Original Research Article

Impact of Labour Laws on Wage Differentials between Formal and Informal Sectors: Evidence From the Indian Manufacturing Sector

Abstract

Labor laws in India have been a subject of contention since their inception. There are arguments against labor laws that say that an adherence tolabor laws push up the wages in the formal sector and reduce employability of the labor. A hike in labor cost makes capital relatively cheaper, causing an increase in capital intensivity of the production.This study is an attempt to show that labor laws are necessary and empirically proves that it is not the labor laws that create the wedges between the formal and informal sector wages. We econometrically test the hypothesis of there being a significant difference between wages in the formal and the informal sector and its correlation with existence of labor laws in the formal sector. The Oaxaca's decomposition technique is used to find out the difference in formal-informal sector wages that could be attributed to existence of labor laws. The results that we obtain show that 87 percent of the difference in wages between the formal and the informal sector is determined by the differences in income generating characteristics of the worker employed. We conclude that labor laws do not drive up the wagesartificially, they just make employment more secure and worthwhile for the worker. We also point out the importance of public investments in human capital creation, underlining the fact that it is these investments that can reduce various inequalities among the wages of workers across employments and sectors.

Key words: labor laws, wage decomposition, laborintensity, wage differentials

Introduction

Studiesoften allege that the stringent labor laws in India make the labor markets rigid, inducing the employers to employ higher capital-labor ratios in manufacturing than would be expected from a country of its level of development and factor endowments. Theses rigidities are said to increase wages, making labor expensive. As the labor becomes expensive the employer prefers hiring more capital, therebyincreasing capital-intensity of production and at the same time reducing employment of labor. The fore mentioned argument is often used as a case against labor laws.We, however, are of the opinion that need for labor laws arise from

the need to regulate the employer-labor relationship by giving workers a basic minimum level of protection. This is in recognition of the fact that labor has lower bargaining power as compared to the employer and in situations of conflict there is a need for the state to intervene. These laws provide the labor with the right to unionize and collectively bargain andputs in place a set of procedures and duties for both parties. At the same timeadherence to labor laws usually imply additional costs for firms. Eitherways, they influence wages, employment, resource allocation, and other aggregated variables such as GDP and growth estimates along with the overall levels of development of the economy.

We believe that labor and labor-related regulations should aim to increase social welfare. Since the law concerns two parties there are important dialectics that need to be addressed, especially if one party gains and the other loses we need to enter a cost benefit analysis.This study is anattempt to estimate how existence of labor laws impact employment generation ability of a firm. In case, adherence to labor laws led to a decrease in employment generation ability of a firm, firms in formal sector should be found to employ lesser labor per unit of output as compared to the informal sector firms and the differences in wages between the two sectors should reflect the wage differential that is said to be a derivative oflabor laws in. That is, when controlled for income generating characteristics of the workers and nature of work there should be a significant difference in wages between the two sectors.

In context we test the null hypothesis,

H_0: the difference between wages in the formal and the informal sector when controlled for income generating characteristics of the workers and nature of work,is systematically correlated with existence of labor laws in the formal sector.If critics of labor laws are to be believed, existence of labor laws should ensure higher wages in the formal sector and therefore the difference in wages between formal andinformal sectors should significantly depend on existence of labor laws and be independent of the other characteristics of workers and work.Testing empirically, we find that the difference in wages is systematically correlated with differences in income generating characteristics of the workers and therefore the null hypothesis is rejected in favor of the alternate hypothesis, H_A: that labor laws do not create a wedge in the wages of formal and informal sector if workers have similar income earning characteristics.

This paper in subdivided into 4 sections, introduction is followed by a review of literature that is a summary accord of studies and findings on similar issues, here we briefly trace the phases that manufacturing sector has been thru and the impacts of these changes on employment generation capacity of the sector.The following isa description of the

methodology used for the study, the procedure used for collecting data and details of the sample. The model used and the results obtained from regressing the wage functions on their characteristics are given in detail in the appendices to the paper. The analysis of results is done separately for the formal and the informal sector and duly explained and collated with other studies in the area. Conclusions form the last subsection of this paper.

Literature review

Manufacturing Industry in India has gone through various phases of development over the period of economic growth. Since independence,the domestic manufacturing sector has traversed from building the industrial foundation in 1950's and early 1960's, to the license–permit raj between 1965 to1980, undergoing a phase of liberalization in 1990's to the present phase of globalisation with opening up of the economy. India's economic growth in last three decades has been led by the growth of service sector. GDP growth during the first decade of the present century (1999-2000 to 2011-2012) averaged 7.3 percent per annum, slowing down substantially in the recent times.

