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Abstract

Education inequality has always been a concern for policy makers due to its long-term and intergenerational impacts. This paper examines the determinants and the sources of education inequality among the youth in the MENA region using harmonized income and expenditure surveys. More attention is given to income and regional disparities as source of education inequality. The paper makes use of the Recentered Influence Functions (RIF) unconditional regression techniques to examine youth education inequality measured by years of schooling and to identify the determinants of Gini index of education across countries. The findings show that higher household income reduces education inequality among youth in Iraq and higher education expenditure reduces education inequality for youth in both Egypt and Iraq. Health expenditure is found to be having insignificant impact on education inequality for youth in all countries. Moreover, increasing the number of earners in the household reduce education inequality in both Jordan and Palestine and increases youth education inequality in Iraq and Egypt. It has been also deduced that rural regions are at a disadvantage in terms of educational attainment and educational inequality in comparison to urban regions across all countries and all income quartiles. The decomposition of rich-poor education inequality, reveals that the education gap among youth appear to increase for the poor compared to the rich. Finally, there is a declining trend in youth educational inequality over time for Egypt and Iraq. However, the gap seems to be widening for Jordan and Palestine.

1. Introduction

In the recent years, education has become a top priority in the reform agenda for many policymakers in MENA countries. According to human capital theory, education is considered an antidote for reducing poverty levels and promoting economic growth, both at the national and household levels. In addition, education is considered one of the key protections against authoritarian governments and a condition for achieving democracy (Akkari, 2004). However, there have been many criticisms regarding the educational system in the MENA countries as a part of the underdevelopment problem rather than a solution.

Policy makers in the MENA region have focused on access to education where enrolment in the region has increased significantly over the past decade to the point where universal primary education has been achieved in most of the region. Net enrolment rate rose from 86% to 94% from 2000-2016 and the level of schooling quadrupled since 1960 (World Bank, 2014). However, there was insufficient attention to the poor quality of schooling where basic skills were not being learned and the level of students learning achieved were significantly low (World Bank, 2013). According to international standardized tests (TIMSS), the MENA region is still below the expected benchmarks and shows unfair access to learning opportunities (Assaad, 2014; Salehi-Isfahani, Hassine and Assaad, 2014). In addition to inqadequacy and inefficiency of public spending on education, overcrowding classrooms, inexistent vocational training, and missing links to employers have been persistent problems in the educational systems (EL-Baradei, 2013;Angel-urdinola, Kuddo, & Wazzan, 2010).

It is worth noting that expansion in schooling coupled with low quality generates low returns in the labor markets. The association between education and labor market proved to decline over time. Returns to education in the MENA region tend to be lower than any other region (Montenegro and Patrinos, 2014; Tzannatos, Diwan and Ahad, 2016; Rizk, 2019). Unemployment rates among secondary and university graduates are extremely high in the region and the inability to have privileged jobs by the middle class graduates not only generates frustration among educated youth but is also considered one of the main causes of the Arab spring uprisings (Campante and Chor, 2012; Binzel and Carvalho, 2017). Poor education outcomes are expected since even though public education is theoretically free to all levels including tertiary education; yet, additional supplements are often required by families to improve children's performance and offer them a competitive edge where it ends up subsidizing the rich instead of the poor (Assaad, 2010; Assaad and Krafft, 2015). Private tutoring is also a widespread phenomenon in the MENA region and is considered to be a critical element for succeeding in school only for those who can afford it (Assaad and El-Badawy, 2004; Tansel and Bircan, 2006; Elbadawy *et al.*, 2007; Ali, 2013; Elbadawy, 2013b, 2013a; Elamin, Rizk and Adams, 2018).

The objectives of this study are: (1) Investigating the education distribution among youth at different income quartiles of the population to examine if education is significantly more

concentrated among high-income groups; i.e. pro-rich education inequality. (2) Identify the most significant determinants of education inequality among youth in rural versus urban areas. (3) Explore the change in youth education inequality overtime during the period from 1999 to 2015. The countries covered in the MENA region are Egypt, Palestine, Iraq and Jordan.

In this study we use Recentered-Influence-Function regressions. The novelty of analysis is that it goes beyond mean comparisons, but rather examines differentials in the whole distribution. Determinants for youth education inequality examined will include demographic and socioeconomic indicators such as gender, household composition, number of children and earners in household, and expenditure on health and education services. Identifying the most significant factors affecting education inequality among youth is particularly useful to predict the impact of different policy changes on education outcomes which in turn is one of the main drivers of growth and poverty reduction.

