School Attainment and Knowledge in Arab Countries

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Abstract

This paper deals with school attainment in the Arab economies. It is based on descriptive statistical analyses on Barro and Lee data for the period 1950-2010. The opportunities lost with the low level of school attainment and the corresponding time trends in Arab countries are discussed. The relatively slow speed of recovery in schooling could already be expressed by the lowest knowledge performances achieved by the economies of North Africa, Sudan and Yemen.

Keywords: School attainment, Arab economies.

Introduction

The issue tackled in this article relates to school attainment through average years of schooling (AYS) as this is targeted in the Millennium Development Goals (United Nations, 2013). Education attainment is an important pillar and driver for facilitating access and use of knowledge economy. It is assumed that higher attainment in schooling and higher literacy rates lead to higher levels in performing and accessing the knowledge economy. This implies that the average years of schooling could have a major role in economic and social development as they express the potential of a country in the knowledge sphere and then in development and growth.

This paper is composed of two parts. While the first is devoted to literature review, the second focuses on the analysis school attainment through the average years of schooling based on Barro and Lee data (2011). Comparisons of trends between Arab countries are also conducted.

I. Literature Review

The paper of Ibourk and Amaghouss (2013) refers to the setting of the relationship between education attainment and economic growth is the MENA Region and is a promising contribution to this subject. The hypothesis that could be submitted to the testing and analysis may link higher (respectively lower) AYS and higher (respectively lower) knowledge economic index (KEI). The same thing would apply for the literacy rate (Cree, Kay & Steward, 2012). But, these two sets of variables are major components of the series of measures used in a diversity of knowledge indicators.

As in Acemoglu (2009), there is a critical relationship between school attainment and labor productivity with an increase in the number of well-educated people implying a higher level of labor productivity with a greater ability to access advanced technologies. But as emphasized in series of publications, empirical investigations of the role of human capital need accurate and internationally comparable measures across countries and over time as mentioned in earlier works by Barro and Lee (1993, 1996 and 2001). The Barro and Lee new database (2010) provides consequently improved and disaggregated estimates by gender for those aged 15 years and over, for 146 countries at 5-year intervals from 1950 to 2010.

Other contributions have investigated the effect of age at school entry on educational attainment using instrumental variables with moments from two samples (Angrist and Krueger, 1992).

Earlier papers have looked at school attainment in relation to literacy and labor force participation. On this latter dimension, Bowen and Finegan (1966) have analyzed the link to labor force participation. But, most of the publications have been emphasizing the importance of the economic role played by educational attainment**.**

For Europe, there has been a general trend of improved educational attainment in the EU across generations. A recent Report on the Intergenerational transmission of disadvantages published by Eurostat, the statistical office of the European Union provides some statistical analyses of these questions. The data show that in the EU28, persistence of educational attainment between generations differs according to the level of education of the parents (Eurostat, 2013).

While International comparisons are required, OECD countries use the International Standard Classification of Education (ISCED-97). This is chosen to define the levels of education attainments with possibilities of comparisons across countries. The OECD Handbook for internationally Comparative Education Statistics describes ISCED-97 education programs and attainments levels with their mappings for each country for OECD (OECD, 2012).

For Middle Eastern and North African countries, one consequence of government investment in education has been a significant increase in the average educational

attainment of the labor force. During the 1980s the mean years of schooling among adults increased significantly, so that by 1990 it was at or above four years in most countries. When this minimum average attainment is present, the quality of labor attains a critical mass allowing greater overall productivity (The World Bank, 1998).

In an earlier paper, Heyneman (1997) shows that under scarcity of education data, the Middle Eastern and North African economies face low quality in education. To the author, this is mainly related to how the existing abundant resources are mismanaged in these countries.

Others contributions such as that of UNESCO (2013) show that despite progress in education, millions in Arab countries are still denied access to this source of knowledge and empowerment.

A previous World Bank Report (The World Bank, 2008) emphasizes the economic and social importance of education in the MENA countries It addresses the few successes and the several challenges facing education. Promising reform options are also discussed. But all target higher educational attainment. But, only few papers have been focusing on educational attainment in Arab countries and none of them has focused on analyzing Barro and Lee data for this part of the world.

II. Empirical Analysis

After introducing the direction of the method and data used in this paper, different dimensions related to school attainment are discussed.

II.1. Methods and Data

This is composed of descriptive, trend analysis and statistical comparisons. For the descriptive part, and in order to show the changes in male and female school attainment, pyramidal graphs are used. They account for educational attainment for both males and females of different ages in different years. The data are those from Barro-Lee datasets. The trend analysis looks at changes in school attainment through time while comparisons focus on the time trends obtained. These methods are first applied to each of the selected Arab country.

The graphs are based on data from Barro-Lee datasets. They present the educational attainment by age group and gender over seven Arab countries (Algeria, Egypt, Jordan, Morocco, Saudi Arabia, Tunisia and UAE). These graphs shown as knowledge pyramids concern primary, secondary and tertiary schooling besides those that were never to school (No schooling) for two periods of time 1990 and 2010. The following is a descriptive analysis for the above countries; it shows from left to right respectively the "No Schooling", "Primary", "Secondary" and "Tertiary" school attainments in years 1990 and 2010. To read each graph females are shown in the right of each figure while males are in the left of the figure.

II.2. Descriptive Analysis

This first part of the analysis focuses mainly on graphical representations showing the attainment of males and females applied to the series of the selected Arab countries.

a. Algeria:

The number of males that have never been to school denoted as "No Schooling" in the graphs is lower than the one of females in 1990. In 2010, the numbers of males and females who have never been to school tend to be lower. The number of females without education in 2010 is less than the one in 1990. However, these numbers stay higher compared to males whose numbers decreased significantly from 1990 to 2010. The primary schooling also shows a low number of females in primary schooling in 1990 compared to males for the categories of age less than 50 years old. These numbers tend to be even lower for age categories above 50 years old while the numbers of males in primary schooling for the same category of age are higher than the ones of females. In 2010, the primary schooling of females is more significant while the one of males becomes higher starting 40 years old. The secondary schooling shows a symmetric form either in 1990 or 2010. The numbers of males and females in secondary schooling in 1990 tend to decrease significantly as the age increases. The difference between 1990 and 2010 resides in the increase in numbers of males and females in secondary schooling in 2010 compared to 1990 in both categories of males or females. However significantly higher numbers follow the same pattern as in 1990 and tend to decrease as the age category increases. The tertiary schooling in Algeria in 1990 shows less numbers of females enrolled than males. These numbers decrease as age increases for both males and females. The numbers of males and females in tertiary schooling are almost the same for males and females in 2010 and tend to be lower for categories higher than 60 years old.

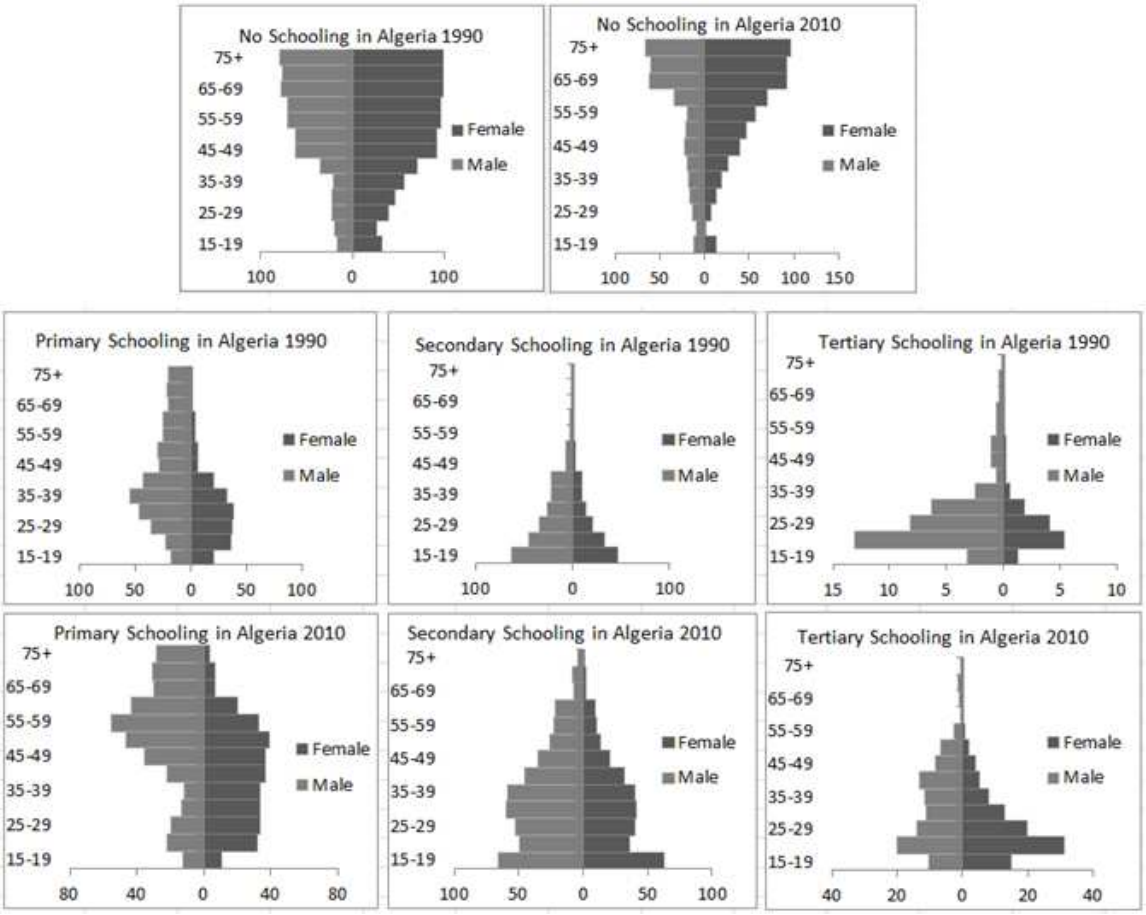

Figure 1: School Attainment in Algeria for males and females in years 1990 and 2010 for no-schooling, primary, secondary and tertiary schooling

b. Egypt:

For Egypt the graphs representing the people who never went to school shows reversed pyramidal shapes. The numbers of males and females that have never been to school are getting higher as the age increases in both 1990 and 2010 and the number of females that have never been to school is significantly higher than the one of males in both years. The numbers for both genders decrease from 1990 to 2010. The number of males with primary schooling is higher for Algeria in 1990 is spectacularly higher than those of females. However, in 2010, these numbers are getting lower for both males and females

and become almost null for the category of age 25-29 years old. The secondary schooling for both categories in 1990 and 2010 has a pyramidal shape where the numbers of males and females with secondary schooling are decreasing as the age increases. The numbers of males and females become more important in 2010 compared with 1990. For the Tertiary level of schooling the number of males is higher than those of females either in 1990 or in 2010. They are null for males and females between 15 and 20 years old in 1990. Moreover, the numbers of males and females in tertiary schooling shrink in 2010 for both genders between 35 and 50 years old.

