INCOME INEQUALITY AND ECONOMIC DEVELOPMENT: FRIENDS OR BEST ENEMIES? EMPIRICAL EVIDENCE FROM ALGERIA

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"there are two kinds of inequality among the human species; one, which I call natural or physical, because it is established by nature, and consists in a difference of age, health, bodily strength, and the qualities of the mind or of the soul: and another, which may be called moral or political inequality, because it depends on a kind of convention, and is established, or at least authorized by the consent of men. This latter consists of the different privileges, which some men enjoy to the prejudice of others; such as that of being more rich, more honored, more powerful or even in a position to exact obedience"[1]

Jean Jacques Rousseau "the Origin and Foundation of The Inequality of Mankind and is it Authorized by Natural Law?"(1754)

The concept of Inequality has been lately widely debated based on the observed fact that the gap between the poor class and rich class seems to take huge proportions in our modern world. Inequalities are considered as the hole through which well-being flees, inflicting on society and the economy significant losses; which each country needs and have to plug to guarantee a decent life to citizens. The relationship between inequalities and economic growth still ambiguous. Assuming that inequalities are a brake that slows down any possible economic growth while creating a social evil and an environment hostile to development , this paper attempts to examine the nature of this relationship taking as special study case the impact of income inequality measured by the Gini index on the Algerian economic growth. Two econometric estimated models are proposed to measure the economic impact of the inequalities for a panel of developing countries as a first step. A series of OLS regressions are run to assess the nature of the relationship between economic growth and income inequality, and the weight of each impact for the Algerian economy as second part.

Keys words: *income Inequality, economic growth, Gini index, panel data, and econometric model.*

INTRODUCTION

When we evoke Inequalities the first thing that comes to one's mind is unfairness, rich are richer and poor are poorer and poorer, poverty, the rich shouldn't be so rich …ect. The term of inequality is applied in many different contexts which seem to be at first more an ethical issue than an economic issue. Contrariwise Equality is linked to the principle of respect for persons[2]. In the last decade Inequalities grew very fast all over the world and has been widely debated based on the observed fact that the gap between the poor class and rich class seems to take a huge proportions in our modern world. In fact in modern societies complete equality between the rich and poor is perceived to be unachievable. This very sad picture makes a growing interest amongst economists and politicians on the question, rising levels of inequality has become a key political issue in recent years, and it has received a huge amount of attention in the policy circles. Inequalities are now one of the most important issues that the economic policies makers must imperatively take into account as central one. They are considered as the hole through which well-being flees, inflicting on society and the economy significant losses; which each country needs and have to plug to guarantee a decent life to citizens. Recent literature is very interested in the relationship between inequalities and economic growth, but this relationship is not very clear and still ambiguous. Indeed when it comes to determine the impact of inequality on the development, researchers have contrary conclusions. From a purely theoretical point of view, it is not clear if an increase in inequality has a positive or a negative impact on the development[3] . In fact, increases in inequality have positive[4] effects as well as negative[5] effects, but there are a number of reasons why we think at the first place that inequality has negative economic and social implications: lower consumer spending, more likely end to growth spells, social friction and political control by the rich. It has a negative effect on societies and economies and it may harm a country's economic performance more than been benefit for it, leading to lower consumer spending, growth spells, social friction and political control by the rich. Indeed inequality causes the increase ill health and health spending and reduces the educational performance, making societies the worse places to live with hostile environment. , which leads to a reduction in the productive potential of the work force. It is more difficult in an unequal societies to climb the economic ladder if the goal gets further and further away. Add to all these empirical researches proved that there may be a correlation between well-being measured by income and/or educational inequality. In another context Inequality can leads to rises in crime, create distrust, anxiety and increases in mental health related disorders (Mary Adeyi , 2016). It may lead also to political instability and social unrest, with harmful effects on growth (Alesina and Perotti, 1996; Knack and Keefer, 2000). All theses consequences create a kind of brake on development. In all societies, human beings care deeply about inequality. Across the world, people hold strong and often contradictory views on what constitutes acceptable and unacceptable inequality. Changes in inequality[6] levels have concrete consequences for people's living conditions, and they challenge beliefs in justice and fairness. In our beliefs Economic inequality is inevitable, however, that where rising inequality is not properly addressed, it leads to social catastrophes. The issue that we address in this paper is whether of these effects are predominant? And which one is the real impact of inequality on the

