

Interaction between Poverty, Growth, and Inequality during the Crisis: A Panel Data Study

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Abstract

Difficulty of reducing poverty represents today a major challenge for all countries. Therefore the purpose of this paper is to consider the effect of economic growth and inequality on poverty during crisis periods. This study covers a MENA sample composed of eight countries (Algeria, Egypt, Iran, Jordan, Morocco, Tunisia, Syria and Yemen) from 1990 up to 2009. The econometric results show that economic growth and income inequality are proceeding in an opposite direction as for as poverty is concerned.

Keywords: economic growth, income inequality, poverty reduction, pro-poor growth, crisis

1. Introduction

The reduction of high levels of poverty represents a fundamental challenge today for both developed and developing countries. Dollar and Kraay (2000) support the necessity of the economic growth, to improve the situation of the poor people. Three different groups of researchers suggest specific visions, based mainly on the relation poverty-growth-inequality. The first vision confirms that growth is good for the poor, as shown by the (World Bank, 1990, 2000; Ravallion and Chen, 1997, 2001, 2003; Dollar and Kraay, 2002; Sala-i-Martin, 2002; Daymon, 2008; Turunç.G, 2009; Besbes and Boujelbene, 2010). The second vision says that inequality should not be omitted, because economic growth is necessary but not sufficient enough, this can be seen in the following surveys of (Deininger and Squire, 1996; Dollar and Kraay, 2001; Ravallion, 2001, 2003; Bourguignon (2004); Ravallion (2005); Besbes (2010) and Youssoufou (2010); Mchiri and Moudden, 2011). Finally the third vision shows that growth on its own is sufficient to reduce poverty, this is shown in the various studies of (Bhalla, 2002; Sala-I-Martin, 2002; Facchini, 2008; Turunç, 2009; Besbes and Boujelbene, 2010). Thus, the relation poverty-growth-inequality may be linked to financial instability which could be harmful, especially for those who suffer from poverty. Therefore, we will consider through my paper the extreme form of financial instability during time of crisis. Indeed, the last years, made us witness the birth of a new thesis called “pro-poor growth”. Which fundamental idea is that economic growth is pro-poor, unless it is followed by more benefits from an economic growth process.

Therefore, the object of this paper is to analyze the effect of the economic growth and the inequality on poverty, through a MENA (**M**iddle **E**ast and **N**orth **A**frica) sample countries, as far as crisis are concerned. So in order to achieve this target we will use a panel of data study. The outline of this paper is as follows: first, we review the theoretical and empirical literature of the relation growth-inequality- poverty. Then, we will try to present our econometric model, based on the found results.

2. Poverty Reduction, Economic Growth and Inequality in Period of Crisis: Review of the Theoretical and Empirical Literature

The study of the relation “*the triangle poverty-growth-inequality*” (Note 1), has generated many debates, as well at the theoretical level and the empirical one, for both developed and developing countries. In this paper, we are only interested in one aspect of this relation; therefore, we have not dealt with the reciprocity between economic growth, inequality and poverty. Indeed, the poverty depends essentially on the increase in the economic growth and the drop of the inequalities.

2.1 A Review of the Theoretical Literature

The interrelationship between poverty reduction, economic growth and inequality led to a debate about economic literature. Indeed, three ideas are as follow:

First, growth is good for the poor. According to the article of Dollar and Kraay (2002), entitled “Growth is good for the poor”, they support that the growth is good, to improve the living standards of the poorest population (Daymon, 2008). And that the growth has no effect on inequality, therefore, they have a dominance of the acceleration of the growth and a negligence of the impact on inequality. Furthermore, this study suggests that governments may not engage in policies pro-poor growth. But, on the contrary they should simply maximize economic growth and ignore the distribution issues (Turunç, 2009; Besbes and Boujelbene, 2010). Other studies suggest the same idea as (World Bank, 1990, 2000; Ravallion and Chen, 1997, 2001, 2003; Sala-I-Martin, 2002; and Bourguignon and Morrisson, 2002).

