

A Study of the Determinants of Absolute Poverty of Households in the Northern Khorasan Province of Iran using Tobit Model

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Abstract

Analyzing poverty determinants in order to study welfare in household properties point of view is an attempt to study how a special variable affects on poverty, *ceteris paribus*. This research aims at studying those household properties which are considered as effective and important factors in household welfare and poverty. The results can use by policymakers to promote society welfare. To this purpose, poverty determinants in Northern Khorasan province have been studied. At first absolute poverty line is estimated based on expenditure data of 162 goods extracted from data of 1396 households of sample of expenditure and income of rural households plan in 2010. The effect of variables of dependency ratio, gender and age of household guardian, educational and health expenditures and dummy variable of being rural or urban households were studied using estimated poverty line and Tobit model in order to study poverty determinants in detail. The results indicated that all explanatory variables highlighted in the model except guardian age were effective on the province poverty in 99.9% level. Virtual variable of being rural or urban household was the most effective on poverty.

Keywords: Iran, Northern Khorasan, Absolute Poverty, Tobit Model, poverty determinants
JEL classification: O53, C82, D31, D63, I32

Introduction

Poverty is a social phenomenon which has befallen human society in all eras and is prominent as a universal phenomenon leading to the poor not to have a correct perception from their capacity and ability. With this view in mind, poverty of regions confronting poverty problem becomes more important. In planning poverty eradication, governments should choose ways to identify the poor and prioritize low income household in the poverty eradication plans so that needy people enjoy state aids widely. One of them is based on determining size of poverty line and identifying effective factors on creation and expansion of poverty. To this purpose, wide researches have been begun since 1970's by publication of Sen's studies for identifying different aspects of poverty.

There is a problem that particular regions and classes in Iran suffer from poverty and subsistence difficulties. Close identification of detail properties of the poor and taking poverty eradication policies along with provincial or regional direction is one of prominent ways in compiling poverty fighting plans because different provinces are different by total economic conditions which makes study provinces and especially those of especial economic conditions more necessary (Jafari Sani, 2006). Among provinces in Iran, Northern Khorasan is one of few provinces its rural population was more than urban population in recent years. This paper is organized as follow: in section 2, a poverty literature is considered briefly. Section 3 is about calculation methodology of absolute poverty line. Section 4 explains the relationship between explanatory variables and poverty and Tobit model. The results of poverty line estimation and Tobit modeling are described in section 5. Section 6 is conclusion.

Review of poverty literature

Poverty is a socio-economic and cultural phenomenon resulted from inability to afford minimum human basic needs. Spiritual and material human needs such as adequate feeding, education, house, having a job

and security guarantee each can be measured according to a minimum threshold. Different definitions for poverty have been offered in available references and studies performed due to its complex and multifaceted nature. The one who doesn't have adequate ability and capability to afford living basic needs and necessities is called poor. However there is no consensus about living necessities. According to Townsend (1960), people, household and population deciles are considered poor when they confront with lack of resources to obtain different food regimes, participate in activities and normal life condition and facilities. Sen (1981) considers poverty as deprivation from basic capabilities rather than only low income. It is of note that privation is a relative concept having different definitions in different times and places. Atkinson (1989) considers two concepts for poverty. In the first concept, poverty means lack of availability of certain subsistence facilities according to which if total expenditure of consuming particular goods by a person is lower than a particular limit, he is considered poor. The second one is the right of having socio-economic facilities and if one's income is lower than a known level, they aren't available for him.

All of these definitions focus on separating the poor from non-poor only by predetermined definitions. So, poverty implies comparison between an observation and a predetermined condition. Booth and Rowntree who were leading in studying poverty in England in the last decades of nineteenth century attempted to offer an appropriate definition for poverty. Both of them made an effort to distinguish between absolute poverty and relative poverty. Absolute poverty is an objective issue and contains a scientific definition formed based on minimum subsistence and it means minimum needs required to continue living. So, absolute poverty is defined as inability to obtain minimum living standard. If one be in lower than this level, he would not have ability to continue his living. According to this definition, absolute poverty depends on how minimum subsistence is defined. In this regards, it is necessary to know what do people need and by availability of how much goods and services their poverty problem is solved. This idea of absolute poverty or minimum subsistence is concerned with Booth's (1889) and Rowntree's (1901 and 1941) last work. Relative poverty is opposite of absolute poverty which is a relative issue in which judgments affect on determining poverty line. Relative poverty is defined as inability to obtain a certain level of living standards recognized as desirable or necessary in the present society. In relative poverty resulted from dramatic income differences, poverty arises from not only lack of resources for affording basic needs but also lack of personal resources to make minimum living standards of society available. So inequality in wealth and income distribution is more considered than absolute income level in defining relative poverty. To obtain inequality depth in income distribution (or consumption) among people or household, total income percentage received by the poorest class in a society can be compared with income percentage received by the richest class. It is of note that this concept is defined differently in different countries and has changed during time because of economic changes (Kakwani, 2003).

