FURTHER EDUCATION OR REENLISTMENT DECISION IN TURKISH ARMED FORCES: A SEEMINGLY UNRELATED PROBIT ANALYSIS

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Previous empirical research regarding Turkish Armed Forces provided information about the magnitude of an individual's enlistment probability and how that probability depends on his personal characteristics, family background, employment situation, and expectations for further education. As previous empirical evidence supports the hypothesis that the desicion to re-enlist is positively affected by conscripts' decision to pursue further education, this study models the joint decision to re-enlist and to have further education in a seemingly unrelated bivariate probit framework. Empirical analysis indicate that the residuals of re-enlistment and further education equations are correlated suggesting that previous single equation models might be misspecified. Moreover the geographical background, education level of the conscript, intension of further education and previous unemployment duration are influential in the re-enlistment decision. Additionally the further education decision appears to be determined by family and sibship characteristics, education level and age.

Keywords: Re-enlistment decision, further education, Turkish Armed Forces, Seemingly unrelated probit.

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INTRODUCTION

The existing studies on the issue of re-enlistment regard joining the army as a choice that an individual makes among alternative courses of action such as against further education, civilian employment, marriage and family or a combination of these (Hosek and Peterson, 1990). Empirical analysis indicate the importance of economic and educational variables in guiding individuals' decisions to reenlist. Warner and Ash (1995), Ash et al. (1983), Goldberg (1982), Dale and Gilroy (1985) and Brown (1985) regard the relative military pay and civilian unemployment rate as the main determinants of the enlistment decision. Additionally, the socioeconomic position of the individual is another factor that is considered to be influential on the enlistment decision. Empirical studies suggest that those with lower family incomes and larger family sizes who have less educated parents are more likely to join the military (Asch *et al.*, 1999; Kilburn and Asch, 2003; Kilburn and Klerman, 1999). Moreover, the enlistment probabilities of men and women are reported to be strongly related to wage rates and employment status and experience, ability to finance further education, parental influence, expectations for further education, social support for enlisting and perceived advantages (job security) of military service (Hosek and Peterson, 1986, 1990; Orvis and Gahart, 1985; Orvis, Gahart, and Ludwig, 1992).

Another strand of the literature reports that compared to enlistment bonuses, educational benefits have a greater effect on high quality enlistments (Fernandez 1982, Polich *et al*., 1986) and expected further education increases the retention rates of first-term service members (Hosek *et al.*, 1989; Smith et.al., 1991). Warner and Asch (1995) point out that higher educational benefits attract personnel who desire to serve for an initial enlistment period. Then the personnel who acquired the educational benefits may quit the army and pursue civilian employment oppotunities. The military services pay the costs of education as an employee benefit to the military personnel.

Similarly, the choice of whether to study further, go into employment or remain unemployed can be analysed within the framework of human capital theory which suggets that individuals will pursue further education if the present value of returns, both monetary and pecuniary, from such attendance is greater than the expected costs (Becker, 1965). The costs of education include the opportunity cost of schooling such as foregone earnings, direct costs, like tuition fees. Additionally there are a number non-monetary costs and benefits affecting an individual's decision to pursue further education such as peronal characteristics, family background and regional characteristics. Empirical evidence indicates that family income and educational achievement and socio-economic background are important in determining choices with respect to further education (Ellwood and Thomas, 2000; Nguyen et al, 2003; Carneiro and Heckman, 2002; Cameron and Heckman, 1998, 2001). They argue that credit constraints facing families affect the resources available to finance further education and that the measures scholastic ability is influenced by long-term family and environmental factors. Moreover, birth order, family size, and sibship sex composition are also regarded as among the determinants of an indivial's further education decision. The economic theory inspired by the pioneering work of Becker (1960) suggests negative relation between educational achievement and total family size (Becker and Lewis (1973), Becker and Tomes (1976), Hanushek (1992); Iacovou (2001); Black et al. 2005; and Booth and Kee (2006)). The confluence model developed by Zajonc (1976), on the other hand, claims that a child's intellectual development depends on the average intelligence of all family members. Accordingly, in the presence of many young children, the family's average intelligence is lower, which then tends to reduce or limit the child's intellectual development. Birth-order effects stem from the fact that older children learn more from teaching younger children than the latter gain from being helped by their older siblings. This would explain the performance drop of the last born who cannot teach something to a younger sibling.

