

## Poverty Change in Tunisia\*

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Abstracts

In this paper, we present a poverty profile for Tunisia in 1995 and we analyse how this profile has changed between 1990 and 1995. Using updated poverty lines based on the consumption of a reference group across different geographical strata, we find that poverty incidence rose between 1990 and 1995, despite steady economic growth and the structural adjustment plan which started before the nineties.

The characteristics of the poor in 1995 are consistent with patterns found in other countries. Poverty is higher among households with: many members or many children, absent or unemployed heads, heads working in construction or agricultural-fishing sectors, young or little educated heads.

In Tunisia, the poor are more concentrated in the North-West, the Centre-West and the South. Moreover, urban areas and their rural surroundings form a consistent poverty environment in each region.

This geographical shift in poverty is accompanied by improvement in the large cities and worsening in the other urban areas and in rural areas. The proportion of the poor declined in rural areas, although is still twice as high as it is in urban areas. Finally, the concentration of the poor across regions and activities have changed across the years. The poor in 1995 are more localised in the Centre-West and peri-urban areas than in 1990. They are also increasingly concentrated in a few sectors: Agriculture-Fishing, Construction and Transport-Telecommunication, and less in Services. Thus, while household heads involved in traditional activities remain and become poor, household heads in the expanding services, tourism and trade activities are more likely to escape poverty. This shift should be taken into account by anti-poverty policies.

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## I. Introduction

Since the independence Tunisian governments have run progressive social policies. Notably, a successful adjustment plan was accompanied by a reduction of the observed poverty incidence in 1990 (Ministère des Affaires Sociales (1991)). What is less clear is how poverty has changed after the adjustment period. Has poverty fallen back to its past level or has it continued its decline during the 1990s? Have the characteristics of poverty changed between 1990 and 1995? What are the factors influencing this evolution in the living standards? Answering these questions would provide insight on the efficacy of the government anti-poverty policies and on how to improve them.

During the structural adjustment period implemented from 1986, the Tunisian government conducted structural reforms, carried out macro-economic stabilization and encouraged the participation of the private sector in the economy. The main objective of the structural adjustment plan was to correct the deterioration of the balance of payments consecutive to the exhaustion of the oil rent. The main measures were: the devaluation of the Tunisian Dinar, a restrictive wage policy, price liberalisation, a decrease in state expenses, and a rise in the interest rate. This package led to a fall almost a quarter in the purchasing power of the minimum wage.

However, economic results over 1987-1994 were good and all basic economic indicators had improved in 1994. The mean growth rate for 1987-94 was 4.5 percent with a mean inflation rate of 5

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percent. Moreover, the public deficit diminished to 2.6 percent in 1994, as compared to 5.5 percent in 1986. As adjustment plans may have adverse short-run consequences on living standards, it is interesting to investigate whether poverty has been affected in parallel to the aggregate improvement of the economy. In this paper, we study the characteristics of poverty in Tunisia in 1995 by using a recent method for calculating the poverty lines and compare it to the situation in 1990.

The aim of this paper is to present a poverty profile of Tunisia in 1995 and to analyse the changes in this profile from 1990 to 1995. In Section 2, we present the data and the method used for updating the poverty lines. We analyse in Section 3, the poverty incidence in 1995. Section 4 presents the poverty profile for 1995 and its change between 1990 and 1995. Finally, Section 5 concludes.

## **II. The Data and the Poverty Lines**

### **2.1. The data**

The data are taken from the 1990 household consumption survey conducted by the Institut National de la Statistique de Tunisie (INS). 7734 households were personally interviewed. The sampling scheme was stratified by regions and clusters of 12 households were drawn at the last sampling level. Daily questionnaires were used over one week for each household to record the current expenditures, mostly relating to food. Two-week retrospective questionnaires were used to collect information of less frequent purchases (hygiene, health, education, etc). Finally, a retrospective questionnaire covering the whole year was used for the large and

infrequent expenses (durable goods, ceremony expenditure, etc).

The sampling scheme of the 1995 Tunisian survey has two levels. First, 900 districts were drawn stratified by *gouvernorats* (Tunisian regions). Then, in each district, 12 households were selected and interviewed for the Budget Consumption Survey. From these 12 households, 6 were interviewed for the Food Consumption Survey. We base our estimates mostly on the sample from the Budget Consumption Survey. Descriptive statistics and preliminary analyses of this survey are available in *République Tunisienne* (1993a, 1993b, 1997a, 1997b).

## 2.2. The Poverty lines

A large literature deals with the construction of poverty lines in Less Developed Countries<sup>1</sup>). Poverty lines in Tunisia have been calculated using various methods (e.g. Oueslati (1987)). However, there is no consensus among researchers about what is the proper technique for updating the poverty line. In this paper, the poverty line is updated to correspond to the situation of 1995, following the same method as that of the 1990 Poverty Profile (Ravallion and van de Walle (1993)). Two reasons guide this choice. Firstly, we want to obtain for each year a consistent profile of poverty in that any two individuals observed in different locations with the same standard of living should be treated identically. Secondly, we want to estimate the changes in levels and structure of poverty between 1990 and 1995. This implies that we must keep the same methodology in fixing the poverty lines in 1990 and 1995 so as to avoid a situation where changes in poverty could come from differences in methods rather than from genuine evolutions.

