PUSH OR PULL FACTORS: DETERMINANTS OF FEMALE LABOR FORCE PARTICIPATION IN BANGLADESH

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Justification of the study

Table 1.1: LFPR in Bangladesh (15+ years)

LFS year	Female	Male	Total
1991-92	14.0	86.2	51.2
1995-96	15.8	87.0	52.0
1999-00	23.9	84.0	54.9
2002-03	26.1	87.4	57.3
2005-06	29.2	86.8	58.5
2010	36.0	82.5	59.3

Table 1.2: FLFPR by area in Bangladesh

LFS year	Rural	Urban
1995-96	17.4	20.5
1999-00	23.1	26.5
2002-03	25.6	27.4
2005-06	29.8	27.4
2010	36.4	34.5

Source: BBS, LFS (various years)

- Data on female and male LFPR (Table 1.1) show that female LFPR went through a continuous rise during 1991 to 2010
- Table 1.2 illustrates the increased aggregate female participation was backed by rural female participation.
- Urban FLFPR becomes slowed down compared to rural areas.

Objectives of the study

- Given the background and context mentioned above, it would be useful to examine the factors that influence female labour force participation and employment
- The purpose of the present study is to enhance the understanding why urban LFPR becomes slowed down?

Literature review: determinants of female labour force participation in Bangladesh

- Bridges et al. (2011)
  - Participation in paid employment: Extreme poor, those with smaller number of young children, unmarried are more likely to participate
  - Participation in self-employment (agriculture): Non-poor and young child has a positive impact. Education has no impact.
- Amin (2005) Participation in paid employment: Female-headed households, smaller family size, lower educational attainment, living in urban areas, lower levels of household wealth and microcredit have a positive impact on participation.
- Rahman (2006) Participation in labour force (all types of employment): Women as head, education SSC+, urban, unmarried have a positive impact. Land ownership, education lower than SSC, young children, and education of household head have a negative impact.
- Khandker (1988) Women's home production labour input: Women's education, husband's assets and landholding have negative effects; female wage has a positive effect.
- Khandker (1987) Participation in cash income earning: Education and female wage have a positive impact; husband's education has a negative impact.

The Neoclassical Model of Allocation of Time or labor-leisure choice model

- The model of labor-leisure choice, which is an extension of the utility maximization problem of consumer theory; its analyzes how individuals make choices in deciding how they will spend a fixed amount of time
- In the simplest model, an individual has two uses for his/her time, either working in the labor market at a real wage rate of W per hour, or "leisure".
- The amount of both consumed will depend on the individual's market wage (W), personal preferences, and the nonlabor income (V) that person enjoys.
- The individual's utility function will be:

$U = f(C, L)$ ……(1)

These constraints can be written as the following:

Time constraint: $L + H = T$ ……(2)

Budget constraint: $C = (W * H) + V$ ……(3)

We can rewrite (2) and (3): $C = W(T - L) + V$……(4)

The Neoclassical Model of Allocation of Time or labor-leisure choice model (contd.)

Setting up the Lagrangian expression to represent the individual's utility maximization problem yields
= U (C, L) + λ {[W (T – L) + V] – C}

The first order conditions for a maximum are

$$\ell = U(C, L) + \lambda \{[W(T - L) + V] - C\}$$

The first order conditions for a maximum are

$$\frac{\partial \ell}{\partial C} = \frac{\partial U}{\partial C} - \lambda = 0 \therefore MU_C = \lambda \qquad (5)$$

$$\frac{\partial \ell}{\partial L} = \frac{\partial U}{\partial L} - \lambda W = 0 \therefore \frac{MU_L}{W} = \lambda \qquad (6)$$

Equating (5) and (6), we get

$$\frac{MU_L}{MU_C} = W \qquad (7)$$

- An increase in W, holding income constant, makes leisure more expensive. An increase in V will cause an increase in leisure time and a decrease in the hours worked, and vice versa.

The Neoclassical Model of Allocation of Time or labor-leisure choice model (contd.)

- This theory has been successfully used to explain women's labor force participation: , she will be willing to participate in the labor force if the reservation wage is greater than or equal to the market wage --that is, if $W^* \geq W$.

- Literature suggests that no. of kids below 5 years, no of earner in the households, marital status increases the reservation wages.

Model Specification

- To examine the determinants of female labor force participation, we will deal with the dependent variable in this study is a dichotomous variable (0, 1).
- Given the nature of the dependent variable, Y, which takes value Y=1 if the respondent (female) is in the workforce; and takes value Y=0 if the female is not in the workforce, the two models, Probit and Logit models, can be used.
- Both of these models provide a prediction for the probability that a female with a given set of characteristics is in employment/workforce.
- However, since logistic model is easier to understand and uses a standard form of analysis, logistic regression model is used in this study.