There have been performed abundant studies about poverty and income distribution in recent years. Wang et al. (2007) employed Ravalion method to calculate rural poverty line in the province Hoby and internal Mongolia in China which is different from Chinese formal poverty lines. Factors affecting on being poor household were also studied in this research using Lagit and Probit models. Asogwa et al. (2012), Etim and Patric (2010) and Somolon and Etim (2010) studied poverty determinants separately in different regions of Niger. They used Tobit regression model to estimate their model. Ravalion and Pradhan (1998) in a paper titled as "measuring poverty using qualitative perception of welfare" studied subjective poverty line in Nepal and Jamaica based on people census. In subjective poverty point of view, being poor or non-poor is completely a personal aspect and grounded on the one or household feelings about poverty. Subjective poverty line can be measured using a questionnaire or personal comments determining whether he feels himself poor in the present situation. Thus using biological or income criteria or their combination and studying household consumption behavior, some living and income level would be obtained lower than which one feels himself poor and by which being poor or non-poor can be measured (Ravalion, 1997). Some of researchers who studied poverty are Abel-Smith and Towsenda (1965), Sen (1973), Kuznets (1977), Ravalion and Vande Walle (1991), Wodon (2000), Khandker, Kakwani and Son (2003),...

Many Iranian researchers have estimated poverty line the first of them was probably Azimi (1351). Other researchers are Kashi Khodadad and Bagheri (2002), Samadi (1999), Dini Torkamani (1996), Hekmati (2000), Arab Mazar and Hosseini (2004), Shoshtarian (2007), PoorTaheri et al. (2011) etc. However, Zaghfhar is the one how has estimated poverty line and its determinants for many times using different methods.

Methodology of Study

In measuring poverty line, income is introduced as the best option for measuring level of living welfare. However, since income calculating is difficult (for example household express their income lower than real level) so using household expenditure rather than income is more optimal for judging about household welfare (Mukherjee, Benson, 2003). There are two common and major ways to calculate absolute poverty line: food energy intake and measuring poverty line based on basic needs. In food energy intake (FEI)

method, first calorie used by household is obtained based on types of foods consumed, then daily expenditures required to take minimum calorie are calculated (Duclos and Araar, 2005). These needs are different from one household to another one and also time by time. This method includes non-food consumption expenditures automatically provided that total consumption expenditures by which the one affords his required calorie is determined (Ravalion, 1997). The present study has been used poverty line based on calories need.

Measuring method of poverty line based on calorie need is based on the concept of absolute poverty and minimum basic needs (feeding needs). Two methods of Orshansky and Rowntree are more common in absolute poverty line approach. In Rowntree method, after determining food poverty line, some constant income is added to afford minimum expenditure of other basic needs (non-food). In other words, in addition to a set of food essential goods, non-food goods such as garment, house, education and health which are necessary for meeting primary needs and continuing life are determined and then in the second step income required for meeting food and non-food needs is calculated in common price. Orshansky method was used to calculate poverty line in this research. This method was first used by Orshansky (1965) to determine poverty line in U.S. This method was later known as "Orshansky method" and has been used by many developing countries to measure absolute poverty line. This method is based on the well-known Engle hypothesis. According to this hypothesis, household who expend the same share of their income for foodstuff are of the same living level (Kakwani, 2003). In this method, first minimum expenditure required for preparing necessary foods is determined then expenditure of non-food goods is added as a particular percentage of food expenditures. If vector of foodstuff required is denoted by X_i , its expenditure vector with P_i , then food poverty line is: $FC = P \times X$

Where FC is minimum food expenditures, P_i is price of foodstuff, X_i is food quantity. Now Engle ratio or ratio of food expenditure to total expenditure (income) is: $ER = FC / TC$

Where, ER is the ratio of food expenditure to total income (Engle ratio) and TC is total expenditure (income). So poverty line equation is written as: $PL = FC / ER$

Thus, inverse Engle ratio has been used for calculating total poverty line (Ravalion, 1997).

