

A. Elhirthi Hamid

Khemis - Miliana University
Algeria

IDENTIFYING PRO-POOR GROWTH EPISODES IN AL- GERIA: AN EMPIRICAL STUDY

Key Words

***Pro-poor growth;
Inequality; Poverty;
Algeria.***

Abstract

This paper aimed to show whether economic growth in Algeria was pro-poor or not (i.e. anti-poor). We used an inductive method based on the relative approach of pro-pooriness by drawing the poverty growth curve (PGC) in terms of historical distribution surveys of selected Arab economies. The findings confirm that economic growth was pro-poor in Algeria during the period 1995-2005 although we show that growth selected economies other than Algeria benefited the poor by a trickle-down effect. However, the study indicates that in general growth didn't exacerbate poverty in most selected Arab countries; at the same time more attention should be given to inequality in order to alleviate poverty in the Arab world.

Introduction

There is a growing focus on reducing poverty; this could be explained by their potential negative effects, which harm societal balance. The early hypothesis of the Kuznets curve led to a large development literature on the potential of economic growth effect on inequality and poverty. According to Kuznets, the first stage of development was described by positive growth rates with rising inequality, but when economy reached the

final step inequality slowdown occurred. This was explained by the famous process of trickle-down, suggesting a mechanic in which the rich get richer first and eventually benefits trickle-down to the poor. Accordingly, analysts used this to describe poverty reduction induced by economic growth without distributive policies, which means that some fraction of total benefits due to economic growth will always profit the poor,

especially the mostly deprived population, due to a sectoral shift from less remunerating sectors to those looking for best award (Kuznets, 1963). It should be mentioned that structural changes (redistributive policies) were omitted by the Kuznets model.

Economic strategies in most of the world are based on the assumption of mechanic trickle-down effect, whose advocates used panel data to support the idea that economic growth leads to greater poverty alleviation. Roemer & Gugerty (1997) used the Deininger-Squire data set to identify 61 intervals, covering 26 developing countries. Their study indicates that growth rate of 10% is associated with income growth of 10% for the poorest 40% of the population. The empirical study of Dollar and Kraay (2000) showed that private property rights, stability, and openness contemporaneously created a good environment for poor households to increase their production and income. The two researchers showed that, in average, past episodes of economic growth were not accompanied with significant modifications of distribution to the detriment or benefit of the severely deprived (Cling *et al.*, 2003).

Recent studies have showed that poverty is affected, in addition to economic growth, by the distribution of revenues between individuals.

However, economic growth is not a sufficient condition alone. In addition to economic growth, the efficiency of poverty reduction depends on how economic growth gains are shared across the population. Hence, the concept of 'pro-poor growth' (PPG) has emerged as an alternative solution to unsatisfactory results in terms of poverty reduction and theoretical analysis of the link between "growth, poverty, and inequality" (Bourguignon, 2000).

Experiences show that the effect of economic growth on poverty could be good, or even bad. Its positive effect was described by Kuznets as more employment opportunities were offered due to sectoral shifts (from rural to urban) and the enhancement in income levels most of the time benefited the poor. However, across transfer payments, if transfer did not work as described by Kuznets' mechanisms, inequality could be worse. That is why economists are still debating on whether growth is pro-poor or pro-rich.

Recent studies have attempted to clarify the link between growth and poverty by defining the PPG concept and proposing approaches and indices to measure it. As a result, various measures of PPG are proposed to investigate the claim that Growth is good for the poor, in order to reorient

policy making and provide a better understanding of the effect of both economic growth and inequality on poverty.

The interest of international community moved from enhancing economic performance in the 1990's toward eliminating poverty aspects, with the United Nations' development program (UNDP) performing an agenda of 8 goals, namely the millennium development goals (MDG's), the first of which aims to reduce by half the number of poor people by 2015. There is also a substantial change in ideas about how to assess poverty (income, consumption, absolute poverty, etc), as a result of bringing human poverty concept up (e.g. health promotion, better education attainment, well standard of living).

A literature review about the subject of economic growth effect on poverty shows that there are two approaches:

- a. A socio-economic (or pragmatic) approach described by efforts of enhancing PPG concept and measurement.
- b. A political (or moral) approach led by international financial institutions and based on inclusive and broad-based growth concept, which is defined as growth that facilitates the participation of the less well- off in expanding market

opportunities, with emphasis on improving basic services in health, education, and infrastructure (Son, 2007).

It seems that the idea of inclusive growth is consistent with that of PPG, that is, both concepts are concerned with the benefits of growth that go to the less well-off than to the better-off in society. However, prelude agendas for underdeveloped countries could hide conditionality in credit convention at international level, which could be detrimental by inhibiting economic performance, expanding the bill of government expenditure on social services, and reducing productive investment.

In order to judge gains of poor people from economic growth, economists came up with measures mostly based on combining economic growth ratio and poverty indices. These measures are more often known as PPG indices (e.g. Kakwani and Son 2008; Son 2004; Ravallion and Chen 2003; Kakwani and Pernia 2000; McCulloch and Baulch 1999). Consequently, various studies have attempted to shed light on how to measure and identify whether growth is pro-poor or not, but the debate is still persisting.

In this research, we use a relative measure to show if economic growth works for the poor more than the rich in Algeria, in order to judge the ne-

cessity for structural change to combat vulnerability. The paper is organized as follows. After the introduction, section 2 presents a definition and measurement of pro-poor growth. Section 3 presents an empirical analysis of growth effect on poverty using the relative approach of measuring PPG. Section 4 summarizes the results and offers guidelines to policy makers based on the findings.

