FEMALE LABOUR FORCE PARTICIPATION: THE CASE OF MACEDONIA

Hyrije Abazi
Business and Economics Faculty, South East European University
Tetovo, Affiliate Fellow at CERGE-EI Prague

Viktorija Atanasovska, PhD candidate,
Staffordshire University, UK,

Abstract
The aim of this paper is to investigate the determinants of female labour force participation (FLFP) in Macedonia. The labour markets in this transition economy has been under continuous restructuring and reforms during the last two decades. However, the gender gap in participation remains still high, and figures indicate that although participation rates fluctuate, there is no clear trend towards a closing of the gap. Macedonia has the lowest participation rate among the working population in the European and Central Asian (ECA) region, while female inactivity rate is twice that of men and the third highest in the ECA region. It also compares very unfavourably to the EU average of 36.7 per cent.

The empirical analysis we use household survey data conducted by the South East European University in cooperation with UNDP Macedonia in 2009. The main objective is the identification of the determinants of FLFP based on the neoclassical economic theory and extending it with contextual factors of the Western Balkans. The statistical significance and effects of the theoretical determinants such as education, remittances, number of children, illness, and other controlling variables are examined estimating a probit model through the conditional mixed process estimator (cmp). This specific model enables the test and control for the potential endogeneity of education, remittances, illness and children in the FFLP equation. Generally our findings suggest that education, age, marriage, ethnicity, income and living in urban areas have positive and significant impact on FLFP. Specifically, empirical results indicate that ethnic Macedonian women, with higher level of education, and those that do not receive remittances are more likely to be part of the labour force.

1. **Introduction**

The Republic of Macedonia is a relatively young democratic country, with a small and open economy, which in the transition period of 21 years of independence moved from a planned to a free market economy. With a population of 2,022,547 inhabitants (State Statistical Office, Census 2002) of which 64.18% are Macedonians, 25.17% Albanians, 3.85% Turks, 2.66% Roma, 1.78% Serbs, 0.84% Bosnians, 0.48% Vlachos and 1.04% of other nationalities, Macedonia faces many challenges in achieving social and economic development. The main socio-economic tension is related to the relatively high unemployment rate and the large brain-drain and grey economy.

Female Labour force participation (LFP) rates in Macedonia between 1990 and 2010 remained flat at about 60%, which is low for Europe and Central Asia (ECA) standards. After Turkey, Macedonia has the lowest LFP rate among the working population in the European and Central Asian (ECA) region. In the study, they suggest that the main reason for female inactivity in the labour force is household priorities. The female inactivity rate in Macedonia is the third highest in the ECA region (after Turkey and Kosovo) and compares very unfavourably to the EU average of 36.7%. The inactivity rate for women is twice that of men. For example, in the age group 25-49 one in every three females is inactive, compared to one in every ten for males. There are indications from a simple analysis of data that slow school-to-work transition, full-time household activities, residence in rural areas and Albanian ethnic background go hand in hand with high inactivity.

According to a World Bank (2008a) study, Macedonians in the age range 15-34 years face slow school to work transition. Most young people cannot find a job after finishing school, and this affects more female than male job-seekers. In Macedonia, the average time taken for transition from school to being employed is 6 years for males and 9 years for females, which for women is 6.5 times longer than the average for OECD countries (1.4 years OECD, 2007).

This can be explained by both the unreformed education system and the stagnant labour market, where especially in times of economic crisis there is a lack of job creation, whilst employers tend to give preference to more experienced workers.

There is significant discrepancy between men and women when it comes to the activity rates of people with lower levels of education. Namely, men with lower educational qualifications participate significantly more than similar females in the labour force. The gap between gender participation in the labour market decreases as the level of education increases (3 and 4 years of secondary education). Interestingly, amongst those with university level education the female activity rate are higher than for males.

According to these tables and figures one can conclude that the lower female unemployment rate is partly due to high non-participation, 34% of women responded that housework was the reason for them not being in the labour force.