The second presents the economic growth as a necessary step but not a sufficient condition to eradicate poverty. According to (Lustig, Arias, Rigolini, 2002): “*the economic growth is a crucial factor in the reduction of poverty, but the level of inequality affects its impact on poverty*” (Note2). Indeed, Ravallion (2005), through his article, entitled “*Inequality is bad for the poor*”, affirms that inequality can be harmful to the poor and that it is a problem not to be omitted in order to fight poverty. Also, Deininger and Squire (1996); Dollar and Kraay (2001); Ravallion (2001, 2003); Bourguignon (2003); Turunç (2009); Besbes (2010) and Youssoufou (2010), share the same idea. Mchiri and Moudden (2011), affirm that “*a high inequality tends to slow down the growth in poor countries and encourage growth in the richest areas*” (Note 3). This implies that inequalities affect the situation of the poor.

The last idea, indicates that the economic growth is sufficient, to reduce poverty. According to Bhalla (2002) and Sala-I-Martin (2002), while referring to the World Bank surveys, they have concluded was too pessimistic and that one year ago, poverty was reduced in a considerable way all over the world (Turunç, 2009; Besbes and Boujelbene, 2010). Also, Facchini (2008) confirms that despite the presence of an egalitarian distribution or an unequal income, this does not have any effect on economic growth.

Moreover, this triangle may be accompanied by financial instability which may affect particularly the poor. According to Kpodar (2006), there is no explicit definition of financial instability. But, nevertheless we can witness two ways of financial instability, as it is suggested by the same economist: the first view deals with a system of financial instability crisis. Whereas the second deals with a succession of more or less regular periods of expansions and contractions of credit, or more generally of irregular levels of financial development. Besides, a crisis is often considered as an extreme situation of financial instability. In this paper, we are only interested in the last situation.

Baldacci, De Mello and Inchauste (2002) studied a sample of industrialized and developed countries during the period of 1960 up to 1998, taking into consideration 65 crises. They confirm that the main channels through which crisis affect poverty were the same for both groups of countries. They have concluded that the financial crisis was followed by strong variations of several macroeconomic variables. Indeed, an increase of the inflation was followed by an income progress held by the groups with intermediate income and a fall of the richest quintile. When the GDP per capita, increases, this explains why a monetary depreciation is sometimes expansionist, especially if the economy is in a recession situation. A crisis causing a decrease in the average national income, leads to the deterioration of income equalities. Hence, they have concluded that, the financial crisis deteriorates the situation of poor people and accentuates the inequalities of incomes.

According to Guillaumont and Kpodar (2005), in their article “*Financial Development, Financial Instability and Poverty*”, there are several reasons to argue that the poor are more vulnerable to banking crisis than the rich. Indeed, the poor are most affected by the disturbances of the payment system when banks close. However, the gel of deposits is found to be particularly prejudicial to the poor, because they are unable to diversify their assets, and to invest their savings in foreign banks. Moreover, when a bank is in difficulty, the small borrowers are the first to be rationed, since their loans are less profitable to the bank. This appears to be as a direct effect of financial instability on the poor. These same authors also underline as, since the rate of investment depends on the availability of financing, then financial instability induces to the instability of this one, and consequently to the growth rate. Otherwise, this instability will lead to a volatility of the relative prices, besides the prices are not influenced by the variation of the credit in the same proportions. Noticing these two instabilities, namely the investment rate and the real exchange rate, this induces to the volatility of the growth. This appears such as an indirect effect on financial instability of the growth.

The cyclic nature of the economic growth leaves the poor more vulnerable than the rich, because of an

asymmetry between the periods of fall and rise of the global income. Indeed, the unskilled workers are often poor and are the first to be dismissed, and unemployed. Guillaumont and Kpodar (2005) present this phenomenon as “the hysteresis effect”, by which the unemployed are the last to be hired. This same effect is presented by Salama (2009), showing that in the presence of crisis, the poor are most affected, because they often have low incomes. This hysteresis effect is explained by rising inequality during the crisis.

