The Impact of Household Heads' Education Levels on the Poverty Risk: The Evidence from Turkey

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Abstract

This study aims to analyze the relationship between the education levels of household heads and the poverty risk of households in Turkey. The logistic regression models have been estimated with the poverty risk of a household as a dependent variable and a set of educational levels as explanatory variables for all households. There are subgroups of households with female and male heads as well as that of different geographical regions. Other household characteristics, including gender, location of residence, employment status, age, and social allowances, have been used as control variables to capture individual heterogeneity. The data has been obtained from the Income and Living Conditions Survey (SILC) conducted by the Turkish Statistical Institute (TURKSTAT) for the year 2011. One of the main results is that, in general, there is a negative association between the probability of a household being poor and the education level of the household heads. It has also been found that the poverty risk of those households whose heads graduated from a vocational or technical high school is less than those who graduated from high school. However, when we focus on only female-headed households, the situation is reverse. Another prominent result is that gaining a vocational or technical high-school diploma takes precedence over graduating from a university with regard to the probability of a household falling below the poverty line in Istanbul and Southeast Anatolia contrary to other regions.

Keywords: Relative Poverty • Education • Logistic Regression • Per Equivalent Income • Turkey • Households • Household Head • Gender • Vocational Schools

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The globalization period observed after the1980s has caused the countries to attach more importance to the link between poverty and education. When the literature is examined, it is seen that education has a dramatic impact on poverty. According to a World Bank (1995) report, primary and lower secondary education especially enhances productivity of the poor, decreases fertility, and improves health conditions. On the other hand, education helps people to gain abilities to participate in the economy and society. According to Berg (2008), the probability of finding a job increases with increase in one's education level, and additionally educated people earn more. Moreover, the effect of education levels on poverty displays differences in diverse regions and under different socioeconomic circumstances. As indicated in Gemmell (1996), primary education turns out to be salient for low-income developing countries, secondary education for middle-income developing countries, and tertiary education for rich countries in terms of economic growth.

Due to the importance of the education level on the issue of poverty alleviation, this study has examined the relationship between the education level of household heads and the poverty risk of households in Turkey by using the logistic regression models for all households, including female and male-headed households, and different geographical regions. The data were obtained from the Income and Living Conditions Survey Micro Data Set (SILC) conducted by Turkish Statistical Institute (TURKSTAT) for the year of 2011.

We show that there is a negative relationship between probability of a household being poor and education levels of household heads in Turkey. In other words, the risk of a household being poor in Turkey decreases when the education level of a household head increases. On the other hand, the probability of being poor is less for the households whose heads graduated from a vocational or technical school as opposed to the households whose heads graduated from high schools in Turkey. However, when we focus on only female-headed households, the poverty risk of those households whose heads graduated from high school is lower than those who graduated from a vocational or technical high school.

Taking into account the change of the poverty lines, which are calculated for each region, we have estimated eight different models for the aggregated statistical areas. Viewing regions separately, an inverse relation has been obtained between the education level of the head of the household and the poverty risk for a household, similar to the findings for the whole country. Furthermore, in Istanbul, Western & Central Anatolia, and the South East Anatolia regions, the poverty risk for a household whose head graduated from a technical high school is lower than those households whose heads graduated from high school. Whereas, in the Aegean, the Mediterranean, the Western & Eastern Black Sea, and the North & Middle Eastern Anatolia regions, graduation from high school for a head of household takes precedence over graduating from a vocational or technical high school for a head of household with regard to the probability of a household falling below the poverty line. Another prominent result is that gaining a vocational or technical high school diploma takes precedence over graduating from a university with regard to the probability of a household falling below the poverty line in Istanbul and Southeast Anatolia contrary to other regions.

The remainder of the study is organized as follows: The next section presents a literature review on this topic. The third section provides information on the data set and empirical methodology. The fourth section presents the empirical results, and the final section submits the concluding remarks.