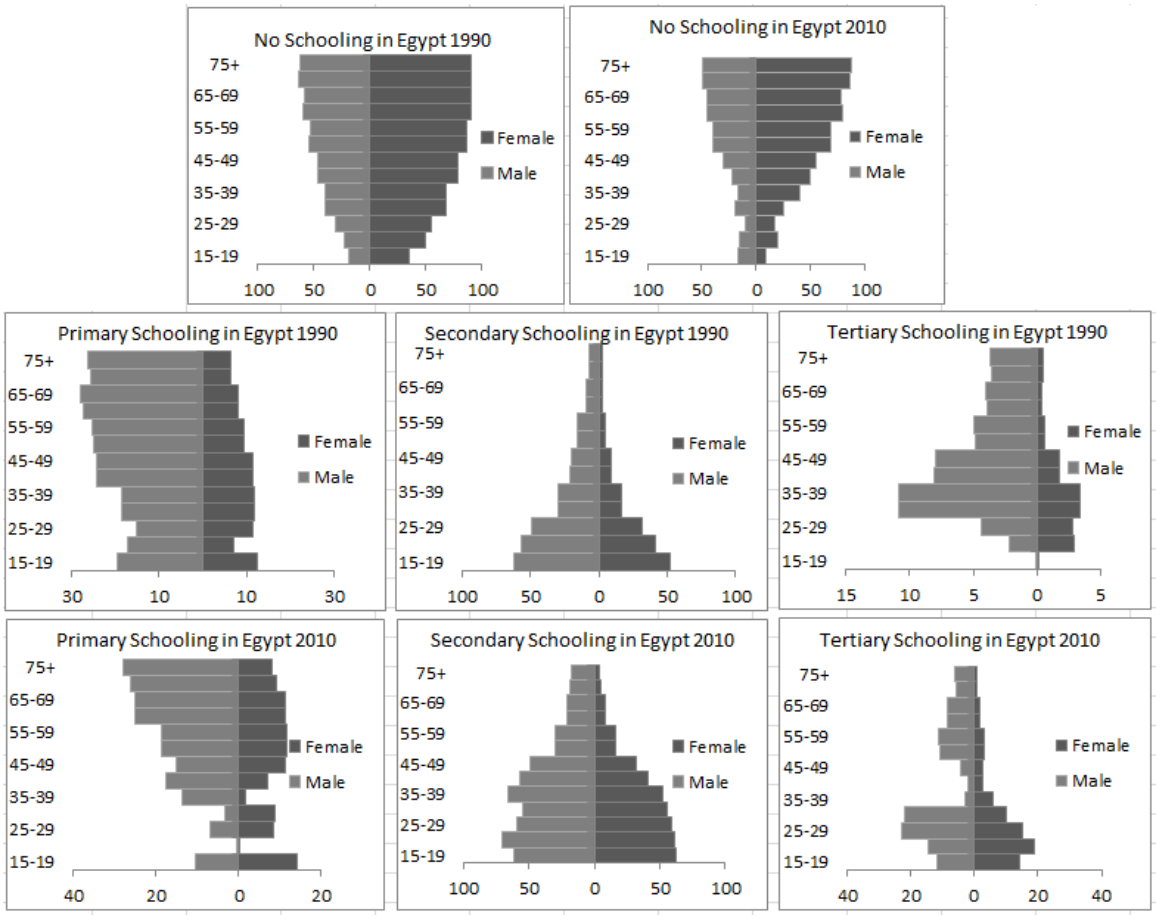

Figure 2: School Attainment in Egypt for males and females in years 1990 and 2010 for no-schooling, primary, secondary and tertiary schooling

c. Jordan:

The number of males and females without schooling has a reversed pyramidal shape with almost equal numbers for males and females in both years. These numbers become larger at the top for the older males and females. However, the numbers decreased from 1990 to 2010 for both genders. Primary schooling shows a somehow pyramidal shape where the numbers of males enrolled are higher than those of females for both years. The numbers are almost nil for people between 20 and 30 years old in 1990 and 20 and 45 years old in 2010. For the secondary schooling, the numbers of males are higher than those of females for both years. The numbers of males and females enrolled in secondary schooling increased from 1990 to 2010. The tertiary schooling shows a really important increase between 1990 and 2010 for both genders. The numbers of males and females with tertiary schooling is almost the same for both years for females and males. However, the number of males in tertiary schooling in 2010 is much higher than their numbers in 2010 for age groups starting 35 years old.

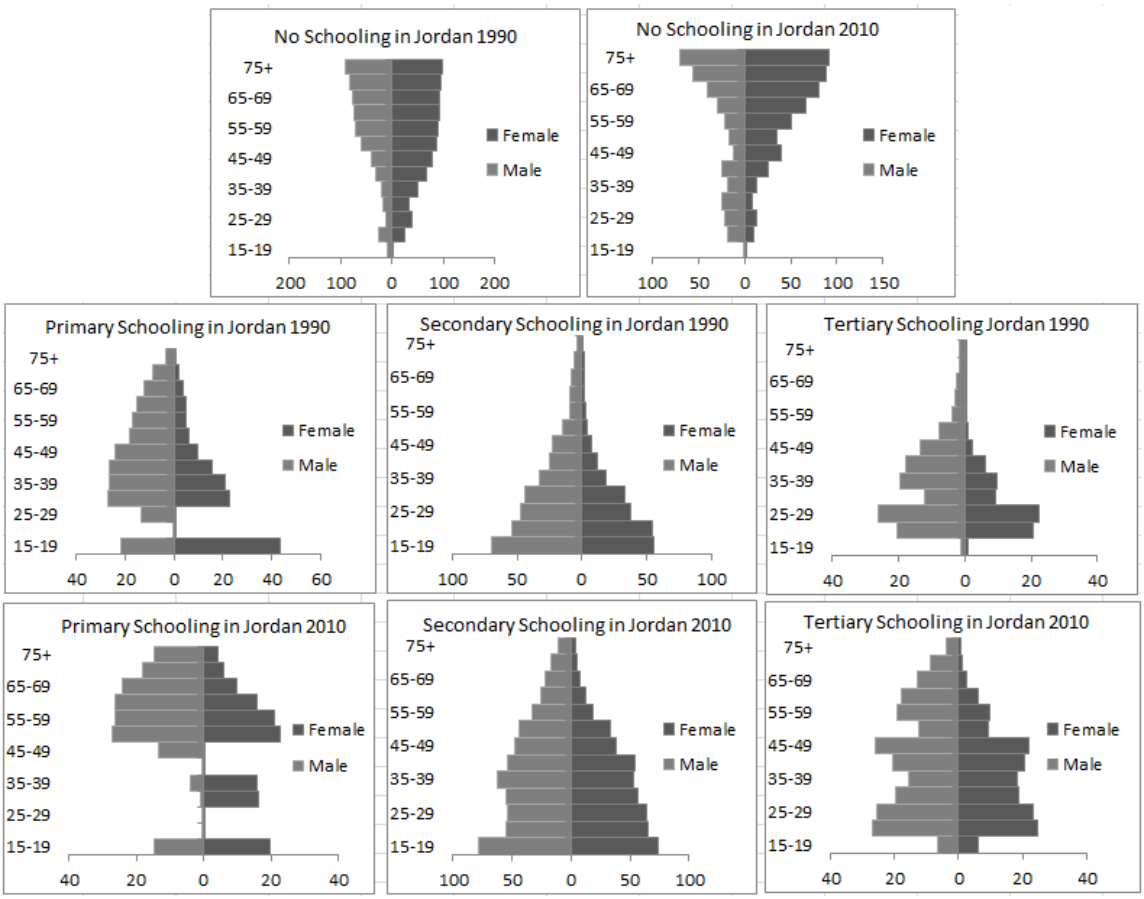

Figure 3: School Attainment in Jordan for males and females in years 1990 and 2010 for no-schooling, primary, secondary and tertiary schooling

d. Morocco:

The numbers of males and females that never were to school are getting lower from 1990 to 2010. However the numbers of females are higher than those of males in both years. The graph has a reversed pyramidal shape whose top becomes narrower in 2010. The primary schooling graphs show that the numbers of males are significantly higher than females for both 1990 and 2010. These numbers are almost the double of those of females. The secondary and tertiary schooling graphs show the same patterns where the numbers of males are significantly higher than those of females. These graphs denote a

significant increase in the numbers of males and females enrolled in the secondary and tertiary schooling. The tertiary schooling graph in 1990 shows that these numbers are null for the age categories of 50 years old and above. The numbers in these categories of age increased in 2010.

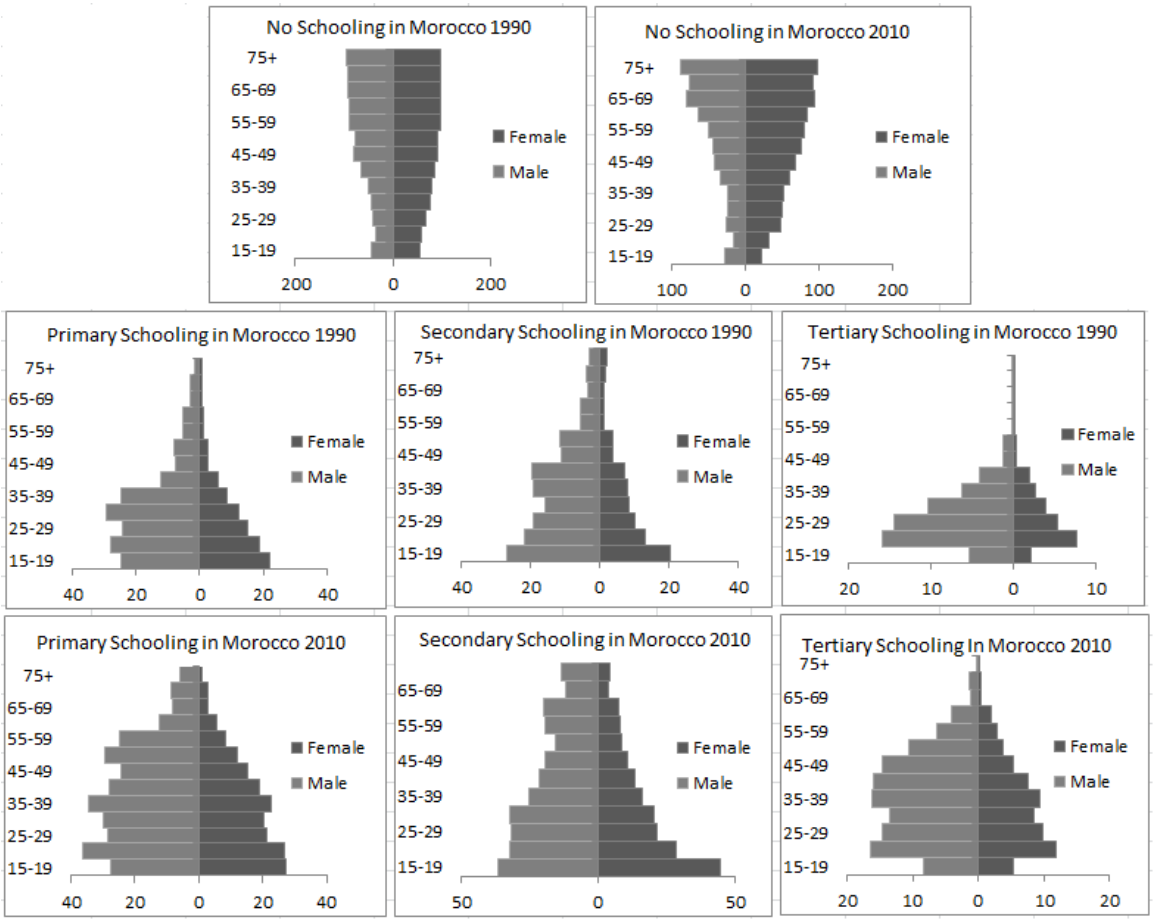

Figure 4: School Attainment in Morocco for males and females in years 1990 and 2010 for no-schooling, primary, secondary and tertiary schooling

e. Saudi Arabia:

In Saudi Arabia the numbers of females that were never to school are significantly higher than those of males in 1990. However these numbers decreased in 2010 to become almost null for males and females aged 15 to 20 years old. In 1990, the primary, secondary and tertiary schooling the numbers of males are significantly higher than those of females in

the three categories. In 2010, the numbers of males in primary schooling remain higher than those of females. Moreover, the numbers of females in primary, secondary and tertiary schooling are getting higher compared to 1990. For the secondary schooling the graph of 2010 shows a pyramidal shape where the numbers of males and females are almost the same. On the other hand, the tertiary schooling graph of 2010 indicates that the numbers of females increased.

