}^k \times D$ (2.4.3)

The final decomposition equation thus becomes:

$\delta = C + D = \sum_{k=1}^{K} C_k + \sum_{k=1}^{K} D_k$ (2.4.4)

Using the decomposition exercise as above one finds the relative contribution of each factor (X^k) and also of the impact of the factor (β^k) in the poverty gap between two regions. Appropriate policy measures in terms of enhancement in X^k or in β^k can be implemented in line with the results of the decomposition analysis so as to equalize the levels of living between these two regions.

III. DATA AND RESULTS

As an illustrative application, the procedure presented above has been applied to Indian National Sample Survey Organization's (NSSO) 68th round of employment-unemployment data conducted during the years 2010-11. The analysis of poverty and segregation has been done for the rural sector of West Bengal, an eastern state of India. Monthly per-capita consumption expenditure has been taken as a proxy for household income (earning). Poverty line has been taken to be the official state level poverty line of Rs.783 per capita per month for rural West Bengal.

The empirical section begins by tabulating the distribution of male and female workers across the occupations for each district. Occupations have been classified as per the National Classification of Occupations (NCO-2004) code. It is observed that there is above 50% of occupational categories which have cent per cent male dominance. On aggregate, the number of male workers is as high as 87 % whereas female counterpart is as low as 13%[9].

The section proceeds with computation of segregation scores for each district based on the formulae given under Section 2.2. For the state as a whole, Duncan index comes out to be 0.48 and the Hutchens index comes out to be 0.23. It is observed that there are wide inter-state variations in the segregation scores (Table 1).

Districts are next classified in terms of the estimated segregation scores as belonging to either Region A or to Region B as per the rule under Section 2.1. Before proceeding into the regression based estimation of poverty using the methodology discussed in Section 2.3, we apply FGT(α) type measures to find out the estimates of poverty for each district (Table 2) and each region (Table 3)[10]. All the three variants of FGT measures corresponding to $\alpha = 0, 1, 2$ come out to be greater for Region A compared to B (Table 3). This implies that incidence of poverty as measured by the head count index $(\alpha = 0)$ or by the poverty gap index $(\alpha = 1)$ or in terms of poverty severity index $(\alpha = 2)$ is greater for the region having a higher level of incidence of segregation. In other words there exists a gap in the measures of poverty between the regions which differ in their levels of segregation.

We seek to find out whether this regional poverty gap is statistically significant or not using the steps below.

1. $\text{Variance}\big(\text{FGT}(\alpha)\big) = \left(\frac{z}{\alpha!}\right)^2 \left[\frac{1}{N}\sum_{i=1}^{N}\left[\left(\frac{z-y_i}{z}\right)^{\alpha}\right]^2 - \big(\text{FGT}(\alpha)\big)^2\right]$; z being the poverty line, y_i being the income of the i^{th} household , N being the number of households[11].

2. $\text{Variance}(\text{FGT}(\alpha)^{\text{A}} - \text{FGT}(\alpha)^{\text{B}}) = \text{Variance}(\text{FGT}(\alpha)^{\text{A}}) + \text{Variance}(\text{FGT}(\alpha)^{\text{B}})$

3. The null hypothesis H_0: $\text{FGT}(\alpha)^{\text{A}} - \text{FGT}(\alpha)^{\text{B}} = 0$ is tested using the statistic:

$$t = \frac{\text{FGT}(\alpha)^{\text{A}} - \text{FGT}(\alpha)^{\text{B}}}{\sqrt{\text{Variance}\big(\text{FGT}(\alpha)\big)}}$$

It is observed that the " t" ratios corresponding to $\alpha = 0, 1, 2$ are greater than the corresponding critical values at 5% level of significance. This leads us to the rejection of the null hypothesis and acceptance of the alternative hypothesis implying that the poverty gap is statistically significant. This is an important observation. As the regions by construction differ in their average levels of segregation, it follows that there is a sort of interdependence between gender disparity across occupations and the levels of development. To get a better understanding of the situation, we seek to look into the genesis of this gap (in the regional incidences of poverty) using a proper regression framework considering relevant demographic and socio-economic factors.