Previous empirical research regarding Turkish Armed Forces provides information about the magnitude of an individual's enlistment probability and how that probability depends on his personal characteristics, family background, employment situation, and expectations for further education (Yildirim and Erdinc, 2007). Findings suggest that even though educational levels of the conscript or of his parents do not affect the re-enlistment decision, the conscripts who would like to have further education are more likely to re-enlist confirming the findings of Hosek et al. (1989), Smith et.al. (1991) and Warner and Asch (1995). Findings suggest that conscripts from relatively less developed the East and South East Anatolia regions are less likely to re-enlist. This is against the argument that conscripts who are from the relatively poor regions are more likely to stay in the army. This could be due to the fact that these regions are in fact wealthier than they seem because of unrecorded border trade with the neighbouring countries.

As empirical evidence supports the hypothesis that the desicion to re-enlist is affected by conscripts' decision to pursue further education, this paper expands the earlier studies and models the joint decision to re-enlist and to have further education in a seemingly unrelated bivariate probit framework. An attempt has been made to address two research questions regarding the conscripts' decision making process: The first is to explore the factors affecting a concript's tendency to have further education and the second is to investigate if the intension of further education is among the determinants of re-enlistment decision among other socio-economic factors. The results differ dramatically between the separate probit models of re-enlistment decision and further education decision, and the seemingly unrelated probit the estimates the both decisions jointly. The standard probit approach confirms the findings of Hosek et al. (1989), Smith et.al. (1991) and Warner and Asch (1995) and Yildirim and Erdinc, (2007) in that the intension of further education positively affects the likelihood of re-enlistment. However, the joint model suggests the opposite. The correlation between the

disturbances of the two equations in the bivariate probit model is statistically significant confirming that there are omitted factors that influence both decisions. Thus seemingly unrelated probit analysis produces reliable estimates compared to the single probit estimates. Empirical evidence suggests that the geographical background, intension of further education family and sibship characteristics are influential in the re-enlistment decision. Moreover, the further education decision appears to be determined by family and sibship characteristics, education level, geographical background and age. The rest of the paper is organized as follows. The following section offers a brief overview of the analytical framework. The definition of re-enlistment and the data are described in Section Three. The empirical results are presented in Section Four. Finally Section Five concludes.

ANALYTICAL FRAMEWORK

This paper attempts to capture the intention of further education on reenlistment decision. Various socio-economic and demographic factors affect the reenlistment decision of conscripts such as place of residence, family income, education level. Additionally reenlistment decision may be influenced by whether a conscript would like to pursue further education or not. As the military services pay for further education expenses as an employee benefit to reenlisted personnel, conscripts who otherwise could not continue their education due to financial difficulties may reenlist in order to overcome this financial problem. As these two decisions could be interdependent, there may be a correlation between the unobservable factors affecting the reenlistment decision and the unobservable factors affecting the further education decision. In order to address this issue, the seemingly unrelated probit model has been estimated where both the reenlistment and the further education decisions depend on the same set of independent variables, and the correlation between the two error terms is estimated as an auxiliary parameter. The significance and direction of the correlation between the two decisions can be investigated by modeling the correlation between the two decisions.

The advantage of the seemingly unrelated probit over the bivariate lies in the fact that we can investigate whether or not the correlation is significantly different from zero, without making a priori identifying restrictions, as would be preferable when using the standard bivariate probit (Powell et al., 2002). Moreover, the seemingly unrelated probit model does not require exclusion restrictions to provide meaningful estimates, particularly of ρ.

