Trends in the Reduction of Inequalities in the Field of Education: Empirical Investigation from African Data

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Abstract
This paper attaches particular attention to the unequal dimension of education in Africa using several indicators. To account for the dynamics of the reduction of inequalities, we estimated the validity of the Kuznets curve of education. The results suggest that the shape of the Kuznets curve depends on the measure used to approximate inequality. Indeed, the assumption of the Kuznets curve is checked if the standard deviation of schooling is used. For its part, the Gini index maintains a significant negative relationship with the average number of years of study. The results also applies to all African countries and for each group of countries with a significant advance in reducing inequalities initiated by English speaking countries.
Keywords: Education, Africa, Trends, Inequality.
JEL Classification Codes: I24, C23, I32, F63.

Eğitimde Fırsat Eşitsizliğini Azaltmaya Yönelik Eğilimler: Afrika Verileri Üzerine Ampirik Bir Çalışma[*]

Öz
Bu çalışma, çeşitli göstergeler kullanılarak Afrika'daki eğitim eşitsizliğine dikkat çekmeyi amaçlamaktadır. Eğitim eşitsizliğini azaltmaya yönelik dinamikler, eğitimde Kuznet Eğrisi'nin geçerliliği bağlamında ele alınmıştır. Ortaya çıkan sonuçlar, Kuznet Eğrisi'nin şeklinin ortalama eşitsizliğinin ölçülmesine bağlı olduğunu önermektedir. Kuznet Eğrisi'ne bağlı olarak ortaya çıkan varsayımlar öğretim verilerinin standart sapmasına bağlı olarak test edilmiştir. Aynı zamanda çalışmada kullanılan Gini İndeksi ortalama eğitim süresine bağlı olarak negatif ilişkiyi ortaya koymaktadır. Sonuçlar aynı zamanda İngilizce konuşulan Afrika ülkelerinde eğitimde fırsat eşitsizliğinin azaltılmasına yönelik pozitif bir eğilim olduğunu ortaya koymaktadır.
Anahtar Kelimeler: Eğitim, Afrika, Yönelim, Eşitsizlik.
JEL Sınıflandırma Kodları: I24, C23, I32, F63.

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1. Introduction

This paper attaches particular attention to the unequal dimension of education. This issue was long neglected by the economic work that has abandoned this question to the sociologists and philosophers of justice. The foundations of this new trend found its roots in the theories of social justice proposing to define the rules for the fair distribution of property.

It was only during the end of last century that economist attitudes vis-à-vis this issue have changed given the changing aspirations of individuals against social inequalities and their remarkable developments, especially with the proliferation of attempts that build indicators able to quantify their magnitudes. Thus, economists have identified several measures of inequality where its history goes back to the early work of Pigou (1912) and Dalton (1920). Many studies have recently multiplied (Glomm & Ravikumar, 1992; Lopez et al., 2002; Castelló, 2010).

The right of education has become a political issue, not just an economic one. The Universal Declaration of Human Rights[1] made access to education as a basic right for the growth and development of people. Although most countries in the world have adopted this statement in their constitutions, it faces major challenges to be applied. Indeed, many countries do not have the resources to provide universal education for their people. Second, social and cultural properties of certain countries do not encourage universal education. Moreover, education is a key factor for the development of any country, and differences in living standards are largely attributable to him. In the economic debate, the issue of education occupies a central place. Models of growth since the early work of Solow (1956) have driven this debate. In this sense, both theoretical and empirical research continues to multiply confirming the importance of education.

In 2000, under the auspices of UNESCO, the World Education Forum is held in Dakar. In this forum, education has been identified as a fundamental human right and as a tool for sustainable development. Delegates from 181 countries at the forum are committed to achieving the goals of Education For All (EFA). However, the EFA report (2008) which is a set Term evaluation of these targets shows that 58 of the 86 countries that have not yet achieved universal primary education will not achieve it by 2015. 72 of 101 countries will not succeed in halving their adult illiteracy by 2015. Only 11 of the 18 countries that had not achieved gender parity in primary and secondary education by 2005 have a chance to realize it by 2015. The report suggests that 31 African countries will reach a rate of 100% primary school enrollment. The equivalent of 19 million children in the world remains outside the school. These figures highlight the first delay that registers African countries in reducing educational inequalities. The aim of this paper fits into this direction. Our approach is innovative because it is based on the verification of the validity of the Kuznets curve in the field of education. Indeed,

the Kuznets curve (from the work of Simon Kuznets on economic development in the 50s) describes a relationship in an inverted U shape between the level of development of a country and income inequality. The configuration of this paper follows the verification of this hypothesis in the field of education. To our knowledge, few studies have focused the study of inequalities in education in Africa in comparative perspective.

This paper is structured as follows: the second section discusses the role of reducing inequalities in development. The third section provides a review of the literature quantifying inequalities in education. The fourth present a quantification of inequalities in education in Africa. The fifth section attempts to empirically test the validity of Kuznets curve for a sample of African countries. The Sixth section concludes.

2. Reducing Inequalities: The Key to Development

The concept of inequality is multidimensional. It drew the attention of the pioneering work of Rawls (1971), Sen (1985), Dworkin (1981), and Roemer (1998), but also development economists. It affects not only the money but also social aspects such inequalities in infant mortality, nutrition, and access and academic success (Ferreira & Schady, 2008 aspects; Bourguignon, Ferreira & Menendez, 2007; UNDP, 2005). According to the World Bank (2006), the fair distribution of opportunities (within and between countries) is an essential ingredient of development. Indeed, the rise in inequality frustrates efforts to reduce poverty by increasing its negative impact on growth (Chen & Ravallion 2005; Thomas & Yan, 2009). In this context, individuals should have the same opportunities to lead a life of their choice and be spared of any event likely to destabilize the situation.

In terms of economic efficiency, macroeconomic aggregates (such as the level of production and the growth rate) are directly affected by the level of wealth distribution (Li et al., 1998; World Bank, 2006). However, more recent studies have focused on the unequal dimension of education in the analysis of growth and development. Indeed, if one factor of production (eg physical capital) is freely traded in a competitive environment, its marginal product tends to equalize through the market mechanism, and its contribution to production is not affected by its distribution. If, against a production factor is not fully exchangeable, its marginal product does not equate compensation and the aggregate production function depends also on its distribution. Thus, the fact that education is a well partially exchangeable variable reflecting its distribution must be included in the analysis.

There are generally two inputs that determine the level of production and well-being within a country. Capital (physical and: or financial) and human capital plus technical progress, natural capital and the institutional framework.

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Thus, in the debate on the determinants of growth, many anchors sank the crucial role of capital accumulation (physical and financial) in promoting growth and therefore improving social welfare. Other forms of capital (human, natural, institutional) are not only inputs but also direct components of well-being.

The accumulation of these forms of capital is crucial to the economic and social development of a country. However, empirical observation relativized these findings. Indeed, in many countries especially in the developing world, the failure of the market structure is an obstacle to the development of human, physical and natural capital. The governments of these countries have failed to provide basic services, health and education for the poor and disadvantaged people.

Throughout the world, women face unequal treatment in their involvement in the development of their society, including in the field of education. Development education whose goal is to better understand this phenomenon can ignore this reality. According to the report of the United Nation Population Fund (UNFPA) 2005 "Women constitute 70% of the 1.3 billion people living below the absolute poverty line; 2/3 illiterates worldwide are women in among decision makers, there are 14 women for every 100 men. Faced with this reality, gender mainstreaming is primarily a question of fairness. The fight against exclusion involves the adoption of policies and development programs including participation of women and men in all spheres of society: domestic, social, cultural, economic, and political."