2. Literature Review

Education in the MENA region is not only viewed as a mean to greater earnings, but also the most important instrument to break the intergenerational transmission of poverty and motivate social mobility (Corak, 2013). Therefore, education proved to reduce income inequality in the MENA region more than any other region (Salehi-Isfahani, Hassine and Assaad, 2014). The 2011 protests and revolutions in the MENA region were mainly fueled by lack of economic and political opportunities and social injustice, which makes income and educational inequality growing concerns for policymakers resulting in receiving more attention in public debate (Ersado and Gignoux, 2017). One of the main drivers of the 2011 Arab uprisings was the expansion of enrolment to formal education coinciding with limited opportunities in the labor market and growing the perception of exclusion (World Bank, 2008).

Understanding the determinants of education inequality in the MENA region tends to increase over the past decades as there is huge supply of university graduates and private tutoring has become crucial to determine education path (Salehi-Isfahani, Hassine and Assaad, 2014). Inequality of opportunity is closely related to educational attainment and the individual's socio-economic background (Breen and Jonsson, 2005). The literature on inequality of opportunity in the MENA region is relatively small due to the data limitations. Several studies have focused mainly on inequality in health outcomes (Assaad *et al.*, 2012) as measured by height for age and weight for height showing that the main determinant of inequality in child health outcomes is due to poor circumstances in Egypt, demographics in Jordan, parental wealth and demographics in Morocco and finally, parental education and wealth and demographics for Turkey. El-Kogali & Krafft(2015) examined the inequality of investment in early childhood development in MENA countries including education, health

and nutrition finding a significant variation in the extent of inequality in early child development across MENA countries and across different dimensions.

Previous studies have focused on education inequality of opportunity in the MENA countries using test scores from TIMSS over time since 1999 concluding that family and community characteristics are among the important factors that contribute to the educational inequality (Salehi-Isfahani, Hassine and Assaad, 2014). Moreover, Assaad, Salehi-Isfahani and Hendy (2014) attempt to examine the relation between probability of secondary school attainment and family and societal characteristics such as parent education, type of community and gender. They showed alarming degree of inequality due to circumstances particularly in Yemen and Iraq due to limited number of schools. Elbadawy (2015) confirmed inequality in education opportunities and outcomes, where wealth and parental education found to affect different aspect of education in Egypt.

Among the challenges of the education system in the MENA region is the admission to general secondary and university relied on high stake national examination where parental investment on private tutoring at early stages could determine later education trajectories (Assaad, 2010; Baradei, 2004). Heyneman (1997) argued that students belonging to rich families are more likely to meet the admission criteria while the majority of students tracked into vocational trajectory. Moreover, learning gaps between students appeared at early ages due to circumstances beyond their control such as parental education, birthplace and socioeconomic conditions (Ersado and Gignoux, 2017).

On the other hand, other studies focused on inequality of opportunity in consumption and income, Hassine (2012) demonstrated that inequality of opportunity in Egypt is declining over time but wage inequality increased. Moreover, family characteristics such as father's education, employment and location of household were found to contribute more to wage inequality. Assaad *et al.* (2018) argue that inequality of opportunity is declining in Egypt yet still social class and other circumstances such as household income and consumption shaped the inequality of opportunity. Another extension of the analysis has been done in Tunisia, Egypt and Jordan and found declining trend in inequality of opportunity and income in MENA region. Others used per capita consumption to measure both poverty and inequality and found that both wealth and region are closely related to inequality of opportunity in the MENA region (Krafft *et al.*, 2017). On measuring the economic inequality, focusing on both urban-rural inequality and metropolitan and non-metropolitan inequality, Hassine (2014) examined the level and determinants of economic opportunity in 12 Arab countries using harmonized micro data. They found demographic, human capital and community characteristics contribute to rural-urban inequality and human capital contributes to metropolitan and non-metropolitan inequality. Ferreira, Gignoux, & Aran (2011) assess the nature and the degree of economic opportunity measured by wealth index among women in Turkey. They demonstrated that between 21%-31% of the observed inequality is due to

circumstances. Besides, inequality increased in rural areas and among families with illiterate mothers. For the studies that show the negative effects of income inequality on economic growth and aggravating poverty in MENA region (Ncube, Anyanwu and Hausken, 2014).

