SHOULD YOU GET A HIGHER EDUCATION: THE TRADE-OFF BETWEEN EDUCATION AND WORK EXPERIENCE

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ABSTRACT

This paper seeks to theoretically explain the trade-off between individuals choosing an additional year of schooling over entering the labour force or vice-versa. To understand this, the theory of the 'wage schooling locus' is explored in the Indian context. The insights so derived help in analysing the relationship between net hourly wages and years of education; and net hourly wages and work experience (or tenure). Further, each of these analyses have been examined against the axis of gender. Based on the analysis, it was found that the wage-schooling locus holds true for higher levels of education. It was found that individuals with a three years Bachelor's degree should continue with their higher education pursuits. In terms of work experience, males who finish their Master's degree must work for more than 10 years to maximise their increase in wage. Moreover, the correlation of years of education and tenure is stronger for men than for women.

KEY FINDINGS

- The theoretical concave relationship between net wages and level of education, as given by the wage-schooling locus, is seen to empirically hold true for a higher level of education in India.

- Individuals who have completed a 3-year undergraduate degree are advised to study further in order to maximise their increase in net wages.

- Individuals who opt for a 4-year or a 5-year (16 or 17 years of schooling) undergraduate program should ideally enter the labour market after completing their degree as the marginal benefit of an additional year of work-experience is greater than the opportunity cost of studying for the additional year.

- From 15 years of education to 18 years of education the increase in wage rate for females is around 9.4%, whereas it is 213.9% for males. This indicates that females even after studying for an extra 3 years are not getting a significant increase in wage.

- A marginal increase in tenure relates to a large increase in wages initially, which begins to increase at a decreasing rate as the work experience increases.

- Males who completed a Masters' degree earn the maximum change in wages with respect to an increase in tenure (more than 10 years).

- The difference in correlation for males and females with respect to wages is more in relation to education than tenure. Hence, the gender wage gap is higher with respect to education than tenure.

1. INTRODUCTION

While imagining and pondering over a variety of concerns in the field of Labour Economics, the question of when do individuals decide when to stop schooling to enter the labour market creates intrigue. This question matters to many because every year fresh graduates decide between studying more or to start working. Does an additional year of schooling bring in more benefits for women than it does for men? Is there a theoretical/empirical way to effectively understand the answers to this question? In a quest for answers, the concept of '*wage-schooling locus*' often crops up. As the name suggests, this concept describes all the points of intersection between the supply of workers with a particular level of schooling and the demand for those workers (Borjas, 2013). Theoretically, the wage schooling locus is an upward sloping concave curve that highlights the quantity by which a worker's income would increase if he/she were to obtain an additional year of schooling (Borjas, 2013). This study seeks to empirically test '*the wage schooling locus*' in the Indian context and check if there is a stronger link between the additional year of schooling and income for women than men. In other words, the study aims to understand the nexus of gender, pay, education and skill levels of workers in the Indian labour market using WageIndicator salary survey for 2017 (K. Tijdens & T. Kabina, 2017).

2. LITERATURE REVIEW

The wage schooling locus looks at the relationship between the wages earned and the years of education. This shows that education is a criterion for the wage range a worker falls into. Huang (1999) reiterates the idea that education acts as a signal and a filtering device such that high ability workers are employed. It is established that an increase in education or seniority increases wages independently, but increasing seniority has little effect on wage differentials between workers with different levels of education (Huang, 1999). However, this study does not look at the wage differentials that an extra year of education has versus an extra year of work. Additionally, since this study was conducted in Taiwan, the applicability of this in India is not known.

Studies have also been conducted with India as the subject. For the cohort of 1983-94, it was noticed that the monetary returns to college level education significantly increased (Duraisamy, 2001). Also, while the monetary returns were higher for females up to secondary school, males had higher returns for higher secondary and college level education. This indicates that the gender pay gap exists even in entry level jobs where the new employees have little to no experience. However, this is a representation of education and job preferences of individuals over three decades ago. Therefore, it's validity in the current times is questionable.

