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The Determinants of Labor Force Participation of Women in Turkey: A Binary Logit Analysis

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Abstract

Compared to many developed and developing countries, the labor force participation of women in Turkey is very low. More interestingly, the rate of the labor force participation of women had declined from the 1980s to 2008 although it had increased in many countries. This paper examines the major determinants of the labor force participation of women in Turkey by using binary logit model on the World Values Survey of 2007. It finds that high level of education, high level of income, and being chief wage earner in the household have a positive impact on the labor force participation of women in Turkey. While the ageing of women has a positive impact until the age of mid-30s, its effect is negative after the age of mid-30s. Marriage and the increasing number of children have also negative impacts on the labor force participation women.

Keywords: Labor force participation, Women, World values survey of 2007, Binary logit model, Turkey.

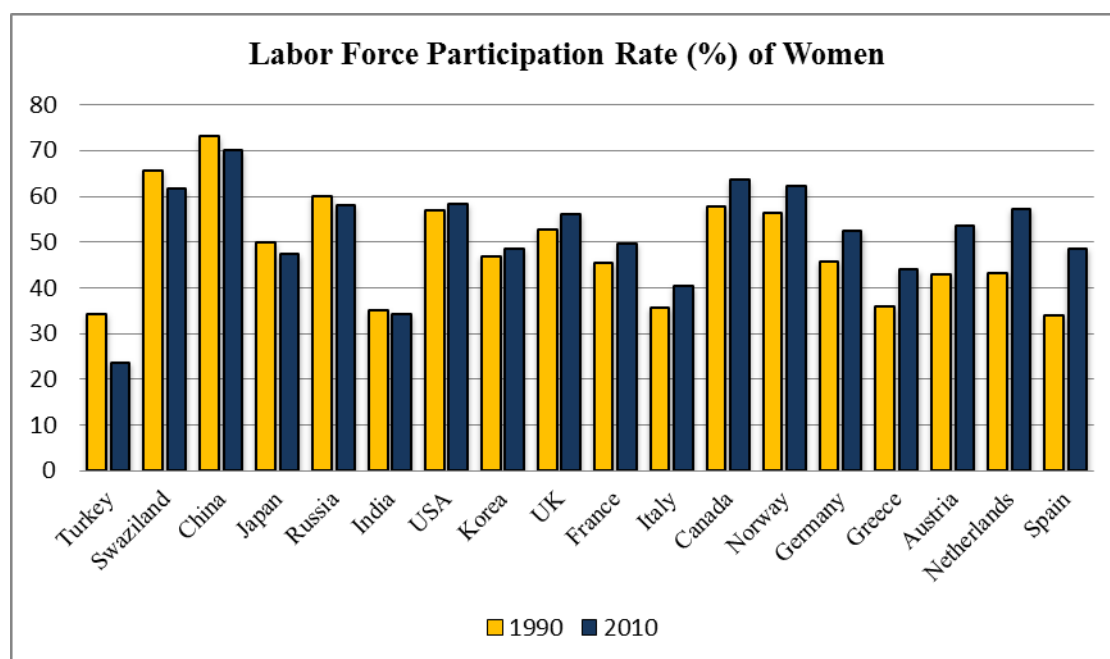
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1. Introduction

Although women's participation in labor force has increased in many parts of the world, one of the most important characteristics of the labor market in Turkey is a quite low rate of the labor force participation (LFP) of women. As it can be seen from Figure 1, women's LFP in Turkey is significantly lower than the rate of many countries. Besides, and interestingly, while the rate of female labor force participation had increased in many countries over time, it had gradually decreased in Turkey until 2008 (see Figure 2). As we can see from Figure 2, while the LFP of women was 34.3 in 1988, it declined to 23,6 in 2007. The declining trend changed and began to increase in 2008. While it was 24 % in 2008, it has become 30,3 % in 2014.

In this article, my aim is to find the determinants of the labor force participation of women in Turkey. I analyze and measure the impact of quite significant variables (i.e., marriage, age, the number of children that women have, the level of education, the income level of women, and whether the woman is a chief wage earner in her household) on the participation of women in the labor force. I utilize the data of the World Values Survey of 2007 to calculate the effect of the variables because the breakpoint in the LFP of women was 2007. My dependent variable is dichotomous; therefore, I utilize the binary logit model as a measurement method.

