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Determinants of Household Education Expenditures: Do Poor Spend Less on Education?

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Abstract

Accumulation of human capital is proved to be crucial for economic growth and poverty alleviation. Education is counted as one of the basic services that allows individuals to gain better skills and knowledge which enhances economic growth and is also essential to combat poverty. Although investment in education is mostly financed by the government, most of the families privately contribute to their children's education. Some of the researches argued that education expenditures depend on the income level of the households. From this point of view, private education can only be afforded by households who are at the higher income groups. Therefore, the focus of this study has twofold: One is to examine the determinants of education expenditure of Turkish households and the other is to reveal the impact of the different income groups on the education expenditures. Household Budget Survey (HBS) for the years 2002, 2010 and 2013 conducted by Turkish Statistic Institution (TurkStat) is utilized for Tobit model estimations. Findings show that higher Household income levels leads to higher educational expenditures. We also find that households with better human capital spend more on their children's education. For 002, however, income elasticity of education expenditure is higher compare for poorer households compared to the richer ones, which means that poor are more sensitive to income changes with respect to education expenditures. We do not find this for the year 2013.

Keywords: Education Expenditure, Poverty, Tobit estimation models, Turkey

JEL Classification: H52, I00, I24, I30

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1. INTRODUCTION

Reaching out to young individuals is very important in order to build a sound economic environment for future generations. Today's young individuals constitute tomorrow's adults and parents. These young individuals have the potential not only enhance the country's economic capacity, but also make an economic impact and place social pressure on the society. In that sense, as a major determinant of the human capital, education is one of the key factors for the economic growth. It is clear that the education increases the human capital inherent in the labor force. This increases labor productivity and growth. The increase in the quality and the level of the education of individuals help to foster the economic growth of the country.

Many governments' in the developing countries apply economic reforms to their education systems since investment in education is a crucial component for both economic growth and development and poverty alleviation. Besides the governments' acts on the education, many families contribute to their children education privately, as they see this option as a principal route for getting out of poverty. Therefore, private spending on education has an importance for human capital accumulation and it is crucial to focus on the relationship between the household income level and the educational expenditures.

Similar to other developing countries, Turkey also treats education as an essential component in facilitating development of individuals and whole society and the government not also mandates the legal period of education but has also increased public expenditures on education during the last two decades.

Although government provides a public school education for the children until the end of the high school, families can prefer private schools or private tutoring for improving their children human capital accumulation. In Turkey, for higher education, students have to enter a competitive national examination system and therefore, aside from the public expenditure on education, private spending of families is an important component for the country. In the literature, the importance of the income level of the households is widely discussed and it is mainly concluded that the private education and private expenditure on education is afforded by the richer families.

In this respect, in this paper we first examine the determinants of education expenditure of Turkish households and then reveal the impact of the different income groups on the education expenditures. For this purpose, we also estimate the income elasticity of educational expenditure of the households. In accordance with the expectations in the literature, we anticipate finding higher income group of households and/or more

educated households spend more on their children's education for Turkey. For the empirical analysis, the data retrieved from Household Budget Surveys (HBS) for the years 2002, 2010 and 2013 is used.

The present paper is organized as follows. The second section is dedicated to the literature review of the determinants of household education expenditure. Third section briefly explains the education system in Turkey and reveals some important issues for the education expenditure of the Turkey. Section 4 presents the data and methodology that our empirical investigation relies on. Section 5 includes the discussions of the empirical findings. And finally section 6 is the conclusion part.

2. DETERMINANTS OF HOUSEHOLD EDUCATION EXPENDITURES

Higher education achievements benefit both individuals and the society. These benefits could provide financial gains to individuals and also provide well-being for the society. The employment status and the gains from the labor market highly depend on the level of the education. The higher returns to education in the future make education more attractive for the individuals. Besides, not only individuals gain from the education, but also society profits from the education by sustaining economic growth.

Role of the education on growth and investment in education are discussed in the numerous studies in the literature. From Adam Smith to present, human capital accumulation is widely investigated in many theoretical and empirical studies. In the literature, education is taken as indicator of human capital in growth model (Solow, 1956), in endogenous growth model (Lucas, 1988) and also in total factor productivity model (Krugman, 1994). With all other empirical studies, these studies examine the role of education on the income level of the country. They conclude the existence of a strong positive linkage between the education and the growth[3].

Investment in education has two components, one driven by public and the other by individuals. . They have one common interest which is the accumulation of human capital (Acevedo and Salinas, 2000; Tilak, 1991).

There has been vast literature on the determinants of the education expenditure in many countries. Most of the studies in the literature found that the one of the prominent important factor that affects the expenditure of the education is the household's income level. Some of them show that higher income level leads to higher educational attainment

[3] For further studies about the roots of this issue, see: Becker, 1964; Mincer, 1974; Rees, 1979; Denison, 1967. There are also some other empirical studies on the role of education and growth, Psacharopoulos, 1994, 2006; Pritchett, 2001; Wilsom and Briscoe, 2004; Hanushek and Wößmann, 2010; Aghion et al, 2009; OECD, 2012.

(Blinder, 1998; Donkoh and Amikuzuno, 2011; Vu, 2012; Psacharapoulos et al, 1997; Qian and Smyth, 2010; Chung and Choe, 2001). However, as the demand for education differs in different countries, the effect of the household income on the spending on education is not same. While some reveal the income elasticity of richer households is negative and for middle income groups, is positive, the others find the opposite effect (Hashimoto and Health, 1995; Tansel and Bircan, 2006; Tilak, 2000, 2002; Fernandez and Rogerson, 2003; Psacharopoulos and Papakonstantinou, 2005). The regional dispersion of the country is also taken as an important component for all different countries. Rural and urban distinction plays a major role on the expenditure of the education, where expenditure on education is higher in the urban areas (Psacharopoulos et al, 1997; Kanellopolos and Psacharopoulos, 1997; Donkoh and Amikuzuno, 2011).

In addition, there are different studies that suggest household characteristics are crucial components of the household expenditure on education. Some of these characteristics are the education level and the employment status of parents, the number of children in the family, the school age of the children, health, and gender (Knight and Shi, 1996; Qian and Smyth, 2010; Choudhury, 2011; Lakshamanasamy, 2006; Tilak, 2002; Psacharopoulos, 1997; Psacharopoulos and Robert, 2000).

There exists a very few studies which examine the determinants of the education expenditure for Turkey based on our knowledge. This fact gives an opportunity for us to fulfill the gap of the issue with this paper. While mainly they remain as a descriptive analysis of the education spending in Turkey (Ayrangöl and Tekdere, 2014; Güngör and Göksu, 2013); they rarely focus on the determinants of the education expenditure (Owings et al, 2012; Tansel and Bircan, 2006). Aside from that, Gürler et al, (2007) focus on the determinants of education demand in Turkey and reveal that the number of children in the family and the education level of parents are positively affect the demand of education. The more educated parents and the higher income households, the more education demand for children. Çağlayan and Astar (2012) analyze the determinant of overall consumption expenditure of households and conclude that age increases the consumption expenditures in urban areas and also expenditures rise as the income increases.

