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An Analysis of Occupational Choice in Pakistan: A Multinomial Approach

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Occupational choice plays an important role in determining earnings and success in the labour market. In the social structure of Pakistan, an occupation reflects the socio-economic status of the individual. In this backdrop, the paper looks at the occupational structure and analyses how different characteristics help individuals to access jobs of their choice. The main issue discussed in the paper is how men and women have a different occupation distribution. Estimates are based on a multinomial log model of occupation choices for men and women, using the Pakistan Integrated Household Survey (PIHS) 2001-02 data. The empirical results show that individuals with high educational achievements choose high-ranking jobs. It is also noted that gender has a role in the labour market and males are sorted out in high-paying occupation. Occupational choice is influenced more by the human capital variables than by the individual characteristics. Among human capital variables, education has the strongest impact in the selection of an occupation of choice.

I. INTRODUCTION

The selection of a particular occupation determines the current earnings as well as the future earnings of individuals which are closely linked with household consumption, health, and general status in the society [Harper and Haq (1997) and Freeman (1971)]. The occupational choice is determined by a number of critical decisions relating to attending school, choosing specific field of study, receiving general or specific training and acquiring experience [Shabbir (1993) and O'Neill (1984)]. As such, the likelihood to enter into the occupation of one's choice increases with subsequent achievements in the field of study or skill development.

The evidence shows that males are generally employed in high paying occupations while females are concentrated in low paying occupations [Zveglich and Rodgers (2004); Teo (2003); Bayard, *et al.* (1999); Blau, Ferber, and Winkler

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(1999); Blau and Kahn (1996)]. If pecuniary returns are the selection criteria for a particular occupation, then why female choose occupations which traditionally have low paid salaries compared to males who opt for high paid occupations? The question then arises; is it the choice of individuals to enter into a particular occupation or the result of some other factors which facilitate their entry into certain occupations? To answer these questions, it is important to understand the issue of occupational choice, particularly in the context of developing countries where the socio-economic status of women is low and their disadvantageous position has not changed much over the years.

A number of studies on the occupational choice of individuals show interesting findings. For example, Allison and Allen (1978) conclude that both males and females show rational behaviour in the choice of a particular occupation. Their decisions are economically motivated and they choose to enter in occupations that have high paying salaries. The authors contend that barriers to entry in some occupations and discrimination against females in hiring and promotion are the major causes of their low earnings. The empirical work of Baldwin, Butler and Johnson (2001); Higginbotham and Weber (1999) also support these findings. It is observed that black women face relatively greater constraints to enter into jobs with good characteristics and low risk of job loss [Kennelly (1999); Reskin (1999); Padavic and Reskin (2002); Reid (2002) Browne (1997)].

Another study reveals that individuals form certain expectations before entering into a particular occupation. The choice of occupation is based on a number of factors such as their interest in the occupation, opportunities and expected cost to enter in the occupation of choice [Brief, Sell, and Aldag (1979)]. Individuals also weigh their personalities, capacities, and above all, the norms and values of society in the selection of a career. These self perceived concepts differ by gender and lead to differences in the pattern of occupational choice.

Beyer and Knight (1989) conclude that beside personal characteristics, some job related characteristics also restrict certain groups to enter into a particular occupation.[1] The authors observed that each occupation requires a particular skill which enhances the productivity of workers in that particular job. The educational achievement, training, and cognitive abilities help workers to acquire these occupation specific skills. Because of the different requirements (skills and experience) for different jobs, salaries differ by occupations. Low salaries are observed for jobs having more non-pecuniary characteristics and females having preferences for such characteristics are found concentrated in low paying occupations [O'Neill (1983, 1984)].

[1]The role of parental characteristics is being highlighted by some studies in the choice of particular occupation and subsequent success in that occupation [Heath (1981) and Wight (1989)].

The "Crowding Hypothesis" of Polachek and Siebert (1993), however, states that the occupations are divided in accordance with the social norms. According to this hypothesis, males have the liberty to exercise their choice of occupations whereas females are limited to choose only from the occupations labelled as the "female jobs". The entry into so-called "female jobs" is easy for women therefore they are concentrated/crowded in these occupations. This oversupply of women due to occupational segregation therefore leads to low earnings for them.

In Pakistan, research evidence on the issue related to occupational choice is limited. Few studies undertaken on the subject, however, confirm the findings that there is occupation segregation and concentration of females in low paying occupations [Nazli (2004); Siddiqui and Hamid (2003); Ashraf and Ashraf (1996)]. In the Pakistani society females are perceived as secondary earners and therefore are encouraged to enter into those occupations where males have the least preferences [Siddiqui and Hamid (2003)]. Although education, experience and other personal characteristics play an important role in job selection, the difference in earnings is mainly due to discrimination against females.[2] The behaviour of individuals for occupational choice is however not analysed by the authors.

Because of the growing interest in labour market participation of female workers and limited choices and opportunities available to them, it is important to study the pattern of their choice for a particular occupation. As the choice of occupation plays a pivotal role in determining the earnings of individuals (current and future) and their bargaining power in the family, it is important to examine the pattern of occupational choice between genders and determine the factors that contribute to the formation of these choices. Over the limited evidence available for Pakistan on the subject, the present study is an important step towards understanding the occupational segregation and the factors responsible for it to fill the gap in research. Hence, the study is pioneer in analysing the occupational choice behaviour of Pakistani males and females and the factors explaining these choices.

There are many factors which restrict females in choosing the occupation of their choice. First, the choices for females are limited due to the lack of industrial diversification in Pakistan which is essential in providing opportunities to females in the selection of occupation of their choice. Secondly, in male dominated Pakistani society, gender inequality is perpetuated in the system with limited opportunities for females to enter the labour market and choose high paid jobs as well as executive positions.[3] Thirdly, under the conditions of high rate of unemployment and thus surplus labour conditions, employers may not find sufficient reasons to employ

[2]In analysing gender discrimination, many studies used relative earnings as an indicator of wage discrimination which is not appropriate [Siddiqui and Hamid (2003); Ashraf and Ashraf (1996)]. Wage rate should be compared with the same kind of job by controlling for age and education. For example, it is apparent that the kind of jobs undertaken by female in agriculture is different from that of male, and working hours does not seem to be conditioned.

