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THE EFFECTS OF RELOCATION ON WAGES: A DECOMPOSITION ANALYSIS*

Asma Hyder

This article estimates the wage differentials between the natives and the relocated workers. Nationwide Pakistan Labor Force Survey 2005–06 has been used with a total sample of 10,401 working individuals. Two wage equations are estimated for those living in that area since birth or those who relocated during the last 10 years or so. Oaxaca-Binder methodology has been used for decomposition analysis. This decomposition analysis further helps to investigate the 'treatment' and 'endowment effect'. The overall decomposition results are in favour of native workers.

INTRODUCTION

Wage differentials between natives and migrants have received a great deal of research attention by modern labour economists since it helps to explain the *Human Capital Theory* and is also helpful in understanding of efficiency wage theories. Urbanization is taking place at a large pace and a remarkable geographical phenomenon (Clark 1998); opened many questions for economists, sociologists and ecologists to be addressed. Wage differentials play very important role when workers make a decision to remain at their place of birth or to migrate. Relocation of labour plays a critical role in modern market economies as well as in the developing economies where this mobility process is rapid and massive. The wage differential between the sending region and the receiving region is an important variable in explaining the determinants of relocation. Chiswick (1978) proposed

the assimilation hypothesis explaining that the wage disparities between natives and migrants are due to human capital endowment and temporary adjustment problems.

The structure of the article is as follows. The next section gives a glimpse of literature from Pakistan and the rest of the world. The third section presents the methodology. The last section, which follows the Results and Analysis section, concludes the study.

LITERATURE REVIEW

Substantial amount of empirical research during the past two decades indicate that in developing countries, migration from the rural areas is influenced by high rates of population increase, inequitable land distribution, inadequate rural employment opportunities and incomes and large differences in income and availability of utilities between urban and rural areas (Bilsborrow et al. 1984; Firebaugh 1979; Peek 1980; Shaw 1974).

Spatial mobility tends to help disadvantaged groups more than the rest of the population in finding employment (Wen 1976). As Long and Hansen (1979) ascertained, job-related reasons (taking new jobs, looking for work and job transfers) accounted for 47 per cent of the interstate migration of the households in the United States.

There are some empirical evidences available in the context of Pakistan and a few studies are discussed in this chapter. Irfan et al. (1983) investigated the direction of internal migration and concluded that internal migration in Pakistan is a rural-to-urban migration phenomenon. Irfan (1986) developed a linkage between internal migration and capital flows and remittances generated through relocation of labour. Ahmed and Sirageldin (1993) established that a relationship between variables like house/land ownership or strong family ties are not only the significant constraints in relocation of human resource but also increase the cost of relocation. Similarly it is also evident from many other studies that family structure plays a very important role in migration decision (See for example Harbison 1981).

The spatial distribution of population is influenced by the characteristics of the sending and receiving areas in terms of push and pulls factors resulting in rural–urban, urban–urban, rural–rural and urban–rural migration flows.[1] Khan and Shehnaz (2000) found that both education and training are directly related with the decision to migrate. The important finding was that the proportion of migrants is very high for those who migrate or relocate due to economic reasons than the non-economic reasons.

DATA

The data used in this article have been collected by Federal Bureau of Statistics, that is, Labour Force Survey 2005–06. The survey comprises of four provinces of Pakistan, tribal areas, military controlled areas and Azad and Jummun Kashmir. However, our analysis is restricted to only four provinces of Pakistan due to unsatisfactory peace conditions in rest of the areas, which may affect the results. The data set consist of only those individuals who were employed at the time of interview and reported their weekly wages. The total sample consists of 10,401 working individuals.

Variables and their construction

The variables included in the analysis are discussed briefly. The definition and statistics of all variables are given in Appendix A and B respectively.

Natives and Migrants. Our total data set is divided into two categories: natives and migrants. For this, all those who are living in that particular area since birth are considered as natives. All those individuals who relocated within the last 10 years or so are considered as migrants. There are 8,175 working native individuals and 2,226 migrants in the total sample.[2]

Hourly Wage. Hourly wage is used as a dependent variable for the analyses of both the natives and the migrants. As it is already mentioned above, our analysis is restricted only to those who were employed and economically active at the time of the interview. Labour Force Survey gives the information of weekly wages. However, we converted the weekly wages into hourly wages by dividing the weekly wages by 40.

