

FEMALE LABOUR PARTICIPATION BEHAVIOUR: A Case Study of Karachi

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In a traditional society like Pakistan where the role of women in the family and the society is largely predetermined, it is interesting to investigate the relevance of the standard Becker-Mincer type of human capital model. First a probit function has been estimated to analyse the factors which influence the decision to participate in the labour force, then an earnings function is estimated in terms of human capital endowments and other family characteristics.

I. Introduction

The role of women in economic development in the third world countries is currently an active area of research. However, in Pakistan where the role of women in the family and the society is determined largely by a culture that has a religious orientation, little is known about the decision making behaviour of women with regard to their participation in market-oriented activities. The female labour force participation rates are very low, specially in urban areas and are confined to a few activities only, such as health, teaching, garment making, house cleaning and packaging. The purpose of this study is to quantify female supply response to various demo-economic conditions. In addition, a female-labour earnings function has also been estimated. Explanation of wage differential in terms of endowments such as education, experience, skill and other family characteristics, which influence productivity is important in devising policies that have special focus on womens' development. Section II of the paper describes the methodology, the model and the data. Empirical findings are presented in Section III. Section IV presents the summary and the conclusion.

II. Methodology and Data

The Becker-Mincer approach which explains wage differentials primarily in terms of differences in human capital has been adopted here [Becker (1964), (1981); Mincer (1962), (1974)]. It is also well known that using only the wage earner's data introduces a censoring error, because wages are observed only for those in the wage sector. This error may be corrected through the Heckman procedure, which consists of estimating a probit function first, with the dependent variable giving the probability of labour force participation. This equation is used to derive the Inverse Mill's Ratio which is included as an additional variable in the earning function. More specifically, our model consists of the following equation:

$$P(\text{WORKER}) = 1 - F(-\beta x) \quad (1)$$

Where x is a vector which includes the following variables:

Family income excluding the income of the working woman (FAMINC): In Pakistan, women usually do not work in the market unless family income is not sufficient to support the family. Therefore, it is hypothesized that the higher the family income the lower would be the probability to work in the market. Total adult male members (MALEADLT): It is hypothesized that the larger this number the smaller the likelihood that women would work. Marital status (MARRID) with unmarried as a reference category: It is hypothesized that in Pakistan, husbands generally do not like their wives to work, the expected sign on this variable is therefore negative. Education of women has been categorized into the following six groups: uneducated (UNEDUC), below matric (BELWMAT) (used as a reference category), Bachelors (BACHL), Master's (MASTER) and Professional (PROFSNL): It is expected that the higher the investment in education, the higher the expected rate of return, and therefore the higher the opportunity cost of staying home. As education increases, the chance to participate in the labour force increases. Number of other adult women in the family (WOMEN): The presence of other adult females at home to take care of the house may increase the probability for some of them to work outside. Number of children below five years (MINOR): It is hypothesized that minors would reduce the probability of women to participate in the labour market. Number of school going children (SCHOOL): If the relatively older children go to school they are not available for household chores, there would therefore be a tendency for the mother to stay home. Tenorial status of the residence (OWNRNT): This variable has been included to proxy for household assets. Neighbourhood influence proxied by a katchi-pakki abadi dummy variable (PAKKI): The average income in katchi abadis is significantly lower than planned areas. This variable is

included to pick this income effect. Age group to which the woman belongs: less than thirty years (AGE30), and age above forty five (AGE60) with age between thirty years to forty five years, taken as the reference category. It is hypothesized that women in this age group will have a more stable marital relationship and will have more grown up children to take care of themselves. Controlling for all other variables, the chance to participate in the labour force in the age groups thirty and forty five years is highest compared to other age groups; and a dummy which takes a value of one if she is the head of the household (HHHOLD). This variable is included to indicate that in the absence of a national level security system, economic pressures compel women to work when a bread earner is not available.

The second equation in the model is the following earnings functions:

$$\text{WAGE} = F(M, Y) \quad (2)$$

Where WAGE is the earning of the woman, M is the Inverse Mill's Ratio obtained from equation (1) and Y is a vector which consists of the following variables:

Education groups as defined in equation (1); experience, (and its square) proxied by the number of years in the present job; occupation, classified into three categories, namely, education (OCUPE), production (OCUPP), and services, including banking, insurance, house keeping, nursing, etc. This category has been taken as a reference category in defining the occupation dummies, the rationale for this classification lies in the fact that majority of the women in our sample belong to education and production categories. While the service category is too broad, the paucity of data does not allow further refinement.

