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OUT OF POCKET EDUCATION EXPENDITURE AND HOUSEHOLD BUDGET: EVIDENCE FROM ARAB COUNTRIES

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Send correspondence to:
Reham Rizk
British University in Cairo
reham.rizk@bue.edu.eg

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21 Al-Sad Al-Aaly Street
Dokki, Giza
Egypt
www.erf.org.eg

Abstract

The paper attempts to present a comparative study for patterns of household expenditure on education using different groups of population. The paper based its empirics on cross sectional evidence from four countries employing Harmonized Household Income and expenditure surveys. The datasets used are 2010/2011 round of the HHIES of Egypt, Jordan and Palestine and 2009 round for Sudan. The paper aims to examine the determinants of family spending on education on one hand and the magnitude of household spending on schooling using different population groups. The paper finds a degree of consistency in the patterns of spending on education across countries. We find that households in lower social strata are found to spend more on educating their children's at all educational level with exception in Egypt, where wealthier household are found to spend more on children's education. Moreover, Parental education and household income have a great influence on the magnitude of household spending on education. Household living in center provinces are more likely to spend more on children's schooling except Sudan. With respect to demographic burden, households with children at primary schooling children are likely to spend less on education, while households with children at secondary and tertiary level of schooling are willing to spend more on education with except in Egypt at tertiary level. Egypt is the only country where free education policy is extended to university students. Despite, all Arab governments are adopting free education policy at elementary level, households still spend considerable amount of their household income on acquiring education, which is expected to be funded by government. Coefficients of elasticity's show that both Sudan and Palestine considered spending on education is a necessity component in the household budget, while in Egypt, households at top income quintiles had the largest spending on education and Jordan is estimated to have unitary elasticity.

JEL Classification: C31, D1, E22 , R20 ,P5 ,O53
Keywords: Cross-sectional models, Family expenditure on education, comparative studies, Arab countries

ملخص

تقدم هذه الورقة دراسة مقارنة لأنماط إنفاق الأسر على التعليم باستخدام مجموعات مختلفة من السكان. تستند الورقة على أدلة مقطعية من أربع دول لمجموعات البيانات المستخدمة 2011/2010 من مسوحات الدخل والانفاق للأسر لكل من مصر والأردن وفلسطين و جولة 2009 للسودان. وتهدف هذه الورقة إلى دراسة محددات إنفاق الأسرة على التعليم من جهة وحجم إنفاق الأسر على التعليم المدرسي باستخدام مجموعات سكانية مختلفة. وجدت الورقة درجة من الاتساق في أنماط الإنفاق على التعليم في مختلف البلدان. نجد أن الأسر في أقل الشرائح الاجتماعية لها انفاق متزايد على تثقيف وأطفالهم في جميع المستويات التعليمية مع استثناء في مصر، حيث تم العثور على ثراء الأسر أن تنفق أكثر على تعليم الأطفال. وعلاوة على ذلك، تعليم الوالدين ودخل الأسرة لديها تأثير كبير على حجم إنفاق الأسر على التعليم. من المرجح أن تنفق أكثر على تعليم الأطفال باستثناء السودان في محافظات الوسط. وفيما يتعلق بالعبء الديموغرافي، والأسر التي لديها أطفال في التعليم الابتدائي فمن المرجح أنها تنفق أقل على التعليم، في حين أن الأسر التي لديها أطفال في المرحلة الثانوية والمرحلة الثالثة من التعليم على استعداد لإنفاق المزيد على التعليم ما عدا في مصر في مرحلة التعليم العالي. ومصر هي البلد الوحيد الذي تم تمديده سياسة التعليم المجاني لطلاب الجامعات فيها. على الرغم من أن جميع الحكومات العربية تبني سياسة مجانية التعليم في المرحلة الابتدائية، فان الأسر لا تزال تنفق قدرا كبيرا من دخلها على الحصول على التعليم. تظهر المعاملات بعض المرونة في أن الإنفاق على التعليم هو عنصر ضروري في ميزانية الأسرة في كل من السودان وفلسطين ، بينما في مصر، كانت الأسر في فئات الدخل الأعلى أكبر من الإنفاق على التعليم أما الأردن فلديها مرونة وحدوية.

1. Introduction

Education is considered the powerful force that can shape the future of the Arab countries. Education has a positive spillover effect not only for the country in terms of speeding up economic growth, improve income distribution and social mobility but also has an impact on the quality of citizen's life by contributing to longer life expectancy and lower fertility rates and cohesive national identity. Investment in education could come from two different domains: public investment and household investment(World Bank 2008). In fact, there is a considerable research on public expenditure on education; there is very limited database on household expenditure particularly in Arab countries. Much attention has been given to public spending on education and its impact on economic growth and poverty reduction, ignoring the quantum of household expenditure on education and its determinants. This attributed to the free education policy that is adopted since mid 20th century as a part of social contract. Thus, lead to incorrect assumptions about the extent and the magnitude of household spending on educations, which consequently lead to formation of incorrect policies on fees and subsidies and this, is predominant in Egypt. The present paper is considered a modest attempt to fill the gap in the empirical literature. The objective of the paper is three-fold: First: to analyze the pattern of household expenditure on off-spring's education by family characteristics such as household income; number of children in the household and educational level of child. Second: investigate the determinants of household expenditure on schooling and finally, calculate the income elasticity of household expenditure on education for each country.

The rest of the paper is organized as follows. Section 2 presents the stylized facts of private and public spending on schooling in Arab countries; section 3 describes the education system in the four countries; section 4 reviews previous literature review; section 5 describes the data ; section 6 presents the econometric model; section7 the empirical results and section 8 concludes.

2. The Evolution of Public and Private Spending on Education in Arab Countries

In MENA countries, government plays a crucial role in accumulating human capital via funding formal schooling. In the period (2000-2013), the average public spending on education as % of GDP is 5.1% in MENA, 3% in Asia, 4.4% in central Europe, 4.6% in Central Asia and 4.5 % in OECD (WDI, 2015). It is observed that MENA spending on public education is the highest compared to its counterpart region as shown in Figure (1). The large spending on education is coupled by increasing in enrollment rates at all educational levels. Enrollment rates are measured as the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education. Figure (2) shows that enrolment rates for all MENA countries at the primary and secondary level increases, while secondary and tertiary enrollment in Sudan has witnessed huge decline compared to its counterpart. Furthermore, it is observed that tertiary enrollment is lower for Egypt (28.8%), West Bank and Gaza (51.3%), Tunisia (35.2), Sudan (14.8%), Jordan (39.9%) compared to Israel (65.8%) and Turkey (60.7%) (WDI, 2015). This is due to low return of education in the labor market coupled with high rates of unemployment. In terms of country context, public spending on education as % of GDP is 5.9% for Tunisia, 5.2% for Morocco, 4.4% for Egypt, 2.2% for Sudan, 4.5% for Algeria 5.4% Israel and 2.6% for Turkey (WDI, 2015).

With respect to private spending on education, households appear to devote 5% of their income to education. Figure (4) show private spending on education consumes 2.8% of household income in Egypt, whereas, consumes 6.8% in Jordan, 5.5% in Palestine and 5% in Sudan.

As shown in Figure (5), the education budget tends to increase with income quintile only in Egypt, where, the wealthiest households devote 2.3 times of household income to education compared to those at the bottom income quintile. While the rest of countries observed to allocate more of their budget to education at the bottom income quintiles. In fact, we can deduce

that apart from Egypt, the poorest households give education higher priority on their budget than those households belong to the top income quintiles. This finding is not striking as households with poor socio-economic background have a strong desire to educate their children and view education as the only mean to have good jobs and mobile upward on social ladder.

Generally speaking, Schooling is free at compulsory level and funded by the state, then it becomes more costly at tertiary level with exception in Egypt as shown in **Figure (6)**. In Egypt and under Nasser presidential period, free-fee policy of schooling is extended to university level. Moreover, large allocations of resources are devoted by households on educating their children at tertiary level in Palestine compared to counterparts. In fact, due to the structure of education system, where Palestine owned 11 universities, 10 are private and only one is public university. With respect to secondary schooling, Sudan is observed to allocate more funds on their children's education. Sudan is the only country where secondary education is not funded by the state even at the public schools.

With respect to spending on education by child, it was known as the number of children enrolled in education increases, more of household's resources are thus diverted to spending on education. It is important to highlight the average spending on education per child to indicate the intensity of household investment on education per child **(Figure 7)**. Spending on one more child at primary schooling ranged from 0.4% to 1.7% of total household income. The low primary spending per child in Arab countries is due to implementation of fee-free policy of education at basic schooling. While, the cost of educating one more child at tertiary level is high in both Palestine and Sudan. Palestine spends 6 times Egypt, while Sudan spends 4 times Egypt.

The breakdown of education spending varies also according with household's socio-economic profile and level of education as shown in **Figure (8).** The general trend was found among Arab countries, with exception of Egypt, households belong to bottom and middle income quintiles are found to spend more on education at all its levels compared to those at highest income quintile. Egypt contradicts this trend where wealthier households are more likely to spend more on children's education than poor households. This result is not striking as public education in Egypt is of poor quality in terms of very low teacher-student ratio, large classroom students as well as the quantity of schools particularly in Upper Egypt. All these factors combined lead to excessive reliance on private tutoring and large drop-out at earlier stages of schooling as poor households couldn't afford costs of private tutoring. The same trend is observed on breaking household education spending per child according to level of education and household income.

3. Educational System

Table (1): summarizes the country's education system and the length of each education cycle. In this section, we will describe the structure of education system in each country and the funding sources.

3.1 Egypt

Schooling in Egypt is of 2 years of preschool and 5 years of primary school. The age of basic schooling starts at age of 6. The secondary schooling is of 2 stages: lower secondary of 3 years and upper secondary is of three years. The latter is divided into general and vocational track. Finally, at the end of general upper secondary, there is an examination "Thanawyia Amma" used for university selection. All the education decisions are made by government including the ministry of education. Public education is free for all and this is applied for all schooling level and funded by the government.

3.2 Jordan

The structure of education system consists of 2 years of preschool and 6 years of primary level for aged children 6. The secondary schooling consists of 4 years lower secondary and two years of upper secondary. The upper secondary is divided into two tracks: academic and vocational. There is an examination for the students required to pass at the end of upper secondary called "Tawijihi" in order to join university. Tertiary duration in Jordan is of four years .schooling is free at compulsory levels as well as secondary only in public schools.

3.3 Palestine

The schooling system in Palestine consists of 2 years of preschool and 4 years of primary schooling. The basic education is compulsory for children aged 6. The secondary education consists of 6 years of lower secondary and 2 years of upper secondary. The latter is of 2 years and divided into two tracks: academic and vocational. The upper academic secondary is ended up with examination "Tawijihi" required for students to join university. The tertiary education is of four years. There are 11 universities in West Banka and Gaza, 10 of them are private and one is public. Funding education comes from the government budget through ministry of finance, while the remaining part comes from donors and international organizations.

3.4 Sudan

Education system in Sudan is consisted of 2 years of preschool and 8 years of primary school. The compulsory education is applied for children aged 6. The formal language is Arabic for education in Sudan since El-Bashir's comes to power. The secondary education is of 3 years and divided into secondary and vocational programs. Education is free only at primary level of schooling.

4. An Overview of Existing Literature

There are several studies that examine the patterns and determinants of household expenditure on education across countries. Some studies examine the correlation between public spending on education and out-pocket household spending on education in Israel. For instance, (Strawczynski and Zeira 2003) found that increasing public spending on education out-crowds household spending on education, due to complementarily nature of the two types of expenditures. However, (Tilak, 1991) found positive correlation between public and family spending on education and they are elastic to the size of total budgets. On examining the determinants of household expenditure on education, (Hashimoto & Heath, 1995) indicate that household income is a crucial factor in determining household expenditure on education in Japan. As, the results shows that income elasticity for education is high for middle-income families and don't fall below zero from poor families and becomes negative for households belong to the top income quintiles. Psacharopoulos, Arieira, and Mattson (1997) find that household whose heads are highly educated and earn high income are more likely to spend more on private education in Bolivia. Besides, Fernandez and Rogerson (2001) finds that personal income is an important determinant of spending per student using time series of panel dataset for U.S over the period (1970-1990). Qian and Smyth (2011) find that household income has a significant influence over spending on children's domestic and overseas education in China. This is also supported by the work of (Quang 2012) that argue that household income affects positively the magnitude of children's education expenditure in Vietnam.