Regarding the global literature, Coady and Dizioli (2017) analyze the impact of education expansion on income inequality in developing and emerging countries. They found positive and significant relation between education inequality and income inequality. Family characteristics closely related to inequality of opportunities in education outcomes (Breen and Jonsson, 2005). Moreover, Benaabdelaali, Hanchane, and Kamal (2012) found a declining trend for education inequality in 146 countries over the period 1950-2010 depending on age, gender and developmental level. They make use of Gini coefficient as a measure of distribution of years of schooling.

The contribution of this study is to fill the gap in the previous literature that mainly focuses on the factors that significantly determine youth educational attainment by examining which factors account for changes (or differences) in distributions in education for rural and urban regions in the MENA region. To do so, we identify the determinants that most significantly impact the education distribution, using the recentered influence function regressions (RIF) developed by Firpo, Fortin, and Lemieux (2009).

3. Data Structure

The aim of this study is to explore the potential causes of socioeconomic-related education inequality among youth in the MENA region using the LISSY-ERF harmonized dataset. We focus our analysis on four countries including Egypt, Iraq, Jordan, and Palestine. We use surveys that have been conducted in the time period between years 1999 and 2015. Waves of surveys used in the analysis are for Egypt (1999, 2004, 2008, 2010, 2012, 2015); Iraq (2007, 2012); Jordan (2002, 2006, 2008, 2010, 2013), and Palestine (2010, 2011). Due to the remarkable differences between the urban and rural populations, we attempt to compare trends in education inequality among youth aged 18-25 in each of those countries and how education inequality varies by income quartile in both urban and rural populations. We investigate using recentered influence functions how the disposable household income, household's number of children, number of earners, consumption expenditure, health care expenditure, and education expenditure impact the degree of educational inequality within the children of the household falling within the age range of 18 and 25 in each of the four MENA countries under study. The age group is restricted to 18-25 years old to ensure that they were living in their birth households with their parents as heads of household and enrolled in school. This makes it easier to examine the household determinants of education inequality for those children.

All the nominal variables converted into real variables using consumer price index[3]. Moreover, variables are then normalized with the number of household members by using the square root of equivalence scale, which divides these variables with the square root of household members except education expenditure divided by square root of members less than 18 years old (Bardazzi and Pazienza, 2018). Education inequality is measured using the Gini Education Index which is a simple and direct measure to inequality. The Gini-Education Index is a continuous variable ranging from 0 to 1 in which a higher value indicates higher inequality.

We start by the summary statistics for the samples under study for each of the four MENA countries. Mean years of education show that in Egypt and Iraq the rural populations tend to have lower years of schooling among the youth on average in comparison to the urban populations. In Jordan, and Palestine the difference does not to seem that significant. The descriptive statistics also show that there is a wide variation across the samples of each country in terms of disposable household income and expenditures on consumption, health, and education. Descriptive statistics of each variable under study is shown in Table 1,Table 2,Table 3 and Table 4.

4. Methodology

Given that we are interested in examining the determinants of household education distribution among the youth, we need to "go beyond the mean" that Oaxaca-Blinder decompositions investigate (Firpo, Fortin, Lemieux, 2009). Despite the popularity of the conventional Quantile regressions, they are strictly conditional regressions that cannot be used to address the impact of X on unconditional quantiles. Using the RIF decomposition method, we run a regression of a transformation of the outcome variable on the explanatory variables which allow us to relax the conditionality restriction and will produce unbiased policy impact estimates on unconditional quantiles.

The RIF approach has been implemented on the specific case of the Gini coefficient. We use the same notation and derivation in Essama-Nssah and Lambert (2012). Suppose that y is the outcome variable we are interested in (in our case, it is years of schooling of the children of the household). Let $F(y)$ be the cumulative distribution of the outcome variable, and let $T(\cdot)$ be a distributional statistic. The influence function is the directional derivative of $T(F)$ at F and it measures the effect of a small perturbation in F on $T(F)$. Let H be some distribution other than F. When the data does not follow F exactly, but a slightly different distribution, one that is "going towards" H, the effect is revealed by the directional derivative of T at F in the direction of H. As we apply this to the Gini-coefficient distributional statistic, the directional derivative of the Gini coefficient is as follows:

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[3] Collected from IMF & WB, International Financial Statistics.