Model of Logistic Regression

- In the logistic model with more than one independent variable, the model can be written as:

$$\text{Prob [Female in workforce]} = \frac{1}{1+e^{-Z}}$$

where Z is a linear function of the explanatory variables. If $X_1, X_2, \ldots\ldots X_k$ represent various characteristics of the household and female respondent, then "Z" equation would be as follows: $Z = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots + \beta_k X_k$

$$\text{Each } \beta_i \text{ can be shown to be } \frac{\partial \log (\text{odds ratio})}{\partial x_i} = -\beta_i$$

where odds ratio is defined as

$$\frac{\text{P[Female in workforce]}}{\text{P[Female not in workforce]}} = e^{-z}$$

- Therefore, β_i provides a measure of change in the logarithm of the odds ratio of the chance of a female working to not working.

Notation and Description of variables in Logistic Regression model

	Variable(s)	Base for dummy variables
AGE	age	
SQAGE	square of age	
MAR_D	Married dummy	Not currently married
NOC5Y	No. of children <5 years in household	
NOME	No. of male earners in household	
NEARNR-N	No. of non-earning males in household	
ASSET_2	No land, other asset	Asset 1 (No land or non-land asset)
ASSET_3	Small land owned	
ASSET_4	Larger land	
URBAN_D	Urban dummy	Rural
EDUC_D2	Education dummy 2 (primary)	No education
EDUC_D3 Education dummy 3 (secondary)	Education dummy 3 (secondary)	
EDUC_D4	Education dummy 4 (above secondary)	
HEDUY	Household head education attainment years)	
HSTAT_D2	Household head status dummy (nonagriculture, wage employment)	HSTAT-D1 (agriculture-self-employed)
REL	Whether head of hhs	Not

Data

- Labor Force Survey 2010

  To find out the drivers and barriers of LFPR, both in rural and urban areas

  Female part of the labor force survey-58297 observations

- Urban area survey data 2013

  To find the reasons behind why urban women drop out from employment?
  We collected 357 individual interviews

Variable specification and expected sign

- Age is a critical variable because young women's participation in the labour force is usually viewed as a positive feature. The influence of age may be non-linear, that is, may decline after some threshold has been reached that's why quadratic term also included
- Education can have an important positive impact on female LFPR. The influence can be in either direction or non-linear, i.e. first declining and then rising.
- Marital status of women is likely to influence the chances of joining the labour force because marriage reduces her independence to move to a location away from home.
- Having children in the family can have a similar discouraging effect. Having children will mean a larger burden to reduce the female labour supply.
- Urban areas has more opportunity for employment, so urban dummy expected positive effects.
- Having more non-labor income increase intercept so it discourage employment.

Table 1.4: Results of logit regression: Determinants of probability of female labour force participation (FP) and salaried (SP)

Independent variables	log(FP/I-FP) Marginal Effect	log(SP/I-SP) Marginal Effect
Age	0.027917***	0.000448***
Square age	-0.000464***	-0.000012***
Marital_d	-0.110999***	-0.017466***
No of kids<5 years	-0.033719***	-0.003933***
No of male earner	0.015207***	-0.002023***
No of nonearner male	-0.073678***	-0.000950*
Asset_d2	0.012783***	-0.001865*
Asset_d3	0.049450***	0.003532***
Asset_d4	-0.042829	-0.008531***
Urban_d	0.020085***	0.014648***
HH head	-0.020158*	0.013875***
Education_d2	0.010206*	0.001599*
Education_d3	0.037621***	0.006842***
Education_d4	0.057568***	0.007052***
Husband edu	0.011978***	0.002052***
Husband wage earner	-0.270196***	0.017469***
Pseudo R2	0.1190	0.1995
Wald chi2(16)	4831.9	2744.8
Prob>chi2	0.0000	0.0000
Log pseudolikelihood	-33982.53	-5959.18
Observation	58297	58297

- Most of the results of the logit regression analysis presented in Table 1.4 are in conformity with a priori expectations.
- Indicators of family responsibility have significant negative coefficients- married, number of children aged 5 years or less, number of male dependents above age five etc.
- Among human capital variables, age has a non-linear effect, first positive and then negative.
- Education has a positive impact. Four levels of education, with 'no education' as base case, have gradually rising positive coefficients. Education raises productivity and, thereby, raises wage/salary and through its substitution effect, raises female LFPR.
- Among the family characteristics, number of male earners has a significant negative coefficient.
- Family asset has positive influence. Compared to the base case of households 'with no land or nonland asset' women in households with own land assets have a significantly higher probability of labour force participation.
- However, ownership of some land raises the probability of female LFP, but in the highest land ownership group, it is insignificant, which may be due to use of more hired labour and prestige considerations.