On the other side, some studies examined the correlation between private tutoring expenditure and household income rather than total household expenditure on education. For instance , Tansel and Bircan (2006), studied the determinants of private tutoring in Turkey. The study uncovers that both parental educational level and household income increases spending on private tutoring as an attempt to provide good quality of education to their children. Psacharopoulos and Papakonstantinou (2005) shows that private tutoring is main component

for household budget in Greece, however education is free for all by constitution. Families are found to allocate large portion of their income to help their children pass the examination required to join college. Also (Dang 2007) claimed that private tutoring consumes household income in Vietnam. In fact, it is considered necessity component for both primary and secondary students and tends to be more progressive at higher levels of education.

Moreover, there are other studies who integrate different factors rather than household income in determining the patterns of children's education expenditure. Tansel (2002) uncovered large gender gap of educational attainments between boys and girls in Turkey. Besides, Chaudhuri and Roy (2006) finds that parents in India exhibit gender bias in education expenditure while educating their children. (Aslam and Kingdon 2008) observed strong gender biases with in households rather than across households in Pakistan. Besides , also caste and religion are used by (Tilak 2002). In addition , number of siblings in the family are also used by (Aysit Tansel and Bircan 2006) , Finally , parental level of education and region are used by (Qian and Smyth 2011;Mauldin, Mimura, and Lino 2001).

The estimation methods used in analyzing the determinants of educational expenditure varied across studies. Some studies used Tobit model in their estimation because the sample contains a large number of households with zero educational expenditure, so it is censored at zero (Qian and Smyth 2011; Quang 2012; Tansel and Bircan 2006; Hashimoto & Heath, 1995) .others studies (Psacharopoulos and Papakonstantinou 2005; Rizk and Owusu-Afriyie 2014; Tilak 2002) applied Ordinary Least Squares (OLS) as the educational expenditure on children's is always positive and continuous.

In the context of Arab countries, there is a shortage of evidence that explored the link between family background and out-pocket schooling spending.(AL-Qudsi 2003) studied the effects of family socio-economic background on the patterns of school enrollment in five Arab countries (Kuwait, Oman, Yemen, Jordan, West Bank and Gaza). The results showed that access to credit and income gaps interacted with gender gap to produce large disparities and wastages in school enrollment in Arab countries. Tansel and Kazemi (2000) investigate the equity measures in distribution of education expenditure in MENA countries at different level of schooling. Assaad, Salehi-Isfahani, and Hendy (2014) studied the relationship between schooling attainment of youth in a group of MENA countries and family characteristics in which they born. Salehi-Isfahani, Hassine, and Assaad (2012) examines the impact of family's characteristics on the academic achievement using students scores in both mathematics and science for a group of MENA countries and over time since 1999.

With respect to country context, few empirical studies are also found exploring the education expenditure pattern of households. Krafft (2015) investigates the influence of early childhood care and education on improving subsequent educational outcomes in Egypt. Dancer and Rammohan (2007) examine the existence of gender gap in Egypt with respect to educational attainment and to what extent it was exacerbated in Upper Egypt. Elbadawy (2014) found that family's wealth and parental educational level have a significant impact on achieving inequality for educational attainment and outcomes in Egypt. (Assaad 2010) focused on analyzing the implication of free education policy adopted by MENA countries. As, this policy is designed initially to achieve equality of educational opportunity for all individuals and resulted in an extreme inequality in access to education.(Ali 2013) examined the determinants of private tutoring in Jordan. The paper observed high spending on private tutoring among students at last year of secondary education and in southern provinces of Jordan.

As displayed above, the linkage between family's characteristics and household out-pocket spending on education in Arab countries are very limited. The intuition behind that is the reliance in public spending on education as education is free for all at elementary level and totally provided by the country and in some countries the free policy extended to cover both

secondary and tertiary schooling. Thus that results in poor quality of education and family's reliance on private tutoring to educate their children.

5. Data

The paper makes use of Household Income, Expenditure and Consumption Surveys (HICES) for a group of MENA countries. The dataset used for this paper are the 2010/2011 round for Egypt, Jordan, Palestine and Tunisia. Besides, the 2009 round of HICES is used for Sudan. The HICES data are nationally representative samples collected by the national statistical agencies of the selected countries and harmonized by the Economic Research Forum (ERF)[1].The harmonized samples for selected countries are 50% drawn from the original national surveys with exception of Palestine (100 percent) and Jordon (25 percent). Instead of including all individuals in the dataset, the paper makes use of only households with dependent children .Moreover, we assume that the dependent children's age should not be older than the age that majority of students graduate from college.

The HICES survey contains detailed information about household structure with respect to income, expenditure, assets ownership and geographic location as well as individual characteristics' such as age , gender ,occupation, marital status and education.

The descriptive statistics of the sample used to analyze the determinants of off-spring's education for MENA countries is reported in table (4). ***In Egypt*** sample, the original sample is of 34,069 and the restricted sample is 9981 of independent children ranged from preschool age to college-aged children (4-22), mean age of the parents are 46 years for father and 39 for mother, 45.7% are females and 97% are married couples and 44% are living in Upper Egypt. The median of household income is 24635. In terms of father's educational attainment, 40% of the fathers are with no schooling and 18.7% are with university degree. For mother's education, 50% are with no schooling and 12.3% only holds university degree. In terms of father's education, 10% of fathers belong to higher-level professions, 21% are middle-level profession, 18% are lower-level professions, 43%are blue-collar and 6% are inactive (including retirees, students, housewives and unemployment). While mothers' occupation, 1.5% belongs to high professions, 9% are middle-level profession, 4%are lower-level profession, 31% are blue-collar and 53% are inactive. In terms of school-aged children, 30% of the families have at least one child at preschool and primary aged children, 31.5% have at least one secondary-aged child and 24% have at least one child at college-aged children.

In Palestine, the original sample is of 22605 respondents; we use a restricted sample of 9109 respondents who's their dependent children's age ranged from 4 years to 22 years. The mean age of parents in the sample is 44 years for father and 39 years for mothers. Of this sample 46.6% are females and 98.4% are married. The median of household income is 40990 pounds. With respect to parent's educational level, 9% of the father's has no schooling, 22.3% of the father's has four year university while, 12.6% of mother's has no schooling and 13% has four year university. In terms of parent's occupation , of father's sample , 5% belongs to high-level profession , 14.5% are middle-level jobs, 39% are lower-level professions,33% are blue-collar and 8% are out of labor force, while of mother's sample, 0.4% belongs to high-level profession , 6 % are middle-level jobs, 4 % are lower-level professions,12% are blue-collar and 77% are out of labor force. Of the sample 64% are residing in West Bank and 35% are in Gaza Strip. With respect to children's age, 36% of households had at least one child at preschool and primary aged children living with then, 13% had at least on child at secondary school age and 22% had at least one child at college age.

In Sudan, instead of using all 48,845 respondents in the original dataset, we restrict the sample to families with dependent children aged 4-20 years old, based on the age at which students

[1] www.erfdataportal.com

join the preschool and graduated from the university. The mean age of the fathers in the sample was 46.5 years, while 37 years for the mothers. Of which 47% are females, 99.4% are married couples and 47% lived in central provinces of Sudan (Darfur, Khartoum and Blue Nile). The median of household income per year in Sudan is 6000 pounds. With respect to employment, 93.4% of the fathers are employed while 16% only of mothers are employed and 81.4% are out of labor force. In terms of education, 26 % of fathers are with no schooling and 13% are of college degree. While, 36% of mothers are with no schooling and 60% are with college degree. Finally, with respect to children's age, 12% of households have at least on child at preschool and primary school age living with them, while 37.4% have at least one at secondary and 27% have at least one child at college.

In Jordon, the sample used to analyze the education expenditure is of 3046 respondents out of 15472 where their dependent children's age should be not older than 22 years old. Of the sample 48% are females and 99% are married couples living together. The mean age of fathers in the sample is 48 years, while mothers are 42 years. The median of household income was 8010 dinar per year. Of the fathers, 26% were college-degree, 19% had a secondary certificate, 44% had a basic schooling and 10% were illiterate. Of mothers, 24% had college-degree, 18.3% had secondary degree, 45% had basic schooling and 13% were illiterate. In terms of occupation, of father's, 0.1% were high-level profession, 18% were medium-level profession, 26% were low-level profession, 25% were blue-collar and 31.4% were not in labor force. Of mother's, 0.72% were high-level profession, 5% were medium-level profession, 3% were low-level profession, 0.03% was blue-collar and 91.3% were not in labor force. In fact, lower rates of economic activity are observed in Jordan compared to those in Egypt, Palestine and Sudan. This is also supported by(Mryyan 2012) reported that total inactivity is about 56% in 2010, which reflected that around 50% of the working population are not contributing to the GDP. Besides, the data shows decline in female labor force participation especially among educated women in Jordon. This is due to deteriorating labor market opportunities for these women. Women in Jordon are primarily work in health and education sector where, the public sector is dominant. Due to contraction of public sector size since 1982 and expansion of the private sector which offers employment opportunities to women temporary and precarious in nature and very unfriendly to married women. Based on , many women opt to stay out of the labor force or even quit after marriage (Assaad, Hendy, and Yassine 2012).In terms of household location , 46% were residing in center Jordan , 43% were in north Jordan and only 11% were in south Jordan. This shows that most of the population is concentrated in urban areas. This is also supported by the work of (Mryyan 2012) stated that 60% of the Jordanians live in Amman and three adjacent governorates to it, Jordan is highly urbanized where 80% of its population lived in urban centers.

With respect to children's age, 27% of the households had at least one child at preschool and primary school age living with them, 22% had at least one child at secondary level and 26.5% at college age.

Finally , table (2-5) summarize the change in the amount that household spend on education by household income. As shown in the tables, richer households are found to spend more on education than poorer households and this is obvious in Egypt and Jordan. However, poorer households are found to spend a greater percentage of their income on children's education. This support the argument that poorer households view education as investment in human capital that will drive their children's out of poverty.

6. Model

6.1 Conceptual framework

The paper makes use of human capital theory in designing the conceptual framework that determine which factors cause the variation of parental expenditure on offspring's different

educational level (Becker, 1964, 1981; Becker and Tomes 1976). Up to the authors' knowledge, there is no research found examining the linkage of children's educational attainment to parental expenditure on children's education at basic, secondary and college level for the Arab countries. Decisions about investment on children's education are always made by parents particularly in Arab countries for different educational levels and rarely by the individual concerned. The cost of education comprises direct and indirect costs, direct costs include tuition fees and any other costs incurred during schooling. Since schooling in Arab countries is free and provided by the state at least at compulsory level. Then, in fact the only cost is foregone earnings due to delay to enter the labor market.

In fact, the paper attempts to provide guidance for parental expenditure on education through introducing parents' characteristics as well as household characteristics as determinants that cause the variation of this expenditure. Human capital theory views education as an investment that maximizes their children's lifetime earnings (Becker, 1964, 1981; Becker and Tomes 1976). Parents' decision to educate their children based on comparing the expected net benefit of investment in children's education to the cost incurred. Human capital theory relates investment in children education to a group of determinants. Some studies find that there is a positive link between investment in children's human capital and parental socio-economic background in terms of parental income and personal characteristics and preferences (Becker and Tomes 1986). Others find that family size affects inversely the children educational achievement as family size increases that decline, the education expenditure per child decreases in case of budget constraint (Hanushek 1992). Besides, Hill and Duncan (1987) and Haveman and Wolfe (1995) argue that parents endowed with more financial resources are transmitted positively to higher educational attainment for adult children and consequently higher future wages. There is causal relationship between parent's educational level and children's educational attainment. In fact, parent's with high schooling level are more likely to invest in children's education than those with low level of schooling (Leibowitz 1974). Finally , parent's occupation has a direct impact on parent's perception towards investment in children's education(Mauldin, Mimura, and Lino 2001).

6.2 Empirical specification

Robust OLS model is specified to estimate the out-pocket expenditure on off-spring's education in Arab countries. The intuition behind using OLS method is that educational expenditure is observed to be continuous and unlimited. Besides, none of the individuals are observed to have zero educational expenditure regardless the educational level and the country used. However, education is free at compulsory education in those countries and sometimes extended to the secondary and college level of education. Education expenditure is not observed to be zero to any of the individuals. This confirms the idea of poor quality of education prevailed in Arab countries and the extensive reliance on private tutoring even at preschool and primary levels, in order to supply their children with good quality of education given the large number of pupils in the classroom and the teacher-student ratio is very small.

