

## **A Study of Factors Affecting Elderly Women's Retirement and Participation in the Labor Market: a Case Study in Tehran**

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**Abstract** While the level of women's participation in the labor market is on the rise in the world, the level of participation of Iranian women has not proportionately increased, and women constitute only a small portion of the active population in Iran. Among factors affecting women's participation in the labor market are the decisions concerning retirement and the willingness to work by the middle-aged population. This study is an attempt to investigate the factors affecting women's participation and retirement in the labor market in Tehran. According to the results of a cross-sectional data analysis in Tehran carried out in 2008, 20% (18 women) of the sample population were re-employed after retirement. The rate of women's participation is very low during retirement and old age. According to the results of 'Logit Regression Model', the later the elderly people retire, the less likely they are to participate in the labor market after retirement. Women are especially more inclined to expedite the retirement process than men. In addition, aging and increased work experience helping women to get out of the labor market more easily and in contrast, educational achievements, family expenditure and the number of people supported by the retired person increase the participation level after middle age.

**Keywords** Elderly women. Employment. Retirement. Rate of participation.

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## Introduction

Level of women's participation in the labor market is on the rise in the world and increasing women's labor force participation is on the agenda in many countries. In some countries, even the retirement age for women is the same as for men. Some countries have recently increased the retirement age for women and made it concordant with the retirement age for men, in order to make the best of the women's work force. Since 1993, the retirement age for women has increased in many countries that are the members of 'Economic Cooperation and Development Organizations' in order to harmonize men's and women's retirement age (Kiarád et al., 2007).

Women's educational level has risen dramatically in Iran during recent years, but their rate of participation in the labor market has not increased proportionally. Statistics from 2006 Census of People and Housing shows while the rate of labor force participation in the whole population was 43.9%, women's rate of participation was only 13.6% while that of men was 73.4%. Furthermore, the rate of participation was 32.1% for people aged 50 and above, 5% for women aged 50 and above, while it was 58.5% for men in that age group. This indicates that in addition to the low rate of women's active population in the whole country, their participation rates are even lower in the elderly active population. On the other hand, the ratio of the employed to the retired people (called support coverage) has fallen dramatically<sup>1</sup> and the number of active people who, for variable reasons, get out of the labor market in their working age and join the inactive population is very high. The mean retirement age is falling in Iran, and only in the 'Social Security Organization', as the biggest retirement insurance in the country, the mean retirement age has decreased to 51 years and the mean early retirement age has fallen to 48 years, and the mean years of service for retirement has decreased to 19 years. This situation is mainly the result of the retirement laws and the tendency for the labor force to use the facilities provided by the 'Social Security Organization' in Iran.

The question is whether early access to retirement facilities causes employees to get out of the labor market or not. In other words, if some employees who are using the retirement facilities get back to the labor market and offer their labor skills, this will be

an indication of their high motivation for re-entry and participation in the labor market. Therefore, elderly labor force re-entry in Iranian labor market can be used as a criterion for measuring the rate of participation from the elderly labor force. In this paper, there will be an attempt to evaluate the elderly labor force participation from this perspective.

Accordingly, investigating factors affecting the rate of participation among elderly women in comparison with men not only provides an opportunity to gain more knowledge about gender-related features of participation in the country's labor market, but it also helps to identify the factors that affect or improve labor force participation, especially on women's part, and consequently, helps develop more efficient policies in order to increase the country's active population.

In this paper, the factors affecting decisions concerning retirement and participation of elderly women in the labor force will be discussed after reviewing the relevant literature. After delineating the research method, statistical data will be analyzed using correlation and regression methods. Finally, concluding remarks will be provided.

## **Review of Literature**

Clark and Anker (1990) studied the rate of participation among elderly men and women in the world. The results of their study showed that the rate of men and women's participation increases along with the changes in the economic development process. Any rise in per capita income leads to a decrease in the rate of participation. Furthermore, the participation from this age group decreases as a consequence of developments and improvements in supportive social security plans. In another study, Hill (2002) investigated the rate of participation among senior women in the labor market using women of the societies as his sample population and using variables such as age group, employment status, the type of employment (part-time or regular), industries employing these people according to age, type of occupation, literacy and educational level, the number of family members, marital status, and their race. He stated the obligation and pressure to make ends meet as the main reason for old women's participation in the labor market. He added that the assumption that retirement means inactiveness is incorrect. The results of his study showed that the

rate of part-time work increases for women as they become older, and they look for careers that are more flexible.