Therole and importance of the manufacturing sector is significant in the structural transformation of an economy (Lewis, 1954). Since the 1990s, the manufacturing sector is no longer as important a driver of economic growth as it once was (Szirmai, 2015). According to Ghose (2014), "analysis of past experiences of economic development yields four important stylised facts about the structure of low-income economies and its evolution in the course of development." The first stylised fact is that, at low levels of per capita income, a very large part of the working population is engaged in agriculture, a small part is engaged in services and an even smaller part is engaged in manufacturing. Second stylised fact is that, at low levels of per capita income, output per worker is lowest in agriculture and highest in services. A third stylised fact says that as growth occurs and the per capita income rises, the employment share of agriculture steadily declines, the employment share of manufacturing moves along an inverted U-shaped trajectory and the employment share of services steadily increases, and the fourth stylised fact is that as growth occurs, labour productivity increases in all economic sectors but at different rates and that it always increases more rapidly in manufacturing than in services (Ghose, 2020).

Although India's gross domestic product (GDP) growth rate since independence has consistently increased, industry (including manufacturing, construction,etc) accounts for only 25 per cent of GDP (in 1950, it was 8 per cent). The manufacturing sector contributed only about 16 per cent in the GDP in 2017, stagnating since economic reforms began in 1991

(Mehrotra, 2020).Economists are more or less unanimous in the opinion that the organised manufacturing sector in India witnessed a long period of 'jobless growth' from the late 1980s (Nath, 2014). Various labour-intensive industries such as textiles and food products witnessed negative employment leading to large-scale retrenchment of workers.

Between 1995-1996 and 2001-2002, 13 per cent of the workforce lost their jobs.The trends in working age population growth and employment growth for men and women in rural and urban areas in the period between 2011-12 and 2017-18 show that the working age population grew by 115.5 million but the labour force grew only by 7.7 million and the workforce actually shrank by 11.3 million. This means there is a significant fall in the labour force participation rate[1] (LFPR) as well as workforce participation rate[2] (WPR), and a sharp rise in the unemployment rate(Nath & Basole, 2020).

Table 1 shows the share of manufacturing in value added and employment in India since the early 1980s. As can be seen, the sector has failed to expand by either measure. The share of employment of manufacturing sector has increased marginally during these 34 years of period and even there is slight decline in its share in the GDP of the country. The employment in organized manufacturing as a share of total manufacturing employment declined from 25.5 % in 1983 to 15.4% in 2004, however after that it increased to 27.5 %. It shows that the employment in the unorganized manufacturing sector has increased much more slowly compared to the organized sector (Thomas, 2018).

According to Kapoor, 2018 the capital intensity of production across the manufacturing sector has been rising over time. This means that capital-labour ratio has increased in capital-intensive as well as labour-intensive indsutreis. (Sen & Das, 2015). The higher capital intesnity of production is one of the reasons for the disconnect observed between employment and GVA growth as it has meant that fewer additional workers have been added to the manufacturing sector.Even within the organized sector, there has been a dramatic increase in the share of informal and contract workers and as per the most recent estimate, close to 60 per cent of workers in the organized sector are informal worker, and in the organized factory sector alone, the share of casual workers has increased from about 13 to 35 per cent between 1993-19944 and 2011-12 (Jha, 2016).

[1] Workforce Participation Rate (WPR): WPR is defined as the percentage of employed persons in the total working age population (individuals aged 15 years and above). It is usually considered a better indicator of conditions in the labour market compared to the Unemployment Rate (UR) as UR can also fall without an increase in employment due to individuals dropping out of the labour force. WPR is calculated for both the Usual Status i.e. considering the 365 days period preceding the survey, and the Current Weekly Status i.e. considering the 7 days period preceding the survey.

[2] Unemployment Rate (UR): UR is defined as the percentage of unemployed persons in the labour force (labour force includes those employed and those unemployed but looking for or available for work.

Based on the data of ASI,Basole & Narayan (2020) indicatea rising trend in the share of contract workers in India's organized manufacturing sector and this is despite labour laws prohibiting large firms from employing contract workers above a certain limit and in specific categories of jobs. It is seen that the share of small enterprises in total manufacturing employment has been smaller than that of large enterprises in the last decade. More significantly, the share of small enterprises in total employment has fallen over this period, while that of large firms has risen. It is evident that the trend growth rate of employment in small firms is significantly lower than that in larger firms. Importantly, net changes in employment and growth rates tend to hide a considerable amount of job creation and destruction. Although conventional wisdom on firm dynamics says that most job creation comes from small enterprises, recent literature has shown that job destruction is equally important in their case and this perhaps explains why these enterprises hardly grow over time (Li & Rama, 2012).

