

## **Regional Pro-Poor Growth and Convergence in Tunisia**

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## **Abstract**

This paper studies the evolution of total and regional poverty in Tunisia using the Growth Incidence Curve (GIC) approach based on individual consumption and education level from the household consumption surveys and other official publications during the period 1990-1995. Three main results are found, *first*, growth is pro-poor in Tunisia and poor households have benefited from growth in the whole country as well as many different governorates. Moreover, poverty reduction is accounted for mainly by a *redistribution effect* in the whole country. *Second*, the empirical analysis tends to confirm the existence of conditional and unconditional convergence in terms of poverty between regions where poor governorates tends to grow more rapidly (with a high pro-poor growth) and to catch up rich ones.

## 1. Introduction

Since achieving independence, Tunisia has chosen deliberately a development strategy based simultaneously on growth promotion and poverty alleviation. As a consequence, poverty has fallen dramatically, largely due to growth achievements which have provided jobs and resources for the government to spend on equity and poor households. Continued progress on poverty alleviation will nonetheless present some challenges. Poverty reduction becomes more difficult as poverty levels approach the core poor, at the very bottom of expenditure distribution. Moreover, continued poverty reduction requires an adequate system for monitoring poverty developments and identifying the key target groups for public policy as they evolve.

In recent years, the term “*pro-poor growth*” has become pervasive in the discussions of development policies. However, despite the large use of this term there is no much consensus on the strict meaning of pro-poor growth<sup>5</sup>. In fact, economic growth is seen as pro-poor according to Kakwani and Pernia (2000) if poverty is reduced by the change in income distribution. Ravallion and Chen (2003) adopted a more broader definition where growth is pro-poor if the poverty measure decreases.

The aim of the paper is to see if growth has been pro-poor in Tunisia either for the whole country or its different governorates during the period 1990-1995. For pro-poor growth we adopt the definition developed by Ravallion and Chen (2003) and we apply the growth incidence curve (GIC) approach. The GIC measures the rate of growth in consumption between two points in time at each percentile of the expenditures distribution and it is estimated using household expenditures micro data. The rate of pro-poor growth (RPPG) is thus the average growth in consumption over the population up to the headcount index.

The GICs are estimated for the whole country, different governorates as well as urban and rural areas during the period 1990-1995. The data is extracted from Household Consumption Surveys (HCS) carried out by the “Institut National de la Statistique” (INS). Other data is also provided by different issues of other official publications (Budget de l’Etat, Rapport de la Banque Centrale (BCT), Caisse Nationale de Sécurité Sociale (CNSS) and Commissariat de Développement Régional). The Datt and Ravallion’s decomposition of changes in the

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<sup>5</sup>The objective of pro-poor growth measures is to see if poor households benefit from economic growth. The Pro-poor growth is defined with two approaches. First, the *Absolute* pro-poor growth studies if poor individuals have increased their income independently from the evolution of inequalities. Second, the *relative* pro-poor growth studies if poor households benefit more from growth than rich ones which tends to reduce inequalities.

headcount index is also simulated for the different regions of the country. It enables to determine growth and redistribution effects after a change in poverty.

We develop also in this paper a convergence analysis in terms of poverty to check if a *poor* governorate (having a high poverty rate) tends to grow more rapidly (with a high pro-poor growth) than a *rich* governorate in a way that the poor region will catch up the poverty rate of rich one. This is similar to the concept of  $\beta$ -convergence developed by Barro and Sala-I-Martin (1990) in the case of GDP per capita convergence across countries.

Three main results are found in this paper are; *first*, growth is pro-poor in the whole country as well as many governorates. This outcome means that poor households have benefited from growth more than other components of the society. Moreover, poverty reduction is accounted for mainly by a *redistribution effect* in the whole country. *Second*, the empirical analysis tends to confirm the existence of conditional and unconditional convergence in terms of poverty between regions where poor governorates tends to grow more rapidly (with a high pro-poor growth) and to catch up rich ones. This result means that economic growth has provided also resources for the public treasury which has permitted to create jobs, to find sufficient resources to make social transfers and to invest in public infrastructure in poor governorates.

The remaining of the paper is organised as follows: Section 2 reviews growth and poverty trends in Tunisia. Section 3 presents the growth incidence curve and pro-poor growth rates. In section 4 we present the headcount index decomposition in the whole country, urban and rural areas and governorates. Section 5 discusses the convergence in terms of growth between poor and rich governorates. Finally, section 6 concludes the paper with some policy recommendations.

## **2. Growth and Poverty in Tunisia**

At the early sixties, Tunisia was a poor country with a low income per capita. However, due to growth performances during the following decades, the average rate of GDP is close to 5% over the period 1960-2000. However, the growth path was not stable because of local and international exogenous shocks and switches in implemented economic policies of the government. The economy has benefitted from favourable oil shocks during the seventies which gave the country large financial resources due to a sharp rise in oil prices. These resources provide to the state large possibilities to grant large fiscal incentives and subsidies to private and public enterprises.

The eighties decade was featured by a slowdown in economic growth especially during the first half due to political instability and bad economic management. During 1980-1990, the average rate of growth of GDP was more than 3%. However, the worsening economic conditions in 1986 pushed the government to adopt structural reforms of the economy. These reforms took few years before providing their beneficial effects. Indeed, the cost of macroeconomic stabilization and structural adjustment was small since economic growth declined from 3,7 % in the first half of eighties to 3 % in the second half.

