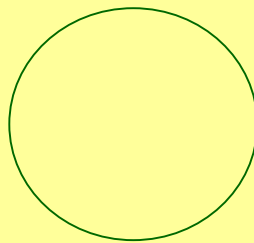# Gender, Poverty, and Occupational Choice in Poor and Non-poor Households: An Analysis Based on the Household Survey Data of Pakistan

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December 2003

PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS
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1. INTRODUCTION

In recent years, increasing economic integration and the pursuit of flexible forms of labour market to retain or improve competitiveness has resulted in the feminisation of labour force in most developing countries. However, despite the increase in labour force participation the females are still in the disadvantaged position in the new labour market setup particularly in terms of low wages, limited access to training, and higher incidence of poverty among working female headed households. This disadvantaged position of females may be attributed to differences in personal characteristics of the working males and females, limited occupational choices for females and gender discrimination in the labour market.

In Pakistan, in 1990s, the differences in mean earnings of males and females remained quite significant. The ratio of average female earning to average male earnings increased to 24 percent in 1998-99 from 19 percent in 1992-93. In nominal terms the difference decreased to Rs 2162.14 in 1998-99 from Rs 1177.52 in 1992-93. This shows that, gender based earnings gap has widened overtime. This gap in earnings could be a result of difference in male-female personal characteristics like education, experience, area of residence and occupational choice, and/or rising involvement of females in the labour market affecting returns to labour adversely.[1] If earning differential is a result of unfair hiring practices due to labour market discrimination then full potential of the work force may not be realised. This under utilisation of the work force leads to economic inefficiencies providing a justification for government intervention. However, if earnings gap is result of individual's own occupational choice then government intervention to ensure 'equal pay' will create distortions. Therefore, it is important to understand the main factors contributing to the differences in earnings of males and females.

The issue of discrimination can be examined from the labour demand or labour supply side. In a perfectly competitive setup discrimination as a result of prejudice can not prevail in the long run as the employers can lower the cost by hiring the females of same productivity. The statistical discrimination could continue because it can be based on group affiliations i.e., the females are paid less as compared to males. In the empirical literature the residual of earning differential, i.e., earning differential after adjusting for differential in productivity, accounts for discrimination.[2]

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[1]The Household Integrated Economic Survey data for the years 1992-93 and 1998-99, published by Federal Bureau of Statistics, show significant changes in occupational composition. However, the data reporting categories of occupations changed in the two survey. Using the individual level data, we were able to organise the information for the comparable occupational groups for the two years.

[2]For the residual earnings, Polachek and Siebert (1996) also used the term 'measure of ignorance'.

As mentioned earlier, gender discrimination in the labour market can be measured in terms of earning differentials among the working males and females, after adjusting for differentials in human capital and other quantifiable personal characteristics. However, due to multi-dimensional nature of gender discrimination (GD), it is difficult to measure it fully. For example, if the females are concentrated in low paying jobs then despite equitable wage structure within occupation, females' earnings may be lower then males' earnings. However, if the wage structure is not equitable within occupation, the earning differential between males and females may be attributed to employers' discrimination. If so, it can be useful for identifying the role of occupational choice in explaining male-female earnings gap and poverty. Therefore, it is important to examine the distribution of workers across occupations and the structure of earnings of workers within an occupation and across occupations.

The workers in Pakistan, particularly females, are crowded in few occupations like sales and service, agriculture workers or production workers. However, within these occupational categories the distribution of females has changed significantly over time. Similarly the comparison of percentage contribution of males and females in household income shows that the percentage share of females in household income declines as the household income increases. How far the change in occupational choice is responsible for the difference in males and females income? Does occupational choice contribute differently to earnings of the poor and non poor households? How far the characteristics adjusted earning differential declines, when we adjust earning profiles for occupational choice also? The analysis of these critical issues is important to understand the linkage between occupational choice and poverty and to propose measures for expansion of occupational choice for females. The present study is an attempt in this direction.

The study is organised in six sections. After the introduction, second section gives a brief over view of the recent studies. Section 3 examines the characteristics of the working males and females and weather these characteristics have changed overtime, i.e., between 1992-93 and 1998-99. The emphasis is on changes in the characteristics of workers in different occupational groups. Brief description of the data is in Section 4. Major issue is the adjustment of the data for changes in occupational composition between the period 1992-93 and 1998-99. The methodology to examine the contribution of personal characteristics on males' and females' earnings and labour market discrimination is discussed in Section 5. The results of the study are discussed in Section 6. Finally, major conclusions and policy directions are given in Section 7.

2. EMPIRICAL EVIDENCE

In the empirical studies, reported below, we briefly discuss the issue of gender discrimination, occupational concentration and poverty. The studies on gender discrimination decompose the wage gap into a part attributable to differences in the vector of characteristics and a part attributable to differences in returns associated to each of these characteristics. However, there is no consensus in the empirical literature on the factors affecting occupational choice and gender discrimination. Factors like decline in

fertility rates, expansion of commercialisation in the economy, decline in subsistence oriented household sector, diversification of economic activities, increase in education and skill have been claimed to be responsible for the rise in female labour market participation in most of the developing Asian countries. However, lack of data on all these indicators in a country makes it difficult to assess the total impact on female labour market situation.

Occupational segregation is an important gender dimension in the labour market. Occupational segregation means tendency for males and females to be employed in different occupations from each other across the entire spectrum of occupations. This is a symmetrical relationship as the degree of segregation for males and females will be the same. Total segregation means that all occupations are staffed exclusively either by males or females. However, there is no occupation in which only one gender is employed implying that total segregation is not possible [see Siltanen, Jarmen and Balckburn (1995)].

A few studies examining the gender dimensions of the labour market, occupational concentration and poverty are discussed below.

Jose (1987) examines the extent of the impact of increase in inflow of female workers in a given occupation on a fall in the relative wage level and on the persistent concentration of female workers in a few occupational groups suppressing female wages and hampering their promotion. The also study finds that occupational segregation can be an indicator of skill-intensity of the labour force. For example an increase in professional and technical workers indicates rising skill intensity of the labour force. Similarly, rising administrative and managerial labour force indicates a rise in quality of the labour force.

Polachek and Siebert (1996) present "Crowding Hypothesis-(CH)" to explain the differences in earnings of males and females. According to the hypothesis, the females' earn less because they are in "women's job", i.e., effect of occupational concentration of females. The hypothesis describes that there are certain jobs that are set aside for females whereas males are allowed to choose any job. Thus, the females are crowded into a small number of occupations lowering their wages. According to Polachek and Siebert (1996), the information shows that both in terms of earnings and occupational achievement females have a secondary economic position. The preferred occupations for females seem to be teaching, nursing and other related low paying segment even within the category of professionals. Furthermore, Polachek and Siebert indicate that the earning gap may change over the life cycle. The earning gap between males and females, lower in the early age, may increase with experience and occupational mobility over time. Therefore, analysis based on broad occupational classifications may be misleading.

Behrman and Zhang (1995) conducted an in-depth study of gender issues and employment for Asian countries. The study reports that higher concentration of females in the agriculture sector led to higher gender segregation in Pakistan, the Philippines, and Turkey.

The study for Mongolia indicates the importance of females' contribution in preventing the poverty of ultra-poor households. The study shows that excluding females' contribution the rural gini and households' poverty gap ratios are 0.63 and 0.32, respectively. When females' income is included the ratios decline to 0.49 and 0.27, respectively implying that females are playing an important role in reducing household poverty in Mongolia [see Subbarao and Ezemenari (1995)].

Zveglich and Rodgers (1999) show that occupational segregation played a small role in gender earnings differentials in Taipei, China. They report that changes in occupational structure over time do not explain the trend in earning differential between males and females. Even after controlling for the differences in observable characteristics, the earning differential across occupational categories remain substantially large and increase over time. These results suggest that, so far, presence of labour standards has not helped in reducing wage gap in Teipei, China, during 1978-1997.

Gender inequality in human capital measured in terms of secondary education has negative impact on economic growth. For example, Dollar and Gatti (1999) report that if secondary education of females increases by 1 percent the growth rate increases by 0.3 percent.

Furthermore, recent empirical research shows that rising unemployment rate among males and females, the concentration of females in low-paying jobs, and gender discrimination affect the returns and performance of females in the labour market [see Siddiqui and Siddiqui (1998), and Siddiqui (2001)].

Using Spanish data for the year 1995, Garcia, Hernandez and Lopez-Nicolas (2001) examine the link between subjective perceptions and objective measures of wage discrimination by estimating the mean and several quintiles in the conditional wage distribution of males and females. The study decomposes the gender wage gap into a part attributed to different characteristics and a part attributed to differential returns to these characteristics. In the process the study takes into account the endogeneity of educational choice and the labour market participation decision of females. The results suggest that the absolute wage gap can be attributed to different returns to improvements in characteristics of workers over the wage scale. In Spain females earn about 75 percent of male earnings and a large part of the difference can not be explained by education, experience or sector of employment.

Okojie (2002), based on Nigeria's experience between 1980 and 1996, claims that there are linkages between gender of the head of the household, education and household poverty. Based on two different poverty line estimates, the study shows a rise in poverty from 27.1 percent in 1980 to 47.3 percent in 1985, to 42.7 percent in 1992 and to 66.9 percent in 1996.[3] The results for Gini coefficient and Theil's entropy measure show that the level of inequality is high in Nigeria and much of the inequality is within groups rather then between groups. The multivariate analysis shows that female headed

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[3]Okojie uses two poverty lines. One is two-thirds of mean household income per capita and second is one-third of mean household income per capita.

households are more likely to be poor and the increase in education reduces the likelihood of being poor. Furthermore, higher household size increases the likelihood of being poor. The study also emphasises that the low human capital among females leads to higher incidence of poverty among females which in turn leads to lower investment in girls' education. The vicious cycle continues and perpetuates poverty among females. Thus, the poverty alleviation programmes should concentrate on increasing the female education and reducing the fertility. The study also concludes that the main issue of concern is not whether female-headed households are poorer, the major issue is the vulnerability of the females and how it can be reduced.

Thus, we can conclude that the rise in employment in few categories may indicate rise in quality and productivity of labour force resulting in lower labour market discrimination. Therefore, the empirical model, discussed in Section 5 of this study, takes into account occupational concentration of males and females, explicitly. This brief over view of studies supports the conclusions of Kanbur (2002) that the gender differences in education and earning are important determinants of household welfare.

3. GENDER DIMENSIONS OF LABOUR MARKET, OCCUPATIONAL DISTRIBUTION, AND POVERTY IN PAKISTAN

In Pakistan, female labour force participation rate is low but rising over time. Comparison of Table 1 and Table 2 reveals that the fraction of females in total employed labour force increased from 13.908 percent in 1992-93 to 22.852 percent in 1998-99. Contrary to the expectations, with the rise in female labour force participation the occupational concentration has also increased, though marginally, over time. In 1992-93, in majority of the occupational categories, less than 1 percent of total employed were females. Only two categories, viz., agriculture, and craft and other related category reported that more than 10 percent of the total employed were females. In personal and protective and sales and service category, share of females in total employed females, increased from 5.389 percent and 0.349 percent in 1992-93 to 6.663 percent and 1.871 percent, respectively, in 1998-99. In fact, in 1998-99, more then half of the total employed in this category were females. Agricultural workers remained major occupational group in both years (see Table 1 and Table 2). The tables also show that sex-ratio, an indicator of occupational concentration/crowding, increased only in few occupational groups, viz., agriculture, personal and protective services, teaching and craft and others. In general, the sex ratio did not change during the two years under consideration. This trend indicates significant and persistent gender differences in labour force participation and in occupational choice of workers.