The empirical specification of the OLS (Tilak, 1991) (Hashimoto & Heath, 1995) (Hashimoto & Heath, 1995; Hashimoto & Heath, 1995; Hashimoto & Heath, 1995) model is as follows:

$$ln\, Y^* = \beta' X + \mu \quad (1)$$

Where $ln\, Y^*$ is defined as logarithm of annual household expenditure on education, X is a vector of various family characteristics namely, household income father's education, mother's education. Besides, parent's occupation, and geographic location of household are used. β' is the estimated coefficient that measures the magnitude that X variables influence household spending on education. Equation (1) was estimated separately in each of the four countries employing all the family characteristics as independent variables (full-sample).

Then, the sample is divided into income quintiles and equation (1) was estimated separately for each income quintile in each country. This is approach is followed by (Qian and Smyth 2011) and (Quang 2012) The intuition is to examine the pattern of household's expenditure on off-spring's education at each income level and observe the effects of family characteristics.

Finally, the full sample is grouped by children's age into three main groups' namely preschool and primary aged children, secondary-aged children and college-aged children. Following the approach of (Hannum 2005), equation (1) is estimated for each sub-sample , removing parent's education and occupation in order to examine the link between socio-economic background of the family in terms of household income , household size and household geographic residence and patterns of educational expenditure for each sub-sample of children's age.

7. Empirical Results

7.1 Determinants of expenditure on children's education (full sample)

Table (7) shows the Robust Ordinary Least squares results for the determinants of educational expenditure in Egypt, Palestine, Jordan and Sudan. ***In Egypt***, With respect to household income quintiles, it is observed that the higher the income group where household belongs, the more resources allocated to spending on education. Households at the fourth income quintiles are found to spend 17% more on education than those at second income quintile. Those households at the highest income quintile are found to spend 48% more than those at the fourth income quintile. Fathers and Mothers education have increasingly positive effect on children's educational expenditure. Fathers and mothers who received secondary and college level of education are found to spend 3%,4%,4.5% and 6% respectively , more than those who are illiterate. In particular, the effect of mother's education is larger than father's. In terms of occupation, fathers whose occupation were in higher and middle-level professions are found to spend 28% and 11.1% more than those who are out-of labor force. Mothers with lower -level and blue-collar jobs are found to spend less on children's education. This is due to the existence wage differential against women belongs to lower paid segment of the Egyptian labor market as blue-collar jobs and women lower than intermediate level of schooling and graduates of vocational and post secondary education (Said 2007). Besides, the contraction of public sector employment for women that is considered more hospitable to married women and result in low female labor force participation and more shift to informal market(Assaad 2015). Father's occupation has higher influence on off-spring's education more than mothers. With respect to household residence, both households located in Lower and Upper Egypt is found to spend less than metropolitan regions. It is observed that households who reside in Upper Egypt are found to spend 90% less than those in Upper Egypt. This result is supported by the work of (Said 2007) who shows large increase in inequality between rural-lower and urban-upper Egypt.

The size of household has a large influence on off-spring's education. One more child at preschool and primary school age children are found to reduce total education expenditure by 18%. While one more child at secondary and college level is found to raise total expenditure on education by 25% and 8%. This result is not surprising giving that education is free at all its levels in Egypt. In fact, the higher cost of education at the secondary level is due to excessive reliance on private tutoring (informal education) required for passing for passing general secondary examination as a prerequisite for joining college in Egypt.

In Palestine, with respect to household income quintiles, we observed significant differences in educational expenditure among different income groups. Households at the 5^{th} and 4^{th} income quintiles are found to spend 50% and 35% more on educational expenditure compared to the 1^{st} income quintile. In terms of parents' education level, father's educational level has increasingly and positive effect on off-springs educational expenditure. Fathers who received education at university level were found to spend 7 times more than those with no schooling. Mothers who received primary are found to spend 29% less on off-spring's education, while

those with secondary level of education are found to spend 45% more than those with no schooling. With respect to occupations, fathers and mothers whose occupation was high and middle –level professions are found to spend 37%,13%,58% and 16% respectively more compared to those out of labor force. In fact, the effect of mothers occupation is large than father's in Palestine. Besides, Mothers whose were blue-collar are found to spend less on children's education. The main reason behind that majority of undereducated Palestinian women is concentrated in blue collar jobs and earns less (Sadeq and Elder 2014). Households located in West Bank are found to spend 10% more than those households located in Gaza Strip. This is due the distance to schools and the quality of secondary and tertiary facilities(Al-Qudsi and Al-Qudsi 1998). One more child at preschool and primary level decreases total education expenditure by 27%, while one more child at college aged increases household's expenditure on education by 40%. This is due to low cost of education at low levels of education compared to the university degree.

In Sudan[2]**,** Households income is found to have significant and positive effect on children's education at different income quintiles, where households at the top income quintiles are found to spend the most 51% than those at the fourth income quintile. As household income increases, spending on off-spring's education increases. For parents' educations, father's education is found significant and positive at higher educational levels where fathers who received secondary and university degree are found to spend 21% and 72% respectively more on children's education than illiterate fathers. While mother's education is found to have positive and significant affect at all mothers educational level. Mothers who receive primary, secondary and college degree are found to spend 26%, 50%, and 43% more than illiterate mothers. With respect to children's age, one more child at preschool and primary age decreases total education expenditure of the household by 26.5%, while one more child at secondary and college age is found to increase the family's expenditure on education by 39.5% and 47.3% respectively. This result is not surprising given that the free education is applied to only elementary education as the government ends free education and accommodation for college students which imply excess burden on poor families to send their children to the college (Gasim 2010).

In Jordan, with respect of household income variables, household income with respect to third, fourth and fifth quintiles are found to spend 19%, 29% and 52% respectively more on children's education than those at the bottom income quintile. In terms of parent's education, fathers who received education at secondary and college levels are found to spend 35% and 48% more respectively on children's education, while mothers with college degree are found to spend 34% more on off-springs education than those with no schooling. With respect to parent's occupation, fathers whose occupation was blue-collar profession and mothers whose occupation was high level profession and low-level profession are found to spend 21%, 50% and 36% respectively than those not in labor force. Households who reside in north and south provinces of Jordan were found to spend 48% and 60% less than those in the Amman and other center provinces adjacent to Amman. One more child at preschool and primary school age decreases household spending on children's education by 61%, while one more child at secondary and college school age increases total spending on children education by 23% and 36% respectively. Knowing that, compulsory education is free and secondary in public schools.

7.2 Education expenditure by household income

In Egypt, Parent's education level is found to be positive and significant among households at highest income quintiles (table 8). While , it is observed that father's and mother's whose occupations are lower and middle-level professions are found to spend more on education at first income quintiles compared to the fifth income quintile. Besides, father's belongs to high professions are found to spend more on children education only among high income quintiles.

[2] With respect to parent's occupation in Sudan, this is question has not been asked in the survey.

With respect to household location, those who belong to bottom income quintiles and reside in Upper Egypt are found to spend 46% and 14% more than those at fifth income quintile. This result concludes the importance of education to children comes from poor households as a mean to provide good opportunity and move upward on social ladder. Similar to the full-sample, the numbers of secondary and college-aged children have positive and significant influence on household's spending on education. Expenditure incurred on more children at secondary –school age is found to be 25% and 28.5% more at bottom income quintiles than those at fifth income quintile. This result confirmed the importance of joining university for children's whose parents belong to poor socioeconomic background.

In Palestine, with respect to parent's education, father's education is significant and positive among all income groups (table 9). In fact, fathers who received primary and college education and belong to the second income quintile are found to spend 30% and 26.6% respectively, more than those at the top income quintile. This is pattern also observed among mothers received college education are found to spend 64% and 27% more at second and middle income quintile compared to those at the top income quintiles. Mothers who received primary education are found to spend more on off-spring's education at first and less on fourth income quintile. In terms of parents' education, fathers whose occupations are high-level are found to spend more on children's education as household income increases. While, fathers whose occupations are lower-level are found to be significant only at top income quintile. In fact, fathers with middle-level professions are found to spend 42.8% more at bottom income quintile compared to the top income quintile, while mothers who occupations are high-level and belongs to the bottom income quintile are found to spend 20.4% compared to those at the top income levels. Besides, the same pattern observed for mothers with middle-level professions and belongs to the top income quintile are found to spend 21.6% more on educating their children compared to the top income quintiles. Mothers with blue-collar jobs are found to spend less on children's education at middle and top income levels due to low earnings and less skilled.

Households located in West Bank are found to spend more on children's education only at top income quintiles. With respect to children's age, the results reported in table (9) supported the results of the full-sample. At all income levels, the expenditure incurred by adding one more child at preschool and primary school age decreases as household income increases. This is due to lower cost of education and free education policy that covered all levels of compulsory education. While, adding one more child at secondary school age increases the total expenditure, 6.4% and 5.8% respectively for the fourth and fifth income quintile, while decreases at first income quintile. This is attributed to the high cost of private tutoring essential to pass Tawjihi examination at the end of the secondary level in order to be able to join university. Finally, adding one more child at the college age have the largest increases in total expenditure at lower income quintiles, spending 39%, 52%and 54% compared to the fourth and fifth income quintiles, spending 29% and 35% respectively.

The results make it clear that households belong to bottom income quintiles are likely to spend on off-spring's education more than those at the highest income quintiles. They are viewing education as a best way to secure their children's future given the economic and political instability. Besides, the absence of social security and pension system in Palestine makes parents more rely on their dependents at older age (Al-Qudsi and Al-Qudsi 1998).

Next we turn to ***Sudan***; Table (10) shows the results of education expenditure by income quintile. With respect to parent's education, it is observed that fathers who received primary , secondary and college level of schooling at the bottom income quintile are found to spend 15%,23% and 111% more than those with no schooling. Besides, fathers who receive college degree at bottom income quintile are found to spend 81% and 25% respectively than those at fourth and fifth income quintile. While, mothers who received college degree and belong to the

bottom income quintile are found to spend 58% more than those at the highest income quintile. This result supports the idea that households belong to the lowest income quintile have a strong desire to educate their off-springs compared to households with higher socio-economic background as it is considered the only mean to mobile socially upward. Moreover, households at the highest income quintile and reside in western, Eastern and Northern provinces of Sudan are found to spend 26%,66% and 46% less compared to the center provinces of Sudan. This result supports the fact that most schools and universities are concentrated in center provinces of Sudan and well-off households is not considering education is the only way to move upward (Qian and Smyth 2011). However, households at second and third income quintiles are found to spend more on education in western and eastern provinces of Sudan compared to those at the center in order to help their off-springs to find better opportunities in life. In terms of children's age, adding one more child at preschool and primary school age reduces total spending on children's education at all income levels. While adding one more child at secondary and college age are found to spend more on education at bottom and middle income quintiles compared to the top income quintiles. Finally, Table (11) shows the results for household expenditure by income quintiles in ***Jordan***. With respect to father's education, Fathers belong to the bottom income quintile and received education at secondary level and below are found to spend more on education compared to those fathers with the same level of education and belong to the fourth and fifth income quintile. This result indirectly shows that fathers who received education below college and with lower socio-economic background have less desire to educate their children compared to those with university degree.

While mothers who received college level and belong to the first income quintile are found to spend more on off-spring's education than those with primary and secondary , while mothers at fourth income quintile are found to spend less on children's education at all educational level. This result shows that educated mothers with lower socio background have a stronger desire to educate their children compared to fathers. In fact, the effect of mother's education is higher than father's at lower income levels, as mothers considered education as a mean to provide them with variety of employment opportunities and to mobile them upward on the social ladder.

With respect to parent's occupation, fathers who had middle-level and blue-collar jobs are located at the top income quintiles are found to spend more on off-spring's education, while fathers had middle-level and blue-collar jobs at lowest income quintiles are found to spend less compared to those out of labor force. Mothers who had lower-level professions and belong to the first income quintile are found to spend less on children's education while mothers at top income quintiles and have middle-level professions are found to spend more than those out of labor force.

Coming to school age children, increasing the number of secondary school-aged children, households at the second and third income quintiles have the largest increases in total expenditure, spending 9%, more than those at the fifth income quintile. While, increasing the number of college- age children has the largest spending at the first and the third income quintiles spending 92% and 48.5% more respectively. This result confirms the idea that household belong to the lowest income quintiles have a strong desire to educate their children at both secondary and college level than those at the highest income quintiles who does not consider education is the only way to move their children upward. Similarly as the full-sample results, adding one more child at preschool and primary aged school reduces total spending on education regardless the income levels. In addition households reside in both north and south provinces of Jordan are found to spend less on education compared to the central provinces regardless the income quintiles.