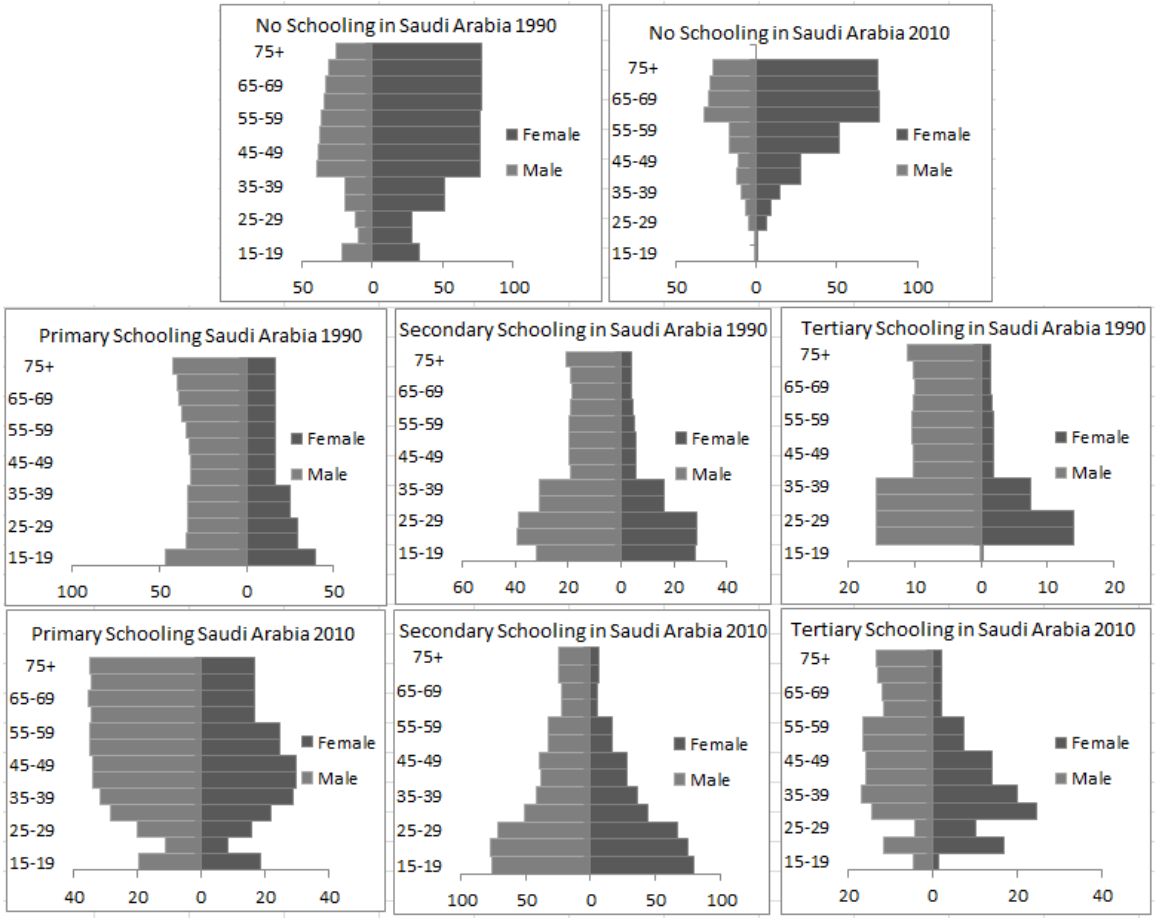

Figure 5: School Attainment in Saudi Arabia for males and females in years 1990 and 2010 for no-schooling, primary, secondary and tertiary schooling

f. Tunisia:

The numbers of males that were never to school are low compared to those of females in both 1990 and 2010. The numbers of females become lower in 2010 compared to 1990. For primary schooling the numbers of males are also higher than those of females for 1990. However, these latter are increasing in 2010. The seconday schooling graphs of 1990 show that the numbers of females are less than those of males and they become null for categories of age starting 45 years old. The 2010 graph for the secondary schooling denotes a pyramidal shape where the numbers of males and females are almost the same. In 1990, the tertiary schooling graph shows that the numbers of male stay dominant and higher than those of females. However, the numbers of females in 2010 are significantly higher than those of males for females aged 20 to 30 years old.

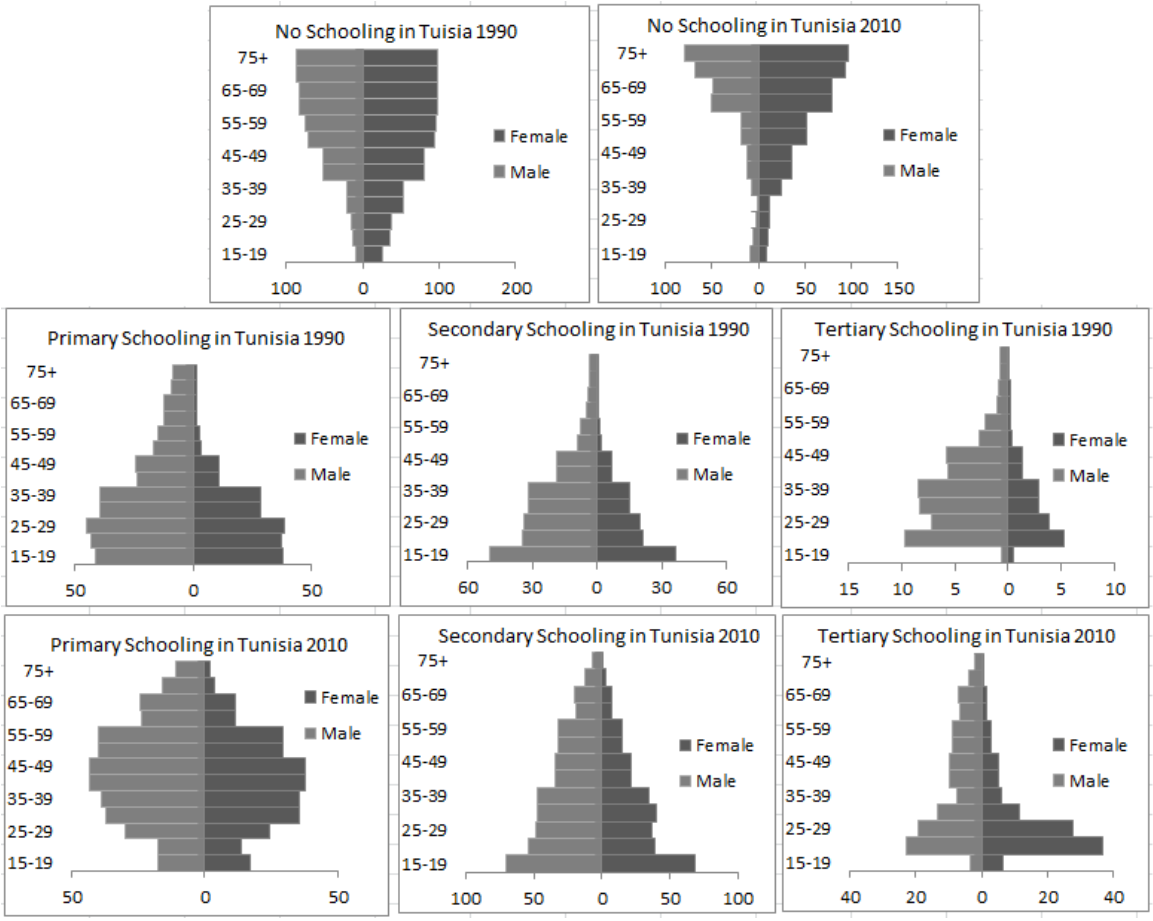

Figure 6: School Attainment in Tunisia for males and females in years 1990 and 2010 for no-schooling, primary, secondary and tertiary schooling

g. UAE:

The numbers of males and females that never were to school is almost the same for males and females in 1990 with a reversed pyramidal shape. These numbers are getting lower for both genders in 2010. The primary schooling graphs for 1990 show that numbers of males with primary schooling is higher than the one of females however in the 2010 graph it shows an increase in both genders but the numbers become almost null for males and females aged 15 to 25 years old. The secondary schooling has a pyramidal shape where the numbers of males and females with secondary schooling is almost the same for

both years. These numbers increase for both genders in 2010. The number of males in tertiary schooling in 1990 is higher than the one of females however the number of females with tertiary schooling aged 20 to 25 is significantly higher than the one of of males in the same age category. The numbers of males and females in tertiary schooling are higher compared to 1990.

