Occupational Wage Inequality Amid Regional Diversity in India: A Nested Theil Approach of Decomposition

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Abstract

Wage inequality has always been a topic of discussion across the globe and is persisting prominently despite occupational and regional diversity in India. An estimation of wage inequality within and between nine broad occupational groups across various regions of India provides a meaningful insight into the existing line of research. An application of Theil index on wage level of 94,460 workers across nine broad occupational groups, obtained from unit level data of Periodic Labour Force Survey, 2019 at all India level, confirms the prevalence of substantial wage inequality. After analysing various aspects of wage inequality among various occupations, the study observed that the wage inequality is estimated to be highest, among managers, professionals, and technicians & associate professionals and least among plant and machine operators and assemblers. Regional analysis in this regard highlights that wage inequality is estimated to be highest in eastern and central regions. The study found that occupational diversity, diverse nature of work assignment in accordance with the cognitive ability of workers are the main reasons behind wage inequalities. Difference in socio-economic conditions, per-capita state domestic product and different labour market conditions contributes towards regional wage inequalities in India.

Keywords: Wage Inequality, Occupational Groups, Regional Diversity, Theil Index JEL: J01, J21, J24, J31

1. Introduction

neven distribution of wages among the workforce is called wage inequality and usually co-exists with income and wealth inequality. Workers with similar educational attainments and work profile may be designated differently and are paid unequally at their workplace. The work environment is structured in a way to maintain the hierarchy of work positions, within an organisation, to perform a diverged nature of tasks for operational efficiency. This leads to division of labour in accordance with capabilities of workers and organisational wage differentials (Madan and Yadav, 2022; Madan, 2019). Further, workers performing under similar work environments in different organisations are also paid differently for their work and this

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is termed as occupational wage inequality (Jonsson et al., 2009).

According to conventional theories. wages are decided in accordance with the marginal productivity of workers. Over a period, wage inequality has been affected by computerization, causing imbalance in the demand and supply of workers, and leading to a further rise in wage inequality. Over the years, wage inequality has been broadly evaluated in many studies in this line, (Balu & Kahn, 1994; Mouw & Kalleberg, 2010; Reenen, 2011; Helland et al, 2017; Sarkar, 2018) which have elaborated increasing wage inequality across the globe for varied reasons. For instance, wage inequality in all OECD countries has been increasing due to skill based technological changes (SBTC). During the 1970s, in the UK and US, both countries were facing massive increase in wage inequality, because of increasing demand of highly educated labour. technological advancement, and inadequate supply for the same (Reenen, 2011). Gender based wage inequalities were higher in the US than in other industrialized countries. Despite government policies to promote self-employment and small industries, wage inequality was increasing in Spain because of the risk factor associated with earning volatility of self-employed workers and those engaged in small scale industries (Albarran et.al, 2007). Further, migration and gender discrimination also have caused a high rise in wage inequality in the Czech Republic and in Western Europe. Discriminatory practices and geographical standards have been major contributors of wage inequality in India. Mahajan & Ramaswami (2018) analysed how wage inequality of about 55 percent exists in between southern and northern regions of India.

Occupational diversity has been one of the important reasons for wage inequality, since the 1980s, and employment status has been changing among high-middle and low skilled occupations. Such changes are characterized as a U-shape pattern of employment. Further, the U-shape pattern of employment is termed as job-polarization, which often coincides with wage-polarization. As per the consequences of wage-polarization, wages have increased across occupations such as; for professionals and managers, because of the consequent rise in the demand of managers and professionals after wage-polarization (Sarkar. 2018: Madan and Mor, 2020). British sociologists emphasized that occupation and the structure of wage inequality are related to each other as within-occupational group wage inequality is found to be comparatively higher than between-occupational groups wage inequality (Williams, 2013). After the evaluation of wage inequality, Mouw & Kalleberg (2010) found that high growth occurs in the presence of betweenoccupational inequalities, whereas moderate growth is witnessed in the prominence of within-occupational inequalities in United States. In the period 2003 to 2012, economic inequality, wealth inequality, income inequality and consumption inequalities increased in most of the western countries, while wage inequality was moderately increasing in Scandinavian countries and in western nations (Helland, 2017). During the last three decades 1975-2004, wage inequality was slightly increasing in the Norwegian labour market. In the period 1995-2002 in Portugal, wage inequality was the highest among those regions where workers were facing lack of educational facilities. Despite two important collective-bargaining characteristics. the system and the egalitarian tradition, wage inequality was increasing across different

types of occupations (Matekaasa, 2011). In the period 1999-2000, female workers' proportion was higher in professional occupations than male workers in India, indicating higher educational attainments among female workers. Researches in this area have also revealed that despite higher educational attainment, females are getting lower wages as compared to their male counterparts regardless of occupational structure (Deshpande, 2015; Madan and Mor, 2020).