Economic growth in the second decade of 21st century has benefited industries that depend more on capital and professional employees as compared to those dependent on unskilled workers. Higher rates of growth of capital-intensive industries along witha general increase in capitalintensity of production over the decade,explains to a large extent, the small contribution of the manufacturing sector in employment generation.Ithas been shown that India uses more capital-intensive techniques of production in manufacturing as compared with countries at similar level of development and with similar factor endowments (Hasan et al. 2013). It is widely understood that India's rigid labor regulations and employment protection legislation has reduced the incentive of firms to hire workers on permanent contracts and pushed them towards adopting more capital-intensive modes of production.The rising capital intensity of production in India's manufacturing sector since 1980 is well established in the literature (Hasan, Robert, & Jandoc, 2012) (Das &Kalita, 2010).

The structure of employment in India has also changed over time, comparing the two periods of last 28 years between 1993-2002 and 2002- 2012 the employment growth shows a decline in the second period. The agriculture still employs 48 percent of total persons employed in 2011and is the largest employer, its share in GDP is just around 14 percent. On the contrary, services which employ just 29 percent of total persons employed, its share in GDP has reached almost 57 percent. In construction, though the share in employment increased more than three times but its share in GDP increased marginally from around 6.6 percent to around 8 percent indicating a low labor productivity growth.

Further, the growth in GDP and employment during the two sub periods is not uniform. GDP growth in the second sub-period is faster at 7.93 percent as compared to 5.69 percent in the first period of 1993-1994 to 2002-2013. The growth in GDP is led by services and manufacturing in the first period butis due to construction services and manufacturing in the second period. However, the growth in employment in the second period of 2003-2004 to 2011-12 is slower at 1 percent but is completely construction sector driven. Manufacturingand services both failed to absorb the labor which was displaced by agriculture (Aggarwal, 2016).It is because of this failure in expansion of jobs that economists have termed this phase as a 'job-less' growth phase. "Therefore, the concern of the Indian policy makers is two-fold; firstly, to increase the share of manufacturing in GDP and secondly, to create jobs such that increasingly displaced workers from agriculture get absorbed and that too in 'good' quality jobs. It is necessary because many of the jobs in India are in the 'informal' sector which is not as productive as the formal sector."(Aggarwal, 2016) According to the NSSO survey on Unincorporated Non-agricultural Enterprises (excluding construction) total employment in unregistered manufacturing increased from 34.8 million in November 2010 to 36.04 million in 2015-2016, a meagre increase of 1.24 million in five years. Perhaps the more important fact is that the rise in employment in the organized manufacturing sector was primarily driven by contractualization and in the un-organized segment, employment increase was accompanied by fragmentation of productive activities. The situation has further worsened because of demonetization and introduction of GST, causing suffocating effects on the un-organized segment of the economy that employs 92.8 per cent of India's workforce. (Roy, 2021)

In fact, the labor cost is not the only factor that gives competitive advantage to a firm(company?),it is also the most general component that a producer employs apart from other factors that are more specific to production. Rise in contractualization in the organized manufacturing is a response to rising laborcost,producers get increasingly reliant on tiny enterprises in the informal segment where wages can be pushed below the value of labor power, ensuring super profits for the entrepreneurs.Changes in labor laws and adoption of theLabor Code, 2020 is done with hopes of reducing the cost of labor. However,we fear that in the long run such policies will widen the gap between labor and capital income further. As a result of which, the effective demand will get depressed, ultimately leading to a decrease in the size of economy.

Methodology

This is a primary survey based study, conducted to find out the impact of existence of labour laws on difference in wages of respondents working in the formal and informal manufacturing sectors. This survey was conducted between December 2020 and August 2021 for 786 respondents, across sectors (400 from formal and 386 from informal sector of employment). Workers were randomly selected from a stratified set usinga mix of interview method and questionnaire method for collection of responses.A well-researched survey form questionnaire was designed for the purpose which was duly translated to Hindi for convenience of the respondents.We selected industrially dense areas for the purpose of data collection, a list of locations we collected the data from and the number of respondents interviewed at each of the location is given in Table2.

Table 3 shows the composition of sample, both by employment and by sex of the worker and table 4 shows the mean wage distribution of sample. Table 5shows the mean values of characteristics of the samplebringing to fore certain interesting facts; for instance, the mean age of workers is higher in the formal sector for male workers but is lower for female workers.This impliesthat female workers tend to drop out of employment at an early age. Average work experience is higher for the male workers in the informal sector, showing that themale workers join the informal labour force at a younger age as compared to their formal sector counterparts. The same holds for female workers though the difference in mean years of work experience is lower in this case owing to the fact that female workers in the informal sector tend to drop out early from the labour force. Further, workers across gender are found to be working longer hours in the informal sector as compared to the formal sector, this is because of the fact that the working hour norms are openly flouted in the informal employment. Also we see that levels of education are lower in the informal sector as compared with the formal sector.

