Sci.int.(Lahore),27(1),791-794,2015 ISSN 1013-5316, CODEN: SINTE 8

A STATISTICAL ANALYSIS OF FACTORS AFFECTING: THE WOMEN EMPLOYMENT IN PAKISTAN

***Atta Muhammad Asif**, **Irshad Ahmed Arshad and Nasir Ali**[1]
Department of Mathematics and Statistics, International Islamic University, Islamabad
[1]Department of Statistics, PMAS-Arid Agriculture University, Rawalpindi
* Corresponding Author**: atta.msst18@iiu.edu.pk**

ABSTRACT: *Using the data of Pakistan Demographic and Health Survey 2012-13, this study indentified the factors effecting the participation of women in labor force. The logistic regression suggested that chances of employment are higher in Punjab. Level of education improves the chances of getting employed, and the women belonging to rich families have lower chances of employment. These results suggest that better level of education, recommendation of same syllabus and provision of good institutions of education could promote the employment level of women in Pakistan.*

Key words: Women employment, Logistic Regression, Pakistan

INTRODUCTION

Unemployment is becoming a serious problem for Pakistan after the economic slowdown in few years. A range of economic and political factors negatively impact the Pakistan's economy in recent years, including persistent inflation driven by high oil prices, , low level of investment, unreliable supply of energy and deteriorating security situation in parts of country. In addition Pakistan has been buffeted by a series of natural disasters such as floods in 2010 and 2011. Consequently, employment growth has not been strong with the majority of workers still in informal employment; structural transformation in terms of an increasing share of workers in industry and services has stalled, with a higher proportion of workers in the agricultural sector than a decade earlier. Specific challenges persist for women, who face considerable disparities in accessing the labor market, though the gender gap in employment is slowly decreasing [1].

In general, unemployment has a significant impact on poverty, homelessness and effects family cohesion. It caused hopelessness and other social evils. The persistence of high unemployment rate in recent years has become a major problem in Pakistan. According to the Labor Force Survey 2010-11 the overall rate of unemployment is Pakistan is 6 percent while the unemployment rate among women is as high as 8.9 percent. This unemployment in 2012-13 increased to 6.2 % as a whole and for women increase to 9 percent (Labor Force Survey). These results suggest that unemployment rate among women is much higher than among men.

There are many social and cultural barriers faced by the Pakistani women that concerns the integration of women in labor market, such as restriction on women mobility, restrictions on the high level and technical education, lack of moral support by the family members, unequal distribution of jobs in every sector of economy and insufficient remuneration for female workers etc, limit their desire for good job. So it is important to make some affective policies by the government to control these disparities to improve women's economic status in the society. As the strength of women is more than men according to population census, so it is necessary to take steps for women employment, because economy could grow well with women's participation in labor market.

Logit model to find determinants of women unemployment in Ethiopia using demographic and health survey data. he conclude that region (provinces), place of residence, age, marital status, exposure to any mass media, husband's occupation, sex of household head, economic status, education level and presence of children under 5 year of age are the significant determinants for women unemployment. The demographic factors affecting the women employment using the cross-sectional data collected through field survey for Bahawalpur district [2]. They used the logit model and conclude that AGE2 (female belongs to age group (25-34) years), AGE4 (female belongs to age group (45-54) years), marital status, family setup, husband's education, number of children influence the work participation of women positively and significantly. In view of the above discussed studies our interest built up to make some extensions and study some socio-economic and demographic factors for Pakistan which may affect women employment. The main objective of this study is to identify and describe the Demographic and Socioeconomic determinants of women's unemployment in Pakistan.

METHODOLOGY

This study utilizes the secondary data from the nationally representative Pakistan Demographic and Health Survey (PDHS) 2012-13. The primary objective of the PDHS 2012-13 was to provide information about population and health indicators for national and provincial level including rural and urban areas as well as for Gilgit Baltistan and ICT Islamabad. PDHS adopted a two stage sampling technique to select the households for interview. In the first stage 500 Primary Sampling Units (PSUs) were selected using a probability proportional to size scheme (248 in urban areas and 252 in rural areas). In second stage 28 households were selected from each sampling point using systematic sampling procedure with random start. A total of 14,000 households were selected for interview (6944 in urban areas and 7056 in rural areas). A total of 14,569 married women of reproductive age (15-49 years) were found to be eligible for interview, however 13,558 were successfully interviewed and used for the analysis in this study, yielding 93% response rate. The response rate stood higher in urban areas than in rural areas. Household wealth status was assessed by using household wealth index as proxy indicator which was generated through Principal Component Analysis (PCA). In the survey there are

five quintiles which are richest, rich, middle, poor and poorest status, but we have change it into three categories by cumulating poor and poorest into poor and richest and rich into rich [3].