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[2] dr simon longstaff ao executive director the ethics centre
[3] real gross domestic product (GDP).
[4] growth-promoting effects
[5] growth-dampening effects
[6] Economic growth is, naturally enough, usually a key policy goal. It's essential if societies are to pay for things like healthcare, education, public parks and so on. But a rise in GDP – the most widely used measure of economic progress – is not necessarily a sign that all is going well. For example, it can disguise underlying problems – such as build-ups of unsustainable debt – that may eventually trigger a painful reversal.

economic development. The answer to this question depends on the degree of income inequality of each economy. Much of inequality discussion has focused on what's been happening in rich countries, we try to discuss this issue in the rest of the world, particularly in Algeria for a specific kind of inequalities which income inequality.

1- GROWTH PROMOTING AND DAMPENING EFFECTS OF INEQUALITY

The relationship between growth and inequality has long been an important issue , a number of theories have emerged over the years around an important question: Are inequalities good or bad for growth? Two groups with opposite points of view tried to answer this question ,the first believe that inequalities can be good and necessary for the development of an economy by providing incentives and a source of investment . Indeed The first research papers for most of them supported the thesis of the positive impact of social inequalities, considering them as the vehicle for economic growth in the way where an increase in income inequality pushes and promotes the economic growth through the higher savings propensity of high-income agents which leads to higher investment levels, and thus has a positive effect on economic growth. a higher income than others are incentive for more investment in one's own education and which will increase productivity , and incentive for risk taking such as innovations. According to Freedman who is one of those who believe that an amount of inequalities is necessary for an economic growth, arguing that inequality is good for growth – up to an amount. But more than that amount, rising inequality means falling growth: *"The few people with the skills or background to compete for the top jobs work hard", "while everyone else coasts because they have little or no chance of reaching the top." This argument makes a case for "optimal" inequality or, what some have called, "just-right inequality"* – not too little, not too much. The second group believes that inequalities have a bad effect on the economic growth because it can prevent poorer people from investing in their education and encourage the rich to grab a bigger slice of the economic cake without making the cake bigger. Inequality carries high economic, social and moral costs. The unequal distribution of income and access to basic services like education and health can overthrow the economic growth and social cohesion, rise health care costs and drive up crime. Having demotivating effects such as reduced efforts lack of investment in one's own education no risk taking effort is not worth it. Social tensions such as increases in strike days increases in property crimes and protests or even economic chaos and political unrest. Because these disturbances unsettle investor's investment declines and production potential grows more slowly. Essential state redistribution measures lead to welfare and growth losses while high taxes present a negative incentive to performance.

In simple Keynesian models, the poor spend most of their incomes, while the rich spend a much smaller portion of their incomes, shifting income from one class to another will reduce the total consumer spending , this would reduce the overall level of income and production. People in the bottom of the income distribution will borrow money to sustain their spending; this borrowing is unfortunately not sustainable and contributed to the eventual fail. Economists have long been interested in the relation between development and inequality level, and the idea that a country's level of development might help determine its level of inequality. One of the pathfinder was Kuznets, he argued that inequality follows a natural trajectory as economies move further away from their agricultural roots and the shape of inequality that it traced – an inverted-U – seemed to match the facts reasonably well. However, rather than rising and then falling, the trajectory of inequality now appears to be more U-shaped: It was high at the start of the 20th century, fell in the middle of the century, but has been rising since the 1970s. this fact shows the dificulties to determine the kind of the complexe relation between inequality and growth. We are here standing as a reader a little bit confused, does inequality good or bad for economic growth? One must wonder if a world with more equal incomes would be devoid of

overly consequences, we have not evidence that a more equal society generates less optimism at the time of economic booms.