The gender and development approach is part of a perspective of social transformation. It involves consideration of gender relations at all levels of reflection and action to solve this problem especially in developing countries.

UNFPA (2005) provides some statistics on the extent of inequality between men / women in the world and especially in Africa. These statistics makes the women after men in terms of access to health, education, fair compensation for the same work.

The persistence of gender inequalities in access to education, especially in developing countries, is largely due to the way the question is designed in such educational policies. United Nations (2002) have identified several mechanisms by which the rise of gender inequality in education is inevitable:

Political inequalities: Women generally suffer from inequalities in access to positions of political responsibility;

Inequalities within the household: the dominant patriarchal power within households reinforces the dependence of women;

Legal inequality: There are many laws which clearly deprive women of basic rights (employment, land, inheritance ...)

Economic inequality: the social division of labour in some economies have created situations where women are poorly paid than men;

Safety and violence: Violence against women prevents them not only to live a normal life; it deprives them of educational opportunities;

Religious inequalities: some religious acts require that women and girls do not have the same educational advantages as men.

Consideration of gender in development policies helped improve the quantity and quality of capital available especially for developing countries. The integration of reflection on gender in the various development policies promotes significantly the quality of human capital, especially in developing countries that suffers from several problems.

3. Quantification of Inequalities in Education in Africa

To measure the level of inequality in education in the Africa region, we focused on four indicators: Gini index of education (Thomas et al., 2002; Qian & Smyth, 2005; Morrison et al., 2010), the standard deviation of distribution ratios (Checchi, 2000; Thomas et al., 2002; Castello & Domenech, 2002). Both indices are widely used in the literature and they are easy to interpret.

The following terms describe respectively the indices in the field of education:

$$GINI = \frac{1}{\mu} \sum_{i=2}^{n} \sum_{j=1}^{i=1} P_i \langle Y_i - Y_j \rangle P_j \tag{1}$$

$$SDS = \sqrt{\sum_{i=1}^{n} p_i (y_i - (\sum_{i=1}^{n} p_i y_i))^2} \tag{2}$$

With GINI is the Gini index of education based on educational attainment, SDS standard deviation of distribution of schooling. Pi and Pj denote the proportion of the population with education i and j. Yi and Yj are the accumulation of years of schooling according to each level of education. n is the number of levels of education. The classification of Barro & Lee (2014) identifies seven levels of study. In this work, we assumed that the duration of each level of study Yi is constant throughout the period and the same for all countries. The result of our calculation is given below.

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Table 1: Evolution of Inequalities in Education in the African- Arabic-Speaking, Gini Index.

Countries	1960	1970	1980	1990	1995	2000	2005	2010
Algeria	0,88	0,82	0,71	0,61	0,55	0,50	0,46	0,42
Egypt	0,93	0,88	0,76	0,61	0,56	0,50	0,46	0,42
Libyan Arab Jamahiriya	0,86	0,76	0,65	0,52	0,46	0,42	0,38	0,36
Morocco	0,95	0,90	0,83	0,74	0,69	0,65	0,61	0,56
Tunisia	0,91	0,82	0,67	0,60	0,54	0,49	0,45	0,41
Mauritania	0,74	0,73	0,71	0,67	0,64	0,60	0,55	0,50
Sudan	0,90	0,86	0,80	0,71	0,68	0,65	0,63	0,63

Source: Achievement of Authors

Table 2: Evolution of Inequalities in Education in Francophone Africa, Gini Index

Pays	1960	1970	1980	1990	1995	2000	2005	2010
Benin	0,92	0,90	0,87	0,80	0,76	0,73	0,69	0,65
Burundi	0,91	0,86	0,82	0,79	0,73	0,68	0,65	0,62
Cameroon	0,85	0,76	0,64	0,52	0,47	0,43	0,42	0,40
Central African Republic	0,93	0,89	0,82	0,73	0,70	0,67	0,65	0,64
Congo	0,85	0,76	0,62	0,52	0,47	0,44	0,42	0,40
Cote dIvoire	0,90	0,87	0,81	0,75	0,69	0,63	0,60	0,57
Democratic Republic of the Congo	0,83	0,78	0,72	0,66	0,64	0,63	0,63	0,64
Gabon	0,86	0,79	0,67	0,55	0,48	0,44	0,39	0,36
Mali	0,96	0,95	0,91	0,88	0,87	0,85	0,82	0,76
Niger	0,94	0,93	0,92	0,88	0,86	0,84	0,83	0,80
Reunion	0,62	0,50	0,41	0,34	0,31	0,28	0,25	0,22
Rwanda	0,88	0,82	0,75	0,70	0,68	0,64	0,61	0,57
Senegal	0,68	0,66	0,62	0,58	0,54	0,50	0,47	0,44
Togo	0,92	0,87	0,73	0,61	0,58	0,55	0,53	0,50

Source: Achievement of Authors

Table 3: Evolution of Inequalities in Education in Anglophone Africa, Gini Index

	1960	1970	1980	1990	1995	2000	2005	2010
Botswana	0,75	0,68	0,60	0,42	0,32	0,27	0,23	0,20
Gambia	0,96	0,95	0,91	0,83	0,78	0,77	0,73	0,68
Ghana	0,84	0,69	0,59	0,51	0,49	0,46	0,43	0,39
Kenya	0,78	0,73	0,58	0,44	0,41	0,39	0,36	0,32
Lesotho	0,45	0,43	0,44	0,44	0,43	0,42	0,38	0,35
Liberia	0,92	0,89	0,80	0,72	0,71	0,68	0,64	0,59
Malawi	0,67	0,59	0,61	0,58	0,57	0,53	0,47	0,43
Mauritius	0,58	0,48	0,47	0,41	0,37	0,36	0,33	0,32
Mozambique	0,82	0,79	0,78	0,82	0,84	0,82	0,80	0,76
Namibia	0,69	0,60	0,53	0,45	0,44	0,46	0,44	0,43
Sierra Leone	0,95	0,92	0,87	0,82	0,78	0,76	0,74	0,71
South Africa	0,58	0,55	0,48	0,36	0,29	0,34	0,29	0,26
Swaziland	0,78	0,66	0,56	0,47	0,42	0,38	0,34	0,32
Uganda	0,81	0,70	0,64	0,54	0,49	0,46	0,42	0,37
United Republic of Tanzania	0,74	0,68	0,59	0,49	0,45	0,41	0,37	0,32
Zambia	0,58	0,52	0,55	0,53	0,41	0,39	0,36	0,32
Zimbabwe	0,57	0,50	0,49	0,39	0,32	0,26	0,23	0,22