Age has been found to be significant for the overall sample and for the informal job market. Square of age is also found to be a significant determinant of wages in both these data sets.Limits for work experience are between 33 years and 0 years and is higher for both genders in the informal jobs. Work experience is found to be a significant determinant of wages in the formal sector jobs. Hours worked per day range from 2 to 18, while in formal sector jobs the range is between 10 and 8; in case of informal jobs the maximum values are 18 for males and 15 for females.Education is found to be highly significant across categories, but for the exception of male workers in the unorganized sector. However, the slope

coefficient varies across categories, with that for males in organized sector being the highest (0.263920), indicating a wage increment of 0.2639 units for every subsequent category jump. This is followed by females in the organized sector (at 0.258471).Number of kids is a (negative) significant determinant of wages in the organized sector, data show that number of kids decrease with female employment and better female education.

Since labour laws are often held guilty of raising the formal sector wages above their equilibrium value thereby creating a wedge between wages paid to similarly skilled workers in the formal and informal sectors we try to empirically establish the exact percentage of wage differential that can be attributed to labour laws.For this purpose we use the Oaxaca model and use the Mincerian wage functions, the details and working of the model are given in the appendix. The basic wage of a workeris understood to be the wage received by a worker for working a normal week, in addition to which, a worker may receive payments for working overtime and other bonus payments. The basic wage plus these extra payments are considered to be the earnings of a worker. Analysis of results is divided by sector, significant variables differ for formal jobs and informal jobs and for males and females within the sectors. The results are reported separately for formal and informal sectors. It must be mentioned that the data/model have been duly tested for multicollinearity, heteroscedasticity and autocorrelation and results have been reported after necessary corrections.

Results and Inferences

Results and inferencesfrom theanalysis of data are discussed separately for the formal and the informal sectors. This is done to bring out the similarities and differences in nature of employment and the variables that determine the nature of this employment. The regression results are tabulated and attached in the appendix for reference.

Formal sector

Wage is found to be significantly and positively dependent on work experience, indicating that wages rise with an increase in work experience (table 6). This can be explained by considering an increase in work experience as being synonymous with increase in productivity augmenting characteristics. Wage is found to be significantly and positively dependent on levels of education, showing a positive return for higher education in the labour market.it is significantlyand negatively dependent on hours worked, showing that those earning higher wages need to put in fewer hours of work. This can be understood with reference to the celebrated backward bending labour supply curve. Wage being negatively related to hours worked show that people in occupations with low wages need to work for

longer hours as compared to people in occupations with higher wages. Marital status shows a positive relation, whereas the number of kids is negatively related to wages.Studying males and females separately do not alter inferences, though we see a difference in levels of significance for the variables and also find different sets of significant variables.

For male workers in the formal sector, wages show a significantly positive relation to work experience and educational levels whereas hours worked show a negative relation to wages.Levels of education shows a positive relation to wages and hours worked show a negative relation to wages.It is important to note that, while levels of education are found to be positively related with wages for both males and females in formal jobs, implying that higher education rewards both categories (though differently); work experience is found significant only for male workers, it can be said that jobs that require labour market experience or a long training period are significantly skewed in favour of male workers.

Informal sector

Wages in the informal sector are significantly dependent on age and square of age, while age has a positive coefficient, that it is for age square is negative, implying that wages rise with increase in age but only up to a certain point, beyond which they start falling (table 7). Wages show a positive relation to work experience which implies that an accumulation of work experience improves wage earning capacity of the worker. Hoursworked show a positive relation with wages; this implies that wages earned are dependent on hours worked. Education is found to have a positive relation with wages showing that better qualification earns better wages/ salaries.Further in case of informal jobs gender is found to be a significant determinant of wages, showing that female workers in informal jobs get lower pay as compared to their male counterparts for similar work.

For both female and male workers in informal jobs, it can be concluded that age is positively and square of age negatively related to wages of a worker. This is because a rise in age would also reflect increase in experience, contributing to greater efficiency and productivity of the worker and thus resulting in higher wages. On the other hand, square of age has a negative impact, in case of informal employment because advancing age is associated with poor health which lowers the work efficiency of the worker.Hours worked show a positive relation to wages earned for the overall sample this is because the proportion of informal sector jobs is greater, and so their trend would prevail.

For male workers in the overall sample, both work experience and education show positive relation to wages implying that wages rise with an increase in educational qualification and with a longer period of time spent in labour market, this can be understood as both these

factors increasing the efficiency and productivity of worker across jobs and sectors (table 8). Hours worked show a negative relation to wages showing that those in better paying jobs need to put in less hours of work as compared to those in lower strata of jobs. For female workers, age and levels of education show a positive relation to wages while age square is negatively related to wages. Educational qualification is a significant determinant of wages earned. A test was also run to check for the selection bias (table 9) and the error term was found to be systematically uncorrelated with the dependent variable.