[3]For details, please see Mahbub ul Haq Human Development Centre (2003).

female labour at the cost of male labour, since male labour is willing to accept lower wage rate than in the period of economic prosperity. This further restricts labour market participation of females and their subsequent choice of occupation. Although the findings of the study have limited applicability due to aforementioned factors, yet the present analysis will contribute towards enhancing our knowledge of the labour market functioning and rationing of jobs between genders in Pakistan and will provide the basis for devising policies and programmes to improve the socio-economic status of women in the society.

The analysis is based on the Pakistan Integrated Household Survey (PIHS) (2001-02) which has wealth of information relevant to the questions addressed in the study and is the latest data set available that has not been used for this purpose. The approach applied to analyse these data is the Maximum Likelihood Estimation procedure through the use of Multinomial Logit (MNL) model which is the most appropriate technique for such an analysis.[4]

The paper is organised as follows. The occupational distribution and earnings of male and females are compared in Section II. The conceptual framework and model of occupational choice is presented in Section III. Salient features of data and its limitations are discussed in Section IV. The main results are reported in Section V and conclusions and policy implications are discussed in the last section.

II. OCCUPATIONAL DISTRIBUTION AND EARNINGS

Men and women are usually engaged in different occupations across the world. The occupational segregation exists either due to the choices made by men and women or due to some other factors which restrict their choices. If choices are made on the free will, these enhance the economic efficiency but if these are the results of limited opportunities for some groups then these cause economic inefficiency and lead to low participation of that group in the economic activities. Gender dominated occupations, according to International Labour Organisation (ILO), are classified as those having higher proportion of either males or females. As reported by ILO, about half of the workers throughout the world are engaged in gender dominated occupations.

The occupational segregation cause oversupply of workers in certain occupations and restricts supply in other occupations. This concentration of workers depresses wages in that occupation and shortage in other occupations put upward pressure on wages in those occupations. Because of the concentration of females in narrow range of female dominated occupations, the wages are low as compared to male dominated occupations. The overcrowding of females in the female dominated

[4]In most of the studies occupation is used as explanatory variable in wage equations which does not reveal the choice of individual rather than explains the variation in wages [for example, see Nazli (2004) and Siddiqui and Hamid (2003)]. The present study uses occupations as dependent variable in the multinomial logit setting where eight choices are given to the individual to choose from.

occupations also leads to the low productivity levels in these occupations. At the same time, the exclusion of females from the male dominated occupations causes shortage of qualified workers in those occupations. The reduced productivity in female dominated occupations is not necessarily be counterbalanced by the higher productivity in male dominated occupations. The situation therefore leads to inefficiencies in the overall output of the economy.

The occupational segregation on the basis of gender affects the socio-economic status of the women. The existence of gender inequalities in educational achievements, skills, and earnings are the reflection of the occupational segregation [ILO (2003)]. Chang (2000) points out that the gender based segregation reduces women's opportunities for labour force participation, restricts their career advancements, and widens the gap in earnings. The low participation of female constrains the economic development of country because the economic well being of population is determined by the proportion of the population participating in the economic activities [World Bank (2004)].

The Pakistani labour market provides a typical picture of an LDC with low participation of females in economic activities along with occupational segregation. The economy is primarily based on the agriculture activities which is the backbone of industrial sector. The Labour Force Survey 2001-02, which is latest data set available on labour statistics, reveals that a large proportion of both men and women are employed in agriculture related occupations. The proportion of females is higher (60.5 percent) than males (35.4 percent) because agriculture sector provides flexibility of hours as well as opportunity to work close to home. The distribution of workers in other occupations show that females are concentrated in Service related occupations (23 percent) including teaching (12.3 percent) and health services (2.3 percent) whereas majority of males are found in production related occupations (28.1 percent). A high percentage of males are also found in managerial and administrative occupations (18.7 percent).

Average earnings in different occupations are presented in Table 1 for both male and female workers. In general female earnings are lower than male earnings. For comparison purpose, we calculated the relative earnings of females to males and the data shows that females earn 83 percent of the male earnings at overall level. When compared with previous studies, the gender gap in earnings has narrowed down over the years [Siddiqui and Hamid (2003)].[5] The occupation specific earnings are high in male dominated occupations as compared to occupations with female concentration. The highest gap in earnings is found in agriculture where women earn 34 percent of the male earnings. As mentioned earlier, this might be misleading because of the nature of job taken by females from that of males in the agriculture (and production). The lowest gap is found in teaching where females earn 88 percent

[5]The study by Siddiqui and Hamid (2003) reported a gender gap of 19 percent earnings in 1992 and 24 percent in 1998-99 which is higher than the gap of 17 percent by the present study.

Table 1

Average Monthly Earnings in Different Occupations, by Sex

Occupations	Both Sexes	Male	Female	Female/Male Ratio
Managers and Administrators	7917.37	8845.29	7058.21	79.80
Professional	6538.65	7538.13	6342.54	84.14
Teaching	2731.11	2862.26	2509.20	87.66
Health Services	2992.59	3153.26	2702.29	85.70
Sales	3139.16	3380.73	1772.52	52.43
Crafted Related Occupations	2563.91	2954.36	2341.39	79.25
Agriculture	2165.93	2182.35	750.00	34.37
Production	3303.12	3257.68	2190.48	67.24
Total	3988.50	4059.43	3385.72	83.40

Source: Labour Force Survey 2001-02.

of the males' earnings.[6] These findings are in line with previous studies which show the existence of gender based occupational segregation in Pakistani labour market [Nasir (2002); Siddiqui and Hamid (2003)].

The occupational segregation and other constraints restrict the participation of females in the labour market activities. Therefore, Pakistan has the lowest participation of females in the labour force and employment in the South Asian Region [Mahbub ul Haq Human Development Centre (2003)]. The low participation of females along with pervasive unemployment and poverty makes economic dependency ratio very high in Pakistan.[7] It is imperative to analyse the gender based occupational choice to understand low participation of females in the labour market and factors responsible for placing males in high paying occupations while females in low paying occupations.