Hung (2003) investigated the participation of the middle-aged and the elderly in the labor market in Taiwan using a survey. He considered the effect of variables such as gender, race, marital status, literacy and education, health, number of children, number of family members, family pension, savings, and other investments. The study concluded that there was a negative and meaningful correlation between participation in work and the low rate of participation from elderly people (61 to 66 years old), female workers who were physically weaker, people who had more populated families and workers with high income or workers who had made investments besides their current work. In addition, there was a positive and meaningful correlation between participation in work and the rate of participation from younger workers, workers who had enough earnings or had more savings. Furthermore, regarding men, it was found that married men had a higher level of participation than single men and that those who were academically educated were more inclined to participate in the labor market than those who were not.

Saczuk (2004) focused on the labor force participation scenarios for 27 European countries from 2002 to 2005. This study included a theoretical analysis of main factors affecting the labor force. The variables consisted of business cycle variations, social security, wage rates, status of other organizations, education, economic activities of women and poverty. Furthermore, the countries with high and low rates of participation were also identified, and the rate of participation from women in the labor market during recent years was examined and discussed according to age in this study.

Siegrist, Wahrendorf, Knesebeck, Jurges and Borsch-Supan (2006) investigated the effect of work quality and health on early retirement. They investigated the effect of welfare and health on early retirement by surveying 3,523 men and women from Europe and employing statistical analysis of data collected from questionnaires. The results showed that poor labor quality and inappropriate rewards, in addition to insufficient supervision, leads to early retirement. Therefore, European countries' investment and effort in "improving labor quality by increasing supervision" and

creating "high-quality labor through rewarding", leads to an increase in the elderly labor force participation.

PourAlaeddini and Razavi (2004) focused on Iranian women's participation and occupation according to the 1996 census. They demonstrated that despite women's improvement in educational and social aspects, their situation in the labor market had not changed very much. The rate of women's participation was low and their rate of unemployment had increased and there were still fewer job opportunities for women.

Using time series data sets and Ordinary Least Squares method, Sadeghi and Emadzadeh (2004) found that education was the most important factor influencing women's occupation in the labor market. The results of this study show that higher education levels significantly increase the chances of women in finding a job in the labor market.

In another study, Pasban (2006) studied the effect of economic and social factors influencing rural women's occupation using time series data sets and Auto-Regressive Distributed Lags and Error Correction Model. The results showed that there was a positive and direct relationship between rural women's occupation and the level of development of a country; and also between the share of the government's expenditures in GDP and labor force participation. The results also indicated a negative relationship between first stages of the development of a country, ratio of marriage to divorce, number of children and family expenditures versus labor force participation.

#### **Factors Influencing Retirement Decisions and Elderly Women's Participation in Labor Force**

Retirement decisions are directly related to labor force participation, especially elderly labor force participation. Generally, elderly people have the opportunity to avail of retirement facilities. Retirement plans may lead to a fall in productive activities through influencing labor force supply (Thompson, 2000). Mandatory retirement plans usually hinder productive activities undesirably (Thompson, 2000). Having access to retirement pension, older workers, especially those who are not in a good state of health, tend to curtail and decrease their activities. Major factors influencing elderly women's participation are as follows:

Education: The higher the women's educational level and knowledge, the more they have access to industrial and service sectors. Therefore, it can be said that there is a positive relationship between education and higher rate of women participation in the labor market (Sultana, Nazli & Malik, 1994). The results of a study by Kozel and Alderman (1990) reveals that expected income, wage rates and educational level have a positive effect on women's rate of participation. Lazear (1979), Blinder (1989), Medoff and Abraham (1981), Ketlokkoff and Gokhale (1992), and Dostie (2006) came to the conclusion that employers tend to offer higher wages for workers with a special skill, which leads to a controversy over efficiency and wage rates for older workers. Therefore, on one hand, companies tend to retire workers with special skills earlier, and on the other hand, these workers who enjoy such high wages because of their skills are not willing to retire and quit the labor market. Findings of Hung's (2003) study show that people who are academically educated are more willing to participate in the labor market than those who are not.