2- HOW INEQUALITY MAY AFFECT ECONOMIC GROWTH: EMPIRICAL EFFECT

Income inequality is a socio-economic problem that affects countries; several considerations have been taken to resolve this problem of distributive justice. Several inequality indexes are constructed to measure this phenomenon. The Gini index is the most used indicator of inequality in research on this subject. As part of this research, we propose to answer the following questions: How do income inequalities evolve over time? Are there disparities in income distribution in Algeria? Is a Kuznets curve still valid?

The problem of income inequality lies at the heart of the economy and affects its growth as well as the well-being of households. The analysis of the evolution of inequalities between the years 1985 and 2015 constitutes the body of this paper. It should be noted that the aim of this work is not to analyze the solutions proposed in order to reduce inequalities but rather to conduct an analysis of income inequalities and visualize their existence in an empirical framework. We try to study the relationship between inequality and economic growth in two parts; the first will be devoted to a panel of 15 countries , 3 countries of sub-Saharan Africa, 04 MENA countries, 02 countries of the " South and East Asia, 04 countries of Latin America, and two other countries. The second will be for the Algerian economy. The models used were thus developed in the same framework and later estimated with two methods (ordinary least squares OLS and generalized moments GMM) however, a problem arises: the lack of data on the distribution of income inequality. This means that there is always a certain margin of error concerning the results obtained.

In this section we tried to estimate the overall impact of inequality on growth under a panel data structure. We first set out to experience the direct effect of inequality on growth, as in most of the research carried out. However, the question arises as to the choice of a growth equation. The chosen equation is inspired by the specification of (Cogneau and Guénard 2002) [7] involving the Gini index delayed by a period (GINI (-1)) and the *Gini* squared index to assess the non a non-linear relationship, while many of the additional control variables are discussed in the literature, we have limited ourselves to a simple and unconditional relationship of the following form:

$$Y_{it} = \alpha_i + \beta_1 G_{it} + \beta_2 G_{it}^2 + \beta_3 G_{it-1} + \beta_4 lg X_{it-1} + \varepsilon_{it}$$

Where i denotes the country and $(t, t-1)$ is a time interval of 31 years (1985-2015), the error term ε_{it} is supposed to satisfy the hypotheses of white noise; α_i refers to a country-specific effect in the panel estimate called the fixed effect.

The GDP Growth (Y) [8] is expressed as the annual growth rate of GDP at market prices based on constant local currencies. Aggregate data is based on constant 2010 US dollars. GDP is the sum of the gross value added of all resident producers in an economy plus all taxes on products-subsidies are included in the value of products. The *Gini* coefficient (G): is defined as the Gini coefficient for the 15 countries, its value varies between 0% and 100%, 0 represents perfect equality and 100% represents perfect inequality[9]. The GDP level (lgX) is translated as the logarithm of annual GDP per capita from 1985 to 2015. GDP per capita is calculated by dividing

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[7] « LES INEGALITES ET LA CROISSANCE : UNE RELATION INTROUVABLE? » Document de travail DIAL / Unité de Recherche CIPRE Janvier 2002

[8] Data were collected from the World Bank website

[9] The data were collected from the University of Texas inequality project http://utip.lbj.utexas.edu/.

the value of GDP by the number of inhabitants of each country. While gross domestic product is often used as an indicator of a country's economic activity, GDP per capita is used as an indicator of the standard of living of its inhabitants and therefore of the level of development of a country.

Two types of estimators are considered: The ordinary least squares estimator in the total data dimension (OLS levels) provides a point of reference in relation to the results of previous work on panel data. Arellano and Bond (1991)[10] propose a more efficient estimator based on the use of additional instruments, widely used for the estimation of functions on panel data. This estimator is used by several authors by studying the link between inequality and growth, namely Forbes (2000); Deininger and Olinto (2000); Castellò (2010); Ostry, Berg and Tsangarides (2014). According to Arellano and Bond the Gini variables are assumed to be endogenous, because there is a sense of causality that can run both ways - from inequality to growth or from growth to inequality - these variables can be correlated with the term error.