Demographic Variables. Apart from 'Age' and 'Agesq', 'Head' of the household or not and 'marital status' are included in the analysis. However, data are restricted to those who are between 14 and 60 years of age. Among natives, 49 per cent of the individuals are the head of the household, but among those who relocated 59 per cent are the head of the household. This may show that those who are head of the household are more ambitious to get better opportunities and they are changing their place of residence.

Human Capital Variables. The model specifications include six educational categories and one training category. The lowest educational category is 'illiterate' and the highest educational category is 'degree', which includes all those individuals who have professional degrees, graduation in social sciences, art, humanities or higher education. Our data set contains 19 per cent with degree education, 10 per cent are intermediate, 22 per cent with matriculation and the rest are below it among the native individuals. Among those who migrated, 25 per cent lies in category 'degree', 10 per cent are intermediate and 18 per cent are matriculation and the rest are below it.

Residential Variables. To capture the residential effect we used the four residential categories and one urban/rural dummy. There is significant difference of magnitude between native and migrant residence. Among the proportion of natives, 56 per cent are in urban areas and the rest in rural areas. Among those who are migrants, 82 per cent are in urban areas. This stylized fact confirms that relocation in Pakistan is mostly rural to urban phenomena and a very little proportion of migrants relocated from urban to rural areas; a plausible explanation for this is that being in urban area provide many employment opportunities and individuals decide to relocate in search of new avenues. However, there are many studies including Anh and McNally (1997) which confirm that in case of *more developed provinces attracted higher volumes of in-migrants, whereas less developed provinces produced more out-migrants.*

Occupational Variables. Occupational variables include the nine categories defined by the Federal Bureau of Statistics, Islamabad. The highest proportion of natives lies in 'technical', 'service' and 'elementary' category. Almost the same trends are observed among those who relocated. The definitions of all these occupational categories are given in Appendix A.

METHODOLOGY

The basic model

In approaching the problem, the labour market is analysed and it is divided into natives and migrants. The first step of our analysis is to estimate the wage equation both for natives and migrants. For each worker *i*, wage in the *j*th sector of the labour market is given by[3]

$$W_{ij} = X_{ji}\beta_j + Z_{ji}\delta_j + \mu_{ji} \tag{1}$$

where W is a column vector of logarithmic values of hourly wages for individuals in both categories and

$j = 1$ if individual is native (living in the present location since birth)

$j = 2$ if individual is migrant (relocated during last 10 years or so)[4]

X_{ji} is a k × 1 vector of person specific explanatory variables; Z_{ji} is a q × 1 vector of other demographic variables, while β and δ are vectors of the unknown parameters. The error term $\mu_j \sim$ N (0, σ_j^2) and subscript *i* are for each individual.

Decomposition of wage differentials

The most popular econometric framework to measure unequal treatment in wages was developed by Blinder (1973) and Oaxaca (1973) in the context of gender.

According to this framework, discrimination or 'unequal treatment' is revealed by differences in the estimated coefficients. More specifically in the absence of selection effects, in our case we have the following earnings equations for natives and migrants,

$$W_{inat} = x'_i \beta_{nat} + \mu_{inat} \quad (2)$$

$$W_{imig} = x'_i \beta_{mig} + \mu_{imig} \quad (3)$$

where W_{nat} and W_{mig} is log of hourly wage for natives and migrants, respectively, and x is the matrix of observations on explanatory variables (demographic, occupational categories, etc., with observations on the same explanatory variables in each of the three groups) and βs are the least square estimates in three sectors of employment. The parameter x contains all the elements in X and Z.