During the 1980s in the UK, wage inequality among self-employed workers kept changing. Labour market economists analysed that in terms of risk, self-employed workers remained in more compromising situations than regular wage earners as there are certain provisions of social and financial securities for regular wage workers, though not in every occupation (Parker, 1999). During 2006 in Germany, gender wage inequality was higher among self-employed workers as compared to wage workers. Gender wage differentials were about 44% and 36% among self-employed and wage workers respectively (Lechmann & Schnabel, 2012; Krizkova, 2010).

Regional diversity also plays an important role in determining wage structure. Regional wage inequality has both a static and dynamic perspective. Regions with the highest number of well qualified workers experience the lowest wage inequality (Pereira & Galego, 2011). Per-capita income was one of the most important factors of increasing wage inequality in Brazil, a well-known country for regional wage inequalities. In 1998, per-capita income was the highest in southern regions and wage inequality was the lowest therein. Inflation and fluctuations in growth rates also affect national GDP, which further creates Occupational Wage Inequality Amid Regional Diversity in India: A Nested Theil Approach of Decomposition

more regional wage diversity (Azzoni & Servo, 2002).

Wage inequality is a wider concept and has a direct and indirect relation with economic growth and the employment generation process in an economy. Higher wage inequality causes lesser economic growth and vice versa. Thus, estimating wage inequality among various occupational groups amid regional diversity of India shall prove to be helpful to providing a meaningful insight for policy decision making.

The study is organised in five sections. Section 1 provides a brief introduction of the existence of wage inequality. Section 2 provides a detailed literature review to explore relevant studies to formulate a test hypothesis to fill the research gap. Detailed methodology for testing of the hypothesis is discussed in section 3 and section 4 presents the results and make a discussion of various important findings of the study. Section 5 provides a conclusion of the study.

2. Literature Review

2.1. Occupational Wage Inequality:

There is a wide range of sociological arguments on occupational structure. Wages and occupational size are the central measure of inequality. Betweenoccupational groups wage inequalities are caused mainly by the skill requirement of workers to perform specified occupational activities, the geographical location of workplace, work status and gender of the worker (Mouw & Kalleberg, 2010). During 1983-2005, wage inequality among various occupational groups have shown an increase, but at the same time it has witnessed a decline within the same

groups in India (Goel, occupational 2017). In the period 1993-2004, betweenoccupational groups wage inequality was one-fourth of the aggregate wage inequality in India. Between-groups wage inequality among professionals was increasing for male workers rather than for female. It started decreasing in the period 1993-1999 and thereafter started increasing in the period 1999-2004 (Mukherjee & Majumder, 2011). Wage inequality withinoccupational groups also increased in last twentieth century because of several factors such as; occupational segregation, nature of industry, education, race, gender and age of the worker (Killewald & Near, 2016). Moreover, the occupation-specific human capital makes occupation mobility more difficult (Kambourov & Manovskii, 2009).

Wage inequality started increasing among professionals and managers after 1999. At the same time wage inequality was the lowest among elementary workers (Ahmad, 2001, Madan and Mor, 2022). In the period 1993-94 to 2011-12, wage inequality among legislators, senior officials & managers, professionals & technicians, and associate professionals was the highest among all occupations. The average daily wage of skilled agriculture and fishery workers & elementary occupation workers was lower as compared to other occupations (India Wage Report, 2011-12). During the phase of high economic growth i.e.1993-94 to 2005-09, wage earnings increased for professional and administrative category workers in urban areas leading to the highest level of wage inequality among those categories of workers (Mehrotra et al., 2014). Workers who are neither skilled nor able to work in formal sectors moved to the informal agriculture sector because of sufficient wages (Acharyya & Marjit, 2000). The Gini coefficient for a skilled agriculture and fishery worker was recorded to be 0.409. At the same time, clerical and trade workers, skilled agricultural labour also face wage discrimination. Despite a consistent rise in the overall wage level, overall wage inequality has increased by 9 percent. However, due to increasing participation of females in managerial occupations, wage inequality has started declining (Moore, 2018). The share of employment growth and wage earnings of IT professionals and construction workers was increasing during 2004-11 (Khurana & Mahajan, 2020). Because of technological changes, the employment has shifted towards sectors which are education and female intensive and away from manufacturing sectors (Chiswick, 1971; Ahuja, 2020).