The first half of the nineties, corresponding to the period of poverty analysis in this paper, was featured by a recovery of the economy despite some climate difficulties in the agricultural sector. The GDP per capita rose by about 1,2 % during the period 1990-1995. The second half of the nineties (1996-2000) saw a rapid growth in income per capita, spurred by exports, and the average rate reached more than 4% per annum, which is the highest rate since the seventies.

These growth achievements over the last four decades have entailed a significant reduction in the incidence of poverty. The growth strategy has targeted, among other things, a substantial decrease in poverty through an active participation in the labor market (mainly labor intensive industries with a substantial female participation and export oriented manufacturing) and an improvement in education quality and productive assets accumulation. In addition, public authorities have implemented social policies<sup>6</sup> that have been efficient in reducing poverty. The average rate of public expenditures (with respect to total current receipts) destined to fight poverty is close to 15 % during the period 1973-1996 and the rate of social transfers (% of GDP) is close to 20 % in 1995. As a consequence, poverty has declined substantially<sup>7</sup> from more than 30 % in the mid-sixties to about 4 % in 2000.

### **3. The pro-poor growth rates (RPPG) and monetary growth incidence curve (MGIC)**

The growth incidence curve (GIC) has been proposed by Ravallion and Chen (2003). It is estimated on the basis of household expenditures micro data, and it measures the rate of growth in consumption between two points in time for each percentile of the expenditures distribution. Ravallion and Chen (2003) define the rate of pro-poor growth (*RPPG*) as follows:

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<sup>6</sup> Such as "Fighting underdevelopment program", (1956-1972) and "the rural development program", (1973-1983) and other special programs (The national solidarity fund (1993) and national solidarity bank (1998)).

<sup>7</sup> The time comparisons are made with caution because of the nature and quality of household expenditures surveys.

$$RPPG = \int_0^{H_t} g_t(p) dp / H_t \quad (1)$$

Where  $g_t(p)$  is the rate of growth of per capita real consumption expenditures for the percentile  $p$  of the distribution and  $H_t$  is the headcount index at the initial point in time ( $t$ ). The rate of pro-poor growth ( $RPPG$ ) is the area under the growth incidence curve ( $GIC$ ) up to the headcount index. It is also the average growth in consumption over the population up to the headcount index. Consumption is considered as the best well-being indicator<sup>8,9</sup> since the monetary income evolution is randomly distributed and may hold more error measures.

The GICs are estimated for the whole country and the different governorates as well as urban and rural areas for the period 1990-1995 based on the Household Consumption Surveys (HCS) for 1990 and 1995 achieved by the *Institut National de la Statistique*. The samples are composed of 2640 and 2505 households in 1990 and 1995 respectively (the definition of variables and sampling methods are identical). The surveys provide food and non-food agricultural expenditures and socio-demographic features of each household (size, age of household head, his education level, socio-professional classes, residence area ...). However, it is still impossible to exploit the surveys of 2000 and 2005 carried out by the INS because of information retaliation motives<sup>10</sup>.

### ***The pro-poor growth rates***

Table (1) shows that for the whole country the different rates of pro-poor growth ( $RPPG$ ) which are positive and decreasing for the whole country and rural areas. However, these rates are particularly high and increasing in rural areas. This result means that inequalities tend to be reduced between urban and rural areas.

For the different governorates, (Table (2)) real growth has been pro-poor for 20 % of poor population in many governorates at the exception of Bizerte, El Kef, Sousse, Gafsa and Tozeur. In the governorates of Zaghouan, Jendouba, Médenine, Kébili and Tataouine, featured by higher poverty concentration, the  $RPPG$  are high in general which has permitted to reduce the poverty gap between poor and rich governorates. Nevertheless, in some other

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<sup>8</sup> See Zheng for a good survey on poverty measures.

<sup>9</sup> See also Charmes, J. (1990) for the case of Tunisia.

<sup>10</sup> Due to data availability on prices, we do not use a consumer price index to deflate individual consumption in carrying out regional poverty analysis.

governorates even with high poverty rates, the *RPPG* are weak and even negative which has extended the poverty gap.

In addition, the rich governorates with a lesser poverty concentration like Ariana, Bizerte, Sousse and Sfax have also weak and negative rates. However, the exception is for Monastir and Mahdia considered as relatively rich with low poverty concentration they have recorded the highest (*RPPG*) which has permitted to improve their ranking with respect to other governorates. This performance of these governorates is accounted for mainly by the development of textile industries considered as intensive in female labor force.

The different results of pro-poor growth rates in the governorates show that regional poverty<sup>11</sup> is more concentrated in the North West, Center West and South West. In Table (3), the poverty incidence has decreased in the different regions of the country but with non linear and heterogeneous proportions. The North West and Center West regions have known a dramatic decline in poverty during the period 1980-1995, whereas it remained stable in the South West. Moreover, the metropolitan area of Tunis has the lowest poverty incidence with a headcount of only 1%.

These results show that we have convergence in terms of poverty between governorates where those with high poverty concentration converges toward those with weak poverty concentration. This fact, may explain the reduced inequalities between the different regions of the country.