9 The Table showing the gender distribution of occupations is not shown here due to lack of space. It would be provided to interested readers on request.

10 The Foster–Greer–Thorbecke (FGT) indices are a family of poverty measures [28].

11 See [29] for the detailed methodology.

Regression Based Estimation of Poverty:

The explanatory variables (X) for estimation of poverty are broadly categorized as[12]:

I. Demographic characteristics of the households.
II. Educational status.
III. Wealth status.
IV. Labour market characteristics.
V. Government aid.

The variables under these broad categories are:

I. Demographic characteristics of the households:

1. 1-dependency ratio, (1-DEPRAT); where

$$\text{Dependency ratio} = \frac{\text{total number of children and old persons in the household}}{\text{household size}}$$

2.Dummy variable, (D_FEMH) , indicating whether the family is female headed or not;

D_FEMH = 1 if the family is female-headed
= 0 otherwise

II. Educational status of the households

1. The proportion of members having secondary education, (PSECEDU).
2. The proportion of members having tertiary education, (PTERTEDU).
3. The average general educational level, (GENEDU).[13]

III. Wealth status of the households

1. Per Capita Amount of land possessed (measured in Hectares), (PLAND).

IV. Labour market characteristics of the households

1. The proportion of members engaged in own account work, (POWNAC).
2. Proportion of members engaged in domestic and other duties, (PDOMO).
3. Proportion of members engaged in domestic duties only, (PDOM).
4. Proportion of members employed, (PEMP).
5. Whether having any MGNREGA Job Card (MGNREGA)[14]

V. Government aid

1. Dummy variable, (D_GOVAID),

D_GOVAID = 1 if at least one member of the household is receiving social security benefit or is a beneficiary.
= 0 otherwise.

Equation (2.3.1) is estimated separately for Region A and B. All the coefficients turn out to be positive and statistically significant (Table 4). Estimates of poverty for Regions A($H_A = 0.28$) and B ($H_B = 0.20$) are found using the equation (2.3.2). The difference of the poverty estimates, δ (=0.08) is decomposed into an *aggregate characteristics effect*, *C* and an *aggregate coefficients effect*, D using equation (2.4.1). The share of C in δ turns out to be 43% and that of D turns out to be 57% (Table 5). This means that if the households of Region A had the same characteristics as those of Region B; the poverty gap would have been less by 43%. The poverty gap would have been less by 57% if the coefficients of the variables influencing consumption were same for both the regions.

The aggregate characteristics effect, C and the aggregate coefficients effect, D can be looked upon as the *resource effect* and the *efficiency effect* respectively in light of the papers by Chattopadhyay [25] , [20]. Positive values of C and D thus imply that the Region A with a higher segregation score is deficient both in terms of resource and efficiency. Efficiency here refers to "earnings efficiency" which can be measured in terms of technical efficiency scores using the concept of "earnings frontier" [30]. The *earnings frontier* (potential earnings) describes the highest potential income associated with a given stock of *human capital, endowment and social opportunities*. All individuals are located either on or below this frontier. Individuals translating their potential earnings into actual earnings enjoy a fully efficient position. On the other hand individuals earning less than their potentials suffer from some kind of *earnings inefficiency*. Some poor households having income less than the poverty line might have an earnings frontier that is above the poverty line. But for some poor households even the 'frontiers' may be below the poverty line. That is, even if they are fully efficient, given

[12] The same set of variables has been used in [25], [20].

[13] Educational levels considered are: not literate, literate without formal schooling, literate but below primary, primary, middle, secondary, higher secondary, diploma/certificate course, graduate, post graduate and above. The average educational level of each household is obtained as the average over codes assigned to different educational levels (in increasing order), starting from zero for the illiterate to the maximum for the category: post graduate and above.

14 MGNREGA or Mahatma Gandhi National Rural Employment Scheme is a government initiative to increase job guarantee in the rural sector. It offers employment tenure of at least 100 days to all the unemployed citizens of rural India who are adults. The objective is to provide non-skilled work to such citizens in each financial year at a stipulated minimum pay. Implementation of MGNREGA ensures that the purchasing power of the rural India improves.

their stock of human capital and endowment, their potential incomes are below the poverty line. Thus these households cannot possibly be pulled out of poverty unless they are given some *extraneous assistance* (say in terms of 'social opportunities').