#### **Spousal Engagement in Work and Labor Force Supply**

The theory of dependence of the labor supply on changes in the marital status of people was developed in the papers from Ashenfelter (1980), Heckman and MaCurdy (1980), and Lundberg (1985); relating it to unemployment and its negative shocks, and was then briefly explained by Gruber and Cullen (2000). In simple words, a negative shock through a fall in lifetime income will force the spouse to increase his/her labor supply. This change reveals itself by surplus workers. In addition, an increase in the presence of one of the couples at home as a consequence of the negative shock may reduce job opportunities for the other and reinforce the effect of surplus workers. There is another reason for expecting an increase in spousal labor supply according to the concept of health shock that is if members of a family have not reached an acceptable time for receiving social security facilities, and have no access to benefits and affluence in order to satisfy their needs, they will increase their labor supply.

Therefore, a negative health shock may not increase spousal labor supply. Firstly, it may become a quick substitute for spouse leisure: the results of all studies on spousal

retirement confirm this happening. Furthermore, a negative health shock can be a good complementary of leisure if it encourages the affected spouse to help in everyday activities.

Secondly, if they have access to employment facilities and benefit from the government, they may barely respond to labor supply. Therefore, the response of spousal labor supply to sudden health changes is not clear, and different responses and reactions are expected depending on the importance of these factors (Coile, 2004).

**Health:** One of the challenges concerning old labor force is the regular increase in the number of old employees affected by early retirement. Feldman (1995), Hanisch (1994), Hardy and Quadagno (1995), and Taylor and Shore (1995) discussed different factors affecting retirement decisions of old workers. The stimulating factors are determined by negative considerations, such as poor health which causes old workers to become retired.

Health is known as one of the most important determining factors influencing retirement and forcing active labor force out of the labor market. Poor health, chronic diseases and disabilities are effective factors in forcing the labor force out of the market. These cases are especially important in occupations in which the workers cannot adapt themselves to the conditions of their job or the job cannot adapt itself to the disabilities of the employees (Siegrist et al., 2006). In another study, Eleonora (2004) found that retired people who could not be re-employed due to their disability were in an inappropriate mental state, lived an undesirable life, suffered from a poor physical condition and complained about bodily pains. In contrast, the retired people who had a job were mentally and physically healthier than their unemployed peers (Pattani, 2004).

Hung (2003) concluded that there was a negative correlation between the physical weakness of female workers and their participation in the labor market. Findings from different studies show that there is a mutual relationship between working and health conditions. According to the findings of a study by Salimzadeh, Eftekhari, Aboulghasempour and Moghimbeygi (2008), the presence of retired people in the labor market and their re-employment has a significantly positive effect on their lifestyle, and those who are occupied and enjoy better health conditions.

**Personal properties and family debt:** Findings of Poterba (2001) show that following a fall in the stock market, many workers who hold shares in the stock market are forced to delay their retirement. According to a study by AARP (2002), 21% of the shareholders who are between 50 to 70 years of age have suffered financial loss and have not retired yet, and have postponed their retirement. According to the findings of Eschtruth and Gemus (2002), the fall in stock market in 2000 has brought about a big change in close-to-retirement labor force supply. Belkar, Cockerell and Edwards (2007) investigated the effect of family debt on spousal (wife) labor supply. In examining the effect of debt on labor force participation, they showed that being in debt increases the possibility of increase in the labor supply. Besides, being in debt has more significant effect on the women who have children and men than the women who have no children.

**Financial status of family:** Naqvi and Shahnaz (2002) focused on the participation of women in Pakistan and showed that financial status of the family, age, education and marital status of women had a positive effect on women's rate of participation. According to the findings of Hung (2003), workers who receive a high income have a high rate of participation. When people reach the retirement age, they encounter an unknown problem, which is unexpected inflation. Despite the retirement programs commit themselves to provide benefits in the form of permanent salary, and also to balance the benefits according to the changes in prices and wage rates, still the problem of changes in inflation and dealing with poor economic conditions and unanticipated problems haunts them (Poterba, 2001). Therefore, increasing uncertainties influence elderly labor force participation. Financial benefits from retirement and pension plans which influence the financial status of families, also affect the labor supply decisions of those who are on the verge of retirement (Thompson, 2000).