### ***The Growth incidence curves (GICs)***

Figures (1), (2) and (3) in the appendix display the GICs for the whole country and for urban and rural sectors. Indeed, in Figure (1) the GIC is a decreasing function featured by high growth rates of the first percentiles of the population<sup>12</sup>. The growth rate remains positive until the last percentile which means that the different income groups of the population have benefitted from growth at the exception the income group relative to rich persons.

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<sup>11</sup> At the regional level, Tunisia is divided into six regions which are North East (NE), North West (NW), Center East (CE), Center West (CW), South East (SE) and South West (SO). Each region contains the following governorates : North East (NE) : Tunis, Ariana, Ben Arous, Nabeul and Bizerte; North West (NW) : Béja, Jendouba, Le Kef, Siliana and Zaghouan; Center West (CW): Kairouan, Kasserine, Sidi Bouzid and Gafsa; Center East (CE): Sousse, Monastir, Mahdia and Sfax; South West (SW): Tozeur, Kebili, Tataouine, Gafsa and Tataouine; South East (SE): Gabes, Medenine.

<sup>12</sup> These results are the same as in Ayadi et al. (2004).

Accordingly, growth has not only been pro-poor according to absolute poverty definition, but also it has been featured by substantial decrease in social inequalities.

The monetary growth incidence curve for urban areas (figure (2)) is on line with the results of pro-poor growth for the whole country. The rate of growth is positive until the 8<sup>th</sup> percentile. The curve is decreasing for poor households yet it is increasing between the 2<sup>nd</sup> and 4<sup>th</sup> percentiles and regains its decreasing slope after. Growth is therefore pro-poor in the urban areas and poor households have highly benefitted from real growth and wealth distribution (at the same time). The households of 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> percentiles have certainly benefitted from growth (positive rate of growth) but have experienced more unequal distribution of income (decreasing slope).

In rural areas (figure (3)), real growth is pro-poor in absolute terms since the rate of growth is positive for the different income groups. However, the slope is fluctuating which means that poor households have benefitted from real growth but the wealth distribution is varying according to the level of consumption with weak amplitude. This fact may be accounted for by income fluctuations in agricultural activities. The evolution of growth rates in the whole country between the percentiles is important with respect to urban and rural areas. The result may be explained by migration income transfers from urban to rural areas.

The growth incidence curves (GICs) for the different governorates (Figures (4) to (23) in the appendix) show that real growth is pro-poor in relative and absolute terms in the governorates of Tunis, Zaghouan, Mahdia and Gabès. However, in the governorates of Ben Arous, Béja, Siliana, Nabeul, Jandouba, Kébili, Médenine, Tataouine and Monastir, growth is only pro-poor in absolute terms (positive rate of growth). For the governorate of Ariana which belongs to the greater Tunis area, real growth is pro-poor (weak percentiles) but is not in favour of rich households (higher percentiles). Inversely, In Sousse, Tozeur and Gafsa, growth has not been in favour of poor households but their situation has deteriorated less than wealthy persons.

Real growth is found to be *only pro-poor households* in the governorates of Bizerte and EL Kef and *neutral* (neither pro-poor nor pro-rich households) in the governorate of Sfax, since the rate of growth of consumption is fluctuating around zero.

#### **4. Decomposition of Changes in the headcount Index**

Datt and Ravallion (1992) have proposed a decomposition of changes in the headcount index in three components. *First*, a growth component which measures the change in poverty if the Lorenz curve has not been modified (constant redistribution). *Second*, a redistribution



component which evaluates the change in poverty due to a shift of the Lorenz curve (Average constant income). *Third*, a residual component which measures the interaction between growth and redistribution effects. The Datt and Ravallion's decomposition enables to determine growth and redistribution effects after a change in poverty. The individual expenditures are deflated by the consumer price index.

For the whole country as well as urban and rural areas (Table (4)) poverty has declined and the correlation between redistribution and poverty reduction is confirmed. In addition, poverty reduction is accounted for mainly by the *redistribution effect* at *urban* and *national levels*<sup>13</sup> and *growth and redistribution effect* in rural areas.

At a regional level (Table (5)), the poverty variation decomposition reveals that poverty has increased in Tunis, Bizerte, El Kef, Sousse, Gafsa and especially Tozeur. In this latter governorate, the rise in poverty rate is explained by the weakness of the redistribution effect which has not compensated the positive growth effect. However, in the governorates of Zaghouan and Jandouba poverty has declined significantly because of the growth effect. In the governorates of Ariana, Sfax and Gabès, the decline in poverty is due to the redistribution effect which is more important than the growth effect. Finally, the decrease in poverty in Zaghouan, Siliana, Monastir, Mahdia and Médenine is accounted for simultaneously by growth and redistribution effects.

In 1995, the agricultural activity has seen a sharp decrease in production mainly in governorates where the principal activity is based on cereals which influenced poverty. However, the income redistribution has paid off the poverty incidence with transfers of national and international migration and antipoverty policies.

## **5. Regional Poverty convergence**

The convergence analysis developed in the paper is based on the intuition that a *poor* governorate (having a high poverty rate) tends to grow more rapidly (with a highly pro-poor growth) than a *rich* governorate in a way that the poor region will catch up the poverty rate of rich one. This is similar to the concept of  $\beta$ -convergence developed by Barro and Sala-I-Martin (1991, 1992) in the case of GDP per capita convergence across countries.

