Explaining cross-state earnings inequality differentials in India: A RIF decomposition approach

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Abstract

This paper investigates the sources of differentials in earnings inequality across Indian states using a decomposition based on the Recentered Influence Function of inequality indices. A counterfactual distribution is constructed in which each target state is given the country's average distribution of relevant characteristics or, alternatively, its earnings structure. It shows the importance of cross-state differences in the composition by education, degree of urbanization, caste, sex, or the occupational/industrial mix, to explain why some states have higher or lower inequality. This empirical exercise also highlights some strengths and limitations of this approach for regional analysis.

Keywords: Earnings inequality, RIF, states, decomposition, India.

JEL Classification: D63, I32, J21, J82.

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1. Introduction

Income inequality levels in India are higher than OECD average levels, but (like in China) still lower than in other emerging countries such as Brazil or South Africa (Arnal and Forster, 2010). Inequality has increased over time, partly because of the growth of the tertiary sector, with a high duality between very small-sized firms and very large firms (Mazunder, 2010). Among the sources of inequality, the importance of caste and religion to determine earnings inequality in India is well-known (e.g. Bhaumik and Chakrabarty, 2006). Different research has also highlighted the importance of geographical factors in explaining this inequality levels and trends. The increase in inequality is associated with the increase observed in urban areas, with an increasing concern about the accentuation of regional imbalances, with the benefits of growth concentrated in the already richer states, leaving the poorest and most populous states further behind (Arnal and Forster, 2010). High growth rates in richer states have led to a boom in commercial and service sector activities, while in most of the poorest states agriculture is still predominant. Between-district inequality was a large proportion of total inequality, and it was explained to a large extent by between-state income differences in rural India (Azam and Bhat, 2016), but within-states inequalities explain most of the overall level of inequality, especially in urban India.

The aim of the paper is to identify the main sources of the variability in within-state earnings inequality in India. The methodology is based on the use of the Recentered Influence Function of different inequality measures. Using regression of these functions on workers' characteristics, we first estimate the marginal contribution of each characteristic on a given inequality index in India and in a selection of states. Then, we measure the expected change in inequality when either the distribution of characteristics or the earnings structure of the whole country replaces that of the state. This exercise also serves to illustrate with the case of India the potential and limitations of the use of this regression-based decomposition technique to regional inequality analysis. This technique has been previously used to decompose interdistributional differences in quantiles and, to a lower extent, in the Gini index. We extend it here to the analysis of other inequality indices such as the Entropy and Atkinson families to investigate how the sources of inequality vary depending on the degree of inequality aversion.

The next two sections present the methodology and data. The fourth section analyzes the empirical recentered influence function of several inequality measures, the fifth and sixth sections discuss the results of the RIF- regressions and decompositions. The final section summarizes the results.

2. Methodology: Decomposing the gap in inequality using the Recentered Influence Function

The aim of this section is to show how to obtain a decomposition of the gap in earnings inequality between each target state and a reference distribution (i.e. the country as a whole). One element of the decomposition is the part explained by differences in characteristics (compositional effect). The remaining unexplained part is the differential that is driven by diverging earnings structures (earnings effect). For that, we use the generalization of the Blinder (1973)-Oaxaca (1973) approach proposed by Firpo, Fortin, and Lemieux (2007, 2009).[1] The simplest version of this method applies the conventional Blinder-Oaxaca decomposition to the Recentered Influence function (RIF) of the

[1] See Fortin, Lemieux, and Firpo (2011a) for a detailed discussion of the approach in the context of other alternatives in the literature.

target statistic between two distributions, using a regression of individual values of that function on workers' characteristics. The RIF is just a measure of the influence of each particular income on the target statistic. This approach is valid for the decomposition of any statistic for which such a function exists. The conventional Blinder-Oaxaca decomposition is the particular case in which the statistic is the mean of (log-)earnings, and the RIF is just (log-)earnings.

The approach has been extensively used so far for the decomposition of the inter-distributional gap in earnings (or income) quantiles, but has also a large potential in decomposing the difference between income inequality indices. We are aware only of decompositions applied to the Gini index though (e.g. Becchetti, Massari, and Naticchioni, 2014; Ferreira, Firpo, and Messina, 2014; Firpo, Fortin, and Lemieux, 2007; Fortin, Lemieux and Firpo, 2011b; Gradín, 2016; Groisman, 2014), none of them to regional analysis.

The decomposition for the inter-distributional gap in any inequality index (I) can be done using a linear approximation based on its influence function. The influence function IF (or Gâteaux or directional derivative, Gâteaux, 1913) is a tool used for robustness analysis in Statistics (introduced by Hampel, 1974) and measures the influence of a small contamination in y on the statistic. By construction it has zero mean and by adding the value of the target statistic we obtain the recentered influence function RIF. The IF (and RIF) of several inequality measures such as Gini, the Generalized Entropy, or the Atkinson families have been previously computed (Monti, 1991; Cowell and Flachaire, 2002 and 2007; or Essama-Nssah and Lambert, 2012).

Let F be the cumulative distribution of income y, with mean μ and inequality index $I(F)$. For $0 < \varepsilon < 1$, $T = (1-\varepsilon)F + \varepsilon\delta_z$ is the mixture distribution[2] obtained by the contamination of F in income z, where δ_z is the cumulative distribution function for a probability measure which gives mass 1 to income z. Then, the influence function of $I(F)$, $IF(z;I)$ is the directional derivative of $I(T)$ with respect to ε at $\varepsilon = 0$, with zero expectation. Table 1 displays these functions. The recentered influence function just adds the index to the corresponding $IF(z;I)$: $RIF(z,I) = IF(z,I) + I(F)$.

Table 1. Influence functions of selected inequality indices

Index			$I(F)$	$IF(z,I)$
Gini	G		$1 - 2\int_0^1 L(p)dp.$	$2\left[\int_0^1 L(p)dp - \mu L\big(F(z)\big) + \frac{z}{\mu}\left[\int_0^1 L(p)dp - \big(1-F(z)\big)\right]\right].$
Entropy	$GE(\alpha)$	$\alpha \neq 0,1$	$\frac{1}{\alpha(\alpha-1)}\int\left[\left(\frac{y}{\mu}\right)^{\alpha} - 1\right]dF(y).$	$[z^{\alpha} - \int y^{\alpha}dF(y)] - \frac{z-\mu}{(\alpha-1)\mu^{\alpha+1}}\int y^{\alpha}dF(y).$
		$\alpha = 0$	$-\int ln\left(\frac{y}{\mu}\right)dF(y).$	$-[ln(z) - \int lnydF(y)] + \frac{z-\mu}{\mu}.$
		$\alpha = 1$	$\int \frac{y}{\mu} ln\left(\frac{y}{\mu}\right)dF(y).$	$\frac{1}{\mu}[zln(z) - \int ylnydF(y)] - \frac{z-\mu}{\mu^2}[\mu + \int ylnydF(y)].$
Atkinson	$A(\varepsilon)$	$\varepsilon \neq 1$ $\varepsilon > 0$	$1 - \left[\int\left(\frac{y}{\mu}\right)^{1-\varepsilon}dF(y)\right]^{1/(1-\varepsilon)}.$	$\frac{1}{(\varepsilon-1)\mu}[\int y^{1-\varepsilon}dF(y)]^{\varepsilon/(1-\varepsilon)}[z^{1-\varepsilon} - \int y^{1-\varepsilon}dF(y)] + \frac{z-\mu}{\mu^2}[\int y^{1-\varepsilon}dF(y)]^{1/(1-\varepsilon)}.$
		$\varepsilon = 1$	$1 - \frac{1}{\mu}e^{\int \ln(y)dF(y)}.$	$-\frac{1}{\mu}e^{\int \ln(y)dF(y)}[\ln(z) - \int \ln(y)\,dF(y)] + \frac{z-\mu}{\mu^2}e^{\int \ln(y)dF(y)}.$

Source: Cowell and Flachaire (2002).

[2] The mixture distribution attaches a probability $1-\varepsilon$ of z being generated by the distribution F and ε of being generated instead by δ_z.

Noteworthy, the $RIF(y;I)$ is a non-monotonic transformation of incomes (y), in which extremely high/low values will have a disproportionally large influence in the inequality index I, with an intensity that depends on the particular sensitivity of that index to values at each part of the distribution.

The simplest version of the RIF decomposition approach assumes that the conditional expectation of $RIF(y;I)$ is a linear function of the explanatory variables, given by matrix X, such that the β-coefficients can be estimated by OLS:

$$E(RIF(y;I)|X) = X'\beta. \quad \textbf{(1)}$$

Then, by the law of iterative expectations:

$$I(y) = E\big(RIF(y;I)\big) = E_X[E(RIF(y;I)|X)] = E(X)'\beta. \quad \textbf{(2)}$$

Each β coefficient reflects the marginal impact on the index of a small change in the average value of the corresponding characteristic. This takes into account the distributional pattern of what earnings are affected most by the change in the characteristic.