Source: Achievement of Authors
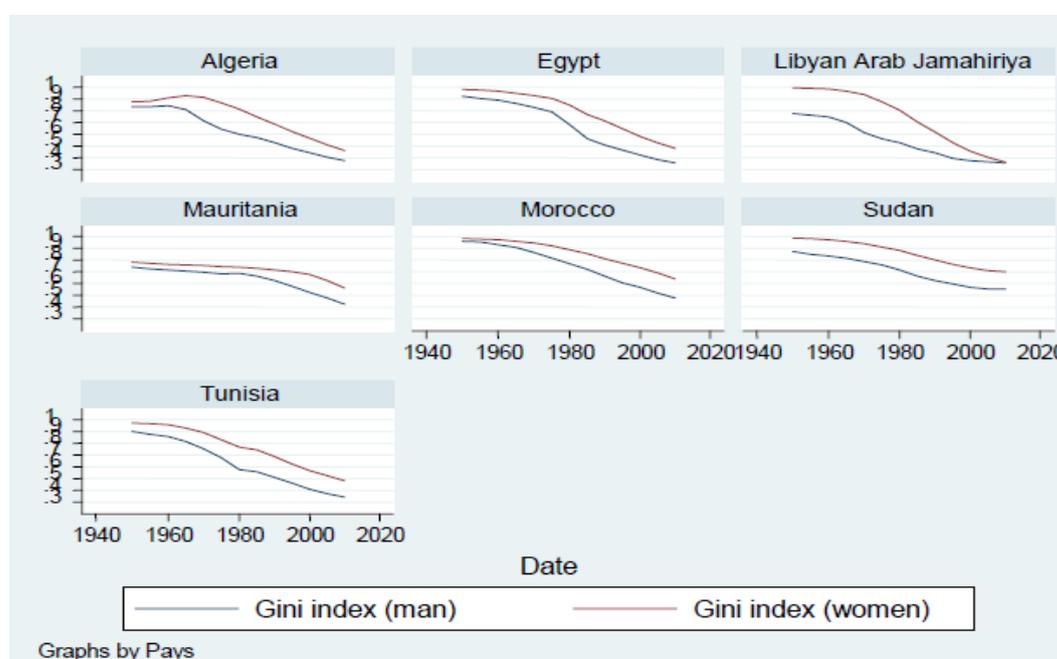
Figure1: Evolution of the Gini Index for Man and Woman, Arabic-Africa
Source: Achievement of Authors

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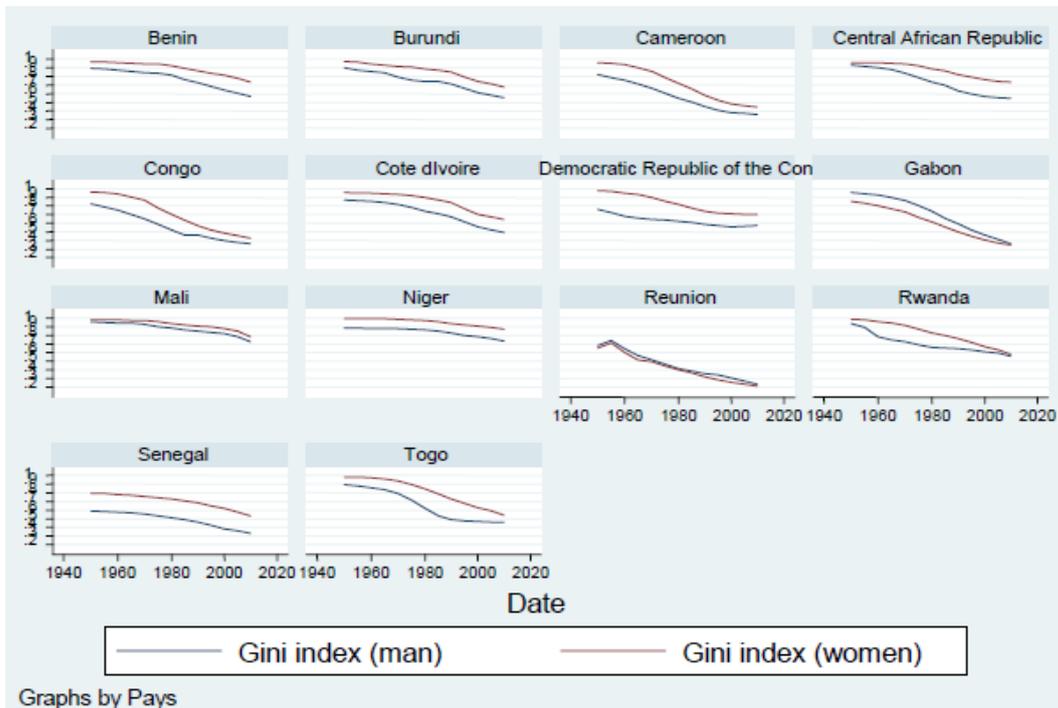
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Figure 2: Evolution of the Gini Index for Men and Women, Francophone-Africa
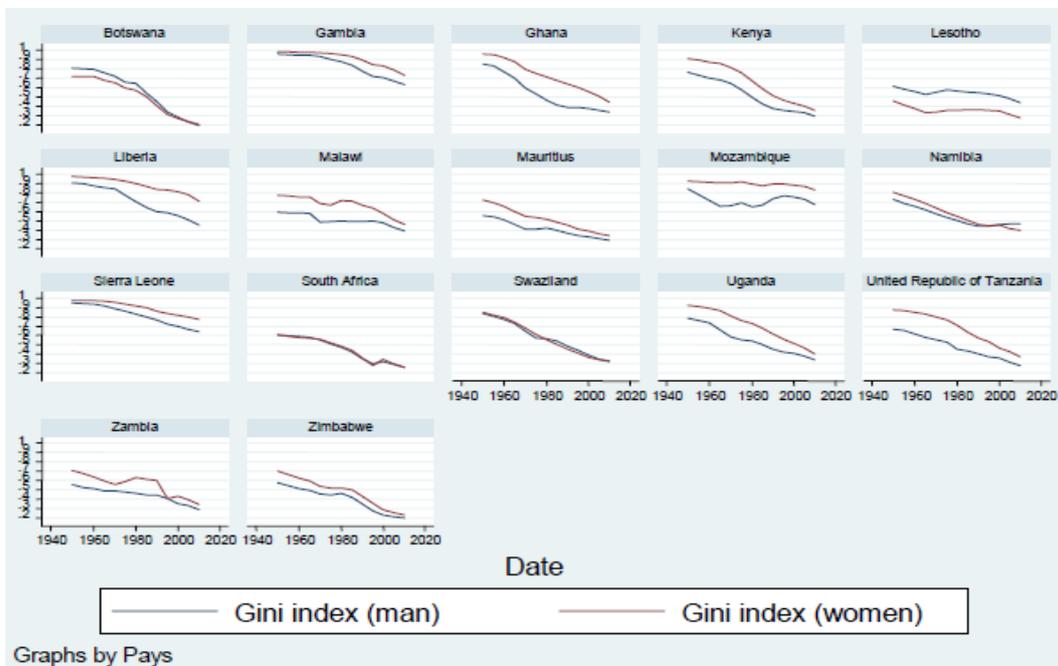
Source: Achievement of Authors

Figure 3: Evolution of the Gini Index for Man and Woman, Anglophone-Africa

Source: Achievement of Authors

4. Foundations of Inequality in Education: Approach by Educational Kuznets Curve

A wide range of empirical work has examined, since the pioneering work of Kuznets (1955), the economic inequality-growth relationship. Transposed to our problem, the objective here is to provide an overview of the shape of the Kuznets curve in the field of education.

The pioneering work of Kuznets (1955) suggests that income inequality increases as the average income increases to a level (called the turning point) where it begins to decrease as the average income increases more.

Many anchor flowed from the work of Simon Kuznets on the relationship between income inequality and economic growth. In previous years there has been a development of the literature on the Kuznets curve in the field of education. The first applications of the Kuznets curve in the field of education back to Ram (1990) and Londono (1990). Their results suggest a hypothesis testing Kuznets applied in the field of education. The dispersion of education increases in the population as the average number of years of schooling increases to a level (called critical point) where it decreases over its evolution. In a more recent work, Thomas et al. (2009) found a significant negative relationship between the Gini index of education and the average number of years of study.

The application of the Kuznets hypothesis in the field of education states that reducing inequality in access to education is reached through a process of mass education.