The differences in occupational concentration of females may result in differential between wage income of male and female workers. Table 1 and Table 2 show that the females are concentrated in teaching profession where differential is lowest. Among the corporate managers and scientific workers, the earning differentials between males and females are high. As mentioned earlier, the gap between earnings of males and females can be attributed to differences in personal characteristics of the workers and to the labour

Table 1

Percentage Distribution of Males and Females across Occupations—1992-93

Occupation	P1	PF1	PF2	PF3	Sex Ratio	Difference in Income (in Rs.)	Difference in Education (in Years)
Legislators	0.510	0.237	6.451	0.464	6.896	1806.81	3.35
Cooperate Manager	0.605	0.293	6.749	0.485	7.238	466.630	2.74
General Managers	9.883	2.424	3.411	0.245	3.531	1289.79	0.87
Physical, Mathematical	0.002	0	0	0	0	12500	13.00
Teaching	2.772	5.679	28.493	2.050	39.846	380.75	0.41
Other Professionals	0.874	0.315	5.013	0.360	5.278	393.17	2.95
Physical and Engineering	0.083	0.064	10.753	0.773	12.048	1046.78	-1.94
Other Associate Professionals	2.660	0.229	1.196	0.086	1.210	822.43	-0.98
Office Clerks	2.476	0.181	1.018	0.073	1.028	399.02	2.05
Customer Services Clerks	0.322	0.012	0.501	0.036	0.504	697.37	2.70
Personal, and Protective	4.132	5.389	18.141	1.304	22.162	824.00	1.70
Market-oriented Skilled Agriculture	34.087	35.694	14.564	1.047	17.047	1072.27	1.19
Subsistence Agriculture	13.530	34.811	35.784	2.573	55.725	705.87	1.04
Extraction and Building	9.159	0.974	1.480	0.106	1.502	507.15	0.39
Metal, Machinery	2.123	0.212	1.388	0.100	1.407	1195.38	2.37
Other Craft And Related Trade	6.820	11.588	23.632	1.699	30.945	1117.72	1.36
Stationary-Plant and Related	0.436	0.360	11.488	0.826	12.979	1201.96	2.20
Chemical Product Machine Operator	1.349	0.486	5.013	0.360	5.277	1455.08	1.40
Drivers and Mobile Plant Operator	4.057	0.361	1.238	0.089	1.253	822.02	0.34
Sales and Services Elementary	1.845	0.349	2.628	0.189	2.699	844.19	0.97
Others	0.757	0.374	2.095	0.076	3.780	607.99	0.36
Total	100	100	13.908	1	16.155	1177.53	1.59

Note: P1= Proportion of workers in each occupation; PF1=Proportion of female workers in each occupation to total female workers; PF2=Share of female workers in total employed in each occupation; PF3= PF2/13.908; Sex Ratio= Female workers as percentage of male workers.

Table 2

Percentage Distribution of Males and Females across Occupations—1998-99

Occupation	P1	PF1	PF2	PF3	Sex Ratio	Difference in Income	Difference Education
Legislators and Senior Officials	0.334	0.443	30.276	1.325	43.422	6354.06	11.42
Cooperate Managers	0.360	0.085	5.372	0.235	5.677	11583.09	10.21
General Managers	0.278	0.019	1.592	0.070	1.617	1995.45	-3.91
Physical, Mathematical	0.228	0.006	0.568	0.025	0.571	5419.11	-4.30
Teaching Professionals	3.147	5.160	37.461	1.639	59.901	1094.95	0.29
Other Professionals	0.512	0.118	5.281	0.231	5.576	6992.34	2.67
Physical and Engineering Science	0.334	0.055	3.743	0.164	3.888	3071.48	-1.59
Other Associate Professionals	0.975	0.057	1.333	0.058	1.351	-208.96	-3.94
Office Clerks	1.716	0.156	2.077	0.091	2.122	1017.02	1.36
Customer Services Clerks	0.497	0.052	2.401	0.105	2.461	2957.18	3.74
Personal and Protective	6.365	6.663	23.922	1.047	31.444	1960.28	3.35
Market-oriented Skilled Agricultural	25.728	28.499	25.313	1.108	33.891	1680.68	2.51
Subsistence Agricultural	11.460	16.937	33.774	1.478	50.997	1504.73	1.90
Extraction and Building	0.971	0.093	2.190	0.096	2.239	2184.13	2.16
Metal, Machinery and	2.189	0.335	3.493	0.153	3.620	2005.01	2.15
Other Craft and Related Trades Workers	3.209	5.760	41.013	1.795	69.530	2231.20	2.98
Stationary-Plant and Related Operators	0.184	0.039	4.927	0.216	5.182	2782.67	4.15
Machine Operators and Assemblers	1.798	0.383	4.867	0.213	5.116	2077.43	1.51
Drivers and Mobile-Plant Operators	3.285	0.081	0.566	0.025	0.569	2721.53	4.12
Sales and Services Elementary	4.858	1.871	8.801	0.385	9.651	1860.54	2.33
Agriculture, Fishery and	6.771	14.384	48.543	2.124	94.338	1204.04	1.72
Others	23.51	17.096	17.801	2.988	46.821	2242.70	3.24
Total	100	100	22.852	1	29.621	2162.14	2.87

Note: See notes under Table 1.

market discrimination. In the personal characteristics, human capital variables, particularly education and experience are important.

Educational and literacy status of a nation is the most important indicator of human capital. Though still far behind most developing countries, data show that literacy rate is rising in Pakistan, but the male-female literacy gap has also increased despite rise in female literacy. According to the Population Census of 1998, the overall literacy rate in Pakistan was 45 percent, but the female literacy rate was only 32.6 percent. The number of literate females increased from 0.8 million in 1961 to 11.4 million in 1998 at an average growth rate of 7.2 percent per year. The growth rate for males' literacy was only 5.1 percent per year.

Despite rapid rise, the overall literacy rate in Pakistan is still lower than that of other countries in the region. The reasons for low literacy could be limited access and availability of educational infrastructure, gender discrimination in sending girls to school and to work. For example, Siddiqui, *et al.* (2001), based on survey of major industrial cities of Pakistan, report that majority of male and female respondents indicate that girl child will be picked up from school in case of financial constraints. The main reasons for the response was that the benefits of investment in females' education may not accrue to the investors and discrimination in the labour market. This supports the view of Mincer and Polachek (1974) that labour market discrimination discourages families to invest in human capital of girls.

Lower investment in girls education leads to lower human capital of working females resulting in significant differences in education of working males and female. On average the difference in education of males and females has increased from 1.59 years of schooling in 1992-93 to 2.87 years of schooling in 1998-99. This shows that despite the rise in female literacy, it has not resulted in reducing the gender gap in human capital resulting in persistent gender gap in earnings of males and females.

Experience reflects accumulation of human capital on the job. However, it is difficult to measure it. Therefore, like most studies, we take age as an indicator of experience. Interestingly, the differences in average age of the male and female workers, across occupations, are not significant implying that experience is not significantly different among the male/females workers across occupational categories. This may not be true due to discontinuities in the labour market experience of females because of family responsibilities and social and cultural factors. However, non availability of the data makes it difficult to quantify actual differences in 'experience' of male and female workers.

Gender discrimination in the labour market is attributed to differences in the personal characteristics of male and female workers and in terms of hiring practices of the employers. It is also argued that differences in education and occupational concentration are responsible for the lower earnings of female workers and large gender gaps in earnings of females and males in some occupations. Based on Pakistan's data, studies show that gender discrimination is significant in Pakistan [see for example, Ashraf and Ashraf (1993) and Siddiqui and Siddiqui (1998)]. Decomposing the earning differential as a consequence of differences in personal characteristics and differences in the labour market, the study by Siddiqui and Siddiqui (1998) revealed that discrimination accounts for

about 20 percent of the earning differential between males and females. Interestingly, the study reveals that wages of highly educated females are a little higher than those of males. This wage difference is also indicated by a negative wage difference among professional workers, implying that education could contribute significantly in lowering gender discrimination in Pakistan. Ashraf and Ashraf (1993) reported similar results. However, the residual approach, applied in both studies, to estimate discrimination, does not take into account the feedback from labour-market discrimination to differences in individual characteristics.

We have mentioned earlier that poverty status of the household may be important in determining gender discrimination in the labour market. In 1990s, most of developing countries, including Pakistan, reported increasing incidence of poverty. As a result, the last two decades' development efforts with the support of the national governments and bilateral and multilateral institutions saw an emphasis on poverty alleviation programs in developing countries. The emphasis of these programs has been to reach the most vulnerable groups of the society, particularly females and children. The *World Development Report-1990* [World Bank (1990)] recommended a two-pronged strategy for poverty alleviation: first, promote employment opportunities, profitability, and efficiency through a market-based approach to resource allocation; and second, enable the poor to take advantage of new opportunities through improvements in human capital formation. However, despite the recognition of the problem and solutions, most countries, including Pakistan, have experienced a return of poverty in the decade of 1990s.

The rationale for including the gender perspective explicitly in the policies for poverty alleviation is that males and females experience poverty differently, because the constraints, options, incentives and needs of females and males are different. Therefore, a full understanding of the gender dimensions of poverty is expected to improve both the equity and efficiency of efforts and reduce poverty. According to Bamberger, et. al., (2002), "Evidence is growing that gender disparities are not only inequitable but also lead to economically inefficient outcomes, resulting in slower growth and lower levels of welfare-that is higher poverty. Increasing evidence shows that growth and social development significantly determine poverty outcomes". The literature also shows that poorer the household the higher is the dependence on female labour implying that poverty is the main factor determining female participation in the labour market. Micro level studies, particularly of rural communities, indicate that the dependence of poor households on females' income is higher.[4] These households are more impoverished due to low human capital, restricted mobility, and lack of access to social and productive assets, and consequently the economic value of female labour is low.

In Pakistan, not only poverty has increased the income distribution has also worsened in the decade of 1990s. A rising trend in gini coefficient over time from 0.369 in 1984-85 to 0.400 in 1996-97 and rise in the ratio of average household income in the highest to the lowest income group implies a widening gap between the rich and the poor

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[4]See for example Subbarao, and Ezeemenari (1995) and Dollar and Gatti (1999).

population. How this has affected the status of the poor household is also a major concern. The poverty estimates, reported in Siddiqui (2001), based on the per capita expenditure data, by gender of the household heads, show that poverty has increased substantially in the rural areas of Pakistan.[5] Based on the head-count ratio, the percentage of population below the poverty line increased from 25.3 percent in 1993-94 to 37.4 percent in 1996-97 among male-headed households in rural areas. Similarly, among female-headed households, head count index of poverty increased from 26.3 percent in 1993-94 to 38.5 percent in 1996-97. This suggests that the rise in poverty was almost similar among the male- and female-headed households. However, in urban areas there was a decline in poverty based on head-count ratio in both male- and female-headed households. The results for PIHS-1998-99 show that 33 percent of the urban male headed households are poor whereas 40 percent of the female headed households are poor and in the rural areas 32.7 percent of male headed households and 65 percent of the female headed households are poor. This supports the view that poverty incidence is higher among the female headed households and it has increased over time, particularly in rural areas.

In this study, keeping in view the occupational concentration of workers, we intend to decompose differences in earnings of males and females due to gender based differences in basic characteristics and labour market discrimination. If occupational concentration and poverty are correlated then the decomposition may give us different results for workers belonging to poor and non poor households. Table 3 and Table 4 report the poverty situation of the workers in 1992-93 and in 1998-99 respectively. The tables show that majority of the workers, in total male and in total female workers, belong to poor households and this share has increased over time. This is not surprising because of the rise in poverty during this period. Table 3 and Table 4 also indicate that incidence of poverty is higher in those occupations where the females are concentrated. Thus, poverty seems to be an important issue linked with females' occupational choice and gender discrimination in the labour market.

4. DATA ISSUES

The data sources for the study are Household Income and Expenditure Survey (HIES) for 1992-93 and 1998-99, published by Government of Pakistan. In HIES-1992-93 and HIES-1998-99, total number of households covered are 14594 and 14679, respectively. Major issue is the change in occupational classification in the two surveys. Using the individual level information and detailed disaggregated occupational classifications, used by Federal Bureaus of Statistics, we matched the occupations in the two surveys, using 1998-99 as the base years. The information was categorised in following occupational groups:

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[5]The poverty line for 1993-94 estimates was assumed to be equal to Rs 309.00. Since the price index increased by 39 percent from 1993-94 to 1996-97, Rs 431.96 are assumed to buy the same commodity bundle in 1996-97. Based on price adjusted poverty line estimates, poverty indicators are estimated. Similarly price adjusted poverty line estimates are computed for the year 1998-99. The estimates are Rs 685 per capita for urban areas and Rs 569.4 per capita for rural areas. Using these estimates, the poverty incidence is computed.