III. CONCEPTUAL FRAMEWORK AND MODEL

To model the occupational choice, we assume that individual "*i*" chooses an occupation "*o*" from "*m*" (mutually exclusive) occupations where each occupation

[6]The low earnings of females also reflect another fact that due to the compulsion of supplementing their family income they have to accept low wages compared to those workers who need not to support household income at all. This is observable in farming, production and informal sector in general (see Table 1).

[7]Along with high dependency ratio, the stagnation of real wages since 1990 and increase in informal sector jobs has made difficult even for employed persons to raise the living standards for their families.

has positive probability of selection. It is also assumed that utility derived from an occupation depends upon the expected life long earnings (Y_o), the expected social status (S_o) and personal characteristics of individuals *(X)* [Dolton, *et al*. (1989)].[8] The utility function U_o of an occupation can be written as

$$U_{oi} = f(Y_{oi}, S_{oi}, X_i) + e_{oi} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

o=1,2,…..*m* and *i*=1,2,3…..*n*

The term e_{oi} represents errors which are assumed to be normally distributed with zero mean and constant variance.

An individual adopts a utility maximisation behaviour and selects the occupation which yields highest level of satisfaction. If variable C_{oi} represents the selected occupation,

then

$$C_o=1 \quad if \quad U_{oi}= max\ (U_1, U_2, U_3 \ldots U_m) \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

C_o=0 *otherwise*

Earnings in a particular occupation play an important role in the formation of choice for that occupation and earnings are determined by human capital factors such as education, training, and experience [Mincer (1974)].[9] If we assume that earnings are specific to occupation and human capital variables exert different effects on the choice of occupation, the earnings function can be written as:

$$LnY_{oi} = f(EDU_i, EXP_i, EXP_i, \ TRAIN_i) + \varepsilon_{oi} \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

In Equation 3, EDU_i, $EXP_{i,}$ and $TRAIN_i$ represent education, experience, and training of an individual respectively. The square term for experience (EXP_i^2) captures the non-linear trend in earnings with experience by showing that earnings decline with experience after reaching at peak with a certain level of experience. The term ε_{io} is used for error term.

Dolton, *et al.* (1989) show that the expected social status of a given occupation is determined by the personal characteristics of the individuals along with their education, training and experience. Therefore

$$S_{oi} = g(EDU_i, EXP_i, TRAIN_i, X_i) + \phi_{oi} \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

In Equation 4, ϕ is used for the error term. Both error term ε and ϕ are normal random variables assumed to be distributed independently with zero mean. After

[8]According to Boskin (1974), an individual chooses a particular occupation if the benefits (pecuniary and non-pecuniary) exceed the cost (training cost, foregone earnings and other such costs). The difference in the choice of occupation differs stems from their ability, preference and taste.

[9]Freeman (1971) argues that ability of an individual has also a role in determining the earnings of individuals. Due to data limitations however such arguments cannot be incorporated in the analysis.

substituting Equations 2, 3, and 4 in Equation 1 we obtain the following reduced form equation

$$U_{oi} = h(EDU_i, EXP_i, TRAIN_i, X_i) + e_{oi} \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

Following Madalla (1983), the multinomial logit estimation procedure applied to Equation 5 produces following selection probabilities:

$$P_o(C_o = 0) = \frac{1}{1 + \sum_{o=1} \exp(a_{1o} + a_{2o}EDU_i + a_{3o}EXP_i + a_{4o}TRAIN_i + a_{5o}X_i)}$$

$$P_s(C_o = 1) = \frac{\sum_{o=1} \exp(a_{1o} + a_{2o}EDU_i + a_{3o}EXP_i + a_{4o}TRAIN_i + a_{5o}X_i)}{1 + \sum_{o=1} \exp(a_{1o} + a_{2o}EDU_i + a_{3o}EXP_i + a_{4o}TRAIN_i + a_{5o}X_i)} \quad (6)$$

P_o refers to the probability that an individual is in the base occupation and P_s refers to probability that an individual is in the occupation other than base i.e. 1,2…..*m*. The choice of the occupation of an individual is the dependent variable of the study, which represents the broad occupational categories such as managerial, professional, and teaching etc. Agriculture is taken as the base category.

A number of studies found that choice of occupation is highly linked with human capital achievements such as education and experience [Shabbir (1993) and O'Neill (1983, 1984)]. Besides, family obligations and responsibilities are also found to be related with occupational choice [Polachek (1981) and Abowd and Killingsworth (1984)]. To capture the impact of human capital, education and experience are included in the occupational choice model. A dummy variable representing marital status of the individual and two variables representing number of children in the family are included in the equation to capture the effect of family responsibilities on the choice of occupation and preference for labour market activities with children. The models include gender dummy to see the relationship of occupational choice with sex. The complete list of variables is described in the next section which deals with the data.

IV. DATA AND ITS LIMITATIONS

The study is based on the Pakistan Integrated Household Survey (PIHS) 2001-02 data which is latest of the series. The survey is conducted by Federal Bureau of Statistics (FBS) and based on a randomly drawn nationally representative sample of the population by using two-stage stratification procedure. The sample covers 14,825 households and provides information on 116,724 individuals. The data set is the most detailed and comprehensive in nature and covers many dimensions of the workers behaviour. The information on the personal characteristics of individuals is particularly important for studying the

occupational choice of these workers. The survey does not go beyond the current employment therefore ignores the different demand conditions individuals may have faced at the time of entry in the labour market. The survey also ignores the ability differences which may exist among individuals who contribute to the difference in occupational distribution.[10]

The sample of the study is restricted to regular wage and salaried workers which is a more homogenous group and useful for such analysis. The choices in other groups such as self-employed and employers are influenced by others factors which may not present the actual picture.[11] The final sample of the study consists of 13793 individual (11573 males and 2220 females) between the ages 10–65 years. The information on worker's age, earnings, education, occupation, training, sex, marital status and other characteristics is particularly important for the study. The data on experience is missing therefore potential experience is calculated by using age, education, and age at which workers has started going to school [Nasir (2002)].[12]

The survey provides information on the type of school attended by individuals. It is observed that most of the affluent parents send their children to private schools. Most of these schools are well equipped with teaching aids such as computers and libraries and the student teacher ratio in these schools is also low as compared to public schools. Therefore the quality of education provided by these schools is relatively high as compared to the public school system [Nasir (1999); Nasir and Nazli (2000)]. It will also capture the social status of the family, as the private schools are expensive compared to the public schools.