We propose to test empirically the shape of the relationship between the level of inequality in education and the average number of years of schooling. The specification of the Kuznets curve in the field of education by using cross-sectional data is given by:

$$ei = a + b\mu + c\mu^2 + \varepsilon \qquad (3)$$

With ei a measure of inequality in education. To study the shape of the Kuznets curve in the field of education in the long term, we used two measures: the standard deviation of schooling (SDS) (De Gregorio & Lee, 2002; Lim & Tang, 2008; Morrisson & Murtin, 2010) and the Gini index, the formula is written as follows:

$$GINI = \frac{1}{\mu} \sum_{i=2}^{n} \sum_{j=1}^{i=1} P_i \langle Y_i - Y_j \rangle P_j$$

$$(4)$$

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Recall that the standard deviation of distribution ratios (SDS) is given by the following formula:

$$SDS = \sqrt{\sum_{i=1}^{n} p_i (y_i - (\sum_{i=1}^{n} p_i y_i))^2} \tag{5}$$

$$\text{Et} \quad \sum_{i=1}^{n} p_i y_i = \mu \tag{6}$$

Determining the turning point is given from the derivation of equation :

$$\frac{\partial ei}{\partial \mu} = b + 2c\mu \tag{7}$$

The first order condition allows us to write:

$$\frac{\partial ei}{\partial \mu} = b + 2c\mu^* = 0$$
$$\mu^* = \frac{-b}{2c} \tag{8}$$

The second order condition allows us to write:

$$\frac{\partial^2 ei}{\partial \mu^2} = 2c \tag{9}$$

5. Empirical Study

5.1. Data and methodology

To empirically verify the validity of the Kuznets curve in the field of education in Africa, we use a sample of 38 African countries divided into tree groups. Thus, we distinguished the Arabic educational systems (7 countries), francophone educational systems (14 countries) and Anglophone education systems (17 countries). Data on the average number of years of schooling are from Barro & Lee (2014). Two types of indicators are used to approximate the inequality: The standard deviation of schooling and the Gini index. Data on inequalities in education are calculated by using equation (1) and (2). All data are calculated on five-year averages from 1960 to 2010.

5.2. The standard Deviation of Schooling as a Measure of Inequality

Before presenting the empirical results for each country, we plot the cloud point for all African countries and for each group of countries. The Figure illustrates the shape of the Kuznets curve in the field of education between the dispersion and the average number of years of education for all in our sample between 1950 and 2010. The analysis of this Figure indicates the validity of the Kuznets curve of education as well as for all countries and for each group of countries. The Figure also gives us a first estimate of the turning point that is between 5 and 7 years.
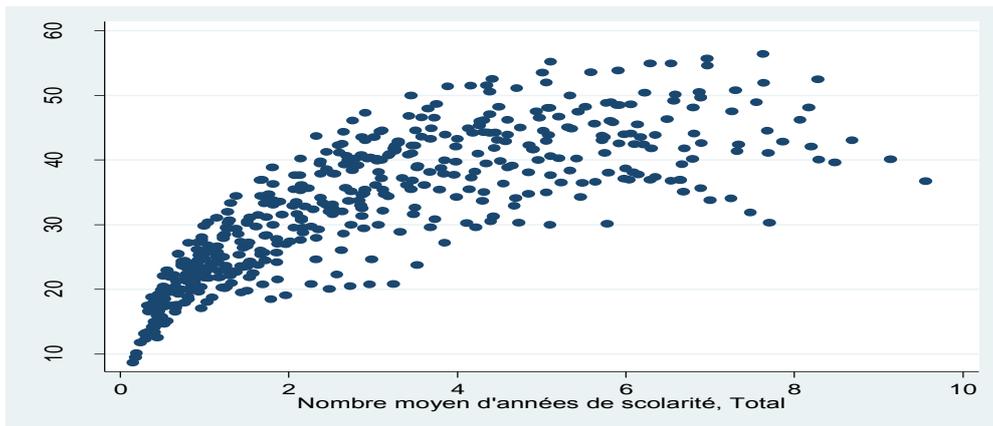
NB : Nombre moyen d'année de scolarité : average year of schooling
Ecart type de scolarisation : Standard deviation of schooling

Figure 4: Estimated Kuznets Curve in Africa, the Total Sample (38 Countries): SDS
Source: Achievement of Authors
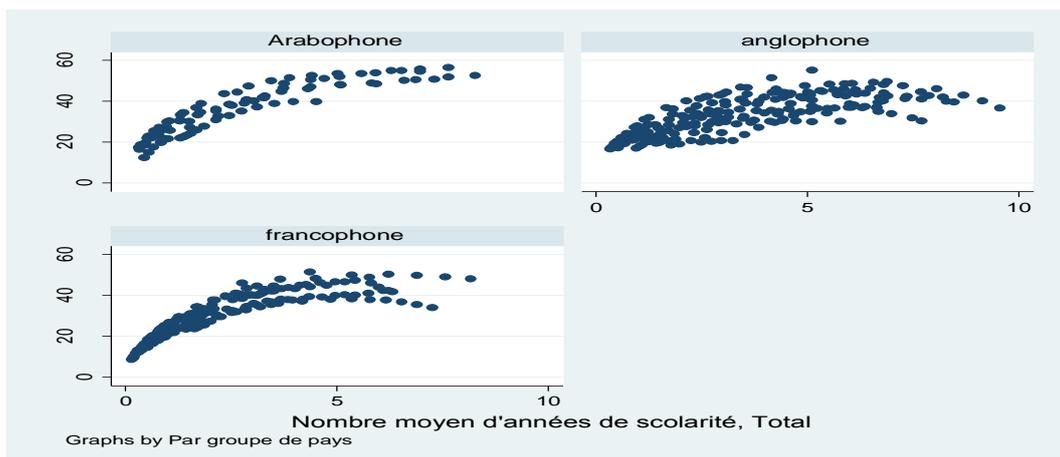
NB : Nombre moyen d'année de scolarité : average year of schooling
Ecart type de scolarisation : Standard deviation of schooling

Figure 5: Estimated Kuznets Curve in Africa by Educational Systems Group, SDS
Source: Achievement of Authors

The table shows the estimation of the Kuznets curve of education by the OLS. R^2 strengthens the validity of the model for different estimates.

Table 4: Estimated educational Kuznets curve by the OLS: dependent variable SDS

μ	Total sample	Arabic countries	Francophone countries	Anglophone countries
μ^2	9.87***	11.234***	12.595***	7.824***
	-.795***	-.818***	-1,147***	-.576***
const	13.997***	14,688***	11,272***	15,457***
F test				F(2,218) = 207.38
	F(2,491)=729,3	F (2,88)=452,91	F (2,179)=717,26	
R-sq	Prob>F=0.0000	Prob>F=0.0000	Prob>F=0.0000	Prob>F=0.0000
	0,74	0,94	0,88	0,65
Observations	418	77	154	187
μ^* $\dfrac{-b}{2c}$				
	6,2	6,21	5,49	6,79

**Source**: Achievement of the Authors, Based on Our Calculations

The verification of the Kuznets in the field of education suggests that the coefficient *b* associated with the average number of years of study into the equation (1) is a positive sign and the coefficient *c* associated with the square of the number Average years is a negative sign.

According to the econometric results in the table, the coefficients b and c are qs expected and have a significant signs. In addition, the second derivative (2c) is negative, indicating that the turning point constitutes the maximum point. These results confirm the validity of the Kuznets curve in the field of education both for the entire sample of African countries and for the three groups of countries.

The results have also allowed us to estimate the turning point. For all of the sample, this turning point is equal to 6.2 years, which is almost equal to that stated in the empirical work. For Arabic-speaking countries, this value is slightly lower than the 6.21 average (6.2). It is 5.49 years for Francophone countries when it stood at 6.79 years for English-speaking countries. Divergences between groups of countries reflect differences in the effectiveness of efforts devoted by each

group of countries to reduce inequalities in access to different levels of education. Thus, the discrepancies enter the three types of educational systems leads us to suppose the existence of divergence even within a country.