Literature Review

The link between poverty and education has been subject to numerous studies through diverse methods and data. The problematic issue in question has focused on variables such as gender, education, age, and region to explain the effect of the given factors on poverty. Gundlach, de Pablo, and Weisert (2001) investigate the relation between education and income inequalities. Given their findings, education is intrinsically a cornerstone to distribute income equally and provides opportunity to the poor to enjoy economic growth to a greater extent. Okojie (2002) analyzed the link between gender, the education of household heads, and the poverty of households in Nigeria between 1980 and 1996 by using multivariate regression models and obtained results which suggest that the probability of being poor in a family with female heads is higher than those with male heads. As inferred, education and size of households have a considerable impact on welfare and poverty. The better educated a household head is, the lower the risk of poverty. Another study conducted by Maitra and Vahid (2006), surveyed the effects of household characteristics of South Africa on poverty and

living standard, using the data of the 1993 South Africa Integrated Household Survey and the 1998 Kwazulu-Natal Income Dynamics Study. In order to identify the poverty status of households, both prohibit and quantile regressions were employed. The study put forth that the households with female heads had very bad economic conditions when compared to those with male heads in 1993; the probability of their having worse economic conditions decreased in 1998; the discrepancy between the educated and uneducated increased; household heads with secondary school educations have much better living conditions than the others.

Javed and Asif (2011) examined the relationship between poverty and households with female and male heads by using the binary logistic regression method. According to the results, education, the households with secondary earnings, the number of children, and occupations are important factors in determining the monthly income of families. The study emphasized the vital role of income, consumption, household size, and the status of the household head in determining the level of poverty. Accordingly, there exists a negative relationship between the educational level of a household head and the poverty risk. According to their research, they found that the households with female heads have less assets and income capacity. Abuka, Ego, Opolot, and Okello (2007) examined the factors related to the poverty risk in Uganda through the logistic regression method. In this study, they used the Uganda National Household Survey's data. The study aims to generate an advanced data related to household population and socioeconomic features in order to scrutinize the development performance. The analysis adopted the food and energy intake method by employing the food cost and consumption expenditures with an aim to calculate the poverty levels to be used later in determining the poor households. The results of the study underline the importance of education in the struggle with poverty. They also show that the increase in the education level of household heads has an effect on productivity and may affect individuals' incomes and also the efficiency of the other family members.

The study conducted by Shirazi (1994 as cited in Janjua & Kamal, 2011) reveals the same result; when the education levels for household heads rises, household poverty risk weakens. Rolleston (2011) investigated the correlation between school attendance, advancement in school, and the level of welfare for the years of 1991-2006 in Ghana. Benefiting from the data

obtained from the Ghana Living Standards Surveys, two models were provided. In accordance with the results of the study, it was put forth that the level of education plays a significant role in determining the household welfare, and high education provides a relatively more crucial and increasing benefit. Awan, Malik, Sarwar, and Waqas (2011) evaluated the effects of gender, experience, and different education levels of experienced persons having a profession as the determinants of poverty. For the study, the data were gained from the Pakistan Household Integrated Economic Surveys of 1998-1999 and 2001-2002, and a logistic regression model was applied by using these data sets. In this model, while the poverty risk of an individual is dealt as a dependent variable, education level, experience, and gender is considered an explanatory variable. According to the results of the study, a negative correlation between experience, education level, and poverty incidence was found out for both of the mentioned years. In addition, it was concluded that the risk of being poor decreases as the education level advances. Furthermore, being a male provides an advantage to preserve a position above the poverty line. As pointed out by Buvinic and Gupta Rao (1997), 61 of 65 studies scanned show that in 38 of 61 studies, female-headed households are subject to some disadvantages. The other 15 studies indicate that poverty is linked to certain types of female-headed households or this link results from certain indicators of poverty. Eight of these studies provide no empirical evidence for the poverty of female-headed households.

Kızılgöl and Demir (2010) analyzed the parameters determining poverty in terms of income and consumption expenditures, benefiting from TUIK's Household Budget Questionnaire of 2002-2006. In this study, poverty analysis was carried out with the logistic regression method, using the pooled data of 2002-2006. They showed that poverty risk decreases as the age and education of the household head increases. Appleton (1997) argues that each year in primary school refers to a 2.5% decrease in poverty risk and that almost doubles early secondary education levels. The study mainly puts forth that education has a crucial impact on poverty risk. Kyereme and Thorbecke (1991) asserted that economic and social issues, such as income providing activities and education, constitute the factors determining the poverty risk. According to Qureshi and Arif (2001), the education level is a significant determinant of the poverty rate and should be taken into account when examining the struggle with poverty. They carried out a study in order to specify the poverty rates of 1998-1999. The poverty discrepancies among

various socioeconomic groups such as rural-urban were investigated by using the logistic regression method. The study displayed that rural households are poorer than urban ones and the poverty rate of farm owners is less than those having no farm.