The medium of instruction in the schools also affect the labour market outcome especially securing job in the formal sector. Those who received education in English medium schools (having English language as medium of instruction) have edge in the labour market in finding good jobs [Chiswick and Miller (2002); Shield and Wheathley (2002)]. The language of instruction is therefore included in the model. Similarly an index of literacy is also included in the model which is found significant in earnings models [Nasir (2002) and Van der Gaag and Vijverberg (1989)]. Beside human capital variables, some non-human capital variables are also included in the model to capture the effect of these dimensions. The definition of each variable is provided in the following Table 2.

[10]Some studies however concluded that ability differences do not significantly affect the parameter estimates. For example, Griliches (1977) demonstrated in the study of wage determination that ability variable does not change the estimated coefficients on education and experience significantly.

[11]It is difficult to disentangle the affect of other factors such as availability of financial capital from the personal traits in the selection of occupation therefore these groups were dropped from the sample to work on a homogenous group of workers.

[12]Mincer (1974) defined potential experience as (Age-Education –6) for US workers. In Pakistan, the school starting age differs by region. The information on school starting age is given in the survey therefore we utilised this information for the construction of experience.

Table 2

Brief Definitions of Important Variables

Variable	Definition
W	Monthly Earnings (in rupees) Wages and Salaries both cash and in kind.
AGE	Age in completed years.
EDUC	Completed years of schooling.
EXP	Total Years of labour market experience calculated as (age-school years-6) we used age starting school in case individual started school after six years of age).
TRAIN	Completed years of technical training.
LITIND	Categorical variables, contains 4 categories of literacy and numeracy.
PRIS	Dichotomous variable equal to 1 if individual is a graduate of private school. 0 otherwise.
ENG	Dichotomous variable equal to 1 if individual received education from English medium school. 0 otherwise.
MSP	Dichotomous variable equal to 1 if individual is married, 0 otherwise.
CHILD06	Number of children below 6 years of age.
CHILD711	Number of Children between 7 and 11 years of Age.
MALE	Dichotomous variable equal to 1 if individual is male, 0 otherwise.
URBAN	Dichotomous variable equal to 1 if individual belongs to urban area.
MANG	Managerial and Administrative Workers.
HPROF	Health Professionals.
TEACH	Teachers.
PROF	Professional Workers.
SALE	Sales Workers.
AGRI	Agriculture Workers.
PROD	Production Workers.
CRAFT	Skilled Craft Related Workers.

The means and standard errors of key variables of males and females along with both sexes are compared in Table 3. The statistics reveals that the average age of the sample is about 33 years and women are, on average, younger than men. A higher percentage of males are found to be illiterate than women but those men who attended school acquired more years of schooling (10 years) than their female counterparts (8.78 years). It is further noted that a lower percentage of females (33 percent) attended government schools compared to males (59 percent). Interestingly both males and females possess almost the same years of average labour market experience i.e. approximately 22 years. Another interesting observation is the relatively lower monthly earnings of women compared to men.

The occupational distribution shows that the majority of women are engaged in those occupations where flexibility of timings and place of work (working at home or close to home) is more pertinent. The statistics show that female are concentrated in craft making profession (33 percent), agriculture related occupations (25 percent) and teaching profession (19 percent).[13] The representation of males in female dominated occupation is thin and majority of them is employed as production (38 percent) and sales workers (27 percent).

[13]Most of the craft making activities are carried out at the residence of the worker where she can take care of children and other household chores along with the work. Similarly agricultural activities are also carried out close to the residence. As far as teaching profession is concerned, it is very flexible in timings and place of work as they are posted close to home and suits to their needs.

Table 3

Means and (Standard Errors) of Key Variables

	Both Sexes		Men		Women	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Education	8.9039	3.9135	9.9782	3.8575	8.7790	4.2185
Illiterate (Proportion)	0.4250	0.4944	0.3861	0.4869	0.6279	0.4835
Less than Primary (Proportion)	0.0713	0.2574	0.0773	0.2671	0.0401	0.1962
Primary but less than Matric (Proportion)	0.2157	0.4113	0.2387	0.4263	0.0959	0.2946
Matric but less than Degree (Proportion)	0.1885	0.3911	0.2000	0.4000	0.1284	0.3346
Graduate Degree (Proportion)	0.0545	0.2269	0.0537	0.2254	0.0586	0.2348
Professional Degree (Proportion)	0.0450	0.2074	0.0442	0.2056	0.0491	0.2161
Experience (Years)	21.7396	14.183	21.7242	14.1154	21.8198	14.5331
Age (Years)	32.86	13.13	33.12	13.12	31.52	13.12
Professional (Proportion)	0.0395	0.1948	0.0438	0.2047	0.0271	0.1297
Managerial (Proportion)	0.0231	0.1503	0.0264	0.1604	0.0159	0.0763
Sales (Proportion)	0.2704	0.4442	0.2888	0.4532	0.0748	0.3799
Skilled Craft (Proportion)	0.1107	0.3138	0.0690	0.2535	0.3279	0.4696
Production (Proportion)	0.3265	0.4690	0.3779	.4849	0.0586	0.2348
Agricultural (Proportion)	0.1445	0.3516	0.1313	0.3377	0.2485	0.4099
Teachers (Proportion)	0.0745	0.2626	0.0565	0.2309	0.1890	0.3744
Health Professionals (Proportion)	0.0181	0.1331	0.0140	0.1175	0.0392	0.1941
Urban Residents (Proportion)	0.4805	0.4996	0.4806	0.4996	0.4797	0.4997
Married (Proportion)	0.6368	0.4809	0.6470	0.4780	0.5840	0.4930
Attended Govt. Schools (Proportion)	0.5456	0.4979	0.5868	0.4924	0.3311	0.4707
Av. Monthly Earnings (Proportion)	3003.16	2704.60	3178.62	2772.43	2037.40	2042.0
N	13793		11564		2229	

Source: HIES 2001-02.