Indeed, some English-speaking countries have very substantial financial resources to invest more in education. They arrived to begin a significant decline in the dispersion of education for a low level of years of schooling. For cons, the Arabic and French education systems have reached the turning point for a higher level of education. In other words, English-speaking countries have already entered the phase of reduction of inequalities (Botswana, Ghana, Mauritius, Namibia, Swaziland, Zambia and Zimbabwe) while most Arabic-speaking and French-speaking countries have barely reached the turning point exception of Gabon and Congo who are able to enter the second phase of reducing inequalities in education. (Figures 6, 7 and 8). The analysis of these Figures clearly indicates the validity of the Kuznets curve of education for each group of countries. The Figures also give an estimate of the turning point which is between 5 and 7.
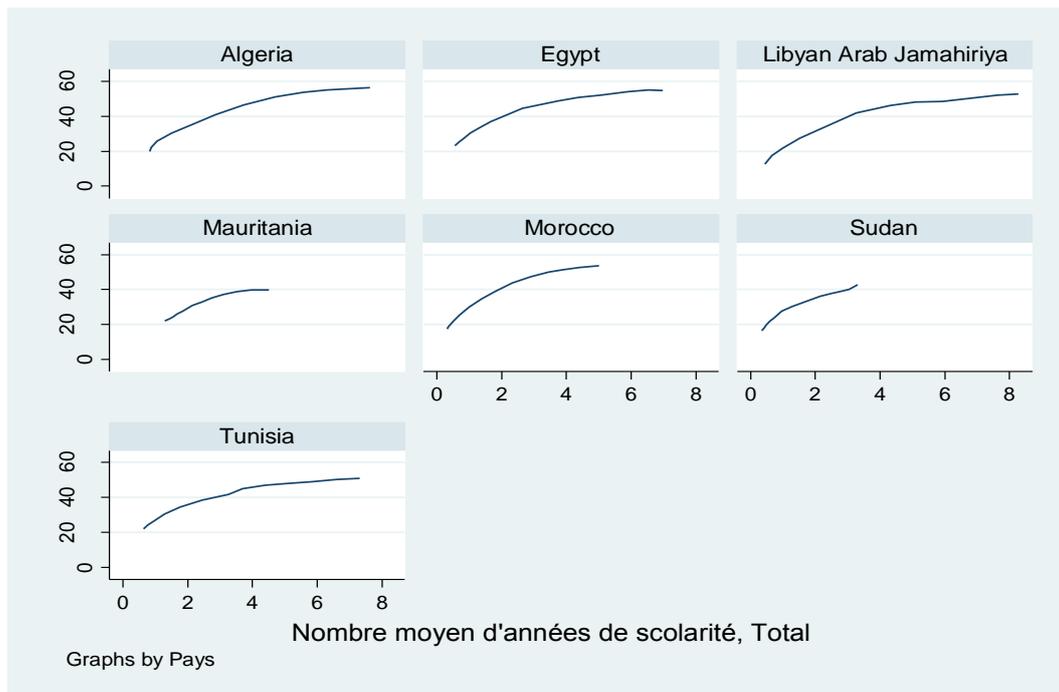
NB : Nombre moyen d'année de scolarité : average year of schooling
Ecart type de scolarisation : Standard deviation of schooling

**Figure 6: Estimated Kuznets curve in Africa; Arab Countries (7 countries), SDS**
Source: Achievement of Authors

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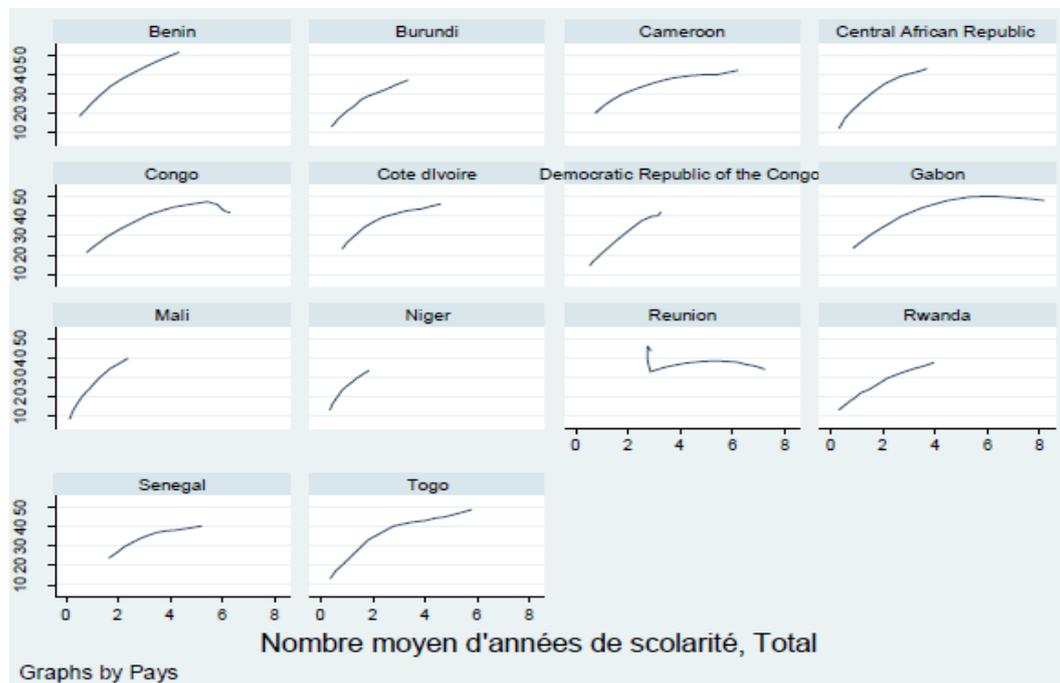
Figure 7: Estimated Kuznets curve in Africa, Francophone Countries, SDS

Source: Achievement of Authors
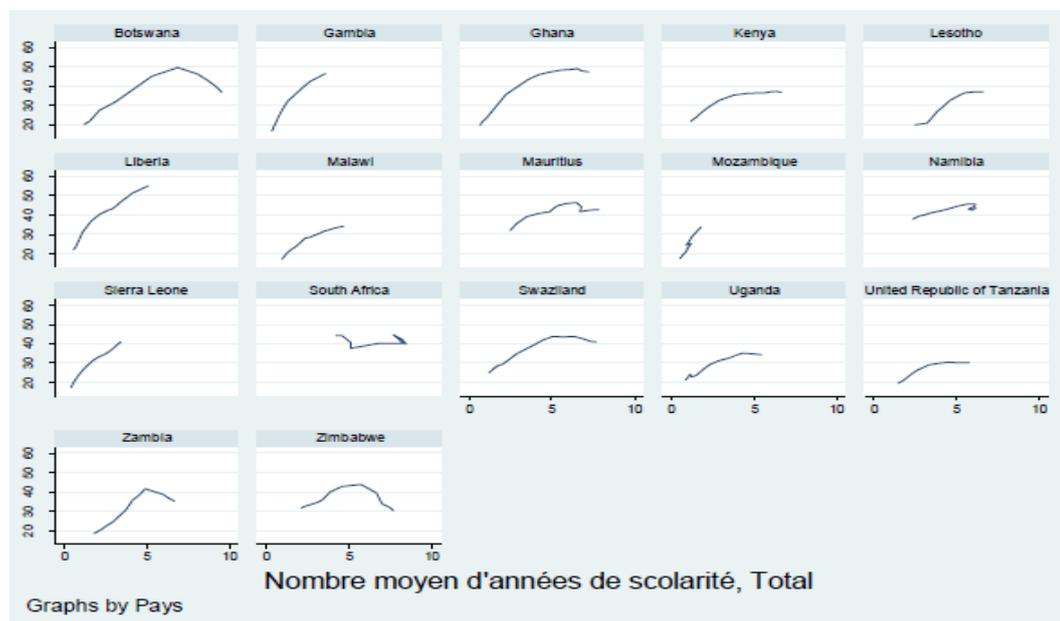
NB : Nombre moyen d'année de scolarité : average year of schooling
Ecart type de scolarisation : Standard deviation of schooling

