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Abstract

Using Turkish Household Budget Surveys from 2003, 2007 and 2012, this paper investigates the determinants of household education expenditures within an Engel curve framework. In particular, we estimate Tobit regressions of real educational expenditures by income groups using a number of household characteristics (i.e. rural residence, employment status, age, educational attainment of the household head, household size, share of female students and primary school students in the household, and total number of students in the household) to examine if and to what extent the determinants of educational expenditures differ by income groups; income elasticities of educational spending evolves over time; and children from middle-class and poor families can benefit enough from educational opportunities. The estimated expenditure elasticities have lower values for the top- and the bottom-income quartiles while they have larger values for the middle-income quartiles. The results also show that for all income groups the expenditure elasticity of education increases over time, indicating that Turkish households allocates greater share of their budgets to education expenditures.

JEL Classifications: I20; I21; I22

Keywords: Household education expenditures, Engel curve, income elasticity, educational demand, Tobit, Turkey

ملخص

باستخدام مسوحات ميزانية الأسرة التركية في الفترة من 2003 و 2007 و 2012، تبحث هذه الورقة محددات نفقات التعليم المنزلي ضمن إطار منحنى إنجل. وعلى وجه الخصوص، نقدر انحدارات طوبيت للنفقات التعليمية الحقيقية من خلال فئات الدخل باستخدام عدد من خصائص الأسر (أي السكن في المناطق الريفية، والوضع الوظيفي، العمر، المستوى التعليمي لرب الأسرة، حجم الأسرة، وحصة الطالبات والطلاب في المدارس الابتدائية في المنزلية، والعدد الإجمالي للطلاب في المنزل) لفحص ما إذا، وإلى أي مدى تختلف محددات النفقات التعليمية من قبل فئات الدخل. تتطور مرونة الدخل من الإنفاق على التعليم مع مرور الوقت. والأطفال من الطبقة المتوسطة والأسر الفقيرة يمكن أن تستفيد بما فيه الكفاية من الفرص التعليمية. مرونة النفقات المقدرة لديها قيم أقل أعلى- والربعية أسفل الدخل بينما لديهم قيم أكبر لالربعية المتوسطة الدخل. تظهر النتائج أيضا أن لجميع فئات الدخل مرونة الإنفاق من التعليم والتي تزيد مع مرور الوقت، مشيرا إلى أن الأسر التركية تخصص حصة أكبر من ميزانياتها لنفقات التعليم.

1. Introduction

Turkey has a potential demographic window of opportunity for economic growth, given that the share of working age population in total has been rising and is expected to continue to do so until 2040. The number of working age people is projected to expand by 800,000, on average, each year in the coming decades. In order to reap the so-called demographic dividend potential, the job creation performance of the economy should be capable of absorbing the new entrants into the labor market, which necessitates enhancing their knowledge and skill levels through high-quality education.

Despite some improvements over the recent years, Turkey's educational outlook is still bleak. Average years of schooling for the adult population is only seven years, falling well below the levels in developed countries. Nevertheless, with the extension of compulsory education from five to eight years in 1997 and twelve years in 2011, new entrants to the market are expected to raise average years of schooling of the workforce in the near future. The introduction of 8-Year Basic Education Program in 1997 also contributed significantly to enrollment rates at elementary and secondary schools, which have reached comparable levels with those in developed economies. Notwithstanding, only little progress has been recorded on the qualitative front. According to the 2012 Program for International Student Assessment (PISA) report, Turkish students performed the second poorest after Mexico among OECD countries in math, science and reading tests. Henceforth, Turkey's next and topmost challenge now is to improve the quality and equity of its education system at all levels, which requires more and better investment. As a matter of fact, both public and private spending on education has been rising in Turkey. Thanks to the fiscal discipline secured after the 2001 economic crisis reducing the budget deficit, debt ratio, and public sector borrowing requirement, the government created larger room for increasing its non-interest expenditures and started spending more on basic services, such as health and education. Accompanied by the country's changing demographic structure and the government's decision to extend the years of compulsory education, the share of education expenditures in total government spending increased from 6.5 percent in 2002 to 9 percent in 2012.

In the meantime, private out of pocket spending on education has also grown. The share of education spending in households' total expenditures rose from 2 percent in 2003 to 2.4 percent in 2012. The reasons are mainly twofold. Firstly, per capita income more than tripled from 3,000 USD in 2001 to approximately 11,000 USD in 2012, and the number of middle class households expanded by around twenty percent. New members of the middle class that used to be poor started to spend more on education. Proportionately, the number of households which can afford the cost of private education increased. Secondly, the government has undertaken initiatives to support private schooling, providing financial incentives to families. The Ministry of National Education (MoNE) subsidizes the per student cost of private kindergarten education by 2,500 Turkish liras (TL), 3,000 TL for private primary school, and 3,500 for private high schools, which on average make up around twenty percent of full tuition. Respectively, the share of students attending private schools more than doubled from 1.74 percent to 4.13 percent, and the share of private schools rose from 2.97 percent to 7.18 percent from 2002-2003 to 2012-2013.

Against this framework, the aim of this paper is to investigate the determinants of household education expenditures and to see whether income elasticity of education expenditure has increased throughout the period in line with the ongoing privatization of the education system. In the event that privatization and subsidization policies have extended the gap in quality of education between the private and public schools, income inequality in the long-run will be inevitable. Given the facts that intergenerational educational mobility in Turkey is one of the lowest among the

OECD countries, with 66 percent of young people having only the same level of education as their parents and with education level being one of the most important determinants of his/her income level, there is a high chance that the low level of intergenerational mobility in education would translate into a low level of intergenerational mobility in income. This means that the children of poor families are destined to have lower income than children of affluent families in the future (Davies, Zhang, and Zeng 2005). Thus, the growth of private schooling could aggravate the already low levels of intergenerational mobility in education and income.

We use data from 2003, 2007 and 2012 Turkish Household Budget Surveys, and estimate Tobit regressions of real educational expenditures by income groups using a number of household characteristics (i.e., rural residence, employment status, age, educational attainment of the household head, household size, share of female students and primary school students in the household, and total number of students in the household). In particular, we seek to find out whether the determinants of educational expenditures differ by income groups; to what extent and in which direction, if income elasticities of educational expenditures have evolved over time; and children from middle-class and poor families were able to benefit enough from the expansion of educational opportunities. To this end, we employed two functional specifications of Engel curves: the double logarithmic form and the Working-Leser form.

The contribution of this study is threefold. First, the paper focuses on the demand for education rather than the supply-side factors, which have drawn rather more interest in the literature. Moreover, we concentrate on the determinants of educational expenditures, unlike traditional studies that typically consider the determinants of educational attainment. As pointed out by Qian and Smyth (2010), educational attainment depends also on the child's personal characteristics, such as performance at school (child's ability), and thus only partially explains the demand for education. On the other hand, focusing on education expenditures has the advantage that it directly reflects parents' willingness to pay for improving their children's educational opportunities. Second, and to the best of our knowledge, there are only a few studies on the determinants of educational expenditures in Turkey (Tansel, 2002; Tansel and Bircan, 2006). Third, unlike existing studies that employ OLS or standard logistic regression models, this paper is conducted using a Tobit model that considers and corrects for the possible left-censoring in the data, given the fact that many poor families are in fact characterized by zero educational expenditures.

In the remainder of the paper, an overview of the educational system in Turkey is presented in Section 2. Section 3 reviews existing literature, and Section 4 describes the data and model. Then, Section 5 presents the empirical results and discussion. The last section concludes.

2. An Overview of Education Policies in Turkey

Turkey has a youthful population of 77.7 million, with 24.3 percent of its people less than 15 years old - the youngest population in Europe. As naturally experienced by every society, Turkey is also undergoing a demographic transition process that refers to the transition from high birth and death rates to low birth and death rates as countries move from a pre-industrial to an industrialized economic system. At a certain stage of the transition in which total fertility rate is declining, working-age population is growing while the old cohort is still small, a demographic window of opportunity for economic growth, or a *demographic dividend,* is created. According to UN projections, the demographic window of opportunity for Turkey opened up in 2005 and will stay strong through 2040. To profit from this demographic window or cash the demographic dividend, Turkey needs to improve the quality and equity of its education system, which constitutes a major concern and bottleneck for the country's growth potential, in the first place.

As the human capital theory claims, better education implies improved productivity and income, hence a better quality of life and a healthier and better nourished population. Departing from this paradigm, Turkish modernization was modeled as a state-centric educational project in the establishment of the Republic (Çelik, 2014). Towards the ultimate goal of Turkey becoming a developed western-style democratic state, education policy was valued as a key instrument. In this respect, the Law for the Unification of Education was enacted on March 3, 1924. This Law was one of the most important educational reforms of this period and unified all educational institutions (traditional dual education system) under the umbrella of the Ministry of National Education (MoNE).

As was the case before[1] and in the beginning of the Republican period, education is still a central focus in public policy debates. One of the most important reforms in the Turkish education system has been the extension of the compulsory primary education from five to eight years in August 1997. The main objective of the eight-year program was to enhance education opportunities for all children since continuing schooling has been shown to be closely associated with family income. According to the Ministry of Development, the last 35 percent segment or the poorest confront many economic barriers to maintain their children in school, even when there are no school fees (Dulger, 2004).

Another major large-scale reform in the Turkish education system, known as "constructivist education reform," was put into action in 2005. The reform entails extension of the secondary school from three to four years; implementation of a new curriculum for elementary education in the fields of science, social studies, mathematics and Turkish, and improvement of the curriculum for all grades. Together with the improvements in the early childhood and primary education curriculum, the eight-year system got more effective. Net schooling rate[2] in primary education climbed slowly but steadily by 5 percentage points between 1997-98 and 2004-05 school years from 84.7 to 89.7 percent, and reached an all-time high of 98.7 percent coverage in 2011-2012. Concurrently, the net enrollment rate for secondary education increased substantially from 37.9 percent in 1997-98 to 67.9 percent in 2011-2012.