7.3 Household expenditure on education by children's age

The effect of household income follows the same pattern across different subsamples (table 12-15). Regardless of child's age in ***Egypt***,(Table 12) as household income increases, families spend more on education. Households who belong to the fifth income quintile are found to spend 162%, 148% and 135% for households who have children at pre-primary, secondary and college-aged children respectively. We also observe that households reside in Lower and Upper Egypt is found to spend less on children's education regardless their school age. Besides, households with children at pre-primary and secondary school age, having another child at pre-primary reduce expenditure on education by 34% and 7.4% respectively. Similarly, having one more child at secondary school aged for households with secondary school aged reduces spending on education by 25%, while adding one more child on pre-primary and college-aged children increases spending on education by 32% and 13% respectively. This confirms the higher cost of secondary education in Egypt due to private tutoring. Adding one more child at college-age for households with college-aged students reduces spending on education by 25%. This is attributed due to higher tuition fees of private universities or book costs for public universities.

In Palestine as shown in table (13), the effect of household income is significant and positive among subsamples. As household income increases, spending on children's education increases regardless their schooling age. It is observed that having children at preschool and primary school age reduces total spending on education on households with 14%,26% and 33% on households with preschool and primary, secondary and college aged children respectively. Besides, households with secondary school aged children ,adding one more at child at college age increases spending on education by 45%, while households with college age children , adding one more child at college increases spending on education by 24%.

In Sudan, as shown in table (14), household income effects follow the same pattern across sub-samples. As household income increases, spending on education increases regardless the children's school age. Households with children at college age at top income quintile are found to spend 36% and 54% more respectively than those with preschool and primary school age children and secondary school age children. This is due high tuition fees for the university education in Sudan and household income is considered the main determinant of spending on offspring's. Besides, households with pre-primary school aged children are found to spend 12% and 10% more on adding one more child at preschool and primary age in western and eastern provinces of Sudan. This explains households with low resources and residing in less developed areas are spending more on education when it is totally covered by the government. Finally, we also observe that adding one more preschool and primary age child on household having children at any age level reduces total spending on off-spring's education. However, adding child at secondary school age on household having children of primary, secondary and tertiary are found to spend 44%, 40% and 41% more respectively on off-spring's education. Similarly, adding child at college school age on household having children of primary, secondary and tertiary are found to spend 46%, 42% and 41% more respectively on off-spring's education.

In Jordan, table (15) shows the household expenditure on children's education by children's age. The effects of household income quintiles vary across subsamples. Households with children at preschool and primary school and secondary school aged children spend more on education if the household at the three top income quintiles while households with college aged children are found to spend more on education if household income at the highest income quintiles only. This result confirms the idea that household income is considered the main determinant of spending on both secondary and college level of education. In fact, the Jordanian government covered only the basic education costs. Households with dependents regardless their age, also having one more child at preschool and primary school age children reduces

education expenditure. While, adding one more child at secondary school and college aged children increases total expenditure on education. Similarly, spending of south and north provinces of Jordan on children's education are less regardless subsample of children's age compared to the center.

8. Conclusion

The paper relies on available Harmonized Household Income and Expenditure Surveys (HHIES) for four Arab countries to understand the determinants of family expenditure on Education. The paper is an attempt to provide a comprehensive framework for the main factors that affect household spending on education across four Arab countries using the same methodology. The empirical studies that investigate the determinants of household expenditure in Arab countries are very limited. The paper makes use of 2010/2011 survey for three countries, namely, Egypt, Jordan and Palestine as well as 2009 survey for Sudan to examine the role of family background and place of residence on household spending on children's education. Understanding the determinants of spending on schooling in Arab countries is considered very crucial since mid 20^{th} century where, free access to education is adopted extensively as an important part of social contract. People in lower socio-economic social strata viewed education as the only path to social and economic mobility(Assaad, Salehi-Isfahani, and Hendy 2014). We use household expenditure model, focusing on education to examine the determinants of household spending on education by different groups of population and finally to calculate the elasticity of household expenditure on education to change in household income.

The empirical results as well as the extensive descriptive statistics yield some important general results on the magnitude of household expenditure on schooling in Arab countries and their determinants. Some of these are listed below and considered general hunches.

Households spend sizeable amounts of income on educating their children but the magnitude varies across Arab countries at all educational levels. Households in Jordon allocate more financial resources compared to counterparts as 73% of the population in Jordan has at least lower secondary education (UNESCO, 2011). This is contradicts the essence of free education policy which is expected to be funded by the government.

Parents belong to low social strata are found to spend more on children's education compared to those at the highest social strata, with exception in Egypt where wealthier households are spending more on children's education.

Parents with children's at college level are found to spend more on education compared to other educational levels with exception in Egypt.

With respect to elasticity of household expenditure, it was found to be elastic for Egypt (1.5), unit elastic for Jordan and inelastic for both Palestine (0.4) and Sudan (0.6).The results of the elasticity implies that spending on education for both Sudan and Palestine are considered necessity in parent's budget (Psacharopoulos and Papakonstantinou 2005) , while , In Egypt , it was found obviously that households at top two income quintiles had the large income elasticity's to education.

With respect to spending on education per child, it is observed that bottom and middle income quintiles are found to spend more on education regardless child's educational level. This confirmed the importance of education to lower socio-economic background households as a mean for economic and social mobility.

The empirical findings of the OLS model highlights major determinants of household spending on children's schooling in Jordan, Palestine, Egypt and Sudan.

- Family's characteristics, in particular household income and parent's educational level are considered a key factor in determining the size of families' expenditure on off-spring education. Generally, this trend is observed across countries, as household income increases spending on schooling increases as well. Moreover, households where mothers and fathers have secondary or college degree are found to spend more on education.
- Number of schooling children in household is considered very important in predicting the level of spending on education. Greater number of children's at primary schooling in household are found to spend less on education in four countries due to free education policy adopted at basic schooling. While , having children at secondary and college schooling are predicted to spend more on education with exception Egypt at tertiary level, as free policy is extended to tertiary education only in Egypt.
- Parental occupations do not experience meaningful pattern across countries, however, fathers are working in high and middle- level professions are more likely to spend more on children's education in Egypt and Palestine, while Mother's occupation has no meaningful influence on off-spring's education across countries. Because of the low female labor force participation rate especially among Arab women especially the married ones due to dominant patriarchal society and inhospitable working conditions.
- The place of residence of household is an important factor in determining household expenditure on education. The more developed regions in the country are found to spend more on educating their children compared rural regions.
- With respect to educational level of the child, families allocate more resources to education with higher level of education with exception in Egypt.

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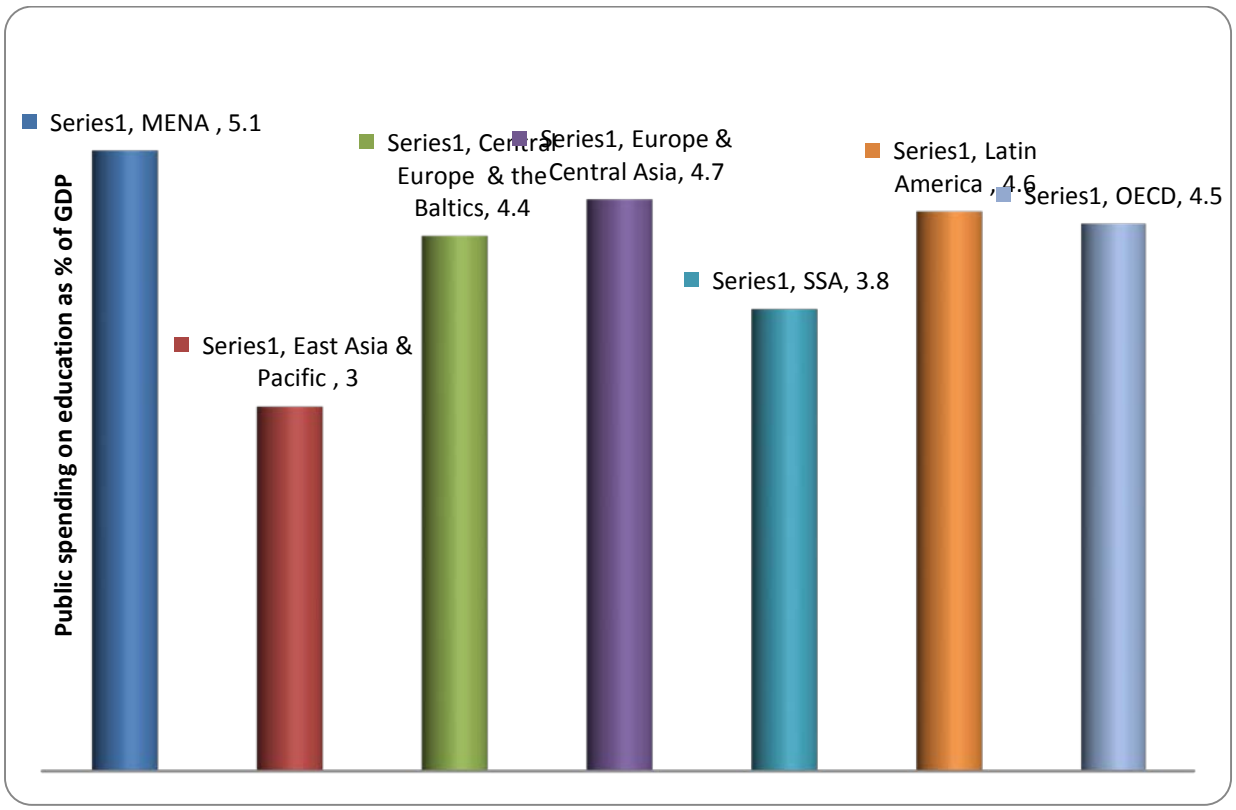
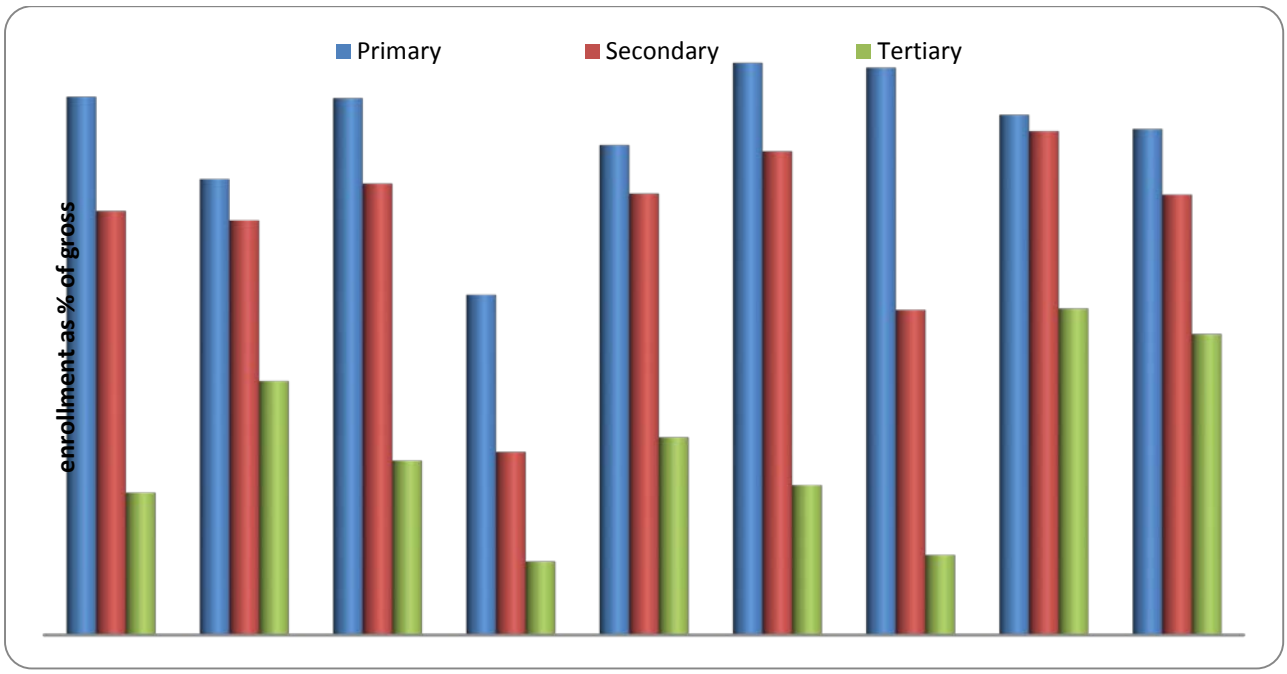
Appendix

Figure 1: Average Public Spending on Education as % of GDP in MENA over the Period (2000-2013)