Definition and Measurement of Pro-poor Growth

PPG could be defined as an issue to understand and analyze the effect of economic growth on poverty; it's an essential tool to judge either growth is good for the poor or not, even it's easy to drive conclusions from PPG indices, it seems that the culminant concern with measuring is to delimit the meaning of poverty.

Defining poverty

Poverty can be defined as "The state in which a given person or group of persons has not enough, in regards to some defined norm or threshold. The problem occurs of course when one attempts to define what is that norm or threshold, supposedly socially admitted (Diallo, 2009: 34-35). For Townsend "Individuals ... can be said to be in poverty when they lack the resources to obtain the types of

diet, participate in the activities and have the living conditions and amenities which are customary, or are at least widely encouraged or approved, in the societies to which they belong".

Poverty Measures

Measuring poverty frequently used a specified line, standards that could be based on: (i) minimum expenditure standard, i.e. the US poverty standard, (ii) minimum income standard, (iii) social indicators, and (iv) other standards.

Using a specified line we could measure poverty index. The mostly used indices are as follows:

The Poverty headcount (H)

The (H) represents the percentage of people under the "PL" in a specified society, community or even all over the world.

$$H = \frac{q}{N} \dots\dots (1)$$

where N is the total size of population and q the number of individuals having resources (i.e. revenues) less than the "PL".

As a policy tool, this measure holds a country in across countries analysis and comparative studies especially those held by World Bank and the UNDP, due to its divulgence in character and simplicity in percep-

tion. While this index complies with the focus and additive decomposability axiom, it does not satisfy the monotonicity and transfer axiom, thereby representing only a restricted guide to policy because it does not show the extent of resources assigned to every individual (i.e. distance between the proper income to a person and the "PL", especially for poor people) and it doesn't consider the important issue of distributional analysis (Amiel and Cowell, 1998).

The poverty gap index (PGI)

The PGI defines how far the poor are from the "PL" as a percentage of the "PL" (Haughton and Khandker, 2009).

If G_i represents the poverty gap for the i^{th} poor individual, then poverty gap is calculated as:

$$PG = \sum_{i=1}^q G_i = \sum_{i=1}^q (z - y_i) = q \cdot (z - \bar{y}) \quad (2)$$

Accordingly, the PGI is written as follows:

$$PGI = \frac{1}{n} \sum_{i=1}^q \frac{(z - y_i)}{z} = \left(\frac{q}{n}\right) \left(\frac{(z - \bar{y})}{z}\right) \quad (3)$$

Note that $\bar{y}$ is the mean income of the poor population, $(z - \bar{y})/z$ is the income gap ratio or poverty incidence (PI), which indicates the average distance between the revenue of the poor

and the "PL". It could be explained as the average gap of expenditure/income needed to reach the "PL" and as the PI breaking the monotonicity principle. It is not a good indicator of poverty: if, for example, the income of a non-poor person decreases below the "PL", the mean income of the poor will rise, thus reduce PI, despite the fact that poverty has risen.

The everity or the Foster Greer and Thorbecke (FGT₂)

Formally The FGT₂ index is written as follows:

$$P_\alpha = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - \bar{y}}{z} \right)^\alpha \quad \dots \quad (4)$$

Where $\alpha \geq 0$ represents a parameter named as "inequality aversion", in order to give selected weight to differences in income distribution between poor individuals.

With $\alpha = 0$, we have the poverty head count (H);

With $\alpha = 1$, it equals the poverty gap index (PGI).

A measure that has been used extensively in the measurement of poverty is P_α with $\alpha = 2$ (or FGT₂), as it satisfies the transfer and monotonicity axiom. Every index of the FGT family is also additively decomposable.

The severity or the FGT₂ index

Before the FGT₂ index family became known, Sen proposed in 1976 a similar poverty index that complies with the transfer principle:

$$S = H[I + (1 + I)G_p].. \quad (5)$$

where G_p is the Gini coefficient, which is a measure of inequality in distribution between poor people. It should be mentioned that for equally shared income between the poor, $G_p = 0$, the Sen Measure equals (PGI).

In comparison with the FGT indices, we criticize the Sen Index on two grounds. The first is the non-additive character of the subgroups contributions summation to total poverty up to 100 per cent. The second is that total poverty may diminish even when the poverty in each subgroup increases.

Inequality measures

The most useful index to measure inequality is the Gini index; it's calculated by:

$$Gini = \frac{1000 - \sum_{i=1}^n bi(a_i + (a_i + c_i))}{10000} \dots \quad (6)$$

where (i) is the share of class; (a) accumulation of income shares; (b) percentage of income receivers; and (c) percent share of income.

Note that there are many other tools to estimate inequality (Kuznets, Thiel index... etc). Recently a particular attention has been given to poverty eradication at international level, viz. studies in world institutions such as IMF, World Bank, UN are frequently using indices based on promoting opportunities, thus proposing many indices to measure poverty especially in the Human Development Reports (HDR).

The Human Development Index (HDI)

The composite HDI is part of the HDR since 1990; it is calculated as a geometric mean of 3 indices (health, education attainment, and economic growth).

$$HDI = \sqrt[3]{I_{Life} \times I_{Education} \times I_{Income}} \dots \quad (7)$$

All 3 indices are based on a following frame of calculation:

$$I_j = \frac{x_{ij} - Minx_{ij}}{Maxx_{ij} - Minx_{ij}} \dots \quad (8)$$

Where x_i is the actual value of index j ; $Min x_i$ and $Max x_i$ are the minimum and maximum fixed values for the index j . There are 2 sub-components for education index: adult literacy rate weighted by two-thirds "2/3" and combined gross en-

rolment rate weighted by one-third “1/3”. (UNDP, 1990)

We criticize HDI on two grounds:

- Upgrades do not take local disparities and deprivations into consideration; as a result, the index doesn't reflect inequality or even vulnerability;
- Because HDI uses economic growth rates, it favors industrial countries and neglects poor or underdeveloped countries. The gender-related development index (GDI) introduced in 1995 differs from HDI just in taking into consideration national gender inequality between male and female.

