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POOLED OLS AND FIXED EFFECT ESTIMATION OF WAGE STRUCTURE AND DIFFERENTIAL IN HANDLOOM SECTOR: CHOOSING THE BETTER METHOD

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ABSTRACT

This study analyzed the wage structures and differentials of weavers in the handloom sector taking pooled Ordinary Least Square (OLS) and fixed effect model. Within Assam, India, primary data was collected from Bodoland Territorial Area Districts (BTAD), both rural and urban areas in the years 2018 and 2021. The result estimated by using pooled OLS shows production, productivity, education, experience, training, and distance of weavers from weaving residence to have a positive impact on the wages of weavers. Age, distance of weaving, and location of weaving were found to have a negative impact on wages. However, the result estimated using panel least square (fixed effect) showed age and location of weaving to have a negative impact on wages. The study also chose the better method among pooled OLS and fixed effect model. Since the probability value the Wald test statistic is less than 0.05, the fixed-effect model is preferred to Pooled OLS.

Contribution/Originality: Previous studies on the wages of handloom weavers were analyzed mainly by multiple regressions considering cross-section data. The study deviates from others because it has considered panel data. The factors affecting the wages can be taken into account to enhance the livelihood of weavers.

1. INTRODUCTION

The understanding of wage differential is an important topic in the empirical study as well as in the labour economics to analyze wage relations and the characteristics of work (Basumatary, 2017). There are two aspects of wage behavior as given by the neoclassical model. First, as labour demand is determined by the value of the marginal product, productivity differences lead to wage differentials (Pindyck, Rubinfeld, & Mehta, 2006). Another aspect refers to the competitive market where free market forces ensures labour of the same quality is paid the same wage (Romaguera, 1991). The basic model that explains the wage differential is the efficiency wage model (EWMs). The efficiency wage hypothesis states that workers' productivity depends positively on their wages (Katz, 1986). In the neoclassical model, wages perform an allocative job by equating labour demand and supply. However, in EWMs it has an additional role that states that wages are also affected by the physical productivity of worker behavior. In the efficiency wage model, the firm may pay a wage to the worker that is higher than their marginal revenue product because paying a higher wage may lead to increased productivity or it may reduce costs associated with turnover (Romaguera, 1991). The compensating wage differential theory that goes back to Smith (1776), *The Wealth of Nations*, defines wage differentials as compensation for unpleasant working conditions. According to this theory, location and the geographical area also determined the wage structure (Smith, 1776). In some areas, higher pay is expected because the cost of living is higher in that area and it is necessary to compensate for a less pleasant working environment (Blackaby & Murphy, 1991). The theory also explains the differences in pay due to differences in jobs for a given worker. An important element of the theory is that non-wage aspects of undesirable occupations decrease the supply of labour for those jobs and a reduced supply of labour forcing the employer to pay higher wages to attract workers (Lauermann, 2006).

The handloom industry is an unorganized sector generating employment next to agriculture. According to Ministry of Textile, Govt. of India, 2021, this sector has provided employment to 35.22 lakh weavers and allied workers. Moreover, 15 per cent of cloth production and 343.69 million of total export valued is been contributed by this sector. In spite of its significant contribution, the industry has experienced a drastic fall in terms of the number of looms and people employed over the years (Hazarika, 2017). One of the main reasons for the decline of the handloom industry is the low wages, which were insufficient to cover their cost of living and to sustain their livelihood (Basumatary, 2017). Wage structure in the handloom sector depends on the nature of weaving. The weavers usually receive a wage for piece-rate (per piece) which depends on the complexity of design, quality, sizing, length of cloth and kind of loom used, etc. The wage structure of weavers in the handloom sector also depends on the different types of products and materials used. There are wage rate differences for different types of products in the handloom sector. The weavers are paid mostly on the basis of products they produced and are paid mainly by piece-rate/products rate. The piece-rate/products rate is the same for all weavers irrespective of caste, creed, gender and religion. However, there are some products for which payment is by the metre of cloth weaved. Wage rates are the same in the handloom sector in the study area but the differences in productivity, total production, work schedules, man-days, product types, etc. caused differences in monthly wage-earning.