Figure 1: LFP Rates of Women in the Basis of Countries from 1990 to 2010

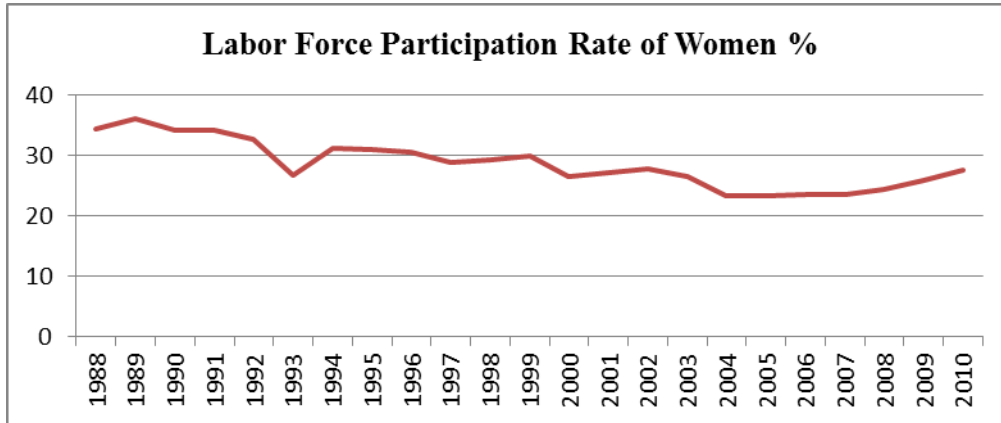


Source: United Nations Statistic Division

2. Trends in the Labor Force Participation of Women in Turkey

According to the data collected by the Turkish Statistical Institute, the labor force participation rate of women in Turkey decreases by the years until 2008. However, this rate tended to rise after 2008 (Figure 2).

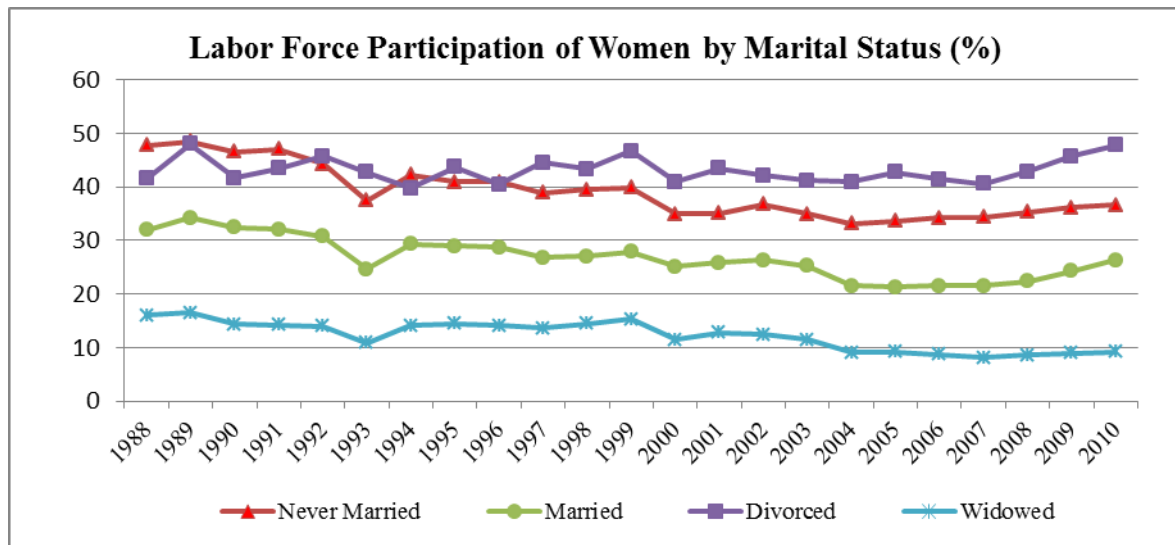
Figure 2: LFP Rate of Women in Turkey from 1988 to 2010



Source: Household Labor Force Statistics (HLFS) web data base, TUIK
(www.tuik.gov.tr) Age: 15+

From 1988 to 2008 in Turkey, labor force participation rate for married, never married or widowed women decreased very significantly (Figure 3). The rate dropped from 32 % to 26 % for married women, from 16 % to 9 % for widowed women, and from 48 % to 37 % for never married women. In contrast, LFP rate of divorced women increased from 42 % to 48 % in this time.