Despite the promising performance of the eight-year compulsory primary education system, the Grand National Assembly passed a sudden radical legislation in March 2012, usually termed by the public as "4+4+4 Law." Under the provisions of the new law, compulsory education is extended to 12 years and split into three levels of four years each, students are allowed to enter technical or vocational schools as early as fifth grade, and age of entry to primary school is lowered to 66 months. In the aftermath of its implementation, net schooling ratio in primary education decreased by 2.6 percent between 2012-13 and 2014-15 school years and remained almost at the same level in lower secondary education and increased by about 9 percentage points in upper secondary education.

The new system seems to mostly affect the pre-primary schooling rates, which is still not compulsory. In contrast to the target set in the 10th Development Plan of achieving 70 percent preschool enrollment rate for the four to five year olds by the end of 2018 (2010-2014 Strategic

[1] The first innovative movements in education took place between 1776 and 1839. Some of these innovative movements: military schools were established, Western languages appeared in curricula for the first time, compulsory elementary educations were put into practice in 1824, French military officers were invited to Turkey to train the army and students were sent to France for the first time in 1826. The second movement commenced after Tanzimat Fermanı in 1839. With Tanzimat era, different types of schools were established to modernize the education system in accordance with Western systems. (Basic Education in Turkey: Background Report", Ministry of National Education, June 2005)

[2] Net schooling rate: ratio of children of official school age who are enrolled in school to the population of the corresponding official school age.

Plan of the Turkish Ministry of Education (MoNE) also has a similar target), there has been a dramatic fall. According to the MoNE statistics, net schooling rates declined from 31 to 28 percent for the 3-5 age group and from 44 to 38 percent for the 4-5 age group in the 2013-14 academic year compared to the previous year (ERI, 2013). There exists strong evidence in the literature (Berlinski, et al., 2009; Sylva, et al. 2010) that high quality pre-primary education has a lasting and positive effect on children's later cognitive, language and social development.

In addition to curricular changes underway, a fundamental structural reform initiative was introduced in 2004 intending to decentralize primary and secondary education. Indeed, Turkey has the most highly centralized educational system among OECD countries where education in all types of schools is centrally governed by the MoNE. The Ministry makes all policy decisions, arranges all aspects of the formal curriculum, and controls implementation with the help of provincial offices. By the above mentioned structural reform, local authorities are given increased roles and responsibilities for the provision of basic public services in formal education (Aksit, 2007). However, it was argued that such a decentralized model would contribute to existing inequalities in the provision of educational opportunity, and bias the principle of a unified education system since students would no longer have equal access to a common curriculum or achieve similar levels of competency.

Although Turkey has significantly expanded access to education in the last decade, critical challenges await on quality and equity issues. On the qualitative front, PISA (Programme for International Student Assessment)[3] data allows evaluating Turkey's performance. According to the 2012 PISA data, Turkey ranks 44th for math, 42nd for reading skills and 43rd for science skills among 65 countries. Boys scored higher than girls like previous years. Furthermore, the percentage of total students who remain below the minimum qualification level (level 2) in math was still very high, and the percentage of those who are top performers (level 5 or 6) was very low in Turkey: 42 percent of students who were surveyed couldn't answer basic math questions in contrast to the OECD average of 23.1 percent. And the top performers in math (level 5 or level 6) comprised only 5.9 percent of total students in Turkey, while it was 12.6 percent for OECD average.

In regards to intergenerational education mobility, Turkey again lags behind the OECD countries. In Turkey, 66 percent of students who participated in survey[4] have the same level of educational attainment of their parents, which puts Turkey at the second lowest rank among OECD countries (Figure 1) after the Slovak Republic. As long as the link between family background and educational opportunity stays strong, education policies cannot effectively solve equity issues.

On the education expenditures front, since 2003 the government has been consistently increasing the amount spent on education both in absolute terms and as a share of central government budget (Figure 2). The central government's education expenditures increased from 10 billion TL (7 percent of total) in 2003 to more than 55 billion TL (13 percent of total) in 2014. The majority of the increased education budget was spent on building more schools and classrooms. The number

[3] PISA 2012 survey assessed the competencies of 15-year-olds in reading, mathematics and science (with a focus on math) in 65 countries and economies. More than five hundred thousand students between the ages of 15 years 3 months and 16 years 2 months participated in PISA 2012 as a whole, representing about 28 million 15 year-olds globally. The students took a paper-based test that lasted 2 hours. The tests were a mixture of open-ended and multiple-choice questions that were organized in groups based on a passage setting out a real-life situation. A total of about 390 minutes of test items were covered. Students took different combinations of different tests. They and their school principals also answered questionnaires to provide information about the students' backgrounds, schools and learning experiences and about the broader school system and learning environment. (http://www.oecd.org/pisa/keyfindings/pisa-2012-results.htm, 09.07.2015)

[4] European Labor Force Survey; conducted annually by Eurostat and surveys 1.5 million people across Europe. For further information see Aslankurt, B. (2013).

of new classrooms built has increased by more than 230,000 since 2002. The need for extra classrooms emerged mainly after the reforms that extended the number of years of compulsory education. The cost of the most recent education reform act called 4+4+4 is calculated as more than 50 percent of the central government's education budget in 2012.

Despite the increase in education expenditures of the central government, education expenditure per student both at the primary and secondary level are significantly lower than the OECD average (Figure 3).

In the majority of OECD countries, the share of private sources in total education expenditures is less than it is in Turkey (Figure 4). In 2011, 13 percent of all education expenditures are made by households. The high share of private expenditures in total is a major underlying factor of the gap between educational outcomes of the students coming from poor and affluent families.

The high share of private sources in total education expenditures is mainly due to the dual institutional structure of the Turkish education system. On the one end, there are public schools and on the other end there are private schools and dershanes, which are institutions that offer courses to the students specifically for national high school and university examinations.

According to MoNe statistics, the number of private schools in total has increased from 1,086 to 3,919 in numbers and from 2.6 percent to 7.3 percent in share between 2003-2004 and 2014-2015. In line with the increase in the share of private schools, the share of students attending private schools in total has also climbed up in the same period from 1.7 percent to 4.0 percent.

3. Literature Review

The determinants of household educational expenditures have received somewhat less attention in the literature compared to educational attainment. For Turkey, the situation is even bleaker, with only a handful of studies on the educational spending of Turkish households. Against this background, first we summarize the most cited studies in the relevant international literature, and then present existing studies on educational expenditure in Turkey.

Using data from household surveys for 1990 and 1992, Psacharopoulos et al. (1997) examine the extent of private expenditure on education in Bolivia and calculate an income elasticity of 0.23. They conclude that education expenditure is not a luxury good for Bolivian families.

Kanellopoulos and Psacharopoulos (1997), using data from the 1988 Family Expenditure Survey, find private tutoring to be a luxury item in Greece. Moreover, they report that household size and number of children under six years of age negatively affect the probability of private spending on education, while the household head's years of education and income have a positive impact on the same variable. In contrast to this study, Psacharopoulos and Papakonstantinou (2005) argue that private education is highly inelastic, hence a necessity household expenditure in Greece. Using a sample of 3000 freshmen, they show that private out of pocket spending to prepare for the entrance exams and study at college exceeds that of public spending. In addition, they find that the share of income spent on education to be higher for the poorer households.

Using Japanese household data and allowing the elasticities to vary non-monotonically with household income, Hashimoto and Health (1995) report that the income elasticity of education expenditure is highest for the middle-income group, lower yet positive for the low-income group, but negative at the upper end of the income distribution.

China et al. (2011) examine income elasticity of education expenditures in China along the domestic/overseas education divide and report strong income effects on both. The results also

display that households where mothers have senior secondary school or college education and fathers who are working in professional occupations are likely to spend more on education. Moreover, being in the highest income category, having a college-educated father, having a mother who is a cadre or middle professional and living in coastal areas increase the probability of sending children overseas for education.

In their study on private schooling in Vietnam, Glewwe and Patrinos (1999) show that higher-income households are less likely to send their children to semi-public schools but more likely to private schools, confirming that as household income increases, the willingness to spend on education rises. The study also reveals that urban households display a higher likelihood of spending resources for education, and that parental education is an important determinant of children's ultimate attainment.

Similarly, Glewwe and Jacoby (2004) use Vietnamese household survey data over the 1993-1998 period to investigate the relationship between household resources and the demand for education. Using consumption expenditures to proxy household wealth, the authors find a positive and significant relationship between changes in wealth and changes in the demand for education. This wealth effect persists even after controlling for several factors such as changes in returns to education, the supply and quality of schools, and the opportunity costs of schooling. The results also reveal that returns to education play a notable role in increasing education demand.

In another study of Vietnam using a Tobit analysis, Huy (2012) also confirms that families with more resources and better human capital spend more resources on their children's education. The probability of greater expenditure is found to be higher for households where the household head has a higher level of education or a professional job. Moreover, households with more primary-school-age or secondary school-age children are found to spend more on education, in contrast to those with pre-school-age or college-age children who make relatively less education expenditure.

Using the 1994 Household Expenditure Survey, Tansel and Bircan (2006) conducted the first study on the demand for private tutoring in Turkey. The determinants of private tutoring examined within a Tobit model framework include total household expenditure, parental education and other household characteristics. The authors show that private tutoring is neither a luxury nor a necessity item in the household's budget. Parents' educational attainments, especially of mothers, are found to significantly affect private tutoring expenditures, which evidences inequity in the intergenerational distribution of education. Moreover, the results indicate that private tutoring expenditures increase at a decreasing rate with the age of the household head, hence implying lifecycle considerations; urban families spend more than rural household residents, and that household private tutoring expenditures decline with the number of children in the household.

In our study, we analyze the income elasticity of education expenditure using an Engel curve methodology. First introduced by the German economist Ernst Engel in the 19th century, the Engel curve is commonly used in the literature to model the relationship between consumer income and quantity demanded. Tansel (1986), who first applied the Engel curve analysis to Turkish households' consumption patterns argues that total expenditure can be used as a proxy of income as it reflects permanent household income better than income itself, due to income being more likely to include transitory and unexpected elements and prone to false reporting. Using the Turkish 1978-1979 urban household expenditure survey, the author estimates Engel curves for eleven expenditure groups employing nine different functional forms. The expenditure elasticity of education which falls under cultural expenditures group is estimated to be greater than unity, hence rendering education as a luxury commodity. In a similar study following the same

methodology, Senesen and Selim (1995) disentangle the elasticity of education expenditures from cultural expenditures using the 1994 Household Income and Consumption Expenditures Survey, which lists education as a separate commodity group. The resulting elasticity of education above 2 indicates that it is a highly luxury commodity in Turkey. The Engle curve approach has also been used to test for gender gaps in education expenditure. For example, Kingdon (2005) and Aslam and Kingdon (2008) investigate whether the intra-household allocation of educational expenditure in Pakistan favors males over females, and report a robust pro-male bias in education expenditures.

