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What Derives Female Labor Force Participation in Muslim Countries? A Generalized Method of Moments Inference

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Abstract

Globalization and its social consequences have engendered newer trends that include increasing preferences of women to become economically active. Economic role of women has become a widely discussed topic in recent times in Muslim world. There are different perspectives and norms that determine their decision to become economically active i.e. to join the labor force. Hardly any study addresses this question with reference to Muslim world. Considering the emergence and rise of female employment in Muslim world, this paper formulates an empirical framework for the factors that affect female labor force participation (FLFP). Data is extracted from international databases World Development Indicators (WDI). For 41 Muslim countries the data was available for the time span of 2003-2013. To conduct rigorous statistical analysis of the relevant variables; we use a widely accepted robust estimation technique, known as Generalized Method of Moments (GMM). Findings of this study provide specific recommendations that are helpful in managing the emerging trends of women employment in Muslim world.

Keywords: female labor force participation, female employment, Muslim world.

1. Introduction

Lamented have been the sorrows and contentions of women since Adam and Eve. Time has seen various reforms regarding the women related social and economic issues. Their economic empowerment has been a hotly debated topic for at least half of a century. The recent catch phrase of ‘women empowerment’ has spread in nearly every part of the world. Muslim countries are not an exception to it. There have been notable social, political and economic changes around the globe during the last few decades. Such changes have made the population of the world more aware of the challenges of modern era. In this modern era, lifestyle and inflation have made ‘economic’ status a dominant

factor in our lives. In addition, nations are in a race of economic growth and are tapping into all of their resources. Labor force is the resource that directly contributes to economic growth. There has been a compositional change in labor force in the form of increasing FLFP. This trend is partly attributed to increasing female to male ratio around the globe. This phenomenon is not specific to western world rather it is spreading in Muslim world as well. Women are argued to contribute to economic growth. Accordingly, the distinction between the activities regarding job nature of men and women has reducing. Recent trends have rendered women more aware of economic independence. Consequently, an observable increase in the magnitude of FLFP has taken place.

Considering the increasing importance of female labor force, this study investigates the driving forces behind the influx. Education has arguably become the leading factor of female labor force but a woman's decision is not just subjected to the attainment of education but reasons such as job availability, decent salary, specific skills, a strong support system, increasing inflation are also crucial. A woman is either 'pushed' or is 'pulled' into labor force. Push factors for the obvious reasons are financial in nature; usually a woman belonging to the lower strata of the society, rising cost of living, a household where breadwinner's income is low and incapacitated to work is pushed into labor force. Pull factors are usually the opportunities and the increased demand for labor. The study analyzes Muslim countries to understand the factors leading to an increase in the female labor participation (FLP). The relationships are empirically tested and explained in the later sections.

1.1 Objectives of the Study

This study aims to identify the economic and social factors that affect FLFP. Such is of interest for theorists and policy makers in the fields of economics, sociology and gender studies. Following is the expression of this objective in statistical manner:

H_A: Selected Macroeconomic and Social Factors Affect the FLFP in Selected Muslim Countries.

In proceeding section, we furnish a review of literature that will necessitate the contribution and need of current study.

2. Literature Review

Economic, social and demographic factors influence women's decisions to join labor force. Factors that increase the FLFP have been investigated by various researchers. Some relevant researchers are reviewed as follows.

Franz (1985) observed that FLFP rate in Germany has increased from 33 to 42 percent. One of the many factors for this increase is upward trend in female wage rate. So the wage gap between male and female has also been reduced and females are substituting for house work to market work. Fadayomi (1991) has inferred in his paper that the proportion of working women increases as the number of children increases as that is a direct (economic) shock to the family income and out of concern for the bright future of children, decrease in the income of the head of the family and the thirst for personal growth also pushes women into labor force. Duleep and Sanders (1994) concluded that the employment among American women is negatively related to the number of children and age of the youngest child. In the work of Galor and Weil (1996) large labor demand

of the government increases the FLFP by growing the relative wage of women and hence inclining women to give more hours to labor market participation.