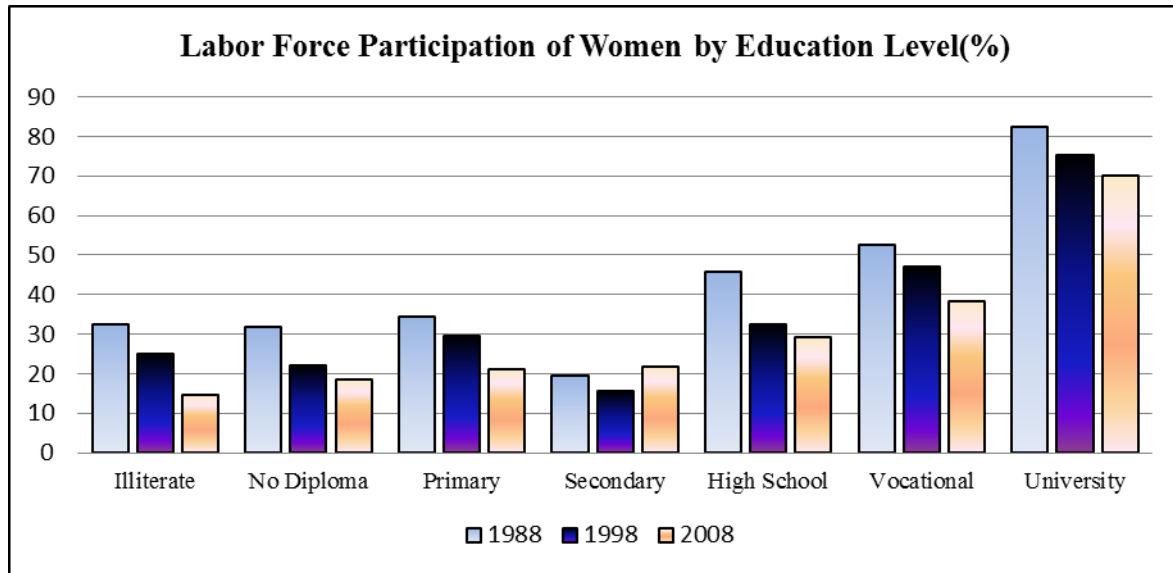
Figure 3: LFP Rate of Women by Marital Status in Turkey from 1988 to 2010



Source: HLFS web data base, TUIK (www.tuik.gov.tr) Age: 15+

Labor force participation rates of women by their educational levels demonstrate a shrinking pattern for all categories, with the exception of secondary school (Figure 4). After 2008, very small increases are observed for all categories. During these 20 years, there have been many economic and political changes in Turkey; therefore, we can say that the reasons of decrease can be varied.

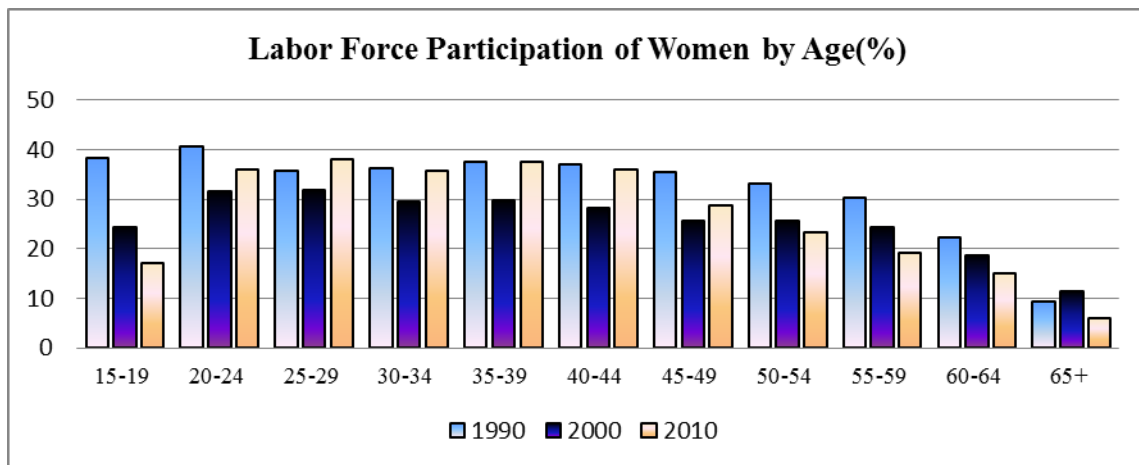
Figure 4: LFP Rate of Women by Education Level in Turkey from 1988 to 2008



Source: HLFS web data base, TUIK (www.tuik.gov.tr)Age:15+

Labor force participation rate of women by their age show a wavy trend for the women at the age of 20 to 44 and a declining pattern for other age groups in last twenty years. From 1990 to 2010, the only category whose LFP rate increased is the women whose ages are between 25 and 29.

Figure 5: LFP Rate of Women by Age in Turkey from 1990 to 2010



Source: HLFS web data base, TUIK (www.tuik.gov.tr)Age:15+

3. Literature Review about the Female Labor Force Participation in Turkey

After examining the trend of the labor force participation of women, we can examine researches aiming to understand the place of women in labor force in Turkey. The labor force participation of women is a multidimensional issue. There are a large number of factors affecting the LFP of women in Turkey. The researches basically focus on four major factors: the impact of urbanization, the level of education, socio-cultural factors, and economic issues.