4. Data and Model

In order to analyze the determinants of out-of-pocket education expenditures, we use data from the 2003, 2007 and 2012 Household Budget Surveys. The Household Budget Survey (HBS) contains detailed information on household income and its composition, as well as on household composition and household's socioeconomic characteristics. HBS is representative of the Turkish resident population. Nonetheless, the institutionalized population is excluded from the surveys. Surveys cover urban (population with 20,001 people and above) and rural (population with fewer than 20001 people) households. The sample unit is a household that comprises one person living alone or a group of people living in the same dwelling who depend on pooled income for major expenses. In conducting the survey, households are visited eight times during the interview month. Non-respondents are replaced by households with similar characteristics. Household expenditures are recorded in a diary by a household member during the interview month. In addition to that diary, members above the age 14 are given an individual expenditure diary to record individual expenditures on a daily basis. Consumption expenditures include not only the purchases of goods and services but also the consumption of the goods derived from the economic activities of household members and the expenditures on the gifts given to the other households or institutions. In constructing the consumption data set, the consumption of goods and services are classified according to the classification of individual consumption by purpose (COICOP)[5]. In our study, we only focus on students attending primary schools (8 years of compulsory schooling) and high schools since that the university students are above 18 years old and some of them could finance their own educational expenses.

We analyze the education expenditures in an Engel curve framework, which is commonly used in the literature to model the relationship between consumer income and quantity demanded. The general form of the Engel curve is given by

$$y_i = g_i(lnc, x) + \varepsilon_i \qquad (1)$$

where y_i represents a measure of expenditure on some commodity or group of commodities i, lnc is the log transformed total expenditures, x is a vector of variables that characterize family composition, and ε_i stands for the error term. The index of the individual household is suppressed. It is assumed that g is common to all households, so that variation across households with the same total expenditures c and the same composition x is only due to the error term ε_i which satisfies $E(\varepsilon_i \mid lnc, x) = 0$

In the Engel curve methodology, an important issue that is particularly nuanced is the choice of functional form. The general functional forms include linear, semi-logarithmic, double-logarithmic and Working-Leser model. In our analysis, we estimate two functional forms that

[5] The classification is as follows: 1. Food, beverages and tobacco, 2. Alcoholic beverages, tobacco and narcotics, 3. Clothing and footwear, 4. Housing, water, electricity, gas and other fuels, 5. Furnishings, household equipment and routine households maintenance, 6. Health, 7. Transport , 8. Communication, 9. Recreation and culture, 10. Education, 11. Restaurants and hotels, and 12. Miscellaneous goods and services.

differ in terms of dependent variables. The first form is the double-logarithmic form where the dependent variable is the logarithm of education expenditures. The second functional form that we employ is the Working-Leser form[6] where the dependent variable is the budget share of educational expenditures in the total expenditure.[7] The equations for the double-logarithmic and the Working-Leser forms are given by equations (2) and (3), respectively:

$$\ln educex = \beta_1 + \beta_2 \ln EXP + \beta_3 AGE + \beta_4 EMP + \beta_5 HHS + \beta_6 SHRPS + \beta_7 RURAL + \beta_8 SHRFS + \beta_9 RURALF + \beta_{10} NS + \sum_{j=2}^{5} \alpha_j EDUCD_j + \varepsilon \quad (2)$$

$$educshr = \beta_1 + \beta_2 \ln EXP + \beta_3 AGE + \beta_4 EMP + \beta_5 HHS + \beta_6 SHRPS + \beta_7 RURAL + \beta_8 SHRFS + \beta_9 RURALF + \beta_{10} NS + \sum_{j=2}^{5} \alpha_j EDUCD_j + \varepsilon \quad (3)$$

The equations capture three types of variables: variables for household heads (age, educational attainment level and employment status of the household head), variables regarding household characteristics (household size and location of the household) and variables relating to students in the household (share of primary school students and share of female students)[8]. In order to see the differences in results by income groups, we estimate separate regressions for each income quartile. The estimations are carried out for 2003, 2007 and 2012 to observe the time dynamics for the variables of interest.

The dependent variables in Equations 2 and 3 are, respectively, the logarithm of total household out-of-pocket education expenditures and the share of total household out-of-pocket education expenditures in the household total expenditure. Education expenditures include the money spent on books, writing materials and on all levels of educational institutions. The share of components of education expenditures are presented in Table 1 for the years under investigation.

As Table 1 illustrates, the largest share of educational expenditures for years 2003 and 2007 belongs to the expenditure on education for post-high school, pre-university item, which is mainly the spending on private tutoring (dershanes). However, the share of this item significantly decreases in 2012, which seems puzzling. One possible reason for this change in the composition of education expenditures could be the increasing amount of private school attendance for primary and high schools.[9]

A commonly used proxy for income in the Engel Curve studies is the total expenditure, due to the fact that it is regarded in the empirical literature to be a better indicator of permanent income. Moreover, compared to income, expenditure suffers less from measurement errors. In this respect, we use the logarithm of total household expenditure (ln*EXP*) and accordingly calculate the total expenditure elasticity of education. The elasticity is given directly by coefficient β_2 in the double

[6] The model was introduced by Working (1943) and considered by Leser (1963).

[7] We choose these functional forms because the double-logarithmic form is one of the most widely used specifications in empirical Engel curve studies, and the Working-Leser form is identified to be the best performing specification by Tansel (1986) who estimates nine different functional forms of Engel curves using data from the 1978-1979 Turkish Urban Household Expenditure Survey.

[8] We also control for the number of students at the university entrance exam ages and high school entrance exam ages due to households' possible higher education expenditures arises from private tutoring expenditures. As their coefficients are statistically insignificant, we do not cover them in the estimations.

[9] When we referred this issue to the Turkish Statistical Institute authorities, they said that this could also be a result of miscoding due to the change in the definitions.

logarithmic specification (Equation 2). However, in the Working-Leser specification (Equation 3), the elasticity should be calculated by using the following formula:

$$e = 1 + \frac{\beta_2}{W} \quad (4)$$

where e is the total household elasticity of education expenditure, β_2 is the coefficient of ln*EXP* in Equation 3, and W is the mean of the share of education expenditure in total household expenditure. Carrying out estimations for different years allows us to see the evolution of the elasticity through time for different income groups.

Some hypotheses regarding the coefficient of income (total expenditure) variable that we aim to test are based on the work of Benson (1961), who argues that income elasticity of education varies with level of household income. More specifically, for low- and high-income households the income elasticity of education is expected to be between zero and one, while for middle-income households its value is more likely to be greater than one. The reason is that middle-income families place great value on education as a means for their children to achieve upward social mobility. This implies a positive relationship between household income and the share of this income spent on education. The low-income households, on the other hand, attach less importance to upward mobility, and therefore, quality of schooling. Thus, in this group, educational expenditures are expected to rise less rapidly than household income, resulting in an income elasticity between zero and one. Finally, the value of income elasticity is also predicted to be between zero and one for the high-income households. The reason is that there will be an upper limit on educational expenditures for each household that is determined by the number of children in the household. Thus, as household income increases beyond this limit, educational expenditures will grow less rapidly than income.

The educational background of the household head is expected to have a positive impact on the educational investment in children. A more educated head could be more conscious of the importance of education and so they could spend more on their children's education. We create five categorical education dummies (*EDUCD*) that take the value of one if the household head's highest educational attainment belongs to one of these categories. These five categories are below primary school (the base category), primary school, secondary school, high school and university. Moreover, in order to see how education expenditure varies with age of the household head, we include *AGE* variable. We also control for the employment status of the household head by adding a dummy variable (*EMP)* that takes 1 if the head is working and 0 otherwise.

In Turkey it is common that multiple generations of families live in the same household. This is more significant for less educated (lower income) households (Cilasun and Kırdar, 2013). In other words, poorer households are generally more crowded compared to higher-income households. Therefore, they could allocate a smaller fraction of their household income to educational expenditures. Thus, we expect to find a negative sign for the household size (*HHS*) variable.

Since education expenditures could differ for students that are at different stages of their education, we include the share of primary school students (*SHRPS*) variable into the model. It is calculated as the number of primary school students in the household divided by the total number of students (primary school students + high school students).

There are significant differences in attitudes towards education between households living in the rural and urban areas in Turkey. In the rural areas, education is considered a luxury since most of the population is working in the agricultural sector. To control for this effect, we include a rural dummy (*RURAL*) to the model.

Another important aspect of the education environment of Turkey is the attitude towards girls. The traditional role of a woman in Turkey is to be a housewife. Therefore, girls often are not expected to enter into the job market. Girls generally end their education after completing compulsory education. The educational attainment of girls is considered less important than that of boys by many parents. This phenomenon is one of the factors that explain lower educational levels of females in Turkey. In order to control for this, we include a variable that captures the share of female students in the household (*SHRFS*). The above-mentioned attitude towards girls is more common in rural areas. In order to control for this phenomenon, we include an interaction term (*RURALF*) that is the product of the rural dummy and the share of female students. Finally, since we are dealing with household educational expenditures and not the expenditure per student, we control for the total number of students in the household (NS).

Because the distribution of education expenditure has a mass at zero, we adopt Tobit analysis as our estimation method, which allows for a mass point in the distribution of the dependent variable. Table 2 displays the percentage of households with zero and positive education expenditures by income quartiles. As expected the percentage of households with zero education expenditures decreases with income. One important fact stands out from the table is that for all income quartiles, the percentage of households with zero expenditure decreases in time, particularly in 2012.