In comparison to women, a higher percentage of male workers are employed as professional (4.4 percent vs. 2.7 percent) and managerial workers (2.3 percent vs. 1.6 percent). The gender based human capital characteristics by major occupational groups are presented in Table 4.

Table 4

Gender-based Means and Standard Errors of Human Capital Variables in Different Occupations

Occupation	Age	Education	Experience	Av. Monthly Earnings
Males				
Administrative and Managerial	38.77	10.68	22.08	8466.18
	(12.55)	(5.28)	(12.67)	(8094.71)
Professionals	39.02	10.76	22.24	6458.63
	(12.32)	(9.61)	(13.62)	(5429.96)
Health Professionals	37.66	11.93	19.98	5728.71
	(10.09)	(4.42)	(16.83)	(4566.50)
Teachers	36.18	12.10	18.06	4590.18
	(9.84)	(4.11)	(10.04)	(2304.99)
Sale Workers	33.33	6.32	21.01	3152.15
	(13.26)	(5.08)	(13.40)	(1999.06)
Craft Workers	28.31	2.02	20.33	2544.15
	(12.66)	(4.01)	(13.34)	(1440.16)
Agriculture Workers	34.14	1.89	26.25	1945.10
	(14.87)	(3.35)	(15.89)	(963.89)
Production Workers	33.53	5.51	22.02	2657.09
	(14.06)	(4.16)	(13.67)	(1545.06)
Females				
Administrative and Managerial	35.15	12.15	17.00	7366.67
	(12.70)	(5.74)	(13.82	(5770.20)
Professionals	36.45	9.60	20.84	4126.43
	(11.80)	(5.88)	(13.18)	(3175.09)
Health Professionals	34.62	10.72	17.90	3715.06
	(13.09)	(6.28)	(10.98)	(3197.94)
Teachers	31.19	11.84	13.35	3617.79
	(9.56)	(4.03)	(9.38)	(2614.31)
Sale Workers	37.98	5.87	26.11	1698.22
	(14.15)	(3.90)	(15.46)	(1297.43)
Craft Workers	28.20	2.40	19.84	1454.13
	(12.26)	(3.30)	(13.34)	(1001.74)
Agriculture Workers	30.04	1.88	22.16	1200.82
	(13.69)	(1.50)	(14.05)	(963.89)
Production Workers	31.81	2.06	23.75	1848.43
	(12.52)	(3.99)	(15.31)	(2541.01)

Source: PIHS 2001-02.

In general, women tend to be younger in age, less educated and less experienced then men in almost all occupational categories. The gap in education is noted to be much smaller than what is observed for age and years of experience between men and women. In fact, women holding administrative and managerial jobs are relatively more educated than men in the same occupation, but they earn less than what men earn in every occupational category. For both men and women, the highest earnings accrue to those in managerial and professional occupations and the lowest earnings to those in agriculture.

V. EMPIRICAL RESULTS

The results of the multinomial logit model are presented in Table 5. The analysis of occupational choice is based on a sample of 13793 individuals, consisting of 11564 men and 2229 women who were working as regular wage employees at the time of interview. The multinominal logit model of occupational choice was run for both sexes and includes years of education, experience, marital status, and number of children between the ages of 0–6 and 7–11. Due to different conditions of the regional labour markets (which might affect the occupational choice of individuals), a dummy variable representing region (urban/rural) was included in the analysis. A gender dummy along with its interaction terms with education and experience is also added to the model. A significant and non-zero coefficient associated with the gender variable will indicate that gender plays a role in determining the occupational choice of individual.[14] Likewise, significant and non-zero coefficients on the interaction terms will indicate that education and experience play different roles in determining the occupational choice of men and women.

The estimated results show a positive and significant coefficient of education for all occupational categories (except craft and production workers) showing the importance of education in the choice of occupations.[15] The results indicate that the likelihood of being in a higher paying job (managerial, professional, teaching, and medical) rather than in agriculture increases with years of education. If we construct occupational ladder by assuming higher compensation for jobs having higher skill requirements, managerial and professional jobs will be on the top of the ladder followed by medical and teaching, sale, craft, production, and agricultural related occupations.

Experience has a relatively smaller but significant effect on occupational choice of individuals as compared to education. The magnitude of the coefficients of education and experience decrease as we move from managerial to production related occupations showing less of a role of education and experience down the

[14]The coefficients associated with the variables in the logit analysis are not the marginal effects, rather the size of the magnitude indicate the important role of that variable compared to other variables.

[15]The magnitude of the education coefficients is enough to make the argument that education plays a more important role in determining the occupational choice of women.