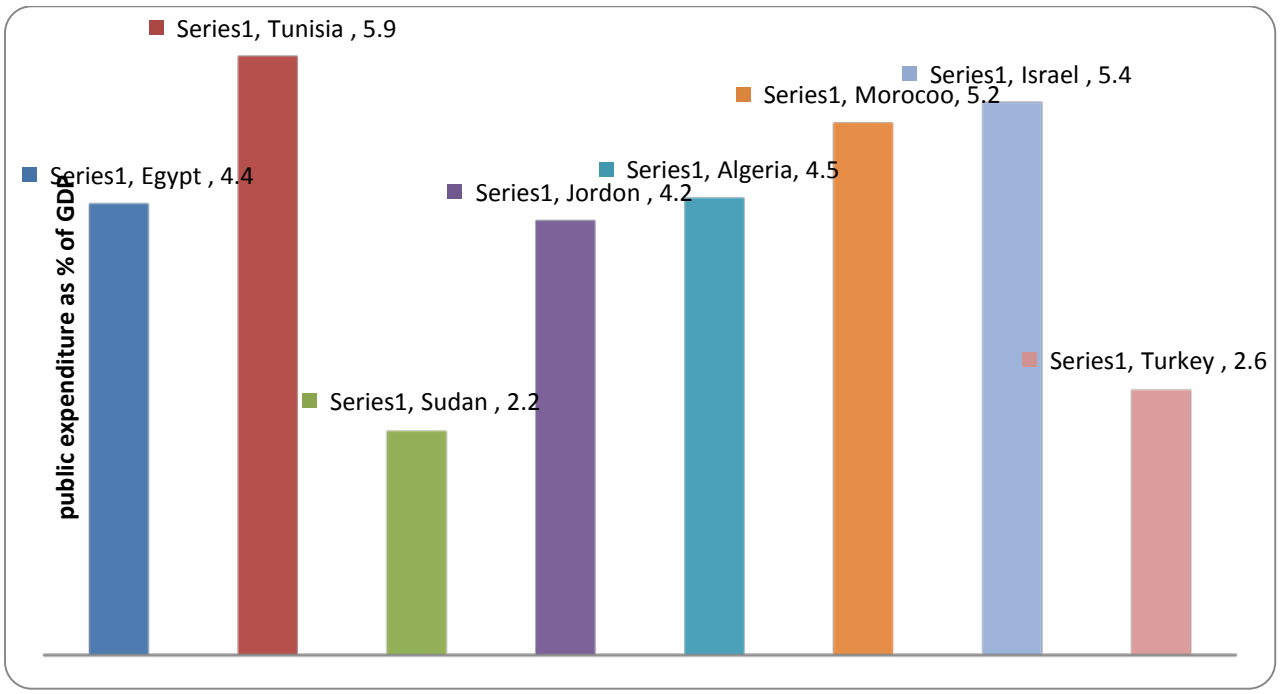
Source: WDI (2015).

Figure 2: Enrollment Rates as % of Gross Enrolment in MENA by Educational Level in 2011



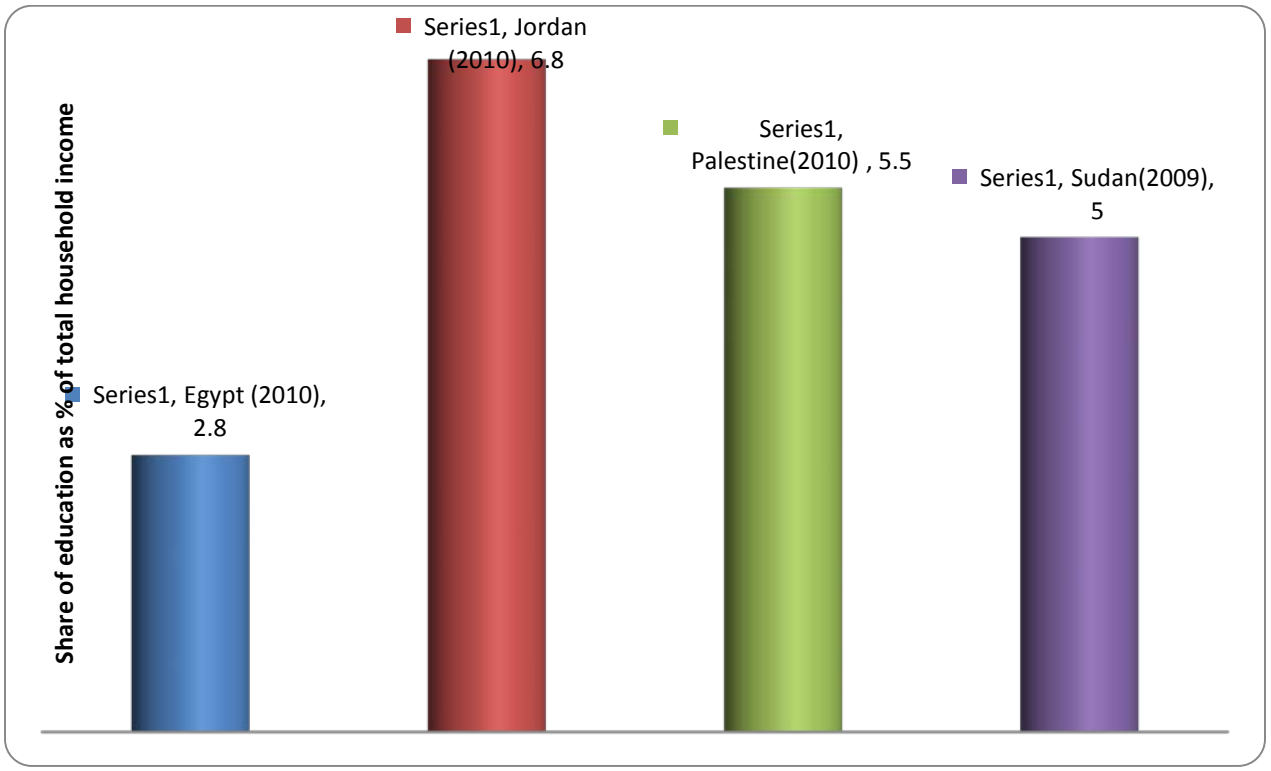
Source: WDI (2015).

Figure 3: Public Spending on Education in 2011, by Country



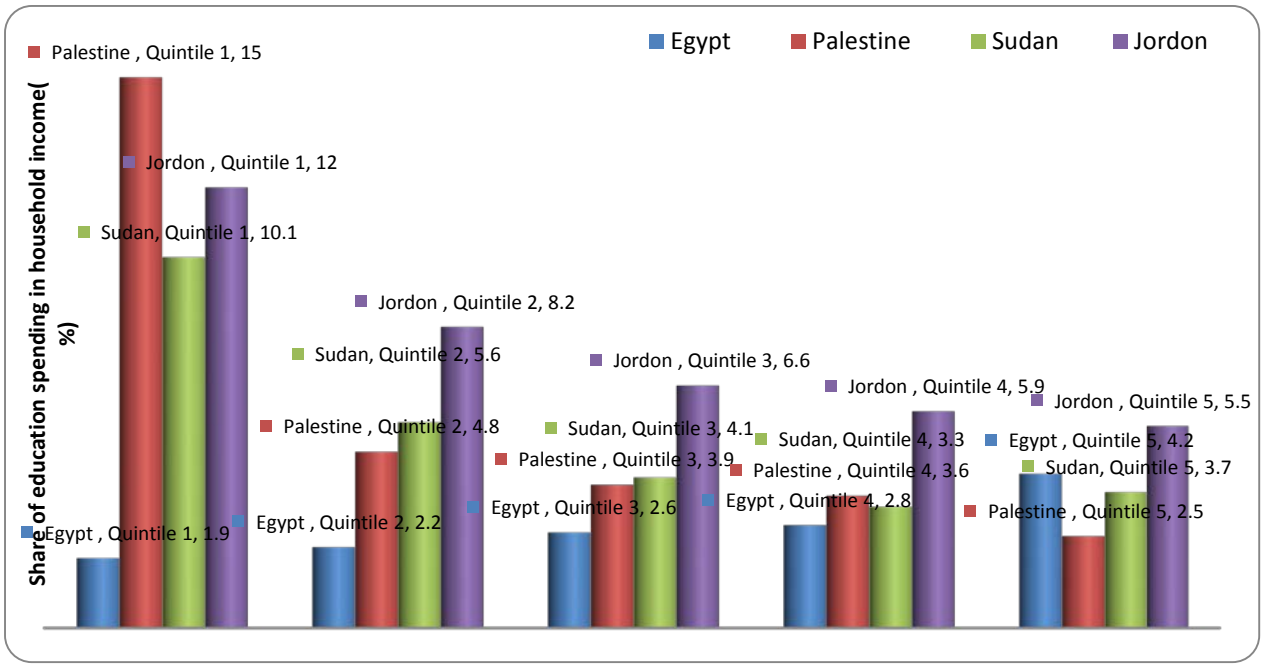
Source: WDI (2015).

Figure 4: Share of Education in Total Household Income, Survey Year



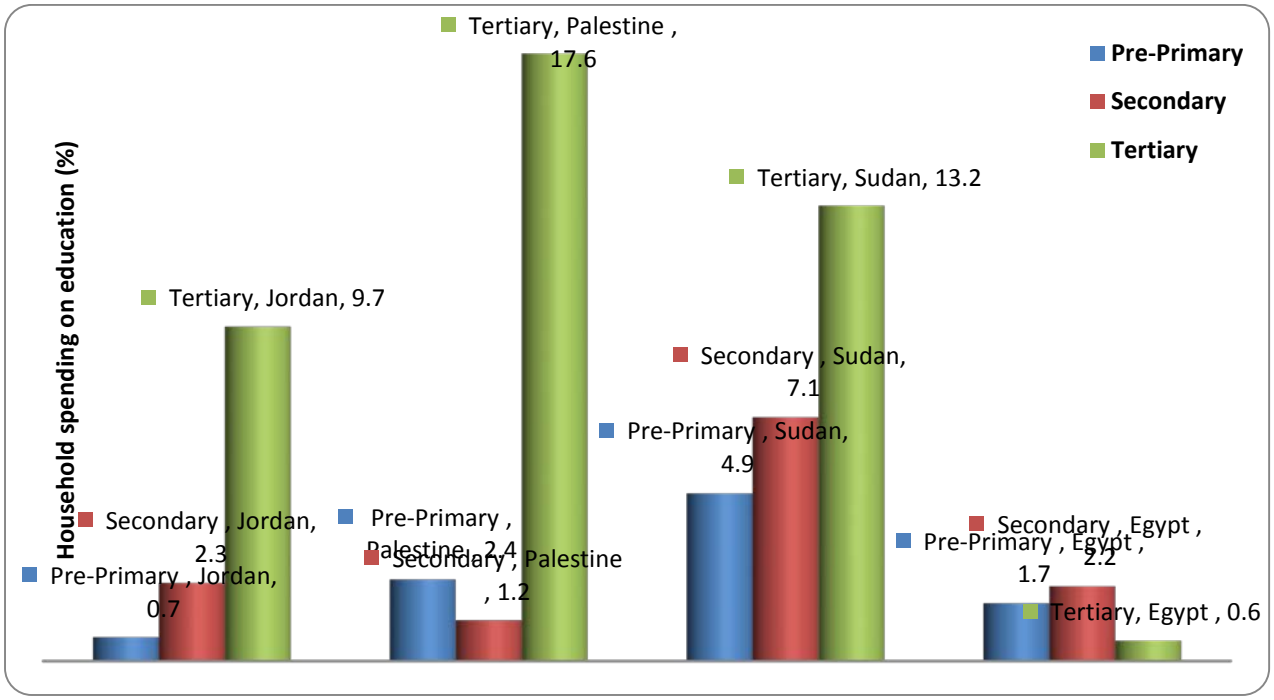
Source: Authors' estimation based on household survey data