A fundamental property of least square estimator is that the fitted regression plane passes through the sample means of the data. This implies that above equations can be written as

$$\overline{W_{nat}} = \bar{\chi}_i' \hat{\beta}_{nat} \quad (4)$$

$$\overline{W_{mig}} = \bar{\chi}_i' \hat{\beta}_{mig} \quad (5)$$

After taking the mean difference in the log wages and difference between the coefficient vectors in the three sectors of employment and then after some manipulation we can obtain the following expressions.

$$\overline{W_{nat}} - \overline{W_{mig}} = \overline{\chi_{mig}}(\hat{\beta}_{nat} - \hat{\beta}_{mig}) + \hat{\beta}_{mig}(\bar{\chi}_{nat} - \bar{\chi}_{mig})' \quad (6)$$

This allows the overall average differential in wages between the two sectors to be decomposed into two parts attributable to differences in productivity characteristics and attributable to differences in the estimated relationship between the natives and migrants (i.e., the differences in returns). These two components have been referred to as the 'unexplained' and 'explained' components; the 'unexplained' component is also referred to as the 'residual' component (see Blinder (1973) and Oaxaca (1973)). More recently, they have been labelled as the 'treatment' and 'endowment' effects, respectively.

Now if we just look on equation (6) the first part at the right hand side of this expression provides the average estimate of the natives' and migrants' pay gap adjusted for productivity characteristics. We could express the first part of expression (6) as

$$\Delta_{Umig} = \overline{\chi'}_{mig} \Delta \hat{\beta} \tag{7}$$

where $\Delta \hat{\beta} = \hat{\beta}_{nat} - \hat{\beta}_{mig}$ and Δ_{Umig} is an unexplained component in equation (6).

This approach is commonly referred to as the 'index number' approach, given its similarity to the calculation of index numbers. The use of an index number approach is subject to the famous 'index number' problem. Thus the expression (7) could be computed using the 'basket' of average characteristics of native workers. Under such circumstances we could re-express expression (6) as

$$\overline{W_{nat}} - \overline{W_{mig}} = \overline{\chi_{nat}}' (\hat{\beta}_{nat} - \hat{\beta}_{mig}) + \hat{\beta}_{mig} (\bar{\chi}_{nat} - \bar{\chi}_{mig})' \tag{8}$$

The first part of this expression could be expressed as

$\Delta_{Unat} = \overline{\chi'_{nat}} \Delta \hat{\beta}$ and it provides another estimate for the average adjusted natives versus migrant pay gap based on average native workers' characteristics. Given the 'index number problem', this may be different from expression (6).

RESULTS AND ANALYSIS

Wage equation estimates

The results of wage equations for natives and relocated workers are presented in Appendix C. Discussion on estimated results of wage equation both for natives and migrants are in order. Starting from human capital variables, all the educational categories have expected signs and magnitudes. The educational variables are significant and their magnitude increases with level of education. However, the estimated coefficients are higher in the wage equation of migrants. This finding supports the hypothesis that returns on education are higher for those who relocated, which may be because of investing in job search/job match. It is already mentioned in the data section that individuals with higher education are in larger proportion in the relocated sample, which also shows that education is important determinant for relocation initiative.[5] To capture the effect of experience, age and age square is used as a proxy; the estimated results confirm the inverted U-shaped curve for experience. The peak earnings occur at 56 and 54 years of age for natives and migrants, respectively. The estimated effect of head of the household is much higher for migrants as compared to natives. The estimated coefficients for those who are married have higher magnitude.

The wage equation also includes the nine occupational categories. Both equations present an approximately similar picture apart from the fact that the coefficients are higher in magnitude for migrants.

Decomposition analysis

The decomposition analysis presented in Table 1 reveals very important results. The negative sign of 'explained or endowment differentials' shows the better characteristics of the migrants; this finding confirms the earlier finding by Pernia (1976) and Portes (1976) in case of Philippines. This is quite obvious because those with better human capital variables and characteristics take the initiative to relocate. The treatment differentials have positive sign and are higher in magnitude; a plausible explanation of this result is that natives are well settled and well established and thus have higher return on their human capital and other characteristics, particularly in informal and private sector. Thus overall results are in favour of natives.

Table 1
Decomposition of Wage Equation

Wage Differentials	*Unexplained or Treatment Differentials*	*Explained or Endowment Differentials*	*Total*
$Y_{nat} - Y_{mig}$	0.40684	–0.1375	0.2693

Note: Y_{nat} denotes the log of hourly wage of natives and Y_{mig} denotes the log of hourly wage of migrants.