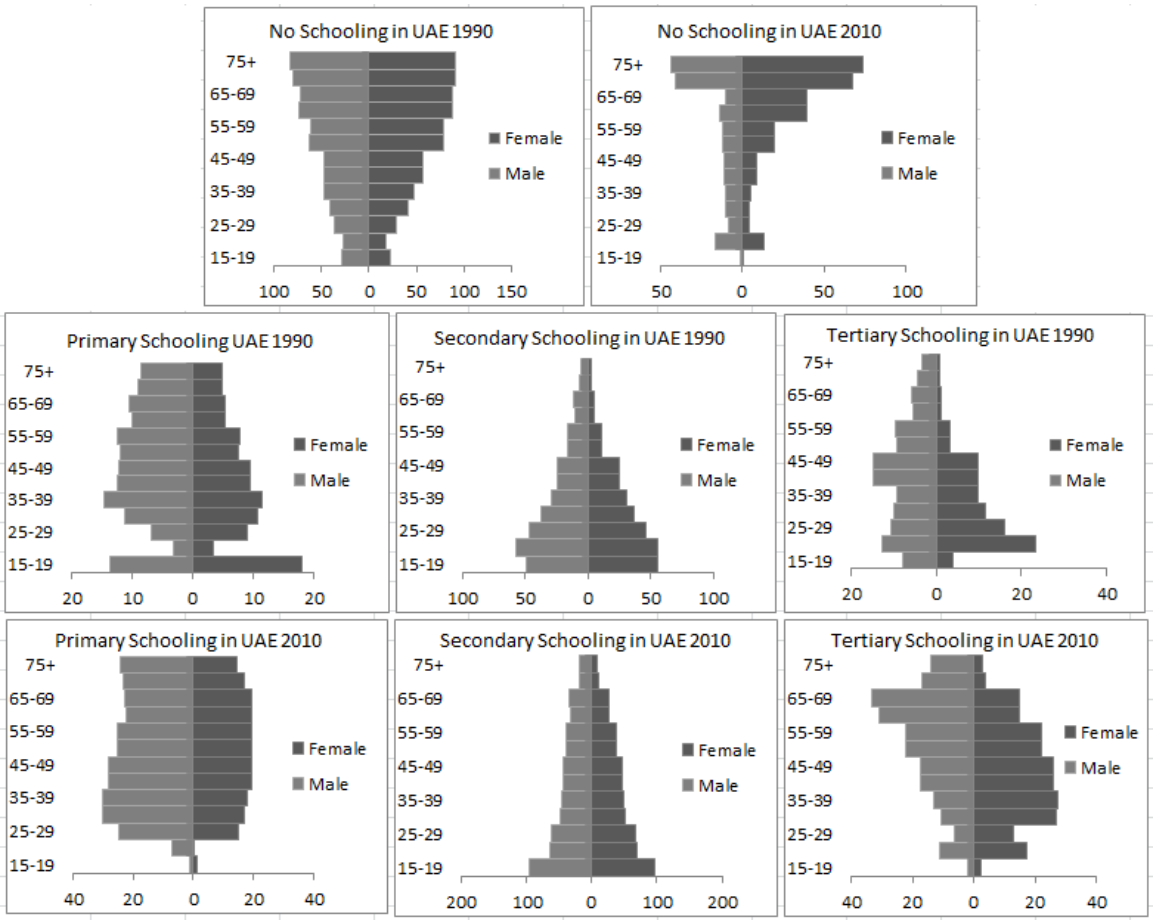

Figure 7: School Attainment in UAE for males and females in years 1990 and 2010 for no-schooling, primary, secondary and tertiary schooling

II.3. Analysis of Changes with respect to gender, age groups and years

These changes cover total and female schooling attainment by age groups and throughout the 60 years of data. Per country trends are also estimated and between country

comparisons made (Appendices I and II). The comparisons of country trends between Arab and EEE countries are also pursued (Appendix III). The following presentation provides the main outcomes but more details are introduced in appendices I to III.

II.3.1 Female Schooling by age group 2010

The following table summarizes regressions on the age groups for the different levels of education for countries of the Arab region. It provides the R^2 along with the coefficients and their respective t-statistics. These regressions are based on the Barro-Lee Datasets for the period 1950 to 2010.

a. Algeria:

For Algeria, the R^2 changes from, 0.939 (No Education), 0.909 (Secondary Education) to 0.706 (Tertiary Education). This value falls below 30% for the Primary Schooling. The coefficients fluctuate between 8.56 (No Education) and 2.073 (Tertiary Education). The coefficients show that as we increase by one age group female with no education increases by 8.558 while Secondary and Tertiary Education decrease by 4.75 and 2.07 respectively.

b. Bahrain:

For Bahrain, the R^2 fluctuates between 0.816 (No Education) and 0.345 (Primary Education). The coefficients fluctuate between 7.113 (No Education) and 1.461 (Primary Education). The coefficients show that as we increase by one age group female that never were to school increases by 7.113 while it decreases for Primary, Secondary and Tertiary Education by 1.46, 6.796 and 1.779 respectively.

c. Egypt:

For Egypt, the R^2 fluctuates between 0.968 (No Education) and 0.779 (Tertiary Education). The coefficients fluctuate between 7.002 (No Education) and 0.296 (Primary Education). The coefficients show that as we increase by one age group it states that the percentage of females with No Education and Primary Education increases by 7.002 and 0.296 respectively while this percentage decreases 5.897 and 1.4 respectively for Secondary and Tertiary Education.

d. Iraq:

For Iraq, the R^2 fluctuates between 0.842 (No Education) and 0.529 (Primary Education). The coefficients fluctuate between 7.389 (No Education) and 0.917 (Primary Education). The coefficients show that as we increase by one age group the percentage of female with No Education increases by 7.389 while it decreases for Primary, Secondary and Tertiary Education by 7.389, 3.766, 2.706 and 0.917 respectively.

e. Jordan:

For Jordan, the R^2 is significant and fluctuates between 0.967 (Secondary Education) and 0.512 (Tertiary Education) but not significant for Primary Education. The coefficients fluctuate between 8.072 (No Education) and 1.656 (Tertiary Education). The coefficients show that as we increase by one age group the percentage of female with No Education increases by 8.072 while Secondary and Tertiary Education increases by 6.451 and 1.656 respectively.

f. Kuwait:

For Jordan, the R^2 is only significant for No Education (0.812) and Secondary (0.711) Education. The coefficients show that the percentage of females that never were to school increases by 5.495 while this percentage decreases by 4.34 as we increase the age groups.

g. Libya:

For Libya, the R^2 has a significant value for the No Education (0.954), Secondary (0.81) and Tertiary (0.549) Education. The coefficients show that as we increase in age categories the percentage of female that never were to school increase by 8.9, the percentage of female in Secondary and Tertiary decreases by 5.561 and 3.503 respectively.

h. Morocco:

For Morocco, the R^2 is significant for all the levels of education. It decreases as the level of education increases No School (0.974), Primary Education (0.966), Secondary Education (0.825) and Tertiary Education (0.773). The coefficients show that as we increase in age categories the percentage of female that never were to school increase by 6.079, the percentage of female in Primary, Secondary and Tertiary decreases by 2.377, 2.791 and 0.905 respectively.

i. Qatar:

For Qatar, the R^2 is only significant for No Education (0.961) and Secondary (0.841) Education. The coefficients show that the percentage of females that never were to school increases by 7.089 while this percentage decreases by 5.998 as we increase the age groups.

j. Syria:

For Syria, the R^2 has a significant value for the No Education (0.888), Primary (0.672) and Secondary (0.523) Education. The coefficients show that as we increase in age categories the percentage of female that never were to school increases by 6.33, the percentage of female in Secondary and Tertiary decreases by 3.337 and 3.029 respectively.

k. Saudi Arabia:

For Saudi Arabia, the R^2 has a significant value for the No Education (0.942), Secondary (0.523) and Tertiary (0.307) Education. The coefficients show that as we increase in age categories the percentage of female that never were to school increase by 7.714, the percentage of female in Secondary and Tertiary decreases by 3.029 and 1.114 respectively.

l. Tunisia:

For Tunisia, the R^2 is significant for all the levels of education except Primary Education. It decreases as the level of education increases No School (0.95), Secondary Education (0.523) and Tertiary Education (0.478). The coefficients show that as we increase in age categories the percentage of female that never were to school increase by 8.197, the percentage of female in Secondary and Tertiary decreases by 3.029 and 1.985 respectively.

m. UAE:

For UAE, the R^2 is significant for all the levels of education except for Tertiary Education. It changes from 0.768 (No Schooling), 0.387 (Primary Education) to 0.921 (Secondary Education). The coefficients show that as we increase in age categories the

percentage of female that never were to school increases by 5.481, the percentage of female in Primary Education increases as well by 1.085 and decreases for Secondary Education by 5.981.

n. Yemen:

For Yemen, the R^2 is significant for all the levels of education. It changes as the level of education increases No School (0.766), Primary Education (0.671), Secondary Education (0.634) and Tertiary Education (0.677). The coefficients show that as we increase in age categories the percentage of female that never were to school increases by 4.243, the percentage of female in Primary, Secondary and Tertiary decreases by 1.251, 2.596 and 0.393 respectively.

The summary of the above outcomes is introduced in table 1.

Table 1: Female Schooling by age group 2010 (13 age groups; t-stat in parentheses)

Country		R^2	DF	Constant	Coefficient
Algeria	No Education	0.939	12	-7.660 (-1.655)	8.558 (13.077)
	Primary Educ	0.248	12	35.113 (5.510)	-1.716 (-1.904)
	Secondary Educ	0.909	12	52.207 (16.335)	-4.753 (-10.516)
	Tertiary Educ	0.706	12	20.088 (7.052)	-2.073 (-5.147)
Bahrain	No Education	0.816	12	-17.998 (-2.497)	7.113 (6.978)
	Primary Educ	0.345	12	7.183 (1.672)	1.461 (2.406)
	Secondary Educ	0.816	12	87.968 (12.796)	-6.796 (-6.990)
	Tertiary Educ	0.566	12	22.847 (6.88)	-1.779 (-3.787)
Egypt	No Education	0.968	12	10.334 (3.844)	7.002 (18.417)
	Primary Educ	0.081	12	7.129 (3.354)	0.296 (0.986)
	Secondary Educ	0.948	12	67.916 (23.168)	-5.897 (-14.225)
	Tertiary Educ	0.779	12	14.619 (9.200)	-1.400 (-6.231)
Iraq	No Education	0.842	12	12.203 (1.790)	7.389 (7.665)
	Primary Educ	0.529	12	45.775 (6.048)	-3.766 (-3.518)
	Secondary Educ	0.641	12	30.099 (6.967)	-2.706 (-4.429)
	Tertiary Educ	0.720	12	11.926 (9.782)	-0.917 (-5.322)
Jordan	No Education	0.938	12	-8.436 (-1.901)	8.072 (12.860)
	Primary Educ	0.0002	12	9.906 (2.055)	0.036 (0.052)
	Secondary Educ	0.967	12	75.989 (29.815)	-6.451 (-17.897)
	Tertiary Educ	0.512	12	22.534 (6.538)	-1.656 (-3.398)
Kuwait	No Education	0.812	12	-12.476 (-2.216)	5.495 (6.901)
	Primary Educ	0.201	12	40.653 (7.453)	-1.285 (-1.666)
	Secondary Educ	0.711	12	64.756 (10.977)	-4.339 (-5.201)
	Tertiary Educ	0.009	12	7.046 (2.467)	0.131 (0.325)