**Marital status:** On the whole, getting married and accepting responsibility for family leads to a decrease in women's participation in the labor market. In contrast, those who are single or divorced have a higher rate of participation in the labor market due to the need of meeting their financial needs (Aly & Quisi, 1996). Hung (2003) also came to the conclusion that married people have a higher rate of participation than single people.

**The number of children and fertility rate:** An increase in the number of children leads to an increase in responsibilities of women, and consequently, will have a negative effect on the occupation of women (Shah, 1986). Belkar et al (2007) found that children have a negative effect on women's labor supply.

Mincer (1980) studied the relationship between working hours of women and their participation. The results of his study showed that family income had an effect on women's demand for work. Therefore, women's occupation is conversely dependent on the wealth index. Furthermore, he concluded that the number of children was also a determinant factor in women's decision to work. Conversely, in another study, Sultana et al (1994) discovered that women's age, education and the number of children they support had no significant effect on their participation in the labor market, but wage rate for women and men had a significant impact on their participation. Aly and Quisi (1996) considered economic and social factors influencing women's participation in the labor market. The result of their study showed that the wage rate for women and education had a positive effect. Moreover, marital status, number of children and age had a negative effect on women's rate of participation.

According to the discussed arguments, postponing or advancing retirement which happens in response to different factors, causes a change in the rate of participation from the elderly and the participation of all labor force in the labor market. However, retirement does not necessarily mean getting out of the labor market. There may be people who are still active in the labor market even after retiring and receiving pension. Although there is a close relationship between retirement and getting out of the market in developed countries, leaving the market after retirement is not very common in Iran, as the retirement pension they receive is not enough to support their family.

Therefore, any factor relating to retirement and retirement decisions has a direct effect on labor force participation, though outflow of labor force from the market and lack of labor force participation in the labor market may be a more general and comprehensive concept than retirement. In other words, factors that influence labor force participation and retirement decisions can also affect retired people's decision to return to the labor market.

## **Method**

The method used in this study is descriptive and analytic. A survey using questionnaires filled in by the participants was conducted. For data analysis, statistical inference techniques and regression analysis is used. SPSS 15.0 and Microsoft Excel are used for analyzing the data and Eviews5.0 is applied for estimating multivariate regression models. Testing the hypotheses and answering the research questions is based on statistical inference and estimation results. In fact, regression is used to consider the effect of any of the independent variables on dependent variables.

Sampling was carried out using Cochran's formula and a questionnaire. About 407 questionnaires were distributed and filled in by the participants who were all retired people from Tehran. Cronbach's Alpha is used to examine the reliability of the study. This method is used to assess the internal consistency of the scales which measure different characteristics. The obtained reliability value for 30 quantitative and ranked questions of the questionnaire is 77.64%. Therefore, the questionnaire enjoys a high level of reliability. For assessing the validity, sessions were held for interacting with experts in the area of the labor market, retirement, and also with the employees of Iranian Retirement Organization. The above experts were also consulted on the questions incorporated in the questionnaire. In addition, the validity of the questions included for eliciting the related information from the participants was tested and insured using three completion tests and subsequent revisions were made.

### **Data Analysis**

According to the collected data from the sample population, the mean age of the 407 respondents is 57.4 and their minimum and maximum age are 42 and 85, respectively. 90 (22.1%) of the participants are female and 317 (77.9%) are male. The standard deviation of the participants' age is 8.9. The age of 59 is more prevalent and the mode of age distribution is 59 years. 33 (8.1%) of the participants are single and the rest (374 (91.9%)) are married. The number of people under the support of the participants in this study varies from 0 to 7. About 125 participants have 3 people

under their support. The Majority of the participants, that is 109 of them, have at least a BA studies.

Retirement age ranges from 38 to 65, among which the age group 51-55 is the most dominant, consisting of 156 (38.4%) people. The length of service for the sample population ranges from 18 to 36 years. Both mode and median measures for years of service is 30. From among the 407 participants in this study, 282 include an active population and are willing to be re-employed after retirement. 212 (52.1%) of this active population have jobs and the remaining 70 (17.2%) are unemployed. Therefore, it can be said that 24.8% of the retired who are willing to be re-employed are unemployed. 155 of the 212 participants who have been re-employed after retirement have full-time jobs and 57 of them have part-time jobs. From the 212 employed people that were surveyed, 138 (65.1%) have jobs related to their specialization. 18 of the women in the sample population (20%) have been re-employed after retirement. Therefore, it can be said that the rate of participation from women during retirement is much lower than men.