3. EDUCATION: What do the numbers say for Turkey?

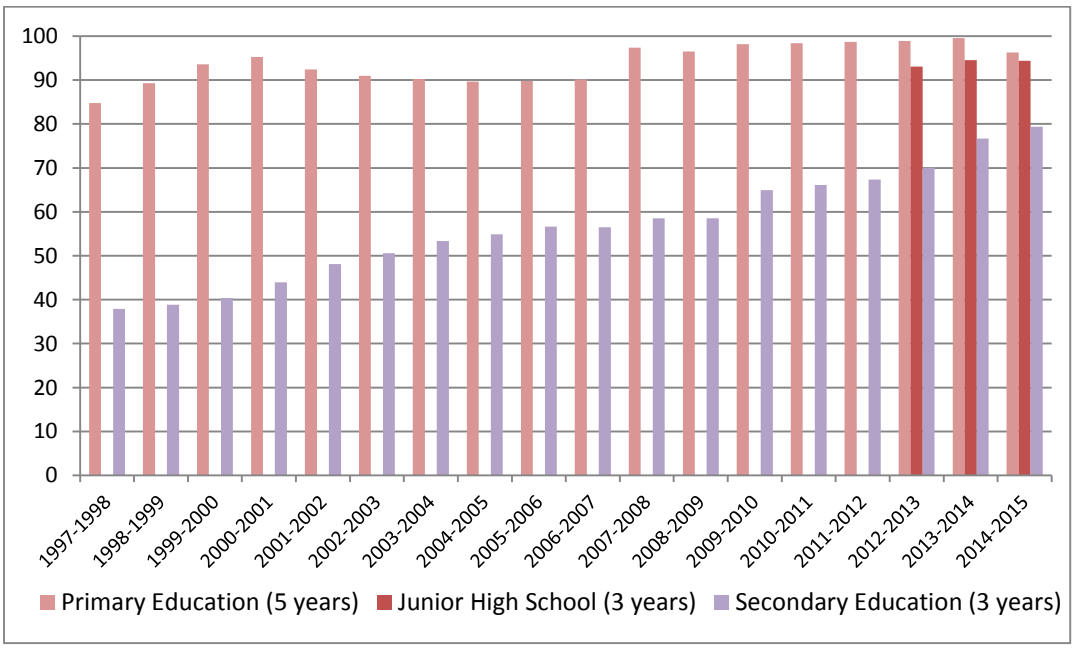
During the development process, financing the education is very crucial to build an accumulating area for the human capital. The public side of financial resources of the education is mainly based on central and local government. Ministry of the Education also provides resources to the public schools and universities. However, for a developing

country like Turkey, financing public education can be problematic due to lack of sufficient resources. Three major economic reforms were implemented in the years 1997, 2005 and 2012. The one main and common goal of these several reforms was to increase the quality and the quantity of education. The one important change was about the increase in years of compulsory education which was five years of primary schooling until the educational reform of 1997, when it was increased to eight years. During that time period, general high schools or vocational high schools were three years of studying which in 2005 was extended to four years. With the educational reform in 2012, compulsory education also covered high schools. Therefore, the extension of the compulsory schooling first to eight years and then to twelve years created longer times spent in compulsory education and lead to higher public and private finances on education.

A. Education Indicators: from where to where

During the last two decades, the change in the years of compulsory education increased the participation ratio of Turkish children and the numbers in Figure 1 shows this situation clearly. The schooling ratio of children aged between 5 and 8 years old in primary education is around 98% and between 8 and 14 years old in junior high schools is around 95%. There also has been an increasing trend for children who are aged between 14 and 18 years old in secondary schools which increased to 79% for the school year of 2014-2015. These ratios are higher compared to previous school years.

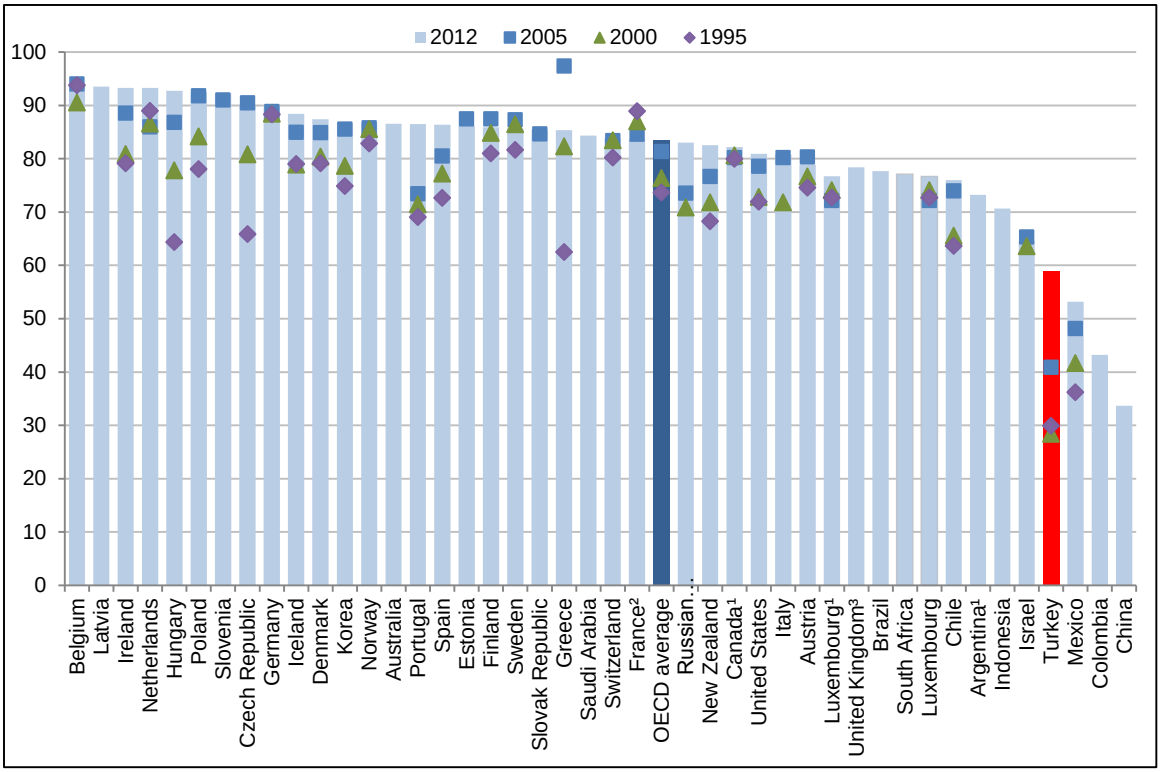
Figure 1: Schooling Ratio of different education levels (%)



Source: Authors calculations from the data set from TurkStat.

As seen from the Figure 1, it is clear that compulsory education system in Turkey helps increase the rate of students in the education throughout time. In Figure 2, the enrollment rates of children aged between 15 to 19 years old are given for the OECD countries. The enrollment rate in education has increased from the year 1995 to 2012 for all countries. The enrollment rate among 15-19 years old of Turkey increased from 29% in 2000 to 41% in 2005 to 59% in 2012 and yet is lower than the OECD average.

Figure 2: Enrollment rates of 15-19 years olds in public and private institutions for the years 1995, 2000, 2009 and 2012.



Source: OECD 2014, Education at a glance.

The participation rate of education and training in formal and non-formal education is depicted in Table 1 with the distinction by region, gender, age group and education attainment for the population over 18 years old. The reasons for participating in formal and non-formal education and training over the ages of 18 years old are due to improve and pursue a carrier (60.9%), and to increase knowledge and skills on a specific subject (33.4%) and to obtain a certificate (27.5%) (TurkStat, 2012).

The participation rate of the adults to the education is higher in urban areas compared to the rural ones. The rate of the participation in urban areas is twice as high than the rural areas for 2012. The participation rate of the adults in formal or non-formal education and training has the highest ratio for the aged between 18 and 24 years old. Among this group, participation to education or training around 46.6% while among 25-34 years old individuals is around 26.9% in 2012. These rates both increase from 2007 to 2012. Table

also shows that highest participation to formal and non-formal education is from the higher education graduates. The rate is around 48.4% while the same rate is only 8.7% for primary school graduates for the year 2012. The rate increase among 18-24 years old individuals indicates that the higher education in Turkey has an increasing trend in Turkey.

Table 1. Participation in education and training by region, gender, age group, education attained and labor status for the population aged over 18 years old.

	Participation in formal education		**Participation in non-formal education**		**Participation in formal *or* non-formal education**		**Participation in formal *and* non-formal education**	
	2007	**2012**	**2007**	**2012**	**2007**	**2012**	**2007**	**2012**
Total	**5.8**	**8.3**	**13.9**	**15.4**	**17.1**	**20.4**	**2.6**	**3,3**
Region								
Urban	7.2	10.1	15.0	17.8	19.1	23.9	3.1	4,0
Rural	2.6	4.1	11.2	10.1	12.5	12.6	1.3	1,6
Gender								
Male	7.2	9.8	17.3	17.5	21.4	23.7	3.2	3,6
Female	4.5	6.8	10.5	13.4	13.1	17.2	2.0	3,0
Age group								
18-24	24.5	33.9	26.0	26.7	39.7	46.6	10.7	14,1
25-34	5.5	9.6	18.0	20.9	21.1	26.9	2.4	3,5
35-54	0.8	2.0	11.6	14.4	12.0	15.6	0.4	0,8
55-64	0.1	0.2	4.4	5.4	4.4	5.6	-	0,0
65+	-	0.0	1.2	1.4	1.2	1.4	-	-
Education Attainment								
Not completed school	0.3	0.7	2.1	3.3	2.3	3.9	0.1	0.1
Primary school	0.4	0.9	6.4	8.0	6.7	8.7	0.1	0.2
Primary school & junior high school	5.8	12.4	13.8	14.4	18.1	23.2	1.5	3.6
General high school	22.3	24.2	28.8	26.2	41.2	40.2	9.9	10.2
Vocational or technical high school	15.1	17.4	27.7	26.6	35.4	36.5	7.4	7.5
Higher education	12.1	16.3	39.0	40.0	44.9	48.4	6.3	7.9
Labor Status								
Employed	5.2	7.7	20.1	21.1	23.1	26.0	2.3	2.9
Unemployed	10.3	13.1	27.6	19.2	31.5	26.6	6.4	5.8

Source: TurkStat, Education Statistics.