The different type of occupational structure results in different levels of wages e.g. workers with risky and technical jobs are getting higher wages as compare to those who are working in less risky occupations as workers in highly risky occupations require specific skills (Madan & Goel, 2019; Madan & Mor, 2020). There is also a difference in performance and labour productivity of high and low skilled labour (Madan and Mor, 2020), which justifies wage differentials among occupations. Occupational distribution and skill endowment may be a reason of wage inequality across different occupational groups. On the other hand, wage inequality is also rising because of the lower wage rate paid to specific occupational groups (Mukherjee & Majumder, 2011). Wage inequality among occupations is also linked with social and legal barriers, which restricts the demand and supply of labour. If an occupation is providing

services of quality, it shows the strength of occupations and further, it affects the wage level of related occupations (Bol & Weeden, 2015).

H₀₁: Wage inequality does not exist across different occupational groups

2.2. Existence of Regional Wage Inequality

India is a country with a large territory with 29 states and 7 union territories and well known for its high levels of regional inequality. Different demographic characteristics, geographical variation and regional variations are part of the economic development, which makes the economic indicators more important. After economic reforms, regional disparities are increasing among Indian states. During 1991, the rich and poor region gap was 7:1, which increased to 11.1 in 2016. Poverty and inequality both increased in the post reform period along with the regional wage disparities. The growth in gross domestic product also became slow after 1991. Further, regional inequalities in the form of state domestic product also have increased among Indian states (Bhattacharya & Sakthivel, 2004; Aneja & Bishnoi, 2009; Aneja et.al., 2021). According to census 2011, states in eastern regions are considered as low-income states. Bihar, Jharkhand, Chhattisgarh, Uttar Pradesh and Madhya Pradesh are states with 50 percent migrant labour. Migrants labour is considered a major cause of wage inequality in these states (Pandey & Gautam, 2020). There is huge difference between the level of urbanisation among Indian regions. Ruralurban wage difference makes the condition worse and boosts wage inequality in eastern region states such as Jharkhand, Chhattisgarh and Odisha. Kanbur & Zhuan (2013) found an interrelation between urbanisation and Occupational Wage Inequality Amid Regional Diversity in India: A Nested Theil Approach of Decomposition

inequality. The low level of urbanisation in some regions makes the states poorer. More urbanised regions are richer as compared to less urbanised. Haryana is the richest state of India according to its per-capita state domestic product, which is five times higher than Bihar. Wages inequality and economic performance of a state are associated with each other. and wages are comparatively higher in highly developed states (Indian Wage Report, 2011). Wage inequality and consumption inequality both are interrelated. Consumption inequality is also increasing from the last decade. According to Chandrasekhar et.al., (2021) Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Uttar Pradesh, Odisha, Rajasthan and West Bengal are at the bottom in ranking in terms of consumption inequality.

H₀₂: Regional wage inequality does not persist in the Indian labour market.

3.1. Data Base and Sampling:

The principal data source of this study is the unit level data obtained from Periodic Labour Force Survey, 2017-18 (PLFS) launched by the National Statistical Office (NSO) in 2019. The survey covered 102113 households and enumerated 433339 workers. The present study has utilised information on 94460 wage earners engaged in different occupations, to estimate wage inequality across nine broad occupations groups. The International Standard Classification of Occupations-08 (ILO, 2012) has been adopted to categorize nine broad occupational groups. To estimate regional wage inequality for different Indian states, the study divides 29 states and 7 union territories into 6 different regions. Hereby, all states and union territories are classified into northern region, north-east region, eastern region, central region, western region and

southern region according to their political territory (Annexure 1).

3.2. Tools and Techniques:

The study has utilised Theil index, an important additive decomposable measure generalized entropy of measures of inequality, developed firstly by Henri Theil in 1967. An inequality measure is an additive decomposable, when it measures total inequality as summation of within-group and between-group inequality (Akita, 2003). The property of additive decomposability provides measurement of each occupation's contribution and other factor's contribution to the overall wage inequality (Beblo & Knaus, 2001). Even though both the Gini index and Theil index are sensitive measures of the generalised entropy index, the Gini index has a limited ability to tackle complex data and patterns related to inequality within and different groups/countries across under consideration (Conceicao & Ferreira, 2000). Hereby, the study utilised the Theil index to facilitate comparing levels of inequality in interest.

The values of the Theil index lie between '0' to '1'. When the value of the Theil index is '0', it indicates a situation of perfect equality, whereas the value '1' shows the situation of perfect inequality in resource distribution. The Theil index has properties which makes it a more powerful measure in comparison to other measures as it can calculate a complex pattern of inequality (Conceicao & Ferreia, 2000).