The wage rate for a particular level of education also varies with gender. With greater levels of education, women are more likely to join the labour force (Bhalla & Kaur, 2011). However, this does not explore the link between the level of education and income of a woman because its area of focus is to understand the labour force participation rates. The results of this study are also supported by Garcia-Prieto and Gómez-Costilla (2017) who conducted a study on gender wage gap and education in Spain. They reported that the wage gap due to gender decreases with increase in education. The gap was reported to be 12% among workers with the lowest level of education and 7% in workers with tertiary education.

All the studies above have looked into the returns to education with respect to wage. However, there are certain gaps which need to be taken into account. First, is the context of study. This study aims to look at the Indian context in the twenty-first century. The data being used was compiled in the year 2017, which would automatically incorporate the changes in education and job trends among the different genders in the current times. Also, to account for the current choices made by most prospective workers, the study is going to focus on the masters level of education. Taking into account these gaps, it has been hypothesized that the wage schooling locus holds true in the current Indian scenario.

3. RESEARCH OBJECTIVES

- To observe, based on empirical evidence, if the theory of wage-schooling locus holds true in the Indian context.
- To ascertain if the change in wages due to the increase in years of education, is worth the additional years of education.
- To determine if there is a difference in the change in wages due to increase in education for men and women.

4. DATA AND RESEARCH METHODOLOGY

The 2017 Salary Survey (Tijdens & Kabina, 2017), dataset as published by the WageIndicator Foundation was used for this study. WageIndicator Foundation aims at creating labour market transparency for the benefit of all employers, employees and workers worldwide by sharing and comparing information on wages and Labour Law, as gathered by primary and secondary data collection and analysis. The variables chosen for this study are the highest level of education (educat1), net wages per hour (wagenehr), work experience (tenure) and gender (gender). Table 1 (See Appendix) contains description of the variables chosen. The approximate number of years an individual spends in his/her education was drawn from the highest level of education (educat1). The reason for selecting net wages and not gross wages was that individuals, while deciding whether to work or not, must look at the net wage that he/she might earn, and then ascertaining the opportunity cost of education with respect to that, take a decision whether to study or work. To see the change in the type of the variable and what they measure refer to Table 2.

Methodology

WageIndicator SalarySurvey Data of 2017 (Tijdens & Kabina, 2017) was used as the source of data. A comparison between the marginal increase in the wage rate with increase in years of education and increase in years of service was made. Interactions between two variables (for example, netwage and tenure) were observed while controlling for a third variable (for example, years or education). The results were then graphed and tabulated for analysis using statistical tools.

5. ANALYSIS AND OBSERVATIONS

5.1 Relationship between Net wages per hour and Level of education

The wage schooling locus is an upward sloping concave curve that highlights the quantity by which a worker's income would increase if he/she were to obtain an additional year of schooling (Borjas, 2013). Two variables are considered for the same: years of education (educat1) and net wages per hour (wagenehr). Eventually, gender as another variable is added to this analysis.

Table 5.1A. *Years of education and mean net wages per hour.*

Years of education	No. of observations	Mean net wages per hour [wagenehr] (Rs.)
12	55	164.88
15	192	255.36
16	249	953.17
17	40	589.88
18	348	617.66

Source: WageIndicator salary survey (2017-2019)

In Table 5.1A; categories with observations below 30 (0, 10, 14, 23 years of education) have not been considered as the results might be skewed. Similarly, in the tables we have considered individuals who earn at least net hourly wages of INR 25 and not lower than that. At the level of high school education (12 years), the mean net wages per hour are Rs. 164.88. As one moves to the bachelor's level [Three year degree (B.com, BBA, B.Sc, B.A. etc.)], one sees that the mean wage rises to Rs. 255.35. At 16 years of education, [Four/five years degree (B.E., MBBS, B.Arch, B.Pharm, LLB, etc.)], there is a drastic change in the net mean wages earnt: Rs. 953.16. At 17 years of

education, (CA/CS/ICWA or equivalent and Advanced certificate/diplomas) the mean net wages earnt drops to Rs. 589.88. At the Masters level [18 years of education (arts, science, engineering, commerce, MBA/equivalent)], the mean net wages become Rs. 617.65.