Another striking point is the participation rate of employed and unemployed individuals. For 2012, participation rate in formal or non-formal education is 26.0% for employed adults while it is 26.6% for unemployed ones. These numbers reveal that, both employed and unemployed individuals give importance to lifelong education and training and have an urge to accumulate their human capital even after they graduate from any school or even have a job.

Students prefer to attend more to public or private universities or courses in order to accumulate more human capital. Actually, this tendency is result from the labor market

conditions in Turkey. The labor market conditions in Turkey are commonly such that the earnings of the individuals are driven with the education level. The reports for the OECD countries show that the earnings premiums of the adults are higher in Turkey compared to OECD countries. On average, the adults graduated from tertiary education earned 91% more than the ones graduated from secondary education while the ones graduated from upper secondary education earned 37% than the ones graduated from below upper secondary education in 2012. The rate of these premiums are around 59% and 22% for OECD average, respectively (OECD, 2014). This fact motives the parents and the adults to get more education or training for their children and themselves. Therefore, if parents and individuals find public education not sufficient, they are likely to invest in private education, as the returns to education are high for Turkey.

B. Education Expenditure

The gains from education are typically higher for those with higher levels of education. There are a number of substantial components in the education expenditures. If a family sends the child to a private school, or starts private tutoring, education expenditures are more likely to be higher.

Both public and private returns to education make it more attractive to individuals. Public spending on education is positively correlated with the income level of the country. Table 2 shows the public spending on education as a percentage of GDP and as a percentage of government budget for Turkey.

Table 2: Education Expenditure of the Government

	Total Education Budget (Thousand TL)	**Total Education Expenditure as a Percentage of Central Government Budget**	**Total Education Expenditure as a Percentage of GDP**
1997	706.763	11.1	2.4
1998	1.635.534	11.1	2.3
1999	2.808.708	10.3	2.7
2000	4.396.875	9.4	2.6
2001	5.411.216	11.2	2.3
2002	9.956.959	10.1	2.8
2003	13.588.605	9.2	3.0
2004	16.748.713	11.1	3.0
2005	20.100.726	12.9	3.1
2006	22.414.968	12.8	3.0
2007	27.942.326	13.6	3.3
2008	30.233.850	13.6	3.2
2009	36.656.415	14.0	3.8
2010	37.592.870	13.1	3.4
2011	45.616.090	14.6	3.8
2012	51.912.982	14.8	3.7
2013	62.724.139	15.5	4.0
2014	72.643.827	16.7	4.2

Source: MONE, Total Budget includes Ministry of National Education, CoHE and Universities

As seen from Table 2, the share of education expenditure in government budget gradually increases over time. While the percentage of education expenditure in the budget was 11.1% in 1997, it reached 16.7% in 2014. Share of education expenditures as a percentage of GDP is also increasing over time, with around 4% in 2014 while it was only 2.4% in 1997. Although, the educational expenditure as a share of government budget and GDP has increased over time, Turkey spends less on education compared to average expenditure number of OECD countries (average of 6%) (OECD, 2014).

Table 3: Expenditure on educational institutions as a percentage of GDP and by education level

	Primary, Secondary and Post-Secondary Non-Tertiary Education				**Tertiary Education**				**All levels of education in Total**			
	1995	**2000**	**2005**	**2010**	**1995**	**2000**	**2005**	**2010**	**1995**	**2000**	**2005**	**2010**
Australia	3.4	3.6	3.7	4.3	1.6	1.4	1.5	1.6	5.0	5.2	5.3	6.1
Austria	4.2	3.9	3.7	3.6	1.2	1.1	1.3	1.5	6.1	5.5	5.5	5.8
Belgium		4.1	4.1	4.4		1.3	1.2	1.4		6.1	6.0	6.6
Canada	4.3	3.3	3.7	3.9	2.1	2.3	2.7	2.7	6.7	5.9	6.5	6.6
Chile			3.2	3.4			1.7	2.4			5.4	6.4
Czech Republic	3.3	2.7	2.9	2.8	0.9	0.8	1.0	1.2	4.8	4.0	4.5	4.7
Denmark	4.0	4.1	4.5	4.8	1.6	1.6	1.7	1.9	6.2	6.6	7.4	8.0
Estonia	4.9	4.5	4.0	3.9	1.1	1.2	1.3	1.6	6.7	6.2	5.8	6.0
Finland	4.0	3.6	3.9	4.1	1.9	1.7	1.7	1.9	6.3	5.6	6.0	6.5
France	4.5	4.3	4.0	4.1	1.4	1.3	1.3	1.5	6.6	6.4	6.0	6.3
Germany	3.4	3.3	3.2		1.1	1.1	1.1		5.1	4.9	5.0	
Greece	2.0	2.7	2.8		0.6	0.8	1.5		2.7	3.6	4.3	
Hungary	3.2	2.8	3.3	2.8	0.8	0.9	0.9	0.8	4.8	4.4	5.1	4.6
Iceland		4.8	5.4	4.9		1.1	1.2	1.2		7.1	8.0	7.7
Ireland	3.8	2.9	3.4	4.8	1.3	1.5	1.1	1.6	5.2	4.4	4.5	6.4
Israel	4.6	4.3	4.1	4.3	1.7	1.9	1.9	1.7	7.8	7.7	7.5	7.4
Italy	3.5	3.1	3.1	3.2	0.7	0.9	0.9	1.0	4.6	4.5	4.4	4.7
Japan	3.1	3.0	2.9	3.0	1.3	1.4	1.4	1.5	4.9	5.0	4.9	5.1
Korea		3.5	4.1	4.2		2.2	2.3	2.6		6.1	6.7	7.6
Luxembourg			3.7	3.5								
Mexico	3.7	3.5	4.0	4.0	1.0	1.0	1.2	1.4	5.1	5.0	5.9	6.2
Netherlands	3.4	3.4	3.8	4.1	1.6	1.4	1.5	1.7	5.4	5.1	5.8	6.3
New Zealand			4.6	5.1			1.5	1.6			6.5	7.3
Norway	5.0	5.0	5.1	5.1	1.9	1.6	1.7	1.7	6.9	6.8	7.5	7.6
Poland	3.6	3.9	3.7	3.7	0.8	1.1	1.6	1.5	5.2	5.6	5.9	5.8
Portugal	3.5	3.7	3.7	3.9	0.9	1.0	1.3	1.5	4.9	5.2	5.5	5.8
Slovak Republic	3.1	2.7	2.9	3.1	0.7	0.8	0.9	0.9	4.6	4.1	4.4	4.6
Slovenia			4.1	3.9			1.3	1.3			6.0	5.9
Spain	3.8	3.2	2.9	3.3	1.0	1.1	1.1	1.3	5.3	4.8	4.6	5.6
Sweden	4.1	4.2	4.2	4.0	1.5	1.6	1.6	1.8	6.0	6.3	6.4	6.5
Switzerland	3.8	4.0	4.2	4.0	1.1	1.1	1.4	1.3	5.2	5.4	5.9	5.6
Turkey	1.2	1.8		2.5	0.5	0.8		1.5	1.7	2.5	3.1	3.0
United Kingdom	3.6	3.6	4.4	4.8	1.1	1.0	1.3	1.4	5.2	4.9	5.9	6.5
United States	3.6	3.7	3.8	4.0	2.2	2.2	2.4	2.8	6.2	6.2	6.6	7.3
OECD average	3.6	3.6	3.8	3.9	1.2	1.3	1.5	1.6	5.4	5.4	5.8	6.3
EU21 average	3.7	3.5	3.6	3.8	1.1	1.1	1.3	1.4	5.3	5.2	5.5	5.9

Source: EuroStat database.