The expenditure required for meeting basic needs has been estimated in two steps. In the first step, minimum food expenditure required of healthy life has been estimated and in the second step, non-food expenditure required has been estimated.

Food component of poverty line: any person needs a particular amount of calorie every day which has been assumed 2300 calories in this study. To calculate poverty line by this method, first, households have been ranked based on total adult equivalence expenditure and have been divided into ten income groups so that each group contained 10% of households. Then to estimate calorie received by households of each group, 162 food products have been selected from household budget statistic. In this regards, the Iran Statistic Center and Nutrition Research Institute of Iran have been the main resource for collecting our data. Having estimated food values of adult equivalence that received by each income group, we consider the first group which its energy received is more than standard energy (2300 calorie). Then food poverty line is: $FPL = FC - (kol - 2300) * P$

Where FC is total food expenditure of selected group, kol is Energy received by selected group and p is price of each received calorie which is obtained by dividing of total food expenditure of selected group by its amount of energy received.

Non-food component of poverty line: The common method to estimate non-food poverty line is to obtain the ratio of food expenditure to total household expenditure and generalize this ratio to food poverty line and total poverty line (Duclos and Araar, 2005). Orshansky method (which is based on Engle rule) has been applied to add minimum non-food expenditure to food poverty line.

Adult equivalence expenditure: one of the important issues in analyzing household welfare is the increase of number of household members. Increase in the number of household members will rise household expenditures but because of collective consumption saving, household expenditures will not increase by increased household dimension proportionately. By using equivalence scale Indices, household expenditures with different size can be related to each other. These indices are generally calculated based on for example household size, age of household members etc. In this research, equivalences scale suggested by Dercon and Krishnan (1998) has been used to allocate equivalences scale for gender and age of household members. Adult equivalences scale has shown in Table 1. Food consumed by any adult in each household has been obtained by dividing food value consumed by any household by adult equivalence of the same household.

Table 1. Nutrition (calorie) based equivalence scales

Years of age	Men	Women	Years of age	Men	Women
0-1	0.33	0.33	12-14	0.96	0.84
1-2	0.46	0.46	14-16	1.06	0.86
2-3	0.54	0.54	16-18	1.14	0.86
3-5	0.62	0.62	18-30	1.04	0.80
5-7	0.74	0.70	30-60	1.00	0.82
7-10	0.84	0.72	60 plus	0.84	0.74
10-12	0.88	0.78			

Source 1. Field Survey Dercon and Krishnan (1998)

Having calculated poverty line, effective factors on poverty line have been studied by using Tobit model. The Likelihood Ratio technique and software Shazam have been used in order to estimate the Tobit model. Dependent variable, household income (expenditure), is zero for household being under poverty line and more than zero for those above of poverty line. Regression equation of this model is:

$$POV_i = \beta_0 + \beta_1 DEP_i + \beta_2 GEN_i + \beta_3 AGE_i + \beta_4 EDU_i + \beta_5 HEL_i + \beta_6 HAP_i + U_i$$

Where variables are following:

POV: poverty line which takes zero for household under poverty line and household annual income for those above poverty line. DEP: pure dependency ratio. GEN: gender of guardian which is one for male and two for female. AGE: age of household guardian,

EDU: household educational expenses. HEL: household health expenses. HAP: the place in which household reside which is one for rural and two for urban.

Tobit model has been used to study the effect of respective variables on absolute poverty line. Using of Tobit model is the most important differences of this study from other studies in Iran. Almost Dami Lagit and Probit models have been used for studying poverty determinants in Iran. Most important problem of these models is considering only two certain values for dependant variable of poverty, one for poor household and zero for non-poor household. Dami Lagit and Probit models don't take into account different levels of income of household. To solve this problem, Tobit model considers true expenses for non-poor household and zero for poor household. Tobit model was developed by Tobin in 1958 and has been used widely by economists for measuring the effect of changing explanatory variable on poverty (McDonald and Moffitt, 1980). In addition to measuring the possibility of a household being poor, this model measures poverty intensity (Tobin, 1958).