The Theil *T* index is defined as (Beblo &Kanus, 2001):

$$T(1) = \frac{1}{N} \sum_{i=1}^{N} \frac{y_i}{\mu} in\left(\frac{y_i}{\mu}\right)$$

In the above formula *N* stands for the size of population, y_i stands for individual income. μ is the mean income of the population. The Mean logarithmic deviation (MLD) is another measure of inequality as the Theil index. The Mean logarithmic deviation Theil *T(0)* can be used as an alternate measure of Theil *(1)*. Mean log deviation is also called Theil (L) index.

Theil *T(0)* is defined as (Henri Theil, 1967):

$$T(0) = Ta = 0 = \frac{1}{N} \sum_{i=1}^{N} in\left(\frac{\mu}{xi}\right)$$

MLD has its own properties as any other method of inequality e.g. when a distribution has zero and negative values, MLD remains undefined. It does not give us any defined maximum value. The calculation can only be done by replacing all the zero value with small values e.g. small income values. MLD doesn't have any upper limit as the Theil index.

3.2.1. Within and Between Occupational Group and Regional Inequalities:

When wages are distributed unequally within a specific occupational group/region this is called within-occupational group (within-regions) wage inequality. Theil's T(1) formula is applied to calculate within-occupational group wage inequality and the same is used to calculate inequality within different regions of India.

Theil's T (1) index is defined as (Beblo & Kanus, 2001)

$$T(1) = \frac{1}{N} \sum_{i=1}^{N} \frac{y_i}{\mu} ln\left(\frac{y_i}{\mu}\right)$$

When wages are distributed unequally between two and more groups this is called between-groups wage inequality. The study has selected nine broad occupational groups/

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six different regions.² for the analysis of wage inequality. T' formula (Conceição & Ferreira, 2000) has been applied to calculate betweenoccupational groups/between-regions wage inequalities.

$$\begin{split} T' &= WOcc. 1 \left[log \left(\frac{WOcc. 1}{NOcc. 1} \right) \right] + WOcc. 2 \left[log \left(\frac{WOcc. 2}{NOcc. 2} \right) \right] + WOcc. 3 \left[log \left(\frac{WOcc. 3}{NOcc. 3} \right) \right] \\ &+ WOcc. 4 \left[log \left(\frac{WOcc. 4}{NOcc. 4} \right) \right] + WOcc. 5 \left[log \left(\frac{WOcc. 5}{NOcc. 5} \right) \right] \\ &+ WOcc. 6 \left[log \left(\frac{WOcc. 6}{NOcc. 6} \right) \right] + WOcc. 7 \left[log \left(\frac{WOcc. 7}{NOcc. 7} \right) \right] \\ &+ WOcc. 8 \left[log \left(\frac{WOcc. 8}{NOcc. 8} \right) \right] + WOcc. 9 \left[log \left(\frac{WOcc. 9}{NOcc. 9} \right) \right] \end{split}$$

$$T'' = WReg. 1 \left[log \left(\frac{WReg. 1}{NReg. 1} \right) \right] + WReg. 2 \left[log \left(\frac{WReg. 2}{NReg. 2} \right) \right] + WReg. 3 \left[log \left(\frac{WReg. 3}{NReg. 3} \right) \right] \\ + WReg. 4 \left[log \left(\frac{WReg. 4}{NReg. 4} \right) \right] + WReg. 5 \left[log \left(\frac{WReg. 5}{WReg. 5} \right) \right] \\ + WReg. 6 \left[log \left(\frac{WReg. 6}{NReg. 6} \right) \right]$$

T' formula is the weighted summation of wage share and logarithm of the ratio between wage and population of each occupational group and each region as well. Where 'WOcc.' stands for wage share and 'NOcc.' stands for population share. Similarly, for the calculation of between-regions inequality 'WReg.' stands for wage share and 'NReg.' stands for population share. 'Population shares' and 'wage shares' are compared with each other. If both shares are equal, it shows perfect wage equality and if the shares are different from each other, it shows different levels of wage inequality.