Table 3 indicates the differences in the public educational expenditure by different level of education. The share of the primary and secondary level of education is higher than

the tertiary level of education for nearly all OECD countries. Actually, this result is compatible with the expectations, as the primary and secondary level of education is a part of the compulsory education system in most of countries as well in Turkey. When we compare the numbers of Turkey with the OECD countries and European Union (EU21) countries, it is seen that the investment in Turkish education is below the average for all different education levels. While the overall education expenditure of Turkey is around 3% for the year 2010, this rate is around on average 6.3% for OECD countries and 5.9% for European Union counties.

Aside from the public expenditure on education, private investment is also another important factor where private funding as share of the education expenditure increased due to the families concern about the education. Table 4 reflects the annual total and private financial investment in education for different education levels for the year 2011. Table 4 includes both numbers for Turkey and the OECD countries on average.

Table 4: Financial Investment in Education for the year 2011

	Turkey	**OECD Average**	**Rank Among OECD countries**
Annual expenditure per student (in equivalent USD, using PPPs)			
Pre-primary education	2412	7428	33 of 36
Primary Education	2218	8296	35 of 38
Secondary Education	2736	9280	35 of 38
Tertiary Education	8193	13958	30 of 37
Share of private expenditure on educational institutions			
Pre-primary education	18%	19%	14 of 33
Primary, secondary and post-secondary non tertiary education	13%	9%	8 of 36
Tertiary education	m	31%	
All level of education	m	16%	

Source: OECD (2014), Education at a Glance.

Private expenditure on the education in Turkey is around 13% for primary, secondary and non-tertiary education levels in 2011, compared to 9% in OECD on average. The private expenditure on the education is t highest for pre-primary education, 18%, and not much below the OECD average. The annual expenditure per students is around 2400$ for pre-primary education and is around 2700$ for secondary education, and around 8100$ for tertiary education. The OECD countries on average spent much higher than Turkey for pre-primary, primary and secondary education levels, where the money spent per student is nearly three times higher than the Turkey.

4. DATA AND METHODOLOGY

As the main goal of this paper is about estimating the household education expenditures, Household Budget Surveys conducted by Turkish Statistical Institute (TurkStat) for the years of 2002, 2010 and 2013 are utilized and estimated with Tobit models.

The focus is to determine the factors that affect the household expenditure on education; hence we prefer to use a Tobit model in where the households with no education expenditure are also taken into consideration.

One major problem with the household expenditure data set is that some of the households did not consume some goods and services. The reason of lack of consumption on some specific goods and services could be result from different reasons. Commonly, expensive goods and services as well as habits of the households, lack of income play major roles on zero consumption. Therefore, a suitable model with missing observations for this data set has to be chosen carefully.

For the investigation of the determinants of the expenditure (dependent variable), using OLS (Ordinary Least Square) approach will cause biased results as the assumptions of the OLS regression will collapse with the zero values of the dependent variable. Therefore, Tobin (1958) introduced a model for this analysis, where he uses this method for revealing the determinants of household expenditure on durable goods[4] when there is censored or truncated data. In that sense, the most suitable method is a Tobit model for continuous dependent variable which is "limited" in the sense we observe it only it is above or below some specific level.

In literature, a Tobit model as the dependent variable has lower or upper limited values, is also called censored and/or truncated regression model (McDonald and Moffitt, 1980)[5]. Tobit model estimates the determinants by using Maximum Likelihood (ML) approach and these results are robust and unbiased under certain assumptions[6].

For the regression model of $y_i = \hat{\beta} x_i + u_i \quad i = 1, \ldots . N$, Tobit model can be expressed as follows:

$$y_i = \begin{cases} y_i^*, & \hat{\beta} x_i + u_i > 0 \\ 0, & \hat{\beta} x_i + u_i \leq 0 \end{cases} \qquad (1)$$

[4] The expenditure on durable goods could be zero until household income exceeds a specific level.
[5] In the regression model, dependent variable is *censored* if we observe only a certain range of observations for dependent variable while we can observe independent variables for all observation and dependent variable is *truncated* if we only observe observations of independent variables where dependent variable is not censored.
[6] Tobit models are estimated by using maximum likelihood method. This method assumes independence across observations. The ML estimator of coefficient of independent variable is consistent and asymptotically normally distributed. However, one weak point of this estimation is: the estimation relies on the one strong assumption which is assuming the latent error term is normally distributed and homoscedastic. If this assumption is violated, the results will be biased.

in where y_i^* is latent dependent variable, x_i is the vector of independent variables, $\hat{\beta}$ is the vector of coefficients, u_i is error term and N is the number of observations. The error term is independently distributed with zero mean and constant variance $u_i \cong N(0, \sigma^2)$. The model assumes that there is a stochastic index which is equal to:

$$y_t = \beta x_t + u_t$$

$$y_t = max\{y_t, L\} \quad (2)$$

Equation (2) is only observed when it is positive, therefore qualifies as an unobserved, latent variable. In the equation, L is the censored value.

Household Budget Survey (HBS) was used the empirical analysis. The data set combine the information collected through a survey conducted within different parts of the country. The dataset of HBS covers both individual and household level variables and the consumption expenditure of the households. Therefore, this survey not also covers the characteristics, socio-economic indicators and income of households, but also their expenditure of different goods and services[7]

Selected years 2002, 2010 and 2013 are examined in order to determine the factors of household expenditure on the education[8]. The annual income of the household, gender, age, the education level of parents, the number of children in the household, the employment status of the parents and regions are taken as independent variables. Therefore, Tobit model for the empirical analysis can be written as follows:

$$lnhouseholdeducationexpenditure = \beta_0 + \beta_1 lnhouseholdincome + \beta_2 (lnhouseholdincome)^2 + \beta_3 literate\_hhhead + \beta_4 primary5\_hhhead + \beta_5 primary8\_hhhead + \beta_6 highschool\_hhhead + \beta_7 highschoolvocational\_hhhead + \beta_8 uniplus\_hhhead + \beta_9 married\_hhhead + \beta_{10} divorced\_hhhead + \beta_{11} widow\_hhhead + \beta_{12} wageearner\_hhhead + \beta_{13} employer\_hhhead + \beta_{14} wageearner\_mother + \beta_{15} employer\_mother + \beta_{16} literate\_mother + \beta_{17} primary5\_mother + \beta_{18} primary8h\_mother + \beta_{19} highschool\_mother + \beta_{20} highschoolvocational\_mother + \beta_{21} uniplus\_mother + \beta_{22} children\_0005 + \beta_{23} children\_0610 + \beta_{24} children\_1117 + \beta_{25} children1822 + \beta_{26} urban + \varepsilon \quad (3)$$

[7] This dataset covers the entire of the all households within the borders of the Turkey. However, some of the individuals like the population in the aged home, elderly house, prisons, military barracks, private hospitals, hotels and child care centers together with the immigrant population are excluded from the data (TurkStat, 2014).

[8] The Turkish data is available from 2002-2013. To explore the difference between the initial and the final year, we chose the years 2002 and 2013. Besides, to examine the effects of the global financial crisis in 2009 on the households' expenditure behaviour, we add year 2010 to our empirical analysis.

The time period from 2002 to 2013 is very long time and Turkey experienced different economic and educational reforms and two different economic crises during this period. Therefore, in order to see the differences throughout the time period, we decide to run the Tobit model separately for the surveys. To do so, the distinction between the different years of Turkey will be explored.

Table 5 reports the brief descriptive summary of the households[9]. According to the general descriptive summary statistics in Table 5, numbers of households in the surveys seem to be stable, and vary from 9,500 and 10,100, which will one more comparable over time. Mean of household size has a decreasing trend for the investigated years, 4.25 in 2002, and 3.66 for 2013. Mean equivalent annual nominal income per household appears to increase steadily over time and is around 4,480 TL in 2002 and reaches to the 18,000 TL in 2013[10][11]. The equivalent mean annual education expenditure of the households is 35.05 TL in 2010 and 31.70 TL in 2013. percentage of GDP and as a percentage of government budgets. In addition to this, there may be another reason which is related to the change in high school entrance exam (SBS) in 2013. Before 2013, SBS was held at the end of 6th, 7th and 8th grades and therefore, most of the students get private tutoring from the private education centers for three years. PTC expenses constitute a significant part of the household budget. However, SBS was started to be held only at the end of 8th grade and thus students may not prefer going to PTC for three years. They may prefer going to PTCs only at 8th grade. Of course, this leads to a decrease in education expenditure

[9] Note that table 5, 6, 7 and 8 are calculated by using the households who have zero or positive value of educational expenditure.