Kingdon and Unni (2001) tested the relationship between education and FLP and discovered a U-shaped relationship of education with labor force participation, meaning that supply of female workers decreases firstly when the growth process starts and then gradually starts to increase when a certain level of education is attained. FLFP differs with age and has significantly increased for all age groups during the last thirty years. Sasaki (2002) has found that married women in Japan are more likely to work if the household is supportive and that there is a negative association between husband's income and female participation. Females of affluent families tend to stay at home and raise family.

Adsera (2004) noted that an important development took place in OECD countries in last two decades is the increased FLFP. It amounted to nearly 48% during 1975 up from 41% during 1960 and radically augmented to 64% by the late 90s. Aromolaran (2004) concluded that not only the education of a woman but the education of husband has also positively influenced the labor force participation of married women in Nigeria. Martinez and Iza (2004) display that in a growing relative wage of skilled labor (in comparison to the wage of unskilled labor) also concurrently raises the total fertility rate and the FLFP.

Masood and Ahmad (2009) empirically tested that education level and wage rates offered in the job market significantly and positively affect the urban women's labor force participation rate. Aminu (2010) tested the factor of presence of an elderly female person in a family and found out that it increases the probability of both male and female participation in the labor force. Contreras and Plaza (2010) showed in their study on the effects of lower income of males on the female work participation and have empirically proved that to substantiate lower income of the males; women participate in the labor market to secure the future of the family and to sustain a certain living standard. Bibi and Afzal (2012) have drawn the same conclusions about the forces of increased inflation that it creates financial pressures and derives women to chip in the household expenditures. In a study by Mujahid et al., (2013) a run relationship is derived between economic growth and FLP. The study concluded that increase in the GDP growth increases the opportunities for work and better salaries thus giving the impetus for women to work. This study has drawn positive correlation between economic growth and FLP and between consumer inflation. It explains that growth pulls in females into work force by creating attractive opportunities and increase in inflation pushes them to work to make extra income.

Review of literature shows that Muslim countries have been deprived of attention of researchers in this field. Impetus to do research for Muslim world comes from fact that Muslim community has its distinct identity, beliefs and norms. Social impacts of Globalization have given rise to newer trends that include increasing preferring of women to become economically active even in Muslim countries. It would be pertinent to enumerate the factors that boost FLP in Muslim world. Accordingly, this study attempts to fill the gap of literature on Muslim world. To the best of our knowledge, this is the first research that analyses the determinants of FLFP in Muslim countries.

3. Methodological Issues

Secondary and balanced panel data is composed in this study. The relevant variables are taken from WDI. The time span for analysis is 10 years i.e. 2003-2013. The selection of countries is based on the availability of data among the Muslim world.[1] These are 41 in number and the dimensions of data are n = 41, t = 10 and n > t. It is micro-panel since the time dimension is small (micro). Micro panel data analysis techniques include panel effects model, system generalized method of moments and difference generalized method of moments among others. Selection of technique shall be done in the following section.

4. Estimable Model

Determinants of FLFP are expressed in functional form in this section.

$$FLFP_{i,t} = \alpha_i + \beta_1(FLFP_{i,t-1}) + \beta_2(WEM_{i,t}) + \beta_3(FHH_{i,t}) + \beta_4(YPC_{i,t}) + \beta_5(LFPM_{i,t}) + \beta_6(TER_{i,t}) + \beta_7(UML_{i,t}) + \beta_8(FER_{i,t}) + \beta_9(INF_{i,t}) + \Omega(T_t) + + \varepsilon_{i,t}$$

The countries included in analysis are: Afghanistan, Albania, Algeria, Bahrain, Bangladesh, Benin, Cameroon, Central African Republic, Chad, Egypt, Arab Republic, Ethiopia, Gambia, Guinea, Guinea-Bissau, Indonesia, Iran, Islamic Republic, Iraq, Jordan, Kuwait, Lebanon, Libya, Malaysia, Mali, Mauritania, Morocco, Niger, Nigeria, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Sierra Leone, Sudan, Syrian Arab Republic, Tanzania, Togo, Tunisia, Turkey, United Arab Emirates and Yemen Republic.