Response Variable

Since our response variable is the employment status of women in Pakistan, which we classify as whether a women is employed or unemployed. Therefore, the outcome for the i^{th}woman is represented by a random variable Y_i which take value 1 if the woman is employed and zero otherwise. That is

Y_i ***= 1, if the i^{th} woman is employed***

= 0, otherwise

Explanatory variables

We have selected some demographic and socio economic variables form PDHS data after looking into the questionnaire and suggested by literature reviewed. Some of these are of continuous in nature and some are categorical in nature (rural/urban). For example, age of women, age of husband of women is continuous, while residential areas, education level, working status of partner are of categorical type. Women age was distributed in four groups (less than 20, 21-29, 30-39 and 40 and above). Partner working in any field of life was considered as working and not working otherwise. Partner working with any source of agriculture (entrepreneur/ agriculture labor/land owner) was considered as agriculture worker and non-agriculture worker otherwise.

Logistic Regression Analysis

In social sciences the response variable are binary in nature often, so we use binary logistic regression for the description of such data as the dependent variable has one of the two categories as employment and unemployment in our case. Due to the following salient futures of logistic regression it has a wide range of applications in case of binary response variable. First, It is less sensitive to the outliers as compared to the probit model and correction of bias is also easy with logit model second, Logistic regression is preferable over the discriminant analysis where the explanatory variables are of categorical or mix of continuous and categorical type and third[5,4]. It does not assume homoscedasticity and has less restrictive requirements the simple linear regression model [6]. However we assume that coding of variables is meaningful and the important variables are present in the model.

Logit Model

As the dependent variable in our study is of dichotomous type, so the possible outcomes are either "being employed" (taken as 1) or "being unemployed" (taken as 0), therefore the magnitude of the relationships of the determinants to carrier outcomes of the women will be analyzed using the Logistic Regression models for the dependent variable " being employed". To estimate the parameters of the logit model method of maximum likelihood (ML) is used instead of conventional ordinary least square (OLS) method [7].

The log likelihood function a for logistic case it will be ***Ln*** (L) = $\sum_i[\ (1-y_i)\ln(1\ -\ \Lambda(\beta' X_i) + y_i \ln\ \Lambda(\beta' X_i)]$ or ***Ln*** (L) = $\sum_{y_{i=0}} \ln(1\ -\ \Lambda(\beta' X_i)$ + $\sum_{y_{i=1}} \ln(\Lambda(\beta' X_i)$ Where β' = $(\beta_0, \beta_1, \beta_2, \dots\dots\dots \beta_k)$ are the model parameters and X' = $(X_0, X_1, X_2, \dots\dots\dots X_k)$ with X_0 = 1 are the explanatory variables.We shall use the AIC (Akaike Information Criteria), BIC (Baisan information Criteria) and deviance to measure the relative quality of estimated statistical models. These criteria deal with the exchange between the goodness of fit of the estimated models and their complexity.

Descriptive Results

Out of 13,558 women 10,833 are unemployed which means 80% of the women have no job, while just 20% of women are employed at the time of survey. Women who live in different provinces have different status of employment. It has observed that the proportion of employment was highest 28.8% in Punjab followed by Sindh 27.2%. The least proportion 6.8%of employment was observed in Gilgit Bultistan. There appeared to be some variation in the proportion of employment in different provinces of Pakistan. The proportion of women employment also differed by place of residence [3].

Among the women residing in urban areas 16.6 % were employed while in rural area 23.2%. It is important to note that women working in agriculture for their own families are also considered as employed. Women were divided in to four categories with respect to age groups. The highest percentage of employment (22.9%) was observed in the age group 30-39 followed by the age group 40 and above which is 22.5 % and the lowest employment ratio was observed for age group less than 20 year (12.3 %). It has also observed that percentage of employed women is highest (23.3%) with no education followed by 23% for a women having education at higher level or above, while the lowest ratio (10.8%) is for the women having secondary school certificate.