Figure 5: Share Education Spending in Household Income by Income Quintile



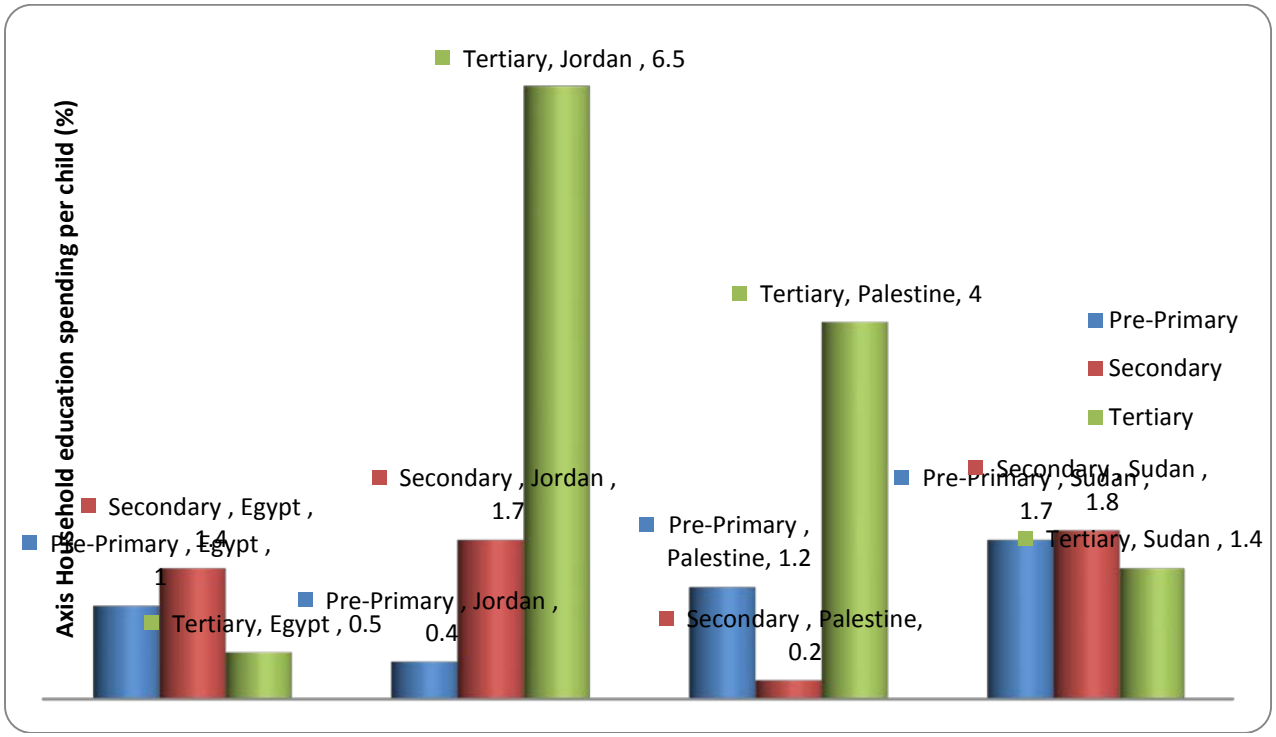
Source: Authors' estimation based on household survey data

Figure 6: Household Education Spending as % of Household Income By Level, Percent



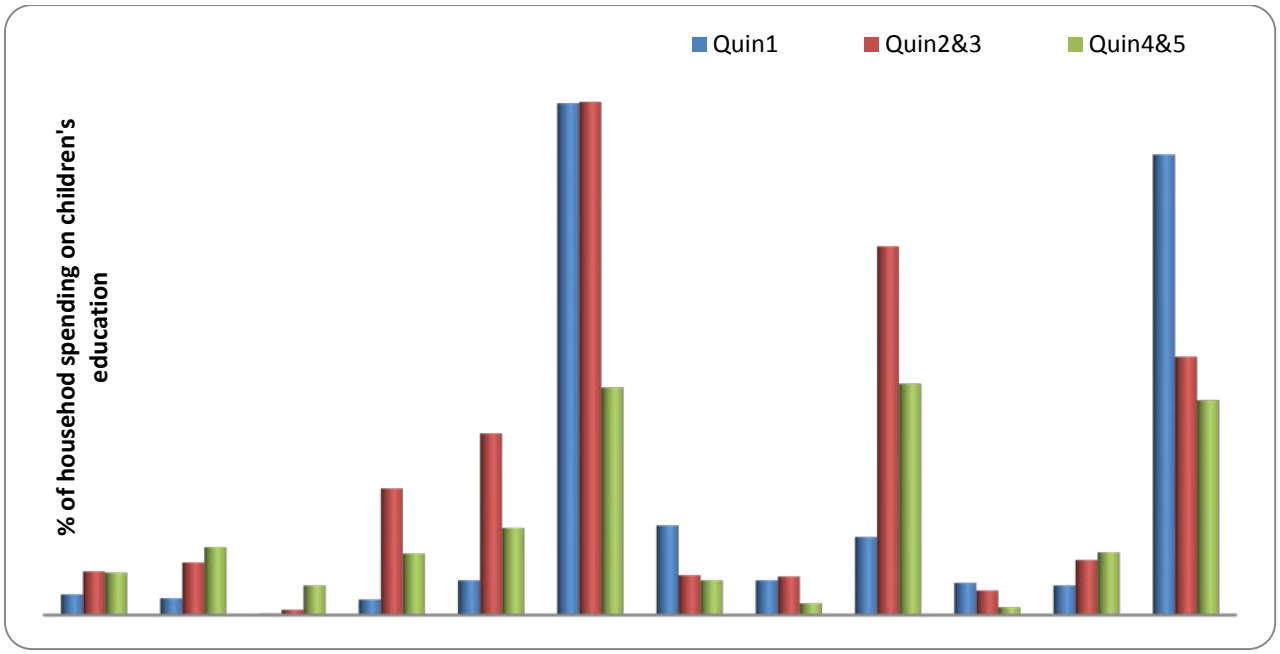
Source: Authors' estimation based on household survey data

Figure 7: Household Education Spending Per Child as % of Household Income by Level, Percent



Source: Authors' estimation based on household survey data

Figure 8: Household Education Spending as % of Household Income, by Level and Household Income



Source: Authors' estimation based on household survey data

Figure 9: Household Education Spending Per Child as % of Household Income, by Level and Household Income

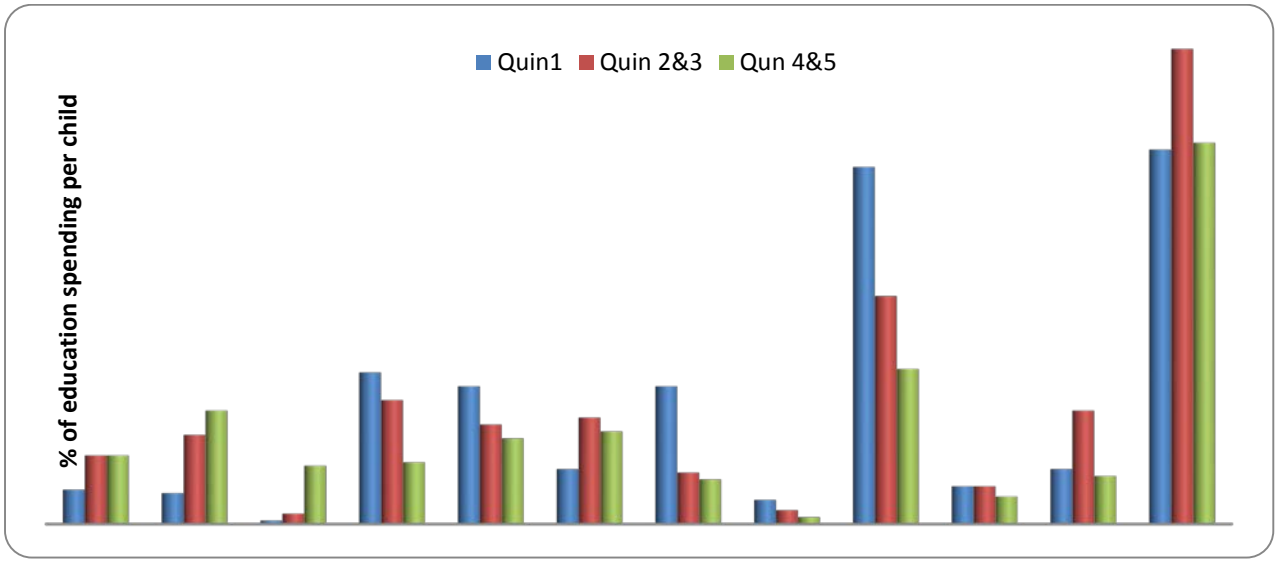
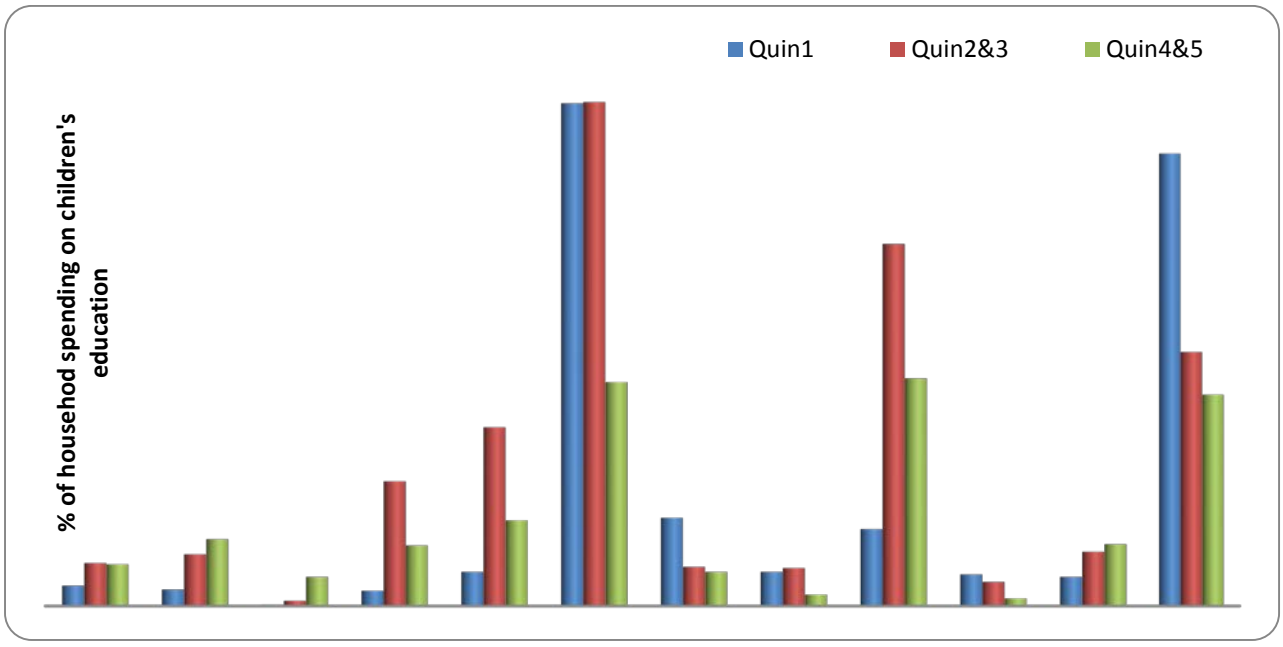


Figure 10: Household Education Spending as % of Household Income, by Level and Household Income



Source: Authors' estimation based on household survey data

Table 1: Basic Schooling Age and Length of Studies by Country and Educational Level

		Length of education cycle (years)			
			Basic		
Country	**Starting age**	**Primary**	**Lower secondary**	**Upper secondary**	**University (Bachelor)**
Egypt	6	6	3	3	4-6
Jordon	6	6	4	2	4
Palestine	6	6	4	2	4
Sudan	6	8		3	3

Notes : Preschool is of two years for all children aged four in all countries

Source: UNESCO ISCED 1997 Mappings for education. http://www.uis.unesco.org/Education/ISCEDMappings/Pages/default.aspx

Table 2: Household Expenditure on the Children Education by Income Quintile in Egypt

Income quintiles	Mean Income	Mean Educational expenditure	Percentage
Quintile 1	9.456933	4.72074	50
Quintile 2	9.788037	5.287003	54
Quintile 3	10.02334	5.687714	57
Quintile 4	10.28209	5.951163	58
Quintile 5	10.80561	6.723768	62

Table 3: Household Expenditure on the Children Education by Income Quintile in Palestine

Income quintiles	Mean Income	Mean Educational expenditure	Percentage
Quintile 1	9.368289	6.095274	65
Quintile 2	10.11019	6.314366	62
Quintile 3	10.53477	6.447307	61
Quintile 4	10.91786	6.788531	62
Quintile 5	11.56558	7.018281	61

Table 4: Household Expenditure on the Children Education by Income Quintile in Sudan

Income quintiles	Mean Income	Mean Educational expenditure	Percentage
Quintile 1	7.223143	3.921623	54
Quintile 2	8.115112	4.009209	49
Quintile 3	8.547604	4.251486	50
Quintile 4	9.053114	4.609033	51
Quintile 5	9.944868	5.519358	55