[10] After 2003, the government of the Turkey decides to remove the six zeros from the Turkish Lira and create a new currency. Therefore, in the Table 5, the mean annual income of the households and the education expenditure values are expressed in terms of the old currency for the year 2002. Therefore, the value of 4480 TL in this sentence actually is 4480000000 TL.

[11] The equivalent income and education expenditure of the households are calculated for empirical analysis. Size of the households in the dataset differ and there may be one or more income earners. However, the literature on the inequality studies assumed that the total income of the households is shared equally within the same household, therefore, even the individuals with no income could benefit from the distributional effects of the total income within the same households. Therefore, in order to make the households comparable to each other, the equivalent income of the households is calculated by using an equivalent scale. In this paper, the scale is calculated as follows: $N = S^e \quad 0 \le e \le 1$ in where S is the household size, e is the elasticity of the scale rate with respect to household size. Commonly, the elasticity of scale is taken as a value of 0.5 in the literature (OECD, 1998 and Atkinson; 1995) and in order to make comparable this study with the others, the same value is used. Then, the disposable income for the individuals in the households is calculated as follows: $Y_{ij} = R_i / S_e$ where Ri and Yij is household total disposable income and equivalent disposable household income per individual (where i refers to households and j refers individuals).

Table 5: General Summary of the Samples

VARIABLES	2002				2010				2013			
	mean	sd	min	max	mean	sd	min	max	mean	sd	min	max
Regions												
Urban	0.85	0.360	0	1	0.67	0.464	0	1	0.701	0.458	0	1
Marital Status of Household head												
Married	0.88	0.321	0	1	0.86	0.352	0	1	0.85	0.360	0	1
Widow	0.08	0.271	0	1	0.09	0.290	0	1	0.09	0.284	0	1
Divorced	0.02	0.109	0	1	0.026	0.159	0	1	0.03	0.179	0	1
Education level of father (%)												
Literate	0.06	0.238	0	1	0.05	0.233	0	1	0.06	0.221	0	1
Primary education (5 years)	0.497	0.500	0	1	0.47	0.499	0	1	0.43	0.496	0	1
Primary education (8 years)	0.10	0.763	0	1	0.09	0.078	0	1	0.09	0.127	0	1
High school	0.11	0.312	0	1	0.08	0.275	0	1	0.08	0.281	0	1
Vocational High School	0.05	0.223	0	1	0.08	0.278	0	1	0.08	0.277	0	1
University and upper	0.09	0.287	0	1	0.12	0.325	0	1	0.15	0.357	0	1
Gender												
Male	0.89	0.301	0	1	0.85	0.353	0	1	0.87	0.341	0	1
Employment Status of household head												
Wage worker	0.46	0.498	0	1	0.42	0.494	0	1	0.44	0.496	0	1
Employer	0.06	0.232	0	1	0.04	0.194	0	1	0.04	0.196	0	1
Education level of mother												
Literate	0.06	0.235	0	1	0.06	0.241	0	1	0.06	0.246	0	1
Primary education (5 years)	0.44	0.497	0	1	0.38	0.487	0	1	0.37	0.482	0	1
Primary education (8 years)	0.003	0.0531	0	1	0.02	0.131	0	1	0.03	0.172	0	1
High school	0.06	0.249	0	1	0.04	0.188	0	1	0.06	0.235	0	1
Vocational High School	0.02	0.142	0	1	0.07	0.240	0	1	0.04	0.201	0	1
University and upper	0.03	0.176	0	1	0.06	0.226	0	1	0.08	0.268	0	1
Employment Status of mother												
Wage worker	0.06	0.245	0	1	0.11	0.308	0	1	0.13	0.335	0	1
Employer	0.001	0.029	0	1	0.02	0.042	0	1	0.003	0.0554	0	1
Number of children												
Age between 0 and 5 years old	0.46	0.737	0	6	0.29	0.589	0	5	0.33	0.636	0	7
Age between 6 and 10 years old	0.44	0.717	0	6	0.59	0.943	0	7	0.32	0.602	0	5
Age between 11 and 17 years old	0.64	0.929	0	7	0.32	0.630	0	6	0.51	0.825	0	6
Age between 18 and 22 years old	0.31	0.606	0	5	0.17	0.451	0	4	0.16	0.365	0	1
Income and expenditure per household (TL)												
Mean annual income	$4{,}48*10^9$	$6{,}33*10^9$	4525489	$2{,}83*10^{11}$	12845	13921	4.5	623595	18073	17864	3.401	539308
Mean annual education expenditure	4261258	$3.53*10^7$	0	$2.83*10^9$	35.059	80.94	0	2395.42	31.70	133.70	0	3537.5
Ln Mean annual income	21.90	0.763	15.33	26.37	9.202	0.705	1.504	13.34	9.557	0.687	1.224	13.20
Ln Mean annual income (squared)	480.1	33.50	234.9	695.3	85.17	12.91	2.262	178.0	91.81	13.00	1.499	174.2
Ln Mean annual education expenditure	2.121	5.484	0	21.76	2.130	1.820	0	7.781	1.070	1.839	0	8.171
Sample Household Size	4.25	2.010	1	20	3.789	1.902	1	20	3.659	1.837	1	24
Sample Household size (# of observation)	9555				10082				10060			

Source: Authors calculations from the data set of TurkStat for the years 2002, 2010 and 2013

The other summary statistics show, for all years, percentage of the households in the urban areas is higher than the rural ones. For 2002, household heads graduated from primary school (5 years) (49.7%), high school (11%), and from university or other institutions of higher education (9%). The same pattern is observed for the other two years. Nearly half of the household heads are wage earners for all investigated years but only 10% of the mothers are wage earners. The percentage of the married household head is around 85-90% and the number of the children aged between 6 and 10 and aged between 11 and 17 are higher than the other groups.

In addition, descriptive statistics of income and education expenditure per income quintiles are given in Table 6, 7 and 8 for years 2002, 2010 and 2013, respectively. The overall households in the sample divided into five different income quintiles. We also report natural logarithms as well as absolute values for income and education expenditure per income quintiles.

Table 6: Household Income and Education Expenditure per Quintile for the Year 2002.

	q1		q2		q3		q4		q5	
	Household Income	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**
N	1,996	1,996	1,955	1,955	1,993	1,993	1,859	1,859	1,751	1,751
mean	1.270.000.000	636.209	2.272.000.000	1.485.000	3.284.000.000	1.999.000	4.871.000.000	5.390.000	11.570.000.000	12.870.000
HH edu exp/HH income		***0,0001***		***0,0654***		***0,0609***		***0,1107***		***0,1112***
sd	397.100.000	6.685.000	254.800.000	8.989.000	348.200.000	11.670.000	613.200.000	19.550.000	12.180.000.000	77.390.000
min	0	0	1.833.000.000	0	2.720.000.000	0	3.927.000.000	0	6.082.000.000	
max	1.833.000.000	187.800.000	2.720.000.000	229.800.000	3.927.000.000	357.800.000	6.080.000.000	350.000.000	282.800.000.000	2.825.000.000
	Log Household Income	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**
N	1,994	1,996	1,955	1,955	1,993	1,993	1,859	1,859	1,751	1,751
mean	20.89	0.976	21.54	1.579	21,91	1.804	22,3	2.787	23,01	3.685
sd	0.430	3.641	0.113	4.697	0.106	5.028	0.125	6.225	0.470	7.046
min	15.33	0	21.33	0	21.72	0	22.09	0	22.53	0
max	21.33	19.05	21.72	19.25	22.09	19.70	22.53	19.67	26.37	21.76

Source: Authors calculations from the data set of TurkStat.