2. Model specification and data measurement

This section presents the empirical model for examining the determinants of female labour force participation in Macedonia. The effect of potential determinants identified in the theoretical review on labour force participation will be estimated using a Probit model. The Probit model is based on the assumption that there is an unobserved variable (latent variable) Y, the value of which is determined by the explanatory variables X_i (Gujarati, 2004):

$$Y_i = \beta_0 + \beta_i X_i$$

In the context of this research Y_i can be thought of as the utility of the woman i due to participation in the labour market and X_i are the explanatory variables. Although the utility level itself is not observable, if it is assumed that there is a critical level of this unobserved utility, Y, such that the woman will participate in the labour market only if $Y > Y^*$, then the actual observed outcome, i.e. whether she participates in the labour market, can be used as the dependent variable in a regression analysis. If it is assumed that the error term, u_i, follows a standard normal distribution (with a mean of 0 and variance of 1), the probability (Pr) of the woman participating in the labour force that can be explained by the following model:

$$\Pr(Y = 1 | X_i) = \Phi\ (\beta_i X_i)$$

Where Y=1 if the woman participates in the workforce and 0 otherwise; Φ is the Cumulative Distribution Function of the standard normal distribution and β_i are the parameters of the explanatory variables X_i that will be estimated by maximum likelihood.

Accordingly, the dependent variable in this research is a dummy variable indicating whether the woman is part of the labour force. According to conventional definition, this would include women that are either working, or actively looking for a job.

The explanatory variables used in this model include a range of individual and household characteristics, and proxies for local infrastructure and labour market conditions.

Education: It is widely recognized in the literature that the level of education is a very important determinant of whether a woman enters the labour market. According to the neoclassical theory of individual labour supply as the level of education completed increases the opportunity costs of not-working increases, since her future earning-power increases as well. However, education and participation seems to be endogenously determined, because the decision to be involved in education partly depends on the willingness a woman to participate in the labour market.

Fertility: One of the main determinants of FLFP is fertility and according to the theoretical and empirical studies, other things being equal, fertility has a negative effect on FLFP. The common explanation is the loss in human capital and permanent reductions in future wage due to the "absence" from the market (the longer the "absence" the higher these effects may be). However, many factors determine a woman's choice between the labour market and childcare, such as preferences and cultural aspects, the price of childcare, possible substitutes for childcare and family taxation policies. This discussion supports the argument that to some extent that children and labour market status are jointly determined decisions, therefore fertility is treated as an endogenous variable in the FLFP model.

Health: Economic theory posits that good health may also have a positive impact on productivity and hence on the probability of females being economically active (Zhang et al., 2009). As an example, individuals may justify their non-participation by claiming that they are in ill-health (Kalwij and Vermeulen, 2005). In order to control for endogeneity, some authors use objective variables as instruments in order to obtain a single exogenous health indicator (Bound et al., 1999, Kerkhofs et al., 1999, and Disney et al., 2004). It is important to note that different health indicators may have a divergent impact on an individual's participation decision. In particular, as Kalwij and Vermeulen (2005) argue, severe health condition like cancer or a stroke may force an individual to leave the labour market, whereas having mild health conditions (high blood pressure or diabetes) may not jeopardize participation.

Age: Age is usually important factor for FLFP. Moreover, it is expected that the relationship between age and FLFP to be non-linear. In other words, FLFP typically initially increases with age, then women in their 30s may leave the market because of children and around their 40s women may return to the labour market and participation reaches the highest levels. Hence, the models of FLFP usually include women's age and age squared.

Marital Status: According to the "traditional" ("male bread-winner") model, the 'wife's' decision to enter the labour market depends mainly on husband's income. In some regions of the country, the patriarchal behaviour may dominate with respect to wife's labour participation, who is predominantly considered as a housewife. On the other hand, labour-saving technological change in the home, falling gender wage differentials and hence rising dowries for educated females, increase the attractions of educating their daughters in anticipation of their future market work. Given that in the Western Balkans households are still predominantly patriarchal families, we may expect married women to be less likely to participate in the labour market.

Household Income and Remittances: In the simplest neoclassical household model, the key determinants of female labour force participation are as in the individual model, but measured at the household level. Since the size of the income effect will also depend upon a household's wealth, empirical studies of the determinants of female labour force participation (FLFP) typically include both household income and wealth as control variables. Household income typically includes non-labour income (remittances and other social transfers, rents, etc.) and income from all members of the household (Saget, 1999). The empirical evidence on the impact of the household income on FLFP is not conclusive.

Social Capital: Social capital has been argued to determine the structure of people's relationships. The extent of social capital of a person depends on the extent of social relationships and the amount and quality of the capital of the people with whom the individual is related (Bourdieu, 1983). Having a widespread of network of people, related in a different way with an individual (family, friends, acquaintances etc.) has been perceived to be of high importance in determining FLFP in the Western Balkans, given the high unemployment rate and the high level of nepotism. Women with a large network are likely to better informed, which in turn leads to higher employment opportunities. Consequently, it is expected a positive effect of social capital on labour participation.