Libya	No Education	0.954	12	-9.586 (-2.314)	8.900 (15.189)
	Primary Educ	0.002	12	10.661 (1.722)	0.143 (0.164)
	Secondary Educ	0.81	12	62.173 (10.826)	-5.561 (-6.847)
	Tertiary Educ	0.549	12	36.938 (5.460)	-3.503 (-3.662)
Morocco	No Education	0.974	12	29.497 (13.892)	6.079 (20.245)
	Primary Educ	0.966	12	28.597 (30.043)	-2.377 (-17.661)
	Secondary Educ	0.825	12	31.186 (11.380)	-2.791 (-7.203)
	Tertiary Educ	0.773	12	10.620 (10.155)	-0.905 (-6.121)
Qatar	No Education	0.961	12	-0.231 (-0.076)	7.089 (16.552)
	Primary Educ	0.091	12	7.730 (3.547)	-0.324 (-1.053)
	Secondary Educ	0.841	12	71.520 (12.869)	-5.998 (-7.632)
	Tertiary Educ	0.063	12	20.981 (3.309)	-0.769 (-0.858)
Syria	No Education	0.888	12	-6.458 (-1.349)	6.330 (9.352)
	Primary Educ	0.672	12	65.525 (13.177)	-3.337 (-4.745)
	Secondary Educ	0.523	12	39.347 (6.388)	-3.029 (-3.477)
	Tertiary Educ	0.007	12	1.648 (2.287)	0.028 (0.273)
Saudi Arabia	No Education	0.942	12	-8.382 (-2.065)	7.714 (13.439)
	Primary Educ	0.0001	12	20.502 (5.738)	0.017 (0.034)
	Secondary Educ	0.523	12	39.347 (6.388)	-3.029 (-3.477)
	Tertiary Educ	0.307	12	16.266 (4.559)	-1.114 (-2.208)
Tunisia	No Education	0.950	12	-3.685 (-0.922)	8.197 (14.504)
	Primary Educ	0.220	12	31.670 (5.031)	-1.571 (-1.764)
	Secondary Educ	0.523	12	39.347 (6.388)	-3.029 (-3.477)
	Tertiary Educ	0.478	12	20.246 (4.579)	-1.985 (-3.174)
UAE	No Education	0.768	12	-9.324 (-1.450)	5.481 (6.029)
	Primary Educ	0.386	12	8.869 (3.038)	1.085 (2.628)
	Secondary Educ	0.921	12	80.152 (21.482)	-5.981 (-11.334)
	Tertiary Educ	0.061	12	20.316 (4.143)	-0.587 (-0.846)
Yemen	No Education	0.766	12	60.577 (12.116)	4.243 (6.001)
	Primary Educ	0.671	12	12.468 (6.679)	-1.251 (-4.737)
	Secondary Educ	0.634	12	23.150 (5.503)	-2.596 (-4.363)
	Tertiary Educ	0.677	12	3.809 (6.577)	-0.393 (-4.804)

II.3.2. Time Trends of Average Schooling by Age Groups 1950-2010 for Selected Countries: Algeria, Morocco and UAE

Based on the Barro-Lee datasets, time trends are derived through regressing the average schooling for different age groups on years running from 1950 and ending 2010. This analysis is conducted respectively for Algeria, Morocco and UAE as selected Arab countries. The outcomes from these regressions are shown respectively for the three countries. The results show the R^2, the levels of the coefficients with corresponding t-statistics.

a. Algeria:

For the Total Schooling, the R^2 decreases from 0.9717 (15-19 years old) to 0.3204 (60-64 years old) this value falls below 30% for individual aged 65 years old and above. It means that the trend line fits only to categories of age from 15 to 64 years old. The coefficient fluctuates between 1.105 (20-24 years old) to reach its highest value 3.055 (60-64 years old). This means that the average years of Total Schooling increases by 1.714 as an average for all categories of age in Algeria when we increase by one year.

For Primary Schooling, the R^2 decreases from 0.98 (15-19 years old) to 0.4309 (50-54 years old) this value falls below 30% for individual aged 55 years old and above. It means that the trend line fits only to categories of age from 15 to 54 years old. The coefficient fluctuates between 2.377 (20-24 years old) to reach its highest value 3.667 (50-54 years old). This means that the average years of Primary Schooling increases by 2.82 as an average for all categories of age in Algeria when we increase by one year.

For Secondary Schooling the R^2 decreases from 0.9344 (15-19 years old) to 0.364 (70-74 years old) this value falls below 30% for individual aged 75 years old and above. It means that the trend line fits only to categories of age from 15 to 74 years old. The coefficient fluctuates between 2.23 (20-24 years old) to reach its highest value 27.49 (70-74 years old). This means that the average years of Primary Schooling increases by 7.90 as an average for all categories of age in Algeria when we increase by one year.

For Tertiary Schooling the R^2 fluctuates between the values 0.8275 (25-29 years old) to 0.3509 (55-59 years old) this value falls below 30% for individual aged 60 years old and above. It means that the trend line fits only to categories of age from 15 to 59 years old. The coefficient fluctuates between 20.35 (25-29 years old) to reach its highest value 193.24 (55-59 years old). This means that the average years of Tertiary Schooling

increases by 51.29 as an average for all categories of age in Algeria when we increase by one year. Tables 2. 1, 2.2 and 2.3 do report the outcomes of the trends described above respectively for three selected countries that are Algeria, Morocco and United Arab Emirates (UAE).

Table 2.1 Algeria

			R^2	df	Coefficient		Constant	
						t-stat		t-stat
Algeria	Total Schooling	15-19	0.97	12	1.26	19.42	-0.08	-0.23
		20-24	0.96	12	1.11	16.99	0.50	1.28
		25-29	0.94	12	1.13	12.58	1.14	2.37
		30-34	0.90	12	1.18	9.95	1.62	2.85
		35-39	0.84	12	1.28	7.61	2.09	3.05
		40-44	0.78	12	1.51	6.19	2.32	2.90
		45-49	0.71	12	1.85	5.16	2.48	2.71
		50-54	0.61	12	2.20	4.13	2.69	2.52
		55-59	0.48	12	2.58	3.21	2.98	2.39
		60-64	0.32	12	3.06	2.28	3.20	2.08
		65-69	0.14	12	4.33	1.35	2.98	1.21
		70-74	0.05	12	2.70	0.75	4.28	1.69
		75+	0.03	12	-2.39	-0.54	7.28	2.77
	Primary Schooling	15-19	0.98	12	2.45	23.23	-1.06	-3.08
		20-24	0.97	12	2.38	18.50	-0.47	-1.16
		25-29	0.94	12	2.43	13.69	0.17	0.35
		30-34	0.92	12	2.57	11.10	0.57	0.96
		35-39	0.86	12	2.71	8.28	1.10	1.51
		40-44	0.79	12	3.00	6.42	1.40	1.58
		45-49	0.70	12	3.35	5.01	1.75	1.66
		50-54	0.58	12	3.67	3.86	2.09	1.67
		55-59	0.43	12	3.99	2.89	2.51	1.69
		60-64	0.25	12	4.43	1.90	2.83	1.46
		65-69	0.04	12	3.27	0.71	4.09	1.41
		70-74	0.00	12	1.02	0.22	5.45	1.94
		75+	0.06	12	-4.37	-0.87	8.06	3.10
	Secondary Schooling	15-19	0.93	12	2.66	12.52	0.99	2.00
		20-24	0.93	12	2.23	11.85	1.37	2.76
		25-29	0.91	12	2.26	10.30	2.02	3.89
		30-34	0.87	12	2.31	8.62	2.55	4.48
		35-39	0.81	12	2.57	6.78	3.02	4.56
		40-44	0.75	12	3.21	5.81	3.28	4.49
		45-49	0.71	12	4.35	5.25	3.42	4.39
		50-54	0.65	12	5.74	4.52	3.62	4.25
		55-59	0.55	12	7.14	3.65	3.95	4.19
		60-64	0.42	12	8.60	2.81	4.34	4.15
		65-69	0.50	12	26.27	3.31	3.25	2.82
		70-74	0.36	12	27.49	2.51	3.72	2.90
		75+	0.20	12	44.32	1.64	3.48	1.89
	Tertiary Schooling	15-19	0.70	12	37.43	5.08	3.73	4.89
		20-24	0.81	12	16.43	6.92	2.99	4.58
		25-29	0.83	12	20.35	7.26	2.95	4.68
		30-34	0.78	12	25.38	6.31	3.15	4.55
		35-39	0.70	12	27.67	5.02	3.62	4.62
		40-44	0.58	12	31.13	3.91	4.06	4.60
		45-49	0.49	12	45.32	3.27	4.22	4.35
		50-54	0.37	12	64.69	2.52	4.41	4.01
		55-59	0.35	12	193.24	2.44	3.32	2.33
		60-64	0.20	12	300.00	1.65	3.00	1.44
		65-69	0.28	12	298.65	2.06	3.47	2.23
		70-74	0.14	12	230.65	1.33	4.40	2.77
		75+	0.02	12	92.86	0.41	5.50	3.34

b. Morocco

For the Total Schooling, the R^2 fluctuates between 0.9825 (20-24 years old) to 0.6168 (60-64 years old) this value does not falls below 30% which means that the trend line fits all categories of age from 15 to 75 years old and above. The coefficient fluctuates between 1.7159 (20-24 years old) to reach its highest value 28.66 (60-64 years old). This means that the average years of Total Schooling increases by 5.94 as an average for all categories of age in Morocco when we increase by one year.

For Primary Schooling the R^2 fluctuates between 0.9796 (20-24 years old) to 0.6411 (60-64 years old) this value does not falls below 30% which means that the trend line fits all categories of age from 15 to 75 years old and above. The coefficient fluctuates between 2.91 (15-19 years old) to reach its highest value 50.32 (75 years old and above). This means that the average years of Primary Schooling increases by 10.80 as an average for all categories of age in Morocco when we increase by one year. For Secondary Schooling the R^2 fluctuates between 0.9847 (20-24 years old) to 0.6053 (60-64 years old) this value does not falls below 30% which means that the trend line fits all categories of age from 15 to 75 years old and above. The coefficient fluctuates between 4.43 (20-24 years old) to reach its highest value 67.22 (75 years old and above). This means that the average years of Primary Schooling increases by 14.33 as an average for all categories of age in Morocco when we increase by one year. For Tertiary Schooling the R^2 fluctuates between the values 0.9265 (20-24 years old) to 0.3928 (65-69 years old) this value falls below 30% for individual aged 70 years old and above. It means that the trend line fits only to categories of age from 15 to 69 years old. The coefficient fluctuates between 21.74 (35-39 years old) to reach its highest value 325 (65- 69 years old).

This means that the average years of Tertiary Schooling increases by 67.72 as an average for all categories of age in Morocco when we increase by one year.