4. Results and Discussion:

4.1. Occupational Wage Inequality:

The distribution of wages among the population is an important indication of wage inequality. When each worker gets a similar share in overall wages, wages can be perceived to be equally distributed. The more the deviation from equal distribution, the larger wage inequality will be. Table 1 presents the share of wages and population in nine different occupational groups. Workers engaged in elementary occupations (Occupation 9) have the lowest 6.32% wage share, whereas workers working in Skilled Agriculture Forestry and Fishery (Occupation

² Note-1: Managers (Occupation 1), Professionals (Occupation 2), Technicians and Associate Professionals (Occupation 3), Clerical Support Workers (Occupation 4), Services and Sales Workers (Occupation 5), Skilled Agriculture Forestry and Fishery (Occupation 6), Craft and Related Trades Workers (Occupation 7), Plant and Machine Operators and Assemblers (Occupation 8), Elementary Occupations (Occupation 9). Note-II: Indian regions are categorises as: Northern Region (Region 1), North-East Region (Region 2), Eastern Region (Region 3), Central Region (Region 4), Western Region (Region 5), Southern Region (Region 6).

Sr. No.	Occupational Groups	Wage Share (in percentage)	Population Share (in percentage)	Difference in Wage Share and Population Share (in percentage points)
1	Managers	13.68	10.15	3.53
2	Professionals	14.21	8.07	6.14
3	Technicians and Associate Professionals	11.52	7.77	3.75
4	Clerical Support Workers	6.5	4.43	2.07
5	Services and Sales Workers	15.13	16.15	-1.02
6	Skilled Agriculture Forestry and Fishery	15.47	23.81	-8.34
7	Craft and Related Trades Workers	9.05	11.50	-2.45
8	Plant and Machine Operators and Assemblers	8.12	8.97	-0.85
9	Elementary Occupations	6.32	9.15	-2.83

Table 1. Wage share and population share in nine broad occupational groups (in percentage).

Source: Authors' calculation based on data obtained from PLFS, 2017-18.

6) have the highest i.e.15.47% share in wages. As far as population share or labour force in each occupational groups is concerned, Clerical Support Workers (Occupation 4) have the lowest 4.43% population share, and workers engaged in Occupation 6 the highest i.e. 23.81% shares in work force in respective occupational groups. The share of wage is not equally distributed among the work force in varied occupations as shown in table 1, which makes it clear that 8.07 percent professionals (occupation 2) are getting a large share in wages i.e. 14.21 percent, in comparison to the work force in other occupations.

This indicates that professionals' wage level is at the higher side followed by technicians and associate professionals (occupation 3), managers (occupation 1) and clerical support workers (occupation 4). At another end, the highest difference between wage and population shares is witnessed among workers engaged in skilled agriculture

forestry and fishery (occupation 6). Herein, 23.81 % of the work force is getting only 15.47% share of wages. Despite the truth that the highest number of workers are engaged in agricultural activities, they are viably getting a lesser share of wage in comparison to workers in other occupational groups. The wage share of elementary workers, craft and related trade workers is also less in relation to the share of work force in these occupational groups. The difference in the wage share and work force share in plant and machine operators and assemblers (occupation 8) is lesser followed by service and sales workers. It indicates that the wage distribution among workers in occupation group 8 and occupation group 5 follows an equal distribution of wages. This makes us infer that the wage level of managers, professionals, technicians and associate professionals and clerical support workers is more in comparison to workers in other occupations as shown by the difference

in the wage share and work force in various occupational groups (table 1).

4.2. Within group wage inequality across broad occupational groups:

To measure wage inequality, at the outset, the average wage level in the wage distribution is defined. In second step, the ratio between individual wage level and the average wage level is computed and their logarithm values are defined. In the third step, the mean log deviation is computed by taking a summation of the logarithm of wages and thereafter it is divided by total number of 'N' and taking its negative to obtain mean log deviation. In the final step, the logarithm of wages is multiplied by the ratio of individual wage level and the average wage level and obtaining summation of the same. Theil index is obtained by dividing the summation obtained in the final step by total number of 'N. The Theil index thus obtained can never be negative. As a rule of thumb, equality between the share of wage and the working population indicates the absence of inequality and diversion from the equality leads towards wage inequality. Table

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2 presents the Theil index and the mean log deviation for wage distribution and represents within groups wage inequality in nine broad occupational groups as indicated by their respective mean log deviation and Theil index. There exists a perfect wage equality among groups when their values are zero. As their values increase, inequality in wage distribution within occupation also increases. Both measures belong to an individual mean family. Table 2 makes clear that the highest wage inequality is found among managers and professionals as indicated by the respective values of their Theil Index i.e 0.1311 and 0.1279. To put the same differently, 13 percent wage variation among managers and 12% wage variation among professionals is estimated.