Table 3 presents a list of summary statistics of the variables used in the model. In 2003, the average real total expenditure of the first quartile group is 3677 TL. The corresponding for the second, third and fourth quartiles are 5342 TL, 7418 TL and 13017 TL, respectively. The average real total household expenditure for all quartiles significantly rise by around fifty percent between 2003 and 2007, whereas the rise is limited to approximately 20 percent for the period 2007-2012. For the total sample, the mean real consumption spending stands at 7270 TL in 2003, and rises to 9494 TL in 2007, and to 12368 TL in 2012.

If we look at the corresponding real education expenditures, we can observe the same increasing pattern over time for all quartiles and years except that of the second quartile between 2007-2012. This rise in absolute value in the education expenditures can also be traced in its share in household consumption expenditures for all quartiles over time. Still, the share of education in total household spending is very limited for all quartiles, ranging between 1-5 percent increasing along the income distribution. Education expenditures make up only 3 percent of the total expenditures for an average Turkish household as of 2012. In contrast to expenditure share terms, if we consider the magnitude of education expenditures, we observe a higher level of inequality along the income distribution. While the highest income group has nearly six times higher income than the lowest income group, their educational expenditures are almost ten times of that of the poorest quartile.

The level of schooling of household head displays a noticeable increasing relationship with income level, and hence with education expenditures. While the share of university graduates (*EDUCD5*) in the lowest income quartile is zero percent, it reaches 24 percent in the top income quartile in 2003. Meanwhile, the share of household heads secondary school degrees displays a flat trend along the income distribution for all years. Another noteworthy point is that, while the share of university graduates in the highest income group is very similar in 2003 and 2007, it sharply increases in 2012.

The average age of the household head in our sample stands between 42-45 for all three years, which corresponds to the middle age group, thereby allowing for interpreting the estimation findings within the framework of the life cycle hypothesis.

The share of an employed household head follows an increasing pattern with income level, from 74 percent for the poorest to 87 percent for the richest in 2012. Over time, we do not see a change in the relevant shares of the upper quartiles, whereas the share of employed household head in the first quartile drops gradually by around 4 percentage points between 2003-2012.

On average the households in our sample have between four to five members. We also note a slight fall in the household size of all income groups over time.

A strongly discernible pattern reveals itself in the relationship between residential area and income status. The share of rural residence decreases along the income distribution. According to the most recent data in 2012, the share of households living in a rural area is 45 percent for the population in the lowest income group, 30 percent for those in the second, 26 percent for those in the third and 18 percent for the fourth income quartiles.

As for share of female students in the household, our sample does not display a discernible difference between different income groups but a clear increase in the rate for all quartiles over time. For the poorest households, female students make up 45 percent of the students in the family in 2012, in contrast to only 39 percent in 2003. Girls' share has risen even more sharply for the upper income groups, by 11, 13 and 13 percent respectively. The total number of students in all groups ranges between 1.55 and 1.78 - the first belonging to the richest and latter to the poorest households.

5. Estimation Results

Tables 4, 5 and 6 give the estimation results of the double logarithmic model of household educational expenditures (Equation 2) for years 2003, 2007 and 2012, respectively. In each table, the first four columns present the estimated coefficients (the unconditional marginal effects) for the income quartiles while the last column shows the results for the overall sample. The parameter estimates for the household expenditure variable (lnEXP) denote elasticities because in this model, as mentioned before, education expenditure and total household expenditure are both in logarithms. The coefficient estimates on lnEXP are seen to be highly significant for all years and income quartiles. The results support Benson's (1961) hypothesis regarding the basic pattern of elasticities by income groups, that is, a peak in the middle income quartiles and a decrease at both ends of the income distribution.

The estimated elasticities have lower values for the top- and the bottom-income quartiles and larger values for the middle-income quartiles. Regarding the magnitude of elasticities across income groups, our results generally support Benson's predictions. As mentioned before, the income elasticity of education is expected to vary by level of household income. More specifically, the income elasticity for the bottom- and the top-income households is expected to be between zero and one, while the income elasticity of education for the middle-income households is expected to be greater than one.

We find that the null hypothesis that the elasticity coefficient is equal to one is rejected for the lowest income quartile in the years 2003 and 2007, while it cannot be rejected for the same quartile in 2012. Thus, as total expenditure increases in this income group, educational expenditure increases less rapidly than total expenditure level in the years 2003 and 2007 - indicating that education is a necessity item in the households' budget. It could also imply that the quality of education is of less importance in these families. For the two middle-income quartiles (the second and the third quartiles), the estimated elasticity is significantly greater than one for all years. In other words, for the households in these income groups, education is a luxury good; as total expenditure increases, educational expenditure rises more rapidly than their total expenditure. The

same result could also be interpreted in the sense that the middle-income households seem to be concerned about the quality of their children's education. For the highest-income group, the estimated elasticity is not different from one for the years 2003 and 2007. Thus, for the highest-income households in these years, education seems to be neither a necessity nor a luxury good. For 2012, on the other hand, it is statistically significantly greater than one. Therefore, contrary to the expectations, the finding for the highest-income group in 2012 is similar to that obtained for the middle-income groups for all years. That is, education is a luxury good, and the parents seem to care about the quality of their children's education. Finally, the results for the overall sample are similar to those obtained for the highest-income group; that is, education is a luxury in 2012 while it is neither a necessity nor a luxury in 2003 and 2007.

Another noticeable finding is that for all income groups and for the overall sample, the expenditure elasticity of education increases over time. This is particularly important considering the fact that textbooks have been distributed to students free of charge by the government since 2004. This result might reflect that households in Turkey have allocated greater shares of their budgets to education expenditures through spending on private schools and private tutoring. This conviction is supported by the observation that both the number of students attending private schools and the number of students receiving private tutoring grew much faster than the total number of students during the period under investigation (Özdebir, 2014; TOBB, 2012).

The pattern of estimated coefficients on the dummies for household head's educational attainment, though not significant in all estimations, reveal, as expected, that the head's level of education has an increasingly positive effect on the children's educational expenditures. Especially for the upper middle income and the top income quartiles, the coefficients of EDUCD4 and EDUCD5 are almost always significant, implying that household heads in these income groups who have high-school and university degrees spend significantly more than those who do not have any education. For example, for the top income quartile in 2012, high-school- and university-educated household heads spend 140 and 191.1 percent more, respectively, than those household heads that are in the below-primary school category. The same pattern is observed for the overall sample as well. Other noticeable findings regarding the educational attainment dummies are that for the second income quartile in 2007, all households with a graduate head spend significantly more than households whose heads lack a diploma; and in all income quartiles in 2012, the household heads with a high-school degree invest more in their children's education than those heads without any educational attainment.

Household size (HHS) variable is highly significant in all estimations. The negative coefficient on this variable implies that crowded households, which are generally poorer as mentioned before, may not be able to spend much on education, as demand for resources for alternative purposes increases. The share of children attending primary schools in the household (SHRPS) is found to be insignificant in almost all estimations. This indicates that spending on primary education and high school education does not differ significantly. The results on variable RURAL tells us that in the year 2003, households in the urban areas spent more on education than those in the rural areas. This result is expected since in rural areas, where most of the population works in the agricultural sector, education is often considered a luxury. In 2007, however, this finding weakens and holds only for lower-income families; and in 2012, the coefficient of RURAL turns out to be insignificant for all income quartiles. A possible explanation for this pattern might be the changing attitudes towards education in the rural areas.

Tables 7, 8, and 9 show the estimation results of the Working-Leser specification (Equation 3) for the years 2003, 2007 and 2012, respectively. The elasticity calculations associated with these

estimations are presented in Table 10. Similar to the double logarithmic form estimations, the results show that the estimated elasticities have lower values for the top- and the bottom-income quartiles and larger values for the middle-income quartiles. The elasticities are significantly greater than one for the two middle income quartiles (the second and the third quartiles), as it was for the first specification. However, now the estimated elasticities are not significantly different from one for the lowest income quartile. Thus, the results from estimating the Working-Leser form support our previous finding that for the households in the two middle-income groups, education is a luxury good, but they do not give support to our earlier results for 2003 and 2007 that education is a necessity item in the budgets of lowest-income households. In the Working-Leser model estimation results, education seems to be neither a necessity nor a luxury for the bottom income-quartile for all years. The same result also holds for the top income-quartile for the years 2003 and 2007. In 2012, on the other hand, education has been found to be a luxury good for the highest-income families. In the double logarithmic form estimations for the overall sample, education was a luxury item in the households' budgets in 2012, while it was neither a necessity nor a luxury in the years 2003 and 2007. In the Working-Leser form estimations for the same sample, it turns out to be a luxury good for all years. Finally, the Working-Leser estimation results corroborate our previous finding that the expenditure elasticity of education increases over time for both all income groups and the overall sample.

The results for the other variables in the Working-Leser regressions are qualitatively very similar to those reported for the double logarithmic specification. The household head's level of education has an increasingly positive effect on the educational expenditures of children. As before, the household heads with a high-school or a university diploma in the upper middle income and the top income quartiles spend significantly more than those heads without any educational background. Household size variable has a highly significant and negative coefficient implying that the demand for resources for alternative purposes increases, and the resources of the household are stretched over a large number of people. The earlier finding that households in the urban areas spend more on education than those in the rural areas in the year 2003 holds, in Working-Lesser estimations, for all households except for those in the highest-income groups. Finally, the variable NS has been added to the models to control for the number of students in the household. The coefficient of this variable is positive and highly significant in all estimations as expected.

6. Conclusion

The implementation of compulsory education act of 1997 has successfully increased schooling rates in Turkey, though there are still problems regarding the quality of education. The net schooling rates in primary and secondary education increased respectively from 84.7 and 37.9 percent in the 1997-1998 academic year to 98.7 and 67.4 percent in the 2011-2012 academic year. Turkey's per capita income nearly quadrupled in real terms during the period 2001-2012. Accordingly, both the share of education expenditures in Turkey's total government spending and the share of private schools have increased substantially during the same period. Parallel to these developments, families have started to spend more on education, and educational expenditures have become one of the major items contributing to the economic burden on families. The number of households that can afford the cost of private education increased substantially in this period as well. Using data from Turkish Household Budget Surveys of the years 2003, 2007 and 2012, this paper estimated household educational expenditures by income groups and sought to obtain answers to such important questions as whether or not the determinants of educational expenditures differ by income groups; how much, and in which direction, income elasticities of educational expenditures have evolved over time; or whether children from middle-class and poor

families were able to benefit enough from the expansion of educational opportunities. To this end, we employed two functional specifications of Engel curves: the double logarithmic form and the Working-Leser form.