### **5.1. Absolute or non conditional convergence**

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<sup>13</sup> This result may explain how the average rate of growth of GDP per capita during the period 1990-1995 is pro-poor.

We have absolute  $\beta$ -convergence when it depends only on initial conditions. In this case testing convergence is carried out by estimating the relationship between pro-poor growth rate and the initial poverty rate<sup>14</sup> and the estimated equation is the following one:

$$PPGR_{i, 1995-1990} = a + b PR_{i, 1990} + \varepsilon_i \quad (2)$$

Where *PPGR* is pro-poor growth rate, *PR* is the poverty rate,  $\varepsilon$  is the error term and finally *a* and *b* are parameters. A positive estimated coefficient *b* implies the convergence between governorates in terms of poverty: those which start with high initial poverty rates tend to have high pro-poor growth. When *b* is equal to unity ( $b = 1$ ) we have a perfect convergence. However, we have divergence between governorates en terms of poverty when *b* is negative. Two pro-poor growth rates are introduced in the empirical investigation: the pro-poor growth rates of the two first percentiles (PPGR20) (20% of very poor population) and the average pro-poor growth rate (APPGR). The different estimates with these dependant variables are presented in Table (9).

The first estimation of equation (2) in Table (6) seem to indicate the existence of an imperfect convergence between governorates en terms of poverty since the coefficient of poverty rate is positive and significant at a 5 % risk level. The result means that poor governorates have benefitted from growth more than rich ones. The second regression in Table (6) where the average pro-poor growth rate is the dependant variable is similar to the precedent one and tends to confirm the regional convergence hypothesis too. The coefficient associated to the initial poverty rate is weak but positive (0,302) and significant at the 99 % confidence level. Figure 37 shows that the initial poverty rate is positively correlated with the average growth rate.

## ***5.2. Conditional Convergence***

The conditional convergence depends on the features of each governorate. Among the local factors having potential incidence on pro-poor growth that should be taken into consideration in testing conditional convergence we have human resources, infrastructure, the number of created companies, regional policies, transfer of funds from urban areas, unemployment and fiscal advantages offered by poor governorates.

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<sup>14</sup> We use the same intuition as Mankiw, Romer and Weil (1992).

To test the conditional  $\beta$ -convergence hypothesis we use the same specification as in equation (2) augmented with other determinants of pro-poor growth as follows:

$$PPGR_{i, 1995-1990} = a + b PR_{i,1990} + cX_i + \varepsilon_i \quad (3)$$

Where  $X_i$  represents a vector of variables influencing pro-poor growth (human capital, investment rate, public infrastructure, social expenditures to fight poverty ...). However because of the lack of data in some governorates, we use the enrolment rate for students whose age is ranging between 6 and 14 years as a proxy of human capital. As a measure of public infrastructure we use the power connection rate (the average for 1990-1995) and the drinking water connection rate (the average for 1990-1995)<sup>15</sup>. We introduce also in the  $X_i$  vector a Dummy variable that reflects the sample heterogeneity that takes the value of 1 in rich coastal governorates and 0 in governorates inside the country.

Table (7) displays the output of the different OLS regressions<sup>16</sup> of equation 3. These estimations tend to confirm the existence of conditional  $\beta$ -convergence between governorates in terms of poverty, since the coefficient of initial poverty rate is significant at the 1 % risk level. This result means that poor governorates have more benefitted from growth than rich ones. The estimated value of  $\beta$  is higher than in the case of absolute convergence (0,8 with respect to 0,25). This fact may be accounted for by the determinants of pro-poor growth introduced which have permitted to differentiate governorates having different development levels.

The rest of the variables reflecting the effect of education policy and public infrastructure enter with significant coefficients in the dynamic process of conditional convergence. The coefficient of enrolment rate is positive and significant which means that education raises growth and diminishes poverty. Likewise, the coefficients of public infrastructure, as proxied by power connection rate and drinking water connection rate, are positive and significant which tends to confirm the role of public policy in reducing poverty.

Finally, the dummy variable, introduced to take into account the heterogeneity between rich coastal governorates and those inside the country, enters also with a positive and significant coefficient at the 5 % level. This result means that coastal governorates are likely to contribute to pro-poor growth more than the other ones.

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<sup>15</sup> Migration is not present as a determinant of pro-poor growth because it is not reported in the surveys of 1990 and 1995.

<sup>16</sup> We are constrained to achieve regressions with a low number of observations (19) due to data limitations.

## 6. Conclusion et Policy recommendations

During the last four decades, Tunisia achieved a good growth performance which entailed a significant reduction in poverty. In this paper we have shown that, *first*, growth has been essential for poverty reduction of households in the whole country as well as in many regions and governorates. *Second*, the empirical analysis tends to confirm the existence of conditional and unconditional convergence in terms of poverty between regions where poor governorates tends to grow more rapidly (with a high pro-poor growth) and to catch up rich ones.