The characteristics of the invariant countries over time (the fixed effect or the individual effect constant over time) can be correlated with the explanatory variables. The fixed effects are contained in the error term in the specification equation (ε_{it}), which includes the unobserved specific effects of a country (Yi), and the observed specific error (eit): $\varepsilon it = Yi + eit$. the presence of a delayed dependent variable ($Gi, t - 1$) gives rise to an autocorrelation. To solve the 1st and the 2nd problem Arellano and Bond (1991) used delayed regressions of the endogenous variables as instrumental variables in our case ($Gi, t - 2; Gi, t - 3 \dots$), which makes our predetermined endogenous variables and therefore not correlated with the error term.

3- EMPIRICAL RESULTS AND INTERPRETATIONS

To assess the effect of income inequality on GDP growth in 15 countries in different regions of the world, we carried out an estimation of a model pooled by OLS and GMMs. The results are summarized in the Table 1. The model (1) examines the direct impact of income inequality on growth, while the second equation introduces a nonlinear Gini effect. If we look closely at these empirical results we can see that inequalities have a significantly positive impact on economic growth with a coefficient between 0.19 and 0.22 (we notice that this positive link which exists is reinforced by instrumentation; 1 additional point of Gini index generates on average between 0.1 and 0.3 points of additional product growth per capita). But the sign of causality is reversed when we consider a non-linear relationship (inequalities appear harmful to growth), of course that growth is weak with a coefficient of 0.01). We can explain this positive relationship as follows: From a purely theoretical point of view, it is not clear whether an increase in income inequality has a positive or negative impact on the development of gross domestic product (GDP). Which of these effects are present in reality? The answer to this question strongly depends on the degree of income inequality already achieved. If the income of an economy is distributed perfectly evenly, there is little incentive for individuals to work more to intensify their efforts to reach the wealthiest class and have this gap destroyed. Therefore, with an increase in income inequality, we can expect growth incentives to prevail and GDP to increase as our empirical results have shown. We can also explain this by the fact that the widening gap between the upper and lower classes encourages the wealthiest to save, which leads to larger investments and therefore a positive effect on economic growth. However,

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[10] « Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations » , The Review of Economic Studies, Vol. 58, No. 2 (Apr., 1991), pp. 277-297

if income is very unevenly distributed, people are also not very motivated to work. In this case, an increase in income inequality should have a negative impact on economic growth. Consequently, it can therefore be assumed that the relationship between the degree of income inequality and economic growth - measured on the basis of GDP growth - follows an inverted U-shaped pattern. If we look at this negative relationship from another point of view, a sharp increase in uneven distribution will impact the quality of services, in other words, when individuals (working in health services, education, commerce, etc.) note that the gap is increasing more and more they will be more encouraged to double their efforts since for them even if they do they will not reach this upper class. An IMF study points out the influence of quality services on three dimensions of economic results (level of development and subsequently economic growth. The above shows that the relationship between the degree of income inequality and economic growth is not linear, and that it acts differently in the short and long term.

Table 1: The model's estimation results

	Model(1)		Model(2)		Model(3)		Model(4)	
	OLS	*GMM*	*OLS*	*GMM*	*OLS*	*GMM*	*OLS*	*GMM*
Constant	-5.52**	-7.05**	-38.79*	-31.98**	-41.26*	-43.07**	-43.91*	-38.73**
	[-2.36]	[-2.33]	[-3.09]	[-2.02]	[-3.02]	[-2.26]	[-3.27]	[-2.18]
Gini index	0.19*	0.22*	1.63*	1.30***	1.58*	2.20**	1.78*	1.48**
	[4.05]	[3.62]	[3.04]	[1.94]	[2.59]	[2.20]	[3.13]	[1.99]
Gini index²	-	-	-0.01*	-0.01	-0.01*	-0.01***	-0.01*	-0.01***
			[-2.69]	[-1.61]	[-2.59]	[-1.93]	[-2.76]	[-1.69]
Gini index (-1	-	-	-	-	0.13	-0.45	-	-
					[1.12]	[-0.96]		
lgX(-1)	-	-	-	-	-	-	0.20***	0.44*
							[1.91]	[3.44]
Number of observations	420	420	420	420	420	420	420	420
R²	0.034	0.031	0.049	0.048	0.054	0.006	0.059	0.073
F-stat	16.423	203.32	11.96	11.091	8.498	0.966	9.338	41.06
D-W	1.64	1.644	1.655	1.664	1.626	1.673	1.647	1.641

Note: Dependent variable GDP growth , the estimation period is, the data are data , t-statistics shown in []. *** significant at 10 percent, ** significant at 5 percent, * significant at 1 percent.