Table 1.5: Results of logit regression: Determinants of probability of female labour force participation (FP) and salaried (SP) employment by rural-urban

Independent variables	log(FP/I-FP)		log(SP/I-SP)	
	Rural	Urban	Rural	Urban
Age	0.02915***	0.02513***	0.00063***	0.00078
Square age	-0.00047***	-0.00045***	-0.00001***	-0.00003***
Marital_d	-0.09346***	-0.16727***	-0.01168***	-0.05329***
No of kids<5 years	-0.02882***	-0.05869***	-0.00143***	-0.02119***
No of male earner	0.01654***	0.00474	-0.00084	-0.01018***
No of nonearner male	-0.06149***	-0.11113***	-0.00003	-0.00628**
Asset_d2	0.02024***	-0.04900***	-0.00128	-0.01387**
Asset_d3	0.05048***	0.03592***	-0.00069	0.02439***
Asset_d4	0.06508	-0.06412***	-0.00044	-0.02858***
HH head	-0.03188***	0.00611***	0.00660	0.04889***
Education_d2	0.01356***	0.01691	0.00330***	0.00070
Education_d3	0.03515***	0.06944***	0.00582***	0.02054***
Education_d4	0.05237***	0.07688***	0.00444***	0.02874***
Husband edu	0.01353***	0.01069***	0.00205***	0.00444***
Husband wage earner	-0.27527***	-0.28067***	0.01011***	0.04707***
Pseudo R2	0.1191	0.1362	0.1615	0.1619
Wald chi2(16)	3461.1	1321.5	1292.14	761.81
Prob>chi2	0.0000	0.0000	0	0
Log pseudolikelihood	-26900.29	-5959.18	-3116.21	-2716.03
Observation	46053	12244	46053	12244

Urban Survey 2013
Summary Statistics of the data

Table 1: Marital status of the sample respondents

Marital status	Not in Job	In Job
Un-married	**0.45**	**18.2**
Married	97.7	65.6
Widowed/divorced	1.80	16.0
Total	220	137

Table 2: Level of education of the respondents

Level of education	Not in Job	In Job
No education	5.45	6.6
Primary incomplete	11.8	16.8
Primary completed	20.9	13.8
Secondary	**20.4**	**10.2**
Higher secondary	**20.9**	**8.03**
Undergraduate	10.9	17.5
Graduate/Higher	9.5	27
Total	220	137

- Marital status has adverse effects on female employment due to family responsibility, i.e. child care, house works and etc.
- Education has positive effects on employment but on the lower and upper level.
- May be urban areas generates fewer jobs for secondary and college graduates

Respondents Level of education and occupational choice

Level of Education	Occupational Status							
	Salaried	Garments	Self-employed	Housewife	Wage employ	Business	Others	Total
No educa	4.76	19.05	0.00	57.14	0.00	0.00	19.05	100.00
Below prim	4.08	32.65	2.04	53.06	0.00	4.08	4.08	100.00
Primary	3.08	12.31	1.54	70.77	1.54	6.15	4.62	100.00
Secondary	10.17	5.08	1.69	76.27	1.69	1.69	3.39	100.00
College	8.93	3.57	3.57	82.14	0.00	0.00	1.79	100.00
Undergrad	**28.26**	0.00	4.35	**52.17**	0.00	4.35	10.87	100.00
Graduate	**49.12**	0.00	1.75	**36.84**	0.00	3.51	8.77	100.00
Total	57	33	8	220	2	11	22	357

- No education and with low level of educated females are employed in low paid jobs like garments and factories. Interestingly, they are less constraint to participate in the job market compared to rest.
- Mid-level educated (secondary and college graduates) female more supposed to be housewife's, compared to lower and upper educated females.
- More than 50% of undergraduates and 36% graduates females are not employed in the job markets, and they are housewives which is a concern issue

Household head occupational status and female employments

Household Head	Respondent Female: Not in Job	In Job	Total
Salaried	34.10	33.86	34.01
Garments	8.29	22.05	13.37
Selfemploy	6.45	8.66	7.27
Housewife	3.23	1.57	2.62
Wage-empl	4.15	3.94	4.07
Business	35.48	22.05	30.52
Others	8.29	7.87	8.14
Total	217	127	357

- The survey results suggested female are less came to job market if she belongs to households with secured jobs and stable income earners like salaried and business.
- Female are more supposed to came to job market if she came from households where household earnings source are not secured and stable like garments/factory workers, petty professions.