The wage inequality is found to be the least i.e. 6.75 percent, among plant and machine operators and assemblers in comparison to other occupational groups. These results correspond with the difference between wage share and population share presented in table 1. The Theil (T) for overall within-groups wage inequality is found to be

Sr. No.	Occupational Groups	MLD (Theil L)	Theil (T)
1	Managers	-0.1374	0.1311
2	Professionals	-0.1438	0.1279
3	Technicians and Associate Professionals	`-0.1423	0.1211
4	Clerical Support Workers	-0.0893	0.0828
5	Services and Sales Workers	-0.1016	0.0991
6	Skilled Agriculture Forestry and Fishery	-0.0902	0.0861
7	Craft and Related Trades Workers	-0.1034	0.0960
8	Plant and Machine Operators and Assemblers	-0.0628	0.0675
9	Elementary Occupations	-0.0915	0.0925
	Within Groups Inequality	-0.1304	0.1306

 Table 2. Theil Index (Theil T) and Mean Log Deviation (MLD, Theil L) for Wage Distribution among Various Occupational Groups.

Source: Authors' calculation based on data obtained from PLFS, 2017-18.

0.1306, which indicates 13 percent variation in the wage level of workers working in broad nine occupational groups.

4.3. Between group wage inequality across broad occupational groups:

The existence of wage inequality in between broad occupational groups is a cause of important concern as it provides a comparative picture of various occupational groups in relation to various factors affecting the wage level of workers therein. Table 3 makes it clear that the highest wage inequality is found in occupational group 2. The contribution of professionals in the Theil index (0.0353) is found to be the highest. The reason behind wage inequality in this group is that it includes professional with diverged work profiles such as; engineers in the field of science, art and technology, professionals with computing skills, teaching professional, self-employed professionals i.e. doctors, lawyers, consultants etc, to perform a varied nature of work. Further, type of organizations e.g. Government and Non-government organisation also matters in wage distribution. It is observed that the non-government organisation pays higher wages to their professionals in comparison to non-government organisation (Ahmad, 2001; Ballou & Weidproad, 2003; Ner, 2011). Herein, the nature of work profile of professionals also matters. Further, some socio-economic factors such as; the work experience of workers, family status, stress bearing & handling abilities, risk seeking capabilities, critical thinking abilities, region etc. also affect interpersonal capabilities of workers making them work & respond differently at their workplaces (Cohen et.al, 2009; Jaffee, 1989; Chakraborty & Chakraborty, 2010; Das, 2012).

Plant and machine operators and assemblers contribute the least share in total, preceded by sales and service workers, craft and related trades workers in the Theil index as wage inequality is comparatively less in these occupational groups. Further, we can say that wage inequality is a prominent feature in the labour market as it indicated by the overall Theil index i.e 0.1586, signaling around 15 percent variation in the wage level of workers (table 3).

Theil index for between-groups wage inequality is found to be 0.028, which is much smaller than within-groups (0.1306). The Theil index for between groups is the summation of contribution of different occupational groups. It indicates that within-groups wage inequality is the main contributor in overall wage inequality. *This provides a sufficient reason to refute our* 1st maintained hypothesis of no-existence of wage inequality across various occupational groups in the Indian labour market.

Hereby, appropriate measures need to be adopted to reduce the wage inequality. Similar studies (Wood, 1997; Ahmad, 2001; Machin, 2002; Ballu & Weidproad, 2003; Cohen et.al, 2009) in this line have suggested that government policies such as; constitutional provision for inequality removal, vocational training and labour awareness programs, different public employment policies for nutrition, health and education may be helpful in reducing the level of wage inequality. The strong legal regulatory framework for the labour market may be helpful in improving the dynamic of wage inequality and protect the rights of workers to make them less vulnerable to exploitation.

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Wage Population Log Contribution to **Broad Occupational Groups** Ratio Ratio Wage Theil Index Managers 0.137 0.102 0.128 0.0175 Professionals 0.142 0.08 0.249 0.0353 Technicians and Associate Professionals 0.115 0.078 0.168 0.0193 0.065 0.044 0.169 0.01 **Clerical Support Workers** Services and Sales Workers 0.152 0.162 -0.027-0.0041 Skilled Agriculture Forestry and Fishery 0.154 0.238 -0.189 -0.029 Craft and Related Trades Workers 0.09 0.116 -0.11 -0.009 Plant and Machine Operators and Assemblers 0.082 0.089 -0.035 -0.002 **Elementary Occupations** 0.063 0.091 -0.159 -0.01 0.028 Between Group Theil Index Within Group Theil index 0.1306 Within + Between Groups = Total Theil Index 0.1586

 Table 3. Between-groups wage inequality and contribution of various occupations in the Theil Index.

Source: Author's calculation based on PLFS, 2017-18.