Source : The authors using Eviews based on the world bank data

3-1- ESTIMATION OF A KUZNETS CURVE

Even if the recent empirical literature has rather neglected the Kuznets curve, we tried to estimate the causal relationship going from growth and development variables to inequalities. The model used is inspired by the University of Texas project on inequality[11], it takes into account the non-linear effect that can exist between growth and inequality. We look to nature of the relationship is whether it is negative so that we can validate what Kuznets has proven in its curve or not. Many authors consider that even if the Kuznets curve can be considered as a

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[11] https://utip.lbj.utexas.edu/

general description of the impact of growth on inequalities, there is no reason why the (full or symmetrical) inverted U curve should be included in the research results especially after the 1960s since the data used comes from manufacturing, they are from different sources and they do not cover the same countries on which Kuznets has worked. With this restriction in time and regions, it is not reasonable to seek evidence of the original Kuznets hypothesis, which was based in part on the experience of the 19th century. Williamson and Lindert (1980)[12] have also emphasized this point, arguing that the ascending part of the Kuznets curve (economic growth increases the level of inequalities) is difficult to detect since Kuznets worked in the years of the industrial era where there was a lot of disparity between the primary sector (the least profitable) and the industrialized sector (the most profitable).

We propose the following model specification

$$G_{it} = \alpha_i + \beta_1 GY_{it-1} + \beta_2 Y_{it-1}^2 + \beta_3 lgX_{it-1}^2 + \beta_4 G_{it-1} + \varepsilon_{it}$$

From the homogeneity test results we opted for a panel model with individual effects caused by the heterogeneity of the constant α_i. It remains only to determine the nature of this effect (fixed or random) by the Hausman test , used here to discriminate between fixed and random effects from individual effects in a panel data model.

In our case we opted for a fixed effect panel model (Test carried out under E.Views).

Table 2: The model's estimation

	Model(1)		Model(2)		Model(3)		Model(4)	
	OLS	*GMM*	*OLS*	*GMM*	*OLS*	*GMM*	*OLS*	*GMM*
Constant	48.51*	46.91*	48.77*	54.75*	12.96*	11.93**	12.89*	24.22
	[65.17]	[45.48]	[64.81]	[8.12]	[8.84]	[5.77]	[8.80]	[0.58]
GDP (-1)	0.10*	0.52*	0.09*	-0.37	-	-	0.024	-0.23
	[3.47]	[2.87]	[3.45]	[-0.44]			[1.30]	[-0.15]
GDP (-1)²	-	-	-0.007*	-0.12	-	-	-0.0017	-0.06
			[-3.35]	[-1.23]			[-1.18]	[-0.26]
lgX (-1)	-	-	-	-	0.025***	0.015***	-	-
					[22.63]	[16.54]		
Gini index (-1)	-	-	-	-	0.72*	0.75*	0.73*	0.56
					[1.80]	[0.98]	[24.59]	[0.97]
Number of observations	435	435	435	435	435	435	435	435
R²	0.026	0.470	0.049	-	0.835	0.826	0.835	0.15
F-stat	11.975	385.25	11.715	-	137.72	103.25	129.27	25.40
D-W	0.518	1.18	0.569	1.962	2.128	2.228	2.16	2.074

*Note: Dependent variable Gini index , the estimation period is, the data are   data , t-statistics shown in []. *** significant at 10 percent, ** significant at 5 percent, * significant at 1 percent.*