1.1. Panel Data

Panel data analysis is a statistical method widely used to analyze data that are collected for multiple periods and over the same individuals or entities. The important models for modeling panel data are Pooled Ordinary Least Square (OLS) , fixed-effect model, random effect model and Feasible Generalized Least Square (FGLS) models (Wooldridge, 2009). However, the three commonly used panel analyses are the independent Pooled OLS regression model, fixed-effect model and random effect model. Pooled panel analysis assumes homogeneity of all sections in a panel data study and does not treat each section differently. There are no unique characteristics of individuals within the measurement set and no universal effects over time in pooled OLS regression. So, the intercept is assumed to be the same for different entities in pooled OLS regression. However, individuality among different cross-sections allows having its own intercept (the intercept may be different for the cross-sections), and heterogeneity is assumed in the fixed effect model with time-invariant. There are unique attributes of individuals that do not vary across time and are correlated with independent variables. The random effect model, known as the variance components model, is also a popular technique for modeling panel analysis. This method allows for heterogeneity and is also time-invariant, but the individual specific effect is uncorrelated with the independent variables (Adefemi, 2017). The different intercepts for different entities in the fixed and random effect model is because of randomness in selecting data, and those differences in intercept are captured by the RE model (Baltagi, 1985).

The study aimed to determine whether fixed effects or Pooled Ordinary Least Squares give better estimates for the panel data model in estimating parameters affecting wages of handloom weavers. Even though the random effect model is considered most the suitable model for n individuals (cross-sectional units), the study could not incorporate it because the study is confined to the data of the handloom industry in which only two cross-section variables are taken.

1.2. Estimation in a Panel Model

The panel model helps in understanding unobserved factors affecting the dependent variable as consisting of two types, i.e. those that are constant and those that vary overtime. Let i denote the cross-sectional unit and t the time period (Wooldridge, 2009), then the model is given by:

$$y_{it}=\alpha_o+\alpha_i\, x_{1,it}+\ldots+\alpha_k x_{k,it}+ w_i+ \delta_t+u_{it} \quad (1)$$

where,

y= log wage of respondents.

i=1,2……. 400, indicating the individual respondent.

t= 2018 and 2021, denotes time period.

x= denotes explanatory variables in the model.

α_k= coefficient/slope of independent variables.

w_i= captures an unobserved individual specific effect affecting y_{it}.

δ_t= captures an unobserved time-constant factors that affect y_{it}.

u_{it}= random disturbance term satisfying the assumption of zero mean and constant variance.

Since δ_t captures an unobserved time-constant factor, it is referred to as unobserved effect or fixed effect. Thus Equation 1 is called unobserved effect model or fixed effect model (Wooldridge, 2009). However, the effect of any time-invariant variable and the effect of any individual invariant variable cannot be estimated by the fixed effect (FE) model (Baltagi, 1985). FE estimation involves a transformation to remove the unobserved effect prior to estimation. The fixed effect transformation is called the 'within transformation', where its goal is to eliminate the unobserved effect because it is thought to be correlated with one or more explanatory variables. However, when w_i and δ_t are random variables with zero means and constant variance, and the unobserved effect is assumed to be uncorrelated with x's, then this model is known as the random effect (RE) model (Baltagi, 1985; Wooldridge, 2009).

2. DATA AND METHODOLOGY

2.1. Data

The study was based on primary data collected in the years 2018 and 2021. Within Assam, India, primary data was collected from two districts of Bodoland Territorial Area District (BTAD) from both rural and urban areas. From selected districts, eight (8) blocks, forty (40) villages, and forty (40) weaving centres were selected purposively taking into account the weaving activities. A total of 400 sample respondents were collected for the study and respondents were identified through simple random sampling. The variables collected from weavers were their monthly wages, production, age, experience, training, sex, community, location of weaving, distance of weaving from the main town, a distance of weaving from the weaver's residence, type of weaver's and marital status.

Table 1. Comparing monthly mean wages (Rs) among different groups of weavers.

Category of weavers		Mean	N	Std. Deviation	Min	Max
Type of weaver	Full time	4480.350	336	2029.910	4210 .830	12219.430
	Part time	2996.870	64	1143.640	2218.560	4350.870
Gender	Male	5448.520	136	2159.590	4582 .320	12219.430
	Female	3621.960	264	1574.520	4210 .540	10355.690
Community	STs	4285.570	264	1847.190	2218.560	11230.750
	Non STs	4590.290	136	2187.310	3500.380	12219.430
Marital status	Married	4368.450	168	2229.870	2895.210	9876.930
	Unmarried	4152.150	232	1797.250	2589.230	11978.740
Weavers	Kokrajhar	3848.500	200	1587.700	2218.560	10219.670
	Chirang	4537.500	200	2291.300	3498. 790	12219.430
Total		4243.000	400	1990.640	27560.660	10689.030

Source: Field study, 2018 and 2021.