Table 2.2 Morocco

			R^2	df	Coefficient		Constant	
						t-stat		t-stat
Morocco	Total Schooling	15-19	0.97	12	1.93	17.66	0.54	1.44
		20-24	0.98	12	1.72	24.83	0.27	0.97
		25-29	0.97	12	1.79	18.35	0.88	2.55
		30-34	0.94	12	1.85	13.39	1.48	3.41
		35-39	0.90	12	1.99	10.02	1.98	3.70
		40-44	0.86	12	2.29	8.11	2.31	3.70
		45-49	0.81	12	2.70	6.86	2.59	3.71
		50-54	0.75	12	3.21	5.77	2.86	3.65
		55-59	0.68	12	3.85	4.79	3.13	3.56
		60-64	0.62	12	5.26	4.21	3.13	3.21
		65-69	0.72	12	10.46	5.33	1.95	2.02
		70-74	0.64	12	11.57	4.43	2.06	1.84
		75+	0.93	12	28.66	12.47	-1.94	-2.77
	Primary Schooling	15-19	0.94	12	2.91	13.36	0.93	2.00
		20-24	0.98	12	3.13	22.99	0.20	0.66
		25-29	0.97	12	3.30	17.63	0.80	2.22
		30-34	0.94	12	3.40	13.24	1.42	3.22
		35-39	0.90	12	3.64	9.96	1.93	3.55
		40-44	0.86	12	4.24	8.20	2.22	3.55
		45-49	0.81	12	4.98	6.92	2.51	3.57
		50-54	0.75	12	5.79	5.69	2.83	3.55
		55-59	0.68	12	7.10	4.80	3.04	3.41
		60-64	0.64	12	10.32	4.43	2.85	2.91
		65-69	0.74	12	19.53	5.63	1.69	1.77
		70-74	0.67	12	21.76	4.75	1.77	1.60
		75+	0.92	12	50.33	11.31	-1.97	-2.55
	Secondary Schooling	15-19	0.98	12	5.83	23.67	0.06	0.20
		20-24	0.98	12	4.43	26.69	0.20	0.77
		25-29	0.97	12	4.68	19.70	0.79	2.44
		30-34	0.95	12	4.93	13.86	1.36	3.20
		35-39	0.91	12	5.45	10.59	1.81	3.47
		40-44	0.87	12	6.14	8.46	2.16	3.52
		45-49	0.82	12	7.16	7.17	2.44	3.56
		50-54	0.77	12	8.47	6.08	2.70	3.52
		55-59	0.69	12	9.60	4.91	3.07	3.53
		60-64	0.61	12	11.95	4.11	3.27	3.37
		65-69	0.69	12	23.79	4.98	2.23	2.27
		70-74	0.63	12	26.63	4.35	2.21	1.99
		75+	0.96	12	67.22	16.32	-1.86	-3.50
	Tertiary Schooling	15-19	0.80	12	96.02	6.67	-0.50	-0.46
		20-24	0.93	12	24.69	11.78	1.50	3.06
		25-29	0.90	12	21.84	9.89	2.17	4.11
		30-34	0.87	12	22.22	8.65	2.68	4.82
		35-39	0.83	12	21.74	7.33	3.19	5.30
		40-44	0.75	12	24.25	5.73	3.67	5.27
		45-49	0.66	12	28.97	4.61	4.08	5.24
		50-54	0.57	12	38.82	3.85	4.42	5.24
		55-59	0.49	12	57.40	3.22	4.72	5.24
		60-64	0.36	12	83.94	2.49	5.10	5.24
		65-69	0.39	12	325.00	2.67	5.00	5.23
		70-74	0.21	12	216.67	1.73	5.50	5.28
		75+	0.08	12	0.00	65535.00	6.00	5.53

c. United Arab Emirates (UAE)

For the Total Schooling, the R^2 fluctuates between 0.9693 (15-19 years old) to 0.7486 (60-64 years old) this value does not falls below 30% which means that the trend line fits all categories of age from 15 to 75 years old and above. The coefficient fluctuates between 1.11 (55-59 years old) to reach its highest value 3.24 (75 years old and above). This means that the average years of Total Schooling increases by 1.44 as an average for all categories of age in UAE when we increase by one year.

For Primary Schooling the R^2 fluctuates between 0.9745 (15-19 years old) and 0.7087 (65-69 years old) this value does not falls below 30% which means that the trend line fits all categories of age from 15 to 75 years old and above. The coefficient fluctuates between 1.89 (15-19 years old) to reach its highest value 5.36 (75 years old and above). This means that the average years of Primary Schooling increases by 2.6 as an average for all categories of age in UAE when we increase by one year.

For Secondary Schooling the R^2 fluctuates between 0.9664 (35-39 years old) and 0.541 (665-69 years old) this value does not falls below 30% which means that the trend line fits all categories of age from 15 to 75 years old and above. The coefficient fluctuates between 2.4 (15-19 years old) to reach its highest value 9.90 (75 years old and above). This means that the average years of Primary Schooling increases by 3.89 as an average for all categories of age in UAE when we increase by one year. For Tertiary Schooling the R^2 fluctuates between the values 0.96 (40-44 years old) to 0.3194 (15-19 years old does not fall below 30% which means that the trend line fits all categories of age from 15 to 75 years old and above. The coefficient fluctuates between means that the average

years of Tertiary Schooling increases by 19.72 as an average for all categories of age in UAE when we increase by one year.

Table 2.3 UAE

			R^2	df	Coefficient		Constant	
						t-stat		t-stat
UAE	Total Schooling	15-19	0.97	12	1.05	18.64	0.87	2.55
		20-24	0.90	12	1.20	10.08	-1.10	-1.39
		25-29	0.92	12	1.26	11.59	-0.79	-1.19
		30-34	0.96	12	1.31	15.37	-0.34	-0.72
		35-39	0.96	12	1.30	17.15	0.20	0.49
		40-44	0.96	12	1.24	16.98	0.93	2.53
		45-49	0.94	12	1.17	13.16	1.62	3.76
		50-54	0.89	12	1.12	9.67	2.27	4.26
		55-59	0.83	12	1.11	7.36	2.84	4.49
		60-64	0.75	12	1.15	5.72	3.34	4.57
		65-69	0.68	12	1.34	4.82	3.70	4.64
		70-74	0.76	12	2.27	5.95	3.26	4.55
		75+	0.76	12	3.24	5.83	3.21	4.37
	Primary Schooling	15-19	0.97	12	1.89	20.51	0.13	0.39
		20-24	0.93	12	2.30	11.67	-1.25	-1.80
		25-29	0.95	12	2.30	13.89	-0.71	-1.29
		30-34	0.96	12	2.32	16.57	-0.13	-0.29
		35-39	0.96	12	2.30	16.68	0.43	1.08
		40-44	0.96	12	2.22	15.76	1.11	2.85
		45-49	0.94	12	2.15	12.68	1.73	3.91
		50-54	0.89	12	2.10	9.60	2.30	4.32
		55-59	0.84	12	2.11	7.55	2.82	4.54
		60-64	0.77	12	2.24	5.99	3.27	4.59
		65-69	0.71	12	2.58	5.17	3.59	4.68
		70-74	0.77	12	3.97	6.00	3.28	4.62
		75+	0.76	12	5.37	5.86	3.25	4.48
	Secondary Schooling	15-19	0.95	12	2.40	14.59	1.87	4.96
		20-24	0.88	12	2.74	9.09	-0.79	-0.94
		25-29	0.91	12	3.10	10.60	-0.76	-1.06
		30-34	0.95	12	3.41	14.31	-0.52	-1.00
		35-39	0.97	12	3.47	17.81	-0.04	-0.09
		40-44	0.97	12	3.32	18.38	0.75	2.16
		45-49	0.95	12	3.13	13.76	1.51	3.60
		50-54	0.90	12	2.97	9.79	2.22	4.19
		55-59	0.83	12	2.93	7.31	2.83	4.44
		60-64	0.74	12	3.04	5.58	3.37	4.52
		65-69	0.65	12	3.56	4.56	3.78	4.59
		70-74	1	12	7	6.06	3.18	4.46
		75+	0.76	12	9.90	5.86	3.14	4.24
	Tertiary Schooling	15-19	0.32	12	33.03	2.27	4.37	3.73
		20-24	0.41	12	16.38	2.78	1.70	0.96
		25-29	0.52	12	17.59	3.42	0.87	0.51
		30-34	0.85	12	22.54	8.04	-0.61	-0.65
		35-39	0.93	12	19.95	12.13	-0.23	-0.39
		40-44	0.96	12	17.06	16.27	0.70	1.76
		45-49	0.92	12	14.49	11.38	1.62	3.26
		50-54	0.87	12	12.48	8.70	2.41	4.18
		55-59	0.78	12	11.23	6.26	3.11	4.44
		60-64	0.68	12	10.48	4.86	3.71	4.68
		65-69	0.59	12	12.42	4.00	4.09	4.73
		70-74	0.69	12	24.69	4.89	3.63	4.55
		75+	0.70	12	44.06	5.03	3.42	4.26

II.3.3. Time Trends for average years of schooling for 15 years and over and 25 years and over for Arab economies

The two subsets considered here are subset A for 15years and over and subset B for 25 years and over.

From the analysis of the average year of schooling in Arab countries, it is noticeable that the values attained over the period 1950-2010 from Barro and Lee (2011) do not lead to high levels of achievement in comparison to other countries.

Over the above period of 60 years, Algeria witnessed an increase in total schooling by almost 10 times for those aged 15 years and above (A) and 8.46 for those with more than 25 years (B). The primary schooling factor is 6.456 and 5.651 for A and B, respectively. For the secondary and tertiary schooling, the respective factors are 36.988 and 36.11 for A and 28.81 and 23.083 for B.

Bahrain shows an increase in total schooling of 59.47, that is a gain of nearly 1 every year under A and 10.501 under B. The primary schooling and tertiary schooling are multiplied respectively by 42.953 and 33.2 under A and 9.117 and 15.921 under B. The secondary schooling factors are 148.52 and 4.549 respectively.

Concerning Egypt, the factors are 13.105 and 12.729 for total schooling under A and B. The primary and tertiary schooling are multiplied by almost the same factor, 10.948 and 10.235 under A and 11.930 and 15.465 under B, respectively. As for the secondary schooling rate, it shows an increase of 18.619 years under A and a lower increase of 7.75 under B.

Regarding Iraq, the total schooling increases by 24.876 under A and 29.428 years under B between 1950 and 2010. This evolution is mainly resulting from an increase in the primary schooling by 27.55 and 36.18, a respective increase in secondary schooling by 22.227 and 23.579, and an evolution of 16.055 and 15.85 years in tertiary schooling, under A and B, respectively.

Jordan shows an increase in total schooling of 7.022 under A and 9.179 under B. The secondary and tertiary schooling are multiplied respectively by 11.808 and 27.5 under A and 15.786 and 23.857 under B. the primary schooling factors are 4.978 and 6.489, respectively.

Kuwait does not follow the trends of the Arab countries previously studied as the schooling rate evolution is quite smaller. In fact, the total schooling factor is multiplied by 4.14 and 5.140 for the two age groups, respectively. The secondary schooling is the one that increased the most as it is multiplied 5.639 for A and 6.64 for B compared to primary and secondary schooling which have grown by 3.37 and 2.6 under A and 6.64 and 3.45 under B , in that order.

For Libya, the total schooling increases by 17.88 and 18.623 between 1950 and 2010 under A and B, respectively. The primary schooling increased, by 10.57 under A and 11.51 under B. But, the secondary and tertiary schooling show a significant evolution of 169 and 348.5 under A and 136.8 and 270 under B.

It is important to see that the total schooling in Morocco increased from 1950 to 2010 by 18.06 years under A and 17.61 under B. By analyzing each schooling level apart, one could notice that the tertiary schooling was the one to grow the most as its factor is of

32.8, compared to primary and secondary schooling, with respective factors of 18 and 16.8 for A, 15.97 and 17.161 for B.