Source : The authors using Eviews based on the world bank data

The results of the estimation of a Kuznets curve confirm the results already obtained (an inverted U shape seems very clear), the growth increases the inequalities at first and then reduces them, even if the estimator of the generalized moments did not give significant

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[12] Long-Term Trends in American Wealth Inequality 1980 by the National Bureau of Economic Research in NBER Book Series Studies in Income and Wealth

estimation, we can obviously see that the generalized least squares estimator proved a positive linear relation between GDP and inequalities , and a significantly negative non-linear relation which is unfortunately a weak one (a coefficient of 0.007). We can conclude that this relation is not subject to a highly significant negative impact and we can explain this by the fact that all of the 15 countries have not yet reached the level of growth necessary to reduce inequalities. If we compare our results with previous research, we find that this relationship is a negative sign in low-income countries (namely we have worked on countries with medium and low GDP growth rates) which amounts to saying that this link is determined by the level of development of the countries and the degree of inequality reached. Strong growth can also reduce inequality through lower unemployment.

3-2- A MODEL FOR THE ALGERIAN ECONOMY

The model specification is inspired by work by the Macroeconomics Laboratory of CREST[13]. We first chose to test a set of theoretically conceivable relationships between inequalities and growth for the Algerian economic variables and we tried to check a shape of the Kuznets curve as a second part . The two models' specifications are of the following forms:

Impact of inequalities on growth:
$$Y_t = \alpha + \beta_1 TCP_t + \beta_2 lgINV_t + \beta_3 RL_t + \beta_4 EV_t + \beta_5 AYSS_{t-1} + \beta_6 G_t + \beta_7 G_{t-1} + \beta_8 G_t^2 + \beta_9 Is_t + \beta_{10} Ig_t + \varepsilon_t$$
Impact of developement on income inqualities
$$G_t = \alpha + \beta_1 lgX_t + \beta_2 lgX_t^2 + \beta_3 lgX_{t-1} + \varepsilon_{it}$$

The model's variables are the Population growth rate (TCP): (From 1980 to 2011) representing the annual population growth rate for year *t* is the exponential growth rate of the mid-year population, from year t-1 to t, expressed as a percentage. Population is based on the de facto definition of population, which includes all residents regardless of legal status or citizenship. The data is collected from the World Bank website. Investment (lgINV) Representing the logarithm of foreign direct investment from Algeria for the same period. It is the sum of equity, reinvested earnings, other long-term capital and short-term capital recognized in the balance of payments. This series shows net inflows (net investment flows - divestments). The Data source is the World Bank. Life expectancy (EV) at birth indicates the number of years of a newborn baby should live if the general rules of mortality at the time of birth are to remain the same throughout their life. Average years of schooling (AYSS) which represents the Gross Secondary Schooling Rate. It corresponds to the total enrollment in secondary education, regardless of age, expressed as a percentage of the population of age to attend formal secondary education. The GER can exceed 100% due to the inclusion of over-aged or under-aged students following early or late schooling, and repetitions. Rule of law (RL) as an index that reflects the extent to which agents trust and respect company rules, and in particular the quality of the execution of contracts, property rights, police and the courts, as well as the likelihood of crime and violence. It is the foundation for the development of peaceful, equitable and prosperous societies. Four key areas constitute the protection of this index (equality before the law, transparency of the law, independent judiciary, and access to legal remedies). Data are collected from the COMSTAT-data center (socio-economic-database-of-Africa) site. Wage inequality (Is) which a major source of total income are. Thus, the evolution of wage inequality is reflected in income inequality. Indeed, pay inequality has been widely used as an alternative to income inequality in many studies. For example, Williamson (1982) argues that "The wage gap" and its evolution appear to correspond to broader income trends; he considered inequality of remuneration as a

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[13] http://crest.science/research

"simplified phenomenon" of the evolution of global inequality. Wage inequality has been calculated with precision for several countries. The data are from the UNIDO source. Gender inequality (man / woman) (Ig) represents the Gender Inequality Index, a composite measure of inequality between men and women in three dimensions: reproductive health, empowerment and the labor market. It is calculated by the United Nations. It is part of the Human Development Indicators (HDI). The prejudice suffered by women and girls is a major source of inequality and one of the most important obstacles to development progress. The data come from the algeria.opendataforafrica.org site.