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1) Greer and Thorbecke (1986), Calan and Nolan (1991), Ravallion and Bidani (1994), Citro and Michael (1995), Ravallion and Sen (1996), Barrington (1997), Ravallion (1998).

The calculation of the various poverty lines is presented in Appendix 1.<sup>2)</sup> The poverty lines are based on the a priori choice of a reference group (RG). The RG for a given year is defined so that the living standards of the households in this group for this year are close to the expected poverty line in this year. Since we want to compare with 1990, we define the '1995 RG' from the changes in the living standards of households belonging to the '1990 RG'.

Consistently with the 1990 approach, we provide results both for the whole urban sector, and separately for large cities and other urban areas. Several reasons justify this approach. On one hand, specific poverty lines for large cities and other urban areas are of interest. Indeed, the 1990 poverty profile has shown that some urban areas are closer to rural areas than to large cities in terms of the characteristics of the poor. Meanwhile, the observed sample of households in the strata Large Cities is small, which reduces the accuracy of the estimated mean of caloric unit values in this stratum. This suggests estimating a poverty line for the whole urban sector as well. For comparison purposes, a national poverty line has also been estimated. Appleton (2003) shows the interest of using regional and national poverty lines to account for conflicting methodological and welfare conceptions.

The strata are defined as: Rural Areas; Large Cities; Other Urban Areas. "Large Cities" is composed of: District of Tunis, Bizerte, Sousse, Kairouan, Sfax and Gabes and their suburban areas. "Other Urban" is composed of all the other cities. "Rural Areas" is composed of the non-urban areas at the time of the

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2) In this appendix, we detail the process of calculation of the poverty lines. We first present the poverty lines calculated by inflating the 1990 poverty lines with the 1995 CPI index. Then, we describe the estimation of the food component for 1995 updated food poverty lines. Finally, we show the extrapolation step taken to produce the final updated lines.

survey. Table 1 presents the obtained set of poverty lines. We now turn to the poverty estimates.

### III. Poverty Incidence in 1995

The number of the poor, the head-count index and the proportion of the national poor have all been estimated for each stratum. The results are presented in Tables 2 and 3. The column "National" in Table 2 is calculated using cumuls of the populations of the poor based on the poverty lines specific to each stratum. The number of poor increased in the period 1990-1995 from 600,000 to 687,000. This change is consistent with the demographic growth during the period.

Table 3 shows the head-count index for various poverty lines and in each stratum<sup>3</sup>). Using the 1990 poverty lines inflated for price increases, the main feature of the changes in poverty in Tunisia between 1990 and 1995 is a noticeable stability. At the national level, the proportion of poor is stable at 14.1 percent of the population with the upper poverty line, and at 7.2 percent (7.4 percent in 1990) with the lower poverty line.

Using the 1995 updated poverty lines, i.e. accounting for the evolution of Tunisian society, provides a similar picture of poverty in Tunisia with nonetheless a few interesting differences. Again, using the lower poverty line, the proportion of the very poor in Tunisia is stabilised (7.6 percent), whereas using the upper poverty line reveals an increase in the head-count index, from 14.1 percent in 1990 to 16.75 percent in 1995. The fact that the percentage of poor people in the population is relatively stable

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3) Then, combining Table 2 and 3 allows readers to calculate the population of each stratum, if wished.

implies that the number of the poor has increased at a rate close to the population growth rate (from 600,000 persons in 1990 to 687,000 persons in 1995).

A few differences emerge from comparing different strata. The head-count index in the Urban Areas has increased for all lines (respectively 10.98 percent and 3.62 percent for upper and lower lines in 1995, to be compared to the respective 8.9 percent and 3.5 percent in 1990). However, there appears to be a clear improvement of the welfare situation in the Large Cities, and a worsening in the Other Urban Areas. Poverty incidence in the Rural Areas has also increased, which may be attributed to the occurrence of severe droughts in the last three years<sup>4</sup>).

All poverty lines show that most of the poverty is in the rural areas. The proportion of the poor observed in rural areas has somewhat diminished (shown in Table 4: 71.87 percent in 1990 and 70.91 percent in 1995 with the lower line, respectively 62.19 percent and 59.97 percent with the upper line). This is consistent with the urbanisation of poverty analysed in Haddad et al. (1999) and Ravallion (2002), and migrations of the poor from rural to urban area. Nonetheless, the number of the poor is still twice as high in rural areas than in urban areas.

Moreover, the share of the large cities in the global number of the poor has collapsed (in 1995: 6.4 percent and 11.5 percent of the poor for respectively the lower and the higher poverty line), compensated by a surge of the share of the other urban areas

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4) For comparison, the columns "Urban" and "National" in Tables 2 and 3 correspond respectively to results using the "Urban poverty line" and the "National poverty line". The column "Urban + Rural" is calculated using the populations of the poor estimated in urban areas based on the urban poverty line. These numbers, which are close to those in the previous table, show the robustness of results to the choice of the urban strata for the calculation of poverty lines. In all cases, the national incidence of poverty is stable when using the lower line and increases slightly when using the upper line.

(respectively 22.6 percent and 28.6 percent). This phenomenon also appears with inflated 1990 lines. If this feature were confirmed with studies focusing more on urban areas, this would imply adjustment of policies against urban poverty. A stronger emphasis on welfare policies directed toward peri-urban areas seems desirable.