Table 5

Multinominal Logit Model of Occupational Choice

Variables	Mang	Prof	Medical	Teachers	Sale	Craft	Production
Constant	–8.345**	–7.039**	–5.914**	–5.830**	–2.688**	–0.535**	–3.233**
	(0.144)	(0.634)	(0.497)	(0.400)	(0.202)	(0.166)	(0.2644)
EDUC	0.5830**	0.4730**	0.3880**	0.550**	0.1850**	0.0324	0.0680
	(0.076)	(0.053)	(0.049)	(0.044)	(0.038)	(0.013)	(0.442)
EXP	0.0550**	0.0627**	0.0520**	0.0337**	0.0419**	0.0124**	0.0196**
	(0.026)	(0.015)	(0.011)	0.010)	(0.006)	(0.005)	(0.008)
MALE	2.454**	0.940	–1.877**	–2.113**	1.139**	–1.227**	2.916**
	(0.794)	(0.640)	(0.544)	(0.394)	(0.204)	(0.184)	(0.264)
MALE* EDUC	–0.154** (0.075)	–0.065**	0.0237	–0.450**	–0.0028	–0.0180	–0.117
		(0.031)	(0.051)	(0.045)	(0.038)	(0.037)	(0.143)
MALE* EXP	–0.0193	–0.0207	–0.035**	–0.0669	–0.037**	–0.013**	–0.029**
	(0.027)	(0.015)	(0.013)	(0.010)	(0.006)	(0.006)	(0.008)
MSP	0.473**	0.132	0.181	0.365	0.0021	–0.0843	0.105
	(0.386)	(0.144)	(0.186)	(0.227)	(0.080)	(0.095)	(0.077)
CHILD 0–6	0.0506	0.0380	0.0150	0.125**	–0.076	0.0994**	–0.084**
	(0.047)	(0.039)	(0.054)	(0.032)	(0.022)	(0.026)	(0.021)
CHILD 711	–0.1848**	–0.101**	0.594**	–0.0466	–0.060**	–0.0403	–0.0254
	(0.0745)	(0.041)	(0.034)	(0.050)	(0.0330)	(0.0390)	(0.031)
LITIND	0.0281**	0.0595	0.447**	0.5671**	0.1431**	0.4100**	0.1841**
	(0.052)	(0.093)	(0.153)	(0.117)	(0.045)	(0.052)	(0.042)
ENG	1.265**	1.177**	1.921**	0.392	0.0526	0.0618	0.0233
	(0.635)	(0.627)	(0.638)	(0.626)	(0.620)	(0.739)	(0.630)
PRIS	1.284**	0.887**	0.274	0.490	0.514	1.017	0.437
	(0.525)	(0.514)	(0.568)	(0.518)	(0.479)	(1.494)	(0.479)
TRAIN	0.2125**	0.4256**	0.3654**	0.4121**	0.2514**	0.0121	0.0273
	(0.031)	(0.011)	(0.053)	(0.012)	(0.013)	(0.022)	(0.042)
URBAN	2.227**	2.289**	1.863**	1.266**	2.397**	2.560**	1.938**
	(0.156)	(0.131)	(0.171)	(0.118)	(0.085)	(0.096)	(0.084)

Likelihood Ratio Index 0.72; **denotes statistical significance at the 5 percent level; *denotes statistical significance at the 10 percent level; standard errors are given in the parenthesis; base category is agriculture.

occupational ladder. More years of education and experience seems to increase the odds that the individuals will be in high paying occupations rather than sales, craft related activities and in production related jobs.[16] The education from private schools or from high quality English medium schools is very rewarding as the odds of having high paying jobs are high for those who graduated from private schools or studied from English medium schools. Similar to education and experience, training in the respective field enhances the odds of getting into the occupation of the choice.[17]

Marriage does not seem to play any role in determining the occupational choice of individuals however the presence of younger children in the family increase the odds for teaching, production or in craft related jobs than agriculture. For the choice of higher paying occupations, children between the ages of 7–11 years play rather more important role than children under six years of age. The odds of finding jobs in high paying occupations increase with the presence of older children (i.e. between the ages of 7–11 years) in the family. The statistically significant and positive coefficient of regional dummy suggests that living in urban areas decreases the odds of being in the agriculture related occupations.

The coefficient of gender dummy (males=1) was negative but significant for medical, teaching, and craft related occupations while positive and significant for managerial and administrative occupations, sales and production related occupations. These findings indicate that the odds of women being engaged in medical, teaching and craft related occupations are high and odds of finding men in managerial and administrative, sale and production related occupations are high relative to agriculture related occupations. The coefficient of gender dummy gives a clear signal of occupational choice of males being in high paying occupations and females being in the low paying occupations.

The negative and significant coefficient of interaction term of gender with education for managerial, professional and teaching jobs re-enforces the role of education for females to place them in higher paying occupations than male workers. In contrast, the role of experience is more pronounced for women to place them in medical, sale, production and craft related occupations. In short, the results show that more years of education and experience increase the likelihood of women to be in the managerial, professional, medical, and sales related occupations rather than in agriculture.

Occupational Choice of Males and Females

The statistically significant coefficient of gender dummy in the overall model strengthens the point that males and females behave differently in choosing

[16]Our results are in line with Beyer and Knight (1989) and Dolton, *et al.* (1989).

[17]The coefficient of training in skills crafts and production related occupations is insignificant indicating no role of training in the occupations. As most of the training is informal and on the job in these occupations, getting into these occupations does not require any certificate or diploma therefore we do not see any significant role of training in the choice of these occupations.

occupations in Pakistani labour market. We therefore estimated separate equations for males and females by using multinominal logit models. In line with other studies, results presented in Tables 6 and 7 indicate that education, experience and other individual characteristics play important role in occupational choice of both men and women [O'Neill (1983, 1984), and Dolton, *et al.* (1989)] Keeping other factors constant, education seems to suggest the following ordering of occupations for men: professional, managerial, medical, teaching, sales, production, skilled craft and agriculture. For women, education suggests the following ordering of occupations: Managerial, professional, teaching, medical, sale, production, craft and agriculture. In other words, more years of education increases the probability that both men and women will be found in services related occupations rather than in production related activities. More importantly, education seems to place workers in higher paying occupations and it exerts a relatively bigger effect on the occupational choice of women than men.