5.1.1 Marginal increase in net wages

Table 5.1B *Years of education and marginal mean net wages.*

Level of education (years)	Marginal net wages (in Rs.)
12	-
12+3	90.4774
12+4	697.8069
12+5	-363.2778
12+6	27.7703

Source: WageIndicator salary survey (2017-2019)

It can be seen that as wage rate increases, suddenly drops and increases again. Hence choosing to work after a 3, 4 or 5 years bachelor's degree instead of spending another year in education yields the highest return in terms of net wages.

If 17 (12+5), (CA/CS/ICWA or equivalent and Advanced certificate/diplomas) years of education is ignored under the assumption that people who pursue their bachelors in business administration, commerce, science and arts will not pursue CA, CS and ICWA at the same time, the net wage difference between passing high school and a bachelor's degree of commerce, business administration, science and arts is Rs. 90.47. On the other hand, the net wage difference between a similar bachelor's and master's degree (educat18) is INR. 452.77.

Hence a student who chooses to pursue a bachelor's degree in business administration, commerce, science and arts and does not simultaneously apply for

CA/CS/ICWA or equivalent and Advanced certificate/diplomas is better off completing his/her master's degree and then joining the labour force instead of starting to work after completing his/her bachelor's degree. The graph in figure 5.1 was drawn under the assumption that people who pursue their bachelors in business administration, commerce, science and arts will not pursue CA, CS and ICWA at the same time

Figure 5.1. Mean net wages per hour against years of education.
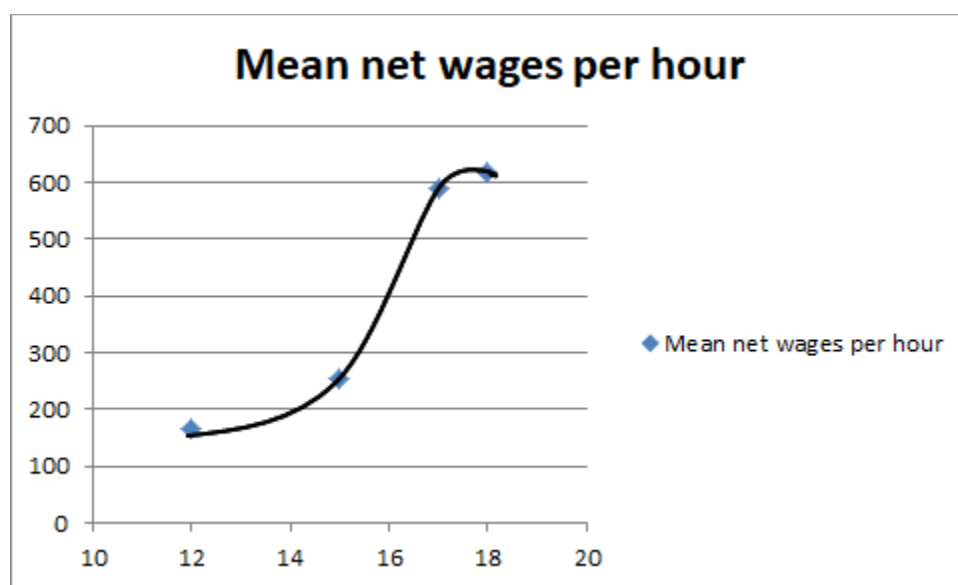
As shown in the above figure and the table the mean hourly net wages initially increase at an increasing rate as the number of years of education increase. After 16 years of education, it starts to increase at a decreasing rate and even decreases at some levels. Therefore, the wage schooling locus and the concave nature of the relationship holds true for these observations.

Since mean is often not always the best way to analyse a dataset, the findings based on that (Table 5.1A and 5.1B) were cross-checked by taking into account median. A new categorical variable (netwage) was used instead of wagenehr for net wages per hour for plotting the box plot. Here, the outliers were discarded to facilitate a better comparison.