**Figure 8: Estimated Kuznets Curve in Africa, English-Speaking Countries
(17 Countries), SDS**

Source: Achievement of Authors

5.3. The Gini Index as a Measure of Inequality

A first Figureal analysis indicates that the relationship between the Gini index and the average number of years of schooling is linear with a negative slope. The invalidity of the Kuznets curve in the field of education when inequality is measured by the Gini index is checked for both the entire sample and for each group of countries (Figure 9 and 10). Indeed, as it is expected, the coefficient associated with the average number of years of study have a negative coefficient, and the coefficient associated with the square of the average number of years of study have a value significantly close to zero.
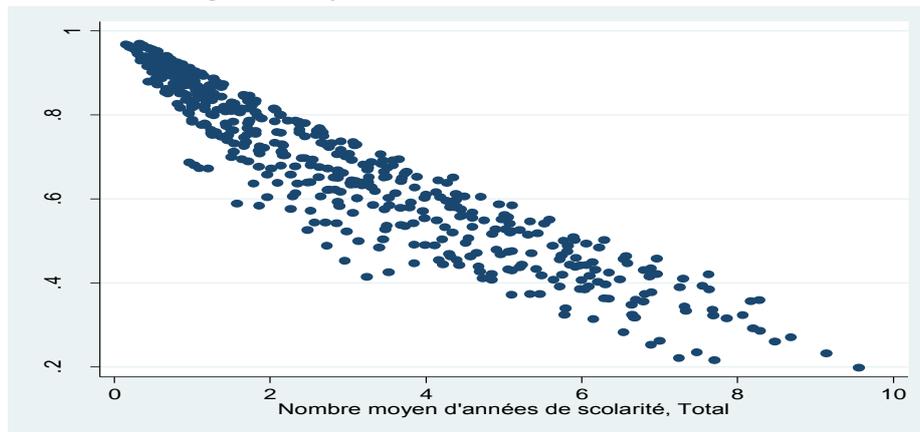
NB : Nombre moyen d'année de scolarité : average year of schooling
     Indice de Gini : Gini index
Figure 9: Estimated Kuznets Curve in Africa, total Sample: Gini
Source: Achievement of Authors
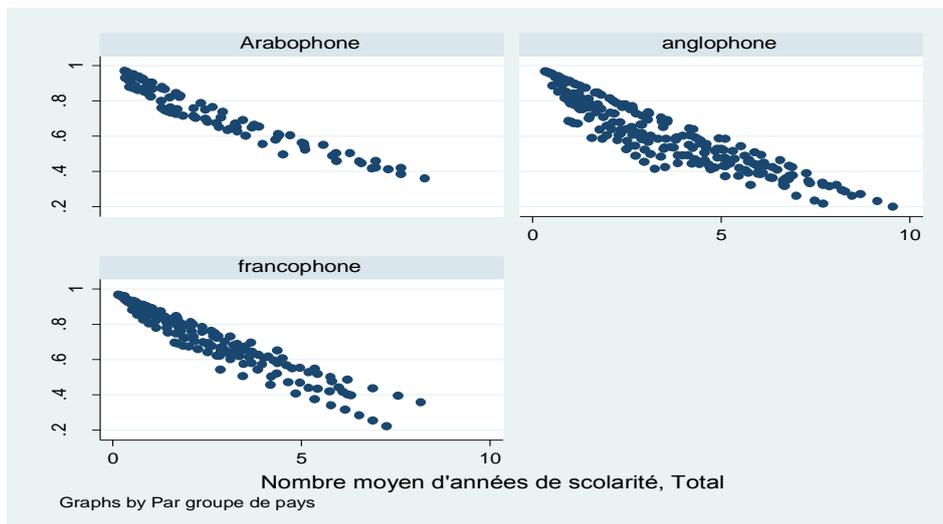
NB : Nombre moyen d'année de scolarité : average year of schooling
     Indice de Gini : Gini index
**Figure10 : Estimated Kuznets Curve in Africa, Group of Educational
Systems, Gini**
Source: Achievement of Authors

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The results in the table suggest that the relationship between the Gini index and the average number of years of schooling has a linear form with a negative and significant slope regardless of the sample used. Indeed, the coefficient associated with the square of the average number of years of schooling is almost nil for the three samples. R^2 strengthens the validity of the model.

Table 5: Estimated Kuznets Curve, OLS: Dependent Variable GI

	Arabic Countries	Francophone	Anglophone
μ			
	-.074***	-.09***	-.079***
const	14,688***	.951***	.888***
F test	F (1,89)=1193,261	F (1,180)=2278.57	F(1,219) = 207.38
	Prob>F=0.0000	Prob>F=0.0000	Prob>F=0.0000
R-sq	0,93	0,92	0,84
Observations	77	154	187

Source: Achievement of Authors
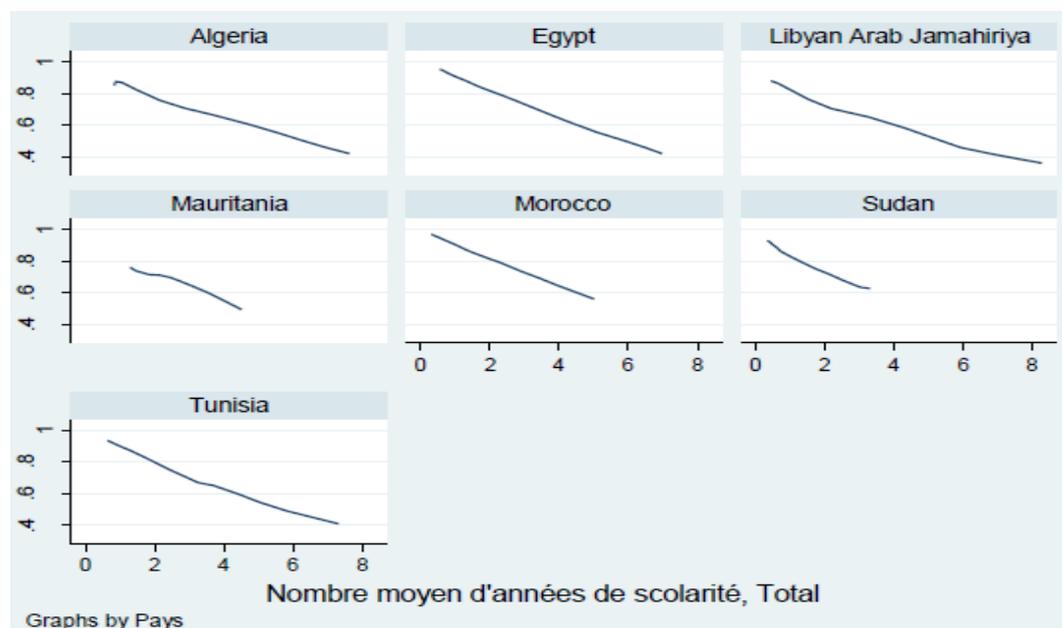
NB : Nombre moyen d'année de scolarité : average year of schooling
Indice de Gini : Gini index