Table 3

Poverty and Occupational Distribution of Males and Females—1992-93

Occupation	MPTPi	MPTMP	MPTP	FPTFi	FPTFP	FPTP	Tfi
Legislators	9.38	0.11	80.00	30.00	0.14	20.00	7.25
Cooperate Manager	28.30	0.41	93.75	20.00	0.14	6.25	8.62
General Managers	34.25	8.58	99.20	33.33	1.30	2.80	2.88
Physical, Mathematical	0	0	0	0	0	0	0
Teaching	28.01	1.43	82.11	14.98	1.63	17.90	28.95
Other Professionals	40.71	0.84	93.88	40.00	0.29	6.12	6.22
Physical and Engineering	22.73	0.05	100.00	0	0	0	8.33
Other Associate Professionals	36.70	2.53	99.53	58.33	0.34	2.47	1.57
Office Clerks	29.17	2.11	98.72	27.27	0.14	1.28	1.37
Customer Services Clerks	30.77	0.26	100.00	0	0	0	1.09
Personal, and Protective	49.64	4.47	80.53	63.10	5.66	19.47	15.98
Market-oriented Skilled Agriculture	69.85	37.48	82.46	76.40	41.78	17.54	16.28
Subsistence Agriculture	67.56	12.18	63.75	78.28	36.31	36.26	32.93
Extraction and Building	57.38	11.84	99.76	34.38	0.53	0.84	1.40
Metal, Machinery	38.52	1.86	98.00	66.67	0.19	1.93	1.13
Other Craft and Related Trade	45.70	5.35	74.21	62.65	9.74	25.79	20.23
Stationary-Plant and Related	36.89	0.35	84.44	63.64	0.34	15.56	9.65
Machine Operator	36.70	1.20	94.24	66.67	0.38	5.76	3.25
Drivers and Mobile Plant Operator	40.43	4.27	98.11	52.94	0.43	1.89	1.45
Sales and Services Elementary	41.91	2.09	97.43	37.50	0.29	2.56	2.86
Labour Not-classified Elsewhere	54.45	1.96	96.83	70.0	0.34	3.17	2.48
Total	51.77	100	83.99	67.29	100.00	16.03	12.81

Notes: MPTP$_i$=Male poor as percentage of total male in each occupation; MPTMP=Male poor as percentage of total male poor; MPTP=Male poor as percentage of total poor;
FPTF$_i$=Female poor as percentage of total female in each occupation; FPTFP=Female poor as percentage of total female Poor; FPTP=Female poor as percentage of total poor; Tf$_i$=Female as percentage of total labour in each occupation.

Table 4

Poverty and Occupational Distribution of Males and Females—1998-99

Occupation	MPTPi	MPTMP	MPTP	FPTPi	FPTFP	FPTP	Tfi
Legislators and Senior Officials	2.58	0.06	20.00	36.36	0.62	80.00	22.15
Cooperate Managers	2.15	0.06	100.00	0	0	0	3.47
General Managers	3.70	0.09	100.00	0	0	0	2.88
Physical, Mathematical	0.94	0.02	100.00	0	0	0	1.84
Teaching Professionals	6.91	0.97	49.53	12.92	2.77	50.47	35.27
Other Professionals	10.38	0.40	95.65	5.88	0.05	4.35	7.42
Physical and Engineering Services	9.09	0.26	93.33	20.00	0.05	6.67	3.15
Other Associate Professionals	6.87	0.49	100.00	0	0	0	1.50
Office Clerks	13.28	1.59	98.86	8.33	0.05	1.14	1.80
Customer Services Clerks	15.25	0.49	93.10	50.00	0.10	6.90	2.21
Personal and Protective	25.29	7.52	72.49	29.43	8.01	27.51	24.59
Market-oriented Skilled Agricultural	23.65	23.71	73.47	21.55	24.03	26.53	28.39
Subsistence Agricultural	20.48	9.20	60.10	32.75	17.15	39.90	29.34
Extraction and Building	13.83	1.02	98.25	7.69	0.05	1.75	3.11
Metal, Machinery and ……..	24.96	3.09	40.75	24.00	0.31	3.43	3.56
Other Craft and Related Trades	24.82	2.58	88.89	36.16	6.78	48.35	39.12
Stationary-Plant and Related Operators	11.94	0.15	92.47	33.33	0.05	11.11	4.29
Machine Operators and Assemblers	30.13	2.47	11.79	57.90	0.57	7.53	4.07
Drivers and Mobile-Plant Operators	16.75	3.70	87.85	14.29	0.05	0.49	0.58
Sales and Service Elementary	26.70	7.54	53.77	39.04	2.93	12.15	8.64
Agriculture, Fishery and….	37.00	6.53	90.34	42.29	15.76	46.24	42.93
Total	22.08	100.00	90.34	29.04	100.00	26.27	21.31

Notes: MPTPᵢ=Male poor as percentage of total male in each occupation; MPTMP=Male poor as percentage of total poor; FPTFi=Female poor as percentage of total female in each occupation; MPTP=Male poor as percentage of total poor; FPTP=Female poor as percentage of total female poor; FPTFP=Female poor as percentage of total poor; Tfi=Female as percentage of total labour in each occupation.

(1) Legislator and senior officials
(2) Corporate managers
(3) General Managers
(4) Physical and Mathematical Professionals
(5) Teaching
(6) Other Professionals
(7) Physical and engineering Science
(8) Other Associate Professionals
(9) Office Clerks
(10) Customer Services clerks
(11) Personal and protective service providers
(12) Market-oriented skilled agriculture workers
(13) Subsistence agriculture workers
(14) Extraction and Building
(15) Metal and machinery operators
(16) Precision and handicraft
(17) Other craft and related workers
(18) Stationary plant and operators
(19) Machine operators and assemblers
(20) Drivers and Mobile Plant Operators
(21) Sales and service elementary
(22) Agriculture-fishing

Furthermore, the data used for estimation of earning functions and gender discrimination is disaggregated by the work status of males and females not by the gender of head of household. Estimation of earning functions is based on individual's earnings and other socio-economic characteristics. However, poverty status is based on per capita income of household. For the year 1992-93, we utilise estimates given by Federal Bureau of Statistics in UNDP (1999). The estimates are Rs 386.41, per capita, per month for urban areas and Rs 320.628 per capita, per month for rural areas. Using price index, the poverty line estimates are computed for the year 1998-99. The computed estimates of the poverty line are: Rs 685.8 for urban areas and Rs 569.3 for rural areas. Based on these poverty line estimates the households are divided between poor and non poor group.

5. METHODOLOGY

We decompose the gender based earning gap into gap due to differences in personal characteristics including occupational choice and gap due to labour market discrimination. The difference in earnings of males and females within occupation, after controlling for differences in personal characteristics, can be attributed to gender discrimination in the labour market.

Utilising the methodology developed by Oaxaca (1973) and Cotton (1988), we estimate the earnings functions for all workers, for male and female workers, separately. The specification of the model and estimation steps are as follows:

(1) The earning functions for males and females are estimated separately. These earning functions include the following explanatory variables to control for the productivity differentials arising due to differences in personal characteristics: Education, Age (proxy for experience) employment status and region (urban/rural).

(2) Using the weights from the estimated earning functions of males and females alternatively, the residual earnings are computed. The residual earnings gap is taken as an indicator of gender discrimination.

To analyse the role of occupational choice in gender earnings gap, we estimate the earning functions inclusive and exclusive of occupational dummy variables. The estimates of the earning functions are used to decompose earning differential into differences in basic characteristics, viz., education, experience, employment status, region, occupational choice and labour market discrimination.

Oaxaca (1973) and Cotton (1988) define the coefficient of discrimination as: [6]

$$D = \frac{Y^M / Y^F - MP^M / MP^F}{[MP^M / MP^F]}$$

$$D + 1 = [(Y^M / Y^F)/(MP^M / MP^F)] \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

Where D is indicator of market discrimination. Y^M and Y^F are wages (earning) of males and females, respectively. MP^M and MP^F are marginal productivity of males and females.

Taking log of (1) we can write:

$$ln(D+1) = [ln(Y^M) - ln(Y^F)] - [ln(MP^M) - ln(MP^F)]$$

$$ln(Y^M) - ln(Y^F) = [ln(MP^M) - ln(MP^F)] + ln(D+1) \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

Where $ln(Y^M) - ln(Y^F)$ is log difference in earnings of males and females which can be decomposed in productivity differences, i.e., $[(ln(MP^M) - ln(MP^F)]$ and labour market discrimination, i.e., $ln(D+1)$.

Taking X_i as the set of basic characteristics of working individual, determining his/her productivity, we can write:

$$ln(Y^M) \equiv f(X_i^M) = \Sigma \beta_i^M X_i^M$$

$$\text{and} \quad ln(Y^F) \equiv f(X_i^F) = \Sigma \beta_i^F X_i^F$$

Substituting in Equation (2), we can write:

$$ln(YM) - ln(YF) = [\Sigma \beta_i^M X_i^M - \Sigma \beta_i^F X_i^F] \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (3)$$

According to Cotton (1988), Equation (3) can be decomposed as:

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[6]Superscripts *M* and *F* are for males and females, respectively.

$$ln(Y^M) - ln(Y^F) = \Sigma\beta^F_i(X^M_i - X^F_i) + \Sigma X^M_i(\beta^M_i - \beta^F_i) \quad \dots \quad \dots \quad \dots \quad \dots \quad (4)$$

$$\text{or} \quad ln(Y^M) - ln(Y^F) = \Sigma\beta^M_i(X^M_i - X^F_i) + \Sigma X^F_i(\beta^M_i - \beta^F_i) \quad \dots \quad \dots \quad \dots \quad \dots \quad (5)$$

First component on the RHS is attributed to differences in productivity and the second component $ln(D+1)$ is attributed to labour market discrimination. Equation (4) reflects earning differentials, based on the assumption that in the absence of discrimination, what will happen if males earn the same as females. Equation (5) is based on the assumption that females earn the same as males in the absence of discrimination.

Using household data for 1998-99, we estimate the earning functions for males and females. The set of characteristics (X_i) include age, age-squared, education, employment status, region (urban/rural) and various occupational categories.

Age is defined in terms of number of years. It is included as a proxy for experience. With the rise in experience the productivity of individual and consequently earnings are expected to rise. Age-squared is included to capture non-linearities in returns to experience. The coefficient of age is expected to be positive and the coefficient of age-squared is expected to be negative.

Education is the critical variable explaining the effect of human capital accumulation. Since more educated are expected to be more productive, the coefficient is expected to be positive showing a positive rate of return to schooling. The variable is defined as years of schooling.

Employment status is included as a categorical variable taking value 1 for the paid employees. The coefficient could be positive/negative depending on whether earning of paid employees are higher or lower relative to earning of self-employed.

The area dummy is included to capture the effect of residence on earnings. The variable takes value of 1 for urban areas and 0 for rural areas. If the earnings in rural areas are lower than earnings in urban areas, the coefficient will be positive.

Similarly the occupational dummies are defined for 14 occupational categories.[7] The coefficients can be negative or positive depending on variations in earnings across occupations with respect to base (excluded category of occupations).[8] Following three sets of earning functions are estimated for all workers and for male and female workers, separately:

(a) The earning functions for the males and females including basic characteristics like age, education, employment status and area.
(b) In the second set of equations the structural dummy variables for occupations are added in (a).

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[7]The occupations, due to few number of observation in some categories, are merged in following categories. Legislative, Managers, Teaching, Clerks, Personal and Protective services, Market oriented skilled workers, subsistence agriculture, metal and machinery operators, precision and handicraft, sales and services, fishing and all others.