As well as the studies analyzing the link between education and poverty, some are focused on working status. Çağlayan and Dayıoğlu (2011) offered a sample of factors determining the poverty status and household living standard in Turkey as well as the poverty probability of the households, adopting the data of the TUIK Household Budget Survey for the year 2008. In this study, parametric and semi-parametric logit models were used and the most crucial indicators of poverty were concluded as working status, the occupation of the household head, and income, as well as the rate of working people in the household. Janjua and Kamal (2011) looked at the period between 1999-2007, using the panel data method for the 40 developing countries and predicted the coefficients through the random effect generalized least squares (GLS) technique. The results reveal that income has a mild positive effect on reducing poverty while income distribution does not have any leading role in that. The study also shows that education is the most important factor in reducing poverty.

Method

Data

The data has been taken from the Income and Living Conditions Survey Micro Data Set (SILC[1]) conducted by the Turkish Statistical Institute (TURKSTAT) for the year of 2011. The survey covers 15,025 households and 56,438 individuals. We have excluded four households from the data set due to the lack of sufficient information about the heads of the households. Thereby, we have implemented our analysis on 15,021 households located in different statistical regions. Initially, SILC defined twelve statistical regions in the data set; however, we have combined several of them and obtained eight aggregated statistical regions. Econometric models have also been estimated by using data from these aggregated statistical regions. The percentage figure of households of the aggregated statistical regions is available in Table 1.

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1   The information about the sampling method of the survey is available on the following website: http://www.tuik.gov.tr/MicroVeri/GYKA_2011/english/meta-data/sampling-design/index.html

Table 1
Percentage Figure of Households over Regions

	Turkey	Male- Headed	Female- Headed
Istanbul	11.4	11.11	13.01
West & East Marmara	14.92	14.97	14.65
Aegean	14.22	13.79	16.59
Mediterranean	10.96	10.54	13.27
West & Central Anatolia	15.63	15.78	14.87
West & East Black Sea	11.61	11.65	11.37
Southeast Anatolia	8.3	8.4	7.76
North & Central East Anatolia	12.95	13.77	8.49

Dependent Variable

Our aim is to quantify the relationship between the probability of a household's poverty risk and the household head's education levels based on the data. To estimate this relationship, it is required to define whether a household is poor or not. We have computed poverty lines by using a relative poverty approach. According to this approach, the poverty line is defined by taking a predetermined percentage of the median of per capita income. We have computed an equivalence scale for each household in order to incorporate both possible externalities, which arise from living together, and possible inequalities between household members into the model. In addition, the equivalence measure allows us to compare the households with different sizes and structures. The OECD measure has been used while computing the equivalence scale for each household. The measure assigns 1 to the household head, 0.5 to household members aged 14 and over, and 0.3 to household members below age 14. The OECD measure is computed as follows:

$$m_i = 1 + (N_i^a - 1) \times 0.50 + (N_i^c) \times 0.30 \qquad (1)$$

m_i denotes i^{th}, the household's equivalence scale, N_i^a refers to the number of adult who reside in the ith household and N_i^c implies the number of children who live in the ith household.

Then, per equivalence disposable income for each household has been computed by dividing the household's total disposable income to the calculated equivalence scale. By taking fifty percent of the median of households' per equivalence disposable income set, the poverty line has been determined. The computation of per equivalence disposable income of each household is given in equation 2.

$$Y_i = \frac{R_i}{m_i} \qquad (2)$$

y_i denotes per equivalence disposable income of the ith household and R_i represents the ith household's total disposable income. Finally, the poverty line has been computed as follows:

Poverty line = (median of { Y_1......Y_n}) x0,50 (3)

If a household's per equivalence income falls below the poverty line, the dependent variable is coded 1, otherwise 0. The value of the computed poverty line in terms of per equivalence disposable income is 4350 TRY for Turkey. We have also used this poverty line while implementing our analysis for both female and male headed households.

However, due to the skewed inter-regional income distribution, the only one representative of the poverty line for the whole country will not be a ubiquitous approach to calculate the poverty line. For example, in an average-low income area, a household may earn per equivalent disposable income above the poverty line of the region. Nonetheless, the household, which is asserted to be non-poor by regional income distribution, might be regarded as poor in the analysis including the national scale. On the other hand, in a region of high levels of average income, a household that is below the poverty line in the region might be accepted to be above the poverty line for the whole country.

Therefore, we have analyzed calculating poverty lines separately for eight aggregated statistical regions. Figure 1 shows the calculated values of poverty lines in terms of equivalent disposable income. As expected, poverty lines differ when calculated for regions. The income gap for per equivalent disposable income between Istanbul, of the highest poverty line, and South Eastern Anatolia, of the lowest line, is notable.