Our model consists of two simultaneous equations, one for the binary decision to reenlist or not (y_{1i}) and the other for the binary outcome to get further education or not (y_{2i}). Let the superscript * denote the unobserved variable and suppose that y_{1i}^{*} and y_{2i}^{*} follow

$$y_{1i}^{*} = \alpha_1 x_{1i} + \beta y_{2i} + \varepsilon_{1i} \qquad \textbf{(1)}$$

$$y_{2i}^{*} = \alpha_2 x_{2i} + \varepsilon_{2i} \qquad \text{for i=1,2,.....,n.} \qquad \textbf{(2)}$$

Where x_{ij}, j=1,2 are $1 \times k_j$ vectors of explanatory variables, αs are $k_j \times 1$ vectors of unknown parameters and the error terms are assumed to be zero-mean bivariate normally distributed with unit variance and correlation coefficient ρ. The correlation between the errors in the two equations, ρ, can be interpreted as the interdependence of the unobserved components in the further education and the reenlistment equations. The subscript i denotes an individual. The explanatory variables in x_{ij} include various socio-economic and demographic characteristics of the conscripts such as age, marital status, education, monthly family income, number of siblings, geographical place of residence, employment status and duration of unemployment prior to the military service. If the error terms of both equations are affected by similar components, then, although they are likely to be normally distributed, they will not be independent. If the error terms are not independent due to the endogeneity of the further education variable, the parameter estimates will not be consistent if estimated by a

univariate probit. The Wald test, and/or a Lagrange multiplier test, provides evidence on the correlation between the unobserved explanatory variables of both equations so that if $\rho = 0$ then y_{2i} is exogenous for the second equation (Fabbri et al., 2004).

The variable y_{1i}^{*} is a continuous measure of the tendency to reenlist. However only the action to reenlist can be observed implying that the observed variable y_{1i} is truncated as a zero-one variable:

$$y_{1i} = \begin{cases} 1 & if \quad y_{1i}^{*} \succ 0 \\ 0 & otherwise \end{cases}$$

Similarly, the tendency to pursue further education is an unobserved latent variable. The observed variable, on the other hand, is truncated as a zero-one variable:

$$y_{2i} = \begin{cases} 1 & if \quad y_{2i}^{*} \succ 0 \\ 0 & otherwise \end{cases}$$

This set of equations constituting the the model of reenlistment and further education is capable of explaining the set of four possible qualitative outcomes regarding the conscripts' decisions provided that the error terms are assumed to be zero-mean bivariate normally distributed with unit variance and correlation coefficient ρ.

The two equation system, then, can be estimated using a bivariate probit maximum likelihood model, where the likelihood function is given by:

$$L = \sum_{i=1}^{n} \ln \Phi_2(q_{1i}\xi_{1i}, q_{2i}\xi_{2i}, \rho_i^{*})$$

Where Φ_2 denotes the cumulative density function of the bivariate normal density and

$q_{1i} = 2y_{1i} - 1$

implying that for a reenlister $q_{1i} = 1$ and for a separator $q_{1i} = -1$,

$q_{2i} = 2y_{2i} - 1$

and similarly for an individual who continiues to have further education $q_{2i} = 1$ and for an individual who does not continiue to have further education $q_{2i} = -1$,

$\xi_{1i} = \alpha_1 x_{1i} + \beta y_{2i}$

from the reenlistment equation

$\xi_{2i} = \alpha_2 x_{2i}$

from the further education equation, and

$\rho_i^* = q_{1i} q_{2i} \rho$.