[8]Excluded category included extraction and building workers, and drivers, and mobile plant operators and others.

(c) In the third set of equations, the occupational dummy variable and interactive occupational dummy with the set of characteristics are included in (a).

These three sets of earning functions are estimated for males and females separately and jointly. The exercise is also carried out, separately, for workers belonging to poor and non poor households.

6. RESULTS

The discussion of estimated earning functions is divided in four sub-sections, i.e., (a) All households; (b) Workers in the poor households; (c) Workers in the non poor households; and (d) Gender Discrimination.

(a) All Households

Table 5 reports the estimated coefficients of earning functions, based on basic characteristics of individual workers. All the coefficients have expected signs and are statistically significant. The rate of return to education is 4.5 for all workers, 2.7 for male and 12.2 for female workers. This shows that returns to females' education are substantially large. However, the coefficients of age are lower for females showing lower returns to experience. The reason could be frequent discontinuity in females' labour market experience due to family responsibilities, and other social and cultural factors. The coefficient of 'sex' is positive and statistically significant showing that male earnings are significantly higher than female earnings. Employment status also affects earnings positively implying that earnings of paid employees' are significantly higher then the earnings of self employed or other workers. Furthermore, the urban workers earn more than rural workers. As compared to males the impact of location is larger on females' earnings.

Table 5

Regression Results—1998-99

	All	Males	Females
Constant	–2.732	–0.974	–0.573
	(34.68)*	(11.43)*	(4.05)*
Age	0.224	0.287	0.10
	(51.86)*	(59.83)*	(11.48)*
Age-squared	–0.002	–0.003	–0.001
	(36.64)*	(44.13)*	(9.38)*
Education	0.045	0.027	0.122
	(15.16)*	(8.077)*	(14.86)*
Employment Status	2.574	2.228	4.174
	(84.20)*	(68.60)*	(57.87)*
Sex	2.715	–	–
	(75.893)*		
Region	0.623	0.435	1.234
	(19.56)*	(12.855)*	(16.65)*
Adj-R^2	0.284	0.371	0.52
F	4898.33	2925.20	1458.62
N	31489	24773	6715

Note: *t*-values are reported in parentheses and entries with '*' are statistically significant at 95 percent.

Whether occupational choice affects the earnings of individuals or not? The results reported in Table 6 show that earnings are affected significantly by occupational choice. Among the 14-occupational categories 6-categories show significant differences in earnings. Average earnings of the male teachers are lower than their average earnings in other occupation, where as the earnings of female teachers are significantly higher. This reflects a higher return to female education. The earnings of workers in personal and protective services category are lower, particularly for females. The results, reported in Table 6, show that in most occupations where skill requirements are lower, the earnings are lower, as expected, and for the occupations where skill requirements are higher, e.g. handicrafts, and others earnings are higher for females. The results show that since the skill requirements determine the occupational concentration, the coefficient of education declines with the inclusion of occupational dummy variables. The impact is larger for the female workers as compared to male workers. This result reflects that education plays critical role in determination of earnings and occupational choice, particularly of females.

Table 7 reports the results for the earning functions, adjusted for occupational concentration and interaction of occupational choice with basic characteristics of workers. The results show that returns to female education are substantially lower in agricultural and traditional sectors. However, in the handicraft category females' earnings are higher. The occupations that require higher level of education, e.g., legislators and administrative workers, the differences are not statistically significant (see the coefficient of sex occupation interactive variables). This is true for most of the occupational categories. Interestingly, in most cases the age-earning profiles are not statistically different across occupations, for males and females both.

The results of the *F*-test, reported in Table 14, show that inclusion of occupational dummy variables and occupational-interactive variables improve the performance of the estimated equations. Thus, we can say that occupational concentration is important for explaining variations in earnings of males and females and the impact is bigger for female workers.

(b) Poor Households

As mentioned earlier, in addition to the choice of occupation and its impact on earnings, we are interested in the issue of poverty also. From the earlier discussion, we know that females are concentrated in the traditional occupations like teaching, agriculture, protective services and handicraft where the incidence of poverty may be higher.

Table 8 reports the results of the estimated earning functions for the poor households. All the coefficients are statistically significant and have expected sign. However, the returns to education are substantially low, particularly for females. The returns to experience are also low for females, as compared to males. Like the earlier results, we can see that the coefficient of education declines, except for males, when variables representing occupational choice are included in the equations. In teaching occupation females' earnings are significantly higher whereas for males the difference is

Table 6

Regression Result with Occupational Dummy Variables—1998-99

	All	Males	Females
Constant	−1.631	0.112	0.518
	(18.614)*	(1.213)	(2.993)*
Age	0.215	0.275	0.120
	(51.00)*	(57.89)*	(12.59)*
Age-squared	−0.002	−0.003	−0.011
	(35.08)*	(41.79)*	(9.86)*
Education	0.023	0.015	0.066
	(6.973)*	(4.141)*	(6.69)*
Employment Status	2.00	1.782	3.428
	(58.80)*	(48.37)*	(45.92)*
Sex	2.760	–	–
	(74.46)*		
Region	0.180	0.052	0.580
	(5.381)*	(1.43)	(7.816)*
Legislator and Senior	−0.707	−0.423	−1.382
Officials	(3.535)*	(1.886)	(3.611)*
Corporate Managers	0.426	0.433	0.037
	(2.074)*	(2.096)*	(0.039)
Life Science and Health	0.716	0.05	1.083
	(5.259)*	(0.30)	(4.74)*
Teaching	0.644	−0.264	0.781
	(7.924)*	(2.80)*	(4.41)*
Clerks	−0.266	−0.211	0.878
	(2.958)*	(2.346)*	(1.624)
Personal and Protective	0.217	−0.192	−0.512
Service Providers	(3.692)*	(2.96)*	(3.61)*
Market Oriented Skilled	−1.515	−1.333	−1.923
Agriculture Workers	(34.276)*	(27.89)*	(15.45)*
Subsistence Agriculture	−1.254	−1.229	−1.121
Workers	(23.35)*	(20.54)*	(8.41)*
Metal and Machinery	−0.159	−0.085	1.028
Operators	(1.67)	(0.89)	(2.367)*
Precision and Handicraft	0.500	1.485	0.723
	(8.34)*	(0.194)	(5.73)*
Stationary Plant and	−0.048	−0.051	2.016
Operators	(0.165)	(0.175)	(1.66)
Machine Operators and	−0.199	−0.149	0.902
Assemblers	(1.733)	(1.29)	(1.82)
Sales and Service	−0.178	−0.259	0.403
Elementary	(2.75)*	(3.91)*	(1.96)
Agriculture-Fishing	−1.129	−1.177	−1.072
	(16.76)*	(14.26)*	(7.78)*
Adj-R^2	0.512	0.395	0.589
F	1650.72	851.32	506.63
N	31489	24773	6715

Note: t-values are reported in parentheses and entries with '*' are significant at 95 percent.

Table 7

Regression Result with Interactive Occupational Dummy Variables—1998-99

	All	Males	Females
Constant	−0.443	1.877	−0.218
	(2.31)*	(11.59)*	(0.41)
Age	0.202	0.208	0.144
	(23.19)*	(23.47)*	(4.58)*
Age-squared	0.002	−0.002	−0.002
	(16.99)*	(17.25)*	(3.77)*
Education	0.036	3.198	(0.119
	(6.87)*	(5.97)*	(4.88)*
Employment Status	1.502	1.406	3.455
	(29.55)*	(27.29)*	(16.55)*
Sex	2.365	0	0
	(19.07)*		
Region	−0.067	−0.105	0.358
	(1.29)	(1.99)*	(1.68)
Legislator and Senior Officials	−1.548	−2.593	−1.605
	(1.37)	(1.78)	(0.87)
Corporate Managers	0.157	1.287	3.720
	(0.06)	(0.47)	(0.29)
Life Science and Health	4.716	2.725	4.289
	(4.58)*	(2.22)*	(2.59)*
Teaching	4.082	3.027	3.071
	(5.28)*	(2.77)*	(2.81)*
Clerks	4.957	3.312	3.29
	(4.92)*	(3.92)*	(0.63)
Personal and Protective Service Providers	0.280	0.650	0.156
	(0.80)	(1.69)	(0.23)
Market Oriented Skilled Agriculture Workers	−4.927	−6.122	−0.060
	(20.96)*	(27.28)*	(0.11)
Subsistence Agriculture Workers	−3.515	−4.237	−0.408
	(12.70)*	(15.88)*	(0.64)
Metal and Machinery Operators	−0.472	−1.731	−1.645
	(0.62)	(2.77)*	(0.55)
Precision and Handicraft	−0.348	−1.426	−0.873
	(1.04)	(3.29)*	(1.37)
Stationary Plant and Operators	3.595	1.833	−2.148
	(1.33)	(0.86)	(0.33)
Machine Operators and Assemblers	0.964	−0.439	−5.375
	(1.17)	(0.66)	(1.95)
Sales and Service Elementary	−0.183	−0.679	−1.824
	(0.41)	(1.69)	(1.77)
Agriculture-Fishing	−0.985	−3.361	0.508
	(2.95)*	(8.38)*	(0.80)
Sex and Occupation			
Legislator and Senior Officials	−0.319	–	–
	(0.51)		
Corporate Managers	0.268	–	–
	(0.23)		
Life Science and Health	−1.80	–	–
	(−5.82)*		
Teaching	−2.014	–	–
	(9.92)*		

Continued—

Table 7—(*Continued*)

Clerks	−1.78	–	–
	(2.95)*		
Personal and Protective Service Providers	0.253	–	–
	(1.43)		
Market Oriented Skilled Agriculture Workers	1.450	–	–
	(10.41)*		
Subsistence Agriculture Workers	0.810	–	–
	(5.26)*		
Metal and Machinery Operators	−1.303	–	–
	(−2.59)*		
Precision and Handicraft	−0.739	–	–
	(−4.35)*		
Stationary Plant and Operators	−1.902	–	–
	(1.30)		
Machine Operators and Assemblers	−1.679	–	–
	(2.92)*		
Sales and Service Elementary	−0.733	–	–
	(3.04)*		
Agriculture-Fishing	−0.206	–	–
	(−1.15)		
Employment and Occupation			
Legislator and Senior Officials	2.070	1.869	1.093
	(3.48)*	(2.87)*	(0.79)
Corporate Managers	−0.878	01.038	–
	(1.84)	(2.17)*	
Life Science and Health	−0.473	−0.383	−2.272
	(1.60)	(1.09)	(4.48)*
Teaching	−0.644	−1.051	−1.891
	(2.20)*	(−2.77)*	(4.35)*
Clerks	−0.579	−0.595	−0.481
	(1.50)	(−1.52)	(0.26)
Personal and Protective Service Providers	0.721	−0.018	0.928
	(6.03)*	(0.13)	(3.33)*
Market Oriented Skilled Agriculture Workers	1.781	1.308	2.167
	(14.04)*	(9.39)*	(7.19)*
Subsistence Agriculture Workers	1.181	0.816	1.521
	(6.74)*	(4.38)*	(3.45)*
Metal and Machinery Operators	0.730	0.802	−0.778
	(3.80)*	(4.16)*	(0.67)
Precision and Handicraft	0.178	0.655	−2.024
	(1.53)	(4.19)*	(8.26)*
Stationary Plant and Operators	0.349	0.478	–
	(0.47)	(0.64)	
Machine Operators and Assemblers	1.012	1.092	0.290
	(3.84)*	(4.08)*	(0.21)
Sales and Service Elementary	0.329	0.340	−0.687
	(2.62)*	(2.62)*	(1.65)
Agriculture-Fishing	2.324	1.492	1.630
	(17.40)*	(9.21)*	(5.94)*
Age and Occupation			
Legislator and Senior Officials	−0.055	0.004	0.0023
	(0.87)	(0.05)	(0.02)
Corporate Managers	0.015	−0.003	−0.465
	(0.131)	(0.02)	(0.43)

Table 7—(*Continued*)