It follows that the households in Region A are not only deficient in terms of availability of resources($\bar{X}_A < \bar{X}_B$); they are comparatively less efficient in translating their potential earnings into actual earnings($\beta_A < \beta_B$). The levels of living between the regions can thus be equalized either by an enhancement in the resource level in A or by an enhancement in the corresponding efficiency level or by a combination of both. Resource deficiency here implies aggregate resource deficiency – the relative deprivation with respect to all the factors (X). The deficiency with respect to a particular factor X^k can be found out from the value of the individual characteristics effect C_k using (2.4.2).

The Individual Characteristic Effect (C_k)

A positive value for an individual variable *k*, i.e., C_k $(= V_{\Delta X}^k \times C)$ means that $(\bar{X}_A^k - \bar{X}_B^k)$ and $\widehat{\beta^*}_A^k$ have the same sign. For the k^{th} variable having a positive impact on consumption (and hence $\beta^* = -\frac{\beta}{\sigma}$ is negative), $(\bar{X}_A^k - \bar{X}_B^k)$ is negative. That is, the explanatory variable *k* has a lower average value in Region A than Region B. Similarly, for a variable that has a negative impact on consumption, the explanatory variable in Region A would have a higher average value in A than in B (for a positive C_k).

Coming to the contributions (C_k's) by individual explanatory variables (Table 5), Educational status has the highest contribution (C_k) with a share $\left(= \frac{C_k}{\delta} \times 100\right)$ of 29% in the poverty gap. This is followed by Labor market status with a share of 19% , Demographic status with a share of 10%. As for labor market status, while there are fewer number of regular wage/salary earners, the number of households with MGNREGA job cards is also less in Region A. Equalization of resource disparity in terms of MGNREGA and PEMP would thus reduce the poverty gap by the extent of 7.5 % and 6% respectively.

A negative value of C_k , on the other hand, implies that $(\bar{X}_A^k - \bar{X}_B^k)$ and $\widehat{\beta^*}_A^k$ have opposite signs. This (using similar arguments) would mean that for a variable that has a positive (negative) impact on consumption, the explanatory variable in Region A would have a higher (lower) average value in A than in B.

It is observed that PLAND, POWNAC, PDOMO and D_GOVAID have negative values of C_k . This implies Region A has higher average values for these variables compared to Region B. While the average wealth status (PLAND) is higher, there are also more households involved in own account work (POWNAC) and in domestic and other duties (PDOMO) in Region A compared to that in B.

The Individual Coefficient Effects (D_k)

Using the relationship (2.4.3), D is decomposed into contributions (D_k's) by individual explanatory variables.

A positive (negative) contribution, D_k by a particular variable, which has a positive coefficient ($\hat{\beta}^k >$ 0), would mean that Region A is having a lower coefficient attached to that particular variable compared to Region B. This signifies that Region A is less (more) efficient than Region B with respect to utilization of that particular resource.

Coming to the contributions (D_k's) by individual explanatory variables *(Table 5)*, Labour market status has the highest contribution (D_k) with a share $\left(= \frac{D_k}{\delta} \times 100\right)$ of 136 % in the poverty gap. The more than 100 % share by the coefficient of the Labour market status variable may be attributed mainly to the extra-ordinary positive contribution (156%) made by the variable MGNREGA. This is due to the fact that $\hat{\beta}^k$ with respect to this particular characteristic is significantly lower in Region A compared to Region B– a partial enhancement in $\hat{\beta}_A{}^k$ would thus eliminate the poverty gap[15]. As for the other variables in Labor market status, POWNAC and PDOM have negative shares implying that $\hat{\beta}_A{}^k > \hat{\beta}_B{}^k$, i.e. Region A is more efficient in respect of POWNAC and PDOM.