2.2. Research Methodology

After estimation, Equation 1 can be written as follows:

$$\hat{y} = \hat{\alpha}_o + \hat{\alpha}_1 x_1 + \ \dots\dots\dots + \hat{\alpha}_k x_k$$

where, $\hat{\alpha}_o$ is the estimate of constant, $\hat{\alpha}_i$ are estimates correspond to explanatory variables.

3. DISCUSSION AND RESULTS

Table 1 shows that the monthly mean wage of full-time weavers is 1.4 times more compared to part-time weavers, male weavers earn 1.50 times more than female weavers, and non-scheduled tribes (Non-ST) weavers earn 1.07 times more compared to ST weavers and married weavers earn1.05 times more compared to an unmarried weaver. In the field survey, it was observed that as married weavers have more responsibilities for their family, they tried to maintain an income every month. District wise too, mean differences in earning was observed where weavers in Chirang earned 1.17 times more than weavers in Kokrajhar district. The reason for the differences in weavers' incomes is the differences in productivity, design, quality of products, etc. Higher earnings are achieved when productivity is higher. As calculated from the data collected from the primary survey, the productivity of males and non-ST weavers is higher than their counterparts by 0.087 metres per hour. Productivity of Chirang district is higher than Kokrajhar district by 0.022 metres per hour.

Full-time weaver's incomes are 5.25 times higher than part-time weavers. Although male weavers' mean income is more compared to females, the number of female weavers is 1.20 times greater than male weavers. The females of the region are born weavers and they traditionally know the art of weaving and are satisfied with the wage they get. Most males need to learn to weave, and the wage is also not sufficient to them, as they get lesser amount than the government structured minimum wage rate for unskilled labour so they prefer to move to other work. Comparing Scheduled tribes[1] (ST) and non-ST weavers, it was found that there are more ST weavers than non-ST. In the case of the of married and unmarried weavers, there are 1.38 times more unmarried weavers than there are married weavers. Wage structures of different products are clearly visible from Table 2. Most of the products, including common gamocha, bihuwan, mekhela, saree, dokna, bed covers, bed sheets, dhoti, scarfs etc., are rated piece wise/ product wise which again depend on the material used. However, products such as shirting and Than cloth are rated in metres wise/per metre. From the table, it is observed that common gamocha of size 135 cm x 62 cm, 54" x 25" of cotton, poly viscose spun is rated at a wage rate of Rs 30 to Rs.32 per piece and Rs. 45 per piece if it is of silk. From the above information, we can say that even if the weavers could weave 2 pieces of silk gamocha in a day, he or she would only get Rs. 90 a day, which is far below the minimum wage rate. When we observed the most important items like saree, mekhela and dokna, it was seen that, the cotton, poly viscose spun mekhela of size 250 cm x85-90 cm, 100"x 35" is rated a wage rate of Rs. 68 -Rs.72, and if it is of silk and muga they are at the rate of Rs. 125 and Rs. 180 respectively per product. In the case of cotton, poly viscose spun saree, the wage rate is Rs. 170 -Rs. 200 per piece, and for silk and muga Rs. 350 and Rs. 400 per piece respectively.When we observed the rate of dokna per piece, it was found that for cotton, poly viscose spun, the rate was Rs. 250 to Rs. 275. That means weavers are paid Rs. 250 to Rs. 275 for weaving cotton, poly viscose spun dokna. The rates for silk and muga dokna were a little higher at Rs. 300 and Rs. 350 respectively per piece. When we observed the wage received by weavers per piece and the minimum daily wage rate, it was found that it was only when weavers (in the case of dokna) could weave one dokna per day that their minimum daily wage rate was achieved. According to the minimum wage (in Rs. per day) for handloom and weaving establishments in Assam (with effect from Jan 1 2020), unskilled workers should get Rs. 344.08 per day, semi-skilled Rs. 401.45, skilled workers Rs. 501.83 and highly

[1] Article 366 (25) defined scheduled tribes (ST) as "such tribes or tribal communities or parts of or groups within such tribes or tribal communities as are deemed under article 342 to be scheduled tribes for the purposes of the constitution of India".

skilled workers Rs. 645.19 per day (Government of Assam, 2021). The table also showed the metres wise (per metre) rated products like shirting.