Life Science and Health	−0.126	−0.102	−0.077
	(2.78)*	(1.79)	(1.05)
Teaching	−0.060	−0.085	−0.0065
	(1.39)	(−1.48)	(0.10)
Clerks	−0.115	−0.118	−0.148
	(2.74)*	(2.80)*	(0.53)
Personal and Protective Service	−0.072	−0.037	−0.094
Providers	(3.96)*	(1.76)	(2.33)*
Market Oriented Skilled	0.077	0.203	−0.107
Agriculture Workers	(6.73)*	(16.47)*	(3.15)*
Subsistence Agriculture	0.042	0.112	−0.032
Workers	(3.05)*	(7.53)*	(0.87)
Metal and Machinery Operators	0.061	0.057	0.199
	(1.57)	(1.48)	(0.91)
Precision and Handicraft	0.051	0.053	0.149
	(2.71)*	(2.15)*	(3.85)*
Stationary Plant and Operators	−0.113	−0.128	−
	(0.87)	(0.96)	
Machine Operators and	−0.006	−0.027	0.682
Assemblers	(0.15)	(0.69)	(3.20)*
Sales and Service Elementary	0.029	0.012	0.158
	(1.41)	(0.57)	(2.79)*
Agriculture-Fishing	−0.072	0.077	−0.126
	(3.90)*	(3.25)*	(3.29)*
Age-squared and Occupation			
Legislator and Senior Officials	0.0005	−0.00005	−0.0003
	(0.67)	(0.06)	(0.14)
Corporate Managers	−0.0002	−0.00006	0.007
	(0.19)	(0.04)	(0.38)
Life Science and Health	0.001	0.0009	0.0008
	(2.22)*	(1.47)	(1.00)
Teaching	0.0003	0.0006	0.0002
	(0.57)	(0.80)	(0.21)
Clerks	0.001	0.001	0.002
	(1.89)	(1.91)	(0.49)
Personal and Protective Service	0.0007	0.0002	0.001
Providers	(3.06)*	(0.95)	(2.57)*
Market Oriented Skilled	−0.0005	−0.002	0.001
Agriculture Workers	(3.39)*	(11.19)	(2.68)*
Subsistence Agriculture	−0.0001	−0.0008	0.003
Workers	(0.76)	(4.16)*	(0.60)
Metal and Machinery Operators	0.0006	−0.0005	−0.003
	(1.01)	(0.95)	(0.87)
Precision and Handicraft	0.0007	−0.0006	−0.002
	(2.86)*	(1.78)	(3.54)*
Stationary Plant and Operators	0.001	0.001	0.004
	(0.82)	(0.90)	(0.80)
Machine Operators and	−0.00007	0.0002	−0.009
Assemblers	(0.14)	(0.41)	(3.22)*
Sales and Service Elementary	0.0003	−0.00006	−0.002
	(1.09)	(0.24)	(2.58)*
Agriculture-Fishing	0.0007	0.0009	0.002
	(3.17)*	(2.92)*	(2.96)*
Region and Occupation			
Legislator and Senior Officials	0.814	0.883	0.136
	(1.36)	(1.37)	(0.10)
Corporate Managers	1.373	0.955	5.621
	(2.26)*	(1.54)	(1.65)

Table 7—(*Continued*)

Life Science and Health	0.191	−0.011	0.098
	(0.71)	(0.03)	(0.21)
Teaching	0.203	0.219	−0.208
	(1.30)	(1.19)	(0.67)
Clerks	0.113	0.126	−0.228
	(0.63)	(0.712)	(0.15)
Personal and Protective Service	0.562	0.320	0.338
Providers	(4.94)*	(2.53)*	(1.19)
Market Oriented Skilled	0.128	0.159	−0.316
Agriculture Workers	(1.12)	(1.26)	(1.11)
Subsistence Agriculture	0.813	0.995	0.177
Workers	(4.78)*	(5.16)*	(0.51)
Metal and Machinery Operators	0.178	0.193	0.414
	(0.90)	(0.97)	(0.38)
Precision and Handicraft	0.325	0.024	0.185
	(2.70)*	(0.15)	(0.74)
Stationary Plant and Operators	0.380	0.435	–
	(0.60)	(0.69)	
Machine Operators and	0.212	0.244	−3.630
Assemblers	(0.92)	(1.05)	(2.11)*
Sales and Service Elementary	0.069	0.058	0.160
	(0.53)	(0.44)	(0.35)
Agriculture-Fishing	1.042	0.353	2.139
	(4.90)*	(1.41)	(5.56)*
Education and Occupation			
Legislator and Senior Officials	0.050	0.014	0.217
	(1.29)	(0.34)	(2.30)*
Corporate Managers	−0.036	−0.031	−0.157
	(0.83)	(0.71)	(0.58)
Life Science and Health	0.033	0.007	−0.030
	(1.29)	(0.23)	(0.66)
Teaching	−0.002	0.001	−0.076
	(0.15)	(0.07)	(2.26)*
Clerks	−0.006	−0.006	0.054
	(0.31)	(0.30)	(0.43)
Personal and Protective Service	0.008	−0.002	0.061
Providers	(0.64)*	(0.11)	(1.62)
Market Oriented Skilled	−0.035	−0.032	−0.079
Agriculture Workers	(3.64)*	(3.27)*	(2.00)*
Subsistence Agriculture	−0.041	−0.044	−0.138
Workers	(3.13)*	(3.15)*	(3.65)*
Metal and Machinery Operators	−0.039	−0.041	−0.049
	(1.76)	(1.80)	(0.41)
Precision and Handicraft	−0.012	0.0001	−0.108
	(0.74)	(0.01)	(3.29)*
Stationary Plant and Operators	−0.031	−0.023	−0.077
	(0.51)	(0.36)	(0.19)
Machine Operators and	0.0018	−0.014	−0.262
Assemblers	(0.67)	(0.53)	(1.63)
Sales and Service Elementary	−0.028	−0.020	−0.166
	(1.85)	(1.27)	(2.71)*
Agriculture-Fishing	−0.006	−0.033	0.058
	(0.29)	(1.43)	(0.91)
Adj-R^2	0.545	0.431	0.631
F	363.61	211.56	135.92
N	3149	24773	6715

Note: *t*-values are reported in parentheses and the entries with '*' are significant at 95 percent.

Table 8

Regression Results—1998-99 (Poor)

	All	Males	Females
Constant	–2.742	–1.500	–0.199
	(–18.724)*	(–9.167)*	(–0.762)
Age	0.230	0.308	0.08519
	(28.689)*	(34.101)*	(5.340)*
Age-squared	–0.002151	–0.002941	–0.0008848
	(–21.083)*	(–26.174)*	(–4.053)*
Education	0.05694	0.02716	0.05494
	(2.746)*	(3.401)*	(2.856)*
Employment Status	2.595	2.255	3.937
	(42.139)*	(33.537)*	(31.142)*
Sex	2.528	–	–
	(37.768)*		
Region	0.817	0.707	1.093
	(13.061)*	(10.353)*	(8.489)*
Adj-R^2	0.478	0.397	0.429
F	1135.938	720.831	294.767
N	7422	5469	1952

Note: t-values are reported in parentheses and the entries with '*' are significant at 95 percent.

not statistically significant. The earnings of males and females, both, are lower among the agricultural workers as compared to other workers. In this case also the returns to teaching are higher for females. However, the earnings of females are more sensitive to occupational choice as compared to earning of males as most of the coefficients of occupational dummy variables are statistically significant for females.

The comparison of results reported in Table 10 with results reported in Table 8 and Table 9, shows that in traditional occupations the returns to males are lower, however, for the occupations that require higher skill, the returns to males are higher as compared to females. Surprisingly, education-occupation interaction does not explain the earnings behavior of poor workers. The reason may be low educational attainment of poor, which limits occupational diversification among the poor households as a result they are concentrated in low pay segment in each occupational category.

The *F*-test, reported in Table 14, shows that for poor households inclusion of occupational concentration improves the fitness of equation significantly but the F-values are not as high as in case (a).

(c) Non-poor Households

The results for the non-poor households are reported in Table 11, Table 12 and Table 13. The results show a better fit, in general, for non poor households as compared to estimated equations for the workers from poor households. The returns to education are higher for non poor females as compared to returns to poor females [see Table 11]. The returns to experience are also higher for the non poor working females. Like case (a)

Table 9

Regression Result with Occupational Dummy Variables—1998-99 (Poor)

	All	Males	Females
Constant	−1.750	−0.322	0.155
	(−10.656)*	(−1.810)	(90.502)*
Age	0.228	0.294	0.107
	(29.172)*	(33.114)*	(7.137)*
Age-squared	−0.002090	−0.002755	−0.001126
	(−21.078)*	(−24.943)*	(−5.469)*
Education	0.02543	0.03645	0.01143
	(3.234)*	(4.452)*	(0.539)
Employment Status	2.056	1.815	3.354
	(31.099)*	(24.623)*	(25.744)*
Sex	2.578	–	–
	(37.216)*		
Region	0.258	0.200	0.604
	(3.906)*	(2.735)*	(4.578)*
Legislator and Senior	−1.435	−1.224	−1.225
Officials	(−2.367)*	(−0.934)	(−1.889)
Corporate Managers	−2.595	−2.418	–
	(−1.922)	(−1.840)	
Life Science and Health	−0.113	−0.394	0.680
	(−0.379)	(−1.100)	(1.383)
Teaching	1.250	0.07926	1.270
	(5.140)*	(0.245)	(3.184)*
Clerks	−0.04206	0.01753	0.195
	(−0.185)	(0.078)	(0.155)
Personal and Protective	−0.03321	−0.190	0.459
Service Providers	(−0.293)	(−1.517)	(1.814)
Market Oriented Skilled	−1.524	−1.305	−1.850
Agriculture Workers	(−17.200)*	(−13.540)*	(−8.378)*
Subsistence Agriculture	−1.513	−1.633	−0.682
Workers	(−14.053)*	(−13.086)*	(−2.935)*
Metal and Machinery	0.06545	0.167	1.054
Operators	(0.352)	(0.906)	(1.176)
Precision and Handicraft	0.339	0.120	0.542
	(3.108)*	(0.857)	(2.498)*
Stationary Plant and	0.261	−0.191	4.440
Operators	(0.335)	(−0.237)	(2.058)*
Machine Operators and	−0.106	−0.198	1.754
Assemblers	(−0.526)	(−0.975)	(2.577)*
Sales and Service	−0.03705	−0.105	0.108
Elementary	(−0.305)	(−0.834)	(0.319)
Agriculture-Fishing	−0.933	−1.296	−0.285
	(−8.305)*	(−9.553)*	(−1.247)
Adj-R^2	0.513	0.429	0.500
F	391.577	217.008	109.522
N	7422	5469	1952

Note: t-values are reported in parentheses and the entries with '*' are significant at 95 percent.