Conclusion

The study explores the effects of relocation on wages while using micro data from Pakistan Labour Force Survey 2005–06. The analysis adopts the Oxacca-Blinder (1973) methodology. The wage equations show that as the level of education increases, the estimated coefficients also increase both for natives and for migrant workers. Further, the decomposition analysis brings some important findings. The natives are the more advantaged workers as compared to their relocated counterparts. The decomposition analysis shows that treatment differentials are very high for natives; they are more settled in their working fields and thus are enjoying more wages. The differentials due to characteristics are more in favour of those who relocated but in a lower magnitude.

The study carries an important message for the labour market of Pakistan; the message is that those who are relocating have more human capital characteristics, which show their dissatisfaction at their original places. But once they relocate their earnings are lower as compared to natives. Although the study has few limitations, it opens many new questions and further research ideas to explore; First, there is need to identify those areas where outflows and inflows of work force are taking place in huge amount. Second important question is to find

out the reasons of relocation, although this study examines the determinants of wages for both categories of work force but this research can fairly be extended to find the reasons of relocation. Thirdly, the employment status of relocated workers (for example; formal or informal) as mentioned by Corden and Findlay (1975) and time period that migrants take to have equivalent wages of their native counterparts.

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Appendix A

Description of the Variables

Variable	*Definition*
Lnhw	Log of the hourly wage, when the wage is expressed in Rupees
Age	Age of individual in years
Nfe	= 1 No formal education; = 0, otherwise
Prim	= 1 if individual has completed his/her primary education but below middle; = 0, otherwise
Middle	= 1 if individual has completed middle school certificate but below matriculation; = 0, otherwise
Matric	= 1 if individual has completed matriculation certificate but below intermediate; = 0, otherwise
Inter	= 1 if individual has completed intermediate after matriculation but below university degree; = 0, otherwise
Degree	= 1 if individual has professional degree in engineering, medicine, computer and agriculture; = 0, otherwise
Train	= 1 if individual has ever completed any technical/vocational training; = 0, otherwise
Urban	= 1 if living in urban area; = 0, otherwise
Punjab	= 1 if individual resides in Punjab; = 0, otherwise
Sind	= 1 if individual resides in Sind; = 0, otherwise
NWFP	= 1 if individual resides in NWFP; = 0, otherwise
Baloch	= 1 if individual resides in Balochistan; = 0, otherwise
Gender	= 1 if individual is male; = 0, otherwise
MS	= 1 if individual is married; = 0, otherwise
Head	= 1 If individual is head of the household; = 0, otherwise
Manager	= 1 if individual lies in the category of 'Legislators, Senior Officials and Mangers'; = 0, otherwise
Professionals	= 1 if individual lies in category of 'Professionals'; = 0, otherwise

(*Appendix A continued*)

(*Appendix A continued*)

Variable	*Definition*
Technician	= 1 if individual lies in the category of 'Technicians and Associate Professionals'; = 0, otherwise
Clerk	= 1 if individual lies in the category of Clerks; = 0, otherwise
Services	= 1 if individual lies in the category of 'Service workers, Shop and Market Sales workers'; = 0, otherwise
Skilled	= 1 if individual lies in the category of 'Skilled Agricultural and Fishery Workers'; = 0, otherwise
Craft	= 1 if individual lies in the category of 'Craft and Related Trade Workers'; = 0, otherwise
Plant	= 1 if individual lies in the category of 'Plant and Machine Operators and Assemblers'; = 0, otherwise
Elementary	= 1 if individual lies in category of 'Elementary Occupations'; = 0, otherwise