In addition, these last years, we perceive the emergence of the thesis called “the growth pro poor”, or, “the growth favorable to the poor”. This concept acquires an essential place in the history of the economic thinking, generating many discussions. According to their article entitled, “*On Various Ways of Measuring Pro-Poor Growth*”, Deutsch and Silber (2011) (Note4), advance the idea of the existence of two groups of authors. On one hand, a first group which supports that the growth is pro poor, when the income of the poor increases. On the other hand, a second group which emphasizes that the economic growth is described as pro poor, only if the increase in the income of the poor is proportionally higher than the average increase of the income of the society.

2.2 A Review of the Empirical Literature

Empirically, there are many works which try to enhance the importance of the relationship between economic growth, inequality and poverty during period of crisis. Through their study entitled, “*Growth is good for the poor*”, Dollar and Kraay (2000) estimate the relationship between the income of the poorest quintile of the population and gross domestic product per capita, and a number of control variables during periods of economic crisis. Their study covers a sample of 80 countries, and a period spreading out on fourth decades. Indeed, they cut their study samples into two periods: a pre period crisis and a post period crisis. According to their results, they conclude that, as the poor, those classified as non-poor are also affected by the economic crisis, and eventually, they believe the crisis is not affecting the people the same way.

In a study carried out in seven countries (Argentina, Chile, Bolivia, Costa Rica, Mexico, Panama and Dominican Republic), Hicks and Wodon (2001) have concluded that during the phases of expansion, the elasticity of the social expenditures reported to the GDP is higher than the unit, whereas on the contrary during recession phases, elasticity is lower than the unit. This means, that when the growth of the GDP per capita drops by a point, the expenditure assigned to the poor lowers by two points. They conclude that this reduction is due to the reduction of the GDP per capita by half and from the increase of the number of the poor caused by the crisis. Consequently, they affirm that the populations with low incomes are most affected. This is also confirmed, by the studies of Salama and Valier (1992, 1997), and Salama (2004, 2008).

Guillaumont and Kpodar (2005), use a model with an indicator of poverty presented by the average of the income per capita of the 20% poorest people and the share of the population earning less than one dollar per day. The variables are: the level of the GDP per capita; the level of financial development. Moreover the level of financial instability can be measured by; residues of the average absolute value which can be have obtained by the regression of the variable on its delayed value. Thus, there are many control variables: the inflation rate, the primary education, the public consumption, the trade openness, the infrastructures, the Gini index of the lands distribution and the climatic shocks. Their sample is composed of 65 developing countries, with data covering the period of 1980 to 2000. They conclude that, the positive direct effect of the financial development on the living level of the poor is not rejected. And that the financial instability largely reduces the income of the poor. They also affirm that, the financial development is more favorable for a poor person, than for one with an average income; whereas the negative effect of financial instability has more impact on the poorest, than the rest of population. They also conclude that the instability of the growth agricultural added value seems to be harmful to the income of the 20% poorest people. The infrastructure indicator represented by the strong road density is associated positively with the average income of the same 20%. And the rate of primary schooling is in negative correlation with the poverty index.

According to Turunç (2009), by combining the factor of growth and the factor of inequality, he notes that an increase in the economic growth and the share of the income held by the poor, guided under the concept of pro poor growth, will generate necessarily a poverty reduction which is higher than the income of the poor even though there is a slow increase for the rest.

Takeda (2009) uses regional data about Russia for the period 1995-2002. He considers the relationship between poverty and economic growth before and after the crisis period. The analysis reveals that the elasticity of poverty to growth drops considerably after the crisis at both national and regional level. Indeed, there is an increasing inequality between the richest and the poorest areas. Hence Takeda (2009) suggests creating pro-poor policies to minimize poverty.

3. Descriptive Analysis and Econometric Estimation: Methodology

3.1 Econometric Estimation

3.1.1 Model Specification, Sample and Data Sources

In order to analyze the relationship between economic growth, inequality and poverty reduction, during a period of crisis, we will use a MENA sample countries (Algeria, Egypt, Iran, Jordan, Morocco, Syria, Tunisia, and Yemen). The data are from the World Development Indicators (2010) and the database POVCALNET. Our analysis extends from 1990 to 2009, through the method of panel data, using the model below. Indeed, the latter refers to the model of (Takeda, 2009; Guillaumont and Kpodar, 2005; Baldacci, De Mello and Inchauste, 2002). The method of panel data allows us to use the transverse dimension of the sample and the temporal one.