Table 2. Wage structure of different products in handloom sector of BTAD, Assam.

Items	Size	Materials	Product Rate	
			Piece rate (per piece, Rs.)	Per metre
Chaddar[2]	170 cm x 90 cm 108" x 40"	Cotton, poly viscose spun	Rs.110.00- Rs.130.00	-
		Silk	Rs. 200.00	-
		Muga	Rs.220.00	
Bihuwan[3]	175 cm x 40 cm 80" x17"	Cotton, poly viscose spun	Rs. 33.00	-
Mekhela[4]	250cm x 85-90 cm 100"x 35"	Cotton, poly viscose spun	Rs. 68.00 -Rs. 72.00	-
		Silk	Rs. 125.00	-
		Muga	Rs.180.00	
Common Gamocha[5]	135 cm x 62 cm 54"x25"	Cotton, poly viscose spun	Rs. 30.00 - Rs.32.00	-
		Silk	Rs.45.00	-
Saree[6]	5 mtr x 125 cm 220"x50"	Cotton, poly viscose spun	Rs. 170.00-Rs.200.00	-
		Silk	Rs.350.00	-
		Muga	Rs.400.00	-
Bed cover[7]	250 cm x 175cm 100"x 70"	Cotton, poly viscose spun	Rs. 95.00-Rs.150.00	-
Bed sheet[8]	225 cm x 150 cm 145"x90"	Cotton, poly viscose spun	Rs.100.00	-
Dokna[9]	330 cm x 130 cm 132"x52"	Cotton, poly viscose spun	Rs.155.00-Rs.275.00	-
		Silk	Rs.300.00	-
		Muga	Rs.350.00	-
Gent's Chaddar	270 cm x125 cm 100"x 50"	Cotton, poly viscose spun	Rs.90.00-Rs.110.00	-
		Blended cotton, poly viscose spun (hand spun)	Rs. 180.00	-
		Endi/eri (Hand spun)	Rs.200.00	-
Dhoti	450 cm x 120 cm 180"x 45"	Cotton, poly viscose spun	Rs. 130.00-145.00	-
Scarf [10]	175 cm x 100 cm 70" x 40 "	Cotton, poly viscose spun	Rs. 110.00	
		Orlon/wool	Rs.130.00	
		Endi/ eri (hand spun)	Rs.140.00	
Shirting [11]	Width 100 cm 40"	Cotton, poly viscose spun	-	Rs.28.00
		Endi/eri (Hand spun)	-	Rs.30.00
		Silk	-	Rs.35.00
Than cloth[12]	Width 90 cm 36"	Cotton, poly viscose spun	-	Rs.25.00
		Muga	-	Rs. 45.00
		Silk	-	Rs.40.00
		Blended with Cotton, poly viscose spun	-	Rs. 50.00

Source: Directorate of Handloom and Textile, BTAD, Assam.

[2] Chaddar: a cloth uses as shawl by women.

[3] Bihuwan: piece of cloth uses as a symbol of cultural pride by the Assamese culture in Assam. It is also used in ceremonies to facilitate guests and in other religious purposes too.

[4] Mekhela: An indigenous traditional garment worn by Assamese women, consisting of a length of cloth worn from waist to the ankles.

[5] Common gamocha: textile items with different function like wiping of body and face and used by males as a lower garment to cover the portion from waist to knee by tying it in waist. sheets.

[6] Saree: a garment that consists of long piece of cloth that women, particularly in the Indian subcontinent wear around their bodies.

[5]Bed sheet.

[7] Bed cover: used to protect our bed from stubborn stains, prevent any kind of liquid from spreading on the bed sheets.

[8] Bed sheet: piece of clothes made of different fabrics use to place between us and mattress or it is sheet to cover our bed.

[9] Dokna: Traditional attire wore by Bodo women in Assam. [8]Dhoti: a garment worn by male, consisting of a piece of material tied around the waist and extending to cover most of legs.

[10] Scarf: a long thin piece of cloth that wear around the neck.

[11] Shirting: material for shirt.

[12] Than cloth: roll fabrics for shirt and pants usually sold mitres wise.

Cotton, poly-viscose spun shirting of width 100 cm 40" is rated Rs. 28 per metre and silk and endi (hand spun) are rated Rs. 35 and Rs. 30 per metre. When we observed the rating of Than cloth width 90 cm 36", cotton, poly viscose spun, Than are rated Rs. 25 per metres, for silk, muga and blended with cotton, poly viscose spun Than are rated Rs. 40, Rs 45 and Rs. 50 respectively.