Where

FLFP = Labor force participation rate, female (% of female population ages 15-64)

TER = School enrollment, tertiary, female (% gross)

WEM = Contraceptive prevalence (% of women ages 15-49)

FER = Fertility rate, total (births per woman)

FHH = Female headed households (% of households with a female head)

YPC = GDP per capita (constant 2000 US$)

UML = Unemployment, male (% of male labor force)

INF = Inflation, consumer prices (annual %)

$\mathbf{T_t}$ is vector of time dummies and $\mathbf{\Omega}$ their respective coefficients and $\boldsymbol{\varepsilon_{i,t}}$ is the error term. **i** shows countries and **t** years.

4.1 Why Generalized Method of Moments (GMM)

In statistical estimation of panel data regressions, endogeneity and heteroskedasticity are quite common. We conducted tests for endogeneity and heteroskedasticity and found their presence in our data as shown in table 1 and table 2. Led by these statistical confirmations, we have used GMM for estimation suggested in Arellano and Bond (1991) which is a broad context to conduct estimations that deliver an estimation framework which comprise of least squares, nonlinear least squares, instrumental variables, and maximum likelihood, and a broad group of estimators. It is employed for models with dynamic specification to acquire unbiased estimates where lagged

dependence is also incorporated. For more recent applications of GMM, see Mehmood & Azim (2014) and Elahi, et al., (2014).

4.2 Tests for Endogeneity

Endogeneity and heteroskedasticity is not a rare issue in panel data analysis. Its detection is undertaken to using the tests. Table 1 tabulates these tests for endogeneity. Both Wu-Hausman and Durbin-Wu-Hausman show statistical significance at 1% level of significance signaling the incidence of endogeneity.

Table 1: Test for Endogeneity

H_0: Regressor is exogenous		
Wu-Hausman F test	F(1,360) = 15.031	p-value = 0.000
Durbin-Wu-Hausman	$\chi^2(1) = 14.749$	p-value = 0.000

Source: Authors' Estimations

4.3 Tests for Heteroskedasticity

Baum et al., (2003) incidence of heteroskedasticity in instrumental variable regression demands for GMM estimator. Subsequent tests are deployed for questioning the appropriateness of GMM in current case. In Table 2, results of statistics have statistical significance at 1%. Thereby the incidence of heteroskedasticity is evidenced and GMM estimator should be implemented.

Table 2: Test for Heteroskedasticity

Ho: Disturbance is Homoskedastic		
Pagan-Hall general test statistic	73.879	p-value = 0.000
Pagan-Hall test w/assumed normality	86.990	p-value = 0.000
White/Koenker nR^2 test statistic	90.825	p-value = 0.000
Breusch-Pagan/Godfrey/Cook-Weisberg	123.013	p-value = 0.000

Source: Authors' Estimations

4.4 Interpretation of GMM Results

The F-test, which displays the overall fitness of the model, is statistically significant which implies that model is properly specified. Number of countries (41) in the regression is larger than instruments (52) and also the observations (368) are also greater than the instruments.

Table 3: GMM Estimates

Dependent Variable ($FLFP_{i,t}$)			
	Coefficient	**t-statistic**	**p-value**
$FLFP_{i,t-1}$	0.8809	19.09	0.000
$TER_{i,t}$	0.3027	1.85	0.066
$WEM_{i,t}$	0.5379	4.72	0.000
$FER_{i,t}$	-0.8341	-2.20	0.029
$FHH_{i,t}$	0.2139	2.82	0.005
$YPC_{i,t}$	0.7879	1.94	0.054
$UML_{i,t}$	0.4437	3.28	0.001
$INF_{i,t}$	0.2984	3.04	0.003
yrtd_01	-0.0014	-0.14	0.890
yrtd_02	-0.4413	-0.51	0.610
yrtd_03	0.1770	0.18	0.857
yrtd_04	0.0977	0.11	0.910
yrtd_05	0.2065	0.31	0.759
yrtd_06	0.3914	0.41	0.684
yrtd_07	0.1329	0.37	0.714
yrtd_08	0.1933	0.58	0.563
Other Tests and Parameters			
Observations = 368	No. of Countries = 41	Instruments = 52	F(8, 40) = 70.96 [p = 0.000]
p-value: Hansen J-Test = 0.693		M_1: p = 0.023 & M_2: p = 0.897	
Difference in Hansen tests / C-tests:[p = 0.359, p = 1.000, p = 0.435 & p = 0.992]			