Local Infrastructure: The quality level of infrastructure may contribute to the decision whether to enter the labour market, especially in the less developed regions of the country. Specifically, the availability of uninterrupted power and piped clean water reduce the time required for many household activities and free-up time for additional child-rearing, educational investments or market production. In addition, poor transport services may be a major constraint upon the ability of rural women to participate in market employment.

Additional control variables: We include several control variables such as regional dummies that control for eight regions in Macedonia, a dummy for rural/urban areas is also employed. The model also controls for ethnic group and we employ the unemployment rate by regions in Macedonia. A list of available explanatory variables for Macedonia and their expected signs are presented in Table 1.

Table 1 Description of the variables

The general model we aim to estimate can be written as follows:

Variable	Expected sign	Notes
The household has received financial remittances or assistance from abroad (*remithhm*)	-	
Level of Education (*edu2*)	+	
Health chronic problem (*illness*)	-	
Number of children under 15 (*children*)	-	
Age - female at 15 and above up to 64 years old (*age*)	+	Non-linear: inverted U shape
Marital Status (*married*)	+/-	
Different ethnicities living in Macedonia (*maced*)	+	
Family member owns business/farm (*ownfarm*)	+	
Whether the household has access to clean water (*access_w1*)	+	
The amount of time spent in social contact other than family (*soc_contact*)	+	
Per capita income (*pc_income*)	-	Assuming that leisure is a normal good then as income rises we wish to work less.
Unemployment rate according to the region (*unemp_rate*)	+	
Eight regions in Macedonia (*control variables*)		
Living in an urban area (*urban*)	+	

$LFP2_i = \beta_0 + \beta_1 remithhm_i + \beta_1 edu2_i + \beta_3 illness_i + \beta_4\, children_i + \beta_5 age_i + \beta_6 agesq_i + \beta_7\, married_i + \beta_8\, maced_i + \beta_9 ownfarm_i + \beta_{10} access\_w1_i + \beta_{11} soc\_contact_i + \beta_{12} pc\_incometh_i + \beta_{13} pc\_incometh2_i + \beta_{14} unemp\_rate_i + \beta_{15} skp_i + \beta_{16} vardar_i + \beta_{17} NEreg_i + \beta_{18} polog_i + \beta_{19} Ereg_i + \beta_{20} pelagonia_i + \beta_{21} Swest_i + \beta_{22} urban_i + u_i$

The dependent variable in the model used is labour force participation (*LFP*), which is equal to one if the respondent is already in employment/looking for a job; whereas the independent variables are the female level of education (*education*), if the household have received any remittances (*remithhm*), is the female suffers any chronic disease (*illness*), the number of children under the age of 15 (*children*), female age (*age*), age squared (*agesq*), marital status (*married*), the ethnicity of the female (*maced*), if the household rents or owns any land used for farming or production of food (*ownfarm*), the access to clean water (*access_w1*), amount of time spent in other social contact (not family)(*soc_contact*), per capita income in thousand of denars (*pc_incometh*), per capita income squared (*pc_incometh2*), unemployment rate in Macedonia by region, regional control dummies and urban control dummy (*urban*).

The following section presents the summary statistics for the variables.

3. Data description

The empirical analysis regarding the determinants of female labour force participation in Macedonian relies on the household survey data used for People Centered Analysis (PCA) 2009 Report. This is a cross section household survey conducted in Macedonia in 2009. Although this is a household survey, we focus on the individual responses of females in each household. This survey presents a nationally representative multi-stage random probability sample. The sample was prepared using The State Institute of Statistics data (2002 census results) for the population aged 18+, considering the structure of the population according to age, gender, education, type of settlement, national affiliation and region, and updated according to estimates and primary information, collected by the research agency BRIMA Gallup.

It was consisted of two sub-samples: nationally representative sample and boosters for three nationalities (Romas, Serbs, and Turks). (Methodological Report provided by BRIMA Gallup).[1] Overall, the PCA data 2009 consists of 3711 females of working age.

Dependent Variable: The dependent variable in the model is the probability of a woman participating in the labour force. The available variable in the dataset is based on two questions: 'Is she employed' and 'Is she looking for a job?. *LFP* is equal to one if the answer to either question is '*yes*' and zero otherwise. According to the survey data, 37% of female respondents were participating in the labour force.

Independent Variables:

Education: This study employs a categorical variable to examine the effect of education on LFP. In other words, our variable consists of seven categories in terms of level of education: no education at all (2.6%), finished primary school (14.3%), unfinished secondary (7.2%), completed secondary school (46.3%), unfinished undergraduate or completed college (8.45%), completed undergraduate studies (20.3%) and graduate education (master and PhD-0.7%).