Table 3. Piece rate of different products of handloom weaving in BTAD based on field survey.

Type of product	Materials	Wage rate per piece	Wage rate per metres
1) Gamocha	Cotton	Rs. 60.00- Rs. 80.00	-
2) Chaddar with full design	Cotton	Rs. 200.00-Rs.300.00	-
3) Chaddar with only border design	Cotton	Rs. 150.00-Rs.200.00	
4) Chaddar with full design	Endi	Rs. 280.00-Rs.320.00	-
5) Plain Dokna (with starch)	Cotton	Rs. 150.00-Rs.200.00	-
6) Plain Dokna(without starch)	Cotton, polyester	Rs. 120.00-Rs.180.00	-
7) Dokna with border design (with starch)	Cotton	Rs. 180.00- Rs.250.00	-
8) Dokna with border design (without starch)	Cotton, polyester	Rs. 150.00-Rs.250.00	-
9) Dokna with full design (with starch)	Cotton	Rs. 300.00-Rs.400.00	-
10) Dokna with full design (without starch)	Cotton, polyester	Rs. 250.00-Rs.350.00	-
11) Dokna	Indi	Rs. 400.00- Rs.500.00	-
12) Aronai[13]	Cotton	Rs.200.00-Rs.300.00	
13) Scarf	Indi	Rs. 200.00-Rs.250.00	-
	Cotton	Rs. 150.00-Rs.250.00	
14) Stole[14]	Wool	Rs.100.00-Rs.200.00	-
	Cotton	Rs. 150.00-Rs. 250.00	
	Indi	Rs. 180.00-Rs. 250.00	
15) Wrapper[15]	Cotton	Rs.180.00-Rs 250.00	-
16) Maflar[16]	Cotton, wool	Rs.100.00- Rs. 250.00	-
17) Shirting	Cotton	-	Rs. 60.00
18) Kurti piece	Cotton	-	Rs. 80.00
	Indi/eri	-	Rs. 100.00

Source: Primary survey, 2018.

Table 3 shows the piece rate of different handloom products based on the field survey. From the primary survey, it was found that the weavers were paid equal wage rates for the same products, but different wage rates for different products. It was observed that among different weavers selected for the study, the piece/products rate slightly differs among different weaving sectors and they have been approximated in the table above. The weavers are paid Rs.60 - Rs. 80 (approximately) per piece for weaving cotton gamocha. Gamocha is a lower garment used by Bodo males and is commonly available in cotton materials. When we considered the product chaddar, it was found in different materials and designs. If the chaddar is designed only with a border and is of cotton material, the weavers received a wage rate of approximately Rs. 150 - Rs.200 per piece. If the chaddar is in the full design and is of cotton material, they received Rs. 250-Rs. 300 approximately. However, if the chaddar is of Indi materials with full design, they received a little higher wage rate, say Rs. 280 - Rs. 320. The weavers in BTAD were also observed to weave scarf, stole, wrapper, and mafler that were available in cotton, indi/eri and wool materials and in different colours. When we considered the scarf of indi material, we found the wage rate to be approximately Rs. 200 - Rs.250. If it was of cotton materials, the wage rate was Rs.150 -Rs. 250 per piece. In the case of wool stole, weavers were paid Rs. 100 - Rs. 200 per piece and for cotton and indi stole, they were paid approximately Rs. 150 -Rs.250 and Rs 180 -Rs.250 respectively. For the cotton wrapper, weavers were paid Rs. 180 -Rs.250 per piece based on the

[13] Aronai: it has great significance in Bodo culture. It is wore on neck as scarf and used to felicitate people with honour.

[14] Stole: a long wide scarf or similar covering worn by women usually across shoulders.