The findings from the paper suggest that the estimated expenditure elasticities have lower values for the top- and the bottom-income quartiles, while they have larger values for the middle-income quartiles. This result is confirmed in all estimations. The estimates of the double logarithmic specification evidence that for the bottom income quartile, the expenditure elasticity is significantly less than one in years 2003 and 2007, implying that education is a necessity item in these households' budget. It also implies that the quality of education is of less importance in these families. However, this result is not robust and appears to break down in the Working-Leser estimations. For the two middle-income quartiles (the second and the third quartiles), the estimated elasticity is significantly greater than one for all years and for both specifications. This result suggests that the families in these income groups seem to be concerned about the quality of their children's education, and education is a luxury good for them; as income increases, educational expenditures rise more rapidly than their income. Contrary to expectations, the estimated elasticity is significantly greater than one for the highest income group in all of the Working-Leser regressions and in the double logarithmic form estimations for 2012.

The results also show that for all income groups, the expenditure elasticity of education increases over time. This result is robust to functional form specification. Together with the observation that the growth rates of number of private school students and the number of students receiving private tutoring greatly surpassed that of the total number of students during the period under investigation, this finding is likely to indicate that households in Turkey have allocated a greater share of their budgets to education expenditures through spending on private schools and private tutoring.

The results for the other variables are qualitatively very similar under the two alternative functional form specifications. The household head's level of education has an increasingly positive effect on the children's educational expenditures. The household heads in the upper middle income and the top income groups who receive high school and university education generally spend more than those heads in the same groups who did not get any education qualifications. The results also demonstrate that for the lower middle income group in 2007, all households with heads having a formal school education spent significantly more than households whose heads lack a diploma; and in all income quartiles in the year 2012, the household heads with a high-school degree invested more in their children's education than those heads without any educational background.

Household size is found to be another important determinant of educational expenditures. The negative coefficient on this variable implies that crowded households may not be able to spend more on education, as demand for resources for alternative purposes increases. The coefficient on rural dummy is negative and significant in the year 2003 in most of the estimations. This suggests that households in urban areas spend more on education than those in rural areas. This is as expected since in rural areas, where most of the population works in the agricultural sector, education is often considered a luxury. The negative relationship, however, weakens over time and eventually disappears. This might be an indication of the changing attitudes towards education in the rural areas.

The results of this study offer some evidence that education is a necessity item for Turkish households at the lowest end of the income distribution. For the poorest group, the estimated expenditure elasticity of education stands generally between zero and one, though not always

significantly different from one. In other words, the budget share of education would go up only less than one percent in response to a one percent increase in household income. Along these findings, we can argue that a public policy solely relying on general increases in income to stimulate greater expenditures on education will not work effectively for poor households. As the burden for financing education is disproportionately heavier for poorer than richer households, public investment should be increased and more public resources should be committed to the poor to ensure the equality of educational opportunity. For example, a recent public policy instrument called school voucher programs can be considered. In these voucher systems, the government issues a certificate of funding to parents to cover their children's tuition expenses for the public or private school of their choice. The system has been applied in countries including Chile, Ireland, Hong Kong, Pakistan, and has been found to improve the equity in educational opportunity. Secondly, the government initiatives to distribute textbooks and tablets free of charge to all students, despite having good intentions, may also have a disruptive effect in terms of equity. The system may be revised in the way that those families who can afford these costs can be asked to pay for them, and these funds can be used for further supporting of the disadvantaged households.

It is obvious that equality could not be achieved unless the education policy takes the potential inequalities among students caused by regional disparities and differences in socio-economic status into account. In this respect, the government has to take measures to enable its citizens to benefit from the schools in line with the needs of higher levels of education and the labor market, and therefore reach their highest potential. Hence, it is crucial to design and implement a more inclusive education system, which provides a better space for everyone, and enable students to benefit from a diversified environment in which a wide range of human qualities and socio-economic status are welcome.

For further research, one can analyze the educational outcomes of the children, especially of the low-income households, attending public schools versus those studying in private schools. If, indeed, the outcomes of those students in private schools compared to those in public schools are found to be better, policy makers may consider extending the promotion of private education. At the one extreme end, all the education system can be privatized, which is not feasible due to obvious legal and technical reasons. However, at least understanding what private schools offer or do better can be investigated in detail. The public education expenditure per student is another subject for further study. If it is found to be similar to or higher than private schools tuition fees, then there exists an inefficiency problem.

References

Aksit, N. (2007). "Educational reform in Turkey", *International Journal of Educational Development* 27, 129-137.

Aslam, M. and G.G. Kingdon (2008). 'Gender and household education expenditure in Pakistan', *Applied Economics*, 40: 20, 2573 — 2591

Aslankurt, B. (2013). "Intergenerational mobility in education: How does Turkey compare in equality of opportunity", TEPAV

Benson, C.S. (1961). "*The Economics of Public Education*." Boston: Houghton. Mifflin.

Berlinski, et al. (2009). "The Effect of Pre-Primary Education on Primary School Performance." *Journal of Public Economies*, 93(1-2), 219-234.

Cilasun, S. M. and Kırdar, M. (2013). "An Analysis of Academic Performance: Could Family Income And Medium of Instruction Be Determinants?", *Sosyoekonomi*, 1, 9-23.

Çelik, R. (2014). "Toward a Justice Oriented Education: An Analysis of Turkish Education from A Rawlsian Perspective", *The Online Journal of New Horizons in Education*, Volume 4, Issue 1

Davies, B. J., Zhang, J., Zeng, J. (2005). "Intergenerational Mobility under Private Vs. Public Education", *Scandinavian Journal of Economics*, 107 (3), 399-417.

Dulger, I. (2004). "Turkey: Rapid Coverage for Compulsory Education- The 1997 Basic Education Program", Washington DC: World Bank

Education Reform Initiative (ERI) (2013). "Education Monitoring Report 2013"

Education Reform Initiative (ERI) (2014). "Türkiye PISA 2012 analizi: Genel bulgular ve eğilimler"

Glewwe, P. and H. Patrinos (1999). "The Role of the Private Sector in Education in Vietnam: Evidence from the Vietnam Living Standards Survey", *World Development*, 27(5), 887-902.

Glewwe, P. and H. Jacoby (2004). "Economic Growth and The Demand For Education: Is There A Wealth Effect?" *Journal of Development Economics*, 74(1), 33-51.

Hashimoto, K. and J.A. Health (1995). "Income Elasticities of Educational Expenditure by Income Class: The Case of Japanese Households", *Economics of Education Review*, 14, 53-71.

Huy, V. Q. (2012). "Determinants of Educational Expenditure in Vietnam", *International Journal of Applied Economics*, 9 (1), 59-72.

Kanellopoulos, C. and G. Psacharopoulos (1997). "Private education expenditure in a 'free education' country: The case of Greece", *International Journal of Educational Development*,17(1), 73–81.

Leser, C.E.V. (1963). "Forms of Engel Functions", *Econometrica*, 31, 694-703.

OECD (2012). "Education at a glance 2012: OECD indicators", OECD Publishing.

http://dx.doi.org/10.1787/eag-2012-en

Özdebir (2014). "Özel Dershaneler",

http://www.ozdebir.org.tr/fls/20140630120942_83512a2f8c7621fdadb9d8138e347912.pdf

Psacharopoulos, G; C. R. Arieira and R. Mattson (1997) “Private Education in a Poor Country: The Case of Urban Bolivia”, *Economics of Education Review*, 16(4), 395-406.

Psacharopoulos, G. and G. Papakonstantinou (2005) “The Real University Cost in a ‘Free’ Higher Education Country”, *Economics of Education Review*, 24, 103-108.

Qian, J. and R. Smyth (2011). “Educational Expenditure in Urban China: Income Effects, Family Characteristics and the Demand for Domestic and Overseas Education”, *Applied Economics*, 43 (24), 3379-3394.

Sylva, K., et al. (2010). “Emergent Literacy Environments: Home and Pre-School Influences on Children's Literacy Development”, In S. B. Neuman and D. K. Dickinson (Eds), *Handbook of Early Literacy Research* (Vol. 3). New York: Guilford Press Publications.

Şenesen, Ü. and R. Selim (1995), "Consumption Patterns of Turkish Urban and Rural Households in 1987," *M E TU Studies in Development* Vol.22, No.2

Tansel, Aysit (1986), "An Engel Curve Analysis of Household Expenditure in Turkey, 1978-79," *METU Studies in Development*, Vol. 13.

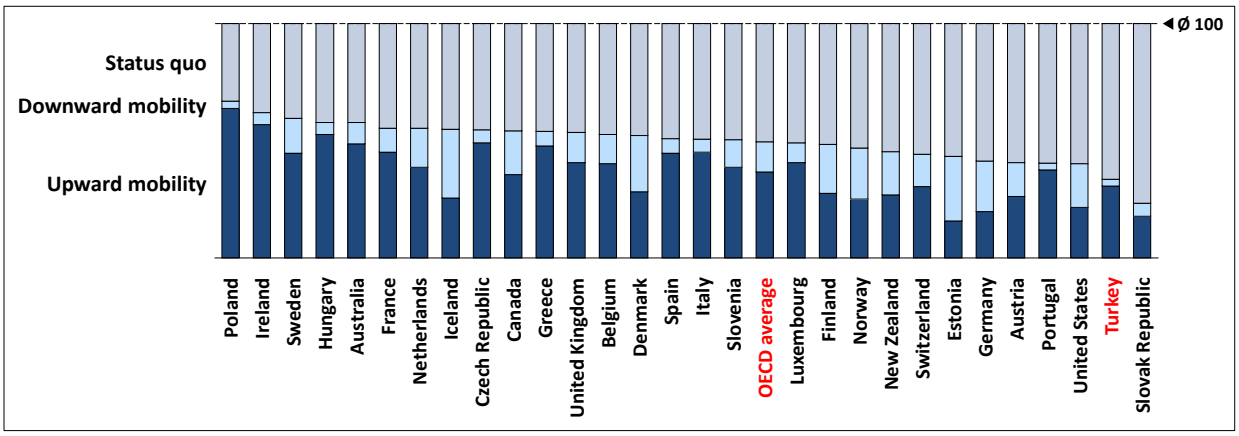
Tansel, A. (2002). “Determinants of School Attainment of Boys and Girls in Turkey: Individual, Household and Community Factors”, *Economics of Education Review*, 21, 455-470.