A large number of researches focus on the negative impact of the urbanization process of Turkey on the LFP of women (Dayıoğlu & Kırdar, 2009; Dixon, 1982; Erman, 1998; Kocak, 1999; Taymaz, 2009; Uraz, Aran, Hüsamoğlu, Okkalı Şanalımış, & Capar, 2010). For these studies, a large number of women were part of agricultural economy in their rural settings and performed their agricultural jobs such as harvesting and farming even if they were unpaid. However, rural people moved to urban areas as a result of a rapid urbanization process in the 1970s, 1980s, and 1990s. As a result of this process, a large number of migrant women were withdrawn from labor force and became unemployed housewives. Many of them did not seek any kind of job in competitive urban job markets because of various factors such as the lack of education and skills, cultural restrictions, low wages, and so on. Thus, while they were part of labor force in rural setting, they were not able to be part of labor force in urban areas.

Another important factor affecting the LFP of women is socio-cultural factors, particularly the patriarchal culture/structure of Turkish society (Alkan, 1995; Antecol, 2000; Başlevant & Onaran, 2003; Dayıoğlu & Kırdar, 2009; Erman, 1998; Eyüboğlu, Özar, & Tanrıöver, 2000; Kasnakoğlu, Ozar & Gunluk-Senesen, 1998; Smits & Hoşgör, 2006; Uraz et al., 2010). In Turkish culture, while housekeeping and childcare are perceived as the most important responsibility of women, money earning activities are recognized as part of men's responsibility. Women are expected to give a priority to their traditional roles and fulfil their family responsibilities. Even if women participate in the labor market in their early adult years, many of them quit their jobs after getting married or having a child to dedicate themselves to their families. Thus, many women refrain from participating in labor force as a result of the impact of patriarchal culture on the relationship between men and women.

Education is also an important issue in the literature about the LFP of women (Başlevant & Onaran, 2003; Dayıoğlu & Kırdar, 2009; Eyüboğlu et al., 2000; Ince & Demir, 2006; Uraz et al., 2010). Almost all studies show that the level of education positively affect the LFP of women. Educated women are able to find better jobs with high wages. Higher education also increases the self-esteem of women and they can resist to the pressure of cultural patterns over them. But, this does not mean that educated women were not under the

impact of cultural factors. Many educated women choose not to work after marriage and having a child.

The literature also examine the impact of economic factors on the LFP of women (Başlevent & Onaran, 2003; Karabıyık, 2012; Korkmaz, Alacahan, Cesim, Yücel, & Aras, 2013; Önder, 2013; Şener, 2011; Aysit Tansel, 1994; Aysıt Tansel, 2001). A large number of women cannot find good jobs with high wages. Women generally work for informal jobs with low wages. They also do not have social security benefits. Thus, for many women, particularly those who has a child, the benefits of working for a job does not satisfy them. As a result of these kinds of problems, they do not seek to find a job. Additionally, married women's participation to labor force has a close relationship with men's participation and income. When a husband has a good job, women tend to refrain from participating in the labor market. But, in the difficult times such as economic crisis, when a husband gets fired, women want to work to support their family budgets.

4. Hypotheses

After examining major factors affecting the LFP of women, we can develop our hypotheses about the determinants of the labor force participation of women in Turkey and test them with the data of the WWS of 2007. We do not develop any hypotheses about the impact of urbanization because of the very low levels of urbanization in 2007. Here are our hypotheses:

- (a) Marriage: Marriage brings some responsibility to women so that married women need to work for sharing the expenses or prefer to be housewife for caring home and her children.
- (b) Education level: When education level increases, finding a job and working will be easier for women, so women can work.
- (c) Age: When the age of women increases, working will be easier to women but until the middle ages. However, the incremental number of children and other problems for middle ages (like health problems, deciding to be housewife, or difficulties for finding a new job because of the lack of experience) will affect the labor force participation of women negatively.
- (d) Number of children women have: If the number of children increases, the responsibility of women will raise. Thus, she can prefer to care of them at home.

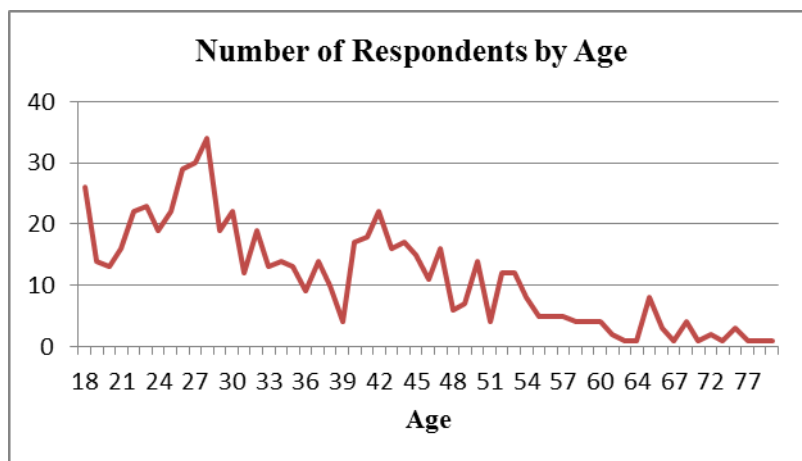
- (e) Income level: The women who are in high income level work because of their contributions to overall household income.²
- (f) Being chief wage earner in the household: The women will take more responsibility. In this situation, women probably work.