However, in spite of these achievements, the Government is called to maintain its commitment to fight poverty. This can be made through the development of labour intensive industries, services and public infrastructure in urban as well as in rural areas. The poverty reduction effort needs also the strengthening of social policies and public programs destined to help needy families. Finally, easing official migration to European countries is likely to reduce poverty<sup>17</sup> through an agreement on services liberalization and labor mobility with EU. External migration has been for a long time an important factor in reducing poverty through easing pressure on local job market and income transfers and remittances.

However, other challenges lie ahead especially with rapid transformations of the international environment (dismantling of the Multi Fibre Agreement, rise in the prices of energy, cereals, broadening Europe). The explosion of oil and cereal prices has increased the amount of subsidies destined to help poor households which may represent a threat for social policies to fight poverty.

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<sup>17</sup> See Adams and Page (2003) for more details on the relationship between migration, remittances and poverty.

## Appendices

### Appendix (1): Tables

*Tableau (1): Pro-poor growth rates*

Percentiles	The whole country	Urban	Rural
10	3,62	1,29	3,71
15	3,50	1,19	3,9
20	3,42	1,12	3,95
25	3,33	1,12	3,94
30	3,28	1,16	4
100	0,70	-0,68	3,67

Source: Author's estimations

*Tableau (2): Regional pro-poor growth rates*

Gouvernorats	Until 20% of the population	The average pro-poor growth rate
Tunis	3,13	1,65
Ariana	2,59	-7,51
Ben Arous	5,07	2,91
Nabeul	3,85	4,36
Zaghouan	14,83	10,98
Bizerte	-2,89	5,01
Béja	0,60	4,71
Jendouba	10,69	12,70
El Kef	-1,26	-3,15
Siliana	1,86	3,99
Sousse	-2,19	-6,9
Monastir	10,75	7,56
Mahdia	12,92	7,55
Sfax	2,36	-2,48
Gafsa	-1,88	-1,99
Tozeur	-4,06	-4,14
Kébili	4,29	9,44
Gabes	5,3	0,03
Médenine	7,83	5,32
Tataouine	12,86	10,93

Source: Author's estimations

*Table (3): the poverty incidence in Tunisia, regional index 1980-2000*

	1980	1985	1990	1995
Greater Tunis	4.3	2.3	2.1	2.4
North East	15.6	8.9	5.9	6.3
North West	30.1	17.9	14.3	11.1
CenterWest	33.8	18	12.5	20
CenterEast	16.5	6.2	3.9	3.5
South West	13	6.7	8.8	8.2
South East	15.7	12.1	3.1	10.5
The whole country	20.1	9.6	6.7	8.1

Source : Household consumer surveys (1980-1995) from the *Institut National de la Statistique*

*Tableau (4): Poverty variation decomposition between 1990 and 1995*

	The whole country	Urbain area	Rural area
Poverty rate variation	-0,041	-0,009	-0,07
Growth	-0,009	0,003	-0,067
Redistribution	-0,037	-0,013	-0,01
Residue	0,004	0,002	-0,007

Source: Author's estimations based on Datt and Ravallion (1992)

Table (5) : Decomposition of Changes in the headcount index at a regional level, 1990-1995

Gouvernorats	Poverty rate Variation	Growth	Redistribution	Residue
Tunis	0,001	-0,003	0,001	0,003
Ariana	-0,026	0,131	-0,052	-0,105
Ben Arous	-0,011	-0,021	0,029	-0,019
Nabeul	-0,026	-0,024	0,021	-0,023
Zagouhan	-0,303	-0,295	-0,122	0,115
Bizerte	0,019	-0,042	0,092	-0,032
Béja	-0,056	-0,104	0,042	0,006
Jendouba	-0,235	-0,250	0,053	-0,038
El Kef	0,015	0,034	-0,021	0,001
Siliana	-0,071	-0,113	-0,006	0,048
Sousse	0,030	0,073	-0,004	-0,039
Monastir	-0,019	-0,010	-0,005	-0,005
Mahdia	-0,094	-0,056	-0,075	0,038
Sfax	-0,008	0,033	-0,039	-0,002
Gafsa	0,017	0,000	-0,019	0,036
Tozeur	0,076	0,031	-0,013	0,058
Kébili	-0,058	-0,094	0,085	-0,049
Gabès	-0,039	0,000	-0,039	0,000
Médenine	-0,143	-0,107	-0,045	0,009
Tataouine	-0,163	-0,139	0,091	-0,115

Source: Author's estimations based on Datt-Ravallion (1992)

Table (6) : Non-conditionnel convergence in poverty

Equations	(1) (PPGR20)	(2) (APPGR)
Constant	1.468 (0.89)*	-0.289 (-0.16)
$PR_{i,1990}$	0.243 (2.43)	0.302 (3.53)
R squared	0.21	0.30

\* *t* statistics between parentheses

Table 7: Determinants of pro-poor growth rates

Equations	(1)	(2)	(3)	(4)
Constant	-3.17 (-1.52)	-7.20 (-2.38)**	-7.80 (-2.70)***	-7.68 (-2.61)**
Initial poverty rate (PR90)	0.38 (4.45)***	0.64 (5.24)***	0.84 (5.89)***	0.87 (6.55)***
Dummy region	4.66 (2.46)*	3.55 (1.72)***	4.68 (2.47)**	4.79 (2.47)**
Initial schooling rate 6-14 (ts 90)		0.80 (2.27)**	0.33 (0.86)	0.26 (0.66)
Power connection rate (PCR)			0.46 (4.12)***	0.42 (3.72)***
Drinking water connection rate able (DWCR)				0.09 (1.83)*
R <sup>2</sup>	0.55	0.55	0.72	0.74
Observations	19	19	19	19

\*, \*\* and \*\*\* means that the coefficient is significant at 10%, 5% and 1% respectively.