### **Hypotheses**

One of the concerns of this study is to identify and consider the effect of different variables, such as lifestyle quality, health and welfare conditions, education, personal characteristics and the occupational status of people and their families, on labor force participation during middle and old age. Tehran's retired people were surveyed to investigate and identify their tendency towards participation in the labor market. It is found that the tendency for re-employment after retirement and presence in the labor market are the main reasons for labor force participation in the labor market.

In experimental studies, researchers have tried to find the relationship between these two variables using correlation methods. In assessing the correlation, the scales of measurement used are important and are usually divided into parametric and non-parametric. As nominal and ordinal scales are used for the variables in this study, Phi correlation coefficient is used for assessing the correlation.

Based on the designed questionnaire, first, the correlation between different factors (such as education, support, work experience, spouse employment, family's occupational status, health, spouse, number of family members, level of income, and family expenditure) and the variable number of re-employed women of the sample population will be examined. After that, the correlation between the mentioned factors and the employed participants in the men sample population will be investigated and compared with the women. Then, the regression between the factors that have a meaningful correlation with the dependent variable (retired people's participation in the labor market or re-employment after retirement) and the dependent variable, will be calculated.

In this section, a hypothesis for any of the mentioned factors will be presented. Considering the fact that the majority of the variables in this study are nominal, we will calculate Phi and Cramer's V correlations will be calculated.

First Hypothesis: there is a meaningful correlation between educational level and women's participation in labor force and their re-employment after retirement. Therefore, regarding the first hypothesis:

$$\varphi = \sqrt{\frac{\chi^2_P}{N}}$$

Using Phi and Cramer's V, the numeric value of the correlation is calculated and is considered at  $P=0.05$  level of significance using correlation coefficient significance test (Pearson test  $t = \frac{\rho\sqrt{n-2}}{\sqrt{1-\rho^2}}$  in which  $P$  is the correlation coefficient and  $n$  is the sample size)

and the following statistical hypotheses are tested:

$$\begin{cases} H_0 : \rho = 0 \\ H_1 : \rho \neq 0 \end{cases}$$

According to table 1, the SPSS output shows that the coefficient is  $\varphi=0.42$ , the significance of which is shown by the  $P$  value. The level of significance has been set at 1%, that is at the 5% level of significance, the null hypothesis is rejected and  $H_1$  is confirmed; which means there is a significant correlation between educational level of the retired and labor force participation or re-employment after retirement.

**Table 1: The Correlation Coefficients among Labor Force Participation (Reemployment after Retirement) and other Variables**

	Men's population			Women's population		
	No.	Pearson value	P value	No.	Pearson value	P value
Educational level	317	0.376	0.01	95	0.042	0.01
The number of people under Variable sponsorship	317	0.251	0.01	95	0.256	0.01
Years of service	317	0.492	0.01	95	0.739	0.01
Spousal employment	317	0.279	0.01	95	0.31	0.01
Family (spouse and children) employment	317	0.072	0.12	95	0.293	0.12
Incidence of disease	317	-0.307	0.01	95	-0.362	0.01
Incidence of disease for the retired person's spouse	317	-0.399	0.01	95	0.145	0.168
Incidence of disease for the retired person's family members	317	-0.256	0.01	95	0.585	0.01
Expenditure	317	0.427	0.01	95	0.752	0.01
Income	317	0.415	0.01	95	0.417	0.01

Based on the first hypothesis, nine more hypotheses concerning the correlated variables influencing the labor force participation after retirement are tested. These variables include the number of people under the support of the retired person, years of service, employment of the retired person's spouse or his/her enjoyment of pension, employment of spouse or children under their support, incidence of disease after retirement, incidence of disease for the retired person's spouse, incidence of disease for the retired person's spouse or children, family income<sup>2</sup>, average family expenditure<sup>3</sup>. The results of the correlation test are shown in Table 1.