Figure 5.2. Net wages for different years of education
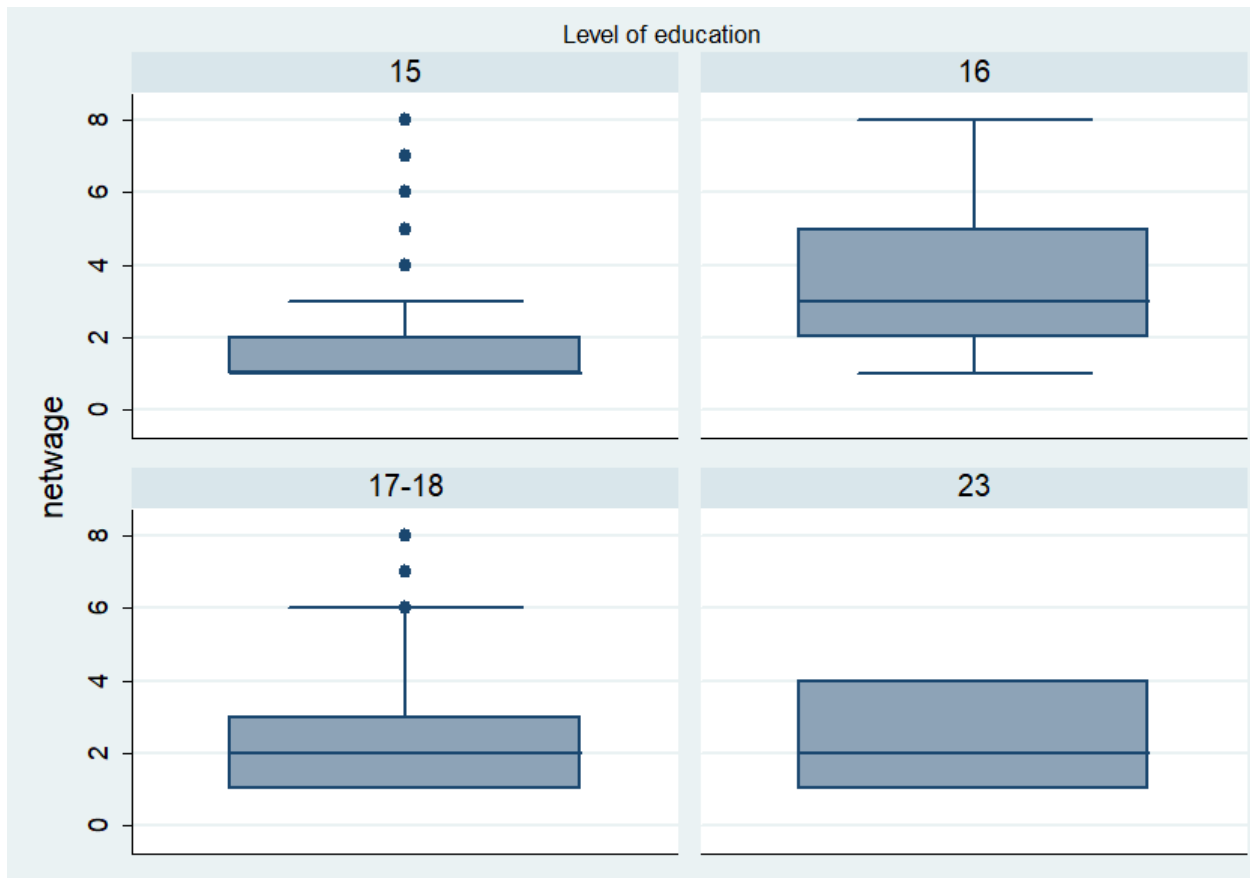
There is a big jump in the median value and the upper quartile as one moves from 15 to 16 years of education. At 17 and 18 years of education, the median decreases and there is a drastic change in the upper quartile. Since there aren't many outliers for level of education other than 15, the findings in the box plot are consistent with the inferences drawn by considering the mean values of net wages because mean subsumes the outliers too.

5.1.2 Analysis of the relationship between wage rate and education level on the basis of gender

Table 5.1C. The intersection of gender with mean net wage rate and education level.