The variable GENEDU is found to have a share of 96% implying that poverty gap would have been reduced by 96% if Region A would have the same coefficient vector with that of Region B $\left(\hat{\beta}_A{}^k = \hat{\beta}_B{}^k\right)$ for this particular characteristic. Again by rising $\hat{\beta}_A{}^k$ for PTERTEDU, 22% of poverty gap may be removed.

Again the variable demographic status has a negative contribution of more than cent per cent. This implies Region A is already much more efficient in utilizing this particular form of characteristic[16].

Table 6 summarizes the above results from the view-point of a policy practitioner. The factors which need enhancement in terms of availability and those which need the same in terms of efficiency are specified. Also the impact of enhancement (in terms of reduction in poverty) is tabulated.

[15] A full enhancement would end up creating a poverty gap in the opposite direction [31]

[16] It may be observed from *Table 5* that $\hat{\beta}_A{}^k \gg \hat{\beta}_B{}^k$ for k= 1-DEPRAT and D_FEMH.

IV. TABLES

Table 1: District-wise Segregation Scores

District Code	Duncan Index	Hutchens Index
1	0.5917	0.4069
2	0.4905	0.2579
3	0.6501	0.4453
4	0.6549	0.4366
5	0.6687	0.4806
6	0.6326	0.4418
7	0.8050	0.5258
8	0.6409	0.4621
9	0.6093	0.3732
10	0.5656	0.3163
11	0.4583	0.2738
12	0.6423	0.4000
13	0.7267	0.5511
14	0.5833	0.3853
15	0.5929	0.3506
16	0.5549	0.3467
18	0.5326	0.3313
19	0.6678	0.4187

Table 2: District-wise Incidences of Poverty

District Code	Headcount Index	Poverty Gap Index	Squared Poverty Gap Index
1	0.2342	0.0392	0.0092
2	0.3515	0.0531	0.0107
3	0.3333	0.0381	0.0058
4	0.4377	0.1073	0.0348
5	0.2241	0.0264	0.0054
6	0.3685	0.0671	0.0167
7	0.2741	0.0518	0.0141
8	0.2617	0.0452	0.0114
9	0.2331	0.0317	0.0065
10	0.2194	0.0239	0.0047
11	0.1176	0.0283	0.0091
12	0.2932	0.0456	0.0091
13	0.1417	0.0217	0.0049
14	0.3156	0.0528	0.0125
15	0.2699	0.0584	0.0193
16	0.1704	0.0255	0.0047
18	0.1102	0.0129	0.0027
19	0.2417	0.0504	0.0180

Table3: Region-wise Incidences of Poverty

Categorization of Regions	Incidence of Poverty			
Bench-mark based on Duncan Index	**FGT**	**□=0**	**□=1**	**□=2**
	Region A	0.28218	0.05059	0.01359
	Region B	0.20615	0.03313	0.00834
Bench-mark based on Hutchens Index	**FGT**	**□=0**	**□=1**	**□=2**
	Region A	0.28048	0.05019	0.01343
	Region B	0.20522	0.03293	0.00832

Table 4: Estimates of the Parameters of Consumption Equation (2.3.1) for Regions A & B (**Dependent Variable**: $\ln(y/z)$)

Characteristics		Variables under characteristics	Region A		Region B	
			β_A	t-value	β_B	t-value
I	Demographic characteristics of the households	1-DEPRAT	0.148	1.83	0.06	0.92
		D_FEMH	0.112	2.18	0.04	0.9
II	Educational status of the household	PSECEDU	0.264	2.74	0.16	1.54
		PTERTEDU	0.319	2.49	0.44	4.53
		GENEDU	0.028	2.97	0.04	4.76
III	Wealth status	PLAND	0.001	4.71	0.00	4.27
IV	Labour market characteristics	POWNAC	0.689	5.75	0.44	4.98
		PDOM	0.470	3.9	0.36	3.37
		PDOMO	0.167	1.62	0.23	2.25
		PEMP	0.232	2.45	0.33	4.01
		MGNREGA	0.079	2.52	0.14	5.53
V	Government aid	D_GOVAID	1.241	6.41	0.72	3.72
	Constant		-0.326	-4.00	-0.35	-5.38

Table 5: Decomposing the Difference of Poverty Incidences between Region A and Region B (Using Estimates of Table 4)