Independent Variables

Education level for the household head is coded as 7 dummies in response to the household head's highest educational attainment. The educational level either falls in literate but not a graduate, primary school, secondary school, high school, vocational or technical high school, or the university or higher education level category, and illiterate is attributed as a reference category. In an overall view of Turkey, approximately 45 percent of household heads' highest educational attainment is primary school. Further information about percentage for other educational attainments is given for all samples in Table 2 and 3.
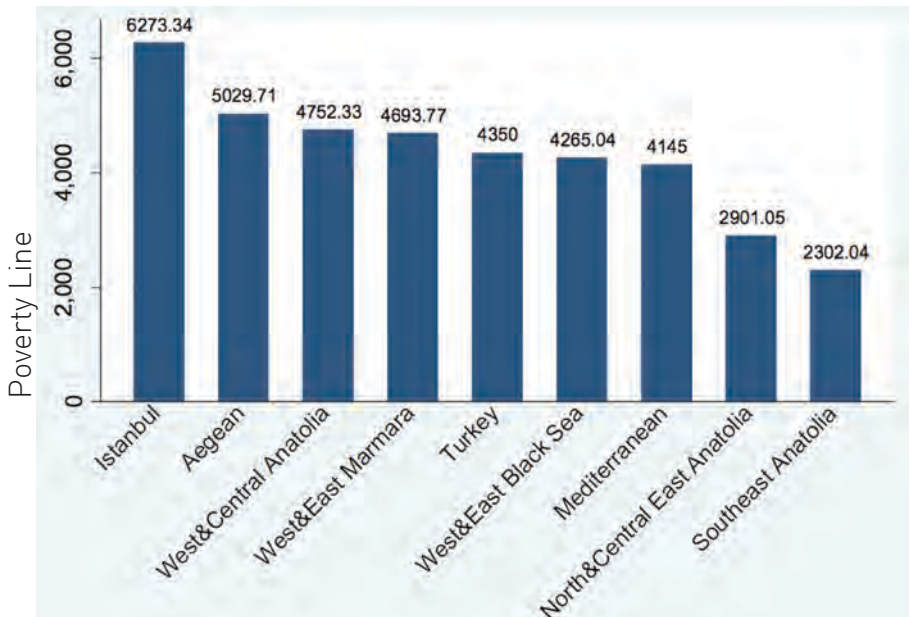

Figure 1: The poverty lines.

Control Variables

We have controlled the effects of household characteristics on poverty apart from household head education levels by using various variables. Gender for the household head is coded as two dummies with female as the reference category. As shown in Table 2, almost 85 percent of household heads are male in Turkey. We have included a location dummy, which is set to 1 if a household is located in an urban area otherwise it is set at 0. Approximately two-thirds of households are located in an urban area in Turkey. We have coded employment status as 3 dummies with unemployed as a reference category. Nearly 65 percent of household heads are employed in Turkey. Information for household heads' ages is gathered into four categories: 15-35, 36-45, 46-55, and 56 or older. The age group of 15-35 is regarded as the reference category. To control for socioeconomic status of the households, we have used the social allowances

dummy variable. If households received at least one of the following forms of social allowances: children related allowances both in cash and in kind, housing allowances, other social allowances both in cash and in kind, regular allowances both in cash and in kind receipt from other households and persons, the social allowances dummy variable is set to 1 or otherwise 0. We suppose that this dummy variable also partially captures the socioeconomic background of the parents of the household head. For instance, a household is less likely receiving one of the forms of social allowances if the head of the household comes from a richer family. On the other hand, there is not sufficient information about socioeconomic backgrounds of the parents of household heads in the SILC. The percentage figures related to control variables are given in Tables 2 and 3.