Table 3: Estimation of the model

	Model(1)	Model(2)	Model(3)	Model(4)	Model(5)	Model(6)
Constant	12.26* [8.74]	15.20* [10.71]	13.25* [19.89]	7.59** [2.42]	16.95* [6.62]	0.839 [0.36]
TCP	-0.89* [-4.10]	0.053 [0.16]	-1.15* [-5.48]	-0.905* [-3.57]	-0.829* [-2.95]	-0.208 [-0.85]
ROL	-1.38* [-3.13]	-1.14* [-3.07]	0.19 [0.63]	-0.08 [-0.26]	0.632 [1.67]	0.23 [0.64]
Investment	0.11* [2.21]	0.084*** [1.98]	6.58E-10* [7.34]	6.00E-10* [6.44]	2.29E-10 [1.41]	0.11* [3.51]
Gini index	-	-0.142* [-3.62]	-	0.349*** [1.84]	-0.092** [-2.55]	-0.058** [-2.27]
Gini index (-1)	-	-	-0.014 [-0.51]	-	-	-
Gini index²	-	-	-	-0.005** [-2.06]	-	-
Is	-	-	-	-	0.059 [1.24]	-
I	-	-	-	-	-9.77** [-2.77]	-
AYSS (-1)	-	-	-	-	-	0.16* [-1.87]
EV	-	-	-	-	-	-0.045*** [5.72]
Number of observations	31	31	31	31	31	31
R²	0.8999	0.9334	0.9733	0.9736	0.9766	0.9789
Prob (F-stat)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Dependent variable GDP growth , the estimation period is, the data are   data , t-statistics shown in []. *** significant at 10 percent, ** significant at 5 percent, * significant at 1 percent

Source : The authors using Eviews based on the world bank data

The R² for the six models is between 90 and 100%, in other words 90% of the variations in GDP growth are explained through each of these models, the fact of entering a Gini variable increased the R² by about 4%. However, the Durbin-Watson statistics refer to a non-autocorrelation of errors for models 4 and 5. As for the heteroscedasticity test, the LM statistics show the absence of the latter for the same models. With regard to the normality of the residuals, the Jarque-Bera test shows that the distribution of errors follows the normal distribution for the five first models. The Ramsey specification test shows a probability greater than 5% for models 2, 3,4 and 5, i.e. these models are well specified (Both models 4 and 5 use the Gini variable as a variable explanatory which shows that we can use these two models to explain the impact of

income inequality on economic growth).The 1st equation represents a set of control variables which generally impact growth with an R² of 0.89. The second equation introduces a Gini coefficient with a significantly negative relationship at the 1% threshold, if we want to establish the relation between this model and the panel estimation to evaluate the position of Algeria among the other countries; it is obviously clear that Algeria is a less unequal country. The long-term relationship represented by the non-linear relation in the 4th equation also reveals a significantly negative relationship (this relationship remains weak with a coefficient of 0.005 at the 5% threshold), which means that a strong income inequality in Algeria will impact the demand for goods and services by consumers, however, if domestic companies find that not all the goods and services produced are in demand enough, this will provide less incentive to increase production capacity through additional investments that come from upper class income. As a result, investment declines due to weak domestic demand for goods. In the long term, this trend leads to stagnation or even economic contraction.

Income inequality is the most common form of inequality given the availability and coverage of data. The model (5) deals with the impact of two other types of inequality on growth: ***Wage inequality considering*** wages are a major source of total income for individuals and it certainly has an effect, which appears in the evolution of the wage differentials between the different sectors. A positive impact can be explained by incentives for stronger performance (individuals will be encouraged to double their efforts to raise their wages and reach the upper class), incentives to invest in their human capital (parents will be more incentive to invest in the education of their children) this will generate a skilled, competent workforce which increases productivity and therefore stimulates growth. ***Gender inequalities*** negatively impact economic growth with a coefficient of -9.77 at the 5% threshold, these disparities between women and men in terms of education, health and participation in the labor market are detrimental to growth. First since women represent 50% of the world population and when we talk about Algeria it is much more harmful because it is cultural issue. The society has the culture to put forward the man, although if the Algerian women would have the same chances as the men they would be twice as productive, since it makes 2 times more efforts than the man to reach a level superior.