$$G_F = T_G(F) = \frac{1}{\mu_F} \int F(x)[1 - F(x)]\, dx : \nabla T_{G,F \to H}$$
$$= \frac{\mu_F - \mu_H}{\mu_F} G_F + \frac{1}{\mu_F} \int [H(x) - F(x)][1 - 2F(x)]dx \qquad (1)$$

The Influence functions *IF(y;T;F)* of the Gini coefficient is:

$$IF(y; T_G; F) = -\frac{\mu_F + y}{\mu_F} G_F + 1 - \frac{y}{\mu_F} + \frac{2}{\mu_F} \int_0^y F(x)\, dx \qquad (2)$$

The Recentered influence functions *RIF(y;T;F)* of the Gini coefficient is:

$$RIF(y; T_G; F) = -\frac{y}{\mu_F} G_F + 1 - \frac{y}{\mu_F} + \frac{2}{\mu_F} \int_0^y F(x) dx \qquad (3)$$

The conditional expectation of RIF(y;G) can be modelled as a linear function of explanatory variables given by matrix X and the relationship will be estimated by Ordinary Least Squares regressions (Firpo, Fortin and Lemieux, 2018):

$$E(RIF(y; G)|X) = X'\beta \qquad (4)$$

By the law of iterative expectations:

$$G = E\big(RIF(y; G)\big) = E_X[E(RIF(y; G)|X)] = E(X)'\beta \qquad (5)$$

Accordingly, the coefficients β will be interpreted as the marginal impact of a small change in $E(X)$ on the Gini index.

Our study will be composed of two sections. The first section will measure education inequality in urban and rural regions of selected MENA countries using the Gini-education Index that will be measured using the years of schooling. The second section of the paper will identify the main determinants which significantly impact education inequality in urban and rural Egypt using the Recentered Influence function (RIF).

The objectives of the paper are fourfold:
(1) Investigating the education distribution among youth at different income quartiles of the population to examine if education is significantly more concentrated among high-income groups; i.e. pro-rich education inequality.

(2) Test if there is a significant difference between education inequalities in rural versus urban areas for youth.

(3) Explore the change in education inequality among youth overtime during the period from 1999 to 2015.

(4) Identify the most significant determinants of education inequality in urban and rural populations of the MENA region using the RIF regressions.

5. Results

In this study, we examined the trends and differences in education attainment between urban and rural population and across different income quartiles for 4 MENA region countries including Egypt, Iraq, Jordan, and Palestine. Tables (5-8) show the average years of education per income quartile for the five countries across the years in which survey waves were available. In all of the 5 countries, there is common observation that education is more pro-rich. In other words, the higher the income quartile, the higher the average number of years of education tends to be. Yet, the magnitude of the difference between in the lowest and highest income quartiles in educational attainment differs from one country to another.

Table (5) shows that in Egypt the number of years of education has been declining in the lowest income quartile especially after the 2011 revolution. In the lowest quartile, the number of years of schooling declined from 4.18 in 2010 to 3.07 in 2015 in urban populations; and has decreased from 2.9 years to 1.7 years of education during the same time period for the rural populations. Not only have the poorer sectors of the population been negatively affected by the political events; but also the number of years of education in the highest quartile has been stagnant if not declining particularly in the urban populations. Moreover, there is a drastic difference between the years of education in the lower quartile in comparison to the highest quartile. In 2015, there is an almost four years' difference in the years of schooling between the lowest quartile and the highest quartile in urban populations of Egypt. Moreover, the difference is even more drastic for the rural populations showing nearly 6 years of difference in schooling between the lowest and highest income quartiles. The lowest quartile in rural populations has average years of schooling as low as 1.7 years of education, which is lower than any other country under study in the region.

In Iraq, as shown in Table 6, the number of years of education has been increasing for all income quartiles across the survey waves. It is worth noting that schooling is also pro-rich showing a higher number of years of schooling for higher income quartiles, yet the difference between the lowest and highest income quartile is not as drastic as it is in Egypt showing a difference of 2.5 years of schooling in urban populations and 1.5 years of schooling in rural populations. Table 7 shows that Jordan has also experienced a decline in the years of education for the lower income quartile in the last decade. It also shows higher number of

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years of education in urban populations in comparison to rural populations across all income quartiles, yet the difference between both urban and rural populations are not significant ranging from only 1 to 2 years. Palestine, however, shows a minimum difference in the years of education between the lowest and highest income quartiles as shown in Table 8.