3.1.2 Presentation of the Model

$$\ln(P_{it}) = \beta_0 + \beta_1 \ln(gdpcg_{it}) + \beta_2 \ln(gini_{it}) + \beta_3 \text{crise} + \beta_4 \ln(\text{inf}_{it}) + \beta_5 \ln(\text{open}_{it}) + \beta_6 \ln(\text{popru}_{it}) + \beta_7 \ln(\text{tel}_{it}) + \beta_8 \ln(\text{pubed}_{it}) + \varepsilon_{it} \quad (1)$$

Where P_{it} is the matrix of the indicators of poverty presented by: the headcount poverty and the poverty gap; $gdpcg_{it}$ is the annual growth rate of the GDP per capita; $gini_{it}$ is the indicator of the inequality; the variable *crisis* takes the value 0 (absence of a crisis) and the value 1 (presence of a crisis); inf_{it} is the rate of inflation; open_{it} is the rate of trade openness; popru_{it} is the ratio of the rural population; tel_{it} is the indicator of infrastructure; pubed_{it} represents the public expenditure on education; ε : error term; i : country and t : time. In our model, the variables of interest are constituted by: the rate of annual growth of the GDP per capita, the indicator of the inequality and the indicator of crisis.

3.1.3 Description of the Variables

-Dependent variable or endogenous

*Poverty Indicators

The headcount poverty: is the percentage of the population living below the international poverty line of one dollar a day. $\ln h_{it}$: denotes the logarithm of headcount poverty in the country i at the time t .

The poverty gap: is the average distance from the income of the poor people when compared to the poverty line. $\ln pg_{it}$: denotes the logarithm of poverty gap in the country i at the time t .

- Independent or exogenous variables

*Indicator of Economic Growth

The growth rate of GDP per capita: to measure the impact of the rate of variation of the GDP annually on poverty. $\ln gdpcg_{it}$: denotes the logarithm of the growth rate of GDP per capita in the country i at the time t .

*Indicator of inequality

The Gini index: to measure inequality of income distribution. $\ln gini_{it}$: denotes the logarithm of the Gini index in the country i at the time t .

*Indicator crisis: This takes the value 0 or 1. We took into account the following crisis: the Gulf War (1990-1991), the crisis of the European Monetary System (SME (1992-1993)), the Mexican economic crisis: Tequila crisis (1994), the Asian economic crisis (1997), the Russian crisis (1998), the Brazilian crisis (1998-1999), the stock market crash of 2001-2002, the Turkish crisis of (2000), the attacks of September 11 (2001), the economic crisis of Argentina (2001), the second Brazilian crisis (2002), the financial crisis: the subprime crisis (2007-2009) and the Greek crisis (2009). Here, we consider only the periods of crisis, which mean when the crisis is equal to 1.

- Variables of control

The rate of inflation: measured by the consumer price index, it captures the impact of macroeconomic stability on poverty. $\ln \text{inf}_{it}$: denotes the logarithm of the rate of inflation in the country i at the time t .

The rate of trade openness: measured by the ratio of the sum of exports and imports of goods and services in the GDP. This rate reflects the impact of globalization on poor. $\ln \text{open}_{it}$: denotes the logarithm of the rate of trade openness in the country i at the time t .

The rural population (% of total population). $\ln \text{popru}_{it}$: denotes the logarithm of the rural population in the country i at the time t .

The number of telephone line (by 100 capita). $\ln \text{tel}_{it}$: denotes the logarithm of the number of telephone lines in

the country i at the time t .

The public expenditure in education (% of the GDP): includes the public expenditure relating to the educational establishments (public and private). $\ln \text{pubed}_{it}$ denotes the logarithm of the public expenditure in education in the country i at the time t .