Table 2
Percentage Figures of Variables I

Variable	Region				
	Turkey	Male-Headed	Female-Headed	Istanbul	West & East Marmara
Dependent Variable					
Poor	15.95	16.12	15.04	11.21	11.07
Non Poor	84.05	83.88	84.96	88.79	88.93
Explanatory Variables					
Education					
Illiterate (Reference)	9.21	4.97	32.44	3.97	6.47
Literate	7.44	6.54	12.37	4.90	6.21
Primary School	44.67	47.29	30.33	46.70	48.75
Secondary School	10.30	11.06	6.16	11.21	11.25
High School	7.94	8.35	5.69	9.81	6.29
Voc./Tech. High School	8.15	8.87	4.22	8.81	9.87
University	12.28	12.92	8.79	14.59	11.16
Gender					
Male	84.55			82.37	84.82
Female (Reference)	15.45			17.63	15.18
Location					
Urban	66.57	65.71	71.31	98.72	67.10
Rural (Reference)	33.43	34.29	28.69	1.28	32.90
Employment					
Employed	64.32	71.80	23.35	63.75	63.04
Retirement	17.43	18.98	8.96	20.02	20.85
Unemployed (Reference)	18.25	9.22	67.69	16.23	16.12
Age Group (Reference: 15-35)					
15-35 (Reference)	22.01	22.78	17.79	24.52	20.31
36-45	24.91	26.83	14.43	26.33	22.77
46-55	22.29	22.98	18.48	23.58	23.39
56 or higher	30.79	27.41	49.29	25.57	33.53
Social Allowances					
Recipient	32.78	30.57	44.85	19.91	23.97
Non Recipient (Reference)	67.22	69.43	55.15	80.09	76.03

Table 3:
Percentage Figure of Variables II

Variable	Region					
	Aegean	Mediterranean	West & Central Anatolia	West & East Black Sea	Southeast Anatolia	North & Central East Anatolia
Dependent Variable						
Poor	12.83	14.03	13.16	11.01	14.60	14.8
Non Poor	87.17	84.97	86.84	88.99	85.40	85.2
Explanatory Variables						
Education						
Illiterate (Reference)	6.65	9.65	6.22	11.01	20.21	14.39
Literate	6.69	6.74	4.81	8.66	11.63	11.92
Primary School	46.35	44.99	44.42	46.10	39.78	38.23
Secondary School	9.18	11.66	10.39	9.29	8.98	10.12
High School	6.93	8.74	8.86	5.91	8.50	8.99
Voc./Tech. High School	8.85	8.14	9.24	8.43	3.69	6.12
University	15.36	10.08	16.06	10.61	7.22	10.23
Gender						
Male	81.98	81.30	85.31	84.86	85.57	89.88
Female (Reference)	18.02	18.70	14.69	15.14	14.43	10.12
Location						
Urban	64.65	66.97	73.98	45.13	68.81	48.3
Rural (Reference)	35.35	33.03	26.02	54.87	31.19	51.7
Employment						
Employed	63.48	62.54	64.57	65.71	60.55	69.58
Retirement	21.25	15.91	20.49	16.97	8.66	10.64
Unemployed (Reference)	15.26	21.55	14.95	17.32	30.79	19.78
Age Group (Reference: 15-35)						
15-35 (Reference)	20.41	22.28	23.47	15.19	28.71	23.33
36-45	24.39	24.53	24.83	23.22	28.23	26.52
46-55	21.54	22.4	21.98	21.44	19.25	23.69
56 or higher	33.66	30.78	29.73	40.14	23.82	26.46
Social Allowances						
Recipient	29.35	32.18	30.88	32.11	48.12	51.59
Non Recipient (Reference)	70.65	67.82	69.12	67.89	51.88	48.41

Empirical Models

In this section, the general framework of the empirical model will be illustrated. Our focus will be on modeling the probability of a household being poor as a function of the household head's education level as well as other household characteristics. A binary logistic regression model has been estimated for the probability of a household being poor on different education levels (Greene, 2008; Demaris, 1995; Wooldridge, 2009).

π denotes the probability of a household being poor and it is specified as the value of the cumulative distribution of z, which is

$$F(z) = \frac{e^z}{1 + e^z} \tag{4}$$

Then, it is specified as a function of exogenous explanatory variables.

$$\pi = Prob(Y_i = 1) = \frac{1}{1 + e^{-(a + \Sigma\beta_i X_i)}} \tag{5}$$

Odds are computed as which is defined as the probability of a household being poor divided by the probability of a household not being poor. Then, taking the log of the odds of a household being poor, we have obtained equation 3, which is used for the estimation.

$$\log(\frac{\pi}{1 - \pi}) \ logit(\pi) = a + \Sigma\beta_i X_i \tag{6}$$

X represents the vector of explanatory variables, which includes personal characteristics of the household head and household characteristics. The models are fitted by maximum likelihood estimation, which uses an iterative process to estimate the parameters. The results will be interpreted through the odds ratios rather than the coefficients. An odds ratio greater than one indicates a positive relation between the probability of a household being poor and the explanatory variables. On the other hand, if the ratio is between

zero and one, it implies a negative association. If it gets the value of one, it is understood that there is no relationship between the probability of a household being poor and the independent variables. The results of the regression models are given in Tables 4, 5, and 6.