The Human Poverty Index (HPI)

Introduced by the HDR in 1997, the HPI consists of 2 formulas given by:

$$HPI - 1 = \left[\frac{(P_1^3 + P_2^3 + P_3^3)}{3} \right]^{1/3} \dots (9)$$

HDI-1 is computed for underdeveloped countries, where P_1 is the percentage of people not expected to survive to age 40, P_2 the percentage of adults who are illiterate, and P_3 deprivation in a decent living standard as an average of 3 subcomponents: the percentage of people without access to safe water (P_{31}), the percentage of

people without access to health services (P_{32}), and the percentage of moderately and severely underweight children under five (P_{33}).

For industrialized countries we used a 2nd formula as follows:

$$HPI - 2 = \left[\frac{(P_1^3 + P_2^3 + P_3^3 + P_4^3)}{4} \right]^{1/3} \dots (10)$$

Where P_1 is the percentage of people not expected to survive to age 60, P_2 the percentage of people who are functionally illiterate as defined by the OECD, P_3 percentage of people living below the income poverty line, set at 50% of the median disposable household income, and P_4 the rate of long-term unemployment.

The Inequality Adjusted Human Development Index (IHDI)

This index treats disparities in distribution between individuals for every dimension of human development and measures the effective human development. The IHDI formula is written as follows:

$$IHDI = \left(\frac{IHDI^*}{HDI^*} \right) \cdot HDI$$

$$= \sqrt[3]{(1 - A_{life}) \cdot (1 - A_{Education}) \cdot (1 - A_{Income})} \cdot HDI.. (11)$$

Where $IHDI^*$, HDI^* are the inequality adjusted HDI and the HDI

using a non-adjusted income, A_j represents Atkinson's measure of inequality for the dimension j , calculated by the following formula:

$$A_x = 1 - \frac{\sqrt[n]{X_1 \cdot \dots \cdot X_n}}{\bar{X}} \dots \quad (12)$$

Due to the diversity of data sources used for dimensional indices, the IHDI cannot explain the effect or interaction between disparities.

The Multidimensional Poverty Index (MPI)

Contrary to IHDI, the MPI is based on household surveys data only. Three dimensions are used, each weighted by a “ $3^{1/3}$ ” to give a sum of 10 points for 10 questions “2 for Health, 2 for Education, and 6 for decent life standard”. (UNDP, 2010)

The MPI is calculated by:

$$MPI = H \cdot A \dots \quad (3)$$

Note here that (q), which is the number of multidimensional poor people (having more than 3 points which means more than one third of indices) divided by the selected sample size or (n), gives the ratio of multidimensional poverty headcount (H). In Contrast, the poverty severity measure (A) is calculated by summing up each household's deprivation (points multiplied by corresponding rate), then dividing it by the result of multi-

plication between (q) and (p), which represents total points of all indices “supposed equal to 10”:

$$A = \frac{\sum_{i=1}^q d_i}{q \cdot p} \dots \quad (14)$$

The MPI is a useful tool to describe poverty in a broad sense but, like other proposed indices, it cannot analyze and judge the effect of economic growth on poverty.

Pro-poor Growth Concept

There is a conflicting debate on defining PPG; the literature shows 3 streams:

- a. The poverty reducing growth “any growth that reduces poverty is said to be pro-poor”. (Ravallion and Datt, 2002). The basics of this stream are first inspired from the work of Fields in 1989, who found in his empirical study across 18 countries that for just one case economic growth didn't have a positive impact on poverty. Moreover, he found that accelerating economic growth was fast in reducing poverty. There are many other empirical studies which gave strong support to the assumption that economic growth reduces poverty such as Deininger and Squire 1996, Ravallion and Chen 1996, and Bruno *et al.*,

1996. Despite this, the main idea of this stream has been criticized.

- b. The inequality reducing growth “a growth process is pro-poor if the poor benefit proportionately more than the rich” (Kakwani and Pernia, 2000; McCulloch and Baulch, 1999).
- c. The strong inequality reducing growth which is broader than the former by taking into consideration comparison of absolute gains between the poor and the non-poor (Kakwani and Son, 2003).

The PPG indices, just like poverty measures, can be classified either relative or absolute according to most studies. We start by reviewing the literature on the subject in order to understand PPG tools, and be able to choose the appropriate index in the next ‘empirical’ section.

Pro-poor Growth Measurement

The McCulloch and Baulch Poverty Bias of Growth

Using the decomposition of changes in poverty (Kakwani, 2000) into growth and inequality components, inequality effect on poverty could be represented, thus the PBG will capture the change in poverty due to inequality change with a 0 growth rate.

$$PBG = \Delta P_{\mu} - \Delta P.... \quad (15)$$

Where ΔP_{μ} is poverty reduction with distributionally neutral growth, and ΔP represents poverty reduction which actually occurred, thereby if the $PBG > 0$, there is a pro-poor bias of growth, while if $PBG < 0$, growth is described by an anti-poor bias (McCulloch and Baulch, 1998: 11). The disadvantage of this measurement lies in the fact that higher values of PBG may not reflect a higher reduction in poverty as the latter depends also on the growth effect.