Gender	Years of education	No. of observations	Mean net wages per hour [wagenehr] (Rs.)
	15	40	351.70
Females	16	35	1014.95
	17-18	117	415.92
	15	152	230
Males	16	214	943.05
	17	31	531.10
	18	240	722.55

Source: WageIndicator salary survey (2017-2019)

Individuals attaining 16 years of education earn a significantly higher wage than those with 15 years of education for both males and females. Hence, no significant difference in the male/female wage gap is observed on that front. Females who have attained 15 years of education (Bachelor's in arts, commerce, science etc) earn a higher wage than males who have completed the same number of years of education. Females also tend to earn marginally more than males for 16 years of education. However, females who complete Masters i.e. around 18 years of education earn significantly lower than males at the same level of education (Males and females earn a mean wage of Rs.

722 and Rs. 384 respectively). A possible reason for this might be the 'sticky floor' that holds women back where they continue with low paying jobs (Khanna, 2012).

From 15 years of education to 18 years of education the increase in wage rate for females is around 9.4%, whereas it is 213.9% (yes, you read it right) for males. This indicates that females even after studying for extra 3 years aren't getting a significant increase in wage. Therefore, it can be said that the opportunity cost of studying for those extra 3 years is higher than entering the labour market and getting 3 years of work experience. Hence, based on this dataset, females are better off entering the labour market after 15 years of education i.e. Bachelor's degree in arts, commerce, science etc.

On the other hand, the percentage increase is considerably high for males for a Master's degree. Therefore, their marginal benefit from studying outweighs the opportunity cost for the extra years given to academia. Hence, males with a 3 year bachelor's degree should ideally go on and complete their masters since there is a higher change in net hourly wage rate.

Table 5.1D. Correlation between highest level of education and mean net wages per hour

Correlation	
	Educat1 (highest level of education) and Wagenehr (net wages per hour)
All	0.09
Female	0.001
Male	0.121

Source: WageIndicator salary survey (2017-2019)

There is a weak positive correlation (0.09) which indicates that as the years of education increases, there should be an increase in the net wages earned by individuals. However, the correlation is a weak correlation which may be due to the years of

education being mutually exclusive. In other words, in the situation explored in this paper, an individual with 15 years of education wouldn't be able to acquire 16 years of education due to the nature of the degree they are pursuing. It should be noted that the correlation in the case of males is relatively stronger (0.121 as compared to 0.001). This highlights the gender-wage gap as it depicts that men receive higher wages for the same change in level of education than their female counterparts.

## 5.2. Relationship between Net wages per hour and Work Experience

The work experience or tenure of the individual also might impact the wage the individual earns at a particular level of education. To explore this, the number of years of education is controlled for to see how much of the change in wage is attributed to tenure and what is the result of the change in level of education. Following is the analysis of the effect of tenure on net wage per hour for 18 years of education (the Master's level).

Table 5.2A. Tenure and mean net wages per hour

Years of Work Experience [Tenure]	No. of Observations	Mean Net Wages per Hour [wagenehr] (Rs.)
0-5	181	289.56
5-10	181	308.06
More than 10	140	403.08

Source: WageIndicator salary survey (2017-2019)

From the summary statistics, it can be seen that the mean net hourly wages increase with increase in tenure. The mean net hourly wages increase at an increasing rate from 0-5 years to 5-10 years (~6.4%) and from 5-10 years to 10-20 years (~27.1%). It then increases at a decreasing rate (~6%). However, this could also be attributed to the huge disparity in the number of observations.