Appendix B

Summary Statistics

	Natives		*Migrants*	
Variables	*Mean*	*STDEV*	*Mean*	*STDEV*
Age	33.4067	11.0270	38.0826	11.3184
Agesq	1237.59	781.0797	1578.33	867.473
Head	0.4892	0.49991	0.5902	0.49188
MS	0.67400	0.4687	0.7861	41.010
Primary	0.12293	0.3283	0.1105	0.3135
Middle	00.1149	0.3190	0.11185	0.31526
Matriculation	.2152	0.4110	0.1805	0.3847
Inter.	0.12207	0.3273	0.10197	0.3026
Degree	0.18911	0.3916	0.25067	0.4334
Training	0.03021	0.1711	0.0548	0.2276
Urban	0.5645	0.4958	0.8167	0.3869
Punjab	0.4437	0.4968	0.5035	0.50009
Sind	0.4184	0.49333	0.45417	0.4980
NWFP	0.1518	0.3588	0.1567	0.3636
Manager	0.0463	0.2102	0.0858	0.2801
Prof.	.05223	0.2225	0.8670	0.2814
Technical	0.2335	0.4230	0.1576	0.3645
Service	0.1809	0.3849	0.1464	0.3536
Skill	0.01137	0.10605	0.0125	0.1114
Craft	0.1394	0.3464	0.1365	0.3434
Plant	0.08782	0.2830	0.0799	0.2712
Elementary	0.1679	0.3738	0.2070	0.4053
Sample Size	8,175		2,226	

Appendix C

Estimated Wage Equation Results (Labor Force Survey 2005–06)

Variables	*Natives*	*Migrants*
Age	0.0554***	0.0658***
	(0.0047)	(0.0095)
Agesq	–0.0004***	–0.00064***
	(0.0000)	(0.0001)
Head	0.0845***	0.1449***
	(0.0187)	(0.0341)
MS	0.1002***	0.0757*
	(0.0217)	(0.0457)
Primary	0.1217***	0.2070***
	(0.0241)	(0.0499)
Middle	0.1823***	0.3149***
	(0.0247)	(0.0506)
Matriculation	0.3660***	0.4546***
	(0.0224)	(0.0475)
Inter.	0.5675***	0.6061***
	(0.0281)	(0.0591)
Degree	0.91125***	0.9861***
	(0.0279)	(0.0555)
Training	0.04966	–.0486
	(0.0400)	(0.0609)
Urban	0.05338***	0.1791***
	(0.01424)	(0.0372)
Punjab	–0.4339***	–0.2443***
	(0.0215)	(0.0696)
Sind	–0.3345***	–0.2465***
	(0.0228)	(0.0712)
NWFP	0.0044	0.0220
	(0.0220)	(0.0440)
Manager	0.1549***	0.2676***
	(0.0402)	(0.0670)
Prof.	0.1457***	0.2420***
	(0.0394)	(0.0682)
Technical	–0.1064***	–0.0880
	(0.0280)	(0.0585)
Service	–0.2337***	–0.3240***
	(0.0307)	(0.0622)
Skill	0.0725	–0.2995*
	(0.0697)	(0.1350)

(*Appendix C continued*)

(*Appendix C continued*)

Variables	*Natives*	*Migrants*
Craft	–0.0912**	–0.1875*
	(0.0329)	(0.0642)
Plant	–0.1669***	–0.1330*
	(0.0358)	(0.0719)
Elementary	–0.2241***	–0.2972***
	(0.0324)	(0.0635)
Cons	1.8439***	1.4375***
	(0.0827)	(0.1896)
R-square	0.4590	0.4850

Notes: ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.1 level, respectively, using two-tailed tests.

Notes

* This article is a revised version of the paper earlier presented at 7th International Con-ference of Academy of Human Resource Development, Bangkok; the author is thankful to anonymous referees of this conference for useful comments on this article. However, the author remains responsible for any error in the article.

1. Khadija and Fatima (2008) unpublished working paper 'Causes and Consequences of Rural-Urban Migration'.
2. Our approach does not segregate the analysis between 'rural to urban' or 'urban to rural' migration; this analysis, however, focuses only on relocation effects on wages.
3. Basic postulation is existence of semi-logarithmic Human Capital Production function of extended Mincer (1974) type.
4. We will use this definition of natives and migrants throughout the document.
5. Many other studies support this finding [for example, Ahmad (1998), Knight and Yueh (2004), Oberai and Singh (1983)].

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