Tansel, A. and F. Bircan (2006). “Demand For Education In Turkey: A Tobit Analysis of Private Tutoring Expenditures”, *Economics of Education Review*, 25, 303–313.

TOBB (2012). “ Türkiye Eğitim Meclisi Sektörü Raporu 2011”

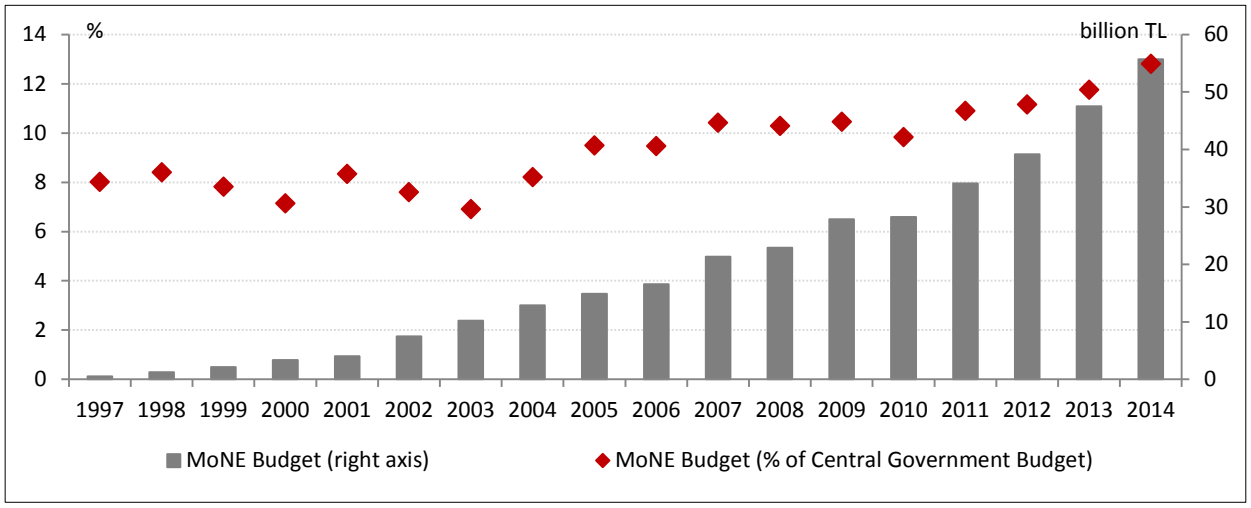
Working, H. (1943). “Statistical Laws of Family Expenditure”, *Journal of American statistical Association*, Vol. 38, 43-56.

Figure 1: Intergenerational Mobility in Education, 2009*



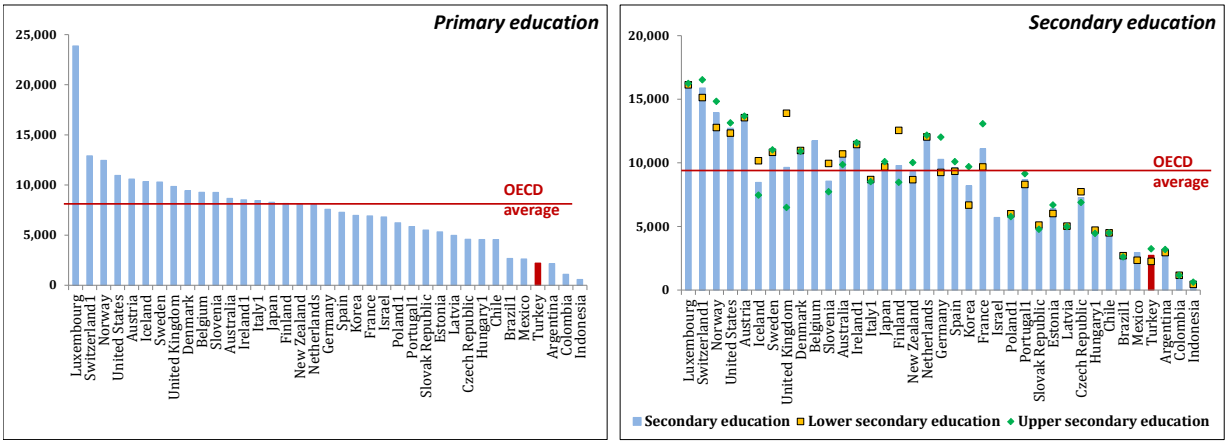
Note: Countries are ranked in ascending order of the proportion of status quo. *Last data available for Turkey. Status quo implies that children have the same level of education with their parents, and upward mobility implies a higher level of education for children than their parents, while downward mobility does vice versa.
Source: OECD (2012), Education at a Glance 2012, http://dx.doi.org/10.1787/888932664993.

Figure 2: Central Government's Education Expenditures (TL and % of Central Government Budget)



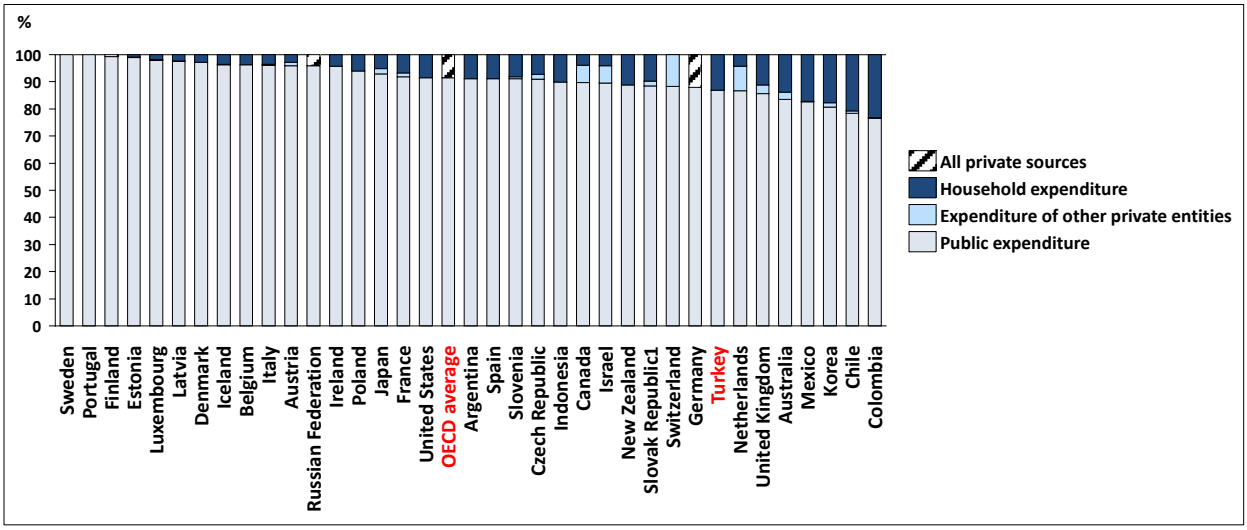
Source: MoNE

Figure 3: Annual Expenditure Per Student by Educational Institutions for All Services, by Level of Education (2011) ***In equivalent USD converted using PPPs, based on full-time equivalents***



Note: (1) Public institutions only
Source: OECD

Figure 4: Distribution of Public And Private Expenditure on Educational Institutions (2011) (Primary, Secondary and Post-Secondary Non-Tertiary Education)



Source: OECD

Table 1: Components of Education Expenditures (Share, %)

Type of expenditure	2003	2007	2012
Book	11.36	7.93	10.29
Writing materials	11.13	7.26	7.37
Primary school and preschool	17.37	16.33	34.93
High school	20.94	24.03	20.05
Post high school- pre University	34.07	38.45	19.50
Other	5.13	5.99	7.85

Table 2: Households with Zero and Positive Education Expenditures (%)

Income quartiles	Households with zero education expenditures (%)			Households with positive education expenditures (%)		
	2003	2007	2012	2003	2007	2012
First quartile	57.95	54.21	42.22	42.05	45.79	57.78
Second quartile	51.61	41.42	31.50	48.39	58.58	68.50
Third quartile	45.65	37.49	24.17	54.35	62.51	75.83
Fourth quartile	37.00	28.95	15.49	63.00	71.05	84.51
Total	48.23	41.21	27.99	51.77	58.79	72.01

Table 3: Summary Statistics

2003

	1st Quartile			2nd Quartile			3rd Quartile			4th Quartile			Total		
Variable	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**
reeleduc	3008	35.26	131.33	3005	81.97	429.69	2811	520.13	1911.93	2811	520.13	1911.93	11871	195.64	1014.73
educshr	3008	0.01	0.03	3005	0.01	0.04	2811	0.03	0.07	2811	0.03	0.07	11871	0.02	0.05
reelc	3008	3677.31	1796.30	3005	5342.74	2189.30	2811	13017.13	9182.80	2811	13017.13	9182.80	11871	7270.85	6065.91
educd1	3008	0.19	0.40	3005	0.10	0.30	2811	0.04	0.19	2811	0.04	0.19	11871	0.10	0.30
educd2	3008	0.65	0.48	3005	0.60	0.49	2811	0.34	0.48	2811	0.34	0.48	11871	0.52	0.50
educd3	3008	0.09	0.29	3005	0.13	0.34	2811	0.11	0.32	2811	0.11	0.32	11871	0.12	0.32
educd4	3008	0.06	0.24	3005	0.15	0.36	2811	0.26	0.44	2811	0.26	0.44	11871	0.17	0.38
educd5	3008	0.00	0.04	3005	0.02	0.14	2811	0.24	0.43	2811	0.24	0.43	11871	0.09	0.28
age	3008	41.50	10.15	3005	42.81	9.91	2811	44.53	9.13	2811	44.53	9.13	11871	43.09	9.80
emp	3008	0.78	0.41	3005	0.79	0.41	2811	0.87	0.34	2811	0.87	0.34	11871	0.82	0.39
hhsize	3008	5.46	2.10	3005	5.20	1.98	2811	5.10	2.08	2811	5.10	2.08	11871	5.23	2.03
primshare	3008	0.83	0.32	3005	0.78	0.36	2811	0.71	0.40	2811	0.71	0.40	11871	0.77	0.37
rural	3008	0.39	0.49	3005	0.32	0.47	2811	0.20	0.40	2811	0.20	0.40	11871	0.29	0.45
girlshare	3008	0.39	0.41	3005	0.36	0.41	2811	0.34	0.42	2811	0.34	0.42	11871	0.36	0.41
totalstu	3008	1.78	0.89	3005	1.70	0.87	2811	1.55	0.76	2811	1.55	0.76	11871	1.67	0.84