Figure 5.3. Net wages for different years of experience.
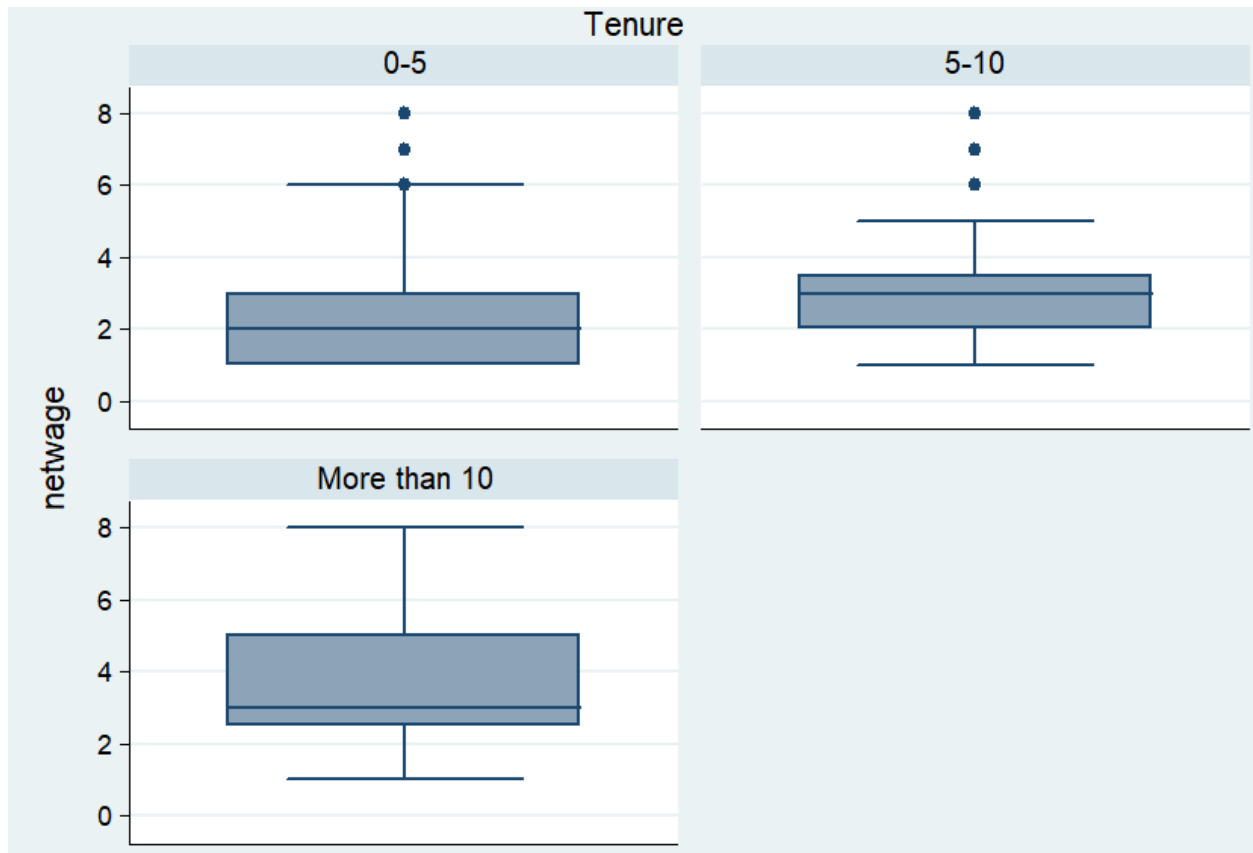
As stated above, since averages are often not always the best way to perform analysis, median was used to cross-check the inferences drawn from mean. The above boxplot shows the net hourly wage for different tenures with the highest education level being at the Masters level (17-18 years of education). It can be seen that the median net hourly wage increases. This also is consistent with our observations with respect to mean. Since, the analysis depends on the values of the mean wages, the outliers must be accounted for. As is visible in the box plot for 0 to 5 years and the 5 to 10 years bracket, there are a few outliers which could have skewed the results.

5.2.1. Analysis of net hourly wage rate and tenure for given years of education on the basis of gender

Table 5.2B. Mean net hourly wage rate and tenure with respect to gender

Gender	Years of Work Experience [Tenure]	No. of Observations	Mean Net Wages per Hour [wagenehr] (Rs.)	Percentage Change
Male	0-5	120	306.3451	-
	5-10	129	325.2544	6.17%
	More than 10	121	414.9683	27.58%

Gender	Years of Work Experience [Tenure]	No.of Observations	Mean Net Wages per Hour [wagenehr] (Rs.)	Percentage Change
Female	0-5	61	256.5445	-
	More than 5	71	266.47	3.87%

Source: WageIndicator salary survey (2017-2019)

It can be inferred from table 5.2B that for the same level of education, men earn (Rs.306) a lot more than women (Rs. 256) at the very initial level of tenure. In other words, the gender-wage gap starts from the very first job. The increase in tenure increases the wages for both females and males. However, the increase in wages due to increase in tenure is significantly greater for males than for females at all levels of tenure (27.58% vs 3.87%). Hence, unfortunately, the gender-pay gap continues to exist throughout all tenure levels.