The Kakwani & Pernia’s PPGI

According to Kakwani and Pernia, poverty elasticity could be used to identify whether growth benefits the poor relatively more than the non-poor. Their **PPG index** is based on comparison between total poverty elasticity of growth (δ), which is the percent of change in poverty due to 1% change in income or consumption and elasticity of poverty with respect on inequality (η) denoted as percent of change in poverty observed when the growth in mean income or consumption is 1% assuming a stable relative inequality “distribution-neutral growth”. The PPGI is defined as:

$$PPGI = \frac{\delta}{\eta} \quad (16)$$

Thus using PPGI to specify pro-pooriness gives one of three possibilities:

Pro-poor growth: $PPGI > 1$;

Trickle-down effect: $0 < PPGI < 1$;

Anti-poor growth: $PPGI < 0$.

Note that with negative growth rate, PPGI must be inferior to 1 as proof of smaller relative loss for poor compared with non-poor. This can be criticized on three grounds: (1) the PPGI is not monotonic, hence poverty degree cannot be assessed, (2) it does not include an actual growth rate “growth in mean income between initial and final period”, and (3) the PPGI may conflict with the Pareto principle as an equitable low growth rate can be judged more pro-poor than an inequitable high growth rate even if the former yields less absolute poverty reduction than the latter (Osmani, 2005). Hence, Kakwani & Son proposed the PEGR as an alternative tool.

The Kakwani & Son's PEGR

The poverty equivalent growth rate or PEGR is the product of PPGI and the growth rate of mean income (Kakwani and Son, 2008).

$$PEGR = PPGI \times g \dots \quad (17)$$

The PEGR satisfies the monotonicity axiom, and captures both the magnitude and the benefits of growth received by the poor. Thus, the growth is pro-poor if $PEGR > g$; anti-poor if $PEGR < g$. In contrast, if the PEGR lies between 0 and g , the growth is accompanied by an increase in inequality despite the fall of the poverty. Finally, the case $PEGR < 0$ corresponds to a situation of ‘immiserizing growth’ where the rise in inequality offsets the benefits of growth (Bhagwati, 1988).

The Ravallion and Chen ‘Growth Incidence Curve’

The GIC uses income growth rates by percentiles of a given income distribution. Let $y_t(p)$ denote the per capita income at the p^{th} percentile at time t ($t = 1, K, T$) and $L_t(p)'$ the first derivative of the Lorenz curve. Then, $y_t(p)$ can be written as:

$$y_t(p) = L_t'(p) \cdot \mu_t \dots \quad (18)$$

where μ is the mean income of the population.

The growth rate of per capita income $g_t(p)$ can be written as follows:

$$g_t(p) = \frac{L_t'(p)}{L_{t-1}'(p)} (\gamma_t + 1) - 1 \dots \quad (19)$$

where γ_t is the growth rate in mean income (i.e., $\gamma_t = (\mu_t / \mu_{t-1}) - 1$), $g_t(p)$ is the Growth Incidence Curve

(Ravallion and Chen, 2003). Hence, if $g_t(p) > 0$ for all p , then the first-order dominance condition leads to a reduction of poverty. Furthermore, if $g_t(p)$ is a decreasing/increasing function of all p , then inequality falls/rises over time for all inequality measures satisfying the Pigou-Dalton transfer principle; in this case, growth process is qualified as pro-poor/not pro-poor.

The GIC implies a Pareto improvement criterion (Amiel and Cowell, 1998).

The Son's Poverty Growth Curve (PGC)

The PGC shows the growth rates in the average income at different percentiles of income or consumption distribution. In particular;

$$g_t(p) = \Delta \ln(L_t(p)) = \Delta \ln(\mu L(p)) = g + \Delta \ln(L(p)) \quad \dots \quad (20)$$

where $g_t(p)$ is the growth rate in the mean income of the bottom p percent of the population, and $L_t(p)$ is the generalized Lorenz curve (Son, 2004); obtained by:

$$L_t(p) = (\mu_p / \mu) \times p \dots \quad (21)$$

where μ_p is the mean income of the p^{th} percentile, and μ the average growth rate.

Suppose that poverty line is unchanged between the two periods used

to draw the Son's PGC, so if $g_t(p) > \mu > 0$ for all p "which means that the poor benefit by a higher rate of economic growth than the rich due to the reduction of inequality $\Delta L(p) > 0$ ", one can conclude that growth was pro-poor; whereas if $0 < g_t(p) < \mu$ for all p means that growth reduced poverty with an increasing inequality, then there is co-existence of reducing poverty "alleviating absolute poverty" with a growing inequality "increasing relative poverty". This process was qualified as trickle-down by Son (2004), in order to differentiate this situation from strong PPG which means reducing both poverty and inequality. In contrast, negative rate of effective growth rate $g_t(p) < 0 < \mu$ means that inequality increases so much to an extent at which the beneficial impact of growth will be absorbed by the rich, a phenomenon could be characterized as immiserizing growth (Bhagwati, 1988). The PGC is based on the second-order dominance, hence compared with GIC the former provides more conclusive results.

In this paper, we will shed light on the link between economic growth and poverty by using the approach developed by Son (2004) using PGC to describe the interaction between both variables.

Empirical Analysis: Growth Effect on Poverty

Data sources of analysis

Episodes of PPG across selected countries

We used Living Standards Measurement survey, abbreviated by LSMS data, for consumption expenditure per capita in Algeria, which is extracted from the National Center of Studies and Analysis for Population and Development. We will also highlight the situation in Algeria relative to some selected Arab countries (see Table 1 and Table 2).