The relative stability in the global picture of the poverty incidence implies a modification in the widespread perception that poverty is doomed to fall in Tunisia as soon as economic growth can be sustained. Attempts to model the relationship of growth and poverty in Tunisia are in Muller (2000) and Bibi (2005) suggests that growth was 'pro-poor' over this period. With a natural demographic rate of 1.90 percent per annum between 1990 and 1995, and a growth rate of consumption per capita of 0.8 percent per year on average during the same period, this growth implies a substantial increase in aggregate consumption. What our estimates show is that the aggregate increase of living standards is insufficient to ensure that poverty is reduced. We now turn to the poverty profile.

## IV. Poverty Profiles in Tunisia 1995

### 4.1. The profiles

The poverty profiles of many countries have been published in the economic literature<sup>5</sup>). However, this is the first time that a poverty profile for Tunisia is presented jointly with the analysis of

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5) E.g., Shari (1979) for the Philippines, Watanabe and Mueller (1984) for Botswana, Kyereme et al. (1987) and Boatend et al. (1990) for Ghana, Gustafson and Makonnen (1992) for Lesotho, McKinley and Alarcon (1995) for Mexico.



its evolution to a broad international audience. Recent studies of changes in poverty across years and based on poverty profiles are in Krishna (2003) and Hulme and Shepard (2003). The profile is shown across six tables upon which we now comment.

Table 5 contrasts the demographic and educational characteristics of the poor and the non-poor. On average the poor households have more members, and in particular more children, than the non-poor households. Obviously, this result may depend on the choice of equivalence scales. Age and sex differences in nutritional requirements are taken into account. However, additional economies of scale related to the presence of public goods in households may attenuate the apparent burden of the presence of many children in poor households. The heads of the poor households are on average slightly younger and much less educated. When using the lower line, more than three fifths of the heads of poor households have no formal education, to be compared with only two fifths for non-poor households.

Tables 6, 7 and 8 respectively present the poverty profiles by region, by professional status of the household head and by activity sector of the household head. The poor are more concentrated in the North-West and the South, and especially in the Centre-West. The incidence of poverty is lower in the District of Tunis and in the Centre-East. The North-East occupies an intermediate position. The ranking of regions does not depend on the considered poverty line.

We find almost the same ranking of regions when focusing on the rural areas only, with higher levels of poverty incidence. The situation is rather similar in the Large Cities with the differences that there are no large cities in the North-West region, and that urban incidence rates are much lower than rural ones. The ranking of regions for the Other Urban Areas is only slightly different

with the South having the second highest incidence level among regions. Therefore, it appears that the urban areas and their rural surroundings form a consistent environment in each region, as far as poverty is concerned.

Let us examine the link of poverty and professional status of the household head. For households without missing value for the professional status of the head<sup>6)</sup>, and for all lines and all strata, the highest poverty incidence corresponds to wage earners. The second category the most affected by the poverty incidence is the independent. Meanwhile, the category of the employer has the lowest poverty incidence. These features are consistent with usual knowledge about these social categories.

Another way to examine how economic activities are related to poverty is to consider the activity sector of the head. The highest head-count indices correspond to households with absent heads, then to households whose head is working in the construction sector, or in the agriculture-fishing sector<sup>7)</sup>. Households with unemployed heads have also a high poverty incidence. To a great extent the ranking of activity sectors in terms of poverty incidence does not depend on the chosen poverty line. On the contrary, the considered strata strongly affect the ranking of sectors in terms of head-count index. In particular, in rural areas poverty incidence is higher in the sectors of: Construction; Absent Heads; Unemployed; Agriculture and Fishing; Transport and Telecommunications; Manufacturing Industries. In view of this, poverty incidence is correlated with absence of active heads (Absent heads, Unemployed heads) or employment of the household head in traditional sectors with low average productivity (Agriculture,

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6) Some households did not provide any useful information about the professional status of the household head.

7) In the remaining tables, cells with a hyphen correspond to an insufficient number of observed households to yield significant results.

Construction).

Tables 9 and 10 respectively exhibit the poverty profiles by education level of the household head, and by household size. For all poverty lines and for all strata, poverty incidence regularly falls when the education level of the household head rises. Households whose head has an education level corresponding to Kouttab (Coranic school) are more likely to be poor than households whose head has a primary education level. Clearly, the human capital of the head has a powerful impact on poverty in Tunisia.

Moreover, poverty incidence is strongly increasing with household size, for all poverty lines and all strata. Although this may partly come from using per capita consumption as the living standard indicator, the strength of the relationship supports anti-poverty interventions directed toward large households. We now examine how the characteristics of poverty have changed between 1990 and 1995.