2007

	1st Quartile			2nd Quartile			3rd Quartile			4th Quartile			Total		
Variable	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**
reeleduc	1116	61.14	297.52	1014	186.17	704.67	898	949.76	3479.58	898	949.76	3479.58	4027	349.77	1757.55
educshr	1116	0.01	0.04	1014	0.02	0.05	898	0.05	0.08	898	0.05	0.08	4027	0.02	0.06
reelc	1116	4891.04	2262.98	1014	7424.84	2872.47	898	16583.80	9099.90	898	16583.80	9099.90	4027	9494.00	6736.43
educd1	1116	0.25	0.43	1014	0.09	0.29	898	0.04	0.20	898	0.04	0.20	4027	0.11	0.31
educd2	1116	0.59	0.49	1014	0.60	0.49	898	0.35	0.48	898	0.35	0.48	4027	0.52	0.50
educd3	1116	0.08	0.28	1014	0.13	0.33	898	0.11	0.31	898	0.11	0.31	4027	0.11	0.31
educd4	1116	0.06	0.24	1014	0.15	0.36	898	0.27	0.44	898	0.27	0.44	4027	0.18	0.38
educd5	1116	0.01	0.09	1014	0.02	0.16	898	0.24	0.42	898	0.24	0.42	4027	0.09	0.29
age	1116	41.98	10.25	1014	43.31	9.80	898	44.38	9.05	898	44.38	9.05	4027	43.32	9.72
emp	1116	0.76	0.43	1014	0.80	0.40	898	0.87	0.33	898	0.87	0.33	4027	0.81	0.39
hhsize	1116	5.40	2.12	1014	5.10	2.12	898	4.92	1.96	898	4.92	1.96	4027	5.09	2.01
primshare	1116	0.87	0.29	1014	0.79	0.34	898	0.70	0.41	898	0.70	0.41	4027	0.78	0.36
rural	1116	0.49	0.50	1014	0.35	0.48	898	0.15	0.36	898	0.15	0.36	4027	0.31	0.46
girlshare	1116	0.45	0.41	1014	0.47	0.42	898	0.46	0.45	898	0.46	0.45	4027	0.47	0.43
totalstu	1116	1.93	1.00	1014	1.73	0.89	898	1.55	0.78	898	1.55	0.78	4027	1.71	0.88

2012

	1st Quartile			2nd Quartile			3rd Quartile			4th Quartile			Total		
Variable	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**
reeleduc	990	103.59	240.90	1111	181.25	321.66	1146	316.98	557.53	1091	1257.50	2440.34	4341	469.81	1353.34
educshr	990	0.02	0.03	1111	0.02	0.03	1146	0.02	0.04	1091	0.05	0.07	4341	0.03	0.05
reelc	990	6178.4	3900.74	1111	8981.35	4180.30	1146	12669.14	6125.31	1091	21134.05	13939.10	4341	12368.00	9883.64
educd1	990	0.20	0.40	1111	0.09	0.29	1146	0.05	0.21	1091	0.04	0.20	4341	0.09	0.29
educd2	990	0.59	0.49	1111	0.54	0.50	1146	0.44	0.50	1091	0.26	0.44	4341	0.46	0.50
educd3	990	0.11	0.32	1111	0.16	0.37	1146	0.14	0.34	1091	0.09	0.29	4341	0.13	0.33
educd4	990	0.09	0.28	1111	0.17	0.38	1146	0.25	0.43	1091	0.23	0.42	4341	0.19	0.39
educd5	990	0.01	0.08	1111	0.03	0.18	1146	0.13	0.34	1091	0.37	0.48	4341	0.14	0.34

Age	990	43.29	10.88	1111	43.45	9.95	1146	44.68	9.38	1091	45.39	9.29	4341	44.22	9.90
Emp	990	0.74	0.44	1111	0.79	0.40	1146	0.84	0.37	1091	0.87	0.34	4341	0.81	0.39
hhsize	990	4.90	1.83	1111	4.75	1.77	1146	4.71	1.70	1091	4.77	2.15	4341	4.78	1.87
primshare	990	0.76	0.37	1111	0.72	0.38	1146	0.65	0.41	1091	0.66	0.41	4341	0.69	0.40
rural	990	0.45	0.50	1111	0.30	0.46	1146	0.26	0.44	1091	0.18	0.39	4341	0.29	0.46
girlshare	990	0.45	0.41	1111	0.47	0.42	1146	0.48	0.43	1091	0.47	0.44	4341	0.47	0.42
totalstu	990	1.87	1.03	1111	1.76	0.93	1146	1.69	0.83	1091	1.62	0.84	4341	1.73	0.91

Table 4: Tobit estimation results of household education expenditures for the double log specification, 2003

Variables	Bottom 25 Marginal Effects	Second 25 Marginal Effects	Third 25 Marginal Effects	Top 25 Marginal Effects	Total Marginal Effects
lnEXP	0.472***	1.674***	1.504***	0.913***	1.078***
	(0.051)	(0.141)	(0.167)	(0.074)	(0.0246)
EDUCD2	0.201	0.0826	0.282	0.437	0.124
	(0.126)	(0.190)	(0.264)	(0.400)	(0.108)
EDUCD3	0.295	0.0767	0.292	0.547	0.197
	(0.211)	(0.226)	(0.289)	(0.455)	(0.134)
EDUCD4	0.343	0.0847	0.352	0.579*	0.203
	(0.236)	(0.730)	(0.288)	(0.295)	(0.163)
EDUCD5	1.115*	0.461	0.380	1.112**	0.478***
	(0.594)	(0.413)	(0.320)	(0.457)	(0.163)
AGE	0.00294	-0.00957	-0.000229	0.00670	-0.00209
	(0.00499)	(0.00626)	(0.00743)	(0.00906)	(0.00343)
EMP	-0.0424	-0.0591	0.284*	-0.184	-0.0111
	(0.111)	(0.135)	(0.167)	(0.233)	(0.0791)
HHS	-0.104***	-0.131***	-0.248***	-0.168***	-0.159***
	(0.0289)	(0.0331)	(0.0414)	(0.0430)	(0.0184)
SHRPS	0.242	0.258	0.335*	-0.157	0.153*
	(0.157)	(0.164)	(0.171)	(0.198)	(0.0868)
RURAL	-0.229*	-0.286*	-0.321*	-0.682***	-0.384***
	(0.126)	(0.148)	(0.177)	(0.216)	(0.0837)
SHRFS	0.0930	0.0263	0.0386	-0.0713	0.0157
	(0.126)	(0.133)	(0.151)	(0.192)	(0.0766)
RURALF	0.0310	-0.0294	-0.116	0.187	0.0345
	(0.110)	(0.132)	(0.187)	(0.202)	(0.0773)
NS	0.276***	0.341***	0.553***	0.491***	0.415***
	(0.0627)	(0.0679)	(0.0795)	(0.105)	(0.0395)
Observations	3,008	3,005	3,045	2,811	11,871

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 5: Tobit Estimation Results of Household Education Expenditures for the Double Log Specification, 2007

Variables	Bottom 25 Marginal Effects	Second 25 Marginal Effects	Third 25 Marginal Effects	Top 25 Marginal Effects	Total Marginal Effects
lnEXP	0.634***	1.827***	1.836***	0.979***	1.312***
	(0.104)	(0.300)	(0.301)	(0.168)	(0.105)
EDUCD2	0.0197	0.647*	0.514	0.919	0.0283
	(0.202)	(0.343)	(0.486)	(0.817)	(0.201)
EDUCD3	0.210	1.527**	0.668	0.989	0.458*
	(0.323)	(0.597)	(0.506)	(0.975)	(0.269)
EDUCD4	0.218	1.585**	1.186**	1.287**	0.381*
	(0.382)	(0.582)	(0.466)	(0.504)	(0.223)
EDUCD5	0.312	2.646***	1.884***	2.262**	0.965***
	(0.716)	(0.921)	(0.482)	(0.954)	(0.303)
AGE	-0.00771	0.0163	-0.0219	-0.00264	-0.00436
	(0.00845)	(0.0127)	(0.0141)	(0.0172)	(0.00641)
EMP	-0.221	0.456*	0.131	-0.730	-0.0299
	(0.197)	(0.270)	(0.334)	(0.466)	(0.153)
HHS	-0.190***	-0.236***	-0.310***	-0.379***	-0.285***
	(0.0561)	(0.0653)	(0.0799)	(0.0918)	(0.0372)
SHRPS	-0.292	0.135	0.536*	-0.0887	0.122
	(0.283)	(0.316)	(0.314)	(0.363)	(0.165)
RURAL	-0.268*	-0.531*	0.292	-0.188	-0.225
	(0.142)	(0.282)	(0.401)	(0.502)	(0.163)
SHRFS	0.0637	-0.226	0.296	0.113	0.0722
	(0.220)	(0.268)	(0.269)	(0.314)	(0.138)
RURALF	0.273*	0.300	-0.352	0.323	0.188
	(0.147)	(0.216)	(0.337)	(0.436)	(0.123)
NS	0.310***	0.491***	0.437***	0.700***	0.496***
	(0.117)	(0.144)	(0.159)	(0.195)	(0.0776)
Observations	1,116	1,014	995	898	4,027

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 6: Tobit Estimation Results of Household Education Expenditures for the Double Log Specification, 2012