There are a number of equations and functions in econometrics in which dependent variable is cut downward. In this case, dependent variable is observable when its values are more or less than a particular limit. Such variables are known as censored variables in econometrics. However, it should be noted that in censored regression models, independent variables are known for all people in a sample but data of dependent variable is observable only in limited amplitude. The sample being of this characteristic is called censored sample (Ghorbani, 2004). Tobin offered a model to regress such variables in 1958 (Tobin, 1958).

Tobit model suggested by Tobin (1958):

$$q = P = X \beta + e \quad , \quad P > P^* \tag{1}$$

$$= 0 = X \beta + e \quad , \quad P \leq P^* \tag{2}$$

$$= 1, 2, \dots, n$$

In above mentioned equation, variables and parameters are defined as:

q : censored dependent variable (Unobserved Variable). Its value for poor household is discontinuous and for non-poor household is continuous. q defined as adult equivalence per capita income. P: Latent or Unobserved Variable, P*: Censor threshold (poverty line) above which dependent variable is observable and is unobservable in lower values.

X : Vector of explanatory variables, β : vector of unknown parameters which should be estimated, n: total number of observations including n_0 zero observation (poor household) and n_1 non-zero observations (non-poor household) from dependent variable, e : Disturbance sentence which is independent from explanatory variables and is based on normal distribution with zero mean and constant variance (σ).

For household those income is more than P^* (poverty line), P is real income (equation 1) and for household those income is lower than P^* (poor household), P is considered zero. In other words, censor threshold of dependent variable is P^* here. Using ordinary least square (OLS) method in a censored sample with limited dependent variable leads to biased and irreconcilable estimations resulted from basic assumptions of OLS method. When dependent variable is cut downward, the assumption $E(\epsilon_i)=0$ is ruled out due to q cut because only observations are analyzed their income is more than poverty line. According to Madala (1983), observations above censor threshold can be defined as:

$$E (P) = E(q | P>P^*) = \beta X + E (e | e > - \beta X + P^*) \tag{3}$$

$$E(q | P > P^*) = \beta X + \delta \frac{\phi(\text{---})}{\Phi(\text{---})} \tag{4}$$

Where $\phi(\text{---})$ and $\Phi(\text{---})$ are standard normal density function and standard normal aggregated density function in the value (---), respectively. The left hand, $E (q | P>P^*)$ is expected value q when q is more than zero and the right hand $E (e | e > - \beta X + P^*)$ is mathematical expectation of error component when more than $-\beta X + P^*$. The statement $-\beta X + P^*$ is obtained by solving equation for e .

The main purpose of Tobit model is identifying factors explaining difference in income values.

$$\text{---}(\text{---}) = \beta \tag{5}$$

β Indicates final effect of variables on a subset of people who have income more than P^* Rial. If it is necessary to estimate parameters for all sample household (total effect measurement), then balanced estimations should be calculated in which parameters of Tobit scale are multiplied by observations probability in the non-censored sample (i.e. non-poor household have ... Rial). Balanced estimation is:

$$\text{---}(\text{---}) = \Phi(\text{---}) \cdot \beta \tag{6}$$

McDonald, J.F and Moffitt (1982), indicated that total effect of changing a variable for example on the expected value of dependent variable is obtained from following equation:

$$E(q) = \Phi(I) E(P) \tag{7}$$

$$I = \text{---} \tag{8}$$

Where β estimated coefficient of variable X and $\Phi (I)$ is probability of being in a potential non-poor household. In addition these researchers indicated that a total effect reflected in the equation (6) is separable as:

$$\text{---}(\text{---}) = \Phi(I)[\text{---}(\text{---})] + E(P) [\frac{\phi(\text{---})}{\Phi(\text{---})}] \tag{9}$$

The effect of changing each independent variable on inclination to payment can be obtained by balancing estimated parameters of Tobit model. In equation (9) partial derivatives are defined as:

$$\frac{\phi(\text{---})}{\Phi(\text{---})} = \Phi(I) \text{---} \tag{10}$$

$$\text{---}(\text{---}) = \beta [1 - ((I \cdot \phi(I))/\Phi(I)) - (\phi(I) / \Phi(I))] \tag{11}$$

$$A = [1 - ((I \cdot \phi(I))/\Phi(I)) - (\phi(I) / \Phi(I))] \tag{12}$$

In the above mentioned equation, all parameters and variables have earlier definitions. Equation (10) indicates that the effect of changing each of variables on the change in probability that a household being in non-poor community can be calculated using estimated parameters of Tobit model which is very important in policymaking. Equation (11) also indicates that the effect of changing each of independent variables on poverty can be obtained by balancing estimated parameters of Tobit model. Equation (6) suggest that to determine the effect of changing each of independent variables on dependent variable in Tobit model, estimated coefficient of the model should be balanced by probability percentage of being a household in a non-poor community $\phi(\text{---})$. Above-mentioned cases all indicate superiority of Tobit model than regression models based on ordinary least squares and observations more than zero.