#### 4.2. Variation in poverty profiles between 1990 and 1995

We present in Tables 11 and 12 the changes in the poverty profiles between 1990 and 1995<sup>8</sup>). The geographical distribution of the poor changed between 1990 and 1995. The Centre-West, the South and the North-West remain the regions with the highest head-count indices, and the District of Tunis and the North-East

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8) We are constrained to limit the analysis to the available poverty lines and the available sorting variables in the published 1990 poverty profile. Because the 1990 poverty profile is published with one decimal digit only, this convention is also used for the calculus of variations. This means that the variation rates are to be considered as approximate numbers, especially when the head-count indices are low. However, they still provide an interesting picture of the changes in the characteristics of the poor between 1990 and 1995. A hyphen in a cell corresponds to no poor people observed in 1990 or 1995.

the ones with the lowest head-count indices. However, poverty incidence has strongly increased in the South and the Centre-West for the lower and upper lines, and in the North-East when considering the upper line only. It has decreased in the Centre-East, and the North-West and in the District of Tunis. Rural areas show an evolution similar to the national context. By contrast, in some regions the Large Cities and the Other Urban areas are characterised by changes in poverty incidence distinct from those at the national level. Poverty incidence has fallen in the large cities of the Centre-West, and has increased in the other urban areas of the Centre-East. Clearly, specific policies for different strata should be considered in these regions.

Even if poverty incidence may be partly transient and caused by the disastrous cereal harvest due to the droughts in the previous years, the estimates suggest that anti-poverty targeting should be flexible and emphasize interventions toward the Centre-West and the South more than in the past.

The poverty incidence in the different activity sectors of the head considerably changed between 1990 and 1995. It increased in the Agriculture and Fishing and in the Construction sectors, where the poor were already concentrated, and also in the sector of Transport and Telecommunications (and in Hotels and Entertainment with the upper line). It fell mostly in Services (and also, while only for the lower line, in Mines and Energy, Commerce, Hotels and Entertainment). What we observe is a structural shift in the activities of the very poor, resulting from differentials in the economic dynamism of sectors. Households whose head operates in traditional activities appear more likely to remain or to become poor than households whose head is involved in services, tourism or trade activities. Meanwhile, the moderately poor households (just below the upper line) face a

much gloomier situation with almost all sectors affected by a rise in poverty incidence<sup>9</sup>).

Despite its ease of interpretation, the head-count index is known to possess mediocre theoretical properties. In particular, it does not properly account for the severity of poverty. To control for this we now present estimates of other popular poverty indices in the next sub-section.

### 4.3. Other Poverty Measures

Tables 13 and 14 show estimates respectively for the Poverty Gap and the Watts poverty measure. The Poverty Gap, analysed in Foster, Greer and Thorbecke (1984), is defined as  $PG = \int_0^z (1 - y/z) d\mu(y)$ , where  $\mu$  is the cdf of the living standard distribution. It satisfies the monotonicity axiom, the transfer axiom, and the sub-group monotonicity axiom and is decomposable. The Watts poverty index, introduced by Watts (1968), is  $W = \int_0^z -\ln(y/z) d\mu(y)$ . The Watts index satisfies the monotonicity, transfer and transfer sensitivity axioms, and is decomposable.

The estimated poverty gap declines when using the lower poverty line and rises with the upper line, which illustrate the importance of considering several poverty lines. The ranking of regions and strata is similar to what was obtained with poverty incidence. For both lines, the poverty gap has increased in the Other Urban Areas and fallen in the Large Cities. It has increased in the Rural Areas with the upper line and decreased with the lower line.

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9) Running regressions of living standards as recently in Datt and Hoogeveen (2003), Ellis and Bahiigwa (2003) and Grootaert and Narayan (2004) would have been useful. Unfortunately, the stringent access status of the data ruled it out.

On the whole the estimates with the Poverty Gap or the Watts index confirm the ranking of regions found with poverty incidence. Nonetheless, a few differences emerge for specific strata. The North-East appears to be relatively less poor than the District of Tunis when accounting for poverty severity. Poverty measured with Watts poverty measure is much higher in the Centre-West and much lower in the Centre-East and the Tunis District.

Moreover, upper and lower poverty lines, which generally lead to similar rankings at the national level, may yield slightly diverging rankings in some strata. The Centre-East, the Tunis District and the North-East in the Other Urban areas; the Tunis District and the North-East in the Large Cities; the Tunis District and the North-West in the Rural Areas often have different rankings when using the upper line rather than the lower line.

## V. Conclusion

In this paper, we study the poverty profile of Tunisia in 1995 and its change between 1990 and 1995. Using a lower poverty line, which identifies the very poor, the proportion of the very poor in Tunisia has stabilised during 1990-95. However, when using a higher poverty line, poverty incidence appears to have increased. Households around and above the higher poverty line are increasingly vulnerable. The relative stability or the slight degradation in the global picture of the poverty incidence contradicts the widespread perception that poverty should fall in Tunisia as soon as economic growth can be sustained.

A few differences emerge from comparing different strata. The head-count index has increased in the urban areas and in the rural areas. The proportion of the poor observed in rural areas

has somewhat diminished, consistently with the secular rural-urban migration of the poor of Tunisia. Nonetheless, the number of the poor is still twice as high in the rural areas than in the urban areas. The share of the large cities in the global number of the poor has collapsed, compensated by a surge in the other urban areas. Stronger emphasis on welfare policies directed toward peri-urban areas seems desirable.

The geographical distribution of the population of the poor has substantially changed between 1990 and 1995. While rural areas are characterised by an evolution of poverty incidence similar to the national context, the Large Cities and the Other Urban areas are characterised by changes very different from those at the national level in some regions. Clearly, specific policies should be considered for different strata in these regions.