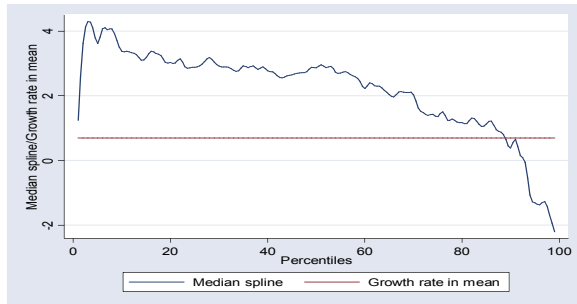
t-Statistics between brackets.

The dependent variable is the pro-poor growth rate of 20 % poor population.

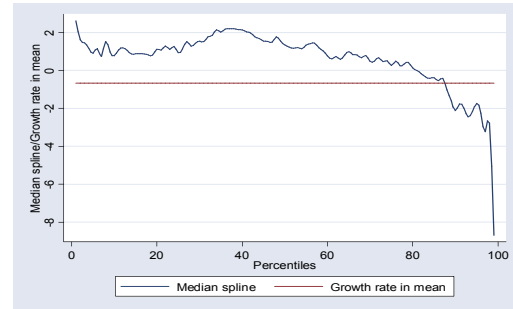


## Appendix (2) : The growth incidence curves (GICs)

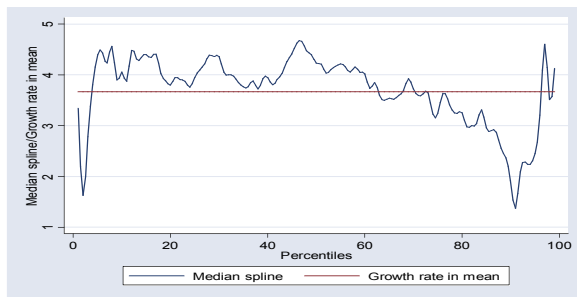
*Figure (1): GIC, national level (1990-1995)*



*Figure (2): GIC, urban area 1990-1995*

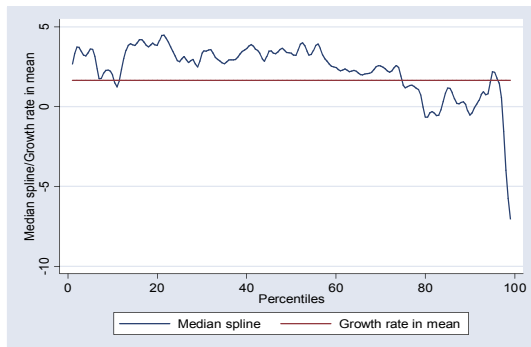


*Figure (3): GIC, rural area 1990-1995*

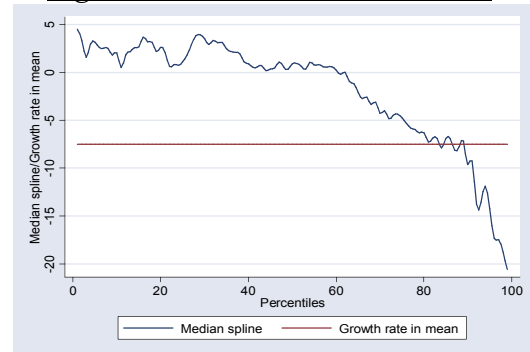


## The growth incidence curves in the Governorates

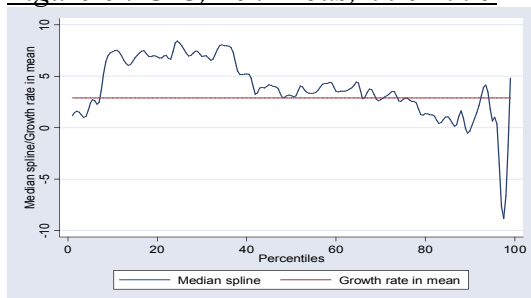
*Figure 4 : GIC, Governorate of Tunis*



*Figure 5 : GIC, Ariana 1990-1995*



*Figure 6 : GIC, Ben Arous, 1990-1995*



*Figure 7 : GIC, Nabeul 1990-1995*

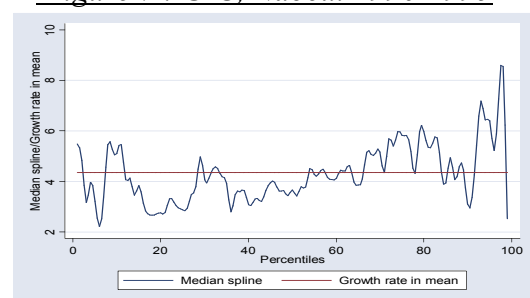


Figure 8 : GIC, Zaghouan (1990-1995)