3.2 Results and Discussions

Figure 1 and Figure 3 illustrate perfectly, the relationship between the indicators of poverty (the headcount poverty and poverty gap) and the growth rate of the GDP per capita, whereas, Figure 2 and 4 illustrate perfectly, the relation between the indicators of poverty and the index of Gini. These graphics are executed by STATA.

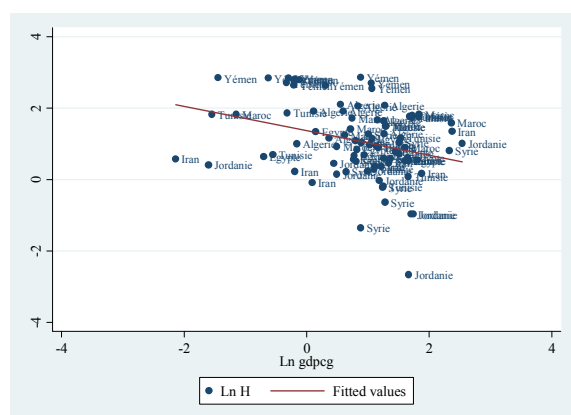


Figure 1. The headcount poverty and the growth rate of GDP

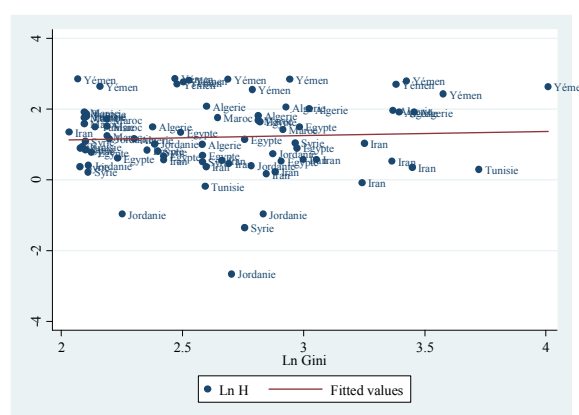


Figure 2. The headcount poverty and the index of Gini

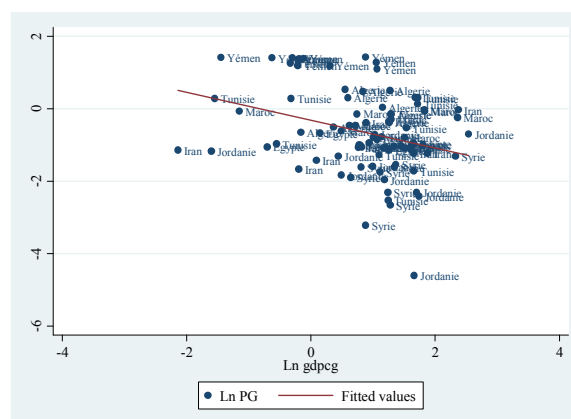


Figure 3. The poverty gap and the growth rate of GDP

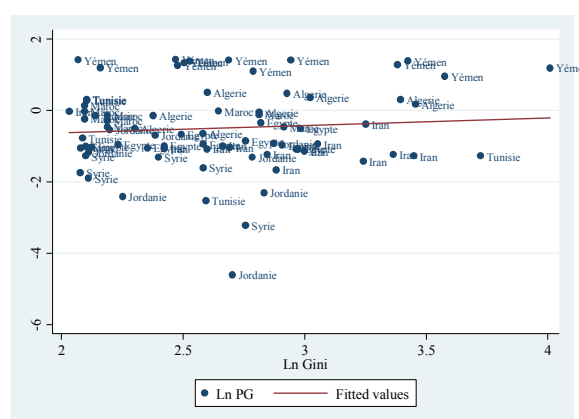


Figure 4. The poverty gap and the index of Gini

Both Figure 1 and 3 prove that the annual growth rate of the GDP per capita disadvantages the headcount poverty, as well as the poverty gap, as it is shown in the downward slope which crosses the group of points. As far as these two graphs, are concerned we can note the existence of negative effects on the growth rate of the GDP per capita on the indicators of poverty. Figure 2 and 4 illustrate perfectly, the relation between the indicators of poverty and the index of Gini. We can note that the index of Gini favors the two indicators of poverty, with a little ascending slope which crosses the group of points. A positive effect of the index of Gini on the indicators of poverty can be established.