[15] Wrapper: a waist or hip length garment, fastening up the front usually used by women

[16] Mafler: a scarf worn around the neck for warmth

design, and for wool and cotton mafler, weavers received Rs. 100 to Rs. 250 per piece. From the field survey, some weaving centres were found producing cloth for shirting and for Kurti and are mostly in cotton material and indi materials. The shirting and Kurti cloth are rated in metres. It was observed that weavers were paid Rs. 60 per metre for cotton shirting and Rs. 80 for indi shirting. In the case of cotton and indi kurti, weavers received slightly higher wage rate per metre of say Rs. 80 and Rs. 100 respectively. The cloths for shirting are mostly found to be simple and plain, and in the case of kurti, simple as well as with minimal design. Now let us consider the product Dokna. It is found in various qualities with and without design, with starch or without starch. In BTAD, starch is used in most of the cotton dokna and this starch was extracted from rice powder or flour. The rice powder or flour when mixed with warm water creates a sticky paste and results in the thickening of the cotton yarns. Generally, before weaving the warp yarns are starched by soaking in liquid starch. The wage rate for cotton dokna with starch were observed to be more than the dokna without starch and the product price of dokna /cloth with starch were also observed to be more than without starch dokna in the study area. From the information collected in the field study, it was found that, the wage rate for plain cotton dokna with starch was approximately Rs. 150 -Rs. 250 and Rs. 120 to Rs.180 per piece without starch. When we considered cotton dokna with starch having full design, the wage rate to weavers was Rs. 280 to Rs. 350 per piece, and without starch it was Rs. 300 to Rs.400. The wage rates for indi dokna were found to be higher and are generally weaved with full design. The wage rate in the study area for indi dokna was approximately Rs. 400 -Rs.500 per piece in the study area.

Table 4. Estimated parameter of factors affecting wage of weavers using pooled OLS.

Variables	Coefficient	Standard Error	T Value	Prob.
Constant	3.243	0.102	286.637	0.000
Production	0.012	0.000	73.472	0.000
Productivity	0.021	0.000	38.571	0.000
Education	0.002	0.000	5.223	0.000
Experience	0.003	0.000	9.257	0.000
Age	-0.001	0.000	-6.351	0.000
Sex	0.042	0.005	8.406	0.000
Training	0.028	0.003	8.406	0.000
Location of weaving	-0.075	0.004	-4.691	0.000
Distance of weaving from weavers' residence	0.002	0.000	16.612	0.000
Distance of weaving from main town	-0.001	0.000	-4.198	0.000
R square =0.515 Adjusted =0.515 S.E of regression= 0.125 Sum squared residual=149.88 Log likelihood=6344.384 F- statistic=729.095 Prob(F-statistic) =0.000	Mean dependent Var=3.57 S.D dependent Var=0.179 Akaike info criterion= -1.983 Schwarz criterion= -1.965 Hannan- Quinn criterion=-1.972 Durbin- Watson statistics= 1.965			

Table 4 presents the estimated parameter of factors affecting the wages of weavers by using the method of pooled OLS.

Table 5 presents the estimated parameter of factors affecting wages of weavers by using panel least square (fixed effect method).

Table 6 presents the Wald test statistics for choosing pooled OLS and fixed effect model. The ideal measure of individual productivity is a measure of individual output (Serneels, 2005). In this study a weaver's monthly production is taken as output and productivity is calculated as the monthly production of weavers divided by hours worked in a day multiplied by days worked in a month. According to the estimated result, production and productivity are found to have a positive relationship with wages. An increase in productivity facilitates an increase in wages, and an increase in wages induces an rise in productivity (Patra & Nayak, 2012). An increase in productivity enhanced wages to weavers in both the districts of the handloom sector, which is evident from the field survey. According to Feldstein (2008) the wages paid by a competitive firm should rise at the same rate as the rise in productivity (Feldstein, 2008). The study found productivity differences among weavers that were determined by different factors such as differences in design, the types and quality of products, loom used and other human-capital and geographic factors. The study observed that products embedded with sophisticated designs needed more skill in the production process and also took a longer time compared to a product without a design.

Table 5. Estimated parameter of factors affecting wage of weavers by using panel least square (Fixed effect).

Variables	Coefficient	Standard Error	T-Statistic	Prob
Constant	3.313	0.046	71.447	0.000
Productivity	4.329	0.065	66.467	0.000
Production	0.012	0.008	15.480	0.000
Education	0.002	0.002	1.427	0.065
Sex	0.035	0.017	2.009	0.045
Age	-0.001	0.001	-1.425	0.154
Training	0.0223	0.018	1.233	0.218
Experience	0.003	0.001	2.021	0.043
Distance of weaving from weavers' residence	0.002	0.000	3.386	0.000
Location of weaving	-0.0763	0.020	-3.806	0.000
Distance of weaving from main town	0.000	0.001	0.252	0.800
R-squared= 0.5130 Adjusted R squared=0.500 S.E of regression=0.127 Sum of squared residual=6.279 Log likelihood=263.258 F statistic= 40.988 Prob (F statistic) =0.000	Mean dependent variable= 3.5700 S.D dependent variable=0.1797 Akaike info criterion= -2.5436 Schwarz criterion= -1.9876 Hannan-Quinn criterion=-1.9755 Durbin-Watson statistic= 2.2137			

Table 6. Wald test for choosing pooled OLS vs Fixed effect model.