4.4. Regional wage inequality across broad occupational groups

Significant wage inequalities exist in each region of India, but their extent varies from occupation to occupation. Table 4 makes it clear that the highest wage inequality is found among managers and professionals in each region. But, in the Eastern region the Theil index is found to be (0.1594) and (0.1656) for managers and professionals respectively. which shows the highest wage variation among both occupations in the eastern region. Herein, the Theil index is found to be (0.1404) among technicians and associate professionals in the central region, which is the highest among all. Further, managers and professionals both have 12% wage variations in the central region. In the southern region, professionals have the highest wage inequality. the Theil index is found to be (0.1339) among professionals. Further, managers and technicians & associate professionals both have 11% wage variation. Herein, the level of wage inequality is almost the same with 10% wage variation among professionals, technicians and associate professionals and services and sales workers in the western region. The Theil index is found to be (0.1097) for professionals, (0.1097) for technician and associate professionals and (0.1068) for services and sales workers.

A different observation provided by the Theil index indicates that the lowest level wage inequality is among plant and machine operators and assemblers in the eastern region. The diverse work profile of workers, type of organization, different level of economic development, diverse labour market conditions and different socio-economic factors are the main reasons behind the occupation wise regional wage inequality (Ahmad, 2001; Ballou & Weisprod, 2003; Marchand et.al, 2020). Along with occupational inequalities, regional disparities are also increasing in the Indian labour market. Table 5 shows wage inequalities among different regions of India.

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Table 4. Regional wage inequality across various occupational groups.

				R	EGION							
	Northern	Region	North-ea	st Region	Eastern	Region	Central I	Region	Western	Region	Southern	Region
Occupations	MLD	Theil	MLD	Theil	MLD	Theil	MLD	Theil	MLD	Theil	MLD	Theil
Managers	-0.1329	0.1306	-0.1161	0.1117	-0.1567	0.1594	-0.1396	0.127	-0.140	0.127	-0.1109	0.1109
Professionals	-0.1449	0.1296	-0.1091	0.0965	-0.1875	0.1656	-0.1317	0.1207	-0.119	0.1084	-0.1403	0.1339
Technicians and Associate Professionals	-0.1648	0.1343	-0.1117	0.0888	-0.1624	0.136	-0.1587	0.1404	-0.120	0.1097	-0.1185	0.1129
Clerical Support Workers	-0.0906	0.0798	-0.0690	0.0595	-0.1052	0.0983	0.0882	0.0832	-0.090	0.0894	-0.0812	0.0827
Services and Sales Workers	-0.1007	0.0981	-0.0833	0.0778	-0.1117	0.1103	-0.0957	0.0965	-0.102	0.1068	-0.0942	0.0954
Skilled Agriculture Forestry and Fishery	-0.1199	0.1002	-0.0581	0.0581	-0.0679	0.0643	-0.0787	0.0761	-0.083	0.0805	-0.0868	0.0816
Craft and Related Trades Workers	-0.0878	0.0804	-0.0830	0.0807	-0.1275	0.1263	-0.1128	0.1037	-0.098	0.0938	-0.1188	0.1043
Plant and Machine Operators and Assemblers	-0.0586	0.0627	-0.0501	0.0505	-0.0929	0.1101	-0.0474	0.0521	-0.057	0.0607	-0.0565	0.0577
Elementary Occupations	-0.0854	0.0840	-0.0714	0.0749	-0.1164	0.1246	-0.0936	0.0988	-0.083	0.085	-0.0847	0.0843

Source: Author's calculation based on PLFS, 2017-18.

Articles

Occupational Wage Inequality Amid Regional Diversity in India: A Nested Theil Approach of Decomposition

Articles

Sr. No.	Regions	Mean Log Deviation (Theil L)	Theil Index (Theil T)
1	Northern Region	-0.1344	0.1327
2	North-Eastern Region	-0.1153	0.1121
3	Eastern Region	-0.1412	0.1504
4	Central Region	-0.1454	0.1541
5	Western Region	-0.1156	0.1183
6	Southern Region	-0.1221	0.1219
7	Within Regions Inequality	-0.1304	0.1306
	Between Regions Inequality		0.003
	Total Inequality= Within Regions + Between Regions Inequality		0.1336

 Table 5. Theil Index for different regions of India.

Source: Author's Calculation based on data from PLFS, 2017-18.