The regression results for different indicators of poverty, for our entire sample of MENA countries over the period 1990-2009 are represented in the summary table 1, and table 2.

Table 1. The headcount poverty

Exogenous Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lngdpcg	-0,056*** (0.088)	-0,046*** (0.089)	-0,058*** (0.091)	-0,134*** (0.073)	-0,064*** (0.076)	-0,071*** (0.088)	-0,129*** (0.068)
Lngini	0,176*** (0.050)	0,165*** (0.051)	0,178*** (0.052)	0,176*** (0.040)	0,163*** (0.043)	0,153*** (0.063)	0,204*** (0.052)
Lninf		-0,133 (0.119)	—	—	—	—	-0,207** (0.092)
Lnopen			0,0013 (0.010)	—	—	—	0,0158* (0.008)
Lnpopru				0,128*** (0.025)	—	—	0,135*** (0.039)
Lntel					-0,058*** (0.013)	—	-0,004 (0.019)
Lnpubed						0,184** (0.084)	0,215*** (0.070)
Cst	-0.786** (0.464)	-0.268** (0.513)	-0.340* (0.755)	-0.751*** (0.608)	-0.677** (0.312)	-0.15** (0.866)	-0.303*** (0.540)
Obs	57	55	57	57	57	53	51
N	8	8	8	8	8	8	8

Notes: The endogenous variable is the headcount poverty. *, **, *** indicate statistical significance respectively at 10%, 5% and 1%.

Table 2. The poverty gap

Exogenous Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lngdpcg	-0,051*** (0.099)	-0,041*** (0.100)	-0,065*** (0.101)	-0,134*** (0.083)	-0,059*** (0.090)	-0,066*** (0.102)	-0,173*** (0.075)
Lngini	0,170*** (0.055)	0,159*** (0.057)	0,180*** (0.057)	0,170*** (0.046)	0,158*** (0.050)	0,147*** (0.073)	0,239*** (0.056)
Lninf		-0,134 (0.133)	—	—	—	—	-0,243*** (0.100)
Lnopen			0,008 (0.012)	—	—	—	0,904*** (0.574)
Lnpopru				0,137*** (0.029)	—	—	0,207*** (0.043)
Lntel					-0,053*** (0.016)	—	0,0264 (0.021)
Lnpubed						0,1909* (0.097)	0,223*** (0.076)
Cst	-0.394*** (0.584)	-0.882*** (0.642)	-0.901*** (0.897)	-0.563*** (0.760)	-0.2*** (0.527)	-0.674*** (0.109)	-0.814*** (0.942)
Obs	56	54	56	56	56	52	50
N	8	8	8	8	8	8	8

Notes: the endogenous variable is the poverty gap. *, **, *** indicate statistical significance respectively at 10%, 5% and 1%.

The statistics of the Hausman test for both poverty indicators appear with a probability $\text{Prob} < 5\%$ ($\text{Prob}=0,027$ and $\text{Prob}=0,005$ respectively for the headcount poverty and the poverty gap, by taking into account only periods of crisis. Thus we keep the fixed effect model for all the cases.

The principal objective of the study is the investigation of a number of variables of interest (the growth rate of the GDP per capita, the indicator of inequality and the indicator of crisis), when mixed with a number of variables of control, they cause an effect on poverty. This latter is explained by two indicators: the headcount poverty and the poverty gap.

The results of our estimation show that: according to all the columns of table 1, and table 2; the coefficient of the

growth rate of the GDP per capita is negative and statistically significant with the level of 1%. At this step we notice: an increase of 1% of the growth rate of the GDP per capita; towards the sample of countries of MENA; will cause a negative effect on the headcount poverty and the poverty gap (according to the column (7)), respectively of 12,9% and 17,3%. And consequently, this effect is translated by a reduction in poverty for both used indicators.