Based on **(2)** it is possible to decompose the inequality index linearly into the total contribution W_k of each characteristic (including the intercept) x_k, $k = 0,1,\dots,K$, on inequality:

$$I(y) = \bar{X}'\beta = \sum_{k=0}^{K} W_k = \beta_0 + \sum_{k=1}^{K} \bar{x}_k\beta_k. \quad \textbf{(3)}$$

The total contribution of the k^{th} characteristic is the product of its average value ($\bar{x}_k$) and the marginal impact of this characteristic on overall inequality (β_k). Thus, from **(3)**, the differential in inequality between the reference and target distributions (with superscripts 0 and 1) can be expressed as the sum of the total contributions of characteristics ($W_k^{\Delta X\beta}, k = 0, \dots, K$):

$$I^1 - I^0 = \bar{X}^{1\prime}\beta^1 - \bar{X}^{0\prime}\beta^0 = \sum_{k=0}^{K} W_k^{\Delta X\beta} = (\beta_1 - \beta_0) + \sum_{k=1}^{K}\big(\bar{x}_k^1\beta_k^1 - \bar{x}_k^0\beta_k^0\big). \quad \textbf{(4)}$$

However, we usually want to brake the total contribution into the impact of differences in average characteristics and that of differences in coefficients. One way to do that is by constructing a counterfactual that combines the average characteristics of one distribution with the coefficients of another.

Let us consider the case in which we give individuals in the target distribution (a state) the average characteristics of the reference (India as a whole), while keeping their own coefficients. By adding and subtracting the inequality level in this counterfactual, $I^{01} = \bar{X}^0\beta^1$, and re-arranging terms, we can rewrite the inter-distributional differential in earnings inequality as:

$$I^1 - I^0 = (\bar{X}^1\beta^1 - \bar{X}^0\beta^0) = (I^1 - I^{01}) + (I^{01} - I^0) = (\bar{X}^1 - \bar{X}^0)\beta^1 + \bar{X}^0(\beta^1 - \beta^0). \quad \textbf{(5)}$$

The overall gap is the sum of the explained and unexplained effects. The *aggregate explained effect* valued at the coefficients of the target distribution is $W^{\Delta X,\beta^1} = (\bar{X}^1 - \bar{X}^0)\beta^1$. The *aggregate unexplained effect*, valued at the characteristics of the reference distribution is $W^{\Delta\beta,\bar{X}^0} = \bar{X}^0(\beta^1 - \beta^0)$.

The explained effect gives us the expected change in earnings inequality in the state when the average characteristics suddenly equal those of the country, keeping constant its own earnings structure, as well as the distribution of characteristics along the earnings distribution. For that reason it is also called the *characteristics* or *compositional effect.* Similarly, the unexplained effect measures the change in inequality if in a second stage, we also bring to the state the Indian earnings structure (and the distributive pattern of characteristics along the earnings scale). For this reasons it is also known as *coefficients* or *earnings structure effect.*

Similarly, we can consider the alternative counterfactual situation in which we give the target distribution the coefficients (earnings structure) of the reference one, while keeping their own average characteristics: $I^{10} = \bar{X}^1\beta^0$

$$I^1 - I^0 = (I^1 - I^{10}) + (I^{10} - I^0) = \bar{X}^1(\beta^1 - \beta^0) + (\bar{X}^1 - \bar{X}^0)\beta^0. \quad \textbf{(6)}$$

In this case, $W^{\Delta X,\beta^0} = (\bar{X}^1 - \bar{X}^0)\beta^0$ and $W^{\Delta\beta,\bar{X}^1} = \bar{X}^1(\beta^1 - \beta^0)$ are the corresponding characteristics and coefficients effects (valued at β^0 and $\bar{X}^1$ respectively). Here the sequence is reversed, we first give the state the Indian earnings structure and, after that, the Indian average characteristics.

It is not obvious which counterfactual we should consider, and that will depend on the purpose of each exercise. This typical index number problem, implies that the results, as well as the interpretation may vary in each case. Note that here, we are not measuring discrimination, the common aim of most Blinder-Oaxaca decompositions in labor economics, and thus there is no clear reference such as the one prevailing in the absence of discrimination. We are just trying to explain the differences between two distributions using one of them (or the pool) as a reference.

Thanks to the linearity of the approach, the individual contribution of each variable x_k to the characteristics and coefficients effects can be measured as $W_k^{\Delta X,\beta^j} = (\bar{x}_k^1 - \bar{x}_k^0)\beta_k^j$ and $W_k^{\Delta\beta,\bar{X}^j} = \bar{x}_k^j(\beta_k^1 - \beta_k^0)$, so that the individual effects sum up the corresponding aggregate effects. The sum of the characteristics and coefficients effects of each characteristic also add up to the total contribution of that same characteristic.

As Gradín (2016) discussed, there have been other regression-based decompositions of inequality measures in the literature. For example, some approaches have assumed (log-)linear conditional incomes and proposed a decomposition of the total effect of characteristics on inequality using different decomposition rules (associated with different inequality indices). In this line, Fields (2003) used the 'natural' decomposition of the variance of logs, which would apply to other indices of inequality following the results of Shorrocks (1982). Similarly, Morduch and Sicular (2002) also used the 'natural' decomposition rules of other inequality measures, such as the Gini index, to produce similar decompositions. In an alternative approach, Wan (2002) and Wan and Zhou (2005) applied the Shapley decomposition (Shorrocks, 2007). These approaches, however, have not separated the characteristics and coefficients effects. Yun (2006), following Juhn, Murphy, and Pierce (1993), however, extended the Fields' (2003) approach, valid only for the case of the variance of logs, an index of inequality that does not entirely verify the most important property (that a small progressive transfer reduces inequality). In this context, the RIF decomposition is quite general, valid for any measure of inequality for which the RIF exists. Given the linearity assumption, it is path-

independent, it is straightforward to compute (including the standard errors), and invariant to the level of aggregation of explanatory factors. Furthermore it can be seen as a generalization of the conventional Blinder-Oaxaca decomposition, which is the particular case in which the target statistic is the mean.[3]

The RIF approach, shares with most counterfactual analyses some limitations, though. According to Fortin, Lemieux and Firpo (2011a), aggregate decompositions need to assume the invariance of the conditional income distribution, which requires two main conditions. One is the simple counterfactual treatment, which implies that there are no general equilibrium effects. The second one is ignorability, meaning that there is no selection of individuals based on their unobservables. Detailed decompositions usually require stronger assumptions, such as linearity in the relationship between RIF (o log-income) and characteristics, or exogeneity of individual characteristics.

Another important limitation of this and other decompositions is the identification problem of the detailed coefficients effect (Oaxaca and Ransom, 1999). The detailed coefficients effect is not invariant to which dummies are omitted to include categorical variables, and to what normalization is used for continuous variables. Fortin, Lemieux, and Firpo (2011a) pointed out that there is no general solution to this problem and those proposed in the literature (such as Gardeazabal and Ugidos, 2004 or Yun, 2005, 2008) are all ad-hoc. For simplicity, we will not discuss the detailed coefficients effects here.

4. Data

We use for our analysis the 2011-12 India Human Development Survey-II (IHDS-II) obtained from the Inter-university Consortium for Political and Social Research at the University of Michigan. This is a nationally representative, multi-topic survey of 42,152 households, covering 1,503 villages and 971 urban neighborhoods across India. It is produced by the National Council of Applied Economic Research at New Delhi, and by the University of Maryland. It mostly re-interviewed between January 2011 and March 2013 households from the first survey wave (2004-05).

The sample is made of 52,741 (unweighted) observations of workers reporting positive hourly earnings and the relevant characteristics. The analysis is done comparing India with a selection of states with a significant number of observations: Uttar Pradesh, West Bengal, Maharashtra, Andhra Pradesh, Karnataka, and Tamil Nadu. Earnings are measured by hourly (take-home) wage and bonuses (cash or in-kind). Workers characteristics include area of residence (metro urban, other urban, more developed village, and less developed village), gender, age in intervals (<25, 25-34, 35-44, 45-54, 55+), caste (Brahmin, Forward/General castes -except Brahmin-, Other Backward Castes –OBC-, Scheduled Castes –SC- Scheduled Tribes –ST-, and Other), Muslim religion, attained education (8 categories, from none to some post-graduate), primary activity status (cultivation, agriculture wage labor, salaried, etc.), type of work (casual daily, casual piecework, contract, regular/permanent/longer contract), occupation and industry (at 1-digit). Table A1 in the Appendix shows the average values of these variables in India and by state.

[3] An alternative approach is to use the RIF-regressions for the detailed decomposition, when the aggregate decomposition was first obtained using DiNardo, Fortin and Lemieux's (1996) re-weighting approach (Firpo, Fortin, and Lemieux, 2007). Alternatively, this detailed decomposition after re-weighting can be obtained using the Shapley decomposition (e.g. Gradín, 2014).