With the coefficient $\eta = \frac{\phi(\text{---})}{\Phi(\text{---})}$ and arranging equation (9), the following equation is obtained:

$$\eta \text{---}(\text{---}) = \eta \Phi(I) + \eta E(P) \tag{13}$$

In Tobit model, values of elasticity are of higher interpretive value than coefficient values because they are independent from measuring units. So, elasticity has been used to study relative importance of explanatory variables in the model. Tobit model offers two types of elasticity. The first is expected elasticity indicating probability percentage of going from zero group (poor) to the opposite group (non-poor) in lieu of one percent change in independent variable. Second elasticity is realized elasticity which is change percent occurred in dependent variable in lieu of one percent change in independent variable. Total elasticity is sum of two elasticities. Statistic LR has been used to measure total significance of the model. In addition, in Tobit model R^2 isn't a reliable measure for good performance. So the statistic of square correlation coefficient (r^2) between real and expected (predicted) values of dependent variable has been used as an index for good performance. The closer the r^2 to one, good performance will be higher (Maddala, 1983).

Results and Discussion

To calculate absolute poverty line by basic needs, first total adult equivalence expenses have been divided into ten groups. Then, average values of Decorn and Krishnan adult equivalence scale, average total expenditure and food adult equivalence expenditure, average kilocalorie received, ratio of food expenditure to total expenditure and implied price have been calculated for each income group shown in Table 2:

Table 2. average Expenditure and calorie received of groups - Northern Khorasan provinces - 2010

Average of deciles						
Legend	adult equivalence scale	total expenditure (annual)	food expenditure (annual)	kilocalorie received	ratio of food expenditure to total expenditure	implied price
First Decile	2.6	75375236	13077348	4834.2	0.2	7.4
Second Decile	2.8	38897252	9596713	3867.8	0.2	6.8
Third Decile	2.9	28271097	8800184	4093	0.3	5.9
Fourth Decile	3.3	22565691	7593058	3679.8	0.3	5.7
Fifth Decile	3.1	18563292	6933331	3698.6	0.4	5.1
Sixth Decile	3.1	15283704	5913030	3403.8	0.4	4.8
Seventh Decile	3.3	12870681	5012507	3098.8	0.4	4.4
Eighth Decile	3.6	24176060	4622197	3097	0.2	4.1
Ninth Decile	3.5	8552699	3953960	2897.3	0.5	3.7
Tenth Decile	4.0	5983280	2896584	2380.3	0.5	3.3

Source 2. Field Survey (2012)

According to Engle, there is a negative relationship between income level and food expenditures and final inclination to consumption in low income groups is more than high income group considering lower consumption size of low income group than high income group. So, the more the number of high income people, final inclination to consumption will be lower in that society and final inclination to saving and its size will be bigger which is consistent with findings in Table 2 on the ratio of food expenditure to total expenditure of data of Northern Khorasan. Then, absolute poverty line was estimated by basic needs method its results are shown in Table 3:

Table 3. poverty line in Northern Khorasan provinces - 2010						
food poverty line - Rial			total poverty line - Rial			
daily	monthly	annual	daily	monthly	annual	
7668.2	233242.48	2798909.8	38341.23	1166212.4	13994549	

Source 3. Field Survey (2012)

Figure 1, indicates the ratio of province poverty. Considering annual poverty line for a typical household in the province in 2010 was calculated 13994549 Rial, so 559 household of total sample household are under poverty line. As seen, 40% of population of Northern Khorasan is considered poor.