Maximization of this bivariate probit maximum likelihood function yields consistent, asymptotically efficient estimates of the model coefficients and the covariance matrix. However, the coefficients cannot be interpreted as straightforward as with linear models, because of the nonlinear nature of the bivariate probit maximum likelihood model (Greene, 1998). The bivariate probit approach is more efficient than the commonly employed two-step procedure because the latter does not take into account the correlation between the disturbances of the re-enlistment and further education equations (Green, 1998). Equations (1) and (2) are estimated by full-information maximum likelihood. The likelihood-ratio test of whether the correlation coeffcient of the residuals ρ is equal to zero can be used as a Hausman endogeneity test (Knapp and Seaks, 1998).

THE DATA

Traditionally, conscripts constitutes the main body of the Turkish Military Service system which has always been a mixed system with a large core of professionals.[1] Even though every male citizen is required to complete compulsory military service, the duration of the service and the service category are determined by the education level of the recruits. According to the recruitment system of Turkish Armed Forces, only serving conscripts can enlist. Conscripts, who would like to join the army, may apply for re-enlistment at the end of their services. Their initial contract shall be 3 years that is the time-in-grade for a second lieutenant, or a non-commissioned officer (NCO) sergeant. Subsequent contracts shall be as long as the time-in-grade of the subsequent rank. They may serve up to 21 years in the armed forces.

Thus, in this study re-enlistment is defined as a conscripts' decision to join the Turkish Armed forces as specialists for at least 36 months, after that they may choose to extend their contracts. In order to examine the possible economic and socio-economic determinants of re-enlistment decision, two separate surveys have been carried out among recruits who were within the first three months of their service and had been having their initial training at the time of the survey. After the initial training they were posted to their bases. The first survey was carried out on November 9th, 2006 with 293 participants and the second one was carried out on December 16th, 2007 with 502 participants, giving an aggregate of 795 at the naval bases in Kocaeli and Istanbul, respectively.[1] One of the questions in the survey asked whether the recruits would like to join the army as specialist for at least 36 months and one of the remaining questions asked whether the conscript would like pursue further education. Bearing in mind that these two decisions may be interdependent, the answers to these questions form the dependent variables in our analysis. The remaining questions are designed to capture the economic and socio-economic as well as educational backgrounds of the recruits.

INSERT TABLE 1 HERE

Table 1 presents some of the characteristics of the conscripts in our data. In panel A the sample is divided into two sections: those who choose to join the armed forces for at least 36 months (stayers) and those who do not (leavers). Panel B, on the other hand, presents the characteristics of conscripts regarding the further education decision. It appears that young conscripts are more likely to enlist and to pursue further education than the old ones. Additionally, Table 1 indicates that there is a negative relationship between the monthly income level of the family and decision to stay. However as the level of income increases the percentage of conscripts who intend to have further education raises. Regarding the education level of the conscripts, university graduates appear to be less likely to re-enlist but more likely to pursue further education. When parents' education levels are considered, it emerges that as

the mothers' education level increases conscripts tend not to re-enlist. The opposite holds for when the fathers' education level is considered. But the education level of the parents' has a positive effect on further education decision. When the geographical aspects of the enlistment decision is considered, conscripts from the Central Anatolia, East and South East Anatolia and Mediterranean regions are more likely to re-enlist compared to the conscripts from other regions. Regarding the further education intention, geographical distribution of conscripts does not exhibit any noteworthy differences. Additionally, conscripts who are married and have children neither likely to stay in the army nor tend to pursue further education. If a conscript lives with his family he is more likely to continue his education, even though there is no significant difference regarding his decision to stay in the army. When the previous employment history of the conscript is investigated, it emerges that conscripts who are previously unemployed more likely to re-enlist. As the duration of unemployment increases the conscript becomes more likely to choose a military career. Furthermore, those who would like to continue their education appear to choose to stay in the army, even though the difference between them and those who would not like to purse their education is marginal. When the reasons to re-enlist are considered, all conscripts agree that social security, pay and benefits, the ability to see different places are major factors for making their decisions to stay. Nearly 34 per cent of the conscripts expressed their love of military as the main factor contributing to the re-enlistment decision. In addition to the questions regarding the socio-economic aspects, questions related to the family structure such as the sibling number, number of sisters and brothers are also directed to conscripts. However, the answers to these questions do not reveal any differences regarding the re-enlistment decision. Whereas when the sibship characteristics are considered for the further education decision, it emerges that an increase in the number of siblings, both sisters and brothers, reduces his intention of having further education.