Table10

Regression Result with Interactive Occupational Dummy Variables—1998-99 (Poor)

	All	Males	Females
Constant	−0.953	1.692	−1.372
	(−2.721)*	(5.276)*	(−1.417)
Age	0.221	0.228	0.198
	(12.994)*	(13.184)*	(3.341)*
Age-squared	−0.002263	−0.2340	−0.002268
	(−10.315)*	(−10.593)*	(−2.709)*
Education	0.0321	0.02618	0.107
	(2.351)*	(1.936)	(1.718)
Employment Status	1.498	1.315	3.553
	(13.934)*	(12.099)*	(9.457)*
Sex	2.630	–	–
	(12.885)*		
Region	0.128	0.02305	0.770
	(1.193)	(0.213)*	(2.010)*
Legislator and Senior Officials	−0.738		−1.623
	(−0.254)		(−0.551)
Corporate Managers	–	–	–
Life Science and Health	5.016	2.754	13.115
	(2.238)*	(1.213)	(2.120)*
Teaching	2.859	0.971	1.701
	(1.008)	(.188)	(0.402)
Clerks	3.709	4.426	−0.884
	(1.706)	(2.306)*	(−0.261)
Personal and Protective	0.815	0.173	1.624
Service Providers	(1.328)	(0.269)	(1.227)
Market Oriented Skilled	−5.199	−6.452	0.877
Agriculture Workers	(−11.390)*	(−14.344)*	(0.796)
Subsistence Agriculture	−2.443	−5.883	2.902
Workers	(−4.818)*	(−11.241)*	(2.558)*
Metal and Machinery	0.296	−0.944	0.345
Operators	(0.211)	(−0.852)	(0.172)
Precision and Handicraft	−0.429	−0.222	−0.980
	(−0.765)	(−0.302)	(−0.861)
Stationary Plant and Operators	3.325	2.719	–
	(0.693)	(0.532)	
Machine Operators and	0.633	−1.821	−0.325
Assemblers	(0.483)	(−1.670)	(−0.028)
Sales and Service Elementary	−1.266	−1.206	−2.266
	(−1.727)	(−1.661)	(−1.403)
Agriculture-Fishing	−0.261	−3.528	1.679
	(−0.485)	(−5.488)*	(1.519)
Sex and Occupation			
Legislator and Senior Officials	−0.03765	–	–
	(−0.019)		
Corporate Managers	–	–	–
Life Science and Health	−0.535	–	–
	(−0.660)		
Teaching	−2.175	–	–
	(−3.669)*		
Clerks	0.257	–	–
	(0.185)		

Continued—

Table 10—(*Continued*)

Personal and Protective Service Providers	−0.745 (−2.467)*	–	–
Market Oriented Skilled Agriculture Workers	1.329 (5.486)*	–	–
Subsistence Agriculture Workers	−0.386 (−1.448)	–	–
Metal and Machinery Operators	−1.449 (−1.501)	–	–
Precision and Handicraft	−0.657 (−2.311)*	–	–
Stationary Plant and Operators	−0.468 (−0.134)	–	–
Machine Operators and Assemblers	−2.584 (−3.353)*	–	–
Sales and Service Elementary	−0.240 (−0.627)	–	–
Agriculture-Fishing	−1.160 (−4.150)*	–	–
Employment and Occupation			
Legislator and Senior Officials	3.059 (1.761)	−0.424 (−0.165)	2.112 (1.179)
Corporate Managers	–	–	–
Life Science and Health	1.475 (2.253)*	1.965 (2.484)*	−0.646 (−0.592)
Teaching	−1.127 (−1.392)	−1.493 (−1.398)	−2.438 (−2.068)*
Clerks	−0.660 (−0.658)	−1.240 (−1.210)	–
Personal and Protective Service Providers	0.127 (0.557)	0.119 (0.162)	−1.562 (−2.988)*
Market Oriented Skilled Agriculture Workers	2.072 (8.095)*	1.235 (4.194)*	1.860 (3.498)*
Subsistence Agriculture Workers	1.591 (4.855)*	1.419 (4.148)*	1.086 (1.234)
Metal and Machinery Operators	0.07118 (0.172)	0.174 (0.426)	0.734 (0.373)
Precision and Handicraft	0.395 (1.797)	0.543 (1.846)	−1.657 (−3.704)*
Stationary Plant and Operators	−2.112 (−0.389)	−1.942 (−0.369)	–
Machine Operators and Assemblers	1.048 (2.250)*	1.240 (2.608)*	−1.228 (−0.695)
Sales and Service Elementary	0.302 (1.265)	0.341 (1.386)	−0.655 (−0.926)
Agriculture-Fishing	2.082 (9.782)*	1.495 (5.685)*	0.698 (1.539)
Age and Occupation			
Legislator and Senior Officials	−0.06343 (−0.317)	–	0.05993 (0.296)
Corporate Managers	–	–	–
Life Science and Health	−0.219 (−2.476)*	−0.112 (−1.1074)	−0.526 (−2.236
Teaching	0.03543 (0.192)	0.03205 (0.106)	0.108 (0.366)
Clerks	−0.164 (−1.816)	−0.151 (−1.687)	–

Continued—

Table 10—(*Continued*)

Personal and Protective	−0.03352	−0.03608	−0.05815
Service Providers	(−1.095)	(−1.081)	(0.754)
Market Oriented Skilled	0.07887	0.198	−0.156
Agriculture Workers	(3.434)*	(8.114)*	(−2.333)*
Subsistence Agriculture	0.0173	0.161	−0.195
Workers	(0.415)	(5.588)*	(−2.811)*
Metal and Machinery	0.05067	0.03191	−
Operators	(0.725)	(4.63)*	
Precision and Handicraft	0.02724	−0.02731	0.119
	(0.825)	(−0.653)	(1.636)
Stationary Plant and Operators	−		−
Machine Operators and	0.03058	0.01696	0.09841
Assemblers	(0.458)	(0.256	(0.104)
Sales and Service Elementary	0.05426	0.03904	0.09352
	(1.494)	(0.256)	(0.992)
Agriculture-Fishing	−0.7244	0.06564	−0.152
	(−2.467)*	(1.782)	(−2.243)*
Age-squared and Occupation			
Legislator and Senior Officials	0.0007245	−0.00004370	−0.0009494
	(0.245)	(−0.065)	(−0.314)
Corporate Managers	−0.2625	−0.002647	−
	(−0.436)	(−0.454)	
Life Science and Health	0.002308	0.001410	0.005343
	(2.623)*	(1.384)	(2.351)*
Teaching	−0.0008694	−0.0007031	−0.001906
	(−0.310)	(−0.165)	(−0.384)
Clerks	0.001614	0.001448	−0.001830
	(1.483)	(1.351)	(−0.546)
Personal and Protective	0.0003856	0.0003655	0.001051
Service Providers	(1.001)	(0.877)	(1.014)
Market Oriented Skilled	−0.0003356	−0.001485	0.001801
Agriculture Workers	(−1.150)	(−4.871)*	(1.925)
Subsistence Agriculture	0.0001899	−0.001262	0.002233
Workers	(0.585)	(−3.585)*	(2.300)*
Metal and Machinery	−0.0005456	−0.0003110	0.0001897
Operators	(−0.544)	(−0.314)	(0.158)
Precision and Handicraft	−0.0002199	0.0004612	−0.001292
	(−4.810)*	(0.835)	(−1.209)
Stationary Plant and Operators	−0.0003192	−0.0003169	0.002603
	(−0.121)	(−0.123)	(2.000)*
Machine Operators and	−0.0003909	−0.0002366	−0.0004978
Assemblers	(−0.435)	(−0.266)	(−0.032)
Sales and Service Elementary	−0.0003760	−0.0001779	−0.0009526
	(−0.814)	(−0.367)	(−0.757)
Agriculture-Fishing	0.0008824	−0.0006034	0.001939
	(2.333)*	(−1.310)	(2.045)*
Region and Occupation			
Legislator and Senior Officials	−1.858	−0.912	−2.651
	(1.162)	(−0.294)	(−1.526)
Corporate Managers	25.711	25.881	−
	(2.172)*	(2.254)*	
Life Science and Health	−1.480	−2.370	−0.195
	(−2.433)*	(−3.165)*	(−0.190)
Teaching	−0.140	−0.01788	−0.722
	(−0.281)	(−0.027)	(−0.955)
Clerks	−0.09684	0.03056	−
	(−0.209)	(0.068	

Continued—

Table 10—(*Continued*)

Personal and Protective Service Providers	0.487	0.508	0.157
	(2.154)	(2.029)*	(0.300)
Market Oriented Skilled Agriculture Workers	0.384	0.556	−0.626
	(1.786)	(2.300)*	(−1.266)
Subsistence Agriculture Workers	0.259	0.386	−0.496
	(0.715)	(0.927)	(−0.715)
Metal and Machinery Operators	−0.06296	0.01390	2.126
	(−0.159)	(0.035)	(0.915)
Precision and Handicraft	0.160	0.07695	−0.332
	(0.741)	(0.256)	(−0.744)
Stationary Plant and Operators	0.04319	0.149	–
	(0.014)	(0.051)	
Machine Operators and Assemblers	0.533	0.642	–
	(1.237)	(1.529)	
Sales and Service Elementary	0.01302	−0.09194	1.221
	(0.054)	(−0.370)	(1.632)
Agriculture-Fishing	0.781	0.329	1.076
	(2.742)*	(0.982)	(1.920)
Education and Occupation			
Legislator and Senior Officials	−0.131	–	−0.04517
	(−0.212)		(−0.79)
Corporate Managers	−1.604	−1.610	–
	(−.871)	(−2.971)*	
Life Science and Health	−0.02390	−0.08102	−0.07852
	(−0.355)	(−1.023)	(−0.380)
Teaching	0.05831	0.04792	0.164
	(1.065)	(0.741)	(1.484)
Clerks	0.06852	0.04721	0.495
	(1.156)	(0815)	(1.732)
Personal and Protective Service Providers	0.01084	0.01972	0.03365
	(0.351)	(0.607	(0.359)
Market Oriented Skilled Agriculture Workers	−0.01658	−0.01987	0.124
	((−0.767)	(−0.925)	(1.317)
Subsistence Agriculture Workers	0.05027	0.03945	0.02219
	(1.721)	(1.243)	(0.277)
Metal and Machinery Operators	0.05473	0.05649	−0.296
	(1.128)	(1.179)	(−0.912)
Precision and Handicraft	0.0488	0.04629	0.107
	(1.435)	(1.282)	(1.487)
Stationary Plant and Operators	−0.02898	−0.03552	–
	(−0.064)	(−0.081)	
Machine Operators and Assemblers	2.649	0.01544	0.159
	(0.498)	(0.284)	(0.633)
Sales and Service Elementary	−0.02415	−0.02871	0.006906
	(−0.777)	(−0.916)	(0.062)
Agriculture-Fishing	0.04801	−0.1508	0.394
	(1.241)	(−0.375)	(3.484)*
Adj-R^2	0.547	0.472	0.542
F	91.619	60.726	32.664
N	7422	5469	1952

Note: t-values are reported in parentheses and the entries with '*' are significant at 95 percent.

Table 11

Regression Results—1998-99 (Non-poor)

	All	Males	Females
Constant	–2.698	–0.764	–0.646
	(29.02)*	(7.71)*	(3.84)*
Age	0.221	0.280	0.103
	(43.36)*	(49.72)*	(9.95)*
Age-squared	–0.002	–0.002	–0.001
	(30.20)*	(36.11)*	(8.40)*
Education	0.055	0.033	0.129
	(15.66)*	(9.09)*	(13.98)*
Employment Status	2.550	2.201	4.250
	(72.59)*	(0.36)	(48.26)*
Sex	2.786	–	–
	(65.98)*		
Region	0.575	0.371	1.321
	(15.52)*	(9.54)*	(14.55)*
Adj-R^2	0.483	0.366	0.554
F	3741.52	2226.52	1183.12
N	24066	19303	4762

Note: t-values are reported in parentheses and the entries with '*' are significant at 95 percent.