The study is based on a sample of 6261 households covered in the socio-economic survey of Karachi carried out in 1987-88 by the Applied Economics Research Centre. The sample was drawn following a multi-stage stratified random sampling technique. The first stage of stratification was the Analysis Zone (AZ). The Master Planning Department of the Karachi Development Authority (KDA) has divided the Metropolitan areas of Karachi into fifty eight Analysis Zones (AZs). The total sample was distributed among these AZs in proportion to their population. In the second stage, within each AZ, the sample was assigned to MPD zones in proportion to the number of residential plots as given in the 1985 Land-use survey [KDA (1987)]. There are in all, 241 MPD zones (Master Plan Department Zones). At the third stage of stratification, the sample assigned to each MPD zone was divided into strata with regard to housing typology which was again based on the 1985 land-use survey. Finally systematic random sampling was followed.

Table 1 highlights the salient features of the sample. The majority of illiterate and less educated women do not work. These data show a consistent positive relationship between the level of education and the probability to enter the work

force. It is also interesting to note that younger and unmarried women have a higher rate of labour force participation than the rest.

III. Results

a) Labour Participation

Results corresponding to the probit equation (1) are presented in Table 2. As expected, family income influences the probability for a woman to participate in market-oriented activities negatively. In urban Pakistan, women 'normally' do not participate in the labour market as is substantiated by our results. They work only if the family income is not 'sufficient'

TABLE 1

Rate of Female Labour Force Participation by
Education, Age and Marital Status

	Percentage in Overall Sample	Working	Not Working
<i>EDUCATION</i>	<u>100</u>		
Illiterate	43	4	96
Below Matric	30	3	97
Matric and Inter	18	7	93
Graduate	7	20	80
Masters	1	47	53
Professionals	1	62	38
<i>AGE</i>	<u>100</u>		
15 to 30 years	31	8	92
31 to 45 years	56	6	94
46 years and above	13	5	95
<i>MARITAL STATUS</i>	<u>100</u>		
Married	73	5	95
Unmarried	27	10	90

TABLE 2

Probit Results of Women Labour Participation

VARIABLES	COEFFICIENTS	t-RATIOS
CONSTANT	-1.07	-6.519
FAMINC	-0.0001	-6.074
MALEADLT	-0.08	-5.078
UNEDUC	-0.26	-2.589
BELWMAT	-0.47	-4.607
BACHL	0.66	6.282
MASTER	1.62	9.927
PROFSNL	2.06	8.257
PAKKI	-0.26	-3.322
MARRID	-0.28	-3.280
OWNRNT	-0.003	-0.044
SCHOOL	-0.04	-2.086
AGE30	-0.45	-5.451
AGE60	-0.45	-3.792
WOMEN	1.77	34.848
MINOR	0.08	2.677
HHHOLD	1.26	7.730
No. of Observations	-	9874
Log Likelihood	-	-943.880
Chisquared (15)	-	2846.800

The coefficient corresponding to marital status is also negative and significant, which is corroborated by Sahn and Alderman (1988) results for Sri Lanka. Additional women in the family influence the probability of female labour force participation positively. This is because there are more women in the family to share household chores including child care, reducing the opportunity cost of work in the market. Tenorial status was included in the model with the intention that it will proxy for household assets. However, the insignificant coefficient indicates that perhaps it did not serve the purpose, possibly because there is no significant difference between the rich and the poor with regard to house ownership. Alternatively, the ownership of consumer durables could have been used. However, although this in-

formation was asked in the survey, the quality of the corresponding data does not permit its use. *Ceteris-paribus*, women living in planned areas have lower probability to work than those living in *katchi abadis* (squatter settlements). Since family income in *katchi abadis* is significantly less than planned areas, this result supports the view that economic pressures encourage market-oriented work. The probability to participate in market-oriented activities increases for women who are heads of households, which shows that in the absence of a national social security system, women have to work if the family does not have a bread earner. Our results indicate that women who have a large number of minors, have a higher probability to work, which seems counter intuitive. However, controlling for family income, the per capita income of larger households would be lower. Therefore the positive sign may reflect the extra economic pressure because of low per capita income. Additional explanation may be found in the cultural set-up of the extended family system, where other family members are available to take care of the children. However, it is interesting to note that compared to minors, school going children influence the probability negatively. Somewhat older school going children could act as a substitute for the mother. However, because they go to school they are not available to perform this function, and hence a tendency for the mother to stay at home. Another possible explanation may be given in terms of the lack of availability of part-time jobs. Mothers of school going children cannot find suitable jobs for the time their children spend in schools. Such jobs are usually low-paid, and are not acceptable to those who can afford to send their children to school. Our results also indicate that the probability of women in the age group 30-45 is higher than others. This result provides some additional support to the above argument because women in this age group are more likely to have grown up children able to take care of themselves.