Figure 11: Estimated Kuznets Curve in Africa, Arab States, Gini Index
Source: Achievement of Authors
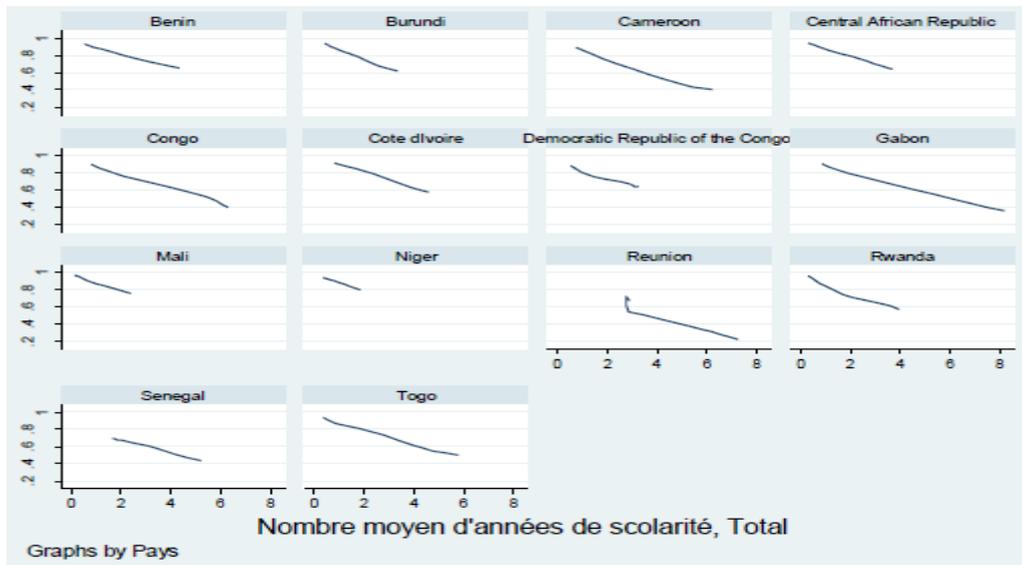
NB : Nombre moyen d'année de scolarité : average year of schooling
Indice de Gini : Gini index

Figure 12: Estimated Kuznets Curve in Africa, French-Speaking Countries (14 Countries), Gini Index

Source: Achievement of Authors
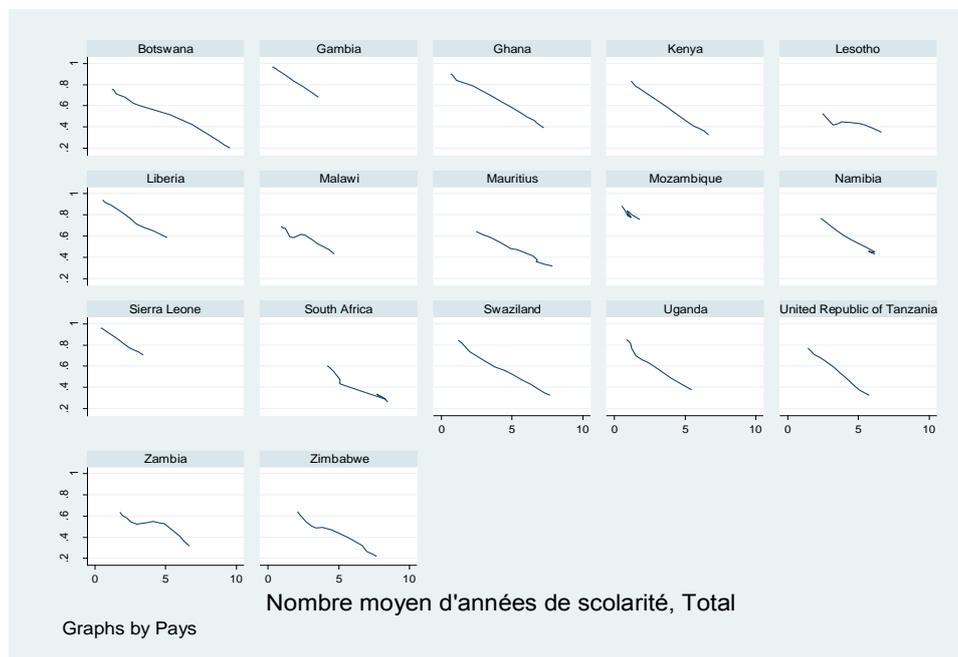
NB : Nombre moyen d'année de scolarité : average year of schooling
Indice de Gini : Gini index

Figure 13: Estimated Kuznets Curve in Africa, English Country, Gini Index

Source: Achievement of Authors

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When we use the Gini index as a measure of inequality, the relationship between the Gini index and the average length of schooling is linear with a negative slope. The nullity of the Kuznets curve in the field of education, where inequalities are measured by the Gini index is confirmed not only for each group, but for each country (Figures 11, 12, 13).

6. Conclusion

To account for the dynamics of the reduction of inequalities, we estimated the validity of the Kuznets curve of education. The results suggest that the shape of the Kuznets curve depends on the measure used to approximate inequality. Indeed, the assumption of the Kuznets curve is checked if the standard deviation of schooling is used. For its part, the Gini index maintains a significant negative relationship with the average number of years of study. The results also applies to all African countries and for each group of countries with a significant advance in reducing inequalities initiated by English speaking countries.

Given the evolution of both conscience and international agreements, one might think that the appearance of an inverted U-shape using the standard deviation of schooling is the result of actions taken since the first World Conference Education For All (EFA) in Jomtien. However, these goals were met with a series of obstacles among which include the international financial crisis.

Indeed, the financial crisis in the world in 2008 and 2009, is considered by experts as the most serious crisis since 1929. The negative impact of this crisis has not only affected the traditional macroeconomic variables but extend beyond that to affect human development indicators. In this sense, the goals of Education For All (EFA) goals set at the World Education Forum in Senegal is at risk. Before the financial crisis, some regions have made considerable efforts to achieve universal primary education before 2015s. Vandemoortele & McCord (2009) argue that the economic crisis affects the educational systems in various ways. However, the level of employment depends on several criteria: the existing level of poverty, the degree of trade and financial openness and the type of regulation of the labor market.

In total, we can say that the efforts made since 1991 to achieve Education for All (EFA) generated unprecedented progress. However, the EFA goals and the Millennium Development Goals (MDGs) will not be fully achieved by 2015 and it is recognized that the EFA agenda retains its relevance and importance. An agenda for new education and future-oriented, which allows to carry to completion the work unfinished while deepening and widening current objectives appears highly necessary.

References

Aghion, P. & Howitt, P. (1998). *Endogenous Growth Theory*. Cambridge, MA: MIT Press.

Altinok, N. (2007). *Essais sur la qualité de l'éducation et la croissance économique*. Thèse de Doctorat,Université de Bougogne.

Amaghouss, J. & Ibourk, A. (2012). Measuring Education Inequalities: Concentration and Dispersion-Based Approach; Lessons from Kuznets Curve in MENA Region. *Word Journal of Education*, 2(6), 51-65.

Appiah-Kubi, K. (2008). *Education Inequality in Ghana: Gini Coefficient of Education*. In B. Kouassi (Eds.), Pauvreté des Ménages et Accès à l'Education en Afrique de l'Ouest: Burkina Faso, Côte d'Ivoire, Ghana et Togo. Paris: Editions Karthala.

Barro, R.J. (1997). *Determinants of Economic Growth: A Cross-Country Empirical Study*. Cambridge, MA: MIT Press.