Table 7: Household Income and Education Expenditure per Quintile for the Year 2010.

	q1		q2		q3		q4		q5	
	Household Income	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**
N	2251	2251	2036	2036	1995	1995	1875	1875	1925	1925
mean	4196	11,1	7492	17,97	10418	24,54	14482	39,01	29543	88,2
HH edu exp/HH income		***0,265***		***0,240***		***0,236***		***0,269***		***0,299***
sd	1304	30,27	779,9	55,22	955,3	45,41	1491	82,56	24582	131,6
min	4,5	0	6137	0	8864	0	12216	0	17343	0
max	6135	883,9	8863	1652	12214	1138	17343	2395	623595	1797
	Log Household Income	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**
N	2251	2251	2036	2036	1995	1995	1875	1875	1925	1925
mean	8,274	1,195	8,916	1,626	9,247	2,036	9,575	2,536	10,18	3,46
sd	0,436	1,467	0,105	1,596	0,0917	1,681	0,102	1,722	0,404	1,758
min	1,504	0	8,722	0	9,09	0	9,411	0	9,761	0
max	8,722	6,784	9,09	7,41	9,41	7,037	9,761	7,781	13,34	7,494

Source: Authors calculations from the data set of TurkStat.

Table 8: Household Income and Education Expenditure per Quintile for the Year 2013.

	q1		q2		q3		q4		q5	
	Household Income	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**	**Household Income**	**HH Education Expenditure**
N	2357	2357	2128	2128	1975	1975	1758	1758	1842	1842
mean	6394	6,862	10931	11,87	15025	19,49	20569	29,55	42157	101,6
HH edu exp/HH income		***0,107***		***0,109***		***0,130***		***0,144***		***0,241***
sd	1803	72,45	1117	42,51	1301	56,79	2067	110,4	30038	259,8
min	3,402	0	8976	0	12863	0	17419	0	24889	0
max	8975	3333	12863	1000	17418	958,3	24885	3417	539308	3538
	Log Household Income	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**	**Log Household Income**	**Log Education Expenditure**
N	2357	2357	2128	2128	1975	1975	1758	1758	1842	1842
mean	8,701	0,428	9,294	0,771	9,614	1,082	9,927	1,328	10,54	1,979
sd	0,459	1,142	0,103	1,497	0,0868	1,747	0,0997	1,912	0,396	2,435
min	1,224	0	9,102	0	9,462	0	9,765	0	10,12	0
max	9,102	8,112	9,462	6,908	9,765	6,865	10,12	8,136	13,2	8,171

Source: Authors calculations from the data set of TurkStat.

The percentage of the education expenditure in the total equivalent household income is also calculated and written in italic at the third row of the tables. For all investigated years, it can be easily seen that at the highest quintile expenditure on education is nearly eight to ten times higher than one at the lowest quintile. For every quintile, percentage of education expenditure in 2013 is lower than the one in 2010, except the highest quintile. In the years 2010 and 2013, on average, percentage of the education expenditures in household income is nearly twice compared to the ones in 2002 for the highest quintile. Another striking point of the different income quintiles is the gap between the expenditure on education between the income quintiles. For instance, while the bottom 20% of income group spends 11.1 TL on average equivalent expenditure on education, the other quintiles spend 17.9, 24.5, 39.0 and 88.2 TL, respectively for the year 2010. This result indicates the existences of the huge gap between the highest quintile and the others. The same is true for the other two years.

5. EMPIRICAL RESULTS

This section introduces the empirical results obtained from the data for the investigated years 2002, 2010 and 2013, respectively. The primary aim of this paper is to explore the determinants of education expenditure of households in Turkey. In addition to this, examining whether there is a difference among income groups via education expenditure. As stated in the methodology section, Tobit model is utilized in this study. Table 9 depicts the parameter estimates from Tobit Model.

Natural logarithm of education expenditure of household is regressed with household income, household head's education level, marital status, gender, employment status as well as mother's education level, marital status, employment status, region (urban-rural), number of children age between 0-5, 6-10, 11-17,18-22. Aside from the income level of the household, all other independent variables are the dummy variables[12].

Table 9: Tobit Model Estimation Results

VARIABLES	2002	2010	2013
Income per household (TL)			
Ln equivalent hh income	49.41***	-0.769**	1.468***
	(18.55)	(0.365)	(0.102)
Ln equivalent hh income squared	-0.953**	0.111***	
	(0.418)	(0.0200)	
Education of Household Head			
Literate	-0.0790	-0.227**	-1.091***
	(2.208)	(0.114)	(0.320)

[12] Base category of these independent variables are chosen as illiterate, single, unpaid and illiterate household head, single household head, unpaid mother and rural areas, respectively.

Primary School (5 years)	1.485	0.144**	-0.319**
	(1.202)	(0.0656)	(0.154)
Primary School (8 years)	7.382	-0.426	-0.712
	(5.660)	(0.305)	(0.490)
High School	6.718***	0.523***	0.872***
	(1.568)	(0.0993)	(0.213)
Vocational High School	9.795***	0.537***	0.778***
	(1.906)	(0.0982)	(0.215)
University and upper	8.285***	0.679***	1.051***
	(1.782)	(0.101)	(0.213)
Marital Status			
Married	5.613*	-0.710***	0.474
	(3.140)	(0.153)	(0.350)
Divorced	6.301	-0.118	-0.0619
	(4.513)	(0.201)	(0.430)
Widowed	2.293	-1.001***	-0.711*
	(3.453)	(0.171)	(0.401)
Gender			
Male	-6.348***	0.772***	-0.840***
	(2.418)	(0.100)	(0.250)
Employment Status of Household Head			
Wage earner	3.101***	0.0277	0.743***
	(0.940)	(0.0536)	(0.119)
Employer	1.926	0.104	1.387***
	(1.743)	(0.121)	(0.247)
Employment Status of Mother			
Wage earner	3.077*	0.0596	0.297*
	(1.588)	(0.0803)	(0.159)
Employer	23.89***	-0.122	0.421
	(9.249)	(0.514)	(0.769)
Education Level of Mother			
Literate	0.927	0.0392	-0.145
	(1.981)	(0.103)	(0.263)
Primary School (5 years)	4.480***	0.185***	0.941***
	(1.092)	(0.0628)	(0.154)
Primary School (8 years)	-1.813	-0.0565	0.327
	(7.784)	(0.187)	(0.356)
High School	5.944***	0.391***	1.302***
	(1.781)	(0.109)	(0.244)
Vocational High School	3.566	0.354***	1.495***
	(2.739)	(0.132)	(0.269)
University and upper	4.338*	0.507***	1.480***
	(2.509)	(0.133)	(0.262)
Number of Children			
Age between 0 and 5 years old	-2.714***	-0.242***	-0.300***
	(0.662)	(0.0430)	(0.0921)

Age between 6 and 10 years old	4.215***	-0.0267	0.683***
	(0.600)	(0.0268)	(0.0885)
Age between 11 and 17 years old	6.065***	0.321***	1.207***
	(0.450)	(0.0376)	(0.0644)
Age between 18 and 22 years old	5.668***	0.411***	2.335***
	(0.643)	(0.0508)	(0.134)
Region			
Urban	3.711***	-0.204***	1.340***
	(1.257)	(0.0525)	(0.132)
Constant	-670.1***	-1.027	-19.01***
	(205.8)	(1.681)	(1.054)
Sigma	24.53***	2.153***	3.976***
	(0.612)	(0.0199)	(0.0598)
Observations	9,552	10,082	10,060

Source: Authors calculations from the data set of TurkStat for the years 2002, 2010 and 2013. Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1.

Since natural logarithm of household expenditure and income are used, coefficient on household income variable estimates the income elasticity of education expenditure. As seen at the first two rows from Table 9, natural logarithm of household income has statistically positive effect while square natural logarithm of household income has a negative effect on education expenditures for year 2002. In order to calculate the income elasticity of education expenditure for a given income level, the simple formula could be expressed as:$49{,}41 - 2 * 0.953 * \ln(\text{household income}))$[13]. It is seen that while the income of the household increases income elasticity of education expenditure decreases[14]. From different perspective, education expenditure of the higher income group households is not sensitive to changes in the income level. In other words, richer households do not change their education expenditure attitude too much when there is a change in their income. However, for the case of the poor households, elasticity is higher which means that they when there is a change at their income level, they are very sensitive to this change and their spending on education increases. On the other hand, if there is a decrease at their income level, their education expenditure decreases more than the magnitude of the decrease in income level.

[13] The income elasticity of education expenditure can be expressed as follows: the equation between education expenditure and household income is: $lnhouseholdeducationexpenditure = \beta_0 + \beta_1 lnhouseholdincome + \beta_2 (lnhouseholdincome)^2$, so the partial derivation of household education expenditure to household income could be written as $\frac{\partial(lny)}{\partial x} = \frac{\beta_1 + 2\beta_2 lnx}{x} \rightarrow \frac{\partial y}{\partial x} * \frac{x}{y} = \beta_1 + 2\beta_2 lnx$ in where the left part of the equation shows the income elasticity of the education expenditure.