Variables	Bottom 25 Marginal Effects	Second 25 Marginal Effects	Third 25 Marginal Effects	Top 25 Marginal Effects	Total Marginal Effects
lnEXP	1.248***	1.951***	2.045***	1.800***	1.951***
	(0.221)	(0.341)	(0.295)	(0.170)	(0.0869)
EDUCD2	0.137	0.00179	0.298	0.404	0.0751
	(0.252)	(0.381)	(0.552)	(0.733)	(0.207)
EDUCD3	0.1847	0.391	0.460	0.275	0.260
	(0.350)	(0.455)	(0.619)	(0.801)	(0.249)
EDUCD4	0.317**	0.883**	0.832**	1.400**	0.826***
	(0.126)	(0.446)	(0.329)	(0.556)	(0.241)
EDUCD5	1.226	0.993	1.477**	1.911**	1.384***
	(0.786)	(0.619)	(0.635)	(0.760)	(0.265)
AGE	-0.00825	0.00528	0.0109	0.0318**	0.0103*
	(0.0103)	(0.0118)	(0.0132)	(0.0136)	(0.00619)
EMP	0.0986	-0.0343	-0.152	0.498	0.118
	(0.221)	(0.256)	(0.291)	(0.329)	(0.139)
HHS	-0.252***	-0.317***	-0.332***	-0.397***	-0.333***
	(0.0730)	(0.0732)	(0.0780)	(0.0789)	(0.0379)
SHRPS	0.00302	0.187	0.0389	-0.00199	0.0452
	(0.255)	(0.255)	(0.241)	(0.234)	(0.124)
RURAL	-0.207	-0.272	0.0169	-0.499	-0.295
	(0.257)	(0.285)	(0.307)	(0.371)	(0.253)
SHRFS	0.183	0.415*	0.139	0.224	0.228**
	(0.239)	(0.223)	(0.226)	(0.209)	(0.113)
RURALF	0.103	0.229	-0.166	-0.0375	0.105
	(0.183)	(0.188)	(0.270)	(0.308)	(0.116)
NS	0.446***	0.580***	0.446***	0.650***	0.538***
	(0.123)	(0.133)	(0.131)	(0.141)	(0.0670)
Observations	990	1,111	1,146	1,091	4,341

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 7: Tobit Estimation Results of Household Education Expenditures for the Working-Leser Specification, 2003

Variables	Bottom 25 Marginal Effects	Second 25 Marginal Effects	Third 25 Marginal Effects	Top 25 Marginal Effects	Total Marginal Effects
lnEXP	-0.00157***	0.0168***	0.0161***	-0.00331***	0.0113***
	(0.00032)	(0.00220)	(0.00248)	(0.00051)	(0.000967)
EDUCD2	0.00132	0.000369	0.00236	0.00623	0.000801
	(0.00115)	(0.00210)	(0.00296)	(0.00525)	(0.00123)
EDUCD3	0.00224	0.00147	0.00255	0.00515	0.000891
	(0.00228)	(0.00244)	(0.00347)	(0.00583)	(0.00157)
EDUCD4	0.00313	0.00211	0.000337	0.00702*	0.00141
	(0.00212)	(0.00296)	(0.00346)	(0.00413)	(0.00170)
EDUCD5	0.00411	0.00444	0.000501	0.0111*	0.00468**
	(0.00320)	(0.00372)	(0.00376)	(0.00653)	(0.00215)
AGE	3.83e-05	-0.000119	8.37e-05	1.75e-05	-1.56e-05
	(4.15e-05)	(7.61e-05)	(8.10e-05)	(0.000142)	(4.23e-05)
EMP	-0.000389	3.61e-05	0.00384*	-0.000823	0.000528
	(0.00103)	(0.00164)	(0.00209)	(0.00318)	(0.000957)
HHS	-0.00107***	-0.00165***	-0.00278***	-0.00252***	-0.00199***
	(0.000256)	(0.000427)	(0.000488)	(0.000563)	(0.000221)
SHRPS	-0.00148	-0.00147	-0.00309	-0.00926***	-0.00380***
	(0.00152)	(0.00206)	(0.00215)	(0.00313)	(0.00115)
RURAL	-0.00235**	-0.00286**	-0.00306*	-0.00940	-0.00417***
	(0.00108)	(0.00141)	(0.00166)	(0.00874)	(0.00107)
SHRFS	0.000888	0.000119	-0.000403	-0.000787	-9.30e-05
	(0.00115)	(0.00159)	(0.00174)	(0.00280)	(0.000949)
RURALF	-0.000281	-0.000739	-0.000694	0.00487	0.000688
	(0.00107)	(0.00152)	(0.00215)	(0.00415)	(0.00103)
NS	0.00293***	0.00379***	0.00569***	0.00738***	0.00490***
	(0.000709)	(0.000887)	(0.000981)	(0.00157)	(0.000518)
Observations	3,008	3,005	3,045	2,811	11,871

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 8: Tobit estimation results of household education expenditures for the Working-Leser specification, 2007

Variables	Bottom 25 Marginal Effects	Second 25 Marginal Effects	Third 25 Marginal Effects	Top 25 Marginal Effects	Total Marginal Effects
lnEXP	-0.00069***	0.0283***	0.0172***	0.00148***	0.0162***
	(0.00014)	(0.00993)	(0.00411)	(0.00052)	(0.00262)
EDUCD2	0.00102	0.00848*	0.0103**	0.0101	0.000635
	(0.00198)	(0.00456)	(0.00514)	(0.0130)	(0.00257)
EDUCD3	0.00378	0.0189**	0.00131	0.0103	0.00315
	(0.00452)	(0.00890)	(0.00621)	(0.0157)	(0.00381)
EDUCD4	0.00503	0.0127*	0.00303*	0.0154*	0.00488*
	(0.00448)	(0.00682)	(0.00163)	(0.0082)	(0.00262)
EDUCD5	0.000782	0.0388**	0.00667**	0.0379**	0.0185***
	(0.00538)	(0.0191)	(0.00332)	(0.0176)	(0.00553)
AGE	-6.72e-05	0.000256	-0.000105	0.000156	1.47e-05
	(7.84e-05)	(0.000184)	(0.000155)	(0.000321)	(9.31e-05)
EMP	-0.00284	0.00722*	-3.35e-05	-0.00358	0.000141
	(0.00225)	(0.00389)	(0.00461)	(0.00764)	(0.00210)
HHS	-0.00195***	-0.00374***	-0.00390***	-0.00620***	-0.00404***
	(0.000586)	(0.00126)	(0.000956)	(0.00159)	(0.000579)
SHRPS	-0.00903**	0.000497	0.00182	-0.00882	-0.00303
	(0.00397)	(0.00514)	(0.00403)	(0.00649)	(0.00253)
RURAL	-0.00264*	-0.00499*	0.00716	0.00272	-0.000417
	(0.00142)	(0.00268)	(0.00568)	(0.00957)	(0.00253)
SHRFS	-0.00275	-0.00286	0.000981	0.00593	0.000412
	(0.00243)	(0.00435)	(0.00352)	(0.00549)	(0.00207)
RURALF	0.00387**	0.00395	-0.00539	0.00475	0.00208
	(0.00177)	(0.00280)	(0.00408)	(0.00710)	(0.00166)
NS	0.00292**	0.00619***	0.00471**	0.0106***	0.00649***
	(0.00130)	(0.00221)	(0.00200)	(0.00360)	(0.00120)
Observations	1,116	1,014	995	898	4,027

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 9: Tobit Estimation Results of Household Education Expenditures for the Working-Leser Specification, 2012

Variables	Bottom 25 Marginal Effects	Second 25 Marginal Effects	Third 25 Marginal Effects	Top 25 Marginal Effects	Total Marginal Effects
lnEXP	0.00469***	0.02836***	0.02412***	0.0227***	0.01938***
	(0.00064)	(0.00459)	(0.00445)	(0.00358)	(0.00156)
EDUCD2	0.00114	0.00212	0.000398	0.00393	0.000563
	(0.00249)	(0.00275)	(0.00497)	(0.00848)	(0.00203)
EDUCD3	0.00207	0.00617*	0.00232	0.00671	0.00662
	(0.00326)	(0.00366)	(0.00591)	(0.0102)	(0.00553)
EDUCD4	0.00255*	0.00860**	0.00466**	0.0210**	0.00682***
	(0.00151)	(0.00356)	(0.00225)	(0.00986)	(0.00245)
EDUCD5	0.00732	0.00911	0.0142**	0.0382***	0.0245***
	(0.00875)	(0.00846)	(0.00688)	(0.0100)	(0.00373)
AGE	1.72e-05	8.15e-05	0.000168	0.000616***	0.000180***
	(9.07e-05)	(9.36e-05)	(0.000134)	(0.000197)	(6.37e-05)
EMP	0.00117	-0.00149	-0.00128	0.00937**	0.00138
	(0.00209)	(0.00239)	(0.00327)	(0.00423)	(0.00149)
HHS	-0.00246***	-0.00270***	-0.00361***	-0.00564***	-0.00387***
	(0.000685)	(0.000612)	(0.000692)	(0.00113)	(0.000400)
SHRPS	-0.00142	-0.00200	-0.00255	-0.00171	-0.00145
	(0.00239)	(0.00224)	(0.00231)	(0.00407)	(0.00147)
RURAL	-0.000761	-0.00136	0.00136	-0.00873	-0.00251
	(0.00237)	(0.00245)	(0.00297)	(0.00781)	(0.00159)
SHRFS	0.00315	0.00427**	0.00259	0.00172	0.00265*
	(0.00239)	(0.00199)	(0.00212)	(0.00377)	(0.00137)
RURALF	-2.71e-05	0.00108	-0.00213	0.000558	0.000706
	(0.00190)	(0.00152)	(0.00236)	(0.00475)	(0.00125)
NS	0.00457***	0.00465***	0.00509***	0.0110***	0.00628***
	(0.00123)	(0.00113)	(0.00130)	(0.00241)	(0.000781)
Observations	990	1,111	1,146	1,091	4,341

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 10: The Expenditure Elasticities Calculated From the Working-Leser Regressions

	Bottom 25	Second 25	Third 25	Top 25	Total
2003	0.833014	2.187573	1.785381	0.89423	1.582751
2007	0.946136	2.137624	1.63874	1.03547	1.59106
2012	1.284547	2.358224	1.961002	1.521586	1.697813