The Gini-education index has been computed for the four countries under study across the surveys. As shown in Table 9, overall education inequality has been improving in Egypt reflected in a decline in its Gini education index. However, educational inequality is significantly higher in rural areas ranging from 0.5 and 0.6. Iraq also shows a relatively high education inequality in the range of 0.4 to 0.5 and higher for rural compared to urban areas as shown in Table 10 . Jordan shows in Table 11 a deteriorating education inequality for both urban and rural populations. Palestine Gini-education indices have been fairly stagnant across the different waves showing no significant difference between urban and rural populations as shown in Table 12.

Recentered influence functions were used to examine the impact of several household-level variables on educational inequality within the children raised in the household. We focus on the youth who have surpassed the age range of basic education; that is, youth falling in the age range of 18 to 25. Results are shown in Tables 13, 14, 15 and 16 . For all the countries under study, higher education expenditure has been negatively associated with education inequality. In other words, higher spending on education reduces education inequality within the society. For Egypt and Iraq, the number of children per household was positively associated with higher educational inequality within the population. This is expected since a higher number of dependents within the household is expected to negatively impact the children's socioeconomic outcomes. Moreover, a higher household disposable income only reduced educational inequality in Iraq but surprisingly did not have any significant impact on the other countries under study. There was no significant association between health care expenditure and educational inequality in all countries under study. Results for the relationship between the number of earners and education inequality are mixed. For Egypt and Iraq a higher number of earners is associated with higher education inequality. On the other hand, in Jordan and Palestine a higher number of earners within the household is associated with lower education inequality.

6. Conclusions and policy recommendations

The paper offers a comprehensive overview to the inequality of opportunity in education outcomes. We use a harmonized household survey for MENA countries including Egypt, Jordan, Palestine, and Iraq. Educational attainment in the MENA region has risen markedly throughout the region. By no means, education is a powerful tool that can improve the quality of life by contributing to earnings. At the same time, MENA region is facing educational crisis where there is huge education disparity with countries coupled with a decrease in the quality and efficiency of access to education and finally, mismatch between labor market demands and education system outcomes. All those factors together, lead to political

instability and social unrest which brought education inequality issue at the top of policymakers' agenda. The literature investigated more the determinants of income and consumption inequality but still education inequality topic is limited. The paper attempts to fill the gap and contribute to the understanding of the determinants of education inequality in MENA countries, focusing on regional and income disparities sources of education inequality.

The analysis of sources of education inequality among youth in MENA countries shows similar pattern. For instance, higher education expenditure found to reduce youth education inequality in all countries. In both Egypt and Iraq, families with large number of independents are found to face huge education inequality among youth. Household income found to reduce education inequality among youth in Iraq but insignificant in other countries. Health expenditure found to have no significant impact on youth education inequality. Higher number of earners lowers youth education inequality in Palestine and Jordan but raises youth education inequality in Iraq and Egypt. The analysis of urban-rural education inequality shows that children belonged to households located in urban areas continue to be much favored than children belonged to households located in rural areas except for Palestine (both is the same). The results of the decomposition of rich-poor education inequality reveal that the education gap among youth appear to increase for the poor compared to the rich. One more common finding across the MENA countries is the declining of educational inequality among youth for Egypt, and Iraq and the gap seems to be widening for Jordan and the same in Palestine.

Policies to address educational inequality in the MENA countries among youth could focus on two main routes. First, policies designed to improve rural locations either through provision of schools, trained teachers and improving curriculum. Second, policies targeted families' demographic characteristics through family planning and awareness campaign for the poor living in poor areas. Besides, more social security programs like Takaful and Karama targeting the poor aimed to squeeze the gap between the poor and the rich and provision of cash transfers to poor families to help them educate their children and motivate social mobility.