This is in conformity with the results obtained by (Delande, 2008), which noted empirically that, the economic growth allows improving the living standard of the poor and more precisely the acceleration of the poverty reduction. Indeed, this result supports the hypothesis according to which, the economic growth decreases the poverty and comes in fact aligned with the majority of the empirical studies, which confirm the negative sign of the rate growth of the GDP per capita.

Our results as mentioned in the columns (1), (2), (3), (4), (5), (6) and (7) of table 1, and table 2, leads to the coefficient of the index of Gini which is positive and statistically significant with a 1% level. Also we can detect: an increase in the coefficient of the index of Gini, towards the countries of our sample; from 1% will lead to an evolution of the headcount poverty and the poverty gap (according to the column (7)) respectively of 20, 4% and 23, 9%.

What is also established by Figure 2 and 4.

This result is in conformity with studies of (Meng, Gregory and Wang, 2005; and Bamba, 2001), which affirms the positive relation between the poverty and the level of inequality of the income; by advancing the idea that a high inequality could affect poverty negatively. And support consequently the second idea exposing the economic growth as a necessary condition but not a sufficient one.

By introducing the variable (Ln inf) which captures the impact of macroeconomic stability on poverty; there is a coefficient which is associated with a negative sign and is statistically significant to the level of 5% for the headcount poverty, and is also, statistically significant to the level of 1% for the poverty gap (column (7) for summary table 1 and 2). This can be explained by: an increase in inflation of 1% will cause deterioration in the headcount poverty and the poverty gap, respectively 20.7% and 24.3%. Moreover, the high inflation blocks the economic convergence of the countries.

In the economic literature, the inflation appears such as a factor which deteriorates the situation of the poor, since it has a negative impact on the real value of the holdings and the purchasing power.

This results with the work of economists (Levine and Renelt (1992), Fisher (1993)) which shows a negative relationship between the inflation and the poverty. However, the high inflation can deteriorate the financial intermediation, which causes the assignment of the value of monetary assets and this leads to the decisions on policies that distort the financial structure. Also, it can generate a distortion in the choice of productive investments, the disadvantage of long-term investments. Also, Dollar and Kraay (2002), affirm the same idea, showing that the rate of inflation acts negatively on the income of the 20% poorest people. Similarly, Baldacci, De Mello and Inchauste (2002) support the idea that there is a negative impact on poverty inflation rate.

By introducing the variable (Ln open), reflecting the rate of trade openness, in order to reflect the impact of the globalization on the poverty. According to the column (7), we notice that the coefficient allotted to this variable is positive and statistically significant. An increase of 1% of the rate of trade openness will result an increase in the headcount poverty and the poverty gap.

By introducing the variable (Ln popru) translating the ratio of the rural population (column (4)), we notices that we have a positive coefficient and statistically significant with the level of 1%. Indeed, the increase of 1% of the ratio of the rural population will generate an increase in the headcount poverty and the poverty gap respectively of 13, 5% and 20, 7%. In addition this result can be explained as follows:

This increase is due to the lack of the occasions of work and the lack of access to the teaching and the level of health in the rural zones.

This level our results are in conformity with those found by Lahimer (2008) which affirms that poverty is denser in the rural zones, and that in these zones the poverty proves more worrying by it's the severity and it's the gap.

By introducing the indicator of infrastructure represented by the number of the line telephone by 100 habitants (column (5) of the table 1 and 2), there is a coefficient which is associated with a negative sign and statistically significant to the level of 1%. This level we can advance:

This indicator makes it possible to act principally on the quality of life of the poor. Indeed, the infrastructures play a significant role in the process of development. It allows the contribution to connect the operators to the

markets, to reduce the costs of the factors and to improve competitiveness of the economy, and also to offer services essential to the populations (such as: the access to the roads, with water) which determine the quality of the life. In addition, the indicator of infrastructure contributes at the same time to the growth and the improvement of the standard of living of the population.