EMPIRICAL RESULTS

Existing studies investigating the determinants of re-enlistment decision have generally employed single equation regression models (see for example Thorpe and Cameron, 2000; Fricker, 2002; Hosek and Totten , 2004 and Yildirim and Erdinc, 2007). These studies regard joining the army as a a choice that an individual makes among alternative careeer and/or education opportunities. However they fail to account for the two salient features of re-enlistment and further education decisions: Both variables are categorical variables and they are jointly determined endogenous variables. The probit equations for re-enlistment decision and further education decision can be estimated individually. However, the random disturbances that affect the two decisions may be correlated. In such a case, estimating the probit equations individually would inappropriately constrain the correlation between the random disturbances to be equal to zero, implying that any randomness affecting the re-enlistment decision was unrelated to the further education decision. This constraint can be relaxed by jointly estimating the re-enlistment and further education equations in the form of a bivariate probit model, which contains an extra parameter to account for the correlation across equations in the same sense as a seemingly unrelated regressions model.

The questionaire consisted of 33 questions. Other than the varibles discussed in the previous section, there are questions considering the financial wealth of the such as whether the conscript owns a personal vehicle and a house. As the main sector of the Turkish economy is agriculture, there is a question aking if the conscripts lives in a rural or urban center. Moreover, it is assumed that if the conscript has any dependant this may positively affect his decision to reenlist, unless he has any sort of social security. In the first part of the empirical analysis presentes the single equation probit estimations of re-enlistment and further education decisions in Tables 2 and 3, respectively. Then the empirical results of the bivariate probit analysis are presented in Table 4. For each case two alternative models are estimated:

The first one incorporates all the avaliable explanatory variables, whereas only the statistically significant variables of the first model are included in the second model.

INSERT TABLE 2 HERE

INSERT TABLE 3 HERE

In Tables 2 and 3 LR denotes the Likelihood Ratio statistic testing the joint significance of the variables. Empirical results presented in Table 2 indicate that concripts who plan to have further education are more likely to stay in the army, confirming the findings of Hosek et al. (1989), Smith et.al. (1991), Warner and Asch (1995) and Yildirim and Erdinc (2007) who claim that higher educational benefits attract personel who desire to serve for an initial enlistment. Additionally as the number of sisters increase the likelihood of joining the army also increases. Having children and living with family have a negative impact on the re-enlistment likelihood. As the education level and unemployment time increases conscripts become more likely to prefer a military career. However all remaining variables are statistically insignificant. Probit estimates of the determinants of further education decision are presented in Table 3. Even though many socio-economic and sibship characteristic variables are considered, only few of them found to be statistically significant. Empirical results suggests that any increase in the education level of the conscript has a positive impact on his further education intentions. Whereas as the number of brothers increases this likelihood diminishes. Additionally, geographical region also affects both the re-enlistment and further education decisions. The Likelihood Ratio test indicates that the model is statistically significant as a whole for all models.

Table 4 provides seemingly unrelated probit estimates where re-enlistment and further education decisions are jointly modelled. The ρ parameter is highly significant in both models, signaling that the error structures of the equations are correlated. This suggests that

the bivariate model is the correct specification. Moreover, the Wald test indicates high joint significance of the variables for both models. It emerges from Table 4 that taking the correlation in the error structures of the equations impacts the parameters estimates. Even though the sinle equation probit estimates suggest that intention of further education positively affects re-enlistment decision the opposite holds regarding the bivarite probit estimates: Conscripts who plans to continue their education lives are less likely to re-enlist. This finding is contrary to the findings of the previous empicial research mentioned above which modelled re-enlistment decision employing single equation methods.