5. RIF of inequality indices

In a first stage, we estimate the RIF of each inequality index associated with each earnings level for the entire country and each state. Figure 1 displays the contribution of each percentile to the overall value of various indices in India (the average is 0.01 by construction). It becomes evident that in all cases the extremes, especially top earnings (whose values are truncated in the figures), contribute disproportionally to each index, but in some cases more than in others.

The $IF(z)$ of most inequality indices is unbounded from above, and in fact this property was used by Cowell and Victoria-Fesser (1996) to show that inequality indices, in general, are not robust to data contamination in high incomes (in some cases also to low incomes). Cowell and Flachaire (2002, 2007) compared the rate of increase to infinity of the influence function of different inequality indices when z goes to infinity, which is equal to z in the cases of Gini, Atkinson and Generalized Entropy ($\alpha \leq 1$), and equal to z^{α} for the Generalized Entropy ($\alpha > 1$). When z goes to 0, Generalized Entropy ($\alpha < 0$) tends to infinity at the rate z^{α}, and the Atkinson ($0 < \varepsilon < 1$) at $z^{1-\varepsilon}$, and Generalized Entropy ($\alpha = 0$) and Atkinson ($\varepsilon = 1$) at the rate $\ln z$.[4]

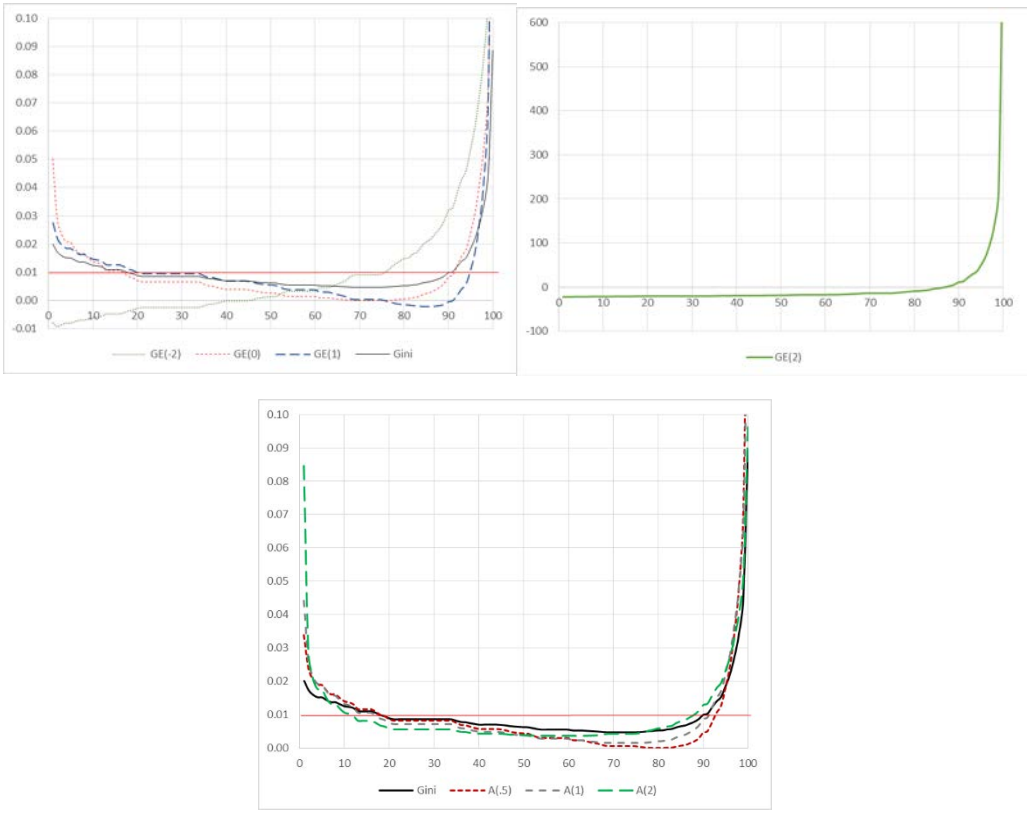
Let us illustrate this with our data. For example, the total contribution of the bottom and top deciles to the national Gini index are 15% and 29% respectively (reported in Table 2). In the case of Atkinson the extremes contribute more: the bottom 20%, 21%, and 23% (for $\varepsilon = .5, 1, 2$), the top 42%, 41% and 34%. As expected, the contribution of the bottom (top) increases (decreases) with the sensitivity parameter. The entropy case is different.[5] The contribution of the bottom generally increases with α (from -8% with $\alpha = -2$ to 23% with $\alpha = 0$, to then decline again: 19% with $\alpha = 1$). The contribution of the top decile, conversely, declines: from 73% ($\alpha = -2$) to 41% ($\alpha = 1$). In the case of $\alpha = 2$ the figures go out of proportion, the contribution is negative until the 87th percentile, and becomes huge in the last three percentiles. This disproportionally large effect of very few observations with high earnings entirely compromises its use in empirical exercises of the type proposed here.

The cases of Gini, GE ($\alpha = 0,1$), and Atkinson ($\varepsilon = .5, 1, 2$) thus show a similar profile, even if with different intensities. The cases of GE ($\alpha = -2, -1,2$), however, show very different profiles.

[4] As Cowell and Victoria-Fesser (1996) pointed out, this sensitivity of inequality indices to extreme values has not to be confused with where in the earnings distribution the impact of a progressive transfer produces the largest increase. For example in the case of the Gini index, it is around the mode of the distribution.

[5] It is well-known that Entropy and Atkinson families are ordinally equivalent if $\varepsilon = 1 - \alpha$ for $\alpha > 0$, where ε is the Atkinson's inequality aversion parameter, and α is the corresponding parameter for the Entropy indices.

Figure 1. The RIF-contribution to inequality indices by percentiles (average=0.01)



Source: Own construction using IHDS-II.

Table 2. The RIF-contribution to inequality indices by decile (average=0.1)

Decile	Gini	A(.5)	A(1)	A(2)	GE(-2)	GE(-1)	GE(0)	GE(1)	GE(2)
1	0.15	0.20	0.21	0.23	-0.08	-0.04	0.23	0.19	-219.08
2	0.11	0.11	0.10	0.08	-0.04	-0.03	0.10	0.12	-210.41
3	0.09	0.08	0.07	0.05	-0.02	-0.02	0.07	0.10	-203.70
4	0.08	0.07	0.06	0.05	-0.02	-0.01	0.06	0.09	-200.18
5	0.07	0.05	0.04	0.04	0.00	0.01	0.03	0.06	-191.71
6	0.06	0.03	0.03	0.04	0.03	0.03	0.02	0.04	-178.70
7	0.05	0.02	0.02	0.04	0.06	0.06	0.00	0.02	-157.38
8	0.05	0.00	0.02	0.05	0.11	0.10	0.00	0.00	-124.76
9	0.07	0.01	0.04	0.09	0.22	0.20	0.03	-0.02	-14.48
10	0.29	0.42	0.41	0.34	0.73	0.69	0.46	0.41	1501.25
Total	1. 00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: Own construction using IHDS-II.

6. RIF-Regressions

In the second stage, we estimate the RIF regressions, which are shown in Table 3 for the case of overall India. These show the marginal effect of a change in each characteristic on the inequality measure. We concentrate on Gini and Atkinson indices for the reasons discussed in the previous

section. The results are quite consistent for these indices, although with different intensity. We can see that the proportion of workers living in less developed areas tend to reduce inequality, as well as the proportions of workers aged 25-34 (with respect to younger ones), unmarried or widowed, from castes other than Brahmin or ST, engaged in cultivation and other agrarian activities, working with short-term contracts (compared with casual daily work), and in the retail sector (compared with agriculture). Inequality, however, increases with the proportion of women, workers older than 45, higher attained education (especially with college), organized business, casual piecework or long-term contracts, or managers and professionals. These regressions are also run separately for each target state (Table A2 in the Appendix).