With regard to the Husband Education the percentage of employment was observed to be 27.2% (highest also) for a women whose husband has no education while this ratio goes down to 14.7% for the women whose husband's education is higher and above.

The percentage of women employment varies regarding the number of household members. As it was maximum (24.1%) for household where the number of household is less than '5' while it becomes smaller and smaller as number of household member increase, as it was just 14.7 % for household with 15 or above residents. The percentage of the employment for women, whose husband has some kind of job, was little better (20.2%) than the women whose husbands have no job (17.1%). While if the husband is Agrarian then the percentage of women employment is as much as (34%) than the non-Agrarian with an employment ratio of just (18%).

Presence of children under 5 years of age also affects the women employment status. As seen the women, have no child is better chance of employment (22.3 %) than the women who has the children of 5 years or below (19%). There are the better chances to work (20.1 %) for the woman who is usual resident than the women who is migrated (18.1 %).

Wealth status of household also affects the women employment status. We have seen that for poor household percentage of employment stood 26.9% while it gradually decreases as the wealth condition of household become well. The employment rate just remains 14% for a household whose wealth status is rich. To analyze the effect of

explanatory variable on dichotomous variable of women employment, multiple logistic regressions was used.

Stepwise procedure of variable selection was used to identify the significant predictors of women employment. Accordingly, Provinces, Place of residence, Women Education, Women Age, Husband Education, Husband Working Field, Sex of household head, Presence of child under five year of age, Migration status and Wealth Status are found to be significant determinant of women employment in Pakistan. Furthermore over all model evaluation, testing of predictors, measure of goodness of fit are also discussed.

Table 1: Results of Logistic regression Analysis

Explanatory Variables	Categories	For National Data	
		Estimates	OR
Provinces	Punjab	Ref	
	Sindh	-0.217*	0.805
	KPK	-1.761*	0.172
	Baluchistan	-1.005*	0.366
	Gigit Baltistan	-2.161*	0.115
	Islamabad	-0.289*	0.749
Type of Residence	Urban	Ref	
	Rural	-0.127*	0.881
Women Education	No Education	Ref	
	Primary	-0.155*	0.856
	Secondary	-0.331*	0.718
	Higher and above	0.823*	2.277
Woman Age	less than 20	Ref	
	20-29	0.441*	1.554
	30-39	0.824*	2.280
	40 and above	0.754*	2.125
Husband Education	No Education	Ref	
	Primary	-0.181*	0.834
	Secondary	-0.380*	0.684
	Higher and above	-0.544*	0.580
Husband's Occupation	Non-Agri	Ref	
	Agri	0.469*	1.598
Sex of Household Head	Male	Ref	
	Female	0.207*	1.230
Presence of child under 5 years	No	Ref	
	Yes	-0.169*	0.845
Migration Status	Migrant	Ref	
	Usual Resident	0.356*	1.428
Wealth Status	Poor	Ref	
	Middle	-0.506*	0.603
	Rich	-1.140*	0.320
Intercept		-.923*	0.198

* represents significance at .05 OR means Odd Ratios

From Table 1 it is shown that the women residing in Gilgit Baltistan is 88.5 percent (OR=0.115) likely to be unemployed followed by a women residing in Khyber Pakhtunkhaw with chance of 82.8 percent (OR=0.172) of being unemployed as compared to a woman who reside in Punjab Province. A women resident of rural areas was 11.9 percent (OR= 0.881) less likely to be unemployed as compared to the resident of urban area. A woman with primary education 14.4 percent (OR=0.856) more likely to be unemployed followed by a women with secondary education 28.8 percent are likely to be unemployed as compared to the women with no education. However when the education level of women is higher and above then there are more chances of employment (OR= 2.277) as compared to a women with no education. The women whose husband with primary education is 16.3 percent less likely to e employed. However these chances increases with increase of husband education as for secondary and higher education there are 36.6 percent and 42 percent respectively. Presence of a child of age five year or less also affects employment status of women negatively as there are 15.5 percent chances of unemployment for a woman who has a child of age five year or less as compared to a woman with no child of this age. Wealth statuses also play a significant role regarding women employment. As the wealth status of women with a rich wealth status has 68 percent chances of being unemployed and further more there are 40 percent chances of unemployment for a woman who belong to a household with wealth status as middle as compared to a poor family (OR=0.32 and OR=0.60, respectively).