Determinants of labor force participation

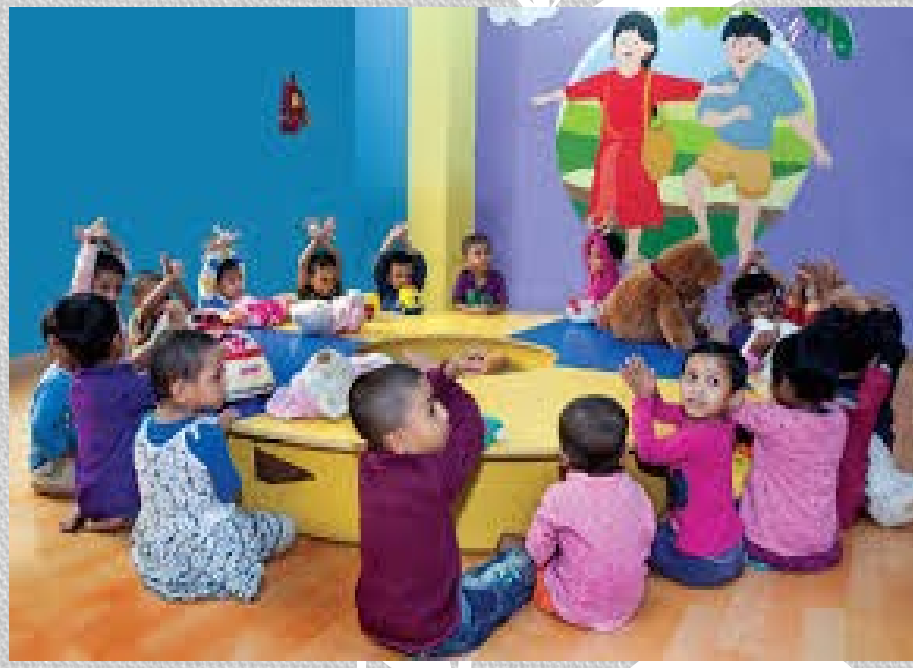
Logistic regression — Number of obs = 333; Wald chi2(10) = 43.19; Prob > chi2 = 0.0000; Log pseudolikelihood = -176.55053; Pseudo R2 = 0.1845

lfp	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
age	-.0109867	.0176524	-0.62	0.534	-.0455849	.0236115
marital_d	-2.767991	1.105473	-2.50	0.012	-4.934679	-.6013028
kids_5yrs	-.7595198	.2918497	-2.60	0.009	-1.331535	-.1875048
educ level	.6091554	.1483378	4.11	0.000	.3184186	.8998921
hhsex_d	.7389839	.4123335	1.79	0.073	-.0691749	1.547143
m_earner	.2318931	.2272891	1.02	0.308	-.2135853	.6773715
hh_educ	-.4740789	.1527748	-3.10	0.002	-.773512	-.1746458
hhoccp_d2	.50234	.662074	0.76	0.448	-.7953011	1.799981
hhoccp_d3	1.810041	.6711519	2.70	0.007	.4946076	3.125475
hhoccp_d4	.3110695	.601784	0.52	0.605	-.8684055	1.490545
_cons	1.355826	1.386896	0.98	0.328	-1.362441	4.074093

Implications of the results: Urban Survey 2013

- Marital status and having kids has significantly negative effects on the labor force participation. In the urban areas, we have very limited and expensive childcare/baby care centers, so lots of female left jobs after becoming mother.
- Educational level has significantly positive effects on labor force participation, which was same as expected. Sex of the household heads also has positive effects on female employment, in absence of male household heads, and number of male earners has week positive effects.
- The level of education of household heads has strong negative effects on female employment or job market participation which is unexpected. The plausible reasons might be, they are employed in secured and high salaried jobs, which influenced the female members not to participate in the job markets.
- The survey results also suggested that garments workers allow their spouses significantly to enter job markets compared to wage earners, but salaried and businessman husband or father are not strongly motivate theirs spouse/daughter to enter job.

Beyond Regression: Female Safety and Childcare or daycare



In the urban area:

1. the transportation in the urban area is not female friendly. Dhaka is the one of the worst traffic congestion city and the public transportation is very limited compared to demand.
2. the working-women facing problem after having baby, due to very limited childcare centers and lack of trusted home servant; as a consequences some of them quit from jobs.

Possible Solution to speed up female job participation

- National Level: emphasis more female education until under-graduation, also emphasis vocational education

- Urban areas: provide more safety environment for female by providing more female transportations, childcare or day care facilities, and also create part-time jobs for house-wives and students

- Rural area: expand more micro-credits, and SME loans to female entrepreneurs, which could generates more job opportunities for females

Comments and Suggestions