Table 5: Household Expenditure on the Children Education by Income Quintile in Jordon

Income quintiles	Mean Income	Mean Educational expenditure	Percentage
Quintile 1	8.075136	4.496356	56
Quintile 2	8.484286	4.417157	52
Quintile 3	8.768761	4.786542	55
Quintile 4	9.132103	5.189508	57
Quintile 5	9.742991	6.023199	62

Table 6: Summary Statistics

	Egypt		Palestine		Sudan		Jordan	
Variable	**Obs.**	**Mean**	**Obs.**	**Mean**	**Obs.**	**Mean**	**Obs.**	**Mean**
Education expenditure	9981	1074.55	9109	1759.15	6080	344.958	3046	610.019
Household income	9981	29407.7	9109	52534.05	6080	10427.440	3046	10114.17
		Min.= 4550 L.E		Min.=243Pound		Min.=111Pound		Min=800pound
Income quintile		Max.=469086		Max.628984		Max.480000		Max=88350
First quintile	9981	0.129	9109	0.1650	6080	0.149	3046	0.0936
Second quintile	9981	0.179	9109	0.1788	6080	0.163	3046	0.1550
Third quintile	9981	0.223	9109	0.2167	6080	0.228	3046	0.2134
Fourth quintile	9981	0.234	9109	0.2155	6080	0.222	3046	0.2393
Fifth quintile	9981	0.235	9109	0.2240	6080	0.239	3046	0.2988
Father's education								
Illiterate	9981	0.409	9109	0.0990	6080	0.257	3046	0.1041
Primary	9981	0.130	9109	0.4922	6080	0.412	3046	0.4416
Secondary	9981	0.275	9109	0.1853	6080	0.198	3046	0.1901
Tertiary	9981	0.187	9109	0.2235	6080	0.133	3046	0.2643
Mother's education								
Illiterate	9981	0.499	9109	0.1265	6080	0.361	3046	0.1297
Primary	9981	0.114	9109	0.5268	6080	0.408	3046	0.4485
Secondary	9981	0.264	9109	0.2095	6080	0.167	3046	0.1835
Tertiary	9981	0.123	9109	0.1372	6080	0.065	3046	0.2383
Father's occupation								
High profession	9981	0.104	9109	0.0518	#	#	3046	0.0010
Middle profession	9981	0.215	9109	0.1454	#	#	3046	0.1796
Lower profession	9981	0.185	9109	0.3892	#	#	3046	0.2561
Blue-collar	9981	0.439	9109	0.3308	#	#	3046	0.2492
Not in Labor Force	9981	0.057	9109	0.0829	#	#	3046	0.3142
Mother's education								
High profession	9981	0.015	9109	0.0044	#	#	3046	0.0072
Middle profession	9981	0.091	9109	0.0618	#	#	3046	0.0499
Lower profession	9981	0.044	9109	0.0404	#	#	3046	0.0289
Blue-collar	9981	0.315	9109	0.1203	#	#	3046	0.0003
Not in Labor Force	9981	0.534	9109	0.7731	#	#	3046	0.9137
Region								
						Center		**Center**
Metropolitan	9981	0.267		**West Bank**	6080	0.4738	3046	0.4632
						Western		**North**
Lower Egypt	9981	0.409	9109	0.6477111	6080	0.1699	3046	0.4290
						Eastern		**South**
Upper Egypt	9981	0.325		**Gaza Strip**	6080	0.1491	3046	0.1076
			9109	0.3522889	6080	**Northern** 0.2070		
No. of school aged children								
Pre and Primary	9981	1.457	9109	1.375892	6080	2.815	3046	1.4961
Secondary	9981	1.194	9109	2.339774	6080	0.713	3046	1.3063
College aged children	9981	0.544	9109	1.148425	6080	0.772	3046	1.1724

Note: # the question is not asked in the survey

Table 7: OLS Estimation for Determinants of Educational Expenditure in MENA (Full sample)

Dependent variable: Log educational expenditure	Egypt	Palestine	Sudan	Jordon
Household income				
First quintile (omitted group)				
Second quintile	0.296***	0.168***	0.117**	0.032
	-0.039	-0.037	-0.054	-0.1
Third quintile	0.469***	0.187***	0.155***	0.195**
	-0.039	-0.039	-0.05	-0.096
Fourth quintile	0.527***	0.356***	0.310***	0.290***
	-0.041	-0.043	-0.054	-0.096
Fifth quintile	1.041***	0.515***	0.827***	0.522***
	-0.045	-0.046	-0.057	-0.098
Father's education				
Illiterate (omitted group)				
Primary	0.160***	0.292***	-0.003	0.115
	-0.037	-0.047	-0.042	-0.094
Secondary	0.283***	0.459***	0.208***	0.350***
	-0.035	-0.054	-0.053	-0.105
College	0.411***	0.674***	0.729***	0.682***
	-0.049	-0.057	-0.064	-0.115
Mother's Education				
Illiterate (omitted group)				
Primary	0.356***	0.131***	0.264***	-0.059
	-0.041	0.042	-0.042	-0.087
Secondary	0.452***	0.114**	0.509***	0.057
	-0.036	-0.049	-0.053	-0.101
College	0.582***	-0.014	0.437***	0.340***
	-0.058	-0.063	-0.079	-0.105
Father's Occupation				
Not in LF (omitted group)				
High-level profession	0.287***	0.373***	#	-0.203
	-0.065	-0.073		-0.762
Middle-level profession	0.111*	0.127**	#	-0.117
	-0.061	-0.06		-0.09
Lower-level profession	-0.013	-0.005	#	-0.047
	-0.058	-0.051		-0.069
Blue collar and service	-0.018	-0.044	#	0.210***
	-0.055	-0.054		-0.07
Mather's Occupation				
Not in LF (omitted group)				
High-level profession	-0.024	0.587***	#	0.509*
	-0.095	-0.09		-0.292
Middle-level profession	0.053	0.162**	#	0.179
	-0.049	0.068		-0.124
Lower-level profession	-0.135**	0.012	#	0.363**
	-0.061	-0.063		-0.145
Blue collar profession	-0.140***	-0.194***	#	-1.07
	-0.028	-0.038		-1.314
Household Place of residence	**Omitted : Metropolitan**	**Omitted :Gaza Strip**	**Omitted : Center Sudan**	**Omitted :Center Jordon**
	Lower Egypt	West Bank	**Western Sudan**	**North Jordon**
	-0.286***	0.105***	0.116***	-0.485***
	-0.032	-0.029	-0.041	-0.053
	Upper Egypt		**Eastern Sudan**	**South Jordon**
	-1.227***		0.027	-0.602***
	-0.037		-0.055	-0.084
			Northern Sudan	
			-0.048	
Number of school aged children			-0.044	
No. of pre and Primary school-aged children	-0.181***	-0.271***	-0.265***	-0.610***
	-0.013	-0.015	-0.013	-0.023
No. of secondary school aged children	0.251***	-0.005	0.395***	0.234***
	-0.013	-0.008	-0.024	-0.022
No. of college-aged children	0.084***	0.406***	0.473***	0.362***
	-0.018	-0.013	-0.021	-0.03
Constant	5.299***	5.832***	3.952***	4.976***
	-0.068	-0.079	-0.063	-0.122
Number of observation	**9981**	**9109**	**6080**	**3046**
R-square	**0.417**	**0.31**	**0.366**	**0.466**

Notes: Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 8: OLS Estimation for Individual Determinants of Educational Expenditure in Egypt by Income Quintile

	First quintile	Second quintile	Third quintile	Fourth quintile	Fifth quintile
Dependent variable : Log educational expenditure					
Father's education					
Illiterate (omitted group)					
Primary	0.107	-0.028	0.038	0.173**	0.557***
	-0.088	-0.074	-0.073	-0.077	-0.101
Secondary	0.156**	0.168**	0.116	0.452***	0.560***
	-0.076	-0.069	-0.074	-0.079	-0.091
College	-0.507	-0.084	0.337***	0.462***	0.876***
	-0.166	-0.108	-0.101	-0.092	-0.109
Mother's Education					
Illiterate (omitted group)					
Primary	0.262***	0.317***	0.183**	0.422***	0.601***
	-0.087	-0.085	-0.08	-0.095	-0.108
Secondary	0.359***	0.373***	0.586***	0.370***	0.569***
	-0.082	-0.073	-0.078	-0.072	-0.093
College	-0.134	0.119	0.353***	0.278***	0.908***
	-0.185	-0.147	-0.132	-0.105	-0.115
Father's Occupation					
Not in LF (omitted group)					
High profession	0.246	-0.583	-0.003	0.349***	0.526***
	-0.209	-0.181	-0.139	-0.123	-0.113
Middle professional	0.521***	-0.178	-0.135	0.207*	0.206*
	-0.194	-0.15	-0.122	-0.119	-0.11
Lower professional	0.269*	-0.258	-0.179	-0.014	0.051
	-0.153	-0.136	-0.112	-0.119	-0.121
Blue collar and service	0.164	-0.471***	-0.105	0.143	-0.013
	-0.149	-0.132	-0.106	-0.115	-0.11
Mather's Occupation					
Not in LF (omitted group)					
High profession	-1.12	0.487*	0.165	-0.231	-0.169
	-0.159	-0.266	-0.174	-0.165	-0.16
Middle professional	0.645**	0.273*	0.13	0.122	-0.224
	-0.271	-0.15	-0.101	-0.09	-0.084
Lower professional	0.602***	-0.218	-0.220*	-0.414***	0.177
	-0.135	-0.149	-0.127	-0.098	-0.145
Blue collar and service	-0.097	-0.152***	-0.125**	-0.248***	-0.083
	-0.06	-0.056	-0.059	-0.058	-0.08
Household location					
Omitted : Metropolitan					
Lower Egypt	0.069	-0.280***	-0.216***	-0.255***	-0.390***
	-0.098	-0.074	-0.071	-0.063	-0.064
Upper Egypt	-0.843***	-1.164***	-1.041***	-1.406***	-1.305***
	-0.092	-0.08	-0.079	-0.081	-0.081
No. of school aged children					
No. of pre and Primary school-aged children	-0.300***	-0.173***	-0.175***	-0.180***	-0.105***
	-0.031	-0.03	-0.027	-0.027	-0.031
No. of secondary school aged children	0.257***	0.285***	0.269***	0.189***	0.279***
	-0.03	-0.031	-0.029	-0.027	-0.028
No. of college-aged children	0.113**	0.011	0.168***	0.039	0.130***
	-0.051	-0.044	-0.041	-0.034	-0.032
Constant	5.092***	6.074***	5.819***	5.918***	5.741***
	-0.173	-0.157	-0.125	-0.126	-0.13
Number of observation	**1284**	**1785**	**2224**	**2338**	**2350**
R-square	**0.334**	**0.296**	**0.259**	**0.326**	**0.367**

Notes: Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 9: OLS Estimation for Individual Determinants of Educational Expenditure in Palestine by Income Quintile

	First quintile	Second quintile	Third quintile	Fourth quintile	Fifth quintile
Dependent variable : Log educational expenditure					
Father's education					
Illiterate (omitted group)					
Primary	0.053	0.513***	0.323***	0.329**	0.213*
	-0.086	-0.081	-0.093	-0.129	-0.113
Secondary	0.488***	0.532***	0.425***	0.333**	0.598***
	-0.1	-0.096	-0.106	-0.144	-0.134
College	0.625***	0.965***	0.441***	0.713***	0.699***
	-0.123	-0.126	-0.117	-0.145	-0.134
Mother's Education					
Illiterate (omitted group)					
Primary	-0.360***	-0.004	-0.092	-0.268**	0.002
	-0.085	-0.073	-0.087	-0.112	-0.099
Secondary	0.335***	0.285***	0.127	-0.078	0.406***
	0.1	-0.091	-0.103	-0.128	-0.121
College	0.061	0.648***	0.270**	0.058	-0.123
	-0.136	-0.145	0.135	-0.143	-0.134
Father's Occupation					
Not in LF (omitted group)					
High profession	0.225	0.585***	0.465**	-0.04	0.788***
	-0.151	-0.195	-0.237	-0.161	-0.151
Middle professional	0.911***	-0.11	0.091	-0.007	0.483***
	-0.149	-0.129	-0.131	-0.126	-0.149
Lower professional	-0.021	0.063	-0.1	-0.151	0.439***
	-0.084	-0.098	-0.113	-0.115	-0.135
Blue collar and service	0.002	0.143	-0.046	-0.365***	0.398***
	-0.091	-0.102	-0.116	-0.116	-0.134
Mather's Occupation					
Not in LF (omitted group)					
High profession	1.190***	#	-0.178	0.576	0.986***
	-0.453		-0.58	-0.476	-0.279
Middle professional	0.686***	-0.166	-0.225	0.470***	0.088
	0.234	-0.192	-0.167	0.127	-0.117
Lower professional	-0.606***	0.01	-0.068	0.252*	0.163
	-0.142	-0.147	-0.161	-0.144	-0.122
Blue collar and service	-0.02	-0.084	-0.159*	-0.305***	-0.225**
	-0.079	-0.086	-0.087	-0.092	-0.088
Household location					
Omitted : Metropolitan					
West Bank	-0.001	0.068	0.09	0.361***	0.260***
	-0.059	-0.056	-0.062	-0.072	-0.096
No. of school aged children					
No .of pre and Primary school-aged children	-0.378***	-0.260***	-0.135***	-0.321***	-0.305***
	-0.032	-0.029	-0.028	-0.031	-0.031
No. of secondary school aged children	-0.068***	0.014	0.003	0.064***	0.058***
	-0.017	-0.017	-0.017	-0.02	-0.021
No. of college-aged children	0.393***	0.523***	0.545***	0.295***	0.350***
	-0.028	-0.026	-0.025	-0.024	-0.027
Constant	6.538***	5.430***	5.764***	6.376***	6.376***
	-0.141	-0.146	-0.168	-0.178	-0.196
Number of observation	**1503**	**1629**	**1974**	**1963**	**2040**
R-square	**0.428**	**0.365**	**0.284**	**0.245**	**0.249**