The last variable relates to education with *matric* as the reference category. These results indicate that the higher the education level, the greater the chances that a woman would work as working longer enhances the returns to the investment made in education. This is quite a plausible result, though it may not be true for rural areas of Pakistan where female education is confined to those who usually do not have economic pressures [Alderman and Chishti (1991)].

b) Earnings Function

The selectivity-bias corrected results corresponding to the wage equation (2) are presented in Table 3. Our results indicate that below *matric* women receive significantly lower wages, and above *matric* women higher wages than the reference category of *matriculates*. It also shows that the larger the differential in education the higher the wage differential. This is quite consistent with the earlier findings

regarding the role of education in wage determination [Kozel and Alderman (1990), Khan and Irfan (1985)]. In the context of Pakistan, Pasha and Wasti also reached a similar conclusion. According to their findings the return on primary education is 13 per cent higher than that for illiterates. Similarly, a college graduate earns 15 per cent higher than an intermediate, while the return on a Master's degree is 19 per cent higher than a graduate [Pasha and Wasti (1991)]. Although qualitatively comparable, our results indicate somewhat higher marginal rates of return than Pasha and Wasti. For instance, according to our results the difference in earnings between a Masters and a graduate degree comes to about 34 per cent, as compared to 19 per cent in Pasha and Wasti's study. Their study is based on a sample consisting of both male and female labour (the weight of male labour being much higher) and employing a different methodology. The results are therefore not quite comparable. Our results also indicate a much higher return at the Masters level compared to other lower levels of education. This is because Intermediate and Bachelors are not generally perceived as terminal degrees in Pakistan. Many jobs, that do not require a Masters degree, usually employ persons holding a Masters degree. The coefficient corresponding to experience is also significant. However, the magnitude of the

TABLE 3

Results of the Regressions Corresponding to
Women's Monthly Earnings Function

VARIABLES	COEFFICIENTS	t-RATIOS
CONSTANT	951.23	4.252
UNEDUC	-1242.18	-6.763
BELWMAT	-990.77	-4.899
BACHL	532.24	3.005
MASTER	1166.75	5.119
PROFSNL	1028.30	3.422
EXP	54.18	2.470
EXPSQU	-0.75	-1.376
OCUPE	-681.88	-4.105
OCUPP	-22.086	-0.181
Inverse Mill's Ratio	-22.086	1.834
No. of Observations	-	638
Adjusted R ²	-	0.210

coefficient indicates that the influence of experience on wages is not as strong as the effect of schooling. This is counter to the popular perception that age (or experience) is the major determinant of wages in Pakistan. According to our results, two year's of university education can enhance the monthly earnings by about 600 rupees which is equivalent to more than eleven years of experience.

Another interesting result is the wage differential with regard to occupation. With services as a reference category, it shows that both teachers and production workers receive less than the services sector employees. It also shows that teachers are significantly underpaid for comparable education and experience than other occupations.

IV. Conclusion

The purpose of the study is to analyze the female labour supply response to various demographic and economic conditions and estimate the influences of productivity endowment on earnings. A Becker-Mincer type of human capital model has been estimated using the Heckman procedure. The results indicate that besides family income and education of the respondent, a number of other family characteristics influence both the decision to participate in the labour force and the level of earnings. The marginal rates of return to education are substantial and far more significant than those attributable to experience. Return to a Masters degree and a professional degree are close to each other. Finally our results also indicate that women in the teaching profession are relatively underpaid.

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References

- Afzal, M., and Z.M. Nassier, 1987, Is female labor force participation really low and declining in Pakistan? A look at alternative data sources, *Pakistan Development Review*, 26(4).
- Alderman, H., and S. Chishti, 1991, Simultaneous determination of household and market-oriented activities of women in rural Pakistan, in : T. Paul Schultz (ed.), *Research in Population Economics*.
- Becker, G.S., 1964, *Human capital*, New York: Columbia University Press.
- Becker, G.S., 1981, *A treatise on the family*, Cambridge: Harvard University Press.
- Heckman, J.J., 1979, Sample selection bias as a specification error, *Econometrica*, 47(1).
- Heckman, J.J., 1976, The common structure of statistical models of truncation, Sample selection and limited dependent variables and a simple estimator for such models, *Annals of Economic and Social Measurement*, No. 5.
- Khan, S.R., and M. Irfan, 1985, Rates of returns to education and the determinants of earnings in Pakistan, *Pakistan Development Review*, 24(3).
- Kozel, V., and H. Alderman, 1990, Factors determining work participation and labor supply decisions in Pakistan's urban areas, *Pakistan Development Review*, 29(1).
- Mincer, J., 1962, Labor force participation of married women, *Aspects of labor economics*, H.G. Lewis (ed.), Universities National Bureau Conference Series No. 14, (for NBER), Princeton: Princeton University Press.
- Mincer, J., 1974, *Schooling, experience and earnings*, New York: Columbia University Press.
- Pasha, Hafiz A., and S. Ashraf Wasti, 1989, Unemployment and rates of return to education, *Singapore Economic Review*, 34(2).
- Sahn, David and H. Alderman, 1988, The effects of human capital on wages and the determinants of labor supply in a developing country, *Journal of Development Economics*, 29(2).