Similarly, the poverty incidence for the activity sectors of the head shifted between 1990 and 1995. In the Agriculture and Fishing and in the Construction sectors, where the poor were already very concentrated, it rose. In contrast, it declined in Services, Mines and Energy, Commerce, Hotels and Entertainment sectors. Clearly, the differential economic dynamism of sectors affects poverty. Households whose head is involved in traditional activities, as opposed to services, tourism or trade, are more likely to remain or to become poor. The results with other poverty measures confirm the qualitative results found with the head-count index.

The government's long-standing commitment to social development has so far contributed to the decline of poverty in Tunisia. During and after the fiscal adjustment of the mid-1980s, the public expenditures important for the welfare of the poor have been preserved. Government programmes in education, health care and basic infrastructure have benefited the poor. Three safety net

programs have been implemented: food subsidies targeted at the poor through self-selection mechanisms based on quality differentiation; direct transfers in kind and in cash targeted at the needy, public works providing short-term jobs for unskilled workers through self-targeting. Moreover, the sustained growth of the economy contributed to the creation of low wage jobs for unskilled workers in labour-intensive export activities, notably in tourism and textile industries.

However, following the structural adjustment plan and the passage from an economy based on agriculture and on rudimentary industries to more sophisticated industries and services, the fight against poverty has become harder. A core of poverty has become resilient to government policies, partly because it is fed by the increasing perception of their minimum needs by the population of the poor. Moreover, progress against poverty incidence has not been uniform across the country, and significant and shifting disparities remain between regions, between rural, peri-urban and central-urban areas and between activity sectors. The poverty map change in the country between 1990 and 1995 calls for an increasing geographical and sector flexibility of anti-poverty governmental interventions.

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## Appendix 1: Calculus of the poverty lines

In this appendix, we detail the process of calculation of the poverty lines. We first present the poverty lines calculated by inflating the 1990 poverty lines with the 1995 CPI index. Then, we describe the estimation of the food component for 1995 updated food poverty lines. Finally, we show the extrapolation step taken to produce the final updated lines.

The calculated inflated poverty lines are given in Table A1. The World Bank (1995a, b) provides details about 1990 lower ( $Z^L$ ) and upper ( $Z^U$ ) poverty lines. The calculation of lower and upper poverty lines is explained below. Using two lines correspond to the wish of The World Bank to provide two perspectives on poverty, sometimes respectively called 'extreme poverty' and 'moderate poverty'. Inflated poverty lines are merely calculated by using the 1990 poverty lines and inflating them using the CPI. The CPI for the food and non-food components have shifted in parallel between 1990 and 1995 (respectively 30 percent and 29 percent). Therefore, adjusted lines separating food and non-food components have not been calculated since they would yield almost identical poverty lines.

[Table A1] Inflated poverty lines (in Tunisian Dinars per year)

		Rural	Large Cities	Other Urban	Total Urban	National
$Z^U$ 1990 in prices	1990	228	343	273	293	252
$Z^L$ 1990 in prices	1990	185	248	208	218	196
$Z^U$ 1990 in prices	1995	296	446	355	381	328
$Z^L$ 1990 in prices	1995	240	322	270	283	255

$Z^L$  is the lower poverty line.  $Z^U$  is the upper poverty line.

## A1. Theoretical estimation of the lower and higher updated poverty lines for 1995

We call *updated poverty lines* the poverty lines estimated as follows, as opposed to the preceding *inflated poverty lines*. The estimation of the updated poverty lines is in nine steps. (1) We choose a reference group whose living standard is close to the expected poverty line. (2) We choose caloric requirements for households in this reference group. (3) We calculate mean structures of consumption for the reference group and mean structures of food consumption both in value and in quantity. (4) We calculate the value of mean food consumption for the reference group in each stratum  $j$ ,  $V_j$ . (5) We calculate the caloric level of the mean food consumption for the reference group in each stratum  $j$ ,  $C_j$ , we calculate the caloric unit value for the reference group in each stratum,  $CUV_j = V_j/C_j$ , and we calculate the average household size (and other average household characteristics for the reference group. (6) We calculate the food poverty line,  $z_j^F$  in each stratum  $j$  as the value of the caloric requirement for stratum  $j$  ( $CR_j$ ):  $z_j^F = CUV_j CR_j = (V_j CR_j)/C_j$ . (7) We estimate the demand function for food by using ordinary least squares for the population group of reference. The model is the following.

$$s_{ij} = \alpha_j + \beta_j \ln(x_j/z_j^F) + \gamma_j [\ln(x_j/z_j^F)]^2 + \delta_j (N_j - N_j^r) + \epsilon_{ij} \quad (\text{EQ1})$$

where  $s_{ij}$  is the share of good  $i$  in total consumption (in percentages) in stratum  $j$ ,  $x_j$  is the per capita consumption in stratum  $j$ ,  $N_j$  is the household size in stratum  $j$  and  $N_j^r$  is the

household size of the reference group in stratum  $j$ ,  $\epsilon_{ij}$  is an error term. (8) From these estimations, we extrapolate the lower poverty line:  $z_j^L = z_j^F(2 - \alpha_j)$ . The lower poverty line and of the higher poverty line are discussed in Ravallion (1998).