Fertility: The variable number of children under 15 is also employed as an independent variable. The question on the number of children in the household under 15 is employed. 65% of the sample indicated that they do not have children under 15, whereas the remaining are 20%, 12% and 1% are with one, two and three children under 15 respectively.

Health: We employ a variable 'illness', which identifies the health condition of the female. The question on health identifies different categories of illness, which we have coded to a dummy variable, equal to one if the female has any of the following diseases: cardio-vascular problem, diabetes, kidney's problems, gastro-intestinal problems, rheum problems and other, or zero if there are no health problems. Out of the sample, 16.15% of females indicated that they had one of these health problems.

Age: The variables age and age square are employed. In the model we include only females aged 15 and above up to 64 years old. On average the observed sample are female at the age of 37.

Marital Status: Out of the marital status question, which was consisted of four categories: (i) married or living with partner; (ii) not living with partner (separated or divorced); (iii) widowed and not living with partner; (iv) never married and not living with partner; we have coded a dummy married and others. 64% of our sample were married women.

Household Income and Remittances: Whether the household has received financial remittances or assistance from abroad is the question on remittances, employed as independent variable. 93% of the sample indicated that they had not received any assistance from abroad in 2008. The income variable is employed as per capita, by putting adjusting for the size of the household.

Social Capital: The social capital variable shows social contact. Women have indicated the amount of time spent in social contact other than with their family. 68.74% have indicated that they have spent just the right amount of time with their social contact, 9.62% of women spent too much time with their social contact whereas 21.65 have indicated that they spent small amount of their time with their social contact (other than family).

Local Infrastructure: Considering the infrastructure of the household, our variable is whether the household has access to clean water. 15,5% of the female have responded that they do not have access to clean water.

Additional control variables: The ethnicity variable consists of seven different ethnicities living in Macedonia. In the model we employ the dummy variable *maced,* which is equal to one if the respondent is ethnic Macedonian. 73% of the sample are Macedonian, with 27% percent remaining for the other ethnicities (Albanian, Turkish, etc). The sample consisted of eight regions in Macedonia. Out of these regions we have generated controlling variables.

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[1] It is important to note that this data set is the second best choice, given that National Statistical Office of Macedonia rejected our official request for the micro dataset of Labour Force Survey in Macedonia.

Another controlling variable is urban/rural. This variable controls for households located in rural or urban areas, with 86% living in urban areas. For generating the unemployment rate variable, we have used the State Statistical Office LFS data and set the unemployment rate according to the region.

4. Empirical results

We consider education, remittances, illness and children as endogenous. These variables are instrumented in the first specification with how well do you read and understand English (*english*), access to health services (*health_s*), if the household has a car (*Hh_car*) and if the household have bedroom for children (*child_bedroom*), respectively. However, the cmp regression analysis indicated that none of these variables (education, remittances, illness and children) are exogenous. Considering illness, according to the study by Kalwij and Vermeulen, (2005), who argue that endogeneity is due to self-reported health or mental health status, the variable used in this model is more likely to be exogenous since it is based on medical diagnosis). For the final specification estimated we employ probit technique and the regression results are as follows. The probit regression results are presented on Table 2.

Table 2 Probit model regression results

Independent Variables	Probit regression		Marginal effects	
	Coef.	Std. Err	dF/dx	Std. Err
Remittances	-.2283**	.1051	-.0831**	.0397
Education	.2739***	.0226	.0954***	.0077
Illness	-.0261	.0781	-.0091	.0274
Children	.0085	.0375	.0029	.0130
Age	.3146***	.0167	.1096***	.0059
Agesq	-.0040***	.0002	-.0014***	.0000
Married	.2797	.0715	.0991***	.0256
Macedonian	.4016	.0737	.1457***	.0276
Own_farm	-.1786**	.0766	-.0640**	.0281
Access_water	-.0674	.0767	.0232	.0260
Social_contact	-.047	.0471	-.016	.0164
PC_incometh	.033***	.0081	.0115***	.0028
PC_incometh2	-.0005***	.0001	-.0001***	.0000
Unemployment_rate	.0081	.0274	.0028	.0095
Skopje	-.6184	.5154	-.2266	.1937
Vardar	-.306	.6905	-.1127	.2648
NE_region	-.695	1.374	-.2661	.5391
Polog	-.8103***	.3517	-.3065	.1347
E_region	-.1948	.1368	-.0704	.0510
Pelagonia	-.4211	.5150	-.1562	.1994
S_west	-.5733	.5012	-.2156	.1960
Urban	.1746**	.0885	.0627	.0328
Cons	-6.034407	.52114		
Observations	3233			
Wald chi2(22)	854.43			
Prob > chi2	0.000			
Pseudo R-squared	0.2883			