Using different poverty lines, we can see that the headcount ratio indicates that poverty decreased over the period 1988-2005 except for the 1990's which witnessed a high level of poverty due to negative effects of economic reforms (see Table 2). A significant increase of inequality had been reached in 2005 after a slowdown in the end of the last century. We chose

a set of countries from the Arab world, with approximate or similar economic structures, to be compared with the case of Algeria, in order to show how varied the growth effect between selected countries.

PPG analyze using a relative index (PGC)

Table 1 shows that absolute poverty rose in Algeria about 2 points using the nutritional PL, and 6 points using the general PL between 1988 and 1995. The main reason was the vulnerability related to the fall down of oil prices in international markets. This led to a large reduction in rental resources which were financed essentially by the oil sector "about 97% of government fiscality came from oil taxation and 99% of exports were "extractive raw materials". Subsequently, the exterior debt bundle increased largely, thus compelling the government to engage in structural reforms to achieve more credits. The first decade of the 3rd millennium

Table 1
Poverty Headcount & Gini index in Algeria

Years	1988	1995	2000	2005
Poverty lines				
1 \$ a day	1,9	-	0,8	0,6
Nutritional	3,6	5,7	3,1	2,7
General	8,1	14,1	12,1	5,7
Gini index	36	35,16	31,71	35,75

Source: LSMS 2005, at: www.ceneap.com.dz/lsms2005.htm

Table 2
Expenditure Surveys of Selected Arab Countries

%population	Jordan		Djibouti		Egypt		Morocco		Mauritania		Yemen	
	1997	2006	1996	2002	1995	2005	1999	2007	1996	2006	1998	2005
Poorest	3,11	3,01	2,37	2,33	4,18	3,85	2,65	2,66	2,43	2,54	2,99	2,91
2 nd decile	4,35	4,20	4,02	3,66	5,33	5,11	3,77	3,86	3,88	3,64	4,44	4,27
3 rd decile	5,27	5,11	5,17	4,70	6,11	5,92	4,74	4,76	5,01	4,71	5,52	5,20
4 th decile	6,20	6,03	6,29	5,79	6,90	6,72	5,77	5,69	6,14	5,82	6,59	6,11
5 th decile	7,20	7,02	7,46	6,96	7,72	7,55	6,91	6,69	7,35	7,00	7,72	7,08
6 th decile	8,34	8,18	8,78	8,30	8,68	8,50	8,22	7,85	8,71	8,35	8,98	8,19
7 th decile	9,73	9,59	10,32	9,93	9,82	9,66	9,81	9,31	10,32	10,00	10,45	9,55
8 th decile	11,60	11,51	12,33	12,07	11,35	11,23	11,95	11,30	12,41	12,28	12,33	11,40
9 th decile	14,67	14,67	15,42	15,52	13,87	13,84	15,39	14,66	15,62	16,10	15,20	14,47
Richest	29,53	30,68	27,48	30,74	26,04	27,62	30,79	33,22	28,13	29,56	27,78	30,82
Gini Coef	36,42	37,72	36,77	39,96	30,13	32,14	39,46	40,88	37,29	39,04	33,44	37,69
Mean Exp	1819	2521	1806	1122	1174	1350	1557	1937	944	1060	1084	1008

Source: world Bank "Povcal data source". At:
<http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp>

witnessed a reduction in terms of absolute poverty. This was divided between 2000 and 2005 using the general PL, but we could see that inequality was still at high rate measured by the Gini index "more than 35% for most cases".

The selected Arab countries showed rising inequality in terms of income distribution using the Gini index, which rose by more than 2 points between the initial and final years in all cases except for Mauritania and Jordan (see Table 2). The least rate of inequality was recorded by the Egyptian economy (Table 1 compared to Table 2).

This study used the PGC index to analyze pro-poorness of growth, in light of its advantage of being easy and requiring just decile or quintile shares extracted from the LSMS data, in addition to respecting the monotonicity criterion unlike some other indices.

Growth was pro-poor for the episode between 1988 and 2005; this was due essentially to the relatively pro-poor growth during 1995-2000 and the continuous fall down of inequality during the period 1988-2000, but since $g(p)$ was negative during the first episode for all values of p , poverty

was increasing in Algeria during this episode (see Table 3).

The PGC for selected Arab countries is presented in Tables 3 and 4 where points “or values” are calculated by Eq. 20. Note that the bottom $p = 100$ effective growth rate or “cumulative average income growth for the p^{th} percentile” is equal to mean growth rate showing in the last row of the Tables 3 and 4.

Results show that we cannot argue for PPG as the mean growth rate (in the last row) is greater than effective

growth rates “other cells in corresponding column” for Jordan, Egypt, Djibouti, and Yemen. In contrast, the results for Morocco and Mauritania are inconclusive “values in the last row are not the highest nor the lowest to other values in corresponding column, thus we cannot judge whether extent growth is pro-poor or not”.