Poverty Gap(H_A-H_B)			Share of Aggregate Characteristics effect (C) in (H_A-H_B) (%)		Share of Aggregate Coefficients effect (D) in (H_A-H_B) (%)	
0.08			43		57	
Decomposition of the Aggregate Effect			Share of Individual Characteristic Effect (C_k) in (H_A-H_B) (%)		Share of Individual Coefficient Effect (D_k) in (H_A-H_B) (%)	
I	Demographic characteristics of the households	1-DEPRAT	9.4	10.6	-94.6	-108.0
		D_FEMH	1.2		-13.4	
II	Educational status of the household	PSECEDU	0.4	28.9	-13.9	104.0
		PTERTEDU	9.0		21.7	
		GENEDU	19.5		96.2	
III	Wealth status	PLAND	-14.2	-14.2	6.1	6.1
IV	Labour market characteristics	POWNAC	-1.9	18.6	-56.7	136.1
		PDOM	8.7		-14.4	
		PDOMO	-1.8		19.3	
		PEMP	6.1		31.1	
		MGNREGA	7.5		156.8	
V	Government aid	D_GOVAID	-1.2	-1.2	-23.9	-23.9
	Constant				-56.8	-56.8

Table 6: Policy Impact Analysis (Summary of Table 5)

Characteristics	Variables under characteristics	Resource Level ($\bar{X}$)	Efficiency Level	Impact of Resource Enhancement on Reduction in Poverty Gap (%)	Impact of Efficiency Enhancement on Reduction in Poverty Gap (%)[17]
Demographic characteristics of the households	1-DEPRAT	$\bar{X}_A^k < \bar{X}_B^k$	$\hat{\beta}_A{}^k \gg \hat{\beta}_B{}^k$	9.4	NA
	D_FEMH	$\bar{X}_A^k < \bar{X}_B^k$	$\hat{\beta}_A{}^k > \hat{\beta}_B{}^k$	1.2	NA
Educational status of the household	PSECEDU	$\bar{X}_A^k < \bar{X}_B^k$	$\hat{\beta}_A{}^k > \hat{\beta}_B{}^k$	0.4	NA
	PTERTEDU	$\bar{X}_A^k < \bar{X}_B^k$	$\hat{\beta}_A{}^k < \hat{\beta}_B{}^k$	9.0	21.7
	GENEDU	$\bar{X}_A^k < \bar{X}_B^k$	$\hat{\beta}_A{}^k \ll \hat{\beta}_B{}^k$	19.5	96.2
Wealth status	PLAND	$\bar{X}_A^k > \bar{X}_B^k$	$\hat{\beta}_A{}^k < \hat{\beta}_B{}^k$	NA	6.1
Labour market characteristics	POWNAC	$\bar{X}_A^k > \bar{X}_B^k$	$\hat{\beta}_A{}^k > \hat{\beta}_B{}^k$	NA	NA
	PDOM	$\bar{X}_A^k < \bar{X}_B^k$	$\hat{\beta}_A{}^k > \hat{\beta}_B{}^k$	8.7	NA
	PDOMO	$\bar{X}_A^k > \bar{X}_B^k$	$\hat{\beta}_A{}^k < \hat{\beta}_B{}^k$	NA	19.3
	PEMP	$\bar{X}_A^k < \bar{X}_B^k$	$\hat{\beta}_A{}^k < \hat{\beta}_B{}^k$	6.1	31.1
	MGNREGA	$\bar{X}_A^k < \bar{X}_B^k$	$\hat{\beta}_A{}^k \ll \hat{\beta}_B{}^k$	7.5	156.8
Government aid	D_GOVAID	$\bar{X}_A^k > \bar{X}_B^k$	$\hat{\beta}_A{}^k > \hat{\beta}_B{}^k$	NA	NA