14 The second partial derivation of the household education expenditure to household income is negative. That is why income elasticity of education expenditure decreases while the income of the household increases.

In order to calculate the income elasticity of education for each quintile separately, mean values of each quintile's household income is used. For the lowest quintile (income groups of the bottom 20% households), mean of household income of this group equals to 20.89 therefore the elasticity of education in the households of the first quintile is $(49{,}41 - 2 * 0.953 * 20.89) = 9.59$.

For the second quintile (for the income group of the 20% lower middle households), the elasticity of education of the household is equal to $(49{,}41 - 2 * 0.953 * 21.54) = 8.35$. The same exercise can be done for all other quintiles and the results are for third, fourth and fifth quintile. The income elasticities of these quintiles are 7.65, 6.9 and 5.5, respectively. As stated before, these calculations indicate that, at the lower quintiles, households are more sensitive to the change in the income while the responsiveness of the education expenditure to income is decreases at the upper levels of income.

In contrast to the results obtained for the year 2002, the Tobit models estimate another scenario for the year 2010 and 2013. For the year 2013, natural logarithm of household income and square natural logarithm of households are utilized; however, both of the coefficients become statistically insignificant. Yet, if only natural logarithm of household income is added to model, then it has statistically positive effect. It is due to the fact the function is not parabolic, but linear. Therefore, only the model with natural logarithm of household income is taken into account. Thus, for the year 2013, income elasticity of education expenditure is constant and positive. This means that as income elasticity is independent from income changes for this year. The income elasticity of the education expenditure of the year 2013 is equal to 1.468.

The Tobit model results of the year 2010 are also given in the same table. As observed from the table, the natural logarithm of household income has statistically negative effect while square natural logarithm of household income has a positive effect on education expenditure. Therefore, for this year the income elasticity of education expenditure for a given income level, the simple formula could be expressed as: $-0.769 + 2 * 0.111 * \ln(\text{household income})$. The results of the model give a clue while the income of the household increases income elasticity of education expenditure increases. From the formula of the elasticity, it is obtained that function has an inverse U-shape[15].

[15] At the highest turning point of the function, the partial derivation of the function will be equal to zero. Therefore if we derive the equation then, $\frac{\partial(lny)}{\partial x} = \frac{\beta_1 + 2\beta_2 lnx}{x} = 0$; we get $\frac{-0.769}{x} + \frac{2 * 0.111 * \ln x}{x} = 0$. If we solve the equation for x, the value of x will give the highest point. Then $x = 31.81$. That means all of the values which are lower than the 31.81 TL indicates that these values are at the left side of the inverse U-shape in where there is a decreasingly increasing trend. As the entire mean of household income of each quintile is lower than the 31.81 TL, they all remain at the left side of the highest point.

The income elasticity of education for the different income quintiles can be calculated by using the formula. For the lowest quintile, mean of the household income is 8.27. The income elasticity of educational expenditure of this quintile is equal to: $-0.769 + 2 * 0.111 * 8.27 = 1.066$. The mean of the household income for all other quintiles are 8.916, 9.247, 9.575 and 10.18, respectively. Then for the same quintiles, the elasticities of the education expenditure are found 1.21, 1.28, 1.36 and 1.49. The results of the year 2010 show that higher income groups are more sensitive to the change in the income than the other lower income quintiles. That means, not only income increases, the educational expenditure increases but also while income increases higher income groups tend to spend more on education than the other quintiles.

All the relation between the income and the education expenditure which is discussed for different income quintiles is summarized in table 10.

Table 10: Sensitivity of Education Expenditure to Income.

	As Income Increases		
	2002	**2010**	**2013**
Education Expenditure	Increases	Increases	Increases
Income elasticity of education expenditure	Decreases	Increases	Constant

Source: Authors calculations from the data set of TurkStat for the years 2002, 2010 and 2013.

For 2002, not only household head's education level but also mother's education level has significant positive effect on education expenditures. The higher education levels of the household heads have significant effect on the education expenditures of the household. Households whose heads were educated from less than high school, we do not find any difference compared to illiterates, as the coefficients are insignificant. The highest effect is result from the households whose household heads' graduated from vocational high school; they spend about 9 times more than those with illiterate households. For the case of education of the mothers, there are some differences. Only the primary (5 years of education), high school and university and plus graduates have a significant effect on education expenditures. Similar to household heads, the highest effect on the education expenditure is for those who graduated from high school. They spend nearly 6 times more than households where the mother is illiterate. The results of the education levels indicate that higher education of the parents (both father and mother) leads to higher education expenditure for the households. The results are consistent with the theoretical expectations. Well educated households tend to spend more on the education. Nearly the same is true for the year 2010 and 2013. Even the effects of the higher education levels of household head and mother are lower compared to year 2002, the trend is the same. Higher education of the parents yields higher

education expenditure while low educated parents have lower education expenditure. This leads to lower educated parents to have lower educated children, meaning is intergenerational educational mobility is low. Since income is highly dependent on education, low educated children will have lower income and they tend to spend less on education etc... This cycle will continue. In other words, it can be said that it is difficult for a person to move outside the income class of his/her family.

In order to reveal the household size, numbers of different age groups within the households are taken into account. For the year 2002, all results are statistically significant. As seen from Table 9, more children aged between 0 and 5 decreases the education expenditure of the household by 271 percent. Similar results are also found by Vu (2012) and Qian and Smyth (2010). The obtained results mean that small aged children cause households to spend less than the others as their children are not in the education age, and this result can be expected. In Turkey, mothers especially prefer to look after their children by themselves compared to sending them to a kindergarten. This case is mainly true for the children under the age two and/or three years old. However, having another child age between 6 and 10 years old increases the education expenditure by 422 percent. The highest value is for the age group of 11-17. This result is related to the fact that the cost of education is higher for 11-17 age groups. These children are probably students at secondary and high school.

It is also found that the household's head being a male has a significant negative effect on education expenditure. This is true for the years 2002 and 2013. For the year 2010, being a male has a significant positive effect on the educational expenditure of household. Living in urban areas has a positive significant effect on education expenditure for the years 2002 and 2013 where households living in urban areas spend 3.7 and 1.3 times more than those in rural areas for the year 2002 and 2013, respectively. Households in urban areas are more likely to make investment for their children since in urban areas it is more likely that education returns are higher. Surprisingly, for the year 2010, living in urban areas effect educational expenditure negatively, and households spend 0.2 times less than those in rural ones.

Employment statuses of household heads and mothers have significant effect on education expenditure for the year 2002. Households whose household heads are wage workers spend about 3.1 times more than the ones whose households are unpaid workers. For the case of the mothers, being self-employer has a positive significant effect on education expenditure and its effect is very high (23.89). Nearly very same results can be seen for the year 2013.

6. CONCLUSION

Relation between human capital and economic growth lead researchers to examine the resources of the human capital accumulation. Education is taken as one of the leading factor of the human capital. Therefore, the expenditure on the education and the quality and quantity of the education level gain importance especially for the developing countries.

The expenditure of the education is a combination of public and private spending. Although, governments control the compulsory education years and guarantee a certain level of education by public schools in many developing countries there is an inequality in the education. This inequality mainly depends on the fact of the inequality in education opportunities. The educational opportunities may differ among regions and households. Considering that education opportunities are mostly related to education expenditures which are done by government and households, examining the determinants that affect the households' expenditures are important.

One of the important findings in this paper is that for the year 2002 lower income families have higher income elasticity of education expenditure whereas the higher income families have lower income elasticity of education. In other words, lower income families (the ones who are at lower quintiles) are more sensitive to income changes. The opposite is true for the year 2010. Higher income groups are more sensitive to change in the income than the lower income groups. Therefore, even for both years, increase in income yields more spending on education, the sensitiveness of the different quintiles differs than each other. However, income elasticity of education expenditure is constant for the year 2013. The amount of change in education expenditure is constant as income changes.

The results of the paper reveal that in contrast to other countries, higher income groups tend to spend more on education in Turkey. Accumulation of human capital is seen as an important factor to get out of the poverty and that for all years; the poor spend less on education.