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Table 1A: Descriptive Statistics (Egypt – Urban Population)

Variable	Obs.	Mean	St. Dev	Min	Max
Years of Schooling	1,522	12.051	2.875	0	18
Age	1,522	20.748	2.221	18	25
Gender (Male=1; Female=0)	1,522	0.551	0.497	0	1
Ever Married (Yes=1, No=0)	1,522	0.084	0.277	0	1
Number of Children	1,522	0.125	0.510	0	3
Ln(Disposable Household Income)	1,522	12.266	0.495	10.714	15.255
Ln(Consumption Expenditure)	1,522	12.203	0.464	10.827	14.706
Ln(Health Expenditure)	1,522	9.057	1.243	1.442	13.321
Ln(Education Expenditure)	1,522	9.672	1.471	4.641	14.039
Number of Earners	1,522	2.032	0.990	1	7

Table 1B: Descriptive Statistics (Egypt – Rural Population)

Variable	Obs.	Mean	St. Dev	Min	Max
Years of Schooling	2,143	10.970	3.378	0	18
Age	2,143	20.740	2.299	18	25
Gender (Male=1; Female=0)	2,143	0.598	0.490	0	1
Ever Married (Yes=1, No=0)	2,143	0.154	0.361	0	1
Number of Children	2,143	0.268	0.819	0	8
Ln(Disposable Household Income)	2,143	12.058	0.431	10.459	13.949
Ln(Consumption Expenditure)	2,143	11.953	0.403	10.759	13.768
Ln(Health Expenditure)	2,143	8.846	1.173	2.226	12.568
Ln(Education Expenditure)	2,143	8.553	1.467	2.338	12.817
Number of Earners	2,143	2.176	1.135	1	7

Table 2A: Descriptive Statistics (Iraq – Urban Population)

Variable	Obs.	Mean	St. Dev	Min	Max
Years of Schooling	4,241	7.893	4.511	0	18
Age	4,241	21.039	2.216	18	25
Gender (Male=1; Female=0)	4,241	0.528	0.499	0	1
Ever Married (Yes=1, No=0)	4,241	0.269	0.444	0	1
Number of Children	4,241	0.351	0.874	0	11
Ln(Disposable Household Income)	4,241	9.745	0.668	5.348	13.154
Ln(Consumption Expenditure)	4,241	9.998	0.660	8.033	12.880
Ln(Health Expenditure)	4,241	6.396	1.154	0.854	11.512
Ln(Education Expenditure)	4,241	6.129	1.663	0.142	10.615
Number of Earners	4,241	1.635	1.284	0	8

Table 2B: Descriptive Statistics (Iraq – Rural Population)

Variable	Obs.	Mean	St. Dev	Min	Max
Years of Schooling	2,032	5.812	4.555	0	18
Age	2,032	20.907	2.210	18	25
Gender (Male=1; Female=0)	2,032	0.516	0.499	0	1
Ever Married (Yes=1, No=0)	2,032	0.328	0.469	0	1
Number of Children	2,032	0.476	1.087	0	14
Ln(Disposable Household Income)	2,032	9.519	0.787	1.568	12.693
Ln(Consumption Expenditure)	2,032	9.873	0.655	8.110	12.152
Ln(Health Expenditure)	2,032	6.224	1.253	0.508	11.082
Ln(Education Expenditure)	2,032	5.616	1.614	0.854	9.982
Number of Earners	2,032	1.446	1.282	0	5

Table 3A: Descriptive Statistics (Jordan – Urban Population)

Variable	Obs.	Mean	St. Dev	Min	Max
Years of Schooling	1,546	11.926	2.615	0	18
Age	1,546	20.897	2.227	18	25
Gender (Male=1; Female=0)	1,546	0.571	0.495	0	1
Ever Married (Yes=1, No=0)	1,546	0.102	0.303	0	1
Number of Children	1,546	0.170	0.692	0	6
Ln(Disposable Household Income)	1,546	9.557	0.612	6.262	11.898
Ln(Consumption Expenditure)	1,546	9.756	0.467	7.99	11.243
Ln(Health Expenditure)	1,546	4.675	1.465	0.506	8.463
Ln(Education Expenditure)	1,546	6.576	2.258	1.370	11.187
Number of Earners	1,546	3.029	1.298	1	9

Table 3B: Descriptive Statistics (Jordan– Rural Population)

Variable	Obs.	Mean	St. Dev	Min	Max
Years of Schooling	1,047	11.985	2.436	0	18
Age	1,047	20.765	2.141	18	25
Gender (Male=1; Female=0)	1,047	0.569	0.495	0	1
Ever Married (Yes=1, No=0)	1,047	0.064	0.245	0	1
Number of Children	1,047	0.094	0.488	0	4
Ln(Disposable Household Income)	1,047	9.560	0.593	6.552	11.299
Ln(Consumption Expenditure)	1,047	9.681	0.439	8.132	11.039
Ln(Health Expenditure)	1,047	4.392	1.450	0.853	7.613
Ln(Education Expenditure)	1,047	6.139	2.142	1.978	10.559
Number of Earners	1,047	2.965	1.261	1	7