5. Description of Data and Methodology

I used the World Values Survey data which was conducted in 2007. World Values Survey data includes totally 1347 respondents in Turkey. 677 of them are male and 670 are female. I limit my sample by using the variables: Marital status, Highest Educational Level Attended, Age, Employment Status, Number of Children, Income Level, and Chief Wage Earner in the Household. There are 21 female respondents who do not answer the question about their income level. Therefore, I only use the answers of 649 female respondents in my calculations.

In our data, the respondents whose ages are between 18 and 30 comprise 45 % of all data as we can see it the Figure 6. Besides, 33 % of our data is composed by the respondents whose ages are between 31 and 45. As a result, we can say that most of our data includes the people who can work and find job easily.

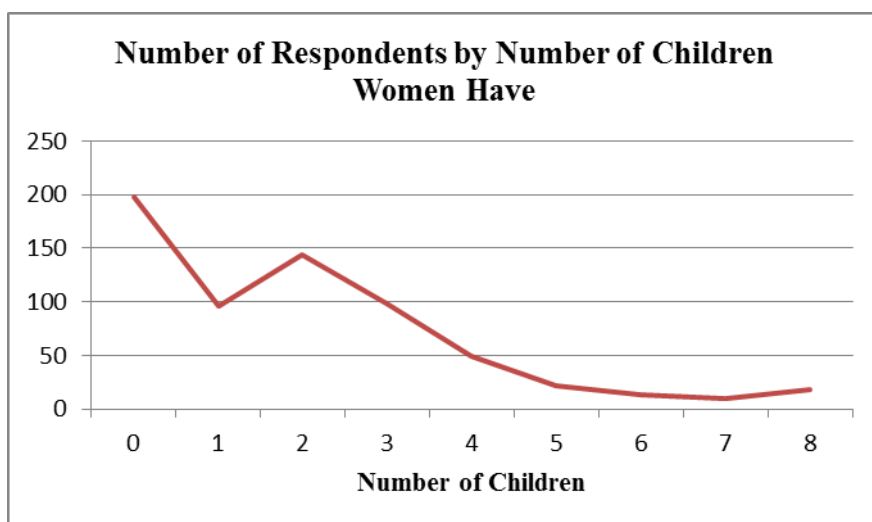
Figure 6: The number of female respondents by age



² In this context, it may be necessary to take into account the impact of changes in income on the LFP of women over time to better understand the relationship between the LFP of women and income. However, I need to emphasize that I do not claim that there is one dimensional relationship between income and the LFP of women. Here, I want to test whether income level is one of the determining factors in the LFP because it is a dominant approach in the literature and a common perception in the Turkish public that a large number of women are employed in low-paid jobs; therefore, they tend to quit their jobs when they have a child after getting married. However, a deep investigation requires taking into account the impact of changes in income level on the LFP of women over time.

It is observed that 31 % of female respondents attending the survey do not have any children while 22 % of those have two children. 74 % of women not having any children are single or never married. All women who have 6, 7, or 8 children are housewives. Although it is expected that most of the women not having children are employed, in our data, it is observed that only 28 % of them work, 37 % of them are housewives and 25 % of them are student.

Figure 7: The number of female respondents by number of children they have



The proportion of the women who have at least college degree is 10 % and 74 % of them is employed. When we look at the incomplete secondary school level, we can see that 90 % of women are housewives and this situation is almost the same for other three categories: No formal education, Incomplete Primary School, and Complete Secondary school. It shows that education level is very important to be employed.

75 % of the women who are housewives is at low income level and this is probably the result of their not working. If they work, they will also contribute the income of their household so their income level will increase. We can see it in the situation of employed women who are in high income level, 51 % of the women having a high income level of household are employed.

In our data, the proportion of married women who are employed is only 13 %. This situation can be associated with the question whether marriage is an obstacle to be employed for women. On the other side, the proportion of employment of women who are not married is only 26 %. This shows that being married or not is not very effective to be employed.