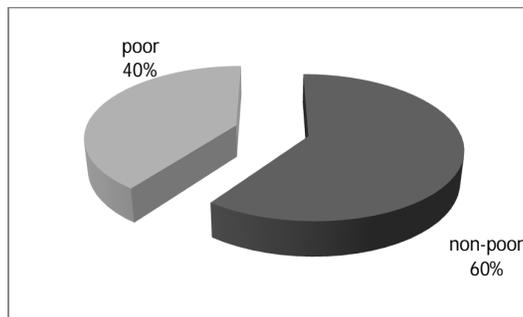


Figure 1. Poor percent population of Northern Khorasan

The value of statistic LR is -16848.470 ruling out null hypothesis that all variable coefficients studied are zero. Indeed it can be said that at least one of explanatory variables has significant effect on probability of poverty creation. Square correlation coefficient (r^2) is 0.437 indicating good performance of model. According to data in Table 4, all explanatory variables marked in the model except household guardian age including

dependency ratio, gender of household guardian, educational expenses and health expenses and resident place of household have significant effect on poverty (in level 99%). In the following the effect of explanatory variables on poverty are considered.

Table 4. Tobit model estimation results of the poverty determinants among population of Northern Khorasan - 2010

Variable	Normalized Coefficient	Standard Error	t- Ratio
dependency ratio	-0.941E-01	0.216E-01	-4.360
gender of household guardian	-0.444	0.916E-01	-4.845
age of household guardian	0.330E-02	0.196E-02	-1.683*
educational expenses	0.661E-07	0.712E-08	9.275
health expenses	0.138E-07	0.887E-09	15.509
Urban - Rural	0.884	0.610E-01	13.838
Constant	-0.152	0.197	-0.770
	Log likelihood= -16848.470		r = 0.437
	$\phi(l) = 0.635$		A= 0.600

Source 4. Field Survey (2012)

*: t-ratio is significant at 10% level of significance

Negative sign and significance of the variable dependency ratio indicate positive effect of this variable on increased probability of poverty creation. Significant and negative coefficient of gender of household guardian indicates that as the ratio female guardian to male guardian increases, probability of the household being poor may increase. According to results of Table 4, increased investment in human resources through increased expenses in education and Health by household leads to decreased poverty in rural areas of the province so that increased educational expenses has positive and significant effect on reduced poverty which is consistent with the results of Hasanzade's (2000) and Mehrabani's (2008) studies about positive effect of educational expense on poverty. Also, increased variable of health expense has positive and significant effect on reduced poverty which is consistent with the results of Beheshti's (2007) and Hasanzade's (2000) studies. Positive and significant coefficient of being rural or urban household on decreased poverty indicates the fact that household resided in urban regions of the province are in better welfare situation than rural household.

Statistic $\Phi(l)$ reported in the Table, indicates that if a household being able to reach to average level of explanatory values of the model, is above poverty line with probability of 63.5% and is considered as a non-poor household. Component A indicates that 59.9% of total changes in income following changes in exogenous variables are resulted from changes in income of non-poor household and 40.1% remainder is from changes in probability of joining poor household to non-poor household.

Table 5. Tobit model elasticities of estimation results

Variable	Elasticity of Index	Elasticity of E(Y)	Elasticity of total
dependency ratio	-0.425	-.304	-0.729
gender of household guardian	-0.754	-0.540	-1.294
educational expenses	0.134	0.096	0.220
health expenses	0.120	0.086	0.206
Urban - Rural	1.905	1.364	3.269

Source 5. Field Survey (2012)

Considering elasticities obtained in Table 5, poverty in rural areas of the province has more elasticity than variable of being rural or urban household and other variables in the table. Total elasticity for variable of dependency ratio is -0.729 indicating that if this variable decreases 1%, poverty may decrease -0.729%, ceteris paribus. Of this decrease, -0.304% is for probability of a household going from poor decile to non-poor decile and -0.425% is for probability of non-poor household being stayed above poverty line. Total elasticity for variable of gender of household guardian is -1.294 indicating that if this variable decreases 1%, probability of creating poverty may decrease -1.294%, ceteris paribus. Of this decrease, -0.754% is for probability of non-poor household being stayed above poverty line and -0.540% is for probability of joining poor household to non-poor household decile. According to the results of Table (5), there is an inverse