Moreover the significant variables of the single equation probit model, number of sisters and living with family, turned out to be statistically insignificat in the bivariate model. As in the single probit model an increase in the number of children decreases the likelihood of re-enlistment while an increase in the education level and previous unemployment duration of conscript increases it. However geographical region and type of the residential area (rural) now has statistically significant effect on the re-enlistment decision. Additionally, as the conscript gets older, he is less likely to re-enlist. Another difference from the single equtaion analysis is that two family charactesristic variables are statistically significant in the new estimates. An increase in the number of brothers negatively affects the intention of re-enlistment. Whereas an increase in the siblings order positively impacts it. The bivariate probit estimates of the further education decision are similar to those of single probit estimates, except age variable is now statistically significant even though it does not have any significant impact in the single equation estimates. As age increases the conscripts liklelihood of pursuing further education decreases. An increase in the number of brothers has a negative impact on the further education decision. However as the level of education increases the liklelihood of having further education increases.

CONCLUSION

This study directly builds on Yildirim and Erdinc (2007) where the determinants of re-enlistment decision have been examined for Turkish armed forces using survey data, where similar to the previous existing studies a single equation logistic analysis have been employed. However the re-enlistment decision is regarded as a choice that a conscript makes among alternatives, the most important of which is to continue the education. In that case the two decisions become interdependent which necessitates joint modeling of the two decisions in a seemingly unrelated probit framework. This study is an attempt to investigate the determinants of re-enlistment and further education decisions jointly of the conscripts of the Turkish Armed forces.

Empirical analysis indicates that even though the further education variable positively affects re-enlistment decision in single probit equation, it has a negative effect once the interdependence between the two decisions are taken into account in a bivariate probit model. This finding suggests that the previous studies ignoring the interdependencies in the decision making process of conscripts and employing a single equation analysis might not have the correct estimates of the effect of further education variable in the re-enlistment or retention equations. When the remaining explanatory variables are considered, it emerges that in addition the socio-economic variables which are common to include in the re-enlistment equation, family characteristic variables have also statistically significant effects on the intention to join the military profession. An increase in the number of brothers that a conscript has negatively affects the likelihood of his re-enlistment. As the order of siblings increases, on the other hand, the likelihood of re-enlistment increases. When the further education variable is considered, the number of brother a conscript has again negatively affects his education opportunities, in addition to increases in his age.

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Table 1: Descriptive Statistics

	Panel A Re-enlistment		Panel B Further Education	
Variable	Yes	No	Yes	No
	45.3	54.7	24.7	75.3
Age				
Less than 20	45.4	56.4	18.3	81.74
Between 20-25	46.1	53.9	27.1	72.9
Between 25-30	25.0	75.0	40.0	60.0
More than 30	25.0	25.0	0.0	100.0
Region				
Blacksea	41.8	58.2	28.2	71.8
Aegean	43.0	57.0	25.6	74.4
Marmara	37.8	62.2	31.7	68.3
East Anatolia	46.9	53.1	29.7	70.3
Southeast Anatolia	47.1	52.9	16.5	83.5
Mediterranian	51.1	48.9	23.9	76.1
Central Anatolia	55.0	45.0	20.0	80.0
Education				
Illiterate	50.0	50.0	0	100
Elementary School Degree	52.9	47.1	11.4	88.6
Secondary School Degree	46.4	53.6	20.9	79.1
High School Degree	52.9	47.1	37.8	62.2
University Degree	33.3	66.7	57.1	42.9
Mother's education level				
Illiterate	45.2	54.8	19.6	80.4
Elementary School Degree	44.0	56.0	22.3	77.7
High School Degree	46.9	53.1	25.0	75.0
University Degree	27.3	72.7	36.4	63.6
Father's education level				
Illiterate	45.8	54.2	17.7	82.3
Elementary School Degree	44.1	55.9	23.0	77.0
High School Degree	44.9	55.1	31.9	68.1
University Degree	58.8	41.2	52.9	47.1
Monthly Income				
Less than US $400	52.1	47.9	23.4	76.6
Between US $400- 800	41.1	58.9	30.7	69.3
Between US $800- 1200	20.7	79.3	24.1	75.9
Between US $1200- 1600	50.0	50.0	7.1	92.9
Between US $1600-2000	62.5	37.5	7.7	92.3
More than US $ 2000	42.9	57.1	28.6	71.4
Married				
Yes	30.6	69.4	12.9	87.1
No	46.5	53.5	25.6	74.4
Any Children				
Yes	31.6	68.4	10.0	90.0
No	48.7	51.3	25.6	74.4
Ever Unemployed				
Yes	50.4	49.6	24.3	75.7
No	35.9	64.1	25.3	74.7