Table 5 contains actual and effective growth rates of selected episodes for Algerian economy. The first column represents mean growth rate calculated by dividing the difference

Table 3
Poverty Growth Curve for Algeria: 1988-2005

Percentile	1988-1995	1995-2000	2000-2005	1988-2005
20%	-0,91	4,18	1,96	1,43
40%	-1,26	3,49	3,29	1,48
60%	-1,31	3,24	3,51	1,45
80%	-1,34	2,90	3,60	1,36
100%	-1,42	1,56	3,29	0,84

Table 4
Poverty Growth Curve for Selected Arab Countries

Percentile	Jordan	Egypt	Morocco	Mauritania	Djibouti	Yemen	Algeria 95-2005
10%	3.263	0.638	2.777	1.602	-5.478	-1.426	-
20%	3.248	0.890	2.923	0.951	-6.007	-1.527	3.07
30%	3.263	1.013	2.863	0.772	-6.158	-1.681	-
40%	3.281	1.089	2.759	0.720	-6.176	-1.827	3.59
50%	3.298	1.144	2.635	0.705	-6.142	-1.953	-
60%	3.326	1.183	2.513	0.714	-6.083	-2.051	3.35
70%	3.357	1.221	2.412	0.744	-5.996	-2.112	-
80%	3.395	1.262	2.329	0.814	-5.892	-2.122	3.05
90%	3.444	1.312	2.283	0.958	-5.745	-1.653	-
100%	3.626	1.552	2.730	1.159	-5.289	-1.038	1.39

Table 5
Gains and Losses for Growth Episodes in Algeria During 1988-2005

Episodes	Growth rate (%)		Losses or gains
	Actual	Effective	
1988-1995	-1,42	-1,33	0,09
1995-2000	1,56	2,48	0,93
2000-2005	3,30	3,30	0,00
1988-2005	0,84	1,15	0,31
1995-2005	2,42	2,89	0,47

between final and initial annual per-capita income by the number of years included in the concerned episode, while the second is the average growth rate for the p^{th} quintile. Note that cumulative shares of income are used to calculate effective growth rate, the last column is obtained by subtracting actual from effective growth rate.

We can observe the relative poverty fall down for almost all the episodes “except for 2000-2005 where growth could be qualified distributionally neutral or without effect on inequality” as $g_t(p) > 0$, while the Algerian economy experienced a slowdown during the period of reforms in the 1990’s, viz. absolute poverty increased but with a less severe effect on the poor relatively to the rich while inequality had been reducing “gains recorded as positive values in Table 5”. In the period between 2000 and 2005 growth benefits were offset by decelerating equality; this situation

could be qualified as trickle-down effect according to the PGC points calculated in Table 3.

In this study we used the PGC index as a measure of PPG during the 1990’s for selected Arab countries. The results show that economic growth was characterized by a trickle-down effect in Jordan and Egypt “as up to the top of PGC (Fig. 1 & 2) the effective growth rate is positive and less than mean growth rate ($0 < g_t < \mu$)”. This case is qualified as poverty reducing growth with an increase in inequality, while for both Djibouti and Yemen we assist a slowdown with an increasing inequality. The absence of economic growth coupled with increasing inequality assumes that the slowdown was severe on the poor.

Note that the shape in Figures 3 & 4 takes the U form ending with negative values of mean growth rate “higher than effective growth rate (g_t)”.

That is what qualifies growth as not pro-poor. Finally inconclusive judgment about growth in both Mauritania and Morocco are presented in Figures 5 & 6 where the PGC shape takes U and Z shape, with a medium final value between maximum and minimum effective growth rates.

This comparative study shows enhancement of inequality reduction during selected periods for Algeria using the Son & Kakwani methodology, as shown in Table 6. We calculate values in the last column for the selected episode for a given economy by using average gains/losses for all subgroups “shares of population” in national distribution. Positive values ($\bar{g}_t > \mu$) reflect gains, while negative

ones reflect losses ($\bar{g}_t < \mu$). The same method is applied to find the results in the 2nd column for effective growth rate, which is calculated by the average of mean income growth rate for each subgroup weighted by the cumulative shares of income.

The PGC presented in Figure 7 takes the shape of inverted U with a lowest end, showing that growth was pro-poor during the 1995-2005 episode in Algeria, while for all $p < 100$ effective growth was higher than mean growth rate ($g_t > \mu$). Thus, there is a higher relative benefit (g_t) for the poor than average “mean growth rate μ ”. According to the results in Table 6, economic growth in the selected countries was not pro-poor in a relative

Table 6
Gains and Losses in Selected Arab Countries Using Son & Kakwani Methodology