Table 1: Number of female respondents by education level, income level, and marital status according to their employment status

	Employed	Housewife	Other	Total	%
Education Level					
No formal education	3	75	0	78	12%
Incomplete primary school	2	29	1	32	5%
Complete primary school	23	224	17	264	41%
Incomplete secondary school	2	26	1	29	4%
Complete secondary school	29	86	62	177	27%
Some univ.-level education, w/o degree	1	1	1	3	0%
University - level education, w degree	49	5	12	66	10%
Income Level					
Low Income (0-1000)	40	334	53	427	66%
Average Income (1000-2000)	34	95	25	154	24%
High Income (2000+)	35	17	16	68	10%
Marital Status					
Married	59	381	15	455	70%
Separated	1	1		2	0%
Divorced	9	4	4	17	3%
Widowed	2	20	6	28	4%
Single/Never married	38	40	69	147	23%

It is also asked to the women whether they are the chief wage earner of their household or not. 9 % of the women state that they are. Although it is expected that all of them work, according to results 8 of them are housewives and 10 of them are retired. If it is analyzed more deeply, we can see that 5 of them are widowed or separated, so they probably take alimony from their former husband. 2 of them are married and 1 of them is never married, but we do not have enough data for how they are chief wage earner in their household in spite of the lack of working.

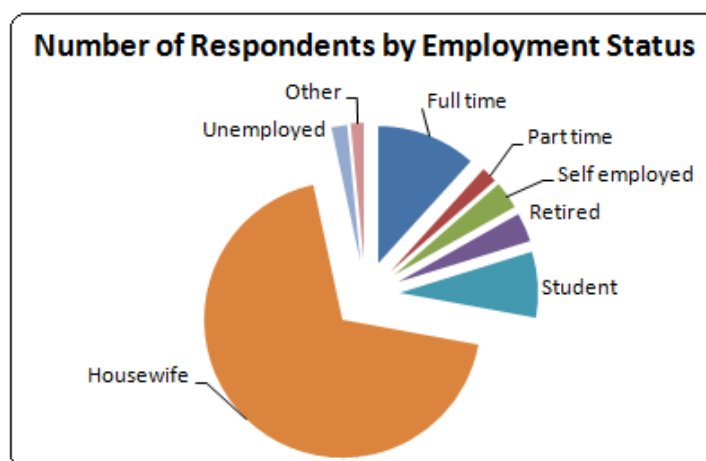
Table 2: Number of female respondents by the status of being chief wage earner according to their employment status

	Employed	Housewife	Other	Total	%
Are you chief wage earner of your household?					
Yes	41	8	10	59	9%
No	68	438	84	590	91%

When we look at the women according to their employment status, it can be seen that the most of the women are housewives (69%). Only 17% of the women are employed and most of them are working in a full-time job.

Table 3 and Figure 8: Number of female respondents by their employment status

Employment Status	Number of Respondents	%
Full time	76	12%
Part time	12	2%
Self employed	21	3%
Retired	22	3%
Student	50	8%
Housewife	446	69%
Unemployed	12	2%
Other	10	2%



A binary logit model has been performed to detect the factors on the female labor force participation in Turkey. The logit model is widely used in participation behavior. Since the dependent variable in our data (Labor Force Participation) is dichotomous (1 means employed, 0 means not employed), I used binary logit model. Binary Logit Model is used if

the dependent variable has only two possible outcomes which are 0 or 1. The dependent variable refers that an event will occur and it is limited between 0 and 1.

The formula of the logistic model is written as follows:

$$Probability(Y = 1) = \frac{1}{1 + e^{-z}} = \frac{e^z}{1 + e^z} = \frac{e^{b_0 + b_1x_1 + b_2x_2 + \dots b_px_p}}{1 + e^{b_0 + b_1x_1 + b_2x_2 + \dots b_px_p}}$$

Y=1 shows that event will occur.

b_i is the coefficient of the variable and x_i shows each variable(predictor).

Logit is also can be shown as follows:

$$\log[Prob(Y = 1)/Prob(Y = 0)] = b_0 + b_1x_1 + b_2x_2 + \dots b_px_p$$

The probabilities changes between 0 and 1 and odds can be bigger than 1. Since it is hard to interpret model because of exponential calculations, the odds are usually used.

Odds equals $Prob(Y=1)/Prob(Y=0)$

We can use Goodness-of-fit test to see that our model is a good fit or not. In order to use this test, we can calculate Log-Likelihood Ratio and Deviance.

$$\text{Log-Likelihood Ratio} = -2 (L_0 - L_1)$$

Here, L_0 is Log-Likelihood of know-nothing model and L_1 is Log-Likelihood of know-all model.

Here are our variables:

Employment Status: There are 8 categories in the answers of the respondents: Full-time, Part-time, Self Employed, Retired, Housewife, Student, Unemployed and Other. Since I examine the determinants of female labor force participation, I used this variable as a dependent variable (LFP) in the logit model. Full-time, Part-time and Self Employed categories show that women have attended into labor force in a way so I took these categories as participated to labor force (1) and others as not participated (0).

Marital Status: This response's results were collected into 5 categories: Married, Divorced, Separated, Widowed, and Single/Never Married. I accepted marital status category as married (1) and other categories not married (0).

Highest Educational Level Attended: This answer shows the education level of the women who attended to the survey. Education level in this data separated into 9 categories. In order to determine which levels are effective, I composed 4 new dummy variables: having no degree (No Degree), graduating from primary school (Primary School), graduating from

secondary school (Secondary School) and graduating from college (College). No Degree variable was dropped in the logit model due to the collinearity.