Decomposing the wage difference between the formal and the informal sector is done to estimate the difference in wages as a result of labour laws. To meet this end, the first step is calculating the actual difference in wages earned by workers in the formal and the informal sectors, this wage difference is then decomposed into difference due to difference in wage generating characteristics and difference in wages due to labour laws (refer to appendix 2 for details). Final step is calculating the percentage of difference in the total wage difference that is attributable to labour laws. Wage difference as a result of labour laws when estimated for all independent variables is 17.5205 percent, after correcting for significant variables the bias falls to 12.25819percent. The results that we obtain in this study clearly show that almost the entire difference in wages between the formal and the informal sector is determined by the differences in income generating characteristics of the worker employed. The widely criticized labour laws are found to account for only 12.26percentof the wage differentials between the two sectors. The remaining 87.74 percentof the differences are wages are explained by differences in wage generating characteristics of the worker.

Income generating characteristics should be understood as any trait that helps a worker in earning income. These would be traits of education, skill, vocation, training, physical health of an individual, the willingness and/or ability to work etc., basically the human capital. When we say that workers who have more of human capital embedded, will earn higher wages we get a false sense of justice. It is false, because all the potential workers do not get an equal opportunity to acquire the said traits. It is mostly the workers who are stuck in low-paying, dead-end, informal sector jobs who are not able to get out of this vicious circle of poverty and remain trapped, generation after generation. It is rarely the lack of will to acquire these traits and more often the financial inability.

Though our results show that differences in human capital determine the differences in wages to a large part, we are worried that these differences in human capital are a result of the differences in wages to begin with. We agree that it is not the labour laws that push down the levels of employment but at the same time we point out that the wage differentialsdo exists

and are rapidly widening. On one hand, it comes as a relief to know that wage differentials between the formal and informal sectors can be explained by the way of differences, on the other hand we are worried that human capital is not easily available to be picked up by anybody who wants to pick it up. The fact that failure to acquire better income generating traits is systematically corelated with lower levels of income by default widens the income differentials.

Conclusions

Instead of arguing that the labour laws artificially peg up the wages of the workers and therefore discourage employment of more labour-intensive techniques, the questions we should be asking are will any reforms or changes in these laws be able to correct the skewed firm-size distribution in Indian manufacturing? What are the reforms doing to correct concentration of large firms almost entirely in the capital-intensive sectors? Will the reforms be able to produce medium and large scale firms in the labour-intensive sectors? Will reforms create more well-paid jobs in the economy? What are we planning to do with the multiple layers of regulation in the remaining two major-factor markets, labour and land that continue to discourage the growth of manufacturing in general and of unskilled labour- intensive products in particular. We are told that codification of labour laws has removed the multiplicity of definitions and authorities, without compromising on the basic concepts of employee welfare and benefits. It is expected that this code will make it easier for employers,both in the organised and the unorganised sector to understand and thereby comply with the code.However, there still are questions that need to be answered; for instance codification of labour laws is more of a consolidation of laws that retains most of the substantive provisions of the earlier laws.

Appendix 1

Model used

The model adopted in the study is a variant of the Oaxaca model and we use Mincerian wage functions, given as follows

$W_f = b_f X_f + U_f$ …. (i)

$W_i = b_i X_i + U_i$ ….(ii)

Where,

W – wages or average daily earnings, the subscripts f and I represent formal and informal sectors, respectively.

X – vector of measured characteristics of workers.

b – vector of regression coefficients, reflecting the returns that markets yield to a unit change in characteristics.

U – present the error term of the model

Though this model was originally used to find out the proportion of gender bias in wage differentials between male and female workers, we are using this model to find out the difference in the level of earnings between workers employed in the formal and informal sectors of the economy. Using Oaxaca's decomposition method, we can estimate the difference in wages between formal and informal sectors as follows:

$$D = \frac{\{W_f/W_i - (W_f/W_i)^*\}}{(W_f/W_i)^*}$$

To calculate the difference, we begin with Mincerian wage functions, usingproperties of OLS estimators, regression lines pass through the mean values of the variable so that

$$Wc_f = \beta_{ef} Xc_f \ldots \text{(iii)}$$

$$Wc_i = \beta_{ei} Xc_i \ldots \text{(iv)}$$

If workers in the informal sector receive the same returns as workers in the formal sector for their endowments of wage determining characteristics, then their average wage would be

$$Wc_i^* = \beta_{ef} Xc_{fi} \ldots \text{(v)}$$

This can be interpreted as the average informal sector wage that would prevail in the absence of wage difference. Subtracting equation (v) from (iv), gives the difference between average formal sector earnings and average informal earnings that would prevail if workers in the informal sector were paid according to formal sector pay structure. This difference reflects differences in endowments of wage generating characteristics, i.e.