Barro, R.J. & Lee, J.W. (1993). International Comparisons of Educational Attainment. *Journal of Monetary Economics*, 32, 363-94.

Barro, R.J. & Lee, J.W. (1996). International Measures of Schooling Years and Schooling Quality. *American Economic Review*, 86, 218-23.

Barro, R.J. & Lee, J.W. (1997). *Schooling Quality in a Cross Section of Countries*, NBER Working Papers 6198, National Bureau of Economic Research, Inc.

Barro, R.J. & Lee, J.W. (2010). *A New Data Set of Educational Attainment in the World, 1950–2010*. NBER Working Paper series 15902. National Bureau of Economic Research, Inc.

Barro, R.J. & Sala-i-Martin, X. (1995). *Technological Diffusion, Convergence and Growth*. Economics Working Papers 116, Department of Economics and Business. Universitat Pompeu Fabra, Barcelona.

Birdsall, N. & Londono, J.L. (1997). Asset Inequality Matters: An Assessment of the World Bank's Approach to Poverty Reduction, *American Economic Review*, 87, 32-37.

Castelló, A. (2010a). Channels through Which Human Capital Inequality Influences Economic Growth. *Journal of Human Capital*, 4(4), 394-450.

Castelló, A. (2010b). Inequality and Growth in Advanced Economies: An Empirical Investigation. *Journal of Economic Inequality*, 8(3), 293-321.

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Fakültesi Dergisi

Çankırı Karatekin University
Journal of The Faculty of Economics
and Administrative Sciences

Castelló, A. & Doménech, R. (2002). Human Capital Inequality and Economic Growth: Some New Evidence. *Economic Journal*, 112(478), 187-200.

Castelló, A. & Doménech, R. (2008). Human Capital Inequality, Life Expectancy and Economic Growth. *Economic Journal*, 118(528), 653-677.

Checchi, D. (2004). *Does Educational Achievement Help to Explain Income Inequality?* In A. Cornia (Eds.), Inequality, Growth and Poverty in an Era of Liberalization and Globalization, Chapter 4. Oxford University Press.

De Gregorio, J. & Lee, J.W. (2002). Education and Income Distribution: New Evidence from Cross-Country Data. *Review of Income and Wealth*, 48(3), 395-416.

Dollar, D. & Gatti, R. (1999). *Gender Inequality, Income, and Growth: Are Good Times Good for Women?*Policy Research Report On Gender and Development Working Paper Series, No. 1. Development Research Group/PREMN, The World Bank.

Földvári, P. & Van Leeuwen, B. (2011). Should Less Inequality in Education Lead to a More Equal Income Distribution? *Education Economics*, 19(5), 537-554.

Glomm, G. & Ravikumar, B. (1992). Public versus Private Investment in Human Capital Endogenous Growth and Income Inequality. *Journal of Political Economy*, 100(4), 813-34.

Hojo, M. (2009). Inequality in Japanese Education Estimation Using the Gini Education Coefficient. *The Japanese Economy*, 36(3), 3-27.

http://www.barrolee.com

Inter-American Development Bank. (1999). *Facing up to Inequality in Latin America* : Economic and Social Progress in Latin America, 1998-99 Report. Johns Hopkins University Press.

King, E.M. & Mason, A.D. (2001). *Engendering Development through Gender Equality in Rights, Resources and Voices* (Summary). A World Bank Policy Research Report. Washington DC: The World Bank Group.

Klasen, S. (1999). *Does Gender Inequality Reduce Growth and Development*? World Bank Policy Research Department, Working Paper 7, World Bank: Washington DC.

Klasen, S. & Lamanna, F. (2008). *The Impact of Gender Inequality in Education and Employment on Economic Growth in Developing Countries: Updates and Extensions*, EUDN Working Paper 2008–10 (Namur, Belgium: European Development Research Network).

Kuznets, S. (1955). Economic Growth and Income Inequality. *American Economic Review*, 65(4), 1-28.

Lim, A.S.K. & Tang, K.K. (2008). Human Capital Inequality and the Kuznets Curve. *The Developing Economies*, 46(1), 26-51.

Londoño, J.L. (1990). *Kuznetsian Tale with Attention to Human Capital*, Paper Presented at the Third Inter-American Seminar in Economics, Rio De Janeiro, Brazil.

Lopez, R. Thomas, V. & Wang, Y. (1998). Addressing the Education Puzzle. *The Distribution of Education and Economic Reform*. World Bank Policy Research Working Paper no.2031.

Maas, J.L. & Criel, C. (1982). *Distribution of primary school Enrolments in Eastern Africa*, World Bank Staff Working Papers No. 511, The World Bank, Washington D.C.

Makdisi, S., Fattah, Z. & Limam, I. (2006). *Determinants of growth in the MENA region*. In J. Nugent and M. H. Pesaran (Eds.), Explaining Growth in Middle East and North Africa. London: Elsevier.

Morrisson, C. & Murtin, F. (2007). *Education Inequalities and the Kuznets Curves: A Global Perspective Since 1870*. PSE Working Papers 2007-12.

Morrisson, C. & Murtin, F. (2009). The Century of Education. *Journal of Human Capital*, 3(1), 1-42.

Morrisson, C., & Murtin, F. (2010). *The Kuznets Curve of Education: A Global Perspective on Education Inequalities*. Centre for the Economics of Education, CEE DP 116.

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

Qian, X. & Smyth, X. (2008). *Measuring Regional Inequality of Education in China*: Widening Coast-Inland Gap or Widening Rural-Urban Gap?, *Journal of International Development*, 20(1), 132-144.

Ram, R. (1990). Educational Expansion and Schooling Inequality: International Evidence and Some Implications, *The Review of Economics and Statistics*, 72(2), 266-27.

Rehme, G. (2007). Education, Economic Growth and Measured Income Inequality. *Economica*, 74(295), 493-514.

Rosthal, R.A. (1978). *Measures of Disparity: A Note Research*, Report published by Killalea Associates, Inc. Available at EDRS Price, ED149482, ERIC database.

Sahn, D.E. & Younger, S.D. (2007). *Decomposing World Education Inequality*. Cornell Food and Nutrition Policy Program Working Paper No. 187.

Salehi-Isfahani, D. (2010). *Human Development in the Middle East and North Africa*, Human Development Research Papers HDRP-2010-26, Human Development Report Office (HDRO), United Nations Development Programme (UNDP).

Schultz, T.P. (1993). *Investments in the Schooling and Health of Women and Men: Quantities and returns*, Papers 702, Yale - Economic Growth Center.

Sen, A.K. (1979). *Equality of What?* Stanford University.

Sen, A.K. (1987). *On ethics and economics*. Oxford: Blackwell.

Sheret, M. (1988). Equality Trends and Comparisons for the Education System of Papua New Guinea. *Studies in Educational Evaluation*, 14(1), 91-112.

Thomas, V., Wang, Y. & Fan, X. (2000). *Measuring Education Inequality: Gini Coefficients of Education*, World Bank Policy Research Working Paper, no. WPS2525.

Thomas, V., Wang, Y. & Fan, X. (2002). *A New Dataset on Inequality in Education: Gini and Theil Indices of Schooling for 140 Countries, 1960–2000*. The World Bank, Washington.

Thomas, V., Wang, Y. & Fan, X. (2003). Measuring Education Inequality: Gini Coefficients of Education for 140 Countries (1960–2000). *Journal of Education Planning and Administration*, 17(1), 5-33.

Zhang, J. & Li, T. (2002). International Inequality and Convergence in Educational Attainment, 1960–1990. *Review of Development Economics*, 6(3), 383-392.

Notes

Not 1. Article 26 of the Universal Declaration of Human Rights.