Table 2: Results of Model Fit for Empty Model and Full Model

Criterion	Model without Explanatory variables (Empty Model)	Model with Explanatory variables (Full Model)
AIC	13607.98	12014.90
BIC	13615.50	12180.23
Deviance	13605.98	11970.90

Table 2 shows that in all criterions the values of AIC, BIC and Deviance decrease as we include explanatory variables in the model, which implies that model with all explanatory variables is better than the model without explanatory variables. Moreover the deviance based chi-square shows that at least one of the explanatory variables is significantly related to the response variable and hence in form that the fit of the model is adequate (χ^2=1635.08, d.f = 21 and p- value < 0.0001).

DISCUSSION

A total of 13,558 women were identified and 10,833 were found to be unemployed which indicate that 80 percent of the Pakistani women have no job while the rate of women employment stood at 20 percent only. Women resident of all regions other than Punjab have low chances of being Punjab and out of these regions, the position of employment is worse in GB. The results demonstrate that the chance of employment increases with an increase in the level of education. However women with primary education have more probability of being unemployed and these results are consistent with other studies [8-12]. This is may be due to the reason that high qualified women can make decisions independently and have high access to job opportunity. Results also revealed that women with higher age group have more chance of employment as compared to lower one which is similar to the results of [2,10].

The Partner's education has strong negative effects on the women working status. A woman has more chances of being employed if her husband is an agri-worker and perhaps it is

due to the reason that Pakistan is an agri-based country and during harvesting season women also work with their husband in the fields. These results are similar to those as in [3]. There are lower chances of employment for women who have children of age under 5 years than a woman with no child of such age. Same results were presented in [9,2]. The results also showed that probability of unemployment was 40 % for the middle class and it further increased to 68% for the women who belonged to a household with rich wealth status and the reason might be that as women become wealthy, they have low interests in being employed. These results are also consistent with [2].

REFERENCES

1. ILO "*Pakistan Labor Market updates*," *ILO country office Pakistan* (2013)
2. Faridi, Z., Chaudhry, I.S. and Anwar, M., "*The Socio-Economic and Demographic Determinants of Women Work participation in Pakistan: Evidence from Bahawalpur District*," *A Research journal of South Asian Studies*, **24**(2), pp.351-367 (2009)
3. "Pakistan Demographic and Health Survey report," *National Institute of Population Studies, Islamabad, 2012-13*
4. Copas, J. B., "Binary Regression Models for Contaminated Data," *Journal of Royal Statistical Association:* **52**(2): pp- 225-265
5. Agresity, A. "*An introduction to Categorical Data Analysis,". Jhon Willy and Sons, Inc, New York* (2007)
6. Agresity, A. "*Categorical data Analysis," Willy Interscience, New York,* (2007)
7. Hosmer, W. D. and Lemeshow, S., "Applied Logistic Regression," 2nd ed,. *Jhon Wiley and Sons, New York,* (2000)
8. Bartali, M. and Yousefy, A., "Women Employment and Higher Education Schoolings," *Procedia Social and Behavioral Sciences*: **15**, pp 3861-3869 (2011)
9. Contreras, D. and Palaza, G., "Cultural Factors in Women's Labor Force Participation in Chile," Feminist Economics, **16**(2): pp-24-46, (2010)
10. Mulu, M. "*Determinants of Women Unemployment in Ethiopia: A multilevel model approach*," *Addis Ababa university, Ethiopia* (2012)
11. Naqvi, Z. F. and Shahnaz, L., "How do women decided to work in Pakistan," *The Pakistan Development review*, **41**(4), pp 495-513
12. Smith, K. E., "The Ups and Downs in Women's Employment-Shifting Compos-ition of Behavior from 1970-2010?" *Upjohn institute working paper; 14-211*, MI: W.E. Upjohn Institute for Employment Research (2014)
13. Ejaz, M. "The Determinants of Female Labor Force Participation in Pakistan: An Instrumental Variable Approach," *CREB working Paper No. 01-11, Centre for Research in Economics and Business, Lahore School of Economic, Pakistan (2011)*