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Disparity in occupational wages

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Abstract

Wage rate is a better measure of the well-being of workers solely dependent on wage income. Achieving a fair and balanced distribution of income is crucial to realising the Sustainable Development Goals of the United Nations Development Programme that aim to attain economic and social equality for all. The present paper aims to find the disparity in occupational wage structure of various sectors of Indian Economy. For this, ANOVA test and Tukey's Honest Significant Difference (HSD) test had been used. The study found that mining industry attracts highest wages. Moreover, study also find the significant difference in occupational wages of various sectors.

Keywords: Occupational wages, ANOVA, HSD test

Introduction

Ensuring decent work and inclusive growth through sustainable wage policies is a widely shared objective across many countries. The Preamble to the ILO Constitution calls for “the provision of an adequate living wage” and the ILO Declaration on Social Justice for a Fair Globalization adopted by the International Labour Conference at its 97th Session in June 2008 calls for wage policies which “ensure a just share of the fruits of progress to all, and a minimum living wage to all in need of such protection”. Achieving a fair and balanced distribution of income is crucial to realising the Sustainable Development Goals of the United Nations Development Programme that aim to attain economic and social equality for all.

But does workers doing similar work paid more in some industries than in others? This question has been an important one in labour economics for many decades. Slichter (1950) ^[6] was among the first to address this issue which revealed that the wage rates are different for unskilled laborers in manufacturing industries. There has been a global trend towards rising wage inequality. Rising wage inequality has been witnessed not only between workers of different skills but also among workers with the same skills. Since then many studies had been done by various stakeholders to examine the inter-industry wage differentials. Dickens and Katz (1987) ^[3] revealed that industry-effects account for 7%–30% of the variation in non-union wages and 10%–29% of the variation in union wage rates. These variations include decline in wages in import-competing industries and increase in exporting industries. The same result had been explained by Amiti and Davis (2012) ^[1] in their firm level analysis. Krueger and Summers (1988) ^[5] empirically tested and rejected classical competitive theories of wage determination by examining differences in wages for equally skilled workers across industries. Standard deviation was used as measure of dispersion in wages across industries which was highly substantial. Additional analysis found that the industry wage structure is highly correlated for workers in small and large firms, in different regions of the U.S., and with varying job tenures. Finally, evidence was presented demonstrating that turnover has a negative relationship with industry wage differentials. These findings suggested that workers in high wage industries received non competitive rents. Corley, Peradel and Popova (2005) ^[2] showed differences in wage growth across occupational groupings between 1990 and 2000. Wages increased faster in high-skilled occupations than in low-skilled occupations for both developed and developing countries. Although these findings do not show a deterioration of the wage position for low-skilled workers in any of these countries, but suggested that wage inequality widened between high- and low skilled workers during the 1990s. Gittleman and Pierce (2012) ^[4] aimed to assess the magnitude of inter-industry differences in pay using compensation microdata.

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It was found that the inclusion of benefits increases industry dispersion, as measured by the standard deviation of inter-industry differentials, by 16 percent when no controls are included and by an even greater 30 percent when controls are included. Tandon (2021) [7] studied the Inter-industry Wage Differentials in Indian Manufacturing sector. Persistent regularity was observed in industry-level wage rates confirming the absence of a convergence behaviour. Wage convergence was measured by standards deviations, coefficient of variation (normalised standard deviation), Gini coefficient, Atkinson index, and Theil index. Results showed that inter-industry wage rates do not appear to be converging. There is no tendency for wage rates in the low-wage industries to come closer to wage rates in the high-wage industries. However, unlike a vast body of literature on income convergence among countries, the inter-industry studies on wage differentials have received relatively less attention. The present study tries to fill this gap by focusing on occupational wages differentials.

Objectives of the study

1. To find the trend and pattern in occupational wage structure in various sectors.
2. To examine the disparity in occupational wage structure with regard to various sectors.

Data

The present study covers mainly three sectors which are manufacturing, mining and plantation sector. Six monthly data had been collected from July 2016 to January 2022. The data is secondary in nature which had been taken from department of labour bureau.

Research Methodology

Line Graph had been used simply to show the pattern of occupational wage structure over the time in various sectors. ANOVA test had been used to find out the disparity in occupational wages of various sectors. Beside this Post Hoc Tukey HSD (beta) had been used to assess the significance of differences between pairs of group means.

Analysis of data

Since wages are based on current market conditions and no two workers or jobs are exactly same, occupational wage data are only useful as a general indication for predicted wages of individuals. Bonuses, which are more strongly correlated with success of the individual and establishment, are not included in data on Occupational Wages. Table 1 shows the occupational wages received by workers by employing themselves in different sector.

Table 1: Showing the data of occupational wages of various sectors

	Manufacturing Sector	Mining Sector	Plantation Sector	All Sector
Jul-16	396.9	1377.8	169.9	493
Jan-17	404.9	1393.8	170.4	501.4
Jul-17	413.9	1440.1	177.9	514.5
Jan-18	423.7	1450.1	184.9	524.1
Jul-18	437.4	1471.5	196.4	538.6
Jan-19	445	1526.4	197.9	551.1
Jul-19	454.5	1540	206.9	561
Jan-20	475	1604.3	212.3	585.5
Jul-20	467.5	1574.6	213.2	576.1
Jan-21	513.3	1581.5	226.1	615.4
Jul-21	501.8	1571.8	214.7	604.1
Jan-22	524.2	1591	230	625.7
Average	454.84	1510.24	200.05	557.54
Std Dev.	42.5315	80.1487	20.6406	44.7087

It can be depicted from table 1 that all sectors are having different wage rate. Average wage rate is minimum in Plantation Sector, i.e. Rs 200.05 and highest in Mining Sector which is Rs 1510.24. Average wage rate of

manufacturing sector is Rs 454.84. The value of standard deviation is also high which shows the wide difference in wages of various sectors.