V. CONCLUSION

The present study has explored into the phenomenon of occupational segregation by looking at its possible consequences in terms of levels of well-being (deprivation) in districts of rural West Bengal, an eastern state of India. By analyzing the variations in the levels of living across regions which are differentiated in terms of their segregation scores, the paper has structurally related the concept of occupational segregation with the concept of development. It has been found out that the region with a higher level of segregation has also a higher intensity of poverty and the poverty gap is statistically significant. The empirical exercise proceeds further with a regression-based decomposition of the poverty gap using the familiar Oaxaca decomposition methodology. Both the *characteristics effect* and the *coefficients effect* come out to be statistically significant in explaining the poverty gap. To get a bit deeper into the analysis, the results are next interpreted in light of some latest developments in the literature. The characteristics effect is looked upon as the resource effect and the coefficient effect as the efficiency effect. As the results suggest, there is (significant) regional difference in the availability of resource and also in the capacity (efficiency) to use the resource. Importantly the difference is much more pronounced particularly with respect to the variables, viz. educational status and labor market characteristics. Quantitative and qualitative enhancement in respect of these two variables is thus needed in improving the standard of living in the poorer region having a higher level of segregation. An important observation worth-mentioning here is that the poorer region is in fact having a higher availability in terms of physical resources and it is the human capital (in the form of educational status variable) and labor market characteristics it (the poorer region) is deficient in[18]. While higher access to tertiary education and average general education level in general would enhance the standard of living, the same can also be achieved, in essence by a much greater amount by enhancing the level the efficiency in use of these characteristics[19]. Regarding the labor market characteristics, higher coverage of MNREGA job card as well as higher efficiency in use of this card would enhance the relative standard of living in the poorer and more segregated region.

[17] $\bar{X}_A^k > \bar{X}_B^k$ / and $\beta_A^k > \beta_B^k$ denote region A is better-off in respect of either/both resource and efficiency for the factor k. So no need for policy measures in such cases.

[18] $\bar{X}_A^k < \bar{X}_B^k$ for k=educational status and labor market characteristics and $\bar{X}_A^k > \bar{X}_B^k$ for k=PLAND

[19] By increasing $\hat{\beta}_A{}^k$ for k= TERTEDU and GENEDU.Doepke & Tertilt [32],Fernandez,[33] model a mechanism through which higher returns to education, in turn, can have spillovers to gender equality in other domains.

The primary contribution of the present analysis is that it has dealt in with the concept of occupational segregation and the incidence of poverty in a single unified framework. Regions have been defined with respect to some fixed bench-mark segregation score estimated from within the sample. This is where in the subsequent decomposition exercise has become so meaningful as it has indirectly built up a link between some of the potential correlates of segregation used in the literature and the poverty correlates used in this paper. The causes of poverty that we have identified are proximate causes, but also have some deep connotations. As we have found out, low levels of education indeed increases the risk of poverty. The question is why some people have low levels of education in the first place. The findings of this paper are in line with a recent paper by Jayachandran [34] exploring the root causes of gender inequality in developing countries. It has been documented that much of the inequality can be structurally related to the process of development itself.