Table 5.2C. *Correlation between tenure and net wages per hour*

	Correlation
	Tenure and Wagenehr (net wages per hour)
All	0.12
Male	0.159
Female	0.101

Source: WageIndicator salary survey (2017-2019)

It can be inferred that there is weak positive (0.12) correlation between tenure and net wages per hour. This means that as work experience increases, so do net wages per hour. For females, there is a positive correlation (0.101) between tenure and net wages per hour, while for males it is (0.159). Even if there is a marginal difference, this shows that as tenure increases, change in net hourly wage rate is higher for males than females.

6. CONCLUSION

This research paper attempts to empirically apply the theory of wage-schooling locus to understand if individuals should invest in additional years of education. As the analysis section no. 5.1 discusses, there is a positive correlation between years of education and the net hourly wages earned by individuals. In addition to that, the concave relationship of the wage-schooling does empirically hold true. It can also be concluded that individuals who have attained three years of graduation (B.com, BBA, B.Sc., B.A. etc.) must not enter the labour market and continue their education by completing masters, as significant changes in net hourly wages are observed if they do so. A lot of differences are not observed for individuals having completed 16 years of education (4 years of graduation) and 18 years of education (Masters+4 years of graduation). Therefore, joining the labour force after attaining either 16 or 17 years of education is a better choice for individuals pursuing those degrees. Furthermore, the correlation for males is stronger than for females. This, as indicated before, is a reflection of the gender-wage gap because men earn more than females for the same additional year of education. It must be noted that these correlations were generated by controlling for tenure.

This research paper also established a correlation between tenure (years of experience) and the number of wages earned by an individual. In the analysis, it was found that tenure and net hourly wages are positively correlated. Moreover, it was observed that a marginal increase in tenure relates to a large increase in wages initially. However, it begins to increase at a decreasing rate as the work experience increases. It was seen that males who completed a Master's degree earn the maximum change in wage with respect to an increase in tenure (More than 10 years). It was also observed that the difference in correlation for males and females with respect to wages is more in relation to education than tenure. Hence, the gender wage gap is higher with respect to education than tenure.

While this paper discusses a few interesting results, it has certain limitations. Firstly, the variable 'educat1' showed the degree that the individual has attained. Therefore, an approximation of the number of years of education with respect to the degree was done. Since, the length of education for certain degrees vary, there are chances of error occurring due to that. Secondly, the study looked at India and controlled for other variables which reduced the number of observations. Therefore, the number of observations were less than optimum. Lastly, the responses for males were significantly higher than females which could have skewed the analysis to a certain degree. However, this presents scope for further study and verifying the observations made in the study.

7. APPENDIX

Table 1. Descriptive Statistics

Variable	Label	Type	Lowest	Highest
Educat1	Highest level of education	Categorical	15	23
Netwage	Net wages per hour	Categorical	1	8
Wagenehr	Net wages per hour	Continuous	INR 25	INR 3000
Tenure	Work experience	Categorical	0	3
Gender	Gender	Binary	0	1

Table 2. Variable labels (as mentioned in the dataset), new labels, change in type of the variable, and what they measure.

Original Label	New Label	Change in Variable Type (if any)	Measures:
educat1			
356190	0		No Formal Education
356191	10		Below 10th Grade
356192	12		High School or Equivalent
356193	15		Three- year degree (B.A./ B.Sc./ B.Com./ BBA etc)
356194	17		CA/ CS/ ICWA or equivalent

356195	16		Four/ five years degree (B.E., MBBS, B.Arch, B.Pharm, LLB, etc.)
356196	18		Masters (arts, science, engineering, commerce, MBA or equivalent)
356197	17		Advanced Certificate/ Diplomas
356198	14		ITI/ Other Certificates
356199	23		PhD or Equivalent
356200	25		Post-Doctoral
wagenehr (in Rs.)	netwage	From continuous to categorical	
25-100	1		
100-200	2		
200-400	3		
400-600	4		
600-1000	5		
1000-1500	6		
1500-2000	7		
Above 2000	8		

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