Table 3. The RIF-regressions, India

	Gini	A(.5)	A(1)	A(2)
Other urban	-0.049***	-0.028***	-0.048***	-0.064***
More developed village	-0.072***	-0.040***	-0.068***	-0.082***
Less developed village	-0.060***	-0.029***	-0.055***	-0.076***
Female	0.045***	0.034***	0.050***	0.053***
Aged 25-34	-0.045***	-0.039***	-0.051***	-0.044***
Aged 35-44	-0.011	-0.018*	-0.015	0.000
Aged 45-54	0.069***	0.039***	0.068***	0.094***
Aged 55+	0.088***	0.052***	0.090***	0.122***
Married (spouse absent)	0.022	0.012	0.027	0.057**
Unmarried	-0.042***	-0.031***	-0.043***	-0.038***
Widowed	-0.032***	-0.020**	-0.033***	-0.043***
Forward/General caste (except Brahmin)	-0.036**	-0.024*	-0.034*	-0.024
Other Backward Caste (OBC)	-0.046***	-0.032**	-0.047***	-0.039*
Scheduled Caste (SC)	-0.051***	-0.035**	-0.050***	-0.035*
Scheduled Tribe (ST)	0.015	0.011	0.019	0.042*
Other caste	-0.016	-0.018	-0.020	-0.006
Muslim	0.005	0.004	0.009	0.024*
1-4 years education	0.017*	0.012	0.017*	0.011
Primary education	0.017*	0.010	0.018*	0.032**
6-9 years education	0.021***	0.011*	0.021**	0.030***
Secondary education	0.030***	0.013	0.029**	0.052***
Higher secondary education	0.059***	0.028**	0.056***	0.084***
Graduate	0.199***	0.120***	0.198***	0.239***
Some post-graduate	0.494***	0.348***	0.513***	0.542***
Cultivation	-0.037***	-0.012	-0.029*	-0.037*
Allied agrarian	-0.057*	-0.028	-0.054	-0.068
Agrarian wage labor	-0.039***	-0.015	-0.032**	-0.039**
Non-agrarian wage labor	-0.016	-0.005	-0.009	0.004
Artisan/independent work	-0.010	0.017	0.006	0.024
Small business	-0.014	0.003	-0.002	0.03
Organized Business	0.200**	0.159**	0.220**	0.224*
Profession	0.029	0.025	0.046	0.118*
Retired	-0.021	-0.01	-0.02	-0.034
Housework	0.012	0.015	0.019	0.031*
Student	0.028	0.034*	0.036	0.018
Unemployed	-0.009	0.004	0.001	0.007
Too young/Unfit	-0.054	-0.024	-0.049	-0.063
Others	-0.011	-0.006	-0.011	-0.018
Casual piecework	0.026**	0.019*	0.037***	0.089***
Contract < 1 year	-0.037***	-0.019	-0.032**	-0.028
Regular/Permanent/Longer contract	0.128***	0.075***	0.131***	0.177***
Occupations 1-9	0.517***	0.393***	0.570***	0.689***
Occupations 10-19	0.229***	0.163***	0.251***	0.322***
Occupations 20-29	0.720***	0.550***	0.782***	0.866***
Occupations 30-39	0.105***	0.061***	0.114***	0.198***
Occupations 40-49	0.048**	0.038*	0.063***	0.118***
Occupations 50-59	0.072***	0.058***	0.089***	0.139***
Occupations 60-68	0.036	0.038	0.043	0.031
Occupations 71-79	0.109***	0.079***	0.136***	0.242***
Occupations 80-89	0.021	0.008	0.023	0.056***
Industries 10-19	0.035	0.036	0.04	0.016
Industries 20-29	-0.046	-0.017	-0.029	0.005
Industries 30-39	-0.044	-0.016	-0.035	-0.036
Industries 40-43	0.084*	0.071*	0.101**	0.142**
Industry 50	-0.027	0.001	-0.021	-0.051
Industries 60-69	-0.101**	-0.051	-0.095**	-0.120**
Industries 70-75	0.002	0.012	0.015	0.047
Industries 80-89	-0.056	-0.029	-0.047	-0.03
Industries 90-99	-0.019	-0.004	-0.006	0.033
Intercept	0.428***	0.134***	0.239***	0.340***
R^2	0.176	0.108	0.155	0.170
N	52,738	52,738	52,738	52,738

Source: Own construction using IHDS-II. Omitted categories: metro urban, male, 24 or younger, Brahmin, non-Muslim, no education, salaried worker, casual daily work, occupation group 9 (90-99), in primary sector (industries 0-6).

7. Decomposing the earnings inequality gap

Using the information from the previous regressions, Tables 4 and 5 report the RIF-decomposition of the earnings inequality gap between each major state and India as a whole for Gini and the Atkinson family. The three states with the largest (negative) differentials in the Gini index are Andhra Pradesh, Uttar Pradesh, and Karnataka, where inequality is respectively 24%, 9% and 8% lower than in the country as a whole.

A large part of the earnings inequality differential in Uttar Pradesh is explained by differences in the composition of workers; or all of it, depending on which earnings structure is used. The characteristics effect valued using the Indian earnings structure (Table 4) explains 63% of the differential (5.9 out of the 9.3 percentage-point differential). The main compositional effects are associated with the occupational and industrial mix (a joint 2.5 percentage points), the distribution by caste (1.4), and education (1). The magnitude and the nature of this differential has, however, clear distributional patterns. The lower the inequality aversion (ε) in the Atkinson measures, the higher the gap (as a proportion of the Indian index, from 6 to 10%) and the more strongly associated with a compositional effect (from 60 to 74%, with increasing contributions of the occupational mix, the distribution by caste and education). When the characteristics effect is valued using the state's earnings structure instead (Table 5), it explains more than the entire gap (inequality would be higher in the state than in India with similar characteristics): 11.2 out of the 9.3 percentage-point differential (120%). The main compositional effects in this case are the distribution of workers by caste (3.3), occupation (3), and activity status/type of worker (a joint 2.3), followed by sex and age (a joint 1.1), with only a smaller role of education (0.8). The distributional pattern is similar as before, with increasing explanatory power of the main factors as inequality aversion gets smaller.

The differential for Karnataka is of similar size as for Uttar Pradesh, with at least near half of it explained by differences in characteristics. The characteristics effect is 44% (3.6) when valued using the Indian earnings structure. The main compositional effect is related with the type of contract (3.2), with also large effects of activity (1.4) and education (1.3), which are partially compensated with the opposite effect of the occupational/industrial mix (3.3). The gap in inequality increases but the proportion explained decreases in this case with lower inequality aversion. Almost the entire gap (7.6; 91%) is explained by characteristics when valued using the state's earnings structure: especially type of worker (6.7), occupation (4.3), education (2.3), and caste (1.4), partially compensated with the opposite effects of industry (5.4) and area and sex (1.5 and 1.1). The proportion that is explained by characteristics again decreases with lower inequality aversion.

In the case of Andhra Pradesh, the composition effect explains less than half the differential. It explains 32% (7.5 percentage points out of 24) with the Indian earnings structure, with largest contributions from differences in the activity status and type of worker (jointly 4), education (1.9) and occupation (1.6), or caste (1.5) and area (1). Like Karnataka, the lower the inequality aversion ε, the higher the gap but the less strongly associated with a compositional effect. With the state's earnings structure, however, the Gini gap actually explained is higher, 52% (12 out of 24), with the characteristics effect driven by the occupational mix and the distribution by caste (about 5 each), and to a lower extent by the area of residence (2.8). Like in Uttar Pradesh, the proportion explained by characteristics (i.e. caste and occupation) increase as we reduce the inequality aversion in this case.

As for the other states, West Bengal shows a smaller Gini differential with the country (only 2.9 percentage points). There is no compositional effect if characteristics are valued using the India earnings structure, while there is a significant compositional effect (4.7, mostly from differences in area and in education) when they are valued using the state's coefficients. In Tamil Nadu, the negative gap in Gini is also relatively small (3.3), but this hides a large compositional effect (about 6 with both earnings structures, especially education and occupation), more than compensated by an even larger unexplained effect (9 or more). Finally, Maharashtra is the only state showing a positive differential (higher inequality than in India). This differential is small (1.6) but the result of a larger compositional effect (7.6) compensated by a negative coefficients effect (6) using the Indian earnings structure. A similar result of smaller size is obtained with the alternative estate's earnings structure. The compositional effect gets larger with lower inequality aversion (while the observed gap becomes negative).

Table 4. RIF-decomposition of state differential in inequality (with respect to India):

(% of the index for India)