In Table 5 the wage inequalities in different regions of India become clear. The Theil index within the eastern region and the central region is found to be (0.1504 and 0.1541) respectively, which is the highest among all. So, there is a 15 percent wage variation among the eastern and central region states. Inequality is concentrated in some lower income states. The eastern and central region of India have the highest number of lower income states e.g. Bihar, Jharkhand, West Bengal, Odisha, Chhattisgarh and Madhya Pradesh. Both the northern region and southern region are considered highly developed regions of India. The Theil index is found to be (0.1327) for the northern region and (0.1219) for the southern region respectively. This makes us draw the conclusion that regional wage inequality also exists in the Indian labour market. This provides us a sufficient reason to reject our second maintained hypothesis that regional wage inequalities do not persist in the Indian labour market. Similar studies (Bhattacharya & Sakthivel, 2004; Aneja & Bishnoi, 2009; Aneja et.al., 2021; Chandrasekhar et.al, 2021) have discussed that poverty and inequality are concentrated in some lower income states.

The difference in the level of urbanisation, inability in taking benefit from accumulation of economic activities, decreasing percapita state domestic product and migrant labour have been some cited reasons for the increasing regional wage inequality in India. The standard of living and urbanisation both are inter-related. The standard of living is also considered as an important aspect which can be helpful in changing inequalities over time (Kanbur & Zhuan, 2013). Government policies for increasing the productivity, labour welfare policies, education policies and increase in per-capita state domestic product can be helpful in decreasing the wage inequality among different regions. The developmental expenditure of the government can decrease disparities among states and regions. The expenditure on social services can be helpful for rural development vide improvement in the facilities of transport & communication in rural areas. Further, government should increase the expenditure on agriculture, health and education to improve the situation of these sectors. Government should focus on the successful implementation of agricultural and educational policies which further can

be helpful in decreasing the level of wage inequality among different regions of India (Aneja & Bishnoi, 2009; Aneja et.al, 2021).

5. Conclusion

The present study reveals that the Indian labour market is suffering from several imperfections, most of which are against economic equality. Wage inequality immensely effects the social fabric of a nation. The study highlights the existence of wage inequality within and between nine broad occupational groups and across all regions of India. After analysing various aspects of wage inequality, the study comes up with the conclusion that the highest wage inequality is among managers and professionals. The main reason for the increasing level of wage inequality is the diverged work profiles of managers and professionals with obligation to perform varied nature of work in different occupations. Furthermore, the regional set up of occupations is also responsible for wage inequality. Though managers and professionals have the highest level of wage inequality in each region, but professionals in eastern region have witnessed 16% wage variation which is highest among all. Herein, overall wage inequality is found to be the highest among the eastern and central region as indicated by the respective Theil index. Further, plant and machine operators and assemblers have experienced the least wage inequality in each region. Furthermore, the difference in the level of urbanisation, percapita income, state domestic product, socialeconomic conditions, transportation facilities, and state of natural resources are some of the cited reasons behind the existence of occupational wage inequality across various regions of India. Government policies to increase per-capita sates domestic product

and expenditure on social and economic development may be helpful in reducing regional wage inequalities. As wage inequality can severely damage the structure of the labour market which further serves as impediments for economic growth, government should adopt constitutional provisions to reduce wage inequality. Provisions for skill enhancement at the workplace can be helpful in raising the labour participation rate in high-paid occupational groups. Further, implementing appropriate wage policies by government can reduce the level of wage inequality.

Availability of data and materials: Unit level microdata has been obtained from the official website of the National Statistical Office (NSO), New Delhi, which is exempted from the individual consent of subjects.

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Annexure 1.

Regional Categorization and States Codes & Union territories codes.

Sr No	State Name	Region	State Code
1	Jammu and Kashmir		1
2	Himachal Pradesh		2
3	Punjab		3
4	Chandigarh		4
5	Utrakhand	Northern Region	5
6	Haryana		6
7	Delhi		7
8	Rajasthan		8
9	Uttar Pradesh	-	9
10	Arunachal Pradesh		12
11	Nagaland		13
12	Manipur	_	14
13	Mizoram	North-east region	15
14	Tripura		16
15	Meghalaya		17
16	Assam		18
17	Bihar		10
18	Sikkim		11
19	West Bengal	Fastern Degion	19
20	Jharkhand		20
21	Odisha	Central region	21
22	Andman Nikobar		35
23	Chhattisgarh		22
24	Madhya Pradesh		23
25	Gujrat		24
26	Daman and Diu		25
27	Dadar and Nagar Haveli	Western region	26
28	Maharashtra		27
29	Goa		30

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Sr No	State Name	Region	State Code
30	Andhra Pradesh		28
31	Karnataka		29
32	Lakshadweep		31
33	Kerala	Southern Region	32
34	Tamil Nadu		33
35	Pudducheri		34
36	Telangana		36

Source: NSSO 72nd round report.