relationship between poverty and human capital so that according to elasticities estimated, total elasticity for variable of educational expense is 0.220 so if the variable increases 1%, rural poverty decreases 0.220%, ceteris paribus. Of this decrease, 0.096% is for probability of going household from poor decile to non-poor decile and 0.134% is the probability that household who are above poverty line being stayed in their place. Total elasticity for health expense variable is 0.206. This elasticity indicates that if this variable increases 1%, poverty may decrease 0.206%, ceteris paribus. Of this decrease, 120% is for probability of non-poor household being stayed in the same place and 0.086% is for probability of joining poor household to non-poor household. Total elasticity for variable of being rural-urban household is 3.269 indicating that if the variable increases 1%, poverty may decrease 3.269%, ceteris paribus. Of this decrease, 1.364% is probability of going household from poor group to non-poor group and 1.905% is probability of non-poor household being above of poverty line. Comparison of total elasticity related to different variables indicates that female guardian has the most effect on increased poverty and being urban household has the most effect on reduced poverty which is consistent with World Bank findings about poverty. World Bank by performing abundant studies about poverty analyzed the role of urbanization in creating as well as decreasing poverty scientifically. This international institution has performed more than 200 researches on this subject throughout the world at least 90% of them were in developing countries. Findings of World Bank indicate that 75% of the poor in third world are still living in rural areas.

Conclusion

To find development obstacles, in this research absolute poverty line has been estimated based on calorie need in 2010 to provide a required ground for poverty eradication in the province of Northern Khorasan. Estimation of poverty line indicates that annual poverty line for a typical household in the province was 13994549 Rial in 2010 so that 40% of its population is considered poor.

To study in detail the factors affecting on poverty, poverty is defined as a censored dependent variable. If household expenditures are under poverty line (being poor), the value is zero and if household expenditures are above poverty line this variable takes real values of expenditures. To measure poverty determinants, Tobit model has been used. The results indicate that all variables identified in the model except age of guardian are significant (in the level 99%). Variables of dependency ratio and gender (being female) of guardian have a direct relationship with poverty creation and variables of investment in human resources including educational and health expenses have negative effect on poverty expansion. Virtual variable of being rural and urban household is the most effective variable on poverty in the model.

Due to inequality of employment system, women are more vulnerable to unemployment and poverty than men. So poverty affects on female guardians more severely and they experience poverty more than their male counterparts because of limited availability to education, employment and health. On one hand, although rural women work in agriculture section, they don't consider employed in national statistics and on the other hand, insurances are based on participation in financing resources from payment of insurance premium so that female guardian are not able to be considered as direct and immediate insurance client until they are considered formal employed. So many women don't access to social security leading to poverty aggravation. Thus training plans on rural jobs such as farming and animal husbandry to increase efficiency and productivity of female guardians of rural household and plans to insurance cover of female guardian should be prioritized of supporting female guardians.

Since pure dependency ratio has direct effect on household poverty and pressure of dependency ratio in the household is sensible and heavy for employed members and guardian, it is suggested that employment system of the country should design a variety of models of dividing household labor considering proficiency and ability level according to Iranian culture as a solution to balance this problem in household and considering that employment is one of big economic subject.

Other results of the study consider the role and importance of variables of human capital in determining effective factors on poverty. To this purpose, educational and health expenses were introduced into the model. Health expenses are considered an investment affecting on household welfare by increased efficiency and productivity. This reflects the importance of government health support shelter and especially state health insurance covering low income people. Public education has positive effect on income from job by increasing productivity of low income people leading to their improved position in labor market. Consequently, income and welfare gap can be decreased through education. On the other hand, investment means costing today and obtaining income in future and since educational expenses cause higher income in the future, so these expenditures may mean investment and justify government presence and state expenditures in this area especially in higher education.

According to the results of the research, progressive movement of societies from agriculture section to more productive economic activities and obtaining higher income from other sections leads to decrease in absolute poverty. This phenomenon indicates the fact that agriculture in rural areas of Northern Khorasan

hasn't had adequate efficiency in production and providing income. So offering solutions to improve efficiency of agriculture section may seem necessary.