Estimating a rough demand system is useful to extrapolate the non-food share of the poverty line in a non-linear way that accounts for household composition. Indeed, non-food expenditure often varies more across households than food expenditure does. Then, some additional flexibility in the extrapolating model is required. The upper line is the solution of the food demand equation where the food share corresponds to the food poverty line. The derivation of the lower poverty line is less obvious and we now spell it out. The calculus of the lower poverty line is based on two subjacent assumptions: (1) basic non-food needs are satisfied before basic food needs; (2) both food and non-food are normal goods once survival needs are satisfied. Under these conditions, let us denote  $f(y)$  the food spending for income  $y$  and let  $z_j^{NF}$  be the non-food poverty line in stratum  $j$ . The lower poverty line in stratum  $j$  is  $z_j^L = z_j^F + z_j^{NF}$ . Consider a person such that  $y = z_j^F$ . Under the chosen assumptions, anything that this person spends on non-food is considered to be a minimum allowance for basic non-food needs since the person gave up basic food needs. Then, a minimum allowance for non-food basic needs is  $y - f(y) = z_j^F - f(z_j^F)$ . Thus, the total poverty line is  $z_j^L = z_j^F + z_j^F - f(z_j^F) = 2z_j^F - f(z_j^F)$ . If the food-share Engel curve is given by (eq1), we obtain  $z_j^L = z_j^F(2 - \alpha_j)$ .

These demand equations are consistent with the Quadratic AID System proposed by Banks et al. (1997), where unobserved price differences and unobserved households characteristics are ignored.

(9) Finally, we extrapolate the upper poverty line,  $z_j^U$ , by solving in  $z^U$ :

$$z_j^F/z_j^U = \alpha_j + \beta_j \ln(z_j^U/z_j^F) + \gamma_j [\ln(z_j^U/z_j^F)]^2 + \delta_j (N_j - N_j^r) + \epsilon_{ij} \quad (EQ2)$$

In practice, the solution is numerically obtained by iterating the method of Newton.

## A2. Practical estimation of food poverty lines for all strata

The reference group (RG) chosen to anchor the 1990 poverty lines was the set of households with per capita consumption in the interval TD200-TD250 (TD = Tunisian Dinar). This group was believed to be representative of the population of households around the calculated poverty lines, especially the upper povertyline that corresponds to substitutions between food and non-food consumption that are consistent with observations of actually satisfied food minima. The choice of the target group is also justified by the necessity of getting sufficient sample sizes for each stratum. The reference group in 1990 represented 6.1 percent of the total population of Tunisia (8 144 000 inhabitants).

The food poverty line in stratum  $j$  is defined as the value of the food consumption that covers the recommended caloric needs of the population corresponding to the RG in stratum  $j$ . For this calculation a simple linear extrapolation is used based on the mean value of the consumption of the population corresponding to the RG in stratum  $j$ , and the mean caloric consumption of the population corresponding to the RG in stratum  $j$ .

The recommended needs (RN = CR) are estimated using WHO's caloric requirements extrapolated to the ideal weights and physical



activities of the household members, which are calculated from their age and gender (Institut National des Statistiques (1990)). The recommended needs are estimated for each stratum and each reference group because they correspond to different household populations. Similarly, the household size, the caloric consumption and the value of the food consumption are estimated for each sub-population. Note that for comparison purposes all the characteristics of the reference group are based on the sub-sample of the food consumption survey (a part of the global consumption survey) like in 1990.

The definition of the reference group in 1995 is based on several requirements. First, the definition must allow intertemporal poverty comparisons between 1990 and 1995. Second, it must correspond to a population of households around the poverty lines to be calculated in 1995. The basic principle is to update the 1990 reference group by trying to define a new reference group that would correspond to the same levels of updated welfare in 1995. Naturally, that is a situation of missing information and only approximate results can be obtained. Two natural cases are explored:

- Hypothesis 1: The welfare levels in the reference groups have evolved, on the whole, as the mean per capita consumption (plus price inflation).
- Hypothesis 2: The welfare levels in the reference groups have stagnated. So, the boundaries of the class are just inflated for the inflation.

Other hypotheses would be possible. For example the reference group could progress faster than the rest of households. However, it would be ad hoc to choose a specific growth rate without additional information. A bad choice of the growth rate of the per capita consumption of the reference group may lead to a mislea-

ding increase in poverty indicators and we prefer avoiding it.

We now turn to the specific calculation for each hypothesis.

**a) Hypothesis 1:** The notion of reference group has evolved with price increases and also in parallel to the growth of the mean per capita consumption. Here, households around the poverty line are assumed to have benefited from the economic growth in the same proportion than the whole set of households. The RG under this hypothesis is, in Dinars 1995, the set of households with per capita consumption in the interval TD270-337. We present in Table A2 the statistics used for estimating the food poverty line in all the strata based on Hypothesis 1.

[Table A2] Food poverty line with Hypothesis 1

	Rural	Urban	Large Cities	Other Urban	National
Recommended Needs (cal./day and person) = RN = CR	2141	2185	2263	2163	2155
Mean Caloric Consumption (cal./day and person) = C for RG	2096	1624	1384	1689	1952
Value of Mean Food Consumption (TD/year) = V for RG	165.28	149.99	143.63	151.88	160.48
Mean Household Size = N for RG	6.6	6.2	6.6	6.1	6.5
Caloric Unit Value ( $10^{-3}$ TD)	0.2160	0.2530	0.2843	0.2463	0.2252
Food Poverty Line (TD/year) = $z^F = (V/C)*RN$	168.79	201.77	234.83	194.49	177.14

The sub-populations "Total Urban" and "National" are treated similarly to the elementary strata. We also obtain therefore an "Urban" food poverty line and a "National" poverty line that are given for comparison purposes.