Empirical Results

The results of the estimated models for Turkey and for the sample head of the household of which is male and/or female have been shown in Table 4. The probability of a household being poor in Turkey, therefore, decreases when the education level of the household head increases. These results are statistically significant at *1%*. On the other hand, graduation of a household head from a vocational or technical high school is more important than graduation from high school with regard to the probability of the household falling below the poverty line. From the analysis of only male-headed

households, we have found out that as education increases, the probability of a household being poor decreases. Moreover, graduation of male heads of households from vocational or technical high schools is proved to be better than graduation of male heads of households from high schools when we compare probabilities of household being poor.

Furthermore, we have conducted an analysis on only female-headed households, and have detected that an earlier relationship between educational levels and the poverty risk plainly have not changed. In addition, the poverty risk for heads of households who are female and high school graduates is lower than the ones who graduate from a vocational or technical high school.

Due to the change of the poverty lines, which are calculated for each region, we have estimated models using the binary logistic regression method for the aggregated statistical areas. Regression results are given in Table 5 and Table 6. Viewing regions separately, an inverse relation has been

Table 4
Logistic Regression Estimates of Poverty Risk I

	Turkey		Male-Headed		Female-Headed	
	B	exp(β)	B	exp(β)	B	exp(β)
Education (Reference: Illiterate)						
Literate	−0.35[a]	0.69[a]	−0.23[c]	0.79[c]	−0.86[a]	0.42[a]
Primary School	−1.37[a]	0.25[a]	−1.31[a]	0.26[a]	−1.51[a]	0.21[a]
Secondary School	−1.95[a]	0.14[a]	−1.87[a]	0.15[a]	−2.5[a]	0.08[a]
High School	−2.51[a]	0.08[a]	−2.43[a]	0.08[a]	−3.28[a]	0.03[a]
Voc./Tech. High School	−2.78[a]	0.06[a]	−2.76[a]	0.06[a]	−2.48[a]	0.08[a]
University	−4.14[a]	0.01[a]	−4.08[a]	0.01[a]	−4.9[a]	0.00[a]
Gender (Reference: Female)						
Male	1.28[a]	3.62[a]				
Location (Reference: Rural)						
Urban	−0.67[a]	0.51[a]	−0.65[a]	0.52[a]	−0.69[a]	0.49[a]
Employment (Reference: Unemployed)						
Employed	−0.89[a]	0.4[a]	−1.06[a]	0.34[a]	0.02	1.02
Retirement	−1.79[a]	0.16[a]	−1.93[a]	0.14[a]	Omitted*	
Age Group (Reference: 15-35)						
36-45	−0.02	0.97	0.000	0.99	−0.37	0.68
46-55	−0.61[a]	0.54[a]	−0.5[a]	0.6[a]	−1.72[a]	0.17[a]
56 or higher	−1.38[a]	0.25[a]	−1.34[a]	0.25[a]	−1.87[a]	0.15[a]
Social Allowances	1.23[a]	3.45[a]	1.17[a]	3.22[a]	1.52[a]	4.58[a]
Constant	−0.21[c]		1.13[a]		0.04	
N	15021		12700		2113	
Pseudo R2	0.25		0.25		0.23	
Log Likelihood	−4934.16		−4174.78		−723.08	
L2 chi2	3315.8		2867.66		447.67	
Prob > chi2	0.00		0.00		0.00	

a, b, c indicate a significance at the 1%, 5%, and 10% levels, respectively.
* All of the households whose heads are retired are non-poor, so the model cannot be fit. Stata eliminates the problem by removing the retirement category from the model so as not to bias the remaining coefficients in the model. The 208 observations that are not used are the 208 households whose heads are retired.

obtained between the education level of the head of household and the poverty risk of a household, similar to the findings for the whole country.

Moreover, in Istanbul, Western & Central Anatolia, and the South East Anatolia regions, the poverty risk of a household whose head graduated from a technical high school is lower than those households whose heads graduated from high school. Whereas, in the Aegean, the Mediterranean, the Western & Eastern Black Sea, and the North & Middle Eastern Anatolia regions, the graduation of the head of the household from high school takes precedence over the graduation of the head of the household from a vocational or technical high school with regard to the probability of a household falling below the poverty line.

When we have taken gender dummies into consideration for all econometrics models, male-headed households are more likely to fall below the poverty line than that of women. This is similar in

the regression models for all regions, except Istanbul, and the model of the entire sample of households dwelling in the urban area rather than rural area is a factor that reduces the risk of poverty. In Istanbul the possibility of falling below the poverty line for a household residing in the rural area is lower than households residing in the urban area. However, this finding is not statistically significant.