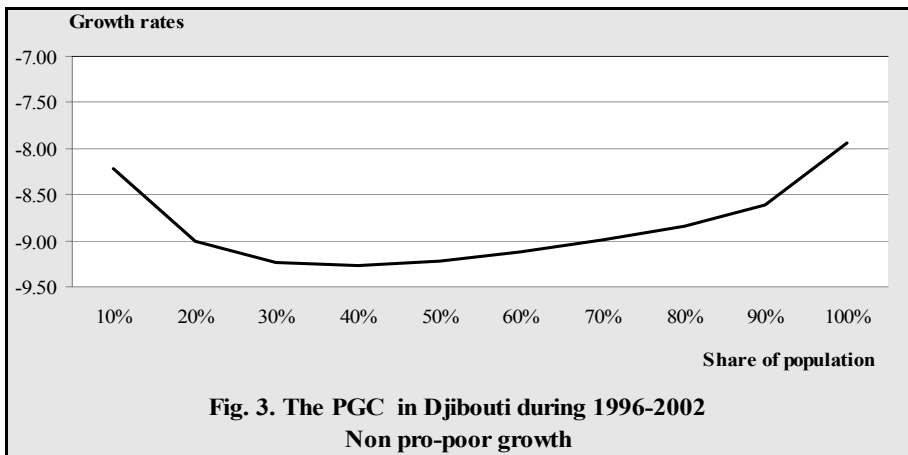
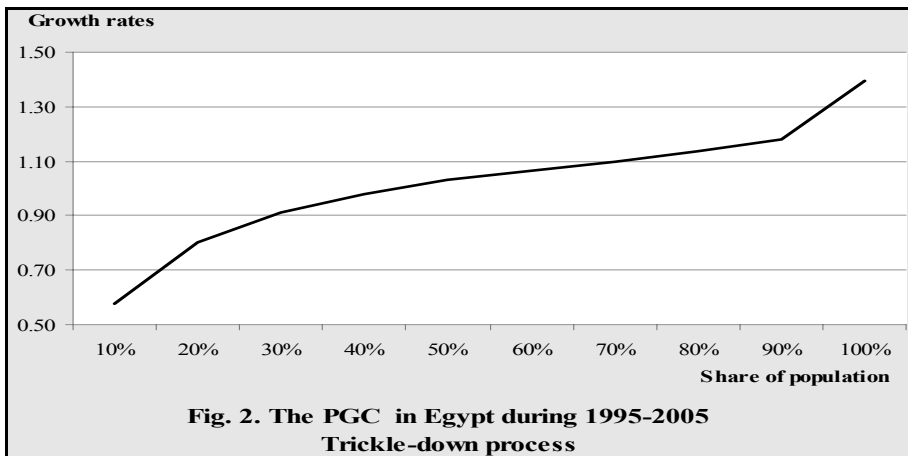
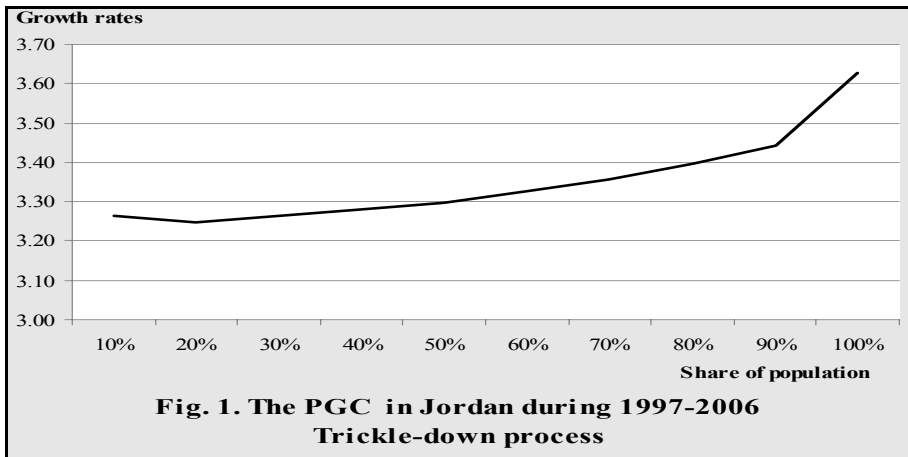
Nation	Period	Actual (*) growth rate	Effective (**) growth rate	gain or Loss (***)
Algeria	1995-2005	2,42	2,89	0.47
Jordan	1997-2006	3,63	3,45	-0.17
Djibouti	1996-2002	-7.93	-8.55	-0.61
Egypt	1995-2005	1.4	1.2	-0.2
Morocco	1999-2007	2.73	2.55	-0.18
Mauritania	1996-2006	1.16	0.97	-0.19
Yemen	1998-2005	-1.04	-1.54	-0.5

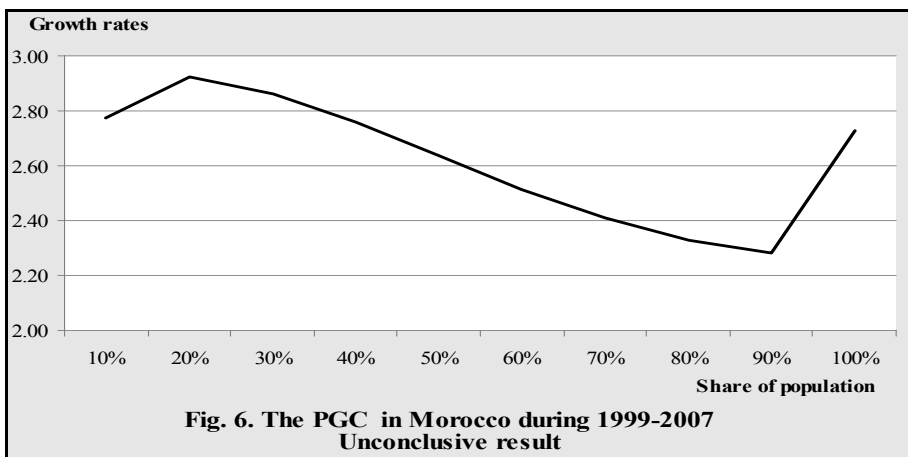
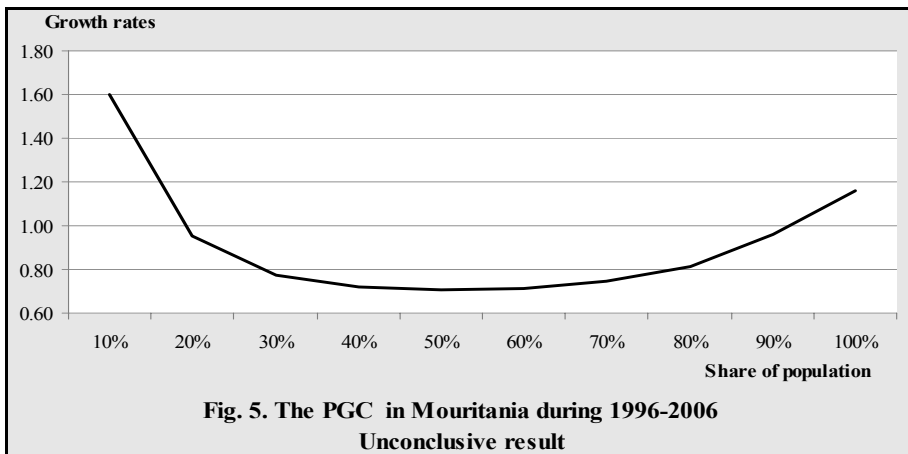
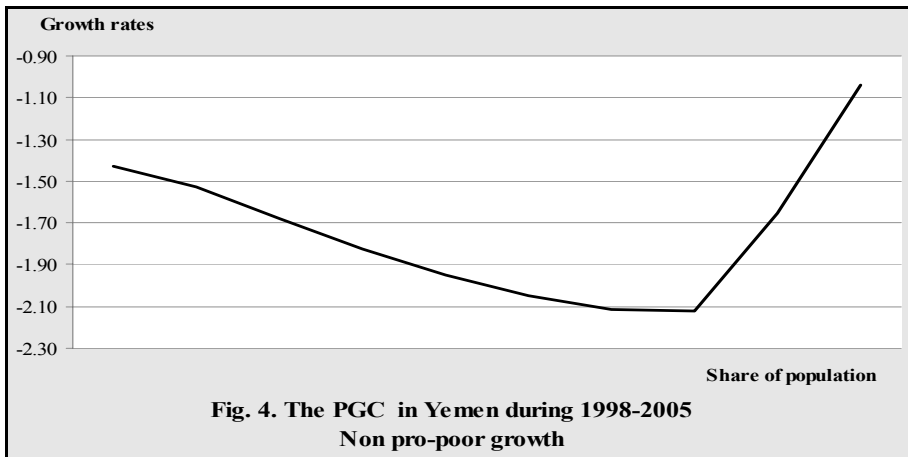
Source: Author's calculation using data of the Table 1.