Duration of Unemployment				
Less than 3 months	44.1	55.9	17.9	82.1
Between 3-6 months	52.3	47.7	18.5	81.5
Between 7-12 months	56.3	43.7	18.8	81.3
Between 13-18 months	50.0	50.0	20.0	80.0
Between 19-24 months	75.0	35.0	20.0	80.0
Between 25-36 months	62.5	37.5	25.0	75.0
More than 36 months	60.0	40.0	15.0	85.0
Living with Family				
Yes	45.3	54.7	25.2	74.8
No	44.9	55.1	19.2	80.8
Sibling Number				
1	42.9	57.1	38.1	61.9
2	43.8	56.2	27.7	72.3
3	45.6	54.4	32.7	67.3
4	44.6	55.4	26.9	73.1
5	50.0	50.0	19.4	80.6
6	49.0	51.0	16.0	84.0
More than 6	42.0	58.0	21.3	78.7
Number of brothers				
1	46.0	54.0	29.8	70.2
2	47.6	52.4	26.6	73.4
3	45.7	54.3	31.1	68.9
4	43.9	56.1	15.9	84.1
5	50.6	49.4	19.5	80.5
6	47.8	52.2	26.5	73.5
More than 6	31.4	68.6	5.7	94.3
Number of sisters				
1	39.6	60.4	22.6	77.4
2	45.3	54.7	43.9	56.1
3	46.3	53.7	25.7	74.3
4	48.7	51.3	15.4	84.6
5	43.1	56.9	21.6	78.4
6	52.6	47.4	28.9	71.1
More than 6	52.2	47.8	17.4	82.6
Further education				
Yes	57.1	42.9	-	-
No	41.4	58.6	-	-
Re-enlistment Reason				
Job Guarantee	42.5			
Salary	10.0			
To see overseas	4.4			
Social Benefits	9.2			
Liking Military	33.9			

Note: All figures are in percentages.

Table 2: Probit Estimation of Re-enlistment Decision

	Model 1			Model 2		
Variables	coefficient	P>|z|		coefficient	P>|z|	
Further education	0.310	0.020		0.333	0.011	
No. of sisters	0.076	0.129		0.059	0.096	
Any children	-0.433	0.224		-0.816	0.001	
Education level	0.205	0.009		0.185	0.015	
Live with family	-0.353	0.072		-0.341	0.074	
Region	0.086	0.011		0.067	0.040	
Unemp Duration	0.110	0.032		0.078	0.107	
Rural	-0.026	0.497				
Income	-0.027	0.642				
Mother's education	-0.016	0.625				
Father's education	0.017	0.681				
No. of siblings	-0.072	0.237				
Sibling order	0.056	0.183				
Car	-0.189	0.253				
Age	-0.133	0.135				
Working	0.229	0.176				
Marriage	-0.352	0.257				
No. of brothers	-0.018	0.740				
constant	-0.432	0.341		-0.663	0.032	
LR χ^2			47.06*			34.07*
			(0.00)			(0.00)
Log likelihood			-261.3			-336.4
Pseudo R^2			0.082			0.048

Note: Values in parentheses are the p-values and *, **and *** denote significance at 1, 5 and 10 per cent level of significance, respectively.