Considering the age factor for the control variables, as the age of the head of the household for all models grows, the poverty risk of the household decreases. In terms of employment for the head of the household, the poverty risk for household heads that work, as is expected, is lower than the household heads that are unemployed. On the other hand, the poverty risk for households where the heads are retired is lower than working heads of households. Finally, for all the econometric models, a household that receives social allowances is highly possible to remain below the poverty line in comparison with a household that receive no social allowances.

Table 5
Logistic Regression Estimates of Poverty Risk II

	Istanbul		West & East Marmara		Aegean		Mediterranean	
	β	exp(β)	B	exp(β)	B	exp(β)	B	exp(β)
Education (Reference: Illiterate)								
Literate	−0.18	0.82	−0.04	0.96	−0.35	0.7	−0.62[c]	0.53[c]
Primary School	−1.06[b]	0.34[b]	−1.02[a]	0.35[a]	−1[a]	0.34[a]	−1.27[a]	0.27[a]
Secondary School	−1.76[a]	0.17[a]	−1.98[a]	0.13[a]	−1.68[a]	0.18[a]	−2.03[a]	0.13[a]
High School	−3.19[a]	0.04[a]	−2.1[a]	0.12[a]	−2.27[a]	0.1[a]	−2.71[a]	0.06[a]
Voc./Tech. High School	−3.51[a]	0.02[a]	−2.43[a]	0.08[a]	−2.1[a]	0.12[a]	−2.13[a]	0.11[a]
University	−3.09[a]	0.04[a]	−4.37[a]	0.01[a]	−5.04[a]	0.00[a]	Omitted*	
Gender (Reference: Female)								
Male	1.31[a]	3.73[a]	1.46[a]	4.33[a]	0.52[b]	1.69[b]	1.22[a]	3.41[a]
Location (Reference: Rural)								
Urban	0.62	1.86	−0.8[a]	0.44[a]	0.66[a]	0.51[a]	−0.31[c]	0.73[a]
Employment (Reference: Unemployed)								
Employed	−1.01[a]	0.36[a]	−1.06[a]	0.34[a]	−0.32	0.72	−0.63[a]	0.53[a]
Retirement	−1.12[a]	0.32[a]	−2.16[a]	0.11[a]	−1.72[a]	0.17[a]	−1.66[a]	0.18[a]
Age Group (Reference: 15–35)								
36-45	−0.14	0.86	0.23	1.26	0.16	1.17	−0.06	0.93
46-55	0.83[a]	0.43[a]	−0.39	0.67	−0.01	0.980	−0.69[a]	0.49[a]
56 or higher	−1.7[a]	0.16[a]	−0.69[b]	0.49[b]	−0.61[b]	0.53[b]	−1[a]	0.36[a]
Social Allowances	1.09[a]	2.98[a]	1[a]	2.74[a]	0.85[a]	2.36[a]	1.2[a]	3.33[a]
Constant	−1.24		−0.8[b]		−0.47		−0.75[b]	
N	1713		2240		2136		1481	
Pseudo R2	0.18		0.2		0.18		0.16	
Log Likelihood	−491.65		−618.36		−668.98		−537.57	
L2 chi2	218.71		322.33		298.63		207.21	
Prob > chi2	0.00		0.00		0.00		0.00	

a, b, c indicates a significance at the 1%, 5%, and 10% levels respectively.
*All the households whose heads graduated from university are non-poor, so the model cannot be fit. Stata eliminates the problem by removing the university category from the model so as not to bias the remaining coefficients in the model. The 166 observations that are not used are the 166 households whose head graduated from university.