Table 12

Regression Result with Occupational Dummy Variables—1998-99 (Non-poor)

	All	Males	Females
Constant	−1.573	0.266	0.872
	(15.23)*	(2.46)*	(4.18)*
Age	0.210	0.268	0.095
	(42.12)*	(48.05)*	(9.99)*
Age-squared	−0.002	−0.002	−0.001
	(28.41)*	(34.10)*	(8.03)*
Education	0.031	0.023	0.085
	(8.20)*	(5.74)*	(7.63)*
Employment Status	1.974	1.768	3.315
	(49.84)*	(41.71)*	(36.28)*
Sex	2.823	–	–
	(64.52)*		
Region	0.155	0.018	0.602
	(4.02)*	(0.44)	(6.74)*
Legislator and Senior	−0.721	−0.508	−1.556
Officials	(3.37)*	(2.21)*	(3.32)*
Corporate Managers	0.388	0.395	−0.206
	(1.85)	(1.87)	(0.22)
Life Science and Health	0.930	0.186	1.001
	(6.09)*	(1.01)	(3.87)*
Teaching	0.547	−0.357	0.546
	(6.28)*	(3.57)*	(2.73)*
Clerks	−0.315	−0.262	0.936
	(3.21)*	(2.66)*	(1.59)
Personal and Protective	−0.259	−0.169	−0.952
Service Providers	(3.78)*	(2.25)*	(5.59)*
Market Oriented Skilled	−1.497	−1.315	−2.072
Agriculture Workers	(29.38)*	(24.00)*	(13.76)*
Subsistence Agriculture	−1.165	−1.114	−1.390
Workers	(18.85)*	(16.40)*	(8.61)*
Metal and Machinery	−0.188	−0.123	0.884
Operators	(1.70)	(1.11)	(1.80)*
Precision and Handicraft	0.610	0.018	0.835
	(8.50)*	(0.20)	(5.43)*
Stationary Plant and	−0.116	−0.060	0.656
Operators	(0.37)	(0.19)	(0.45)
Machine Operators and	−0.176	0.067	0.425
Assemblers	(1.26)	(0.48)	(0.58)
Sales and Service	−0.191	−0.279	0.705
Elementary	(2.51)*	(3.59)*	(2.73)*
Agriculture-Fishing	−1.207	−1.020	−1.633
	(14.22)*	(9.85)*	(9.48)*
Adj-R^2	0.511	0.387	0.629
F	1258.54	642.70	426.24
N	24066	19303	4762

Note: t-values are reported in parentheses and the entries with '*' are significant at 95 percent.

Table 13

Regression Result with Interactive Occupational Dummy Variables—1998-99

	All	Males	Females
Constant	–0.199	1.962	0.760
	(0.87)	(10.54)*	(1.17)
Age	0.195	0.202	0.106
	(19.49)*	(19.74)*	(2.87)*
Age-squared	–0.002	–0.002	–0.001
	(13.92)*	(14.11)*	(2.44)*
Education	0.044	0.038	0.168
	(7.58)*	(6.42)*	(6.22)*
Employment Status	1.503	1.431	3.141
	(26.19)*	(24.58)*	(12.50)*
Sex	2.222	–	–
	(14.38)*		
Region	–0.111	–0.130	0.095
	(1.87)	(2.16)*	(0.36)
Legislator and Senior Officials	–1.986	–2.670	–3.439
	(1.53)	(–1.80)	(1.30)
Corporate Managers	0.347	1.791	2.742
	(0.14)	(0.64)	(0.22)
Life Science and Health	4.574	3.352	3.251
	(3.90)*	(2.19)*	(1.85)
Teaching	4.213	2.982	2.709
	(5.00)*	(2.59)*	(2.27)*
Clerks	5.274	3.135	5.364
	(4.61)*	(3.29)*	(0.86)
Personal and Protective Service Providers	0.309	0.974	–0.823
	(0.72)	(2.02)*	(1.01)
Market Oriented Skilled Agriculture Workers	–5.016	–6.091	–1.022
	(18.91)*	(23.69)*	(1.49)
Subsistence Agriculture Workers	–3.856	–3.670	–2.554
	(11.71)*	(11.89)*	(3.34)*
Metal and Machinery Operators	–0.668	–1.943	–6.923
	(0.75)	(2.59)*	(1.40)
Precision and Handicraft	–0.067	–2.022	–0.631
	(0.16)	(3.81)*	(0.82)
Stationary Plant and Operators	2.930	1.669	–
	(1.01)	(0.74)	
Machine Operators and Assemblers	0.694	0.376	–11.503
	(0.63)	(0.45)	(2.36)*
Sales and Service Elementary	0.649	–0.466	–0.142
	(1.17)	(0.98)	(0.10)
Agriculture-Fishing	–1.348	–3.246	–0.813
	(3.41)*	(6.36)*	(1.01)
Sex and Occupation			
Legislator and Senior Officials	–0.345	–	–
	(0.47)		
Corporate Managers	0.494	–	–
	(0.43)		
Life Science and Health	–1.684	–	–
	(4.84)*		
Teaching	–1.900	–	–
	(8.28)*		
Clerks	–2.154	–	–
	(3.19)*		
Personal and Protective Service Providers	0.692	–	–
	(3.19)*		

Continued—

Table 13—(*Continued*)

Market Oriented Skilled Agriculture Workers	1.575 (9.24)*	–	–
Subsistence Agriculture Workers	1.198 (6.34)*	–	–
Metal and Machinery Operators	−1.247 (2.14)*	–	–
Precision and Handicraft	−0.845 (4.01)*	–	–
Stationary Plant and Operators	−1.321 (0.76)	–	–
Machine Operators and Assemblers	−0.611 (0.69)	–	–
Sales and Service Elementary	−1.154 (3.75)*	–	–
Agriculture-Fishing	0.417 (1.82)	–	–
Employment and Occupation			
Legislator and Senior Officials	1.864 (2.85)*	1.986 (2.95)*	−2.952 (1.06)
Corporate Managers	−0.800 (1.66)	−0.981 (2.02)*	–
Life Science and Health	−1.080 (3.21)*	−1.073 (2.68)*	−2.495 (4.43)*
Teaching	−0.584 (1.85)	−1.023 (2.51)*	−1.490 (3.20)*
Clerks	0.616 (1.47)	−0.497 (1.17)	−3.645 (1.14)
Personal and Protective Service Providers	0.908 (6.45)*	−0.097 (0.60)	1.945 (5.88)*
Market Oriented Skilled Agriculture Workers	1.702 (11.71)*	1.318 (8.37)*	2.643 (7.28)
Subsistence Agriculture Workers	1.170 (5.67)*	0.766 (3.47)*	2.042 (4.08)*
Metal and Machinery Operators	0.910 (4.15)*	0.961 (4.37)*	−1.005 (0.47)
Precision and Handicraft	0.038 (0.279)	0.738 (4.03)*	−2.073 (7.10)*
Stationary Plant and Operators	0.636 (0.82)	0.706 (0.90)	–
Machine Operators and Assemblers	0.847 (2.61)*	0.908 (2.79)*	1.839 (0.56)
Sales and Service Elementary	0.277 (1.85)	0.341 (2.21)*	−0.898 (1.65)
Agriculture-Fishing	2.397 (13.62)*	1.488 (7.22)*	2.704 (7.50)*
Age and Occupation			
Legislator and Senior Officials	−0.034 (0.49)	0.006 (0.07)	0.142 (0.70)
Corporate Managers	−0.004 (0.03)	−0.025 (0.20)	−0.427 (0.41)
Life Science and Health	−0.098 (1.76)	−0.111 (1.54)	0.010 (0.13)
Teaching	−0.073 (1.59)	−0.082 (1.40)	0.002 (0.03)
Clerks	−0.106 (2.20)*	−0.112 (2.31)*	0.008 (0.03)
Personal and Protective Service Providers	−0.104 (4.61)	−0.046 (1.71)	−0.077 (1.65)
Market Oriented Skilled Agriculture Workers	0.079 (6.08)*	0.207 (14.61)*	−0.069 (1.75)

Continued—

Table 13—(*Continued*)

Subsistence Agriculture Workers	0.045	0.087	0.064
	(2.79)*	(5.04)*	(1.50)
Metal and Machinery Operators	0.062	0.065	0.635
	(1.36)	(1.40)	(1.60)
Precision and Handicraft	0.048	0.090	0.143
	(2.09)*	(3.00)*	(3.14)*
Stationary Plant and Operators	–0.133	–0.139	–
	(0.96)	(0.99)	
Machine Operators and Assemblers	–0.030	–0.053	1.142
	(0.64)	(1.13)	(3.42)*
Sales and Service Elementary	0.009	–0.0004	0.154
	(0.40)	(0.02)	(2.10)*
Agriculture-Fishing	–0.079	–0.077	–0.074
	(3.31)*	(2.50)*	(1.54)
Age-squared and Occupation			
Legislator and Senior Officials	0.0002	–0.0002	–0.003
	(0.28)	(0.18)	(0.84)
Corporate Managers	–0.0001	0.00007	0.007
	(0.12)	(0.05)	(0.38)
Life science and Health	0.0007	0.0009	–0.0001
	(1.21)	(1.13)	(0.13)
Teaching	0.0004	0.0005	0.0001
	(0.73)	(0.66)	(0.18)
Clerks	0.0008	0.0009	–0.0004
	(1.41)	(1.51)	(0.11)
Personal and Protective Service Providers	0.001	0.0004	0.001
	(3.67)*	(1.04)	(1.76)
Market Oriented Skilled Agriculture Workers	–0.0006	–0.002	0.0008
	(3.41)*	(10.30)*	(1.57)
Subsistence Agriculture Workers	–0.0001	–0.0005	–0.0008
	(0.66)	(2.22)*	(1.37)
Metal and Machinery Operators	–0.0005	–0.0006	–0.011
	(0.81)	(0.87)	(1.58)
Precision and Handicraft	0.0008	–0.001	–0.002
	(2.50)*	(2.60)*	(3.06)*
Stationary Plant and Operators	0.002	0.002	0.002
	(0.93)	(0.91)	(0.86)
Machine Operators and Assemblers	0.0002	0.0005	–0.014
	(0.31)	(0.81)	(3.57)*
Sales and Service Elementary	–0.0001	0.00003	–0.002
	(0.40)	(0.09)	(2.22)*
Agriculture-Fishing	0.0008	–0.0008	0.0007
	(2.63)*	(2.19)*	(1.09)
Region and Occupation			
legislator and Senior Officials	1.345	1.021	12.684
	(2.04)*	(1.54)	(3.00)
Corporate Managers	1.427	0.993	6.199
	(2.34)*	(1.59)	(1.90)
Life Science and Health	0.460	0.409	0.382
	(1.52)	(1.12)	(0.75)
Teaching	0.288	0.288	0.098
	(1.73)	(1.47)	(0.28)
Clerks	0.131	0.147	0.265
	(0.68)	(0.76)	(0.11)
Personal and Protective Service Providers	0.604	0.256	0.507
	(4.56)*	(1.74)	(1.50)
Market Oriented Skilled Agriculture Workers	0.026	0.007	–0.015
	(0.19)	(0.05)	(0.04)
Subsistence Agriculture Workers	0.933	1.066	0.589
	(4.86)*	(4.91)*	(1.47)

Continued—

Table 13—(*Continued*)

Metal and Machinery Operators	0.227	0.223	–0.168
	(1.00)	(0.97)	(0.13)
Precision and Handicraft	0.395	0.041	0.524
	(2.73)*	(0.21)	(1.72)
Stationary Plant and Operators	0.561	0.579	–
	(0.85)	(0.87)	
Machine Operators and Assemblers	0.038	0.062	–6.212
	(0.14)	(0.23)	(3.00)*
Sales and Service Elementary	0.051	0.093	–0.562
	(0.33)	(0.60)	(0.97)
Agriculture-Fishing	1.186	0.551	3.137
	(3.57)*	(1.46)	(5.21)*
Education and Occupation			
Legislator and Senior Officials	0.031	0.005	–0.264
	(0.73)	(0.11)	(1.30)
Corporate Managers	–0.030	–0.023	–0.206
	(0.69)	(0.53)	(0.79)
Life Science and Health	0.013	0.017	–0.114
	(0.45)	(0.46)	(2.31)*
Teaching	–0.011	–0.006	–0.128
	(0.67)	(0.30)	(3.61)*
Clerks	–0.019	–0.014	–0.135
	(0.69)	(0.66)	(0.81)
Personal and Protective Service Providers	0.012	–0.005	0.047
	(0.78)	(0.34)	(1.14)
Market Oriented Skilled Agriculture Workers	–0.027	–0.024	–0.121
	(2.52)*	(2.14)*	(2.83)*
Subsistence Agriculture Workers	–0.051	–0.050	–0.156
	(3.46)*	(3.25)*	(3.58)*
Metal and Machinery Operators	–0.053	–0.056	–0.032
	(2.10)*	(2.20)*	0.20)
Precision and Handicraft	–0.012	–0.004	–0.128
	(0.62)	(0.19)	(3.32)*
Stationary Plant and Operators	–0.037	–0.030	–0.170
	(0.56)	(0.45)	(0.75)
Machine Operators and Assemblers	–0.022	–0.014	–0.478
	(0.71)	(0.46)	(1.53)
Sales and Service Elementary	–0.016	–0.075	–0.182
	(0.92)	(0.42)	(2.38)*
Agriculture-Fishing	–0.014	–0.024	–0.072
	(0.54)	(0.87)	(0.91)
Adj-R^2	0.547	0.422	0.680
F	280.44	159.44	121.39
N	24.066	19303	4762

Note: t-values are reported in parentheses and the entries with '*' are significant at 95 percent.