Table 3: Probit Estimation of Further Education Decision

	Model 1			Model 2		
Variables	coefficient	P>|z|		coefficient	P>|z|	
No. of sisters	-0.043	0.466				
Any children	-0.162	0.698				
Education level	0.340	0.000		0.378	0.000	
Live with family	0.339	0.146				
Region	-0.019	0.593				
Unemp Duration	0.031	0.556				
Rural	-0.084	0.048		-0.130	0.000	
Income	0.068	0.299				
Mother's education	-0.014	0.699				
Father's education	0.008	0.854				
No. of siblings	0.013	0.840				
Sibling order	-0.012	0.789				
Car	-0.137	0.447				
Age	-0.117	0.299				
Working	-0.045	0.808				
Marriage	-0.148	0.671				
No. of brothers	-0.065	0.298		-0.055	0.094	
constant	-0.984	0.056		-0.983	0.000	
LR χ^2			47.06*			66.53*
			(0.00)			(0.00)
Log likelihood			-261.3			-411.5
Pseudo R^2			0.082			0.074

Note: Values in parentheses are the p-values and *, **and *** denote significance at 1, 5 and 10 per cent level of significance, respectively.

Table 4. Bivariate probit Estimates

Re-enlistment equation				
	Model 1		Model 2	
Variables	coefficient	P>|z|	coefficient	P>|z|
Further education	-1.253	0.000	-1.333	0.000
No. of sisters	0.040	0.401		
Any children	-0.401	0.220	-0.469	0.007
Education level	0.315	0.000	0.309	0.000
Live with family	-0.122	0.541		
Region	0.053	0.104	0.066	0.003
Unemp Duration	0.092	0.058	0.058	0.064
Rural	-0.063	0.073	-0.071	0.031
Income	0.016	0.776		
Mother's education	-0.016	0.605		
Father's education	0.017	0.659		
No. of siblings	-0.054	0.335		
Sibling order	0.038	0.332	0.041	0.081
Car	-0.197	0.192		
Age	-0.147	0.077	-0.132	0.091
Working	0.137	0.399		
Marriage	-0.265	0.357		
No. of brothers	-0.039	0.439	-0.083	0.016
constant	-0.103	0.803	-0.129	0.621
Further education equation				
	Model 1		Model 2	
Variables	coefficient	P>|z|	coefficient	P>|z|
No. of sisters	-0.031	0.596		
Any children	-0.084	0.840		
Education level	0.344	0.000	0.367	0.000
Live with family	0.315	0.159		
Region	-0.031	0.397		
Unemp Duration	0.028	0.600		
Rural	-0.082	0.045	-0.086	0.021
Income	0.049	0.435		
Mother's education	-0.004	0.916		
Father's education	-0.0008	0.985		
No. of siblings	-0.004	0.953		
Sibling order	-0.005	0.899		
Car	-0.110	0.526		
Age	-0.149	0.170	-0.128	0.177
Working	-0.018	0.924		
Marriage	-0.208	0.536		
No. of brothers	-0.062	0.330	-0.077	0.041
constant			-1.084	0.000
Wald χ^2		185.4*		343.5*
		(0.00)		(0.00)
Log likelihood		-588.9		-594.2
ρ		0.931		0.998
LR χ^2: ρ=0		4.308 (0.037)**		10.039 (0.001)*

Note: Values in parentheses are the p-values and *, **and *** denote significance at 1, 5 and 10 per cent level of significance, respectively.

Endnotes

[1] In order to ensure that this sampling is a valid representative of the population, the data from the surveys have been compared to the 2002 population data where male population between 20-29 years of age is grouped according the region and education level. The comparison indicates that our sampling is a valid representative of the male population in Turkey.