Source: Authors' Estimations

Lagged variable of $FLFP_{i,t-1}$ is has coefficient (0.8809) with p-value of 0.000. It affirms that it is a dynamic model which encourages the implementation of GMM. Roodman (2009) suggests that the absolute coefficient for lagged dependent variable should be < 1. The result for TER is statistically significant at 10% level of significance with coefficient of 0.3027 which means that tertiary education increases FLFP. Women empowerment is a diverse phenomenon. In this, it is measured with a proxy i.e. contraceptive prevalence (Gage, 1995). Its sign is positive showing a direct relationship between women empowerment and FLFP. Moreover, statistical significance holds at 1% level of significance.

Coefficient of fertility is negative, depicting the negative relationship between increase in number of babies and FLFP. This result is institutive since the increase in number of childbirth reduces the ability of women to participate in labor force. Statistical significance is at 5%. Results show affinity between FLFP and female headship of

household. Relationship is statistically significant. When household is headed by a female, the motivation to become a part of labor force is there. This justifies the positive sign of this coefficient. As per results an increase in income per capita affects the FLFP positively. This relationship does not hold ideal level of statistical significance (significant only at 10%). The underlying reason for this positive relation might be due to the fact that increase per capita income increases the materialistic thinking in society. This leads to increased participation of female in labor force to further their financial status.

One of the interesting findings of this empirical study is the positive relationship between male unemployment and FLFP. It can be interpreted as the crowding out of male employees from labor market when their female counter parts replace them in employment opportunities. This can lead to increase in female headed households that in turn increase the FLFP. Male unemployment is found to have a feedback effect via female headed households on FLFP. This fact has also been discussed in Contreras and Plaza (2010) and they have proved that lower income of the male or male unemployment put pressure on women and pushes them into work. Inflation as a cause of increase in FLFP is evidenced in these results. This contribution is visible via positive contribution of inflation in female labor force contribution and the statistical significance at 1%. Bibi and Afzal (2012) have also concluded in their study that higher expenditures and the increase in the inflation rates compels women to take part in the economic activities and look for work opportunities. This relationship also been proved by the other studies, Mujahid et al., (2013) conducted a study in Pakistan taking data from 1980 to 2010 and found that consumer inflation is positively correlated with FLP. Increasing inflation leads to increasing cost of living, this triggers the participation of female labor to cope with increasing cost of living.

Sarafidis et al., (2009) advocate the introduction of time dummies to increase the statistical diagnostics of the model. Results of these dummy variables are listed in table 3. For autocorrelation test, AR(1) is significant with probability p=0.023. This reveals the presence of first order autocorrelation in the data. Test for serial autocorrelation is AR(2) process in first difference which matters more than AR(1) process. Test for AR(2) should show insignificance like it is in current regression (p = 0.897). One can infer the absence of second order serial autocorrelation. Over-identification test (Hansen J test) which affirms instrument validity. Statistical insignificant of this test (p = 0.693) affirms the absence of over-identification and validity of instruments.

4.5 Causality Analysis

To check the causality between labor force participation and its determinants we conduct panel Granger causality analysis.

Table 4: Panel Granger Causality Test Results

Null Hypothesis	F-Statistic	p-value
Tertiary School Enrollment Among Females does not Granger cause FLFP Rate	4.057	0.018
FLFP Rate does not Granger cause Tertiary School Enrollment Among Females	0.187	0.830
Contraceptive prevalence does not Granger cause FLFP Rate	40.551	0.000
FLFP Rate does not Granger cause Contraceptive prevalence	3.617	0.028
Fertility Rate does not Granger cause FLFP Rate	9.140	0.000
FLFP Rate does not Granger cause Fertility Rate	2.685	0.070
Female Headed Households does not Granger cause FLFP Rate	20.923	0.000
FLFP Rate does not Granger cause Female Headed Households	0.003	0.997
GDP Per Capita does not Granger cause FLFP Rate	2.653	0.072
FLFP Rate does not Granger cause GDP Per Capita	0.121	0.886
Unemployment Among Males does not Granger cause FLFP Rate	3.994	0.019
FLFP Rate does not Granger cause Unemployment Among Males	20.640	0.000
Inflation does not Granger cause FLFP Rate	2.912	0.056
FLFP Rate does not Granger cause Inflation	0.648	0.524