REFERENCES

[1] United Nations. Report of the Economic and Social Council for 1997, 1997.
[2] W. T. Bileby, J. N. Baron, Men and Women at Work: Sex Segregation and Statistical Discrimination, American Journal of Sociology , 91(4), 1986 ,759-799.
[3] Y. Flückiger, J Silber, The Measurement of Segregation in the Labour Force (Physica-Verlag.1999).
[4] T. Peterson, I. Saporta, The Oppurtunity Structure for Discrimination, American Journal of Sociology, 109(4), 2004, 852-901.
[5] P. Findlay, J. Findlay, R. Stewart, The Consequences of Caring: Skills, Regulation and Reward among Early Years Workers, Work, Employment and Society , 23(3), 2009,422-441.
[6] B.Reskin, M. Maroto, What trends? Whose choices? Comment on England, Gender and Society , 25 (1), 2011, 81-87.
[7] B. Reskin, P. Roos, Job Queues, Gender Queues (Philadelphia: Temple University Press.1990).
[8] C. Hakim, Job Segregation: Trends in the 1970's, Employment Gazette, 521-529, 1981.
[9] M. Charles, D. Grusky, Occupational Ghettos: the Worldwide Segregation of Women and Men, (Stanford: Stanford University Press.2004).
[10] P. England, The Gender Revolution: Uneven and Stalled, Gender & Society , 24, 2010, 149-166.
[11] G. Becker, Human Capital, Effort, and the Sexual Division of Labor, Journal of Labour Economics , 3 (1), 1985, S33-S58.
[12] S. Polachek, Occupational self-selection: A Human Capital Approach to sex Differences in Occupational Structure, Reviews of Economics and Statistics , 63(1), 1981, 60-69.
[13] L. Quillian, Segregation and Poverty Concentration: The Role of Three Segregations, American Socioligical Review , 77(3), 2012, 354-379.
[14] S. D. Massey, American Apartheid: Segregation and the Making of the Underclass, American Journal of Sociology , 95, 1990, 1153-1188.
[15] S. D. Massey, J. Tannen, Segregation, Race, and the Social Worlds of Rich and Poor in I. Kirsch, H. Braun (Ed.) The Dynamics of Opportunity in India, 2016.
[16] M. Swaminathan, S. Majumdar, Workers in Urban India: Changes in Gender Segregation of Occupations, 1983-2000, Indian Journal of Labour Economics , 49 (2), 2006, 273-292.
[17] M. Chattopadhyay, S. Chakraborty, R. Anker, Sex Segregation in India's Formal Manufacturing Sector, International Labour Review , 152 (1), 2013, 43-58.
[18] S. Chakraborty, Occupational Sex Segregation: an Inquiry Into Indian Job Market, Journal of Regional Development and Planning, 5,(2), 2016.
[19] D. Mukherjee, R. Majumder, Occupational Pattern, Wage Rates and Earning Disparities in India: A Decomposition Analysis, Indian Economic Review, 46(1), 2011 , 131-152.
[20] S.Chattopadhyay, Analysis of Poverty and Efficiency: An Earnings Frontier Approach. Bulletin of Economic Research , 66 (2), 2014, 133-155.
[21] O. D. Duncan, B. Duncan, A Methodological Analysis of Segregation Indices.,American Sociological Review , 20 (2), 1955, 210-217.
[22] R. Hutchens, Numerical Measure of Segregation: Desirable Properties and Their Implications, Mathematical Social Sciences , 42(1), 2001, 13-29.
[23] R.Hutchens, Segregation Curve, Lorenz Curves, and Inequality in the Distribution of People across Occupations, Mathematical Social Sciences , 21, 1991, 31-51.
[24] S. R.Chakravarty, J. Silber, A generalized Index of Employment Segregation. Mathematical Social Science , 53, 2007,185-195.
[25] S. Chattopadhyay, Inter-regional Poverty Comparisons in India: Case of West Bengal, Journal of Quantitative Economics, 9(2), 2011 , 104-122.
[26] S. Chattopadhyay, District-level Poverty Estimation: A Spatial Approach. Economics Bulletin , 30 (4), 2010, 2962-2977.
[27] R. Oaxaca, Male-Female Wage Differentials in Urban Labor Markets, International Economic Review , 14(3), 1973, 693-709.
[28] J. Foster, J. Greer, E. Thorbecke, A Class of Decomposable Poverty Measures, Econometrica, 52(3), 1984, 761-766.
[29] R. Davidson, Y .J. Duclos, Statistical Inference for Stochastic Dominance and for the Measurement of Poverty and Inequality, Econometrica , 68, 2000, 1435-1464.
[30] S. Chattopadhyay, Earnings Efficiency and Poverty Dominance Analysis: A Spatial Approach. Economics Bulletin , 31 (3),2011, 2298-2398.
[31] S. K. Bhaumik, M. Chakrabarty, Is Education the Panacea for Economic Deprivation of Muslims?: Evidence from Wage Earners in India, 1987-2005., Journal of Asian Economics , 20 (2), 2009, 137-149.
[32] M. Doepke, M. Tertilt, Women's Liberation: What's in It for Men?, Quarterly Journal of Economics , 124, 2009, 1541-1591.
[33] R. Fernandez, Women's Rights and Development, Journal of Economic Growth, 19, 2014, 37-80
[34] S. Jayachandran, The Roots of Gender Inequality in Developing Countries, 7, 2014, 63-68.

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