$$Wc_f - Wc_i^* = \beta_{ef} Xc_f - \beta_{ef} Xc_i$$

$$Wc_f - Wc_i^* = \beta_{ef}(Xc_f - Xc_i) \quad \ldots \text{(vi)}$$

Subtracting (vii) from (x), yields the difference between the hypothetical 'endowment determined' informal sector wage and the actual wage. This difference reflects different returns to the same wage generating characteristics.

$$Wc_i^* - Wc_i = Xc_i (\beta_{ef} - \beta_{ei}) \quad \ldots \text{(vii)}$$

Adding (vi) and (vii)

$$(Wc_f - Wc_i^*) + (Wc_i^* - Wc_i) = \beta_{ef}(Xc_f - Xc_i) + Xc_i (\beta_{ef} - \beta_{ei})$$

$$Wc_f - Wc_i = \beta_{em}(Xc_f - Xc_i) + Xc_i (\beta_{ef} - \beta_{ei}) \quad \ldots \text{(viii)}$$

Equation (viii) reflects the overall average formal-informal wage gap. This has been decomposed into two components $\beta_{ef}(Xc_f - Xc_i)$, i.e., the portion attributable to differences in endowments of wage generating characteristics $(Xc_f - Xc_i)$ evaluated at formal sector returns 'β_{ef}'and $Xc_i (\beta_{ef} - \beta_{ei})$, i.e., the portion attributable to differences in returns $(\beta_{ef} - \beta_{ei})$ that formal and informal sector workers get for same endowment of wage generating characteristics 'Xc_i'. The later component is explained as being due to existence of labour laws in the formal sector.

Specification of wage function:

$$\ln W = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 x_5 + \beta_6 X_6 + \beta_7 X_7 + u$$

Where;

W= total wage per day (TWR)

X_1 = age in years (AGE)

X_2 = age square (AGE2)

X_3 = education in years (EDN)

X_4 = experience in years (EXP)

X_5 = hours worked (HRSW)

X_6 = marital status (MARST)

X_7 = number of kids (NKIDS)

X_8 = health dummy

X_9 = gender dummy

u = error term.

Specifications of control variables:

The wage rate is expected to be directly and positively associated with age of respondents; because a rise in age would reflect an increase in experience, contributing to greater efficiency and productivity of worker. On the other hand, age square should be negatively related as advancing age may lead to inefficiencies (especially in the informal labour market). Educational achievements are assumed to be positively related to the wage rate since higher qualifications are expected to result in better wages in the labour market.

Experience is again expected to be positively related to the wage rate as it increases the work efficiency and productivity of the worker; it is measured as the number of years spent by the worker in the labour market.

The hypothesized relation between hours worked, and the wage rate is negative because the higher the number of worked hours, the higher the labour supply and lower the wage payments.

The health dummy (1 for good health, 0 otherwise) is expected to be positively related to wages because it will again determine the efficiency and productivity of the worker. The gender dummy (1 for males, 0 for females) is also considered in the case of estimating wages for overall workers.

Working of the Model

Three different wage functions were set up for formal sector workers (W_f), informal sector workers (W_i) and an overall wage function. Natural log of wages (per day wage) was taken as the dependent variable; regressions were run to find out the significant determinants of wages. This exercise was performed in three stages, for instance, for formal-informal employment and overall employment; each stage was subdivided into male and female workers. A test was conducted to check for the selection bias in the data to rule out any possibility of selection error.

Oaxaca's decomposition technique was used to find out the difference in formal-informal sector wages that could be attributed to the existence of labour laws. The wage differential is calculated using the decomposition model

$$\ln W_f - \ln W_i = \beta_f (X_f - X_i) + X_i (\beta_f - \beta_i)$$

Following are the components estimated mean formal sector wages (W_f)are calculated as the summation of coefficients of formal sector characteristics multiplied by the average value of characteristics ($\sum \beta_f X_f$). Similarly, the mean of informal sector wages is calculated ($W_i = \sum \beta_i X_i$). The mean informal sector wages, when informal sector characteristics are evaluated at formal sector pay structure ($W^*_i = \sum \beta_f X_i$) are estimated by multiplying the informal sector characteristics with formal sector coefficients and taking a summation across characteristics. This represent the informal sector wage that would prevail in the absence of labour laws.

The next step is calculating the gross difference in wages ($(W_f - W_i) = \sum \beta_f X_f - \sum \beta_i X_i$) and decomposing it into the difference that may be decomposed into components that can be explained by difference in wage generating characteristics between formal and informal sector workers ($W_f - W^*_i = \sum \beta_f (X_f - X_i)$), and the component that goes unexplained and is attributable to labour laws, given by ($W^*_i - W_{fi} = \sum X_i(\beta_f - \beta_i)$).