Over the same period, 1950-2010, Qatar's total schooling shows an evolution of only 4.15 for A and 6.792 for B, resulting from an increase in primary schooling by 3.85 and 6.803, 4.53 and 6.92 in secondary schooling, and 4.96 and 6.12 in tertiary schooling, under A and B, respectively.

Saudi Arabia does not witness a significant increase in its average years of schooling since 1950. In fact, the total schooling in Saudi Arabia increases by only 3.08 for A and 2.68 for B over 60 years of study. The primary schooling factor is 2.471 and 2.19 for A and B, respectively. For the secondary and tertiary schooling, the respective factors are 5.091 and 3.025 for A and 4.07 and 3.06 for B.

Over the above period (60years), Syria witnesses a slightly higher evolution in its average year of schooling compared to Saudi Arabia. Indeed, the total schooling increases by 5.39 under A and 6.93 under B. The primary schooling factor is 4.532 and 5.93 for A and B, respectively. For the secondary and tertiary schooling, the respective factors are 17.10 and 7.09 for A and 17.49 and 9.07 for B.

Concerning Tunisia, the total schooling factor is 11.53 and 13.61 for A and B, respectively. Indeed, tertiary schooling is the one that knew a relatively significant increase as its factor if of 27.14 for A and 19.8 for B, followed by secondary schooling with respective factors of 15.33 for A and 18.45 for B .The primary schooling factors are of 11.53 and 11.60 under A and B respectively.

The values attained for the United Arab of Emirates do not show a high level of achievement in terms of education and schooling. The total schooling shows an evolution of 11.41 and 13.36 under A and B, respectively. The primary schooling factor is 11.004 for A and 14.41 for B. for the secondary and tertiary schooling, their respective factors are 12.08 and 7.86 under A and 12.96 and 8.98 under B.

Yemen is the country that shows the highest evolution in its average year of schooling among the Arab countries already studied. In fact, the total schooling factor increases by 335 for A that is an annual gain of 5.8 every year. This is mainly explained by in the number of people attending primary schools per year expressed by annual gain of 3.6 every year.

All the above results are shown in table 3.

Table 3: Arab Countries: Time Trends 1950-2010 for different Average Years Schooling Components

Countries	**Age Group**	**TS/APS**	**TS/ASS**	**TS/ATS**	**APS/ASS**	**APS/ATS**	**ASS:ATS**
Algeria	15+	-0.6375	3.7346	5.8518	6.8302	5.3123	-6.0133
	25+	2.6442	-3.4687	-5.1375	0.2252	-7.5026	0.2417
Bahrain	15+	0.1367	-10.4421	-0.0303	-11.1911	-0.7018	0.3515
	25+	1.5795	-4.5168	1.3114	0.1386	0.7703	0.3992
Egypt	15+	0.3381	-4.8277	66.018	-7.854	8.4292	0.118
	25+	0.8652	-2.5218	3.681	0.1768	3.2519	0.1748
Iraq	15+	-0.141	0.1373	-0.4116	0.2929	0.0644	0.1342
	25+	-0.4469	0.2433	2.8156	0.1773	3.2738	0.3121
Jordan	15+	1.861	-14.1359	-0.4525	-26.612	-2.691	1.6664
	25+	6.4741	-6.027	-5.8773	0.1836	-12.9423	0.1728
Kuwait	15+	1.2785	-4.7911	-5.348	-8.7192	-9.5967	0.6934
	25+	1.512	-20.666	-5.7578	0.2808	-6.4511	0.59910.’
Libya	15+	0.8519	-9.3637	-29.0283	-16.244	-17.1145	0.2364
	25+	4.2886	-5.2801	-8.8919	0.1096	-11.5649	0.2685
Morocco	15+	-0.042	0.6372	-28.8786	0.0181	-8.4371	0.1355
	25+	0.6166	0.6372	-7.891	0.1587	-8.4371	0.262
Qatar	15+	0.2497	-6.6575	-3.3015	-10.919	-2.9018	0.2097

	25+	4.5381	-6.6575	-1.3828	0.0715	-2.9018	0.1355
Saudia	15+	1.6291	-10.6794	-0.0423	-17.352	-6.5579	0.2685
	25+	7.2475	-10.6794	-0.0231	0.2552	-4.3989	0.2097
Syria	15+	0.3645	-5.6551	-9.329	-7.9573	-10.0238	0.4945
	25+	2.5849	-5.6551	-8.1875	0.3239	-6.5579	0.4945
Tunisia	15+	0.474	-6.0184	-0.0194	-10.939	-0.387	8.1729
	25+	6.2368	-6.0184	-12.2385	0.122	-10.0238	0.2279
UAE	15+	-0.1377	-0.1659	-2.5311	-0.2232	-1.1899	0.2254
	25+	6.0704	-0.1659	-1.1528	0.0987	-15.1449	0.2254
Yemen	15+	-0.092	-1.2183	-0.381	-1.817	-0.7916	0.2455
	25+	0.603	-1.2183	-0.1795	0.2433	-0.7916	0.2455

Conclusion

Based on the important dataset on school attainment by Barro and Lee (2010), this paper has shown evidence about schooling in Arab countries during the 1950-2010 period. Gender trends, age group trends as well as time trends are estimated for each group with comparisons at different levels of assessments. The attained results show major time change throughout the years in data for Arab economies. They also show how previous generations in Arab countries have not all the time benefited from education generating thus important losses to the economy. But these trends need to be enhanced to ensure higher levels of inclusion and participation. The gender issue with the role of females in accessing education and achieving higher levels of school attainments are important issues for the Arab economies.

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Appendices

APPENDIX 1: Country Trends Comparisons

Reporting trends with their standard deviations: Arab Countries 15+

Country	TS	APS	ASS	ATS
Algeria	0.4506 0.7093	0.8263 0.5648	-0.335 0.1670	-0.0409 0.02836
Bahrain	0.3867 0.2196	0.1446 0.2915	1.3336 0.2245	0.3942 1.1968
Egypt	1.3797 0.3508	0.8966 0.3592	2.13037983687153 0.4086	0.0211 0.0193
Iraq	1.1783 0.3010	1.1985 0.2906	1.1599 0.3533	1.1907 0.3021
Jordan	-1.030 0.2313	-3.005 0.3174	0.7653 0.374	1.476 5.760
Kuwait	-3.115 0.9124	-4.7461 0.8097	-0.9497 1.2724	1.3281 2.0376
Libya	1.3616 0.2512	0.3978 0.2950	2.4974 0.3367	4.3641 0.7466
Morocco	1.2658 0.2740	1.1973 0.2697	1.1953 0.2673	2.3439 0.3858

Qatar	-3.9347 0.1671	-4.255 0.1784	-3.4735 0.1721	-3.645 0.7059
Saudi Arabia	-2.6201 0.5968	-4.5099 0.6779	-0.0811 0.5674	-2.6137 0.7372
Syria	-1.504 0.6524	-2.0993 0.4571	0.4785 1.0249	2.0880 1.3729
Tunisia	0.7638 0.2411	0.1992 0.2004	1.534 0.3722	3.3670 28.309
UAE	0.6359 0.3583	0.6279 0.3557	0.6596 0.3402	0.89850 0.7027
Yemen	3.8059 0.5822	3.6652 0.5604	4.1075 0.6295	3.8482 0.5718

Reporting trends with their standard deviations: Arab Countries 25+

Country	TS	APS	ASS	ATS
Algeria	2.3625 0.5527	1.7558 0.5710	3.1306 0.5319	3.6241 0.6466
Bahrain	1.1955 0.3222	0.9811 0.3423	1.8033 0.3368	0.6733 1.3413
Egypt	1.6555 0.4063	1.5164 0.3809	2.1133 0.4798	0.5389 0.9691
Iraq	2.4312 0.4215	2.5080 0.4204	2.3879 0.4481	1.954 0.4075
Jordan	0.8246 0.4302	-0.3022 0.4225	1.9409 0.4757	1.7805 0.3637
Kuwait	-2.2921 0.7707	-2.8019 0.8776	2.9444 0.4198	1.3211 2.0326
Libya	2.0770 0.3840	1.4296 0.3549	2.9444 0.4198	4.3658 0.8047
Morocco	1.2658 0.2740	1.1973 0.2697	1.1953 0.2673	2.3439 0.3858
Qatar	-3.9347 0.1671	-4.2550 0.1784	-3.4735 0.1721	-3.6451 0.7059
Saudi Arabia	-2.6201 0.5968	-4.5099 0.6779	-0.081 0.5674	-2.6137 0.7372
Syria	-1.504 0.6524	-2.0993 0.4571	0.4785 1.0249	2.0880 1.3729
Tunisia	0.7638 0.2411	0.1992 0.2004	1.5343 0.3722	3.3670 0.6962
UAE	0.6359 0.358	0.0048 0.0358	0.6596 0.3402	0.8985 0.7027
Yemen	3.8059 0.5822	3.6652 0.5604	4.1075 0.6295	3.8482 0.5718

APPENDIX II: Comparing trends in variables per country: 15+

Variables in rows- variables in columns:

Algeria:

	TS	APS	ASS	ATS
TS		-0.6375	3.7346	5.8518
APS			6.8302	5.3123
ASS				-6.0133
ATS				

Bahrain:

	TS	APS	ASS	ATS
TS		0.136706036	-10.4421	-0.0303
APS			-11.1911886	-0.7018
ASS				0.3515
ATS				

Egypt:

	TS	APS	ASS	ATS
TS		0.338141933	-4.8277	66.0180
APS			-7.85451799	8.4292
ASS				0.118092301
ATS				

Iraq:

	TS	APS	ASS	ATS
TS		-0.1410895	0.1373	-0.4116
APS			0.292902154	0.0644
ASS				0.1342
ATS				

Jordan:

	TS	APS	ASS	ATS
TS		1.861415274	-14.1359	-0.4525
APS			-26.6128192	-2.6910
ASS				1.6664
ATS				

Kuwait

	TS	APS	ASS	ATS
TS		1.278575261	-4.7911	-5.348767007
APS			-8.71929447	-9.5967
ASS				0.6934
ATS				

Libya

	TS	APS	ASS	ATS
TS		0.851922826	-9.3637	-29.0283
APS			-16.2447592	-17.1145
ASS				0.236449065
ATS				

Morocco:

	TS	APS	ASS	ATS
TS		-0.042553618	0.6372	-28.8786
APS			0.018174475	-8.4371
ASS				0.135513398
ATS				

Qatar:

	TS	APS	ASS	ATS
TS		0.249762567	-6.6575	-3.3015
APS			-10.9197974	-2.9018
ASS				0.209747965
ATS				

Saudia Arabia:

	TS	APS	ASS	ATS
TS		1.629102652	-10.6794	-0.0423
APS			-17.3526558	-6.5579
ASS				0.268580199
ATS				

Syrian Arab Republic

	TS	APS	ASS	ATS
TS		0.364512077	-5.6551	-9.329
APS			-7.95731532	-10.0238
ASS				0.494595864
ATS				

Tunisia:

	TS	APS	ASS	ATS
TS		0.474006804	-6.0184	-0.0194
APS			-10.9390457	-0.38761578
ASS				8.172971609
ATS				

UAE:

	TS	APS	ASS	ATS
TS		-0.137713557	-0.1659	-2.5311
APS			-0.22328951	-1.1899
ASS				0.225409098
ATS				

Yemen:

	TS	APS	ASS	ATS

TS		-0.092616601	-1.2183	-0.3810
APS			-1.81773235	-0.791635532
ASS				0.245522753
ATS				

Comparing trends in variables per country: Arab 25+

Algeria

	TS	APS	ASS	ATS
TS		2.6442	-3.4687	-5.1375
APS			0.2252	-7.5026
ASS				0.2417
ATS				

Bahrain

	TS	APS	ASS	ATS
TS		1.5795	-4.5168	1.3114
APS			0.1386	0.7703
ASS				0.3992
ATS				

Egypt

	TS	APS	ASS	ATS
TS		0.8652	-2.5218	3.6810
APS			0.1768	3.2519
ASS				0.1748
ATS				

Iraq

	TS	APS	ASS	ATS
TS		-0.4469	0.2433	2.8156
APS			0.1773	3.2738
ASS				0.3121
ATS				

Jordan

	TS	APS	ASS	ATS
TS		6.4741	-6.027	-5.8773
APS			0.1836	-12.9423
ASS				0.1728
ATS				

Kuwait

	TS	APS	ASS	ATS
TS		1.5120	-20.666	-5.7578
APS			0.2808	-6.4511
ASS				0.5991
ATS				

Libya

	TS	APS	ASS	ATS
TS		4.2886	-5.2801	-8.8919

APS			0.1096	-11.5649
ASS				0.2685
ATS				

Morocco

	TS	APS	ASS	ATS
TS		0.6166	0.6372	-7.8910
APS			0.1587	-8.4371
ASS				0.2620
ATS				

Qatar

	TS	APS	ASS	ATS
TS		4.5381	-6.6575	-1.3828
APS			0.0715	-2.9018
ASS				0.1355
ATS				

Saudi

	TS	APS	ASS	ATS
TS		7.2475	-10.6794	-0.0231
APS			0.2552	-4.3989
ASS				0.2097
ATS				

Syria

	TS	APS	ASS	ATS
TS		2.5849	-5.6551	-8.1875
APS			0.3239	-6.5579
ASS				0.4945
ATS				

Tunisia

	TS	APS	ASS	ATS
TS		6.2368	-6.0184	-12.2385
APS			0.1220	-10.0238
ASS				0.2279
ATS				

UAE

	TS	APS	ASS	ATS
TS		6.0704	-0.1659	-1.1528
APS			0.0987	-15.1449
ASS				0.2254
ATS				

Yemen:

	TS	APS	ASS	ATS
TS		0.6030	-1.2183	-0.1795
APS			0.2433	-0.7916
ASS				0.2455

ATS				

Comparing trends in variables per country: 15+

APPENDIX III: Country Comparisons

TS; Arab 15+:

For total years of schooling, Yemen appears to have the highest trend. It is followed by Egypt, Qatar, and then by Jordan and Saudi Arabia. North African countries appear to exhibit trends higher for Algeria in comparison with Morocco and Libya but similar to that of Tunisia. Kuwait shows trends that are lower than most of the Arab countries.

Comparisons of total years of schooling trends between Arab countries

TS	Alg	Bahrain	Egy	Iraq	Jord	Kuw	Liby	Moro	Qatar	Saudi	Syr	Tunisia	UAE	Yemen
Alg		0.297	-4.06	-3.27	6.874	10.68	-4.19	-3.71	20.84	11.47	7.02	-1.44	-0.8	-12.66
Bahrain			-8.3	-7.35	15.38	12.92	-10.1	-8.66	10.49	16.37	9.518	-4	-2.05	-19.03
Egypt				1.51	19.86	15.93	0.14	0.88	844.4	20.01	13.48	5.012	5.14	-12.36
Iraq					20.14	15.48	-1.62	-0.74	51.43	19.68	12.93	3.72	4.01	-13.88
Jordan						7.67	-24.3	-22.2	35.24	8.6	2.37	-18.6	-13.5	-26.73
Kuwait							-16.4	-15.9	3.05	-1.57	-4.97	-14.2	-13.25	-22.15
Libya								0.89	60.79	21.29	14.2	5.94	5.74	-13.35
Morocco									56.11	20.49	13.56	4.76	4.83	-13.67
Qatar										-7.34	-12.5	-55.5	-40.04	-44.26
Saudi											-4.36	-18.2	-16.2	-26.69
Syria												-11.3	-9.96	-21.03
Tunisia													0.73	-13.83
UAE														-16.06

APS; Arab 15+:

For average primary schooling, Kuwait appears to have the lowest trends in comparison with the other Arab countries. Qatar, Jordan and Saudi Arabia do also show lower trends. Iraq, Yemen, Morocco, Algeria, Egypt and UAE exhibit higher trends relative to most Arab economies.

Comparisons of primary years of schooling trends between Arab countries

APS	Alg	Bahrain	Egy	Iraq	Jord	Kuw	Liby	Moro	Qatar	Saudi	Syr	Tunisia	UAE	Yemen
Alg		3.71	-0.36	-2.03	20.48	19.55	2.33	-2.05	29.71	20.95	13.95	3.62	1.03	-12.35
Bahrain			-5.63	-8.86	25.31	19.68	-2.11	-9.18	10.34	21.85	14.33	-0.53	-3.64	-19.3
Egypt				-2.26	28.19	22.06	3.72	-2.32	768.3	24.41	17.85	5.87	1.8	-14.4
Iraq					33.83	23.93	6.69	0.01	55.38	26.81	21.08	9.81	4.31	-13.53

Jordan						6.93	-27.2	-34.9	11.89	6.96	-5.63	-29.6	-26.39	-35.87
Kuwait							-20.7	-24.1	-2.05	-0.77	-9.85	-20.5	-21.04	-29.58
Libya								-6.93	46.75	22.99	15.89	1.93	-1.72	-17.87
Morocco									58.41	27.09	21.51	10.28	4.42	-13.74
Qatar										1.26	-15.2	-57.5	-42.4	-46.64
Saudi											-10.2	-23.1	-23.24	-32.19
Syria												-16	-16.3	-27.61
Tunisia													0.73	-13.83
UAE														-16.06

ATS; Arab 15+:

With regard to the average years of tertiary schooling, Yemen shows the highest trends relative to the other countries. It is followed by Libya, Iraq and Syria. Morocco has trends higher than the other countries at the exception of Libya. Algeria has trends that are lower than the other countries except Qatar and Saudi Arabia.

ATS	Alg	Bahrain	Egy	Iraq	Jord	Kuw	Liby	Moro	Qatar	Saudi	Syr	Tunisia	UAE	Yemen
Alg		-1.25	-6.26	-14.1	-0.91	-2.32	-20.4	-21.4	17.67	12.08	-5.37	-0.42	-4.63	-23.53
Bahrain			1.08	-2.23	-0.64	-1.37	-9.75	-5.37	4.67	7.41	-3.22	-0.36	-1.26	-9.02
Egypt				-13.4	-0.87	-2.22	-20.1	-20.8	176.4	12.37	-5.21	-0.41	-4.32	-23.17
Iraq					-0.17	-0.23	-13.7	-8.15	21.82	16.54	-2.21	-0.26	1.32	-14.23
Jordan						0.084	-1.72	-0.52	3.05	2.44	-0.35	-0.22	0.34	-1.42
Kuwait							-4.84	-1.69	7.98	6.3	-1.07	-0.25	0.69	-4.12
Libya								8.32	27.01	23.03	5.04	0.12	11.71	1.9
Morocco									25.79	20.64	0.62	-0.12	6.24	-7.55
Qatar										-3.5	-12.9	-0.86	-15.8	-28.57
Saudi											-10.5	-0.73	-11.94	-23.99
Syria												-0.15	2.67	-4.09
Tunisia													1.59	-0.31
UAE														-11.27

TS; Arab 25+: +

Concerning total years of schooling for those aged 25 and above, Yemen appears to show the highest trends compared to other Arab Countries. It is followed by Iraq, Egypt, Morocco, and Saudi Arabia. Morocco exhibits trends that are most of the time better than the other countries with the exception of Algeria, Egypt, Iraq and Libya.

TS	Alg	Bahrain	Egy	Iraq	Jord	Kuw	Liby	Moro	Qatar	Saudi	Syr	Tunisia	UAE	Yemen
Alg		6.32	3.57	-0.34	7.6	16.99	1.47	6.15	37.77	21.22	15.66	9.18	9.07	-6.23
Bahrain			-3.07	-8.06	2.38	14.46	-6.09	-0.57	48.95	19.48	12.85	3.71	4.02	-13.58
Egypt				-4.58	4.86	15.69	-2.61	2.75	44.07	20.51	14.24	6.54	6.52	-10.49
Iraq					7.14	16.23	1.63	5.73	32.89	19.84	14.81	8.34	8.38	-5.46
Jordan						12.23	-7.52	-2.99	35.72	16.22	10.32	0.43	1.17	-14.26
Kuwait							-17.6	-15.1	7.21	1.16	-2.7	-5.47	-11.93	-21.86

Libya								5.95	49.71	22.92	16.38	10.03	9.5	-8.58
Morocco									56.11	20.49	13.56	4.76	4.83	-13.67
Qatar										-7.34	-12.5	-55.5	-40.04	-44.26
Saudi											-4.36	-18.2	-16.2	-26.69
Syria												-11.3	-9.96	-21.03
Tunisia													1.02	-16.72
UAE														-16.06

Regarding the average years of tertiary schooling for those aged 25 and above, Yemen appears to have the highest trends relative to the other countries. It is followed by Libya, Morocco, Algeria, and Iraq. Qatar and Saudi Arabia seem to exhibit the lowest trends compared to the other countries

ATS

ATS	Alg	Bahrain	Egy	Iraq	Jord	Kuw	Liby	Moro	Qatar	Saudi	Syr	Tunisia	UAE	Yemen
Alg		6.86	9.17	7.56	8.61	3.74	-2.49	5.89	26.3	22.03	3.51	0.93	9.88	-0.89
Bahrain			0.28	-3.16	-2.76	-0.92	-8.17	-4.14	9.87	7.44	-2.55	-6.17	-0.51	-7.54
Egypt				-4.66	-4.15	-1.21	-10.5	-5.99	12.08	8.96	-3.19	-8.21	-1.04	-10.18
Iraq					0.82	1.03	-8.13	-1.81	20.38	16.23	-0.3	-5.18	3.85	-7.65
Jordan						0.77	-10.1	-3.68	23.67	18.51	-0.75	-6.99	3.86	-10.56
Kuwait							-4.82	-1.71	7.99	6.3	-1.08	-2.47	0.68	-4.14
Libya								7.84	25.92	22.15	4.96	3.251	11.24	1.82
Morocco									25.78	20.64	0.62	-4.45	6.24	-7.55
Qatar										-3.5	-12.9	-24.5	-15.8	-28.573
Saudi											-10.5	-20.4	-11.94	-23.99
Syria												-2.87	2.67	-4.09
Tunisia													8.64	-1.84
UAE														-11.27