Table 6

Multinominal Logit Model of Occupational Choice for Men

Variables	MANG	PROF	MEDP	TEACH	SALE	CRAFT	PROD
Constant	–5.108**	–5.489**	–6.957**	–5.946**	–0.929**	–1.591**	0.3353**
	(0.295)	(0.268)	(0.648)	(0.342)	(0.106)	(0.150)	(0.093)
EDUC	0.4900**	0.567**	0.4690**	0.446**	0.2180**	0.0517	0.0889
	(0.025)	(0.022)	(0.032)	(0.021)	(0.015)	(0.019)	(0.015)
EXP	0.0326**	0.0408**	0.0171**	0.0214**	0.0043**	0.024**	0.0126**
	(0.006)	(0.005)	(0.009)	(0.005)	(0.003)	(0.005)	(0.003)
MSP	0.531**	0.161	0.144	0.585	0.0759	–0.1233	0.1530
	(0.194)	(0.155)	(0.240)	(0.153)	(0.090)	(0.124)	(0.183)
CHILD 06	0.0734	0.0590	0.0991	0.161**	0.0958**	0.0376**	0.0871**
	(0.049)	(0.041)	(0.065)	(0.035)	(0.024)	(0.034)	(0.023)
CHILD 711	–0.1321**	–0.0588	0.0667	0.0552	0.0254*	–0.0566	0.0522
	(0.076)	(0.062)	(0.091)	(0.055)	(0.0360)	(0.051)	(0.033)
LITIND	0.0512**	0.0118	0.158**	0.0957**	0.0302**	0.1780**	0.0091**
	(0.109)	(0.098)	(0.232)	(0.122)	(0.006)	(0.061)	(0.004)
ENG	1.128**	1.033**	1.651**	0.275	0.0772	0.0898	0.0301
	(0.645)	(0.063)	(0.655)	(0.640)	(0.629)	(0.799)	(0.639)
PRIS	1.472**	0.962**	0.111	0.500	0.6500	1.288**	0.0633
	(0.574)	(0.058)	(0.712)	(0.603)	(0.531)	(0.549)	(0.053)
TRAIN	0.32288	0.4716))	0.401**	0.341**	0.195**	0.0151	0.047**
	(0.02)	(0.015)	(0.035)	(0.022)	(0.022)	(0.032)	(0.015)
URBAN	1.990**	2.109**	1.939**	0.800**	2.216**	2.865**	1.820**
	(0.160)	(0.137)	(0.203)	(0.131)	(0.092)	(0.116)	(0.089)

Likilihood Ratio Index 0.63; **denotes statistical significance at the 5 percent level; *denotes statistical significance at the 10 percent level; standard errors are given in the parenthesis; base category is agriculture.

Table 7

Multinominal Logit Model of Occupational Choice for Women

Variables	MANG	PROF	MEDP	TEACH	SALE	CRAFT	PROD
Constant	–9.093**	–6.200**	–5.742**	–6.715**	–2.261**	–0.769**	–2.557**
	(0.1623)	(0.794)	(0.574)	(0.636)	(0.246)	(0.188)	(0.323)
EDUC	0.507**	0.424**	0.3240**	0.413**	0.1510**	0.0273	0.133
	(0.094)	(0.065)	(0.056)	(0.048)	(0.046)	(0.043)	(0.055)
EXP	0.0631**	0.0653**	0.0633**	0.0446**	0.0473**	0.0035*	0.0281**
	(0.031)	(0.016)	(0.012)	(0.011)	(0.006)	(0.006)	(0.008)
MSP	0.132	0.147	0.213**	0.203**	–0.460	0.266**	–0.628
	(0.199)	(0.411)	(0.003)	(0.049)	(0.380)	(0.118)	(0.412)
CHILD 06	–0.0751	–0.2970	–0.067	–0.075**	–0.0897	0.1046**	–0.0286*
	(0.0264)	(0.189)	(0.101)	(0.080)	(0.023)	(0.046)	(0.078)
CHILD 711	–0.0134**	0.296	0.193**	0.139**	–0.282**	0.117**	–0.241**
	(0.036)	(0.225)	(0.044)	(0.011)	(0.084)	(0.068)	(0.021)
LITIND	0.1052**	0.192	0.079**	0.0143**	0.239**	0.0783**	0.0248**
	(0.420)	(0.265)	(0.220)	(0.228)	(0.121)	(0.014)	(0.001)
ENG	17.365*	16.716*	18.163*	16.385	15.179	1.297	0.0711
	(1.146)	(1.032)	(0.906)	(0.864)	(1.318)	(1.081)	(0.002)
PRIS	0.603**	0.311**	0.122	0.167	0.2720	0.266**	0.0752
	(0.014)	(0.026)	(0.190)	(0.031)	(1.180)	(1.141)	(0.015)
TRAIN	0.4191**	0.5341**	0.321**	0.471**	0.342**	0.0221	0.025
	(0.056)	(0.071)	(0.040)	(0.052)	(0.063)	(0.061)	(0.021)
URBAN	3.613**	2.855**	1.862**	2.470**	2.963**	2.293*	2.389**
	(1.111)	(0.495)	(0.328)	(0.274)	(0.214)	(0.201)	(0.264)

Likilihood Ratio Index 0.63; **denotes statistical significance at the 5 percent level; *denotes statistical significance at the 10 percent level; standard errors are given in the parenthesis; base category is agriculture.

When the effect of years of experience is considered, the probability of men being in the high paying occupations such as professional, and managerial and teaching increases with more years of experience but its role for other occupations is small. For instance, the coefficient of experience is significant but small for medical, sales, craft and production related occupations indicating that more years of experience increases the odds of men being in high paying activities than agriculture. Comparing experience coefficients for men and women indicates that, just as in the case of education, years of experience also plays a more important role in determining the occupational choice of women. More years of experience pushes women into professional and medical occupations which offer relatively higher earnings.[18] However, when the effect of experience at the lower end of the ordering is considered, more years of experience does not seem to guarantee higher paying jobs for women. For instance, while more year of experience increases the probability that women will be in services rather than in production related activities, it also means that women will be in the low paying occupations such as craft, production and agriculture.

Marital status seems to play rather important role in placing women in those occupations which are socially acceptable in Pakistan. Marriage increases the

[18]Years of experience seems to affect the odds of being in medical and teaching related activities equally for women.

probability of finding women in teaching, medical and craft related occupations. Given the caring nature of these occupations (for the sick and the children), and flexibility of place and hours, it is not surprising to find that these occupations do not clash with the socially prescribed roles for married women, pushing them into such occupations. These findings support the findings of the other studies [Polachek (1981) and Abowd and Killingsworth (1984)]. In other occupations, the likelihood of finding married women is same as the unmarried women. Marriage seems to place men in managerial and professional occupations which have not only the higher earnings but also the higher social status. Being the primary bread winners of the family, it is desirable for married men to be engaged in such occupations which offer higher pecuniary benefits along with higher social status [Dolton, *et al.* (1989)]. For other occupations, marriage does not seem to play any significant role for men.