Age: Age is given in years in the data so I did not change it; thus we can see how age's effect on labor force participation of women.

Number of Children: I also think that the number of children women have is an important category which is given in numbers. By using this category, we can see the effect of the increase of the number of children on working status of women.

Income Level: There are 10 income level categories in original data from lower step to upper step. In order to interpret the variable easily, 3 new dummy variables are created by using these categories. Depending on the economic situation of Turkey in 2007, these are low income level which is between 0 and 1000 TL, average income level which is between 1000 TL and 2000 TL, and high income level which is between 2000 TL and upper.

Chief Wage Earner: This variable is a question in the survey which asks whether the woman is chief wage earner in her household or not. If the answer is "yes", I accepted it as 1, otherwise 0.

6. Results

In binary logit model, the Labor Force Participation of women (LFP) is stated as a dependent variable. No Degree and Average Income Level predictors are excluded from the model because of the collinearity. When we run the logit model in STATA by using our data, we can get the results below.

Table 4: The summary of binary logit model outputs

Variable (X)	Parameter Estimate (β)	Standard Error	Odds Ratio	P> z
Constant	-7.987	2.191		0
Married	0.103***	0.374	1.109	0.782
Education Level				
Primary School	-0.082***	0.57	0.921	0.885
Secondary School	0.152***	0.606	1.164	0.802

College	1.914*	0.675	6.779	0.005
Income Level				
Low Income	-0.821*	0.338	0.44	0.015
High Income	0.723**	0.409	2.06	0.077
Chief Wage Earner	3.290*	0.508	26.837	0
Age	0.417*	0.13	1.517	0.001
Age Square	-0.006*	0.002	0.994	0.001
Number of Children	-0.345*	0.155	0.708	0.026

* Significant at 0.05 level, ** Significant at 0.10 level, *** Not significant

As we can see from the Table 4, there are 10 predictors for expecting labor force participation of women. Firstly, in order to see that our model is statistically indistinguishable from the saturated model, we can use the goodness-of-fit of our model by way of deviance and likelihood ratio test. Our model's deviance is 346.253 and degree of freedom is 638 (649-10-1), by using these values, we find that probability is 0.9999. Since 0.9999 is higher than 0.05, we can say that our model doesn't deviate much from the know-it-all model. From our model, we find Log Likelihood (L_1) as -173.1262505. When we run the intercept only (know-nothing) model in STATA, we get Log Likelihood (L_0) as -293.7515786. By using these two statistics, we can calculate Likelihood Ratio. Likelihood ratio = $-2(L_0 - L_1) = 241.2507$. Since our likelihood ratio is 241.2507, the probability is 0. So we can say that our model fits significantly better than a model with no predictors (know-nothing model).

When we look the p values of variables, we can say that College, Low Income, Chief Wage Earner, Age, Age Square and Number of Children predictors are statistically significant. On the other side, since their p values are higher than 0.05, we can say that other variables (Married, Primary School, Secondary School and High Income) are not statistically significant at 5% level. The coefficient for College variable is positive and equals 1.914. This supports the nonlinear relationship between College and Labor Force Participation of Women. It means that women who graduated from college have 1.914 increased in the predicted logit, controlling for other variables. Odds ratio on college is 6.779 and it indicates that if a woman graduated from college, this situation increases the odds by a factor of 6.779. This means that

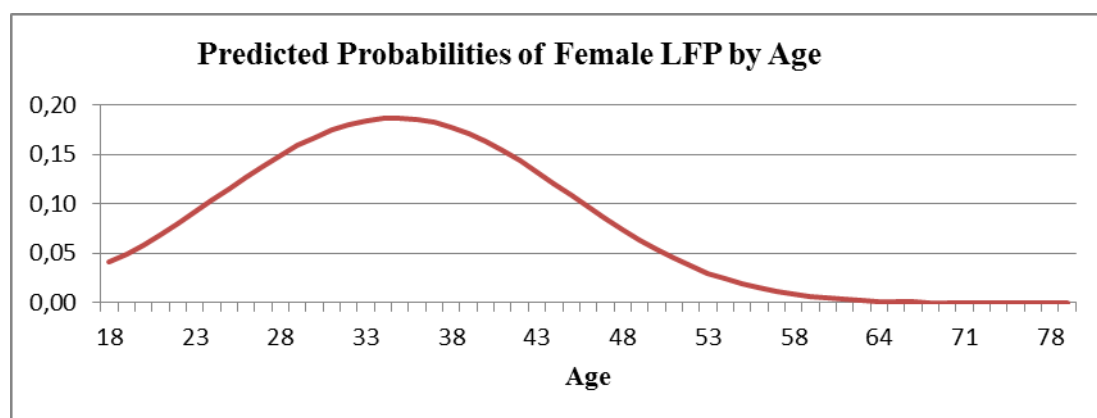
a woman who has a college degree is 6.779 times more likely to be employed, controlling for other variables.