The unadjusted informal to formal sector earnings ratio is calculated by taking the ratio of mean informal sector wages to mean formal sector wages ($\sum \beta_i X_i / \sum \beta_i X_i$). Similarly, adjusted informal sector to formal sector earnings ratio is calculated by taking the ratio of the mean of informal sector

wage evaluated at formal sector characteristics to the mean of formal sector wages ($\sum \beta_f X_i / \sum \beta_f X_f$).The final step is calculating the percentage of difference due to labour laws in the total wage difference. The entire exercise is undertaken twice (i) for all variables and (ii) for significant variables only.

Appendix 2

Toestimate the proportion of the difference in wages between these two sectors due to labour laws being in place.

Wage differential is calculated using the decomposition model.

$\ln W_f - \ln W_i = \beta_f(X_f - X_i) + X_i(\beta_f - \beta_i)$

Following are the components estimated;

Mean formal sector wages (W_f)are calculated as a summation of coefficients of formal sector characteristics multiplied by the average value of characteristics ($\sum\beta_f X_f$). Similarly, mean of informal sector wages is calculated ($W_i = \sum\beta_i X_i$). Mean informal sector wages when informal sector characteristics are evaluated at formal sector pay structure ($W^*_i = \sum\beta_f X_i$) are estimated by multiplying the informal sector characteristics by formal sector coefficients and taking a summation across characteristics. This is the informal sector wage that would prevail in absence of labour laws. Next, we calculate the gross difference in wages ($(W_f - W_i) = \sum\beta_f X_f - \sum\beta_i X_i$) and decomposing it into difference that can be decomposed into components that can be explained by difference in wage generating characteristics between formal and informal sector workers ($W_f - W^*_i = \sum\beta_f(X_f - X_i)$), and the component that goes unexplained and is attributable to labour laws ($W^*_i - W_i = \sum X_i(\beta_f - \beta_i)$). Unadjusted informal to formal earnings ratio is calculated by taking the ratio of mean wages ($\sum\beta_i X_i / \sum\beta_f X_f$). Similarly, adjusted earnings ratio is calculated by taking the ratio of mean of informal sector wage evaluated at formal sector characteristics to the mean of formal sector wages ($\sum\beta_f X_i / \sum\beta_f X_f$).

Appendix 3

Table 1: Share of Manufacturing (Organised and Un-organised) in Employment and Value Added in India (1983-2015)

Year	Employment	Value-added
1983	10.6	17.3
1987	12.2	16.8
1993	10.6	16.5
1999	11	15.8
2004	12.3	16.4
2011	12.6	16.1
2017	12.1	14.9

Source: Based on data in National Sample Survey Employment–Unemployment Surveys, various years; World Development Indicators, various years

Table 2: Areas in Delhi NCR where the survey has been conducted and break of the surveys at these locations

Location surveyed	Number of respondents surveyed

Khandsa, Gurgaon	85
Kapasheda, Delhi	57
Manesar, Gurgaon	60
IMT Manesar, Gurgaon	52
Wajirpur Industrial Area, Delhi	124
Bawana Industrial Area, Delhi	127
JehangirPuri, Delhi	90
SamaypurBadli Industrial Area, Delhi	79
Karawal Nagar, Delhi	112

	Overall			Informal			Formal		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
Absolute figures	500	136	636	400	90	490	100	46	146

Table 3: Composition of the sample by sector and sex of the respondent

Table 4: Mean wage distribution of the sample (in Rs)

Table 5: Mean values of characteristics of the sample

	Overall		Formal		Informal	
Characteristics	Xm	Xf	Xm	Xf	Xm	Xf
Age (in years)	28.754	27.608	32.3256	27.36486	30.6667	30.5893
Work experience (in years)	6.706	3.8903	5.5642	3.0642	9.1521	5.0089
Hours worked (number of hours worked per day)	8.983	7.949	7.4918	7.6622	9.3103	8.4107
Educational levels	4.138	2.655	5.8771	5.0541	1.9425	2.9286

Overall		Formal		Informal	
Males	Females	Males	Females	Males	Females
285.9263	268.7408	354.2344	351.1662	190.1379	159.8214