Source: Author's Estimates

Results of causality reveal that increase in tertiary education causes FLP to increase and the direction of causality is unidirectional. Female headed household causes the FLFP while vice versa does not hold. Similarly, GDP per capita and inflation also cause FLFP while they are not caused by FLFP. In case of women empowerment the causality in bidirectional. This bidirectional causality holds for fertility rate and male unemployment.

5. Implications of Panel Granger Causality Tests

Various studies in the past have proved the importance of education; it has been proven that education is one variable that directly effects the labor participation be that labor male or female. In case of female it has been observed that as the higher levels of education are attained the chances to land better jobs are increased by manifolds. There is no wonder in the fact that women with no education or little education are not employed or do not have the skills to be offered better jobs or have less confidence to attain jobs, so in comparison to it women with tertiary education are at more advantageous point to get jobs that satisfy them, gives them the impetus to grow in future. Tertiary education prepares them according to the requirements of the job market so attainment of tertiary education causes females to participate.

It has also been proven that households where there are no males to bring in bread and butter get into tremendous economic pressures. Situations like death of a father or husband, incapacitation to such an extent that he cannot extent, households where women is a single divorced parent or situations where there is no male member to ear or provide

for the family usually such households also do not have financial security like inheritance. Such circumstances make households and women more prone towards poverty and financial insecurity and thus cause them to work and provide for the family and children. It has been observed worldwide that rising costs and general increase in the prices put financial pressures and for that matter willing, motivated and able women chip in to secure the future of their families. Increase in per capita also causes women to work. Higher per capita means that people have more money to invest and spent and due to prosperity people start educating girls which was not possible before and due to this participation takes place.

A novel finding is the bi-causality between FLFP and male unemployment. It highlights that increasing labor force participation crowds out the male labor and increases the male unemployment. This phenomenon of crowding out is likely to be more prominent in developing countries with preexisting higher unemployment rates.

6. Conclusion

The study has found and reiterated the fact that the role of women today is far more diverse and complicated than before. Today the women of Muslim world are actively engaging in economic activities. Their decision to work is influenced by the same push and pulls factors as those of the women of the western world. The estimations show that the attainment of tertiary education and FLP has a positive link. Education increases the possibilities of better jobs and respectable salaries; it gives them the impetus to enter into the job market with confidence. It has multiple affects; it instills a sense of empowerment and nurtures their desires for better future thus increasing participation.

The results also show that as their sense of empowerment increases they become more aware of their rights and available opportunities. This in turn leads to increase in the use of contraceptive; they tend to eradicate the hindrances resulting from child birth during the active working years, as child birth poses a direct threat to the process of maintaining employment. The relationship between the number of children and female participation rate has turned out to be negative because as the number of children in the family increases the responsibility of raising them also increases. This leaves the mother with less time to invest in work place therefore reducing her chances to work. Increase in GDP and per-capita income leads to more female participation because as the economy grows, it provides more avenues and opportunities for work, it also increases the demand for labor which is met by educated, able and willing female work force.

An interesting relationship is drawn between rising inflation and female participation rate. The results of the study show that there exists a positive relationship between these variables because as the cost of living increases it puts financial pressure on females to chip in and provide for the better future of their family and children. Increase in male unemployment and lower spousal income also compels females to provide for families. Female employment rate also increases if the support system around females is strong and usually families which are headed by female counter parts are more supportive and understanding towards them. The study has concluded that women belonging to Muslim world are also reaping the fruit of economic growth and despite the prevalence of strong social stigmas and religious factors are actively participating in the economic affairs of their countries whether they are being pushed or pulled. Today the modern Muslim

woman is strong and aware of her responsibilities and rights and she is making an effort to do her bit.