Table14

Results of F-Test

| | Occupational Dummy Variables | | |
	All Household	Poor Household	Non-poor Household
Both Sex	126.52	38.34	101.02
Male	65.25	22.72	49.21
Female	74.95	22.21	70.04
Occupational Dummy and Occupation * Basic Careerists			
Both sex	45.18	13.12	35.94
Male	27.30	11.31	23.77
Female	21.22	8.30	25.06

and case (b), region plays an important role as earnings of urban workers are significantly then the earnings of the rural workers.

Similarly, for males workers, returns to education do not decline when occupational choice variables are included in the model but for females returns to education decline when the variables representing occupational choice are included [see Table 11 and Table 12].

The differences between earnings of males and females are similar, across occupational categories. This suggests that among the non poor households the gender differences in terms of occupational choice are smaller. However, the interaction between employment status and occupational choice is important as most of coefficients of interactive variables are statistically significant. This reflects that interaction of employment status and occupational choice affects the earnings of male and female workers in the non poor households significantly. Similarly inclusion of other occupational interaction dummy variables improves the fit.

The *F*-test shows significant improvement in the performance of estimated equation when we include the occupational choice variables [see Table 14]. Thus, we can say that interactive dummy variables show improvement for all households, and the impact of occupational choice is much stronger on earnings of non poor workers as compared to poor workers.

The results also support the view that occupational concentration is wider for the non poor females. This could be a result of higher educational attainment, better socio-economic environment and/or better access to labour market among the non poor households. Thus we can conclude that poverty status plays an important role in explaining the earning behaviour of workers, particularly of female workers.

(d) Gender Discrimination

As mentioned earlier, the issue of gender discrimination in the labour market is important but it is difficult to capture it fully. Most empirical studies estimate gender discrimination as the residual earning differential between earnings of males and females

after adjustments for the differences in socio-economic characteristics. Following the methodology discussed in Section 5, we have estimated the gender discrimination in the labour market in this section. The results of earning differentials and of the decomposition are reported in Table 15. The results show that estimates of gender discrimination lower when the occupational choice variables are included in the model. This reflects the following:

(i) The estimates of gender discrimination are sensitive to specification of the model.

(ii) Explicit inclusion of occupational choice for males and females reduces the discrimination implying that a significant proportion of earning differentials can be explained by differences in occupational choice between males and females.

(iii) However, even after accounting for occupational concentration, the residual is quite high, which can be attributed to gender discrimination in the labour market.

(iv) Education plays important role in reducing the earning differentials. Therefore, improving human capital is important to reduce occupational concentration and reduce gender discrimination.

(v) Occupational choice for poor females is relatively narrow and discrimination is higher relative to non poor workers. Thus, we can conclude that despite widening occupational choice, the gender discrimination does not disappear for the non poor households.

7. CONCLUSION AND POLICY RECOMMENDATIONS

Recent literature identifies four aspects of gender dimensions of poverty, particularly with reference to gender, viz., poverty of opportunities, capabilities, security and empowerment [see Bamberger, *et al.* (2002)]. Policy efforts are required on all fronts to improve the status of females. However, to develop effective and meaningful policies, it is critical to understand the status, dimension and causes of poverty. For this purpose, as a first step, we have examined the labour market in Pakistan, in terms of limited opportunities particularly with reference to occupational concentration, and gender discrimination in the labour market faced by the workers in the poor and non poor households.

The results of the study give us important insights in the earning decomposition based on gender and gender based poverty. Major findings and policy recommendations of the study are outlined as:

(1) Education and experience contribute significantly to earnings of females and males. For females the return to education are higher, whereas the returns to experience are higher among males. Thus, efforts to improve human capital are critical for improving the productivity of workers.

(2) The estimates of the rate of return are also sensitive to the occupational structure of the labour force implying a close linkage between education and

Table 15

Decomposition of Earnings

	All $ln(Y_m)-ln(Y_f)=3.7109$			Poor $[ln(Y_m)-ln(Y_p)]=3.2805$			Non-poor $lnY_m-lnY_f=3.8319$		
	$\beta_f(\Delta X)$	$\Delta\beta(X_m)$	$\beta_mX_m-\beta_fX_f$	$\beta_f(\Delta X)$	$\Delta\beta(X_m)$	$\beta_mX_m-\beta_fX_f$	$\beta_f(\Delta X)$	$\Delta\beta(X_m)$	$\beta_mX_m-\beta_fX_f$
No O.D.	1.431	2.03	3.458	0.960	3.647	4.607	1.514	2.459	3.973
With O.D.	0.686	1.53	2.216	0.733	2.974	3.707	2.052	2.834	4.886
OD and OD*Characteristics	1.250	1.23	2.480	0.688	−0.333	0.354	1.679	−0.103	1.576
	$\beta_m(\Delta X)$	$\Delta\beta(X_f)$	$\beta_mX_m-\beta_fX_f$	$\beta_m(\Delta X)$	$\Delta\beta(X_f)$	$\beta_mX_m-\beta_fX_f$	$\beta_m(\Delta X)$	$\Delta\beta(X_f)$	$\beta_mX_m-\beta_fX_f$
No O.D.	0.805	2.65	3.454	0.938	3.035	4.607	0.697	3.91	3.973

Note: O.D. = Occupational Dummy Variables.

occupational choice particularly among the non poor households. Furthermore, efforts to improve human capital will improve the earnings and expand the occupational choice for the labour force.

(3) The residual earning gap is present for both groups implying the females, of poor and non poor households, both, face labour market discrimination. Thus, direct measures to reduce earning differentials between males and females are needed to improve the status of females in the labour market.

(4) As mentioned earlier, occupational choice is an important determinant of earnings, particularly of females' earnings. However, it is difficult to determine whether occupational concentration is an outcome of individual choice or of employers' preference. This is important for policy purposes, as direct interventions to raise female earnings may not be very productive and sustainable in the former case. Thus, there is a need to study the determinants of occupational concentration in depth.

(5) Poverty is an important dimension to examine occupational choice and gender discrimination. In order to integrate gender in poverty analysis, following steps are critical: (1) ensure that gender is addressed in all four dimensions of gender based poverty, i.e., poverty of opportunity, poverty of capabilities, security and empowerment; (2) documentation of the experience of poverty in all dimensions, mentioned above; (3) ensure availability of reliable data with gender based information; and (4) undertake gender based analysis of the data gathered and integrate the findings into the country's poverty diagnosis.

(6) Full understanding of the gender dimensions of poverty can significantly change the priorities, policies and programme interventions supported by the Poverty Reduction Strategies. There is growing empirical evidence that gender sensitive development strategies contribute significantly to economic growth as well as to equity by ensuring that benefits of the programmes are shared by all groups of poor population. However, the gender differences may not be fully recognised due to lack of understanding of the gender related impact of the policies [see Bamberger, *et al.* (2002)]. Thus, there is a need to formulate gender sensitive development policies, particularly in recent efforts to formulate poverty reduction strategy in Pakistan.

(7) So far only a few exercises of the poverty reduction strategies have incorporated the gender dimensions. Table 16 summarises the existing evidence on the issue. We can see that only in 8 country cases Poverty Reduction Strategies, include gender-based poverty diagnosis. Gender based monitoring and evaluation indicators are included only in few studies. The table shows that almost half of the studies, formulating poverty reduction strategies in various developing countries, include detailed discussion of gender dimensions of poverty explicitly. About 42 percent include gender in the discussion of poverty diagnosis, 31 percent for the selection of priority public actions, 10 percent for monitoring and evaluation, and 21 percent for

Table 16

Treatment of Gender Issues in the First 15 I-PRSPs and Four PRSPs

Stage of the PRSP	No Reference to Gender Issues	A Brief Reference to Gender Issues	More Detailed Discussion of Gender
(a) Poverty diagnosis	4	7	8
• Gender Differences in the Incidence of Poverty	4	7	8
• Labour Markets, Income and Employment	7	7	5
• Health	5	9	5
• Education	4	9	6
(b) Priority Public Actions	3	10	6
• Safety Nets	11	6	2
• Labour Markets, Income and Employment	9	8	2
• Health	3	11	5
• Education	5	8	6
(c) Indicators, Targets, Maintaining and Evaluation	6	11	2
(d) Participatory and the Consultation Process	10	5	4

Source: Bamberger, *et al.* (2002).

participatory considerations. Most of these strategy papers include gender dimension for education and health. In some cases limited discussion of labour markets is included but there is no discussion of gender dimensions of the impact for sectoral analysis. Thus, there is a need to fully integrate gender dimensions in poverty reduction strategies for effective reduction in poverty. For example, our results reveal that poverty and occupational choice are interlinked. Therefore, ignoring the gender and occupational dimensions may affect the performance of the poverty reduction strategies in Pakistan.

(8) Deterioration of macroeconomic indicators, environmental degradation, poor governance, ineffective implementation of legislation, inefficient public institutions, rent seeking activities and corruption of public officials are also blamed for continued poverty. Therefore, it is important to introduce reform packages in all directions for effective poverty reduction.

(9) Finally, for future research, it will be important to test the direct causality between occupational choice and poverty and examine the micro-macro linkages, in depth, for the formulation of better and effective poverty reduction strategy for Pakistan.

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ABSTRACT

In the 1990s, poverty increased in Pakistan and the differences in mean earnings of males and females remained quite significant. In 1998-99, the ratio of average female earnings to average male earnings declined to 19 percent from 24 percent in 1992-93. In nominal terms the earnings difference decreased to Rs 2386.76 in 1998-99 from Rs 1177.52 in 1992-93. This shows that, gender-based earnings gap is high and it increased in Pakistan during 1992–1999. The earnings gap could be a result of the difference in male-female education and rising involvement of females in the labour market. Another reason could be the change in occupational composition of males and females. The study decomposes the earnings differences in productivity differences and market discrimination for the male and female worker belonging to poor and non-poor households.

The earnings differential could be the result of unfair hiring practices leading to labour market discrimination. This implies that full potential of the work force is not utilised, which will lead to economic inefficiencies, providing a justification for government intervention. However, if the earnings gap is the result of individual's own occupational choice, then government intervention to ensure 'equal pay' will create distortions. Therefore, it is important to understand the main factors contributing to the differences in the earnings gap, keeping in view the occupational concentration of males and females.

The workers in Pakistan, particularly females, are crowded in a few occupations like sales and service workers, agricultural workers, or production workers. However, within these occupational categories the distribution of females has changed significantly over time. The study examines the following questions: Is occupational concentration different between the poor and non-poor households? How far do the characteristics-adjusted earnings differential decline when we adjust earnings profiles for occupational choice?

The results of the study give us important insights into the earnings decomposition based on gender and poverty-gender. The results support the view that education and experience contribute significantly to the earnings of females and males. For females, the returns to education are higher, whereas the returns to experience are higher for males. The estimates of the rate of return are also sensitive to the occupational structure, implying a close linkage between education and occupational choice. The results are more sensitive to occupational concentration among the non-poor households. Furthermore, the residual earning gap is present for both groups, implying that the females of poor and non-poor households, both, face labour market discrimination.

The analysis shows that poverty is an important dimension to examine occupational choice and gender discrimination. In order to integrate gender into poverty analysis, the following steps are critical: (1) ensuring that gender is addressed in all four dimensions, viz., education, occupational concentration, poverty of opportunity, and poverty of capability; (2) documentation of the experience of poverty in all four dimensions mentioned above; (3) undertaking of gender analysis of the data gathered and integrating the findings into the country's poverty diagnosis; and (4) ensuring availability of reliable data with gender-based information.