	Uttar Pradesh				West Bengal				Maharashtra			
	A(.5)	A(1)	A(2)	Gini	A(.5)	A(1)	A(2)	Gini	A(.5)	A(1)	A(2)	Gini
Difference	-13.3	-12.7	-9.7	-9.3	2.4	-1.4	-5.1	-2.9	-1.3	1.9	2.7	1.6
Explained	-9.9	-9.0	-5.8	-5.9	-0.2	0.1	1.2	-0.4	11.3	11.5	8.7	7.6
Area	0.2	-0.2	-0.6	-0.2	2.5	2.1	1.3	1.3	1.6	1.9	1.9	1.3
Sex	-1.1	-1.0	-0.7	-0.6	-1.1	-0.9	-0.6	-0.5	0.1	0.1	0.0	0.0
Age	-1.0	-1.1	-0.9	-0.7	-0.2	-0.3	-0.2	-0.2	0.2	0.2	0.1	0.1
Married	0.1	0.1	0.2	0.1	-0.3	-0.2	-0.1	-0.1	-0.4	-0.4	-0.3	-0.2
Caste	-2.6	-2.4	-1.8	-1.4	-0.1	0.0	0.2	-0.1	0.9	0.8	0.5	0.4
Muslim	0.2	0.3	0.4	0.1	0.3	0.4	0.7	0.1	-0.1	-0.2	-0.3	-0.1
Education	-1.6	-1.5	-1.1	-1.0	-2.9	-2.9	-2.5	-1.8	2.5	2.9	2.6	1.9
Activity	1.2	1.2	1.3	0.6	-0.5	-0.6	-0.4	-0.4	-0.8	-0.9	-1.4	-0.3
Work type	-0.5	-0.5	-0.4	-0.3	1.8	1.9	2.0	1.1	1.1	1.1	1.0	0.7
Occupation	-3.5	-2.7	-1.4	-1.6	0.5	0.6	0.9	0.2	6.7	5.0	2.9	2.8
Industry	-1.2	-1.3	-0.8	-0.9	-0.2	-0.2	0.1	-0.1	-0.4	1.0	1.6	0.9
Unexplained	-3.4	-3.7	-3.9	-3.4	2.6	-1.5	-6.3	-2.5	-12.6	-9.6	-6.0	-6.0
	Andhra Pradesh				**Karnataka**				**Tamil Nadu**			
	A(.5)	A(1)	A(2)	Gini	A(.5)	A(1)	A(2)	Gini	A(.5)	A(1)	A(2)	Gini
Difference	-36.7	-35.9	-31.6	-23.7	-12.1	-11.2	-3.3	-8.4	-8.7	-5.6	-2.6	-3.3
Explained	-12.1	-12.7	-11.8	-7.5	-6.4	-6.0	-4.5	-3.6	9.0	9.3	8.6	5.8
Area	-2.1	-1.6	-0.5	-1.0	-0.4	-0.1	0.4	0.0	0.4	0.7	0.7	0.6
Sex	2.2	1.9	1.3	1.1	1.5	1.3	0.8	0.7	0.9	0.8	0.6	0.5
Age	-0.1	0.0	0.1	0.0	-0.8	-0.7	-0.5	-0.4	2.4	2.4	2.1	1.5
Married	0.6	0.4	0.2	0.3	-1.0	-0.8	-0.5	-0.5	0.0	-0.1	-0.2	0.0
Caste	-3.0	-2.6	-1.8	-1.5	0.1	0.2	0.1	0.2	-3.7	-3.2	-2.2	-1.8
Muslim	-0.1	-0.1	-0.2	0.0	0.0	0.1	0.1	0.0	-0.2	-0.3	-0.5	-0.1
Education	-3.1	-3.0	-2.2	-1.9	-2.4	-2.1	-1.6	-1.3	6.5	5.8	4.0	3.5
Activity	-2.2	-2.8	-2.5	-1.9	-2.0	-2.2	-2.0	-1.4	-1.1	-0.7	-0.3	-0.3
Work type	-3.4	-3.5	-3.0	-2.1	-5.2	-5.3	-4.6	-3.2	0.7	0.7	0.1	0.5
Occupation	-1.6	-2.6	-3.4	-1.6	3.7	2.4	1.3	1.2	3.7	3.8	3.9	2.1
Industry	0.8	1.2	0.3	1.1	0.0	1.3	1.9	1.1	-0.7	-0.6	0.3	-0.6
Unexplained	-24.5	-23.2	-19.8	-16.2	-5.8	-5.2	1.2	-4.8	-17.7	-14.9	-11.2	-9.0

Note: Counterfactual: Indian coefficients, sate's characteristics.

Source: Own construction using IHDS-II.

Table 5. RIF-decomposition of state differential in inequality (with respect to India):

(% of the index for India)

	Uttar Pradesh				West Bengal				Maharashtra			
	A(.5)	A(1)	A(2)	Gini	A(.5)	A(1)	A(2)	Gini	A(.5)	A(1)	A(2)	Gini
Difference	-13.3	-12.7	-9.7	-9.3	2.4	-1.4	-5.1	-2.9	-1.3	1.9	2.7	1.6
Explained	-18.0	-16.4	-11.4	-11.2	-7.2	-6.4	-3.6	-4.7	8.3	8.3	4.5	4.6
Area	-0.2	-0.6	-1.1	-0.4	-6.4	-5.6	-3.3	-3.7	1.1	2.5	2.5	1.1
Sex	-0.8	-0.9	-1.0	-0.5	-0.8	-0.9	-1.3	-0.4	0.1	0.1	0.1	0.1
Age	-0.8	-0.8	-0.6	-0.6	-0.7	-0.7	-0.5	-0.4	0.5	0.4	0.3	0.2
Married	0.2	0.3	0.4	0.1	-0.7	-0.6	-0.4	-0.3	-0.1	-0.1	-0.1	-0.1
Caste	-5.8	-5.2	-3.5	-3.3	2.3	1.7	0.3	0.8	-0.3	-0.8	-1.2	-0.4
Muslim	-0.7	-0.5	-0.5	-0.3	-0.8	0.1	1.7	0.1	0.0	0.0	0.2	0.0
Education	-1.3	-1.1	-0.6	-0.8	-4.6	-4.5	-3.7	-2.9	4.9	4.4	3.6	2.3
Activity	-3.0	-2.6	-1.6	-1.6	0.2	-0.2	-0.6	-0.2	0.6	-0.5	-2.1	-0.1
Work type	-1.0	-1.3	-1.5	-0.7	2.2	2.0	1.4	1.4	1.7	1.4	1.1	0.8
Occupation	-4.7	-4.2	-2.6	-3.0	2.2	2.3	2.6	1.2	41.1	27.2	14.5	14.4
Industry	0.2	0.4	1.1	0.0	-0.2	-0.1	0.2	-0.2	-41.2	-26.4	-14.4	-13.6
Unexplained	4.6	3.7	1.7	1.9	9.6	5.0	-1.5	1.8	-9.6	-6.3	-1.8	-3.0
	Andhra Pradesh				**Karnataka**				**Tamil Nadu**			
	A(.5)	A(1)	A(2)	Gini	A(.5)	A(1)	A(2)	Gini	A(.5)	A(1)	A(2)	Gini
Difference	-36.7	-35.9	-31.6	-23.7	-12.1	-11.2	-3.3	-8.4	-8.7	-5.6	-2.6	-3.3
Explained	-18.9	-17.2	-12.6	-12.4	-12.8	-13.7	-16.3	-7.6	11.0	10.0	7.5	6.3
Area	-3.8	-3.8	-3.3	-2.8	2.9	2.3	1.8	1.5	0.1	0.5	1.5	0.1
Sex	2.0	1.7	0.9	1.5	1.6	1.5	0.5	1.1	2.7	2.3	1.3	1.5
Age	-0.2	-0.2	-0.2	-0.1	-0.7	-0.6	-0.3	-0.4	0.4	0.4	-1.2	0.6
Married	0.9	0.7	0.4	0.5	-1.0	-0.8	-0.5	-0.5	0.6	0.5	0.5	0.3
Caste	-10.4	-8.0	-4.7	-4.9	-2.4	-2.3	-1.8	-1.4	2.5	1.7	0.5	1.2
Muslim	-0.2	-0.1	0.1	-0.2	0.4	0.4	0.2	0.2	1.7	1.5	1.8	0.8
Education	-0.2	-0.3	-0.1	-0.4	-3.9	-3.5	-2.2	-2.3	5.3	4.9	3.7	3.0
Activity	4.4	2.8	2.3	0.9	-0.9	-1.0	-2.1	-0.3	-4.8	-4.2	-2.3	-2.6
Work type	-1.4	-1.7	-1.1	-1.6	-10.4	-10.9	-10.6	-6.7	-0.1	-0.4	-0.8	0.1
Occupation	-9.0	-7.1	-3.9	-5.1	-6.8	-6.4	-5.8	-4.3	7.3	7.5	6.5	4.4
Industry	-1.0	-1.3	-2.8	-0.2	8.5	7.5	4.5	5.4	-4.7	-4.8	-3.8	-3.0
Unexplained	-17.8	-18.6	-19.1	-11.3	0.7	2.5	13.0	-0.7	-19.8	-15.6	-10.2	-9.6

Note: Counterfactual: Indian characteristics, state's coefficients.

Source: Own construction using IHDS-II.

8. Concluding remarks

In this paper we have used RIF-regressions to identify the contribution of several workers' characteristics to explain the earnings inequality gap between several Indian states and the country as a whole. The results show the different magnitude of the gap and the extent to which this is explained by differences in characteristics. We have also shown the distinct role of geographic, demographic and labor market characteristics in explaining the inequality gaps. Most outstanding roles are played by the distribution by caste, the degree of urbanization, and, especially, the labor market composition by occupations and type of work. Differences in earnings structures have shown to be important in several cases.

Using the Atkinson index, we have additionally shown how the magnitude of the gap, and the extent to which this is explained by characteristics, may change as we change the inequality aversion. From a practical point of view we have also shown that the results strongly depend on which counterfactual is considered, like in most counterfactual analyses. Furthermore, the extreme sensitivity of some Entropy measures compromised their use in this type of exercise.