6.1 Future Directions and Limitations

Future studies can be conducted on how education achievement and maternity affects labor force participation decision of females. The scope of the study can be regional, national or multi-national depending on the availability of data. Due to paucity of data, important variable of 'poverty' could not be included. We expect poverty to play a vital role in determining the decision of females to join labor force.

There are some caveats; the World Bank sets the working age as 15 or above, but obviously lots of high school- or college-aged girls and women don't work because they're getting an education. This is especially true in wealthier countries where education rates are higher, for example in Europe, and artificially depresses the participation rates. The second caveat is that some countries have high unemployment for men and women, so low female participation rates could partially reflect high unemployment across the board.

REFERENCES

Adsera, A. (2004). Changing fertility rates in developed countries. The impact of labor market institutions. *Journal of Population Economics,* 17, 17-43.

Aminu, A. (2010). *Determinants of participation and earnings in wage employment in Nigeria.* Paper presented in 5th IZA/World Ban conference on employment and development; 3-4 May.

Arellano, M. & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies,* 58(2), 277-297.

Aromolaran, A. (2004). Female schooling, non-market productivity, and labor market participation in Nigeria. *Economic Growth Centre, Discussion Paper 879,* Yale University, USA.

Baum, C. F., Schaffer, M. E., & Stillman, S. (2003). Instrumental variables and GMM: Estimation and testing. *Stata Journal,* 3(1), 1-31.

Bibi, A. & Afzal, A. (2012). Determinants of married women labor force participation in Wah Cantt: A descriptive analysis. *Academic Research International,* 2(1), 599-622.

Contreras, D. & Plaza, G. (2010). Cultural factors in women's labor force participation in Chile. *Feminist Economics, 16*(2), 27-46.

Duleep, H. & Sanders, S., (1994). Empirical regularities across cultures: The effect of children on women's work. *The Journal of Human Resources,* 29(2), 328-347.

Fadayomi, T. O. P. (1991). Women in the Nigerian labor force. *International Journal of Sociology of the Family,* 21(2), 175-188.

Franz, W. (1985). An economic analysis of female work participation, education, and fertility: Theory and empirical evidence for the Federal Republic of Germany. *Journal of Labor Economics,* 3(1), 218-234.

Gage, A. J. (1995). Women's socioeconomic position and contraceptive behavior in Togo. *Studies in Family Planning*, 26(5), 264–277.

Galor, O. & Weil, D. N. (1996). The gender gap, fertility and growth. *American Economic Review*, 86, 374-387.

Kingdon, G. G. & Unni, J., (2001). Education and women's labor market outcomes in India. *Education Economics*, 9(2), 174-195.

Martinez, D. F. & Iza, A. (2004). Skill premium effects on fertility and female labor supply, *Journal of Population Economics*, 17, 1-16.

Masood, T. & Ahmad, I. M. (2009). An econometric analysis of inter-state variations in women's labor force participation in India, *Munich Personal RePEc Archive.*

Mehmood, B. & Azim, P. (2014). Total factor productivity, demographic traits and ICT: Empirical analysis for Asia. *Informatica Economică,* 18(1), 8-16.

Elahi, A.R., Mehmood, B., & Awan, M.M.H. (2014). Macroeconomic covariates of default risk: Case of Pakistani non-financial firms. *Zagreb International Review of Economics & Business*, 17(1), 15-26.

Mujahid, N., Muhammed, S. D. & Noman, M. (2013). Economic determinants and female labor force participation: An empirical analysis of Pakistan. *Developing Country Studies*, 3(7). 12-23.

Roodman, D. (2009). A note on the theme of too many instruments. *Oxford Bulletin of Economics of Statistics*, 71(1), 135-158.

Sarafidis, V., Yamagata, T., & Robertson, D. (2009). A test of cross section dependence for a linear dynamic panel model with regressors. *Journal of Econometrics*, 148(2), 149-161.

Sasaki, M. (2002). The casual effect of family structure on labor force participation among Japanese married women. *The Journal of Human Resources*, 37(2), 431-440.