Two variables representing children of different ages were included in the model to see whether they play any role in the choice of occupation, especially younger ones. The expectations were that younger children demand more of women's time compared to older children and, therefore, if children were to play a role in the occupational choice of women (for example, forcing them into occupations that offer flexible working hours), it should be the younger not the older children. Our results support the conjecture and children 0–6 years were found to be very important factor in increasing the odds for women to be in teaching and craft related occupations rather than in other occupations. These two occupations have more flexibility in terms of hours therefore suits to the needs of the female who want to work.[19]

For women, the negative and significant coefficients of older children for managerial, sales, and production related jobs indicate that children between the ages of 7–11 years reduce the odds for women to choose managerial, sales and production related occupations. The main reason behind these findings is that these occupations are least compatible with child rearing duties. Sales related jobs might require frequent travelling and managerial and production related occupations might offer very little flexibility in working hours thus creating difficulty for women to manage their domestic responsibilities. Therefore, women with children might simply not prefer to get into such occupations. Another plausible reason relates with the employees who might not prefer women with children i.e. employers might discriminate against women with children. The choice of occupation of women with children is for those which as socially approved and provide non-pecuniary benefits.

The Predicted Probabilities of Occupational Choice

Our results show that the structural differences in the occupational choice of gender being witnessed in the previous section stem from the difference in personal

[19]In case of craft related activities, they do not even have to leave their home because most of the craft related work is carried out at the residence of the workers.

characteristics which lead to different occupational distribution for men and women. We further explored the changes in choice probabilities of men and women by assuming the same effect of variables determining the occupational choice for both sexes. To do so, the personal characteristics of women were first evaluated at women's coefficients and then men's coefficients. In the next step, men's characteristics were evaluated at women's coefficients and women's characteristics at men's coefficients. The differences in two distributions indicate the presence of gender discrimination in the labour market, beside the difference in tastes and preferences.[20] The above procedure is used by many studies analysing the gap in earnings [Zveglich and Rodgers (2004); Teo (2003) and Dolton, *et al.* (1989)].

It is observed that when women were given men's coefficients, the probability of women into high paying occupations increased. The results show that the probability of women being in managerial occupation increased by 5 percentage points when their personal characteristics were evaluated at men's coefficients. The results further show that the probabilities of women being in low paying careers decrease when their personal characteristics were evaluated at men's coefficients. These results show that women can enter into high paying occupations with their superior personal characteristics if there is no discrimination against them in the labour market.

Table 8

Predicted Choice Probabilities for Men and Women

	Predicted Choice Probabilities of:			
%	Women: Using Men's Eq	Women: Using Men's Eq	Women: Using Women's Eq	Men: Using Women's Eq
Managerial	21.68	26.69	20.54	19.68
Professional	21.10	20.80	19.49	19.68
Medical	11.50	6.86	19.36	20.09
Teaching	8.40	8.57	18.40	18.34
Sales	13.00	11.02	18.10	18.00
Craft	12.39	13.17	3.78	3.79
Production	11.52	12.52	0.32	0.45

Interestingly when men's personal characteristics were evaluated at women's coefficients, we found almost the similar choice probabilities for both sexes. The reduction in the occupational choice between genders by the above analysis shows that the discrimination in the labour market plays a role in placing men and women in different occupations. The extent of the discrimination is however not very clear.

[20]Women's choice probabilities predicted using women's coefficients and women's choice probabilities predicted using men's coefficients.

VI. CONCLUSIONS AND POLICY IMPLICATIONS

The main focus of the study has been to investigate the occupational segregation between genders and to determine the role of different factors in the occupational choice of individuals in Pakistan. By employing multinominal logit model on PIHS 2001-02 data, we found that human capital variables (education, training and experience) play an important role in determining the occupational choice of both males and females. It is rather interesting to note that the role of human capital variables is stronger than the role of personal characteristics which give rise to different occupational choices between genders. The results further show that education has the strongest impact in the selection of occupation for both sexes but its role is more pronounced for females than males in the selection process.

The occupational choice of men is not being substantially affected by family responsibility as marriage and presence of children in the family are not having any statistically significant impact on the occupational choice. However for females, marriage and children in the family play important role in the selection of occupation. For men, the family related factors may have an important role for taking part in the labour market activities rather than in the choice of a particular occupation. Whereas for women, these factors may not have much relevance at the time of entry in the labour market but become important when choosing a particular occupation.

The difference in occupational choices reduces substantially between genders when women's occupational choices were predicted by using men's coefficients and prediction of men's by using women's coefficients. This leads to the conclusion that the major differences in occupational choices are the result of labour market discrimination as well as the variation in personal characteristics. It is noted that some occupations are labelled as men's and some are labelled as women's occupations and stereo type employers just follow the tradition rather than using job requirements.[21] This attitude of the employers restricts the entry of males in so called female's occupations and entry of females in males dominated occupations.

There is a need to introduce changes in the system and steps to open more occupations to women for the promotion of both economic efficiency and gender equality in the country. It is observed that education and training play important role in the occupational choice for both men and women but its roles for women is rather strong. The major recommendation of the study is therefore based on the role of human capital factors. Education is the single most important factor for female labour to overcome gender bias. Therefore, every effort has to be made to promote female education, in particular post primary education. There should be targeted programmes for the promotion of female education to help them move into higher paying occupations and enhance their prospects of getting jobs in the formal sector.[22]

[21]Our results are in line with the "Crowding Hypothesis" of Polachek and Siebert (1993).

[22]Currently a majority of the females are working in the informal sector where these women are pushed down to the lower paying occupations [Pakistan (2001-02)].

However, a limited participation of female in labour market is more due to the socio-cultural factors this society has inherited and maintained, and to the stagnant industrial structure, than simply due to the state of education alone. Therefore, it is not going to reduce the occupational segregation substantially. The issue of discrimination has also to be taken seriously in devising programmes for reducing occupational segregation. Such type of social programmes should be initiated that dispel the belief of employers about suitability of males and females for different jobs. These social programmes will change the views of employers for labelling of occupations as men's and women's. These programmes will also benefit females by making their employers to compensate equally for same jobs. This will reduce the wage inequality. Although the time and cost associated with such programmes is high, the social, economic and political benefits are high enough for making an effort.

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