**b) Hypothesis 2:** Here, the notion of reference group is assumed to have evolved in parallel to the evolution of prices only. This

means that these households are assumed to have typically not benefited from the growth of the economy. The RG under this hypothesis is, in Dinars 1995, the set of households with per capita consumption in the interval TD260-325. It represents 6.2 percent of the population in 1995 and corresponds to a mean per capita consumption of TD295. The statistics used for the calculation of the food poverty lines are shown in Table A3.

**[Table A3] Food poverty line in Hypothesis 2**

	Rural	Urban	Large Cities	Other Urban	National
Recommended Needs (cal./day and person) = RN	2165	2173	2143	2179	2168
Mean Caloric Consumption (cal./day and person) = C for RG	2067	1615	1402	1659	1929
Value of Mean Food Consumption (TD/year) = V for RG	160.65	147.26	139.07	149.23	156.44
Mean Household Size = N for RG	6.7	6.5	6.9	6.4	6.6
Caloric Unit Value ( $10^{-3}$ TD)	0.2129	0.2498	0.2717	0.2464	0.2222
<i>Food Poverty Line (TD) = <math>z^F = (V/C)*RN</math></i>	168.23	198.12	212.57	195.97	175.83

For reference, we provide in Table A4 the statistics used for the estimation of 1990 food poverty lines.

**[Table A4] 1990 Food poverty lines**

	Rural	Large Cities	Other Urban	National
Recommended Needs (cal./day and person) = RN	2115	2160	2148	-
Caloric Unit Value ( $10^{-3}$ TD of 1990)	0.173	0.216	0.184	0.176
Caloric Unit Value ( $10^{-3}$ TD of 1995)	0.225	0.281	0.239	0.229
Food Poverty Line (TD of 1990) = $z^F = (V/C)*RN$	134	170	144	-
<i>Food Poverty Line (TD of 1995) = <math>z^F = (V/C)*RN</math></i>	174.2	221	187.2	-

### A.3. Practical estimation of the updated upper and lower poverty lines

Once the food component of the poverty line is known, it remains to derive its non-food component. We follow the method used for the 1990 poverty profile (Ravallion and van de Walle (1993), The World Bank (1995a, b), Ravallion (1998)). The upper and lower poverty lines are derived using the following food demand model that is estimated in each stratum separately with the whole sample of households in the stratum.

$$s_j = \tilde{\alpha} + \tilde{\beta}_j \ln(x) + \gamma_j [\ln(x)]^2 + \rho_j N_j \quad (EQ3)$$

where  $s_j$  is the share of food in total consumption (in percentages) in stratum  $j$ ,  $\tilde{\alpha}_j = \alpha_j + \beta_j \ln(z_j^F) + \gamma_j (\ln(z_j^F))^2$ ,  $\tilde{\beta}_j = \beta_j - \gamma_j \ln(z_j^F)$ ,  $x$  is the per capita consumption (in Millimes, i.e.  $10^{-3}$  TD) in stratum  $j$  and  $N_j$  the mean household size in stratum  $j$ . The OLS estimation results are presented in Table A5.

[Table A5] Estimates of Engel curves.

	Rural	Urban	Large Cities	Other Urban	National
Constant	-457.02	-83.82	36.43	-180.19	-100.91
$\ln(x)$	87.78 (10.50)	30.15 (6.07)	12.93 (1.59)	44.20 (6.57)	33.38 (9.28)
$[\ln(x)]^2$	-3.710 (11.67)	-1.493 (8.33)	-0.878 (3.04)	-2.003 (8.19)	-1.639 (12.38)
$N$	-0.8723 (12.69)	-1.1170 (18.75)	-1.1370 (10.69)	-1.1240 (15.6)	-0.9780 (21.72)
$R^2$	0.475	0.586	0.605	0.567	0.588

The lower poverty line ( $Z^L$ ) corresponds to households who can just afford to meet their nutritional requirement. The upper

poverty line ( $Z^U$ ) corresponds to households that actually meet these requirements.

The lower poverty line is obtained by replacing the value of the per capita consumption in (Eq3) with the value of the food poverty line in the considered stratum. This yields the share of food expenditure ( $s$ ) at the lower poverty line. The lower poverty line is therefore equal to  $z^L = (2 - s) \cdot z^F$ . The upper poverty line is obtained by solving numerically (Eq3) in  $x$  when  $s^j$  is equal to  $z^F/x$ . We use the method of Newton and extrapolations based on the regression curve.

The comparison of the values of the lower poverty lines and the boundaries of the interval of per capita consumption for the reference group shows similar features to what was obtained with the 1990 poverty lines. Namely, the rural lower poverty line and the urban upper poverty lines are outside the per capita consumption interval for the reference group. All other lines fall in this interval. Since it would be unrealistic to expect all lines to be in the interval, we consider that the present situation is consistent with a safe comparison of the updated lines across time.