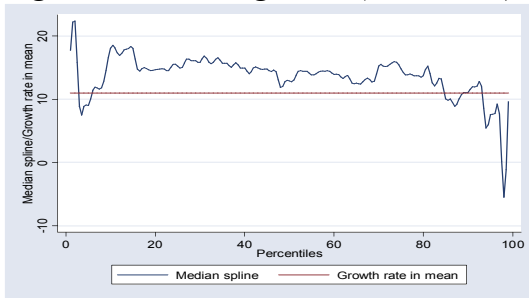


Figure 9 : GIC, Bizerte (1990-1995)

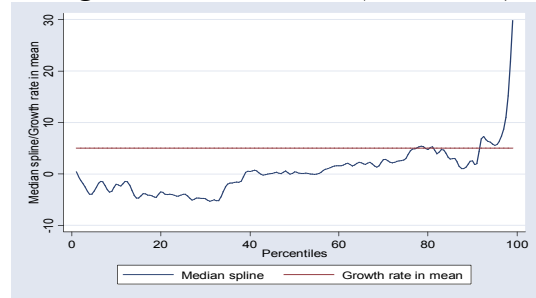


Figure 10 : GIC, Beja (1990-1995)

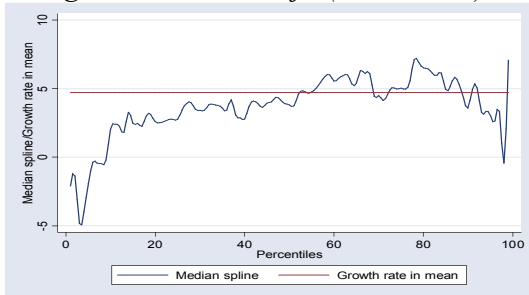


Figure 11 : GIC, Jandouba (1990-1995)

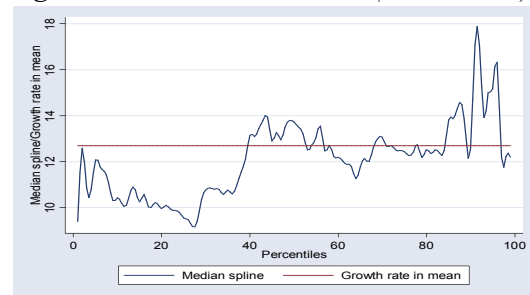


Figure 12 : GIC, El Kef (1990-1995)

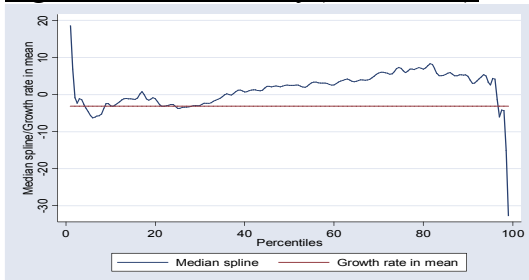


Figure 13 : GIC, Siliana (1990-1995)

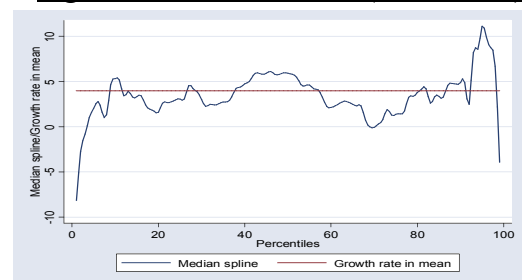


Figure 14 : GIC, Sousse (1990-1995)

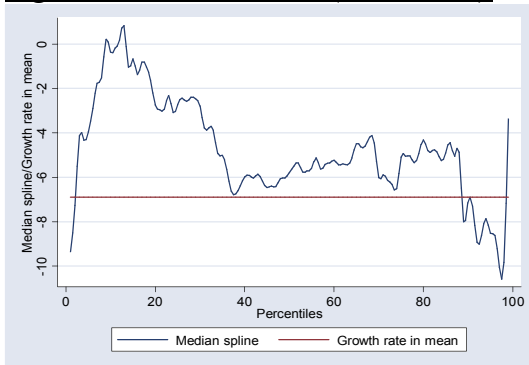


Figure 15 : GIC, Monastir (1990-1995)

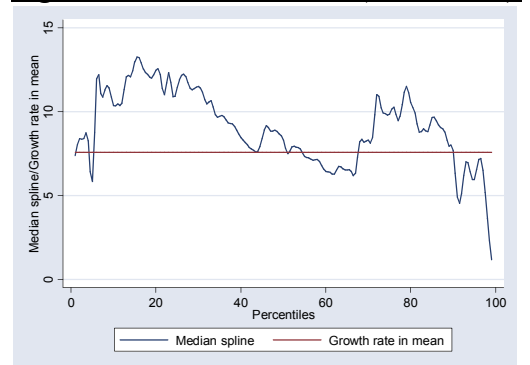
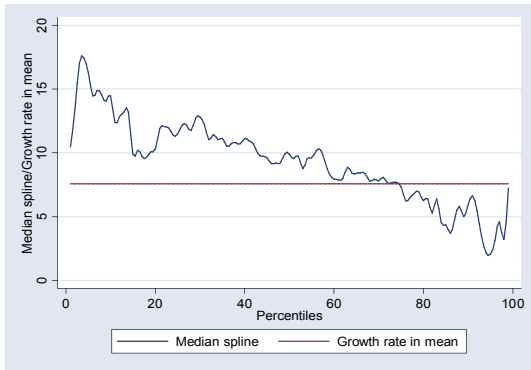