When we look at the coefficient of Low Income variable, it is negative and -0.082. This means that if the respondent has a low income, she will have decreased logit of -0.082, controlling for other variables. In other words, a woman who has a low income is 0.44 times less likely to be employed, controlling for other variables. High Income variable is significant at 0.10 level. We can say that if a woman has a high income, she has 0.723 increased in predicted logit, controlling for other variables. For High Income variable at %10 significance level, we can say that if a woman has a high income, she is 2.06 times likely to be employed, controlling for other variables.

If a woman is a chief wage earner in her household, she will increase logit of 3.29, controlling for other variables. That is, a woman being the chief wage earner in her household is 26.837 times likely to be employed, controlling for other variables.

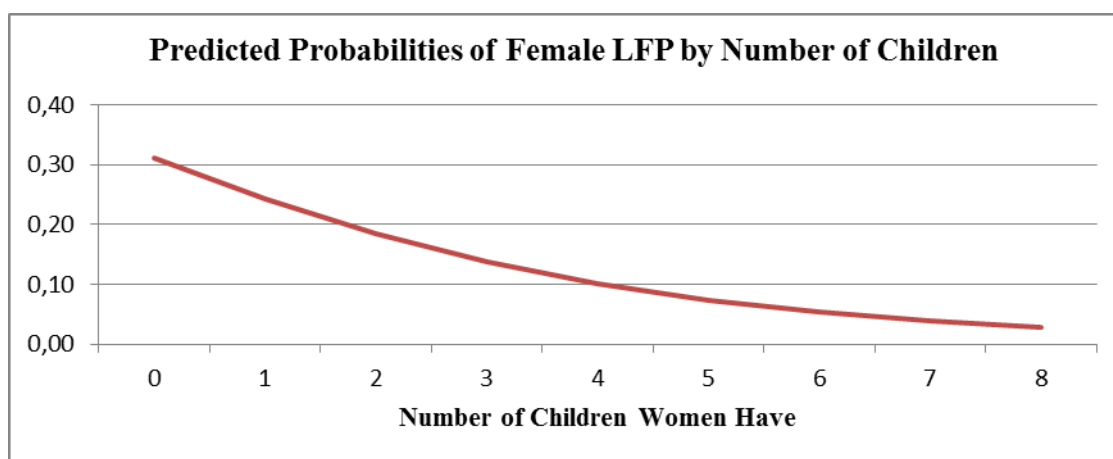
The coefficient of age is positive although age square's coefficient is negative and much smaller. It indicates that one unit increase in age is associated with increase of logit by 0.417, controlling for other variables. It suggests that a small increase in age would bring in an increase in the odds of women participation to labor force by about 51.7% or 1.517 times, controlling for other variables. When we calculate the probabilities of female labor force participation by age with all other variables at their sample means in the logit model, we obtain the Figure 9. From the Figure 9, it can be said that predicted probabilities to be employed increases until around age of 34-35, then this probability tends to decrease. Especially after the age of 50s, the reason for this decrease can be retirement.

Figure 9: Predicted Probabilities of Female LFP by Age according to the binary logit model results



The number of children a woman has is also very important determinant for participation to labor force for the woman. It has a negative effect on it since its coefficient is -0.345. That is to say, one unit increase in the number of children the woman has, is connected with decrease of logit by -0.345, controlling for other variables. We can say that, a small increase in the number of children a woman has would leads to a decrease in the odds of labor force participation of the woman by about 70.8 %, controlling for other variables. When predicted probabilities of female LFP by number of children women have, are calculated in the logit model by taking all other variables at their sample means, the Figure 10 is found. According to this figure, we can say that when the number of children increases, the predicted probability to be employed for women decreases.

Figure 10: Predicted Probabilities of Female LFP by Number of Children According to the Binary Logit Model Results



7. Conclusion

In this paper, I examined major factors affecting the labor force participation of women in Turkey by using binary logit model. According to the results of the model, if a woman graduates from college or upper education, she has more chance to be employed than the women who have lower education level. In this situation, we can say that, graduating from college is an important determinant for women's LFP. Besides this, if a woman is in the low-income level, her participation to labor force shows a negative pattern. On the other side, if women are in high income level, it demonstrates a positive pattern. As a result, being in the low or high-income level can give us the information about whether women are employed or not. Being chief wage earner in the household is also an important factor for LFP of women. Furthermore, ageing has a positive effect on the LFP of women until the age of 35-36, whereas its impact is negative after mid-30s. Last but not least, when numbers of children women have increase, the probability of being employed for women decreases, so it has a negative effect.

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