In addition, families whose household heads and mothers have higher education level are likely to invest more on education than the others. From this point of view, it can be stated that not only intergenerational educational mobility but also intergenerational income mobility is low in Turkey. Therefore, it is very difficult for children from poor families to "catch up" to higher income families. This will also result in low intergenerational socioeconomic mobility. In sum, policy makers in Turkey should take into account the equality of opportunity in education to ensure that children from low

education families have as much access to education as their wealthier counterparts; thus leading to higher intergenerational mobility in Turkey.

REFERENCES

Acemoglu, D., Aghion, P. and Zilibotti, F., (2002). "Distance to Frontier, Selection, and Economic Growth", *Journal of the European Economic Association*, Vol. 4(1), pages 37-74.

Acevedo, G.L. and Salinas, A., (2000), "Marginal Willingness to Pay for Education and the Determinants of Enrolment in Mexico", *World Bank Policy Research Working Paper* No. 2405, pages: 1-22.

Aghion, P., Boustan, L., Hoxby, C. and Vandenbussche, J., (2009), "The Causal Impact of Education on Economic Growth: Evidence from the United States" *Brookings Papers on Economic Activity*, Spring.

Ayrangöl, Z., and Tekdere, M., (2014), "Comparative Analysis of the Education Spending in Turkey and OECD Countries", *EUL Journal of Social Sciences*, Vol. 2, pages: 1-28, (in Turkish).

Becker, G. S. (1964), "Human Capital: A Theoretical and Empirical Analysis", with Special Reference to Education. New York: Columbia University Press.

Binder, M. (1998), "Family Background, Gender and Schooling in Mexico," *Journal of Development Economics*, 35, 54-71.

Çağlayan, E., & Astar, M. (2012). "A Microeconometric Analysis of Household Consumption Expenditure Determinants For Both Rural And Urban Areas In Turkey", American International Journal of Contemporary Research. 2012; Vol 2 (2), pages 27-34.

Choudhury, P. K. (2011), "Patterns and Determinants of Household Expenditure on Engineering Education in Delhi", *Rethinking Development in an Age of Scarcity and Uncertainty, New Values, Vocies and Alliances for Increased Resilience.*

Chung, Y. S., and Choe, M. K., (2001), "Sources of family income and expenditure on children's private, after-school education in Korea", International Journal of Consumer Studies, Vol. 25 (3), pages: 193-199.

Donkoh, S. A. and Amikuzuno, J. A. (2011), "The Determinants of Household Education Expenditure in Ghana", *Educational Research and Reviews*, Vol. 6(8), pages: 570-579.

Denison, E. F., (1967), "Why Growth Rates Differ: Postwar Experience in Nine Western Countries", Washington, DC: Brookings Institution.

Fernandez, and Rogerson, R., (2003), "The Determinants of Public Education Expenditures: Longer-Run Evidence from the States," *Journal of Education Finance*, Vol. 27, pages: 567-584.

Güngör, G. and Göksu, A., (2013), "Education Finance in Turkey and Intercountry Comparsion", *Yönetim ve Ekonomi*, Vol. 20, pages: 59-72, (in Turkish).

Gürler, Ö. K., Turgutlu, T., Kırcı, N. and Üçdoğruk, Ş., (2007), "Determinants of Education Demand in Turkey", *Finans, Politik ve Ekonomik Yorumlar*, Vol. 44 (512), pages: 89-101, (in Turkish).

Hanushek E. A. and Wößmann, L., (2007), "The Role of Education Quality in Economic Growth", *World Bank Policy Research Working Paper*, Number 4122.

Hanushek, E. A. and Wößmann, L., (2010), "Education and Growth", *Economics of Education*, Elsevier, pages: 60-67.

Hashimoto, K., and Health, J. A., (1995), "Income Elasticities of Educational Expenditure by Income Class: The Case of Japanese Households", *Economics of Education Review*, Vol.14, pages: 63-71.

Kanellopoulos, C. and Psacharopoulos, G., (1997), "Private Education Expenditure in a Free Education Country: The Case of Greece", International Journalof Educational Development, Vol. 17 (1), pages: 73-81. **,**

Knight, J. and Shi, L., (1996), "Educational Attainment and the Rural-Urban Divide in China," *Oxford Bulletin of Economics and Statistics*, Vol. 58, pages: 83-117.

Krueger, A. and Lindahl, M., (2001), "Education for Growth: Why and for Whom?" *Journal of Economic Literature*, Vol. 39, pages 1101-1136.

Krugman, P., (1994), "The Myth of Asian's Miracle" *Foreign Affairs*, Vol. 73, pages: 67-78.

Lakshmanasamy, T., (2006), "Demand for Higher Education and Willingness to Pay: An Econometric Analysis using Contingent Valuation Method," *Manpower Journal*, Vol. 4, pages: 97-120.

Lucas, R., (1988), "On the Mechanics of Economic Development", *Journal of Monetary Economics*, Vol. 22, pages 3-42.

McDonald, J. F., and Miffitt, R. A. (1980), "The Uses of Tobit Analysis", *The Review of Economics and Statistics,* Vol. 62 (2), pages: 318-321

Mincer, J., (1974), "Schooling, Experience, and Earnings". New York: Columbia University Press.

OECD, (2012), "How does education affect the economy?", in Education at a Glance 2012: Highlights, OECD Publishing.

OECD, (2014), Education at a Glance 2014, OECD Publishing.

Owings, W. A., Kaplan, L. S., and Pırım, Z., (2012), "Education as an Investment in Turkey's Human Capital: A Work in Progress", *Eurasian Journal of Business and Economics*, Vol. 5 (10), pages: 45-70.

Psacharopoulos, G. (1994) "Returns to Investment in Education: A Global Update." *World Development*, Vol. 22 (9), pages: 1325-1343.

Psacharapoulos, G., Arieira, C. R. and Mattson, R. (1997), "Private Education in a Poor Country: The Case of Urban Bolivia", Economics of Education Review, Vol. 16, No. 4, pp. 395-406.

Psacharopoulos, G. and Mattson, R., (2000)), "Family Size, Education Expenditure and Attainment in a Poor Country." *Journal of Educational Planning and Administration*, Vol. 14 (2), pages: 169-186.

Psacharopoulos, G. and Papakonstantinou, G., (2005), "The Real University Cost in a Free Higher Education Country", Economics of Education Review, Vol.24, pages: 103-108.

Psacharopoulos, G. (2006) "World Bank Policy on Education: A Personal Account", *International Journal of Educational Development*, Vol. 26 (3), pages 329-338.

Pritchett, L., (2001) "Where Has All the Education Gone?" World Bank Economic Review, Vol. 15 (3), pages 367-391.

Qian, J. and Smyth. R., (2010), "Educational Expenditure in Urban China: Income Effects, Family Characteristics and the Demand for Domestic and Overseas Education," *Applied Economics,* pages: 1-16.

Rees, A., (1979), "The Economics of Work and Pay (2nd ed.)", New York: Harper and Row.

Solow, R. M., (1956), "A Contribution to the Theory of Economic Growth", *Quarterly Journal of Economics*, Vol. 70 (1), pages 65-94.

Tansel, A. and F. Bircan. (2006), "Demand for Education in Turkey: a Tobit Analysis of Private Tutoring Expenditures," *Economics of Education Review,* Vol. 25, pages: 303 - 13.

Tilak, J. B. G., (1991), "Family and Government Investments in Education" *International Journal of Educational Development*, Vol. 11 (2), pages: 91-106.

Tilak, J. B. G., (2000), "Household Expenditure on Education in India: A Preliminary Explanation of the 52nd Round of the National Sample Survey," NIEPA, New Delhi.

Tilak, J.B.G., (2002), "Determinants of Household Expenditure on Education in Rural India," *NCAER Working Paper Series*, No.88.

Tobin, J., (1958), "Estimation of Relationships for Limited Dependent Variables", *Econometrica*, Vol. 26, pages: 24-36.

TurkStat, (2012), "Adult Education Survey- Period : 2012", *Press Releases*.

Vu Q. H., (2012), "Determinants of Educational Expenditure in Vietnam", *International Journal of Applied Economics,* Vol. 9(1), *pages: 59-72*.

Wilson, R. A. and Briscoe, G. (2004) "The Impact of Human Capital on Economic Growth: A Review." in P. Descy and M. Tesssaruy (Eds.), Impact of Education and Training. Third Report on Vocational Training Research in Europe: Background Report. Luxembourg: Office for Official Publication of the European Communities 2004, Cedefop Reference Series, 54.