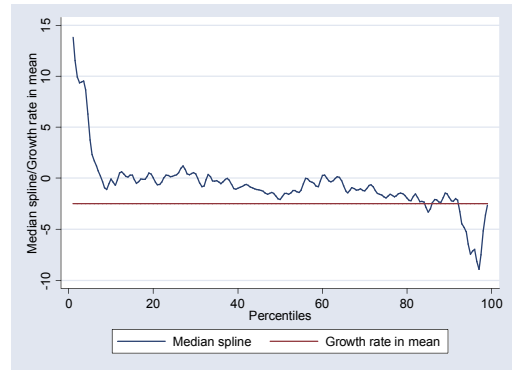
Figure 16 : GIC, Mahdia (1990-1995)



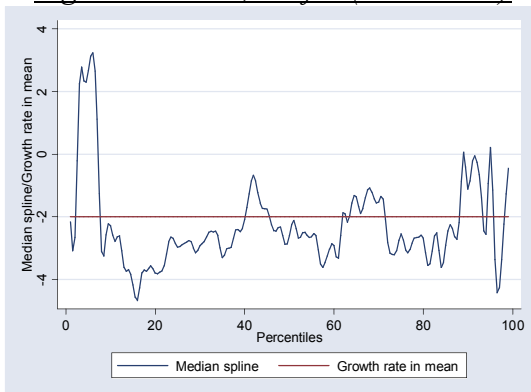
Figure 17 : GIC, Sfax (1990-1995)



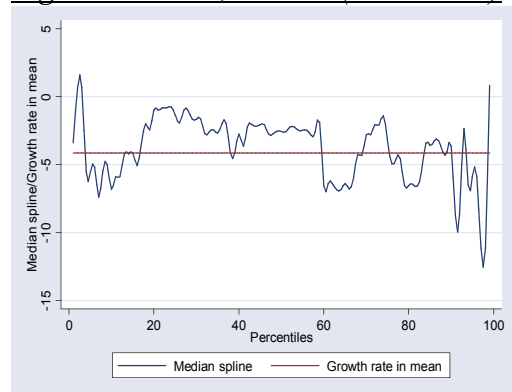
*Figure 18 : GIC, Gafsa (1990-1995)*



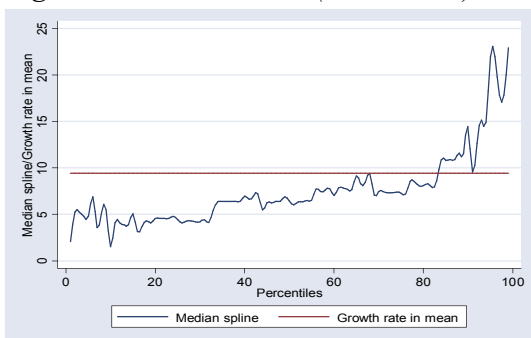
*Figure 19 : GIC, Tozeur (1990-1995)*



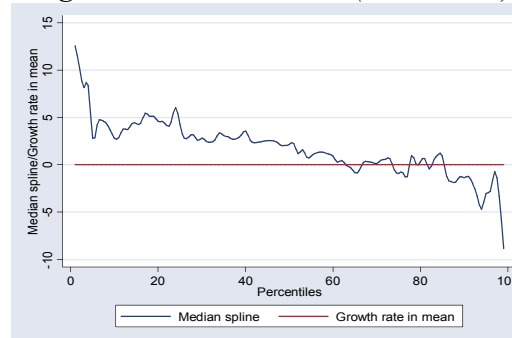
*Figure 20 : GIC, Kebili (1990-1995)*



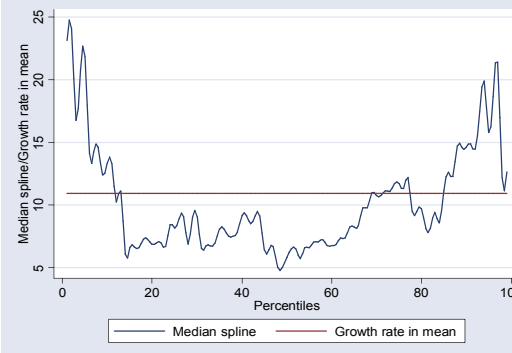
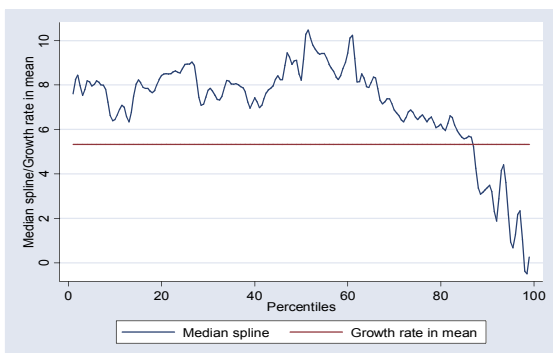
*Figure 21 : GIC, Gabes (1990-1995)*



*Figure 22 : GIC, Médenine (1990-1995)*



*Figure 23 : GIC, Tataouine (1990-1995)*



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