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Table A1. Workers' distribution by characteristics in India and selected states

Characteristics	India	Uttar Pradesh	West Bengal	Maharashtra	Andhra Pradesh	Karnataka	Tamil Nadu
Metro urban	0.067	0.046	0.249	0.135	0.079	0.073	0.099
Other urban	0.246	0.254	0.150	0.159	0.232	0.181	0.410
More developed village	0.320	0.156	0.150	0.461	0.557	0.459	0.366
Less developed village	0.367	0.544	0.450	0.244	0.132	0.287	0.124
Female	0.307	0.224	0.232	0.335	0.404	0.381	0.348
Aged <25	0.180	0.228	0.180	0.174	0.168	0.175	0.112
Aged 25-34	0.259	0.250	0.261	0.258	0.253	0.263	0.226
Aged 35-44	0.247	0.241	0.248	0.250	0.268	0.246	0.275
Aged 45-54	0.188	0.160	0.207	0.192	0.183	0.186	0.213
Aged 55+	0.125	0.121	0.104	0.126	0.128	0.129	0.174
Married (spouse absent)	0.017	0.029	0.014	0.007	0.012	0.015	0.014
Married	0.734	0.714	0.717	0.747	0.768	0.694	0.736
Unmarried	0.187	0.210	0.214	0.175	0.143	0.212	0.169
Widowed	0.061	0.048	0.054	0.071	0.077	0.079	0.081
Brahmin	0.035	0.047	0.052	0.015	0.007	0.017	0.009
Forward/General caste (except Brahmin)	0.171	0.138	0.413	0.293	0.087	0.082	0.011
Other Backward Castes (OBC)	0.389	0.482	0.080	0.335	0.536	0.462	0.577
Scheduled Castes (SC)	0.274	0.302	0.392	0.208	0.304	0.248	0.367
Scheduled Tribes (ST)	0.118	0.029	0.045	0.140	0.047	0.140	0.014
Other caste	0.013	0.001	0.018	0.008	0.020	0.050	0.023
Muslim	0.106	0.237	0.225	0.062	0.062	0.107	0.028
No education	0.310	0.366	0.304	0.221	0.466	0.354	0.271
1-4 years education	0.093	0.078	0.174	0.122	0.059	0.115	0.081
Primary education	0.086	0.108	0.070	0.042	0.074	0.057	0.107
6-9 years education	0.250	0.235	0.233	0.282	0.158	0.254	0.237
Secondary education	0.105	0.075	0.076	0.128	0.127	0.101	0.136
Higher secondary education	0.072	0.062	0.045	0.108	0.054	0.065	0.065
Graduate	0.052	0.044	0.071	0.082	0.030	0.034	0.056
Some post-graduate	0.032	0.032	0.028	0.016	0.031	0.019	0.048
Cultivation	0.111	0.109	0.080	0.128	0.123	0.128	0.032
Allied agrarian	0.005	0.003	0.006	0.005	0.009	0.002	0.011
Agrarian wage labor	0.176	0.095	0.188	0.333	0.363	0.390	0.220
Non-agrarian wage labor	0.304	0.396	0.323	0.132	0.237	0.220	0.407
Artisan/independent work	0.014	0.011	0.013	0.006	0.037	0.014	0.008
Small business	0.014	0.026	0.024	0.003	0.007	0.012	0.012
Organized Business	0.001	0.000	0.000	0.000	0.001	0.001	0.002
Salaried	0.252	0.208	0.273	0.277	0.160	0.179	0.235
Profession	0.003	0.002	0.004	0.003	0.003	0.001	0.001
Retired	0.002	0.001	0.001	0.001	0.002	0.001	0.001
Housework	0.092	0.109	0.053	0.080	0.023	0.041	0.025
Student	0.015	0.030	0.016	0.016	0.013	0.006	0.003
Unemployed	0.003	0.003	0.005	0.009	0.005	0.001	0.003
Too young/Unfit	0.004	0.002	0.007	0.004	0.010	0.004	0.001
Others	0.006	0.005	0.009	0.004	0.006	0.001	0.040
Casual daily	0.693	0.723	0.608	0.692	0.750	0.821	0.754
Casual piecework	0.058	0.072	0.084	0.047	0.062	0.051	0.019
Contract < 1 year	0.046	0.011	0.039	0.070	0.055	0.048	0.026
Regular/Permanent/Longer contract	0.203	0.194	0.269	0.190	0.133	0.080	0.201
Occupations 1-9	0.015	0.010	0.019	0.011	0.015	0.012	0.021
Occupations 10-19	0.051	0.051	0.056	0.032	0.027	0.043	0.047
Occupations 20-29	0.011	0.008	0.014	0.016	0.007	0.007	0.013
Occupations 30-39	0.062	0.043	0.070	0.090	0.037	0.044	0.058
Occupations 40-49	0.036	0.038	0.039	0.024	0.037	0.026	0.047
Occupations 50-59	0.059	0.056	0.054	0.054	0.043	0.057	0.066
Occupations 60-68	0.305	0.223	0.251	0.554	0.461	0.531	0.249
Occupations 71-79	0.053	0.101	0.097	0.019	0.060	0.067	0.097
Occupations 80-89	0.064	0.076	0.061	0.037	0.051	0.057	0.076
Occupations 90-99	0.344	0.394	0.341	0.163	0.263	0.158	0.327
Industries 0-9	0.306	0.227	0.255	0.557	0.457	0.530	0.252
Industries 10-19	0.008	0.001	0.008	0.005	0.014	0.005	0.001
Industries 20-29	0.067	0.119	0.127	0.031	0.070	0.073	0.106
Industries 30-39	0.067	0.154	0.061	0.057	0.035	0.036	0.074
Industries 40-43	0.015	0.020	0.010	0.010	0.012	0.014	0.019
Industry 50	0.248	0.220	0.250	0.089	0.202	0.093	0.218
Industries 60-69	0.041	0.051	0.036	0.039	0.039	0.042	0.051
Industries 70-75	0.069	0.061	0.059	0.058	0.063	0.070	0.088
Industries 80-89	0.020	0.013	0.018	0.021	0.013	0.019	0.027
Industries 90-99	0.159	0.135	0.176	0.133	0.096	0.119	0.164

Source: Own construction using IHDS-II.