Test Statistic	Value	Probability
F-statistics	3.114	0.045
Chi-square	6.228	0.044

The wages of weavers were found to be significantly affected by their experience, enabling them to increase their skill and knowledge in understanding the technique used to increase productivity. According to Light and Ureta (1995), almost half of the raw gender wage gap is accounted for by work experience (Light & Ureta, 1995). While analyzing the effect of education and experience, especially the differences in rural and urban labour markets in Thailand, Wannakrairoj (2013) found a significant relationship between wages and experience in both the rural and urban markets. It was also found that log earnings was a function of individual experience (Hartog & Gerritsen, 2016; Mincer, 1975). Further in another study, it was found that 4.2 percent of wage in urban areas and 4 percent in rural areas are raised by additional year of experience. However, for an additional 10 years of experience, the urban area effect on wage declines by around 0.049 percent and the rural area by roughly 0.054 percent. So, after certain years of experience, wages are found to diminish (Wannakrairoj, 2013).

The regression result shows a significant negative relationship between wage and the age of weavers suggesting a reduction in wage as weavers grow older. This is due to the fact that as the worker grows older, physical strength reduces, and since weaving needs strength there is a gap between productivity and wages. This finding is similar to the findings of Johnson 1993, where individual job performance and labour productivity were found to reduce from around 40 or 50 years of age (Johnson, 1993). The older individual is less productive, and the productivity variation over the life cycle is addressed with emphasis on cognitive abilities affecting labour market performance (Skirbekk, 2004). The educational status of weavers was found to be insignificant according to the estimated result using the fixed-effect model, which suggested wages of weavers were not affected by education.

Whether the weavers are less qualified or more qualified, it doesn't matter in the case of their wages. Weavers' wages are affected more by other social and economic factors (Bortamuly & Goswami, 2012). The dummy variable 'Training' was also found to be insignificant according to the fixed-effect model. There was no difference in wages of weavers for those who received training and those who did not. The number of weavers in our study who received training is relatively small, and the period of training is also short (not more than 3 months). No increase in productivity was observed between those who received training and those that had not. With a relatively small sample size we were unable to detect the effect of training on their wages.

While analyzing the locational factors, it was found that the distance of weaving from weavers' residence has a positive effect on wages, and the location of weaving has a negative impact (fixed effect model). To understand it fully, the distance of weaving from weavers' residence has been classified into three groups (up to 1 km, 1 to 5 km, and above 5 km). The slope of wages of more than 5 km is found to be more than the other two groups (up to 1 km and 1 to 5 km) and it is significant at a 1 percent level. It was observed from the primary survey that male weavers travel longer distances for their work and have also have higher wages than female weavers because they are more productive than their female counterparts. This could be one of the reasons for the higher slope of wages for more than 5 km of weavers' residence from weaving. The location of weaving has been categorized as weaving situated in rural areas and weaving situated in urban areas. In this case, the slope of coefficient for weaving situated in an urban area was also found to be more than the weaving situated in rural areas. Schultz and Mwabu (1998) also found that wages were 34 percent lower in rural areas than in urban areas for African men, whereas for African women rural wages are 30 percent lower after taking into account their education and experience, (Schultz & Mwabu, 1998).

The estimated result by using pooled OLS shows production, productivity, education, experience, training and distance of weavers from weaving residence to have a positive impact on the wages of weavers. Age, distance of weaving, and location of weaving were found to have a negative impact on wages. However, the estimated result by using panel least square (fixed effect) shows that only age and location of weaving have a negative impact on wages.

4. CONCLUSIONS

To choose whether pooled OLS or fixed effect model is better, the Wald test was done. The null hypothesis is that pooled regression is more appropriate than the fixed-effect model. If the significant value is less than 0.05 then we reject the null hypothesis and accept the fixed effect method and vice versa. The probability value according to the Wald test statistic shows 0.045 and 0.044 for F- statistics and chi-square respectively. In this case, the null hypothesis is rejected and we accept that the fixed effect model to be better than Pooled OLS.

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