Table 6
Logistic Regression Estimates of Poverty Risk III

	West & Central Anatolia		West & East Black Sea		Southeast Anatolia		North & Central East Anatolia	
	B	exp(β)	β	exp(β)	β	exp(β)	β	exp(β)
Education (Reference: Illiterate)								
Literate	−0.15	0.85	−1.16[a]	0.31[a]	−0.37	0.68	0.33	1.40
Primary School	−1.24[a]	0.28[a]	−1.18[a]	0.3[a]	−0.52[b]	0.58[b]	−0.51[b]	0.59[b]
Secondary School	−2.2[a]	0.1[a]	−2.01[a]	0.13[a]	−0.81[b]	0.44[b]	−1.24[a]	0.28[a]
High School	−2.51[a]	0.08[a]	−3.54[a]	0.02[a]	−1.1[b]	0.33[b]	−2.57[a]	0.07[a]
Voc./Tech. High School	−2.8[a]	0.06[a]	−2.58[a]	0.07[a]	−1.84[c]	0.15[c]	−2.27[a]	0.1[a]
University	−5.43[a]	0.00[a]	−3.41[a]	0.03[a]	−1.44[b]	0.23[b]	−2.32[a]	0.09[a]
Gender (Reference: Female)								
Male	0.58[b]	1.79[b]	1.25[a]	3.5[a]	0.74[a]	2.11[a]	1.23[a]	3.43[a]
Location (Reference: Rural)								
Urban	−0.79[a]	0.45[a]	−0.54[a]	0.57[a]	−0.69[a]	0.49[a]	−0.37[b]	0.68[b]
Employment (Reference: Unemployed)								
Employed	−0.61[a]	0.54[a]	−0.44[c]	0.63[c]	−0.99[a]	0.37[a]	−0.87[a]	0.41[a]
Retirement	−1.03[a]	0.35[a]	−2.84[a]	0.05[a]	−1.37[b]	0.25[b]	−1.45[a]	0.23[a]
Age Group (Reference: 15-35)								
36-45	0.03[a]	1.03	0	1	0.21	1.245	0.27	1.31
46-55	−0.73[a]	0.48[a]	−0.65[b]	0.51[b]	−0.12	0.88	−0.61[a]	0.54[a]
56 or higher	−1.64[a]	0.19[a]	−1.23[a]	0.28[a]	−1[a]	0.36[a]	−1.3[a]	0.27[a]
Social Allowances	1.12[a]	3.08[a]	1.46[a]	4.34[a]	1.03[a]	2.82[a]	0.92[a]	2.51[a]
Constant	0.3		−1.23[a]		−1.34[a]		−1.71[a]	
N	2348		1744		1247		1946	
Pseudo R2	0.23		0.22		0.15		0.19	
Log Likelihood	−697.55		−468.81		−438.65		−653.82	
L2 chi2	433.6		271.96		159.25		323.93	
Prob > chi2	0.00		0.00		0.00		0.00	

a, b, c indicates a significance at the 1%, 5%, and 10% levels respectively.

Conclusion

In this study, we have investigated the relationship between the education level of the household head and the poverty risk in Turkey. We find that the probability of the relevant household to remain below the poverty line decreases as the household head's education level increases. That is why education policies must aim to have an important role in the struggle with poverty when seeking to enhance the participation in formal and informal education.

We also find that the risk of being poor in households whose heads graduated from vocational or technical schools is lower than the households whose heads graduated from high schools in Turkey. The vocational and technical high schools constitute an important part in Turkish secondary education in terms of school type and number. According to the Turkish Statistical Institute's report (2013), 65% of high schools are a vocational school in Turkey. In addition to being a bridge between primary and university education, they

also have a duty to prepare individuals that do not seek a university education to automatically enter the work field. In contrast, being a graduate of a regular school is more important than being a graduate of a vocational or technical school in female-headed households. One of the reasons for this result is that a majority of the technical and vocational schools in Turkey have been arranged separately for male and female students, and most of them only accept male students. The Ministry of Education should distribute the resources more effectively by decreasing the gender discrimination on the secondary school level.

Analyzing regions separately, we show that the graduation of a household head from a vocational or technical high school is more important than their being a graduate of a regular one with regard to reducing the poverty risk of a household in Istanbul, Western & Central Anatolia, and the South East Anatolia regions. Moreover, we find that gaining a vocational or technical high school diploma takes precedence over graduating from a university with regard to the probability of a household falling below

the poverty line in Istanbul and Southeast Anatolia contrary to other regions. These results may be related to the structure of the labor market in which households who have received technical training are more in demanded in these regions. On the other hand, the study reveals that graduating from a regular high school rather than a vocational or technical one has greater importance in the Aegean, Mediterranean, the West and East Black Sea, and the North & Middle Eastern Anatolia regions in terms of poverty risk. We also show that the poverty risk of the households with female heads is lower than those with male heads. Furthermore, dwelling in urban areas rather than rural areas reduces the risk of being poor for the households.

Taking into account the poverty alleviation effect of education in Turkey, it is obvious that education should be extended on every level including pre-school. Along with the differences in regions and school types regarding the poverty-education relationship, considering the rural-urban distinction should fulfill the equity principle in education. What is required is a master education plan that will provide technical equipment to improve the education, meet the needs of qualified teachers, create additional financial resources, and agree on their Ministry of Education, High Education Institution, State Planning Institution and Development Plans.

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