Table A2. The RIF-regressions, selected states

	Uttar Pradesh				West Bengal				Maharashtra			
Regressors	**Gini**	**A(.5)**	**A(1)**	**A(2)**	**Gini**	**A(.5)**	**A(1)**	**A(2)**	**Gini**	**A(.5)**	**A(1)**	**A(2)**
Other urban	0.132***	0.100***	0.147***	0.184***	0.109***	0.072***	0.121***	0.191***	-0.101***	-0.041*	-0.102***	-0.158***
More developed village	0.124***	0.098***	0.150***	0.215***	-0.018	-0.015	-0.019	-0.027	-0.100***	-0.040*	-0.104***	-0.174***
Less developed village	0.106***	0.085***	0.126***	0.163***	-0.017	-0.011	-0.006	0.040	-0.099***	-0.039	-0.101***	-0.156***
Female	0.059***	0.037***	0.070***	0.128***	0.042*	0.031*	0.058**	0.132***	0.093***	0.062***	0.096***	0.093***
Aged 25-34	-0.064***	-0.050***	-0.073***	-0.090***	-0.056**	-0.044**	-0.058*	-0.027	-0.038*	-0.032	-0.044*	-0.044
Aged 35-44	-0.049**	-0.041***	-0.057***	-0.066*	-0.039	-0.038*	-0.049	-0.039	0.014	0.005	0.014	0.025
Aged 45-54	0.029	0.009	0.019	0.015	0.009	-0.004	0.002	0.022	0.113***	0.087***	0.127***	0.158***
Aged 55+	0.095***	0.060***	0.095***	0.115***	0.080**	0.047*	0.080**	0.115**	0.072**	0.048*	0.075**	0.092**
Married (spouse absent)	0.006	0.005	0.012	0.041	0.057	0.014	0.023	-0.074	-0.028	-0.021	-0.032	-0.036
Unmarried	-0.034*	-0.026*	-0.034*	-0.021	-0.098***	-0.074***	-0.106***	-0.117***	-0.025	-0.016	-0.029	-0.041
Widowed	-0.060**	-0.045***	-0.071***	-0.122***	-0.043	-0.026	-0.043	-0.070	-0.048*	-0.032	-0.051*	-0.058*
Forward/General caste (except Brahmin)	-0.063**	-0.043**	-0.058*	-0.038	0.054	0.057*	0.066	0.046	0.002	0.028	0.014	0.004
Other Backward Caste (OBC)	-0.075***	-0.053***	-0.070**	-0.044	0.057	0.053	0.066	0.071	0.013	0.03	0.027	0.045
Scheduled Caste (SC)	-0.082***	-0.059***	-0.080***	-0.065	0.063*	0.057*	0.075*	0.087	0.02	0.038	0.033	0.023
Scheduled Tribe (ST)	-0.059	-0.049*	-0.057	-0.031	0.004	0.015	0.010	0.002	0.038	0.046	0.048	0.038
Other caste	0.566***	0.379***	0.570***	0.654**	-0.051	-0.02	-0.064	-0.200*	0.095	0.082	0.111	0.141
Muslim	-0.008	-0.008	-0.011	-0.02	-0.001	-0.01	0.002	0.063*	0.004	0.002	0.001	-0.017
1-4 years education	-0.014	-0.007	-0.022	-0.077**	0.018	0.012	0.019	0.019	0.014	0.010	0.013	0.001
Primary education	0.011	0.004	0.010	0.017	0.029	0.020	0.033	0.043	0.027	0.021	0.028	0.029
6-9 years education	0.004	-0.002	-0.004	-0.026	0.016	0.013	0.017	0.023	0.045**	0.036*	0.050**	0.062**
Secondary education	0.019	0.006	0.010	-0.003	-0.006	-0.015	-0.01	0.009	0.026	0.018	0.029	0.040
Higher secondary education	0.063**	0.035**	0.057**	0.063	0.082*	0.030	0.072	0.118*	0.045*	0.028	0.049	0.068*
Graduate	0.087***	0.038*	0.078**	0.150***	0.189***	0.109***	0.188***	0.262***	0.224***	0.167***	0.249***	0.298***
Some post-graduate	0.425***	0.294***	0.422***	0.443***	0.779***	0.529***	0.803***	0.923***	0.205***	0.144***	0.217***	0.226***
Cultivation	-0.125***	-0.068***	-0.104***	-0.088*	-0.109**	-0.058*	-0.099**	-0.117*	-0.057	-0.047	-0.061	-0.048
Allied agrarian	-0.162*	-0.086	-0.146	-0.19	-0.097	-0.051	-0.103	-0.191	-0.118	-0.092	-0.131	-0.148
Agrarian wage labor	-0.098***	-0.052***	-0.082***	-0.080*	-0.073*	-0.033	-0.066	-0.105*	-0.051	-0.042	-0.055	-0.043
Non-agrarian wage labor	-0.106***	-0.062***	-0.094***	-0.089**	-0.078**	-0.045*	-0.071*	-0.071	-0.044	-0.042	-0.049	-0.032
Artisan/independent work	-0.187***	-0.125***	-0.191***	-0.209**	-0.227***	-0.139**	-0.224***	-0.267***	0.130*	0.091	0.185**	0.504***
Small business	-0.093***	-0.056**	-0.087**	-0.095	-0.092*	-0.041	-0.077	-0.08	0.008	0.003	0.065	0.405***
Organized Business	-0.214	-0.162	-0.225	-0.172	-0.547	-0.316	-0.527	-0.672	-0.085	-0.062	-0.089	-0.094
Profession	-0.210*	-0.106	-0.091	0.398*	-0.326***	-0.203**	-0.329**	-0.379**	-0.148	-0.152	-0.165	-0.093
Retired	0.735***	0.570***	0.784***	0.790**	-0.001	-0.038	-0.019	0.038	-0.124	-0.053	-0.128	-0.217
Housework	-0.074***	-0.041**	-0.064**	-0.06	-0.064	-0.030	-0.050	-0.041	-0.003	-0.010	-0.005	0.012
Student	-0.105***	-0.058**	-0.099**	-0.143**	0.146**	0.156***	0.177**	0.123	-0.027	-0.022	-0.030	-0.028
Unemployed	-0.112	-0.058	-0.065	0.050	-0.051	-0.020	-0.038	-0.060	0.002	-0.006	0.017	0.105
Too young/Unfit	0.100	0.087	0.112	0.106	-0.057	-0.022	-0.047	-0.052	-0.021	-0.026	-0.026	-0.009
Others	-0.240***	-0.174***	-0.263***	-0.336***	-0.004	0.029	0.033	0.065	0.400***	0.297***	0.427***	0.428***
Casual piecework	0.028	0.012	0.042*	0.152***	0.083***	0.061***	0.088***	0.110***	-0.044	-0.025	-0.044	-0.054
Contract < 1 year	0.022	0.012	0.043	0.134	0.104**	0.094**	0.134**	0.214***	0.059**	0.073***	0.076**	0.072**
Regular/Permanent/Longer contract	0.112***	0.065***	0.119***	0.201***	0.131***	0.077***	0.125***	0.152***	0.005	-0.022	-0.004	0.014
Occupations 1-9	0.424***	0.292***	0.436***	0.520***	0.334***	0.206***	0.337***	0.434***	0.412***	0.292***	0.447***	0.532***
Occupations 10-19	0.218***	0.155***	0.236***	0.263***	0.222***	0.111**	0.209***	0.318***	0.583***	0.444***	0.640***	0.715***
Occupations 20-29	0.674***	0.437***	0.671***	0.763***	0.447***	0.220***	0.423***	0.617***	0.714***	0.660***	0.832***	0.850***
Occupations 30-39	0.088**	0.043*	0.096**	0.195***	0.149***	0.077**	0.143***	0.228***	0.133***	0.109***	0.163***	0.250***
Occupations 40-49	0.103**	0.048*	0.106**	0.201***	-0.054	-0.038	-0.042	0.03	0.141***	0.122**	0.178***	0.296***
Occupations 50-59	0.099***	0.066***	0.124***	0.264***	-0.029	-0.022	-0.016	0.051	0.109***	0.108***	0.132***	0.144***
Occupations 60-68	0.124*	0.073*	0.124*	0.178*	-0.088	-0.090	-0.111	-0.099	0.388***	0.408***	0.455***	0.347***
Occupations 71-79	0.115***	0.079***	0.149***	0.334***	0.170***	0.112***	0.209***	0.416***	0.184***	0.155***	0.201***	0.154**
Occupations 80-89	0.054**	0.028*	0.053*	0.094**	0.048	0.028	0.049	0.074	0.091**	0.092**	0.108**	0.097*
Industries 10-19	-0.014	0.002	-0.022	-0.133	-0.175	-0.190*	-0.229	-0.212	0.301**	0.274**	0.358**	0.429**
Industries 20-29	0.029	0.018	0.042	0.107	-0.085	-0.083	-0.090	-0.002	0.149*	0.194**	0.202*	0.223*
Industries 30-39	0.015	0.012	0.031	0.105	-0.143	-0.132*	-0.161	-0.097	0.188**	0.219**	0.238**	0.228*
Industries 40-43	0.192**	0.092*	0.192**	0.359***	-0.123	-0.140	-0.156	-0.086	0.196*	0.222**	0.239*	0.194
Industry 50	0.027	0.021	0.040	0.100	-0.143	-0.125*	-0.166	-0.162	0.391***	0.434***	0.476***	0.402***
Industries 60-69	-0.062	-0.033	-0.054	-0.05	-0.198*	-0.159*	-0.224*	-0.259*	0.169*	0.213**	0.209*	0.114
Industries 70-75	0.094	0.053	0.101	0.191*	-0.089	-0.096	-0.106	-0.044	0.337***	0.343***	0.402***	0.382***
Industries 80-89	0.142*	0.069	0.134*	0.226*	0.389***	0.327***	0.427***	0.430***	0.193*	0.210**	0.237**	0.217*
Industries 90-99	0.03	0.008	0.044	0.173	-0.071	-0.083	-0.092	-0.052	0.245***	0.266***	0.303***	0.297***
Intercept	0.325***	0.090*	0.125	0.088	0.446***	0.197**	0.280**	0.279*	0.046	-0.293***	-0.210*	0.026
R^2	0.274	0.235	0.259	0.201	0.265	0.186	0.237	0.256	0.157	0.097	0.145	0.204
N	7,626	7,626	7,626	7,626	5,810	5,810	5,810	5,810	8,328	8,328	8,328	8,328