After generating the probit model for LFP we calculated the marginal effects coefficients. We find significant coefficients for remittances, education, age, marital status, ethnicity, owning a farm, income, Pollog region and urban area, which can be interpreted as follows:

- The coefficient of the education level is positive and statistically significant. This indicates that a change from one level (primary education) to another higher (secondary education) level of *education* increases the probability of participating in the LF by 9.5 percent.
- The relationship between LFP and age is found to be statistically significant and non-linear, in particular labour force participation initially rises with age and reaches a maximum at the age of 39 (the turning point is calculated using the approach of Wooldridge (2002)).[2] Amongst those aged forty or more the effect of age is negative. These findings are consistent with those found the literature. The non-linear effect of age on FLFP is found in both developed and developing countries (Pagani and Marenzi, 2008; Contreras et al., 2010; Balleer et al., 2009; Pastore and Verashchagina, 2008; Del Boca et al. 2009; Narayana and Shongwe, 2010).
- Contrary to our expectation married females are 10 percent more likely to participate in the LF compared to unmarried females, and this effect is statistically significant. Given the current economic situation in Macedonia and the low living standards, women are forced to enter the labour market, in order to contribute to the family budget to meet the monthly living expenditures.
- Ethnic Macedonian females are 15 percent more likely to participate in the LF than females from the other ethnicities and this finding is statistically significant.
- Female labour force participation is significantly and negatively associated with households which own or rent a farm. In other words, women in such households have a 6.4 percent lower participation in the labour market. This is consistent with the expectations, since the work on the farm may serve as both household production (food for personal consumption) and source of incoming if these products are sold on the market.
- Females living in urban areas are 6% more likely to participate in the LF than those in rural areas and this effect is found to be statistically significant. Given that at present time the regions in Macedonia, especially urban vs. rural, are not equally developed and the focus of development is rather on the urban areas, with special emphasis to the capital, Skopje, it is reasonable that a higher LFP to be in the urban areas. In addition, females in rural areas could be either discouraged to initiate any LFP or the traditional "bread winner" concept still prevails.
- The coefficient of remittances is negative and statistically significant and suggests that households receiving remittances have an 8% lower female participation in labour force than females from households not receiving remittances. This finding is consistent with the expectations, because remittances could be considered as a substitute for the potential female income.
- The variable indicating the health of female is insignificant, even though we expected to find significant negative coefficient.

5. Conclusion

This paper examines the determinants of the female labour force participation in Macedonia. In particular, P-WISE empirically examines the potential factors that determine the labour force participation of women, with special reference to vulnerable groups (single-mothers, women with poor health condition, poor women and ethnic minorities considering the multi-ethnic nature in Western Balkans) in the labour market. P-WISE is focused on answering several questions that would enhance the understanding of the factors that affect female labour force participation. Specifically, P-WISE provides answers on: (i) what determines women's ability and willingness to enter and remain in the labour market?; (ii) does the level of education affect the female labour force participation in Macedonia?; (iii) what is the impact of fertility on female labour force participation in Macedonia?; (iv) how does age affect FLFP?; (v) are there any differences between different ethnicities?; (vi) does marital status affect the FLFP in Macedonia?; (vii) are there any differences between female living in urban and rural areas with respect to LFP?; (viii) what are the employment policies in Macedonia?; (ix) how can the government help the vulnerable groups seeking to enter the LF?; and (x) what can be done in order to increase the FLFP?

The effects of the potential determinants identified in the theoretical review of labour force participation have been examined empirically using household survey data for 2009 conducted by the South East European University in cooperation with UNDP Macedonia. The empirical analysis was conducted using cross-sectional data and probit model. Expected endogeneity problems were solved by using instruments for the suspected endogenous variables.

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[2] In the estimated equation with *B>0 and B_2<0,* the turning point is always achieved at the coefficient on *x* over twice the absolute value of the coefficient on X_2. $X^* = |B_1/(2B_2)|$.

The empirical findings suggest that women's: (i) level of education, (ii) age, (iii) household income, (iv) marital status, (v) Macedonian ethnicity and (vi) living in urban areas have higher probability to participate in the labour market. Women (i) not receiving remittances, and (ii) not owning a farm, were also found to have higher probability to participate in the labour market.

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