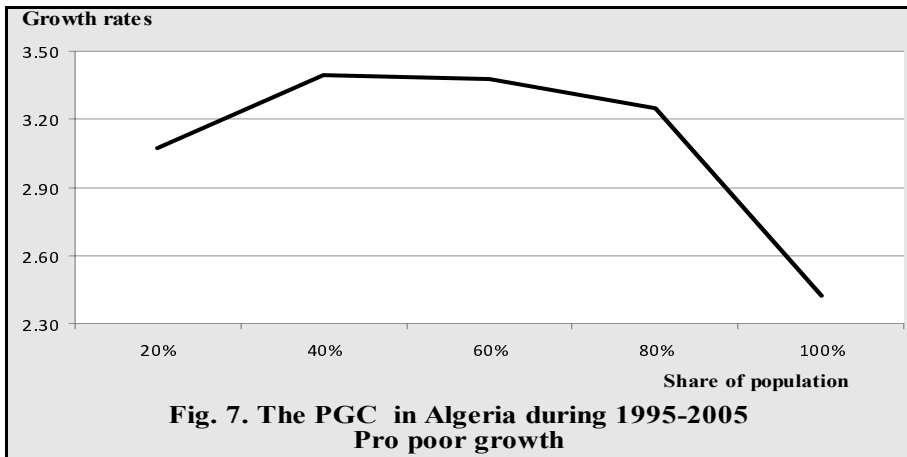
Notes: (*) Annual growth rate of mean expenditure.

(**) Average growth rate of all deciles mean annual expenditure.

(***) Results represent the change in inequality, and are calculated by the difference between effective and actual growth rate.







sense except for Algeria, but certainly this was due to economic reforms engaged by the governments of almost all underdeveloped economies. The comparative beneficial effect of growth on poverty in Algeria (shown in Tables 4 & 6) is due essentially to reflationary fiscal policy pushed by the progress of returns from the oil sector following the rise of prices in international oil markets.

Concluding remarks

This paper employed a relative methodology proposed by Son to investigate whether growth was pro-poor or not. It also compared the results between selected countries using episodes from the 1990's and the first decade of the new millennium. Thus, the empirical investigations which have considered the Algerian economy case show that episodes were

pro-poor except for the one between 2000 and 2005.

Regarding the selected Arab countries, the results indicate that the economic slowdown was more severe on the poor than on the rich in both Djibouti and Yemen and could be considered as pro-rich. However, for Egypt and Jordan growth could be described by a trickle-down process as the value in the last row which represents growth rate in mean (μ) is positive and greater than other values (g_t) for the corresponding column. As for the PGC of Morocco and Mauritania, the results were inconclusive.

Finally, it should be mentioned that using expenditure surveys in this empirical study may hide interesting results because it only treats consumption distribution, which is a material aspect of welfare. Introducing other aspects such as income distribution, education, health, etc. may reveal

different conclusions, including how far marginalized strata are poor in Algeria using a broader index. As we know, expenditure does not reflect significantly the welfare or wellbeing of individuals in underdeveloped countries.

Our findings support what Ali (2009) concluded in his study about pro-poorness of economic growth for the same sample of Arab countries “used in our study to be compared with Algerian economy”. He found that economic growth was not pro-poor because inequality rose up.

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Abdallah Elhrtsi Hamid (Ph. D. in Economics from Chlef University - Algeria). Assistant Class "A" at the Faculty of Economic Commercial and Managerial Sciences, Khemis-Miliana Univeristy - Algeria, his research interests are economic growth, poverty, finance especially: public and local finance, sociology applications for economies, entrepreneurship, psychology sociology of production, econometrics.

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