The results show that there is a significant correlation between variables such as the number of people under the support of the retired person, spousal employment, incidence of disease after retirement, incidence of disease for the retired person's spouse, average family income, and average family expenditure, and labor force participation (re-employment after retirement). As expected, there is a negative correlation between incidence of disease for the retired person and his/her re-employment after retirement which satisfies the theoretical expectations to some extent. All of the hypotheses are accepted at the 1% level of probability.

There is no correlation between employment of the retired person's spouse and children, incidence of disease for the spouse and children under the support of the retired person, and re-employment after retirement.

Regarding the correlation between family expenditure and labor force participation in the labor market after retirement, because the average monthly family expenditure had been included in the questionnaire and the questioned family expenditure was in Iran Rials (IRR) and has an ordinal nature, the t-test will also be used.

Independent t-test conducted for comparing the average monthly expenditure of the re-employed and unemployed groups after retirement shows that there is a significant difference in labor force participation after retirement depending on the family expenditure<sup>3</sup>. Therefore, it can be said that family expenditure has an effect on re-employment after retirement (Table 2).

**Table 2: T-test with Labor Force Participation or Re-employment after Retirement as the Independent Variable and 'Family Expenditure' as the Dependent Variable**

	Level of significance	Degrees of freedom	t-Statistic	F-Statistic*
Women's population	0.01	88	-7.49	39.42
Men's population	0.01	315	-5.22	21.91

\*F- statistic, as shown in Table 2, is the equal sample test.

In case of equality of variances, the test is conducted under the hypothesis that the sample variances are equal. In the case of inequality of the variances, it is concluded under the hypothesis that they are unequal. In this study, based on the value of F, the equality of variances is confirmed and the t-test is conducted under the hypothesis that the variances are equal.

The results of the correlation tests are almost the same for sample population of men. Variables such as education, years of service, spousal employment, incidence of disease for the retired person, and the level of expenditure have less correlation with labor force participation (of re-employment after retirement) for men in comparison with women. In contrast, variables such as employment of the retired person's spouse and children, and incidence of disease for the retired person's spouse have a higher correlation coefficient with re-employment after retirement among men in comparison with women. There is no significant difference between men and women in the correlation coefficient for the variables of 'number of people under support' and 'level of income'. Also, no significant correlation is found between the retired men's working spouse or children and their re-employment after retirement. The correlation coefficients for other variables are found to be significant at 5% level of probability.

### **Regression Analysis**

After testing the hypotheses and determining the correlation between the variables under study and people's re-employment in the labor market after retirement, regressive analysis of the factors influencing 'retirement after employment' (as the dependent variable) will be conducted.

Regression analysis has more precision in determining the degree of influence of different explanatory variables over the dependent variable, and shows the extent of the effect of every variable separately (Derakhshan, 2005). In other words, regression analysis enjoys more precision and authority in investigating the role of different variables in participation after retirement. Therefore, regression analyses will be the basis for analysis and interpretation in this study. Logit Regression will be used due to the binary nature of the variable of employment after retirement (using only 0 and 1).

After reconsidering the independent and dependent variables based on the filled-in questionnaires, the following model has been specified:

$$y_i = \alpha + \beta_1 TERM_i + \beta_2 + EARLY_i + \beta_3 EDU_i + \beta_4 SPON_i + \beta_5 EXPP_i + \beta_6 OLD_i + \varepsilon_i \quad (1)$$

in which the following are the explanatory (independent) variables of the study, and labor force participation during retirement or re-employment after retirement is the dependent variable represented by 'Y'.

*TERM* : Years of service,

*EARLY* : The binary variable for early exit from the labor market and premature retirement,

*EDU* : Level of education,

*SPON* : The number of people sponsored or supported by the retired person,

*EXPP* : Average family expenditure per month, and

*OLD* : Retirement age

Table 3 shows the estimation results of model (1). According to the results of the Table 1, the variable 'years of service' (*TERM*) with the coefficient of  $\beta_1 = -0.15$  has a negative impact on employment after retirement. In other words, a one-unit increase in years of service for the retired person decreases the probability of re-employment after retirement by 15%. In addition, early exit from the labor market and using retirement facilities (*EARLY*) has a negative impact on re-employment after retirement (Y).