Table 6: Regression results for formal sector jobs

Variables	Relevant statistics
DEPENDENT VARIABLE: L wage	Mean 5.6667 S.D. 0.5794

INDEPENDENT VARIABLES[3]	Coefficient	Standard Error[4]
Age	0.0087	0.0332(0.2623)
Age squared	-0.0005	0.0005(0.9364)
Work experience* **	0.0737	0.0179(4.1151)
Hours worked***	-0.1189	0.0144(8.2336)
Educational Qualification***	0.2252	0.0301(7.4857)
Gender	0.0814	0.0507(1.6048)
Health	-0.1209	0.1390(0.8694)
Marital Status***	0.3153	0.0936(3.3669)
Number of Kids**	-0.1127	0.0399(2.8242)
Religion	0.0115	0.0406(0.2818)
Rsq (AdjRsq)	00.7014 (0.6837)	
Fstat (P Fstat)	39.7157 (0.0000)	

Table 7: Regression results for workers in informal sector jobs

Variables	Relevant statistics	
DEPENDENT VARIABLE: L wage	Mean 4.933554	S.D. 0.691926
INDEPENDENT VARIABLES	Coefficient	Standard Error
Age**	0.0579	0.0271(2.1437)
Age squared**	- 0.0007	0.0003 (2.1374)

[3] Note: 1%, 5% and 10% levels of significance are shown by ***, ** and * respectively.
[4] t-stat in parenthesis,
the coefficients are reported and analyzed as antilog values.

Work experience**	0.0455 0.0232 (1.9639)
Hours worked*	0.0569 0.0169 (3.3735)
Educational Qualification**	0.1102 0.0394 (2.7994)
Gender*	0.3292 0.0948 (3.4728)
Health	-0.0305 0.1517 (0.2008)
Marital Status*	0.3152 0.1294(2.4349)
Number of Kids	-0.0558 0.0418 (1.3342)
Religion	0.0851 0.0731(1.1657)
Rsq (AdjRsq)	0.5773 (.5334)
Fstat (P Fstat)	10.8743 (0.000000)

Table 8 : Regression results across sample

Variables	Relevant statistics
DEPENDENT VARIABLE: L wage	Mean 5.423101, S.D. 0.683450
INDEPENDENT VARIABLES[5]	Coefficient Standard Error[6]
Age***	0.0659 0.0198(3.3329)
Age squared***	-0.0008 0.0002(3.3669)
Work experience	0.0127 0.0146(0.8706)
Hours worked***	0.0673 0.0128 (5.2519)
Educational Qualification***	0.1408 0.0304(4.6256)
Gender**	0.1666 0.0586 (2.8442)

[5] Note: 1%, 5% and 10% levels of significance are shown by ***, ** and * respectively.
[6] t-stat in parenthesis

Health	-0.0434 0.1224 (0.3547)
Marital Status	0.0837 0.0856(0.0977)
Number of Kids	-0.0726 0.0726(2.2424)
Religion	0.0527 0.0527(1.1660)
Sector of employment***	0.2455 0.0954(2.5734)
Rsq (AdjRsq)	0.57356 (0.58762)
Fstat (P Fstat	28.84363 (0.000000)

Table 9: Decomposing the wage difference between sectors

Component and equation	Significant variables (log values)	All variables (log values)
Mean formal sector wage: (W_f)	3.380104	3.4532
Mean informal sector wage: (W_i)	2.25378	2.309823
Mean informal sector wage evaluated at formal sector pay structure: (W^*_i)	4.450119	2.509849
Gross difference in wages: $(W_f - W_i) = \sum \beta_f X_f - \sum \beta_i X_i$	1.126324	1.143377
Difference in wages due to difference in wage generating characteristics (i.e. explained difference): $W_f - W^*_i = \sum \beta_f (X_f - X_i)$	0.988259	0.943352
Difference in wages as a result of labour laws: $W^*_i - W_i = \sum X_i (\beta_f - \beta_i)$	0.138067	0.200026
Unadjusted formal sector - informal sector earnings ratio: $\sum \beta_i X_i / \sum \beta_f X_f$	0.666778	1.4950063
Adjusted formal sector - informal sector earnings ratio: $\sum \beta_f X_i / \sum \beta_f X_f$	1.316563	0.726818
Percentage of difference in wage due to labour laws in total wage difference: $(\sum X_i (\beta_f - \beta_i) / (W_f - W_i)) \times 100$	12.25819	17.5205
Percentage of wage difference explained by difference in characteristics: $(\sum \beta_f (X_f - X_i) / (W_f - W_i)) \times 100$	87.74198	82.5058

Variables	Relevant statistics	
DEPENDENT VARIABLE: L wage	Mean 5.440602 S.D. 0.368467	
INDEPENDENT VARIABLES	Coefficient	Standard Error
C	5.440602	0.04958210 (9.7288)
RSD	0.058707	0.119881 (0.489708)
Rsq (AdjRsq)	0.004421	(-0.014015)
Fstat (P Fstat)	0.239814	(0.626324)
Inference: error term systematically uncorrelated with the dependent variable; log of wage.		

Table 10: Checking for selection bias

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