Table A2 (cont.). The RIF-regressions, selected states

	Andhra Pradesh				Karnataka				Tamil Nadu			
Regreassors	**Gini**	**A(.5)**	**A(1)**	**A(2)**	**Gini**	**A(.5)**	**A(1)**	**A(2)**	**Gini**	**A(.5)**	**A(1)**	**A(2)**
Other urban	-0.131***	-0.111***	-0.151***	-0.231***	-0.053*	-0.031	-0.039	0.017	-0.055*	-0.029	-0.063*	-0.144***
More developed village	-0.140***	-0.113***	-0.155***	-0.229***	-0.055*	-0.018	-0.033	0.023	-0.063**	-0.033	-0.071**	-0.152***
Less developed village	-0.103**	-0.094***	-0.121***	-0.184***	-0.079**	-0.04	-0.061	-0.023	-0.064*	-0.035	-0.077**	-0.180***
Female	0.062***	0.038**	0.051***	0.024	0.076***	0.044*	0.068***	0.049*	0.091***	0.073***	0.087***	0.036
Aged 25-34	-0.055*	-0.043*	-0.061*	-0.070*	-0.028	-0.028	-0.036	-0.049	-0.077**	-0.067***	-0.096***	-0.161***
Aged 35-44	-0.03	-0.024	-0.036	-0.048	-0.017	-0.022	-0.027	-0.056	-0.025	-0.035	-0.046	-0.106**
Aged 45-54	0.034	0.024	0.028	0.005	0.053	0.039	0.049	0.024	0.027	-0.001	0.006	-0.054
Aged 55+	0.062*	0.045	0.060	0.054	0.079**	0.040	0.067	0.043	0.057	0.027	0.041	-0.024
Married (spouse absent)	-0.035	-0.02	-0.036	-0.068	-0.002	0.002	-0.007	-0.044	0.007	-0.006	0.007	0.026
Unmarried	-0.049*	-0.033	-0.047	-0.047	-0.049*	-0.036	-0.051*	-0.054	-0.107***	-0.076***	-0.115***	-0.139***
Widowed	-0.030	-0.021	-0.034	-0.051	-0.013	-0.009	-0.013	-0.018	-0.010	-0.002	-0.003	0.009
Forward/General caste (except Brahmin)	-0.566***	-0.507***	-0.626***	-0.582***	-0.432***	-0.305***	-0.440***	-0.432***	-0.493***	-0.383***	-0.520***	-0.477***
Other Backward Caste (OBC)	-0.560***	-0.493***	-0.616***	-0.585***	-0.430***	-0.302***	-0.440***	-0.436***	-0.412***	-0.319***	-0.439***	-0.418***
Scheduled Caste (SC)	-0.578***	-0.510***	-0.637***	-0.607***	-0.439***	-0.311***	-0.448***	-0.428***	-0.448***	-0.344***	-0.478***	-0.471***
Scheduled Tribe (ST)	-0.521***	-0.468***	-0.582***	-0.564***	-0.438***	-0.312***	-0.441***	-0.388***	-0.438***	-0.344***	-0.473***	-0.465***
Other caste	-0.634***	-0.552***	-0.669***	-0.465***	-0.418***	-0.294***	-0.433***	-0.462***	-0.350***	-0.279***	-0.377***	-0.360***
Muslim	0.012	0.004	0.006	-0.006	0.051*	0.028	0.050*	0.053*	-0.06	-0.048	-0.072	-0.113*
1-4 years education	-0.001	-0.005	-0.004	-0.005	-0.004	-0.005	-0.007	-0.022	0.063*	0.057**	0.073**	0.071*
Primary education	0.063**	0.058**	0.071**	0.060*	0.028	0.014	0.027	0.042	-0.012	-0.008	-0.013	-0.021
6-9 years education	0.002	-0.001	-0.003	-0.021	0.030	0.016	0.028	0.022	0.030	0.021	0.031	0.034
Secondary education	-0.008	-0.010	-0.011	-0.006	0.074**	0.065*	0.080**	0.073*	0.041	0.026	0.043	0.065*
Higher secondary education	0.053	0.024	0.052	0.123***	0.016	-0.009	0.012	0.068	0.021	0.012	0.019	0.008
Graduate	-0.036	-0.044	-0.046	-0.022	0.259***	0.134**	0.232***	0.222***	0.114***	0.068**	0.111**	0.114*
Some post-graduate	0.300***	0.173***	0.280***	0.369***	0.739***	0.521***	0.742***	0.662***	0.600***	0.424***	0.630***	0.691***
Cultivation	-0.010	0.022	0.014	0.030	0.071*	0.071	0.073	0.008	0.107**	0.093**	0.115**	0.078
Allied agrarian	0.009	0.032	0.031	0.058	0.037	0.047	0.038	-0.038	0.017	0.027	0.019	-0.027
Agrarian wage labor	-0.005	0.026	0.021	0.047	0.058	0.063	0.058	-0.014	0.012	0.018	0.015	-0.011
Non-agrarian wage labor	-0.002	0.022	0.022	0.066	0.049	0.052	0.054	0.022	-0.016	-0.005	-0.012	-0.021
Artisan/independent work	0.094*	0.123***	0.132**	0.112*	0.681***	0.765***	0.821***	0.699***	-0.067	-0.03	-0.052	-0.049
Small business	-0.011	0.018	0.006	0.001	0.111	0.099	0.148*	0.271***	0.012	0.019	0.026	0.040
Organized Business	-0.039	0.009	-0.029	-0.116	0.509**	0.363	0.494*	0.331	0.519**	0.361**	0.547**	0.615**
Profession	0.051	0.036	0.05	0.056	-0.216	-0.204	-0.257	-0.234	0.355*	0.216	0.351	0.409
Retired	0.975***	0.722***	1.004***	1.057***	-0.399	-0.267	-0.412	-0.544	-0.457	-0.336	-0.497	-0.583
Housework	-0.044	0.000	-0.022	-0.031	0.084*	0.084	0.090	0.031	0.033	0.027	0.032	0.001
Student	0.036	0.059	0.05	0.002	0.031	0.053	0.015	-0.181	-0.057	-0.046	-0.069	-0.14
Unemployed	-0.112	-0.034	-0.084	-0.118	0.128	0.113	0.104	-0.070	0.002	0.000	-0.018	-0.108
Too young/Unfit	-0.032	0.011	-0.012	-0.03	0.020	0.047	0.024	-0.078	-0.242	-0.150	-0.261	-0.377
Others	0.140	0.088	0.142	0.205*	0.059	0.065	0.114	0.408	-0.006	0.008	-0.005	-0.04
Casual piecework	0.046	0.020	0.044	0.073*	0.020	-0.011	0.011	0.000	0.069	0.048	0.09	0.151*
Contract < 1 year	-0.073*	-0.051	-0.071*	-0.080*	-0.003	-0.004	-0.017	-0.105**	-0.051	-0.034	-0.054	-0.084
Regular/Permanent/Longer contract	0.070**	0.018	0.047	0.053	0.250***	0.144***	0.259***	0.413***	0.143***	0.091***	0.148***	0.179***
Occupations 1-9	0.734***	0.632***	0.807***	0.849***	0.473***	0.329***	0.467***	0.427***	0.498***	0.346***	0.519***	0.564***
Occupations 10-19	0.501***	0.355***	0.514***	0.643***	0.163***	0.156**	0.188**	0.217***	0.075	0.038	0.069	0.081
Occupations 20-29	1.047***	0.754***	1.068***	1.195***	0.453***	0.340***	0.468***	0.452***	0.495***	0.381***	0.539***	0.583***
Occupations 30-39	0.022	0.013	0.028	0.081	0.136***	0.124**	0.187***	0.401***	0.062	0.037	0.058	0.054
Occupations 40-49	0.015	0.024	0.026	0.028	0.037	0.031	0.039	0.034	0.021	0.016	0.022	0.024
Occupations 50-59	-0.01	-0.001	0.011	0.130*	0.025	0.012	0.013	-0.059	0.107**	0.091***	0.115**	0.088
Occupations 60-68	-0.017	-0.007	-0.003	0.046	-0.085	-0.046	-0.081	-0.128	-0.306**	-0.188*	-0.317*	-0.414**
Occupations 71-79	0.141**	0.090	0.165**	0.330***	0.045	0.029	0.056	0.116	-0.023	-0.011	-0.022	-0.033
Occupations 80-89	-0.076	-0.058	-0.076	-0.049	-0.028	-0.034	-0.043	-0.078	-0.039	-0.038	-0.04	-0.014
Industries 10-19	-0.099	-0.045	-0.069	-0.038	0.168	0.179	0.217	0.210	-0.377	-0.237	-0.394	-0.518
Industries 20-29	0.016	0.013	0.041	0.143	-0.097	-0.048	-0.071	-0.012	-0.252*	-0.153	-0.258*	-0.329*
Industries 30-39	0.006	0.007	0.017	0.055	-0.128	-0.070	-0.104	-0.058	-0.255*	-0.155	-0.262*	-0.343*
Industries 40-43	0.271**	0.214**	0.294**	0.345**	-0.040	0.010	-0.009	0.006	-0.136	-0.061	-0.143	-0.259
Industry 50	-0.04	-0.021	-0.024	0.021	-0.135	-0.085	-0.128	-0.144	-0.251*	-0.160	-0.265*	-0.346*
Industries 60-69	-0.039	-0.020	-0.025	0.019	-0.167	-0.094	-0.148	-0.122	-0.268*	-0.140	-0.261*	-0.330*
Industries 70-75	0.029	0.013	0.049	0.217*	-0.059	-0.028	-0.041	-0.018	-0.273*	-0.170	-0.280*	-0.341*
Industries 80-89	0.102	0.096	0.125	0.146	-0.170	-0.111	-0.173	-0.227	-0.479***	-0.329***	-0.501***	-0.570***
Industries 90-99	0.009	0.014	0.020	0.037	-0.092	-0.031	-0.053	0.056	-0.261*	-0.159	-0.262*	-0.317*
Intercept	0.972***	0.643***	0.856***	0.941***	0.797***	0.386**	0.623***	0.800***	1.064***	0.597***	0.955***	1.347***
R^2	0.170	0.119	0.148	0.165	0.106	0.051	0.085	0.118	0.259	0.215	0.245	0.223
N	6,882	6,882	6,882	6,882	11,926	11,926	11,926	11,926	5,332	5,332	5,332	5,332

Source: Own construction using IHDS-II. Omitted categories: metro urban, male, 24 or younger, Brahmin, non-Muslim, no education, salaried worker, casual daily work, occupation group 9 (90-99), in primary sector (industries 0-6).