References

- Arabmazar A, Hosseininezhad M, 2004. Estimates of poverty in rural households of different job Iran. *Journal of Agricultural Economic and Development*. 113-140.
- Asogwa B, Ume J, Okwoche V, 2012. Estimating the Determinants of Poverty Depth among the Peri-Urban Farmers in Nigeria. *Journal of social Sciences*. 4:201-206.
- Becker G, 1964. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, New York: Columbia University Press.
- Becker G, Morphy R, Tamura R, 1990. Human capital, fertility and economic growth, *journal of political economy* 98.
- Datt GK, Simler MS, 2000. Determinants of poverty in Mozambique: 1996-97. FCND Discussion paper.
- Dercon S, Krishnan P, 1998. Changes in poverty in rural Ethiopia 1989-1995: measurement, robustness tests and decomposition. Working Paper Series 98:7. Centre for the Study of African Economies (CSAE). Oxford University.
- Dhmrhd M, Omrani M, Mohammadzadeh Z, 2009. Factors determining rural poverty and social changes in the region of Sistan. *Journal of Agricultural Economics Research*. 1: 21-42.
- Duclos J, Araar A, 2005. Poverty and equity: measurement" policy and estimation with DAD. Department Economique. Universte Laval. Quebec. Canada.
- Etim N, Patric I, 2010. Estimating the Determinants of Poverty among Fishing Households in Akwa Ibom State, Nigeria. *Journal of Agriculture and Social Sciences*. 6:24-28.
- Etim NA, 2010. Determinants of rural poverty among broiler farmers in Uyo, Nigeria: Implications for rural household food security. *Journal of Agriculture and Social Sciences*. 6:24-28.
- Ghorbani M, Dehghanian S, Firoozzare A, 2004. Effective socioeconomic factors on contracts between sugarbeet farmers and sugar factories of North-Khorasan province. *Journal of Science and agricultural industries*. 18:205-214.
- Hassanzadeh A, 1996. Factors Affecting Poverty: The Case of Iran. *Journal of Economic Research*. 135-183.
- Hekmati F, Fallahi S, Mohammadzadeh P, 2010. Survey poverty and its determinants among the urban households. *Journal of Economic Modeling Research*. 2:41-64.
- Hekmati F, Shoostarian A, 2007. Institutional determinants of rural poverty, rural poverty, with an emphasis on women in Fars Province, month Aban 8-9.
- Iran SCo. The results of the project expenditure and income of rural and urban households in North Khorasan Province.
- Jafari Sani M, Bakhshodeh M, 2008. Spatial distribution of poverty and food insecurity in rural and urban households. *Journal of Agricultural Economic and Development*. 103-123.
- Jamshidi F, Harandi F, 2008. How cute likelihood of employment among married women in rural and urban areas of individual and household characteristics. *Journal of Knowledge and Development*. 191-205.
- Kakwani N, 2003. *Issues in Setting Absolute Poverty Line, Poverty and Social Development Papers*, Asian Development Bank.
- Maddala G, 1983. *Limited-dependent and qualitative variables in econometrics*. Cambridge University Press, Cambridge, MA.
- McDonald J, Moffitt R, 1980. The Review of economics and statistics. 62:318-321.
- McDonald J, Moffitt R, 1982. The uses of Tobit analysis, *Rev. Econ. and Stat*. 62:318-321.
- Mehrsbani V, 2008. Impact of education on poverty and income inequality. *Journal of Economic Research*. 43: 1-15.
- Mukherjee S, Benson T, 2003. Thedeterminans of Poverty in Malaw, 1998. *Journal of World Development*. 31:339-358.
- Nili F, 1997. *Evolution of poverty, income and social welfare of the economy*. Tehran, Institute for Research in Planning and Development.
- Poortaheri M, Talebi H, Roknoddin A, 2010. Analysis of Social and economic factors affecting rural poverty reduction, with emphasis on food poverty: the city of Qom Khljstan, *Spatial Planning*. 15-19.
- Psacharopoulos J, Vvdhal M, 1994. *Education for Development: An Analysis of Investment selects*. Tehran, Plan and Budget Organization.
- Raghfr H, Sanei L, 2010. Measuring poverty in vulnerable households in Tehran: A method of identifying poor households. *Journal of Social Welfare*. 389-427.
- Ravallion M, 1997. *Comparing Poverty*.

- Ravallion M, 1998. Poverty Lines in Theory and Practice. LSMS Working paper, Washington D.C. The World Bank.
- Shooshtarian A, Najafi B, 2007. Estimates of poverty, as poverty and its determinants in rural and urban Iran. Journal of Agricultural Economic and Development. 1-24.
- Stephen S, Thorbeck E, 1991. Factor effecting food poverty in Gena. Journal of Developing studies. 28,:39-52.
- Tavassoli G, 1996. Sociology of Work and jobs. Tehran: Organization and Development of Human, (Samt).
- Tobin J, 1958. Estimation of relationships for limited dependent variables, Econometrica. 26:4-36.