In Algeria, the success rate of girls in education is higher than that of boys if we take for example the success rate in BAC exam in 2018, the gap between girls and boys was about 30%. Girls are constrained an obligation of results; not just exams, to assert oneself as a human being equal to man in a society with negative prejudices against women. They provide proof that the country cannot advance scientifically, economically and culturally without perfect equality of rights and duties between the two components of our society. This difference can also be explained by girls' marriage before their 18th birthday, which reduces their chances of going to school, earning a living and enjoying their independence.

3-3- ESTIMATION OF KUZNETS' CURVE

From the estimation about 90% of the variations in the Gini index are explained by the explanatory variables used in the two equations . White's test shows that the errors of the two models are not autocorrelated or heteroscedastic. The model attempts to evaluate the economic development impact represented by the logarithm of the gross domestic product on income inequality. If we examine the 1st and the 2nd equation we can notice that the negative effect increases from one year to another (a coefficient significantly negative of 4.12 (year-1) against a coefficient of 19.01 (year t)). This means that an increase in the gross domestic product of a unit will lead to a decrease in income inequality of 4.04%, and if we try to assess   the non-linear relationship presented in equation (2) we can notice that a shape of an "ordinary U" seems better seated which is the opposite of the Kuznets hypothesis. This can be explained by

the use of GDP as a development indicator , the disparities in the results of research on this issue always come back to the indicators used which differ whether it is for measuring inequality or growth.

Table 5 : Estimation of the Kuznets curve results

Dependent variable :	Gini index	
	Courbe(1)	Courbe(2)
Constant	77.56*	158.06*
	[25.14]	[5.15]
lgX	-	-19.01*
		[-3.34]
lgX(-1)	-4.12*	-
	[-14.67]	
lgX²	-	0.683**
		[2.62]
Number of observations	31	31
R²	0.8813	0.9129
F-stat	215.32	152.06
Normalité des résidus	0.26	0.68
D-W(erreurs)	0.884	0.709
Test d'hétéroscedasticité des erreurs- Test de White- (LM-stat)	16.57	4.687

Source : The authors using Eviews based on the world bank data

CONCLUSION

The issue of the relation between income inequalities and economic growth is still far from resolved and, as explained in this article, the answer to the question of how unequal income affects a country's growth is still not clear, both from a theoretical and empirical perspective. Indeed, The use of GINI index to measure income inequalities seems to be quit acceptable but the use of GDP as a development indicator because the disparities in the results of research on this relationship always come back to the indicators used which differ whether it is for measuring inequality or growth.. a strong income inequality in Algeria will impact the demand for goods and services by consumers, however, if domestic companies find that not all the goods and services produced are in demand enough, this will provide less incentive to increase production capacity through additional investments that come from upper class income. As a result, investment declines due to weak domestic demand for goods. In the long term, this trend leads to stagnation or even economic contraction. A negative relationship can be observed between the level of inequality and economic growth, but the fact that a correlation exists does not necessarily mean there is a cause-effect relationship. However, it should be noted that, although inequality is, to some extent, an inevitable phenomenon in modern economies, the latest empirical evidence suggests that, if inequality is reduced, particularly among the lowest income groups, this has a positive effect not only in terms of social justice but also in terms of economic growth. High levels of inequality reduce growth in relatively poor countries but encourage growth in richer countries, according to a recent paper by NBER Research Associate **Robert Barro**. In **Inequality, Growth and Investment** (NBER Working Paper No.7038), Barro studies a broad panel of countries between 1960 and1995 and finds that growth tends to fall with greater inequality when income per capita is less than \$2,000 (in 1985 dollars) and to rise with inequality when income per capita is more than \$2,000.

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