Table 4A: Descriptive Statistics (Palestine – Urban Population)

Variable	Obs.	Mean	St. Dev	Min	Max
Years of Schooling	1,608	11.769	2.681	0	18
Age	1,608	20.789	2.175	12	25
Gender (Male=1; Female=0)	1,608	0.567	0.495	0	1
Ever Married (Yes=1, No=0)	1,608	0.188	0.391	0	1
Number of Children	1,608	0.258	0.812	0	6
Ln(Disposable Household Income)	1,608	10.737	0.740	8.298	12.781
Ln(Consumption Expenditure)	1,608	11.058	0.589	9.593	13.695
Ln(Health Expenditure)	1,608	7.099	1.419	2.849	11.799
Ln(Education Expenditure)	1,608	7.722	1.915	1.973	12.386
Number of Earners	1,608	1.822	1.149	0	6

Table 4B: Descriptive Statistics (Palestine– Rural Population)

Variable	Obs.	Mean	St. Dev	Min	Max
Years of Schooling	754	11.603	2.876	0	18
Age	754	20.931	2.205	18	25
Gender (Male=1; Female=0)	754	0.558	0.497	0	1
Ever Married (Yes=1, No=0)	754	0.198	0.398	0	1
Number of Children	754	0.177	0.637	0	6
Ln(Disposable Household Income)	754	10.853	0.793	8.101	13.011
Ln(Consumption Expenditure)	754	11.146	0.626	9.734	13.420
Ln(Health Expenditure)	754	7.151	1.596	2.299	13.329
Ln(Education Expenditure)	754	7.664	1.944	2.666	11.058
Number of Earners	754	2.201	1.395	0	7

Table 5: The distribution of years of education across different income groups in Egypt

	Year	1999	2004	2008	2010	2012	2015
Urban	Low quartile	5.486	5.628	4.625	4.187	3.717	3.069
	Second quartile	7.204	7.158	6.176	5.906	4.795	4.451
	Third quartile	8.479	8.554	7.458	7.061	6.536	6.805
	High quartile	10.466	10.722	9.519	9.192	8.894	9.827
Rural	Low quartile	3.636	4.163	3.868	2.959	2.171	1.726
	Second quartile	4.898	5.353	4.955	4.897	3.849	3.476
	Third quartile	5.334	6.217	5.593	5.652	5.478	5.611
	High quartile	6.299	7.141	6.559	6.632	6.513	7.689

Table 6: The distribution of years of education across different income groups in Iraq

	Year	2007	2012
Urban	Low quartile	4.830	4.473
	Second quartile	5.500	5.451
	Third quartile	6.062	6.182
	High quartile	6.541	7.172
Rural	Low quartile	3.220	3.722
	Second quartile	3.670	4.350
	Third quartile	3.775	4.791
	High quartile	3.908	5.109

Table 7: The distribution of years of education across different income groups in Jordan

	Year	2002	2006	2008	2010	2013
Urban	Low quartile	7.634	8.616	8.677	6.839	6.645
	Second quartile	8.877	9.935	9.975	7.825	7.750
	Third quartile	9.375	10.457	10.472	8.579	8.370
	High quartile	10.368	11.556	11.726	10.381	9.905
Rural	Low quartile	6.358	7.593	7.285	5.733	5.905
	Second quartile	7.943	9.095	9.379	7.074	7.421
	Third quartile	8.305	9.081	9.193	7.825	7.867
	High quartile	9.065	10.13	10.224	8.995	9.053

Table 8: The distribution of years of education across different income groups in Palestine

	Year	2010	2011
Urban	Low quartile	7.161	7.057
	Second quartile	7.778	7.828
	Third quartile	8.338	8.298
	High quartile	9.057	9.211
Rural	Low quartile	6.321	6.721
	Second quartile	7.255	7.269
	Third quartile	7.902	7.835
	High quartile	8.607	8.741

Table 9: Gini Education Index for Egypt

Gini Education Index	1999	2004	2008	2010	2012	2015
Total	0.531	0.502	0.493	0.471	0.468	0.355
Urban	0.43	0.418	0.418	0.401	0.399	0.295
Rural	0.599	0.567	0.545	0.521	0.516	0.4