This result is advanced by Guillaumont and Kpodar (2005), showing a high road density is positively associated with the poverty indicator.

By introducing the variable ($\ln \text{puped}$) representative of the public expenditure on education (% of GDP), there is a positive coefficient and statistically significant at level of 1% for the headcount poverty and the poverty gap. For the expenditure on education, our estimates indicate a negative relation for the headcount poverty and the poverty gap. Indeed, an increase in a point of the percentage of the expenditure in education reduces the headcount poverty of 21, 5% and the poverty gap of 22, 3% (column (7) of the table 1 and 2).

This result is in conformity with the studies of (Baldacci, De Mello and Inchauste, 2002).

Thus, the increase in the public expenditure involves the reduction in poverty. Indeed, the MENA countries present a high proportion of the public expenditure in education relative to the total expenditures of the state, which allows the reduction of poverty because the education in these countries constitutes a growth economic potential factor. Moreover, in these countries, the governments are making large efforts to expand access to education for all children. However, the number of students which finishes the cycle of primary education teaching is in rise. Consequently, the public expenditure devoted to education is in rise, which generates a reduction in poverty in these economies.

Finally, by establishing a mixing between the various variables, we notice that the results of the total estimate of the model (column (7) of the table 1 and 2) confirm the results found above.

4. Conclusion

The poverty represents a crucial phenomenon, affecting the stability of the developing countries. And prove among the objectives of the millennium for the development. Our study shows, that in order to eradicate the phenomenon of poverty, it is necessary to examine the role of the economic growth. But, it appears as a condition necessary, but insufficient. Indeed, the presence of the inequalities affects the reduction of poverty negatively.

In this article, and in order to study the interrelationship between the economic growth, the inequality and the poverty in selected MENA countries, for the periods of crisis presented such as an indicator of financial instability, we tried, in the empirical part, with an estimate by the panel. Our period of study extends from 1990 to 2009. Indeed, for the two indicators of poverty we drew the principal conclusions:

- ✓ The economic growth remains necessary, but not sufficient in the reduction of the poverty.
- ✓ The inequality indicator allows a deteriorating situation of the poor, and we must act on this indicator, in order to reduce poverty. And an aggravation of the inequality compensates for the positive effect of the economic growth, which can appear, such as a major obstacle to growth.
- ✓ For our variables of controls: the trade openness, the indicator of infrastructure, influence poverty positively, whereas, demographic growth, and the expenditure in education influences negatively the various indicators of poverty. But, for the inflation and the rate of exchange their impact remains ambiguous.

Indeed, in order to fight against the poverty, the governments must concentrate with a growth poor pro, otherwise, a growth which centered on equity, the good governance, and with the improvement of the essential needs. Also, our study can be expanded to the level of the variables, with the primary education rate of schooling shown like indicator of human capital, and the ratio of the public expenditure to GDP.

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Notes

Note 1. An appellation of Bourguignon (2004).

Note 2. Lustig, N., Arias, O., & Rigolini, J. (2002). Poverty Reduction and Economic Growth: A Two-Way Causality. Inter-American Development Bank Washington, D. C. Sustainable Development Department Technical Papers Series.

Note 3. Mchiri, H., & Moudden, F. (2011). Développement Financier, Croissance économique et Réduction des Inégalités dans les pays Emergents: Analyse empirique en données de panel.

Note 4. Deutsch, J., & Silber, J. (2011). On Various Ways of Measuring Pro-Poor Growth. Discussion Paper No. 2011-13. Economics, The Open Access, Open- Assessment E-journal.

Appendix

Appendix 1. Definitions of variables

Variables	Descriptions
H	The headcount poverty
Pg	The poverty gap
Gdpcg	The annual growth rate of the GDP per capita
Gini	The Gini index
Inf	The rate of inflation
Open	The rate of trade openness
Popru	The ratio of the rural population
Tel	The number of telephone line (by 100 capita)
Pubed	The public expenditure on education (of the % GDP)

Appendix 2. Samples of Countries

Countries: Algeria, Egypt, Iran, Jordan, Morocco, Syria, Tunisia, Yemen