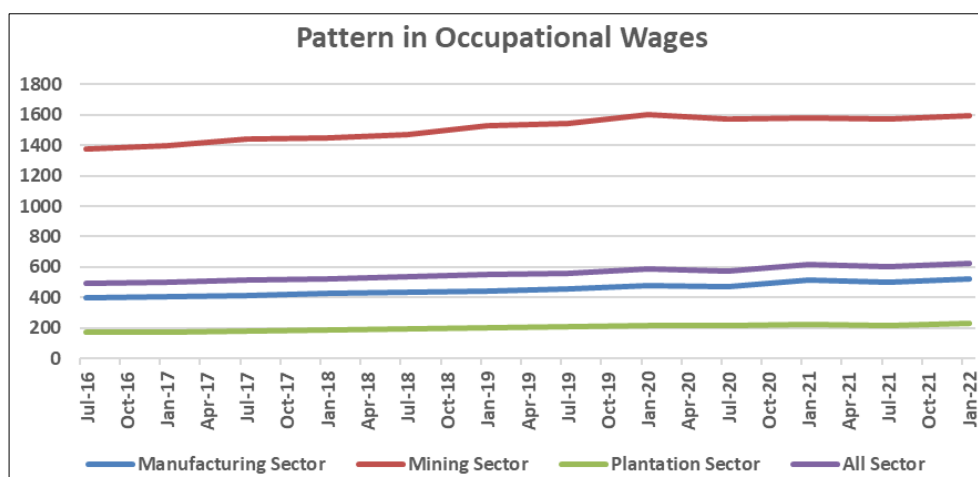


Fig 1: Showing pattern in occupational wages of various sectors

Figure 1 depicted that wage rate of all sectors showing slightly increase over the years where mining sector attracts highest wages. Wages for occupations such as mining laborers are generally higher than wages of laborers with

similar skill levels who work in other industries as Mining laborers have to perform physical labor in dangerous conditions. Thus, mine workers may be compensated for their unpleasant working conditions.

Table 2: Showing result of ANOVA

ANOVA Table				
Treatments				
Manufacturing Sector (T ₁)	Mining Sector (T ₂)	Plantation Sector (T ₃)	All Sector (T ₄)	Total
Result Details				
Source	SS	Df	MS	
Between-treatments	11824125.0856	3	3941375.02	$F = 1479.26598$
Within-treatments	117234.1575	44	2664.4127	
Total	11941359.2431	47		

Table 2 shows the result of ANOVA test. The f -ratio value is 1479.26598. The p -value is $< .00001$. The result is significant at $p < .05$. This shows that significant difference exist in wage structure of various sectors.

procedure facilitates pairwise comparisons within your ANOVA data. The F statistic (above) tells you whether there is an overall difference between your sample means. Tukey's HSD test allows you to determine between which of the various pairs of means - if any of them - there is a significant difference.

Post Hoc Tukey HSD (beta)

The Tukey's HSD (honestly significant difference)

Table 3: Showing result of HSD test

Pairwise Comparisons		HSD _{.05} = 56.2655 HSD _{.01} = 69.5466	Q _{.05} = 3.7760 Q _{.01} = 4.6673
T ₁ :T ₂	M ₁ = 454.84	1055.40	Q = 70.83 ($p = .00000$)
	M ₂ = 1510.24		
T ₁ :T ₃	M ₁ = 454.84	254.79	Q = 17.10 ($p = .00000$)
	M ₃ = 200.05		
T ₁ :T ₄	M ₁ = 454.84	102.70	Q = 6.89 ($p = .00008$)
	M ₄ = 557.54		
T ₂ :T ₃	M ₂ = 1510.24	1310.19	Q = 87.93 ($p = .00000$)
	M ₃ = 200.05		
T ₂ :T ₄	M ₂ = 1510.24	952.70	Q = 63.94 ($p = .00000$)
	M ₄ = 557.54		
T ₃ :T ₄	M ₃ = 200.05	357.49	Q = 23.99 ($p = .00000$)
	M ₄ = 557.54		

HSD test pairwise difference between two sample means. First pair is of manufacturing and mining sector which gives the Q value of 70.83. The p -value is .0000 which shows the significant difference between these two pairs. Second pair is of manufacturing and plantation sector which gives the Q value of 17.10. The p -value is .0000 which shows the significant difference between these two pairs. Similarly, third pair of manufacturing sector is with all sector which gives the Q-value of 6.89 with p value of .0008 which is significant at $p < .05$.

Next pairing of mining sector with plantation sector and all sector which gives the Q-value of 87.93 and 63.94 with p -value of 0.0000, hence significant. Last pairing is plantation sector with all sector which shows the Q-value of 23.99 with significant p -value. Thus, significant difference exists between all pairs of means.

Conclusion

The paper has a focus on the disparity in occupational wage rates across various sectors in India. The paper studied mainly three sectors: manufacturing, mining and plantation sector. The major objective was to find the trend and mainly difference in the wage structure of these sectors. For this,

secondary data had been taken from labour bureau department.

Results showed that mining sector attracts highest wages as compared to other sector wage rate. The main reason attributed to dangerous and hazardous nature of mining job. The result of ANOVA test showed that significant difference exist in wage structure of these sectors. After this, Post Hoc Tukey HSD (beta) had been used which showed significant difference exists between all pairs of means.

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