Table 10: Gini Education Index for Iraq

Gini Education Index	2007	2012
Total	0.497	0.469
Urban	0.466	0.444
Rural	0.564	0.508

Table 11: Gini Education Index for Jordan

Gini Education Index	2002	2006	2008	2010	2013
Total	0.263	0.231	0.231	0.347	0.351
Urban	0.251	0.225	0.223	0.343	0.346
Rural	0.304	0.263	0.269	0.369	0.370

Table 12: Gini Education Index for Palestine

Gini Education Index	2010	2011
Total	0.336	0.339
Urban	0.333	0.337
Rural	0.349	0.350

Table 13: RIF-OLS Regression for Gini Education Index of Egypt

	Coef.	Std. Err.	t-statistic	P>|t|
Age	0.002	0.001	1.54	0.123
Gender (Male=1)	-0.012*	0.006	-1.89	0.058
Ever Married	-0.021	0.015	-1.42	0.156
Number of Children	0.072***	0.007	10.34	0.000
ln(Disposable Income)	-0.018	0.011	-1.63	0.103
ln(Household Consumption Expenditure)	-0.002	0.013	-0.13	0.898
ln(Household Health Expenditure)	0.004	0.003	1.40	0.160
ln(Household Education Expenditure)	-0.019***	0.003	-7.63	0.000
Region (Rural=1)	0.014**	0.006	-2.14	0.032
Number of Earners in Household	0.018***	0.003	5.79	0.000
Number of Observations	3665			

*s *p<0.1, **p<0.05, ***p<0.01*

Table 14: RIF-OLS Regression for Gini Education Index of Iraq

	Coef.	Std. Err.	t-statistic	P>|t|
Age	0.005**	0.002	2.29	0.022
Gender (Male=1)	-0.025***	0.009	-2.83	0.005
Ever Married	0.071***	0.013	5.64	0.000
Number of Children	0.028***	0.006	4.40	0.000
ln(Disposable Income)	-0.042***	0.007	-5.70	0.000
ln(Household Consumption Expenditure)	-0.047***	0.008	-5.66	0.000
ln(Household Health Expenditure)	0.006	0.004	1.45	0.148
ln(Household Education Expenditure)	-0.036***	0.003	-12.90	0.000
Region (Rural=1)	0 .091***	0.010	9.23	0.000
Number of Earners in Household	0.022***	0.003	6.80	0.000
Number of Observations	6273			

*p<0.1, **p<0.05, ***p<0.01*

Table 15: RIF-OLS Regression for Gini Education Index of Jordan

	Coef.	Std. Err.	t-statistic	P>|t|
Age	0.009***	.0012095	7.28	0.000
Gender (Male=1)	0.024***	.005231	4.61	0.000
Ever Married	0.079***	.0135428	5.85	0.000
Number of Childen	-0.008	.0059739	-1.31	0.190
ln(Disposable Income)	0.004	.0052294	0.73	0.468
ln(Household Consumption Expenditure)	0.019***	.0073909	2.53	0.012
ln(Household Health Expenditure)	0.003	.0018642	1.60	0.111
ln(Household Education Expenditure)	-0.015***	.0013472	-11.39	0.000
Region (Rural=1)	-0.024	.00638	-3.74	0.000
Number of Earners in Household	-0.005**	.0021802	-2.23	0.026
Number of Observations	2593			

*Standard Error in Parenthesis *p<0.1, **p<0.05, ***p<0.01*

Table 16: RIF-OLS Regression for Gini Education Index of Palestine

	Coef.	Std. Err.	t-statistic	P>|t|
Age	0.012***	0.001	8.40	0.000
Gender (Male=1)	-0.007	0.006	-1.21	0.227
Ever Married	-0.016*	0.010	-1.65	0.099
Number of Children	-0.005	0.005	-1.04	0.297
ln(Disposable Income)	-0.005	0.005	-1.01	0.315
ln(Household Consumption Expenditure)	0.006	0.007	0.86	0.390
ln(Household Health Expenditure)	-0.001	0.002	-0.68	0.499
ln(Household Education Expenditure)	-0.011***	0.002	-6.96	0.000
Region (Rural=1)	0.011	0.007	1.48	0.138
Number of Earners in Household	-0.005*	0.003	-1.72	0.085
Number of Observations	2362			

*Standard Error in Parenthesis *p<0.1, **p<0.05, ***p<0.01*