Notes: Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 10: OLS Estimation for Individual Determinants of Educational Expenditure in Sudan by Income Quintile

	First quintile	Second quintile	Third quintile	Fourth quintile	Fifth quintile
Dependent variable : Log educational expenditure					
Father's education					
Illiterate (omitted group)					
Primary	0.154*	-0.022	0.069	0.263**	0.072
	-0.08	-0.091	-0.092	0.106	-0.103
Secondary	0.233**	0.186	0.288**	-0.137	0.405***
	-0.097	-0.124	-0.123	-0.126	-0.113
College	1.113***	0.725*	0.833***	0.298**	0.874***
	-0.173	-0.421	-0.167	-0.142	-0.107
Mother's Education					
Illiterate (omitted group)					
Primary	0.158*	0.266***	0.197**	0.357***	0.185*
	-0.087	-0.088	-0.09	-0.096	-0.105
Secondary	0.019	-0.096	0.745***	0.580***	0.640***
	-0.105	-0.13	-0.116	-0.122	-0.116
College	0.946***	0.317	0.671***	0.542***	0.360**
	-0.122	-0.447	-0.175	-0.143	-0.143
Household location					
Omitted : Center Sudan					
Western Sudan	-0.032	0.260***	0.354***	0.435***	-0.363***
	-0.081	-0.092	-0.088	-0.104	-0.097
Eastern Sudan	-0.101	0.560***	0.314***	0.254**	-0.667***
	-0.179	-0.131	-0.111	-0.102	-0.115
Northern Sudan	0.105	0.308***	-0.079	0.044	-0.464***
	-0.1	-0.109	-0.087	-0.101	-0.106
No. of school aged children					
No. of pre and Primary school-aged children	-0.262***	-0.232***	-0.350***	-0.220***	-0.248***
	-0.026	-0.03	-0.03	-0.03	-0.026
No. of secondary school aged children	0.427***	0.443***	0.463***	0.244***	0.437***
	-0.058	-0.067	-0.05	-0.052	-0.053
No. of college-aged children	0.314***	0.629***	0.458***	0.567***	0.436***
	-0.047	-0.07	-0.037	-0.042	-0.046
Constant	4.020***	3.783***	4.181***	4.262***	4.885***
	-0.122	-0.135	-0.114	-0.135	-0.129
Number of observation	**903**	**989**	**1388**	**1349**	**1451**
R-square	**0.283**	**0.302**	**0.317**	**0.276**	**0.284**

Notes: Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 11: OLS Estimation for Individual Determinants of Educational Expenditure in Jordon by Income Quintile

	First quintile	Second quintile	Third quintile	Fourth Quintile	Fifth quintile
Dependent variable : Log educational expenditure					
Father's education					
Illiterate (omitted group)					
Primary	0.482**	0.157	0.466*	0.355*	0.381**
	-0.213	-0.233	-0.247	-0.208	-0.167
Secondary	1.060***	-0.116	0.511*	1.050***	0.494***
	-0.255	-0.257	-0.267	-0.232	-0.179
College	0.654**	0.669**	0.746**	1.025***	0.312
	-0.32	-0.322	-0.297	-0.247	-0.196
Mother's Education					
Illiterate (omitted group)					
Primary	1.381***	-0.093	-0.266	-0.467**	-0.035
	-0.229	-0.196	-0.211	-0.196	-0.152
Secondary	1.589***	0.093	0.025	-0.459**	-0.545***
	-0.262	-0.231	-0.24	-0.215	-0.189
College	2.088***	0.425*	0.448*	-0.752***	-0.097
	-0.339	-0.238	-0.25	-0.229	-0.18
Father's Occupation					
Not in LF (omitted group)					
High profession	#	#	#	0.148	#
				-0.779	
Middle professional	-0.204	-0.859**	0.631***	0.976***	0.368**
	-0.328	-0.384	-0.199	-0.189	-0.149
Lower professional	0.375**	-0.349**	0.239	0.685***	0.362***
	-0.188	-0.147	-0.158	-0.148	-0.129
Blue collar and service	0.227	0.047	0.868***	0.439***	0.443***
	-0.19	-0.158	-0.151	-0.149	-0.141
Mather's Occupation					
Not in LF (omitted group)					
High profession	#	#	#	#	-0.49
					-0.305
Middle professional	#	#	0.178	0.706***	0.361*
			-0.438	-0.211	-0.188
Lower professional	-0.023	-1.095***	-0.043	-0.28	-0.039
	-0.467	-0.374	-0.436	-0.286	-0.252
Blue collar and service	-1.703	#	#	#	#
	-1.045				
Household location					
Omitted : Center Jordon					
North Jordon	-0.346**	-0.682***	-0.073	-0.194*	-0.951***
	-0.15	-0.12	-0.112	-0.114	-0.106
South Jordon	0.083	-1.359***	0.037	-0.494***	-0.953***
	-0.252	-0.195	-0.185	-0.172	-0.168
No. of school aged children					
No.of pre and Primary school-aged children	-0.740***	-0.778***	-0.524***	-0.513***	-0.599***
	-0.065	-0.054	-0.049	-0.045	-0.047
No. of secondary school aged children	0.162**	0.390***	0.389***	0.126***	0.229***
	-0.063	-0.055	-0.049	-0.044	-0.046
No. of college-aged children	0.923***	0.061	0.485***	0.342***	0.186***
	-0.126	-0.086	-0.057	-0.054	-0.061
Constant	4.019***	5.806***	3.873***	5.812***	6.237***
	-0.255	-0.27	-0.283	-0.257	-0.192
Number of observation	**285**	**472**	**650**	**729**	**910**
R-square	**0.719**	**0.597**	**0.506**	**0.377**	**0.312**

Notes: Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 12: OLS Estimation for Household Education Expenditure by Children Age in Egypt

Variables	pre and Primary school-aged children	secondary school aged children	College-aged
Dependent variable : Log educational expenditure			
Household income			
First quintile (omitted group)			
Second quintile	0.393***	0.371***	0.280*
	-0.048	-0.07	-0.143
Third quintile	0.639***	0.621***	0.477***
	-0.051	-0.067	-0.136
Fourth quintile	0.859***	0.786***	0.612***
	-0.054	-0.069	-0.131
Fifth quintile	1.622***	1.484***	1.357***
	-0.065	-0.079	-0.135
Household location			
Omitted : Metropolitan			
Lower Egypt	-0.293***	-0.347***	-0.462***
	-0.045	-0.054	-0.087
Upper Egypt	-1.291***	-1.314***	-1.580***
	-0.053	-0.064	-0.1
No. of school aged children			
No. of pre and Primary school-aged children	-0.342***	-0.074***	-0.045
	-0.022	-0.025	-0.049
No. of secondary school aged children	0.324***	-0.257***	0.135***
	-0.021	-0.027	-0.04
No. of college-aged children	0.013	-0.023	-0.251***
	-0.038	-0.032	-0.05
Constant	5.811***	6.476***	6.363***
	-0.068	-0.087	-0.152
Number of observation	4550	3262	1421
R-square	0.415	0.339	0.291

Notes: Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 13: OLS Estimation for Household Education Expenditure by Children Age in Palestine

Variables	pre and Primary school-aged children	secondary school aged children	College-aged
Dependent variable : Log educational expenditure			
Household income			
First quintile (omitted group)			
Second quintile	0.189***	0.197***	0.164**
	-0.052	-0.051	-0.071
Third quintile	0.342***	0.307***	0.241***
	-0.054	-0.053	-0.074
Fourth quintile	0.570***	0.585***	0.458***
	-0.061	-0.058	-0.075
Fifth quintile	0.734***	0.696***	0.664***
	-0.068	-0.063	-0.083
Household location			
Omitted : Metropolitan			
West Bank	-0.004	-0.058	-0.004
	-0.04	-0.038	-0.049
No. of school aged children			
No. of pre and Primary school-aged children	-0.148***	-0.263***	-0.333***
	-0.024	-0.022	-0.029
No. of secondary school aged children	-0.027**	-0.018	0.024
	-0.012	-0.011	-0.015
No. of college-aged children	0.471***	0.457***	0.246***
	-0.029	-0.021	-0.022
Constant	5.787***	6.054***	6.423***
	-0.066	-0.062	-0.075
Number of observation	3481	4561	2779
R-square	0.213	0.263	0.219

Notes: Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 14: OLS Estimation for Household Education Expenditure by Children Age in Sudan

Variables	pre and Primary school-aged children	secondary school aged children	College-aged
Dependent variable : Log educational expenditure			
Household income			
First quintile (omitted group)			
Second quintile	0.125**	0.082	0.173*
	-0.056	-0.096	-0.104
Third quintile	0.231***	0.199**	0.290***
	-0.055	-0.094	-0.097
Fourth quintile	0.506***	0.570***	0.707***
	-0.058	-0.098	-0.1
Fifth quintile	1.152***	1.134***	1.188***
	-0.063	-0.105	-0.106
Household location			
Omitted : Center Sudan			
Western Sudan	0.125***	0.118	0.119
	-0.044	-0.075	-0.079
Eastern Sudan	0.107*	0.09	0.014
	-0.063	-0.105	-0.113
Northern Sudan	-0.036	0.088	0.092
	-0.051	-0.085	-0.087
No. of school aged children			
No. of pre and Primary school-aged children	-0.258***	-0.264***	-0.284***
	-0.016	-0.025	-0.026
No. of secondary school aged children	0.447***	0.405***	0.418***
	-0.029	-0.044	-0.053
No. of college-aged children	0.461***	0.424***	0.413***
	-0.027	-0.045	-0.04
Constant	4.057***	4.083***	4.090***
	-0.069	-0.108	-0.11
Number of observation	4591	1660	1664
R-square	0.291	0.309	0.321

Notes: Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 15: OLS Estimation for Household Education Expenditure by Children Age in Jordon

Variables	pre and Primary school-aged children	secondary school aged children	College-aged
Dependent variable : Log educational expenditure			
Household income			
First quintile (omitted group)			
Second quintile	0.131	0.046	-0.041
	-0.121	-0.16	-0.175
Third quintile	0.358***	0.277*	0.225
	-0.117	-0.151	-0.165
Fourth quintile	0.510***	0.308**	0.475***
	-0.119	-0.149	-0.163
Fifth quintile	0.827***	0.667***	0.711***
	-0.135	-0.156	-0.162
Household location			
Omitted : Center Jordon			
North Jordon	-0.485***	-0.542***	-0.751***
	-0.074	-0.092	-0.087
South Jordon	-0.959***	-0.798***	-0.969***
	-0.119	-0.147	-0.141
No. of school aged children			
No. of pre and Primary school-aged children	-0.535***	-0.519***	-0.597***
	-0.035	-0.042	-0.041
No. of secondary school aged children	0.216***	0.244***	0.210***
	-0.035	-0.038	-0.041
No. of college-aged children	0.596***	0.421***	0.232***
	-0.048	-0.052	-0.048
Constant	4.841***	5.012***	5.562***
	-0.126	-0.159	-0.162
Number of observation	1280	1020	1005
R-square	0.422	0.389	0.402

Notes: Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%