**Table 3: Results of Regression (Dependent Variable: Participation in Labor Market Post-retirement) in Model 1**

Explanatory variables	Dependent variable: re-employment after retirement					
	Men's population			Women's population		
	Coeff.	Z-value	Prob. level	Coeff.	Z-value	Prob. level
Intercept	6.57	2.33	0.02	22.5	1.43	0.15
TERM	-0.27	-3.27	0.001	-0.15	-1.44	0.15
EARLY	0.96	2.29	0.022	-3.9	-1.92	0.06
EDU	0.23	1.73	0.083	2.7	2.74	0.006
SPON	0.5	4.77	0.00	0.12	0.3	0.76
EXPP	0.004	5.03	0.00	0.01	2.98	0.003
OLD	-0.08	-1.96	0.05	-0.76	-2.07	0.038

McFadden R2	0.37	0.73
LR value	155.00	66.35

Considering the numerical coefficient of +2.7 for the independent variable of education (EDU), the more educated people are the more chance they have to be re-employed after retirement.

The coefficient of 0.12 for the variable 'the number of people sponsored' (SPON) indicates the positive effect of the number of sponsored people by retired women on their reappearance in the labor market after retirement. The coefficient for average family expenditure (EXPP) is +0.01, meaning that the higher the average family expenditure, the more likely the retired person is to be re-employed after retirement.

Estimation coefficient for retirement age (OLD), the significance of which has been confirmed based on Pearson Z, is found to be  $\beta_6 = -0.76$ . In other words, it can be said that a one-unit increase in retirement age leads to a 0.76% reduction in re-employment probability after retirement. Therefore, the higher the retirement age for women, the less likely they are to participate in the labor market after retirement. Except the variable 'years of service', which is not proved to have a significant effect, the independent variable 'early retirement' is found to be at 90%, and other independent variables at 95% level of significance, respectively.

Whereas the results of retirement and early retirement seem to be different for the two groups of male and female retired population, based on the results from the above test equation about the re-employment of retired men, years of service coefficient value for men is also found to be higher. Therefore, an increase in years of service for men leads to a decrease in their reappearance in the labor market. The coefficient for the binary variable, 'early use of/access to retirement facilities', is positive in men in contrast with women, which means 'early access to/use of retirement facilities has led to the retired people's participation in the labor market, and increased their participation in comparison with other retired people. Educational level coefficient value, average family expenditure and retirement age are higher for men than women, and the coefficient for the sponsored people (by the retired person) is also higher for the

sample population of men. The coefficient for the variable 'educational level' is found to be significant at greater than 90% level of probability and other variables at greater than 95% level of probability. The explanatory power of model test (1) is significantly higher for women and is  $R^2 = 0.73$ .

### **Summary and Discussion**

Retirement decisions are directly related to labor force, and especially elderly labor force participation. Major factors affecting elderly women participation include education, working spouse or spousal labor force supply, health, personal properties and family debt, financial status of the family, marital status, number of children and fertility rate. The results of the data analysis confirm that these variables do have an effect on elderly women's participation in the labor market. From the 407 participants in the study, 90 were women and 317 were men, and the mean age was 57.4.

About 20% (18 women) of the sample population were re-employed after retirement. This number is very small in comparison with 194 (61.2%) of the men population. Therefore, it can be said that the rate of participation from women, especially during retirement and old age, is much less than men.

As the statistical analyses show, educational level, work experience, working spouse and children, and incidence of disease for the spouse and children influences women's re-employment during old age and after retirement. The results of Logit regression also show that as women get older and their retirement age rises, they not only become less inclined to participate in the labor market after retirement, but also try to get out of the labor market and decrease their participation by retiring early. Educational level, family expenditure and sponsoring family members have a positive correlation with women's participation in the labor market after retirement; and an increase in any of these variables increases the probability of women's participation after retirement. In the sample population of men, an increase in variables such as educational level, sponsorship and family expenditure increases the probability of their participation in the labor market after retirement. Aging and increasing the years of service leads to a decline in men's participation rate after retirement, but in contrast with women, early

retirement increases the probability of men's participation in labor force during old age and after retirement.

### **Notes:**

1. According to the information provided by Iranian Social Security Organization, the proportion of support coverage is on the decrease and has fallen from 19.4% in 1991 to 11.4% in 2007.

2. Income index used in this part of the study is ranked based on the data from the questionnaire and the researcher's perception.

3. Expenditure index used in this part of the study is ranked based on the data from the questionnaire and the researcher's perception.

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