The differences between the two updated lines (Hypothesis 1 and Hypothesis 2) are moderate whatever the considered stratum. As a matter of fact, with a substantial inflation (30 percent over 5 years), any reasonable extrapolation of the reference group should yield similar sub-populations. Indeed, the growth of mean p.c. consumption is only 4.5 percent over 5 years. Then, one does not expect the two definitions of the RG to diverge a lot only on grounds related to the growth of the economy. In practice the two hypotheses yield very close results. Larger differences occur for the strata Large Cities that can be attributed to random small sample variations. By contrast, the differences between updated lines and inflated lines can be more substantial, although they are generally

reasonable.

#### **A4. Choice of the poverty lines for the poverty profile**

The choice of the specific poverty line on which the poverty profile will be based is determined by several elements:

- Although the results are quite similar, Hypothesis 2 is preferred to Hypothesis 1. Indeed, if one believes that the reference group and the poor form together an homogeneous group, at least as a first order approximation, and if (in link to the definition of Hypothesis 1), one believes that the living standards of these two categories should have progressed at a rhythm close to the growth of the per capita consumption, then one would expect a decrease in poverty shown by results based on the inflated poverty line. In practice, such reasoning is far from rigorous but conveys the idea that the stabilisation or the increase in the estimated number of poor for all lines (shown in the text) is little consistent with an optimistic perception of the evolution of living standards of the poorest households. On the whole, we believe that a stagnation of real per capita consumption of the reference group is closer to the true situation than a progression at the rhythm of the growth of aggregate per capita consumption. Therefore, Hypothesis 2 makes more sense than Hypothesis 1.
- One advantage of using the updated lines is that specific poverty lines for the urban stratum and at the national level can also be estimated, which is impossible with deflated lines since they have not been calculated using the 1990 survey.
- A difficulty with the inflated lines is that they are heavily based on the CPI. Unfortunately, this price index is not the one that one would like to dispose of. Indeed, the price level

and the price structure for the reference group are not necessarily the ones for the whole population. A specific price index representing better the consumption structure of the poor would be desirable since some items used in the definition of the weights of the national price index are typically not consumed by the poor. Also, regional price indices for urban and rural areas would be important since the distribution of poverty across strata is not only of interest, but also a basic component of the method on which the lines are based. Naturally, such concerns are also valid for the updated lines. However, one expects that the updating method captures part of the price differences across time and households.

Finally, one of the main reason to prefer the updated lines is that it is necessary to account for the present situation of Tunisia (prices, qualities of consumed goods, environment, household characteristics and perceptions) to estimate the poverty line, rather than to base it implicitly on the 1990 situation. In conclusion, we choose to use the updated poverty lines corresponding to Hypothesis 2.

### Appendix 3: Tables

[Table 1] Updated and inflated poverty lines (in Tunisian Dinars per year)

	Rural	Large Cities	Other Urban	Total Urban	National
$z^L$ (Hyp. 1)	242	343	283	293	253
$z^L$ (Hyp. 2)	242	310	286	288	252
$z^L$ 1990 (a)	240	322	270	-	-
$z^U$ (Hyp. 1)	316	472	397	407	344
$z^U$ (Hyp. 2)	314	426	399	402	341
$z^U$ 1990 (a)	296	446	355	-	-

(a) in 1995 prices.

**[Table 2] Populations of poor persons**

	Rural	Large Cities	Other Urban	National
$Z^U$	902,848	173,203	431,888	1,507,937
$Z^U$ 1990 inflated	774,085	196,063	302,815	1,272,963
$Z^L$	487,488	44,259	155,635	687,382
$Z^L$ 1990 inflated	473,683	51,459	122,485	647,627
Total population	3,491,257	2,397,300	3,112,897	9,001,454
Nb. of sampled households	396	21	151	568
	National (b)	Urban(a)	Urban(a) + Rural	
$Z^U$	1,412,458	572,611	1,475,459	
$Z^L$	651,312	193,510	680,998	
Total population	9,001,454	5,510,197	9,001,454	

(a) Calculated using the Urban poverty line for all urban strata.

(b) Calculated using the National poverty line for all strata.

**[Table 3] Head-Count Index (percentages):**

	Rural	Large Cities	Other Urban	Total Urban	Total National
$Z^U$	25.86	7.22	13.87	10.98	16.75
$Z^U$ 1990 inflated	22.17	8.18	9.73	9.05	14.14
1990 (upper line)	21.6	8.6	9.2	8.9	14.1
$Z^L$	13.93	1.85	5.00	3.62	7.64
$Z^L$ 1990 inflated	13.57	2.15	3.93	3.16	7.2
1990 (lower line)	13.1	2.8	4.0	3.5	7.4
	Urban (a)	Urban + Rural (a)	National (b)		
$Z^U$	10.39	16.39	15.69		
$Z^L$	3.51		7.23		

(a) Calculated using the Urban poverty lines. (b) Calculated using the National poverty lines.

**[Table 4] Proportion of the national poor in each stratum (percentages)**

Lines	Rural Areas	Large Cities	Other Urban	Total Urban	Total National
$Z^U$	59.87	11.48	28.64	40.12	100
$Z^U$ 1990 inflated	60.81	15.40	23.79	39.19	100
1990, upper line (a)	62.19	21.47	16.22	37.69	100
$Z^L$	70.91	6.44	22.64	29.08	100
$Z^L$ 1990 inflated	73.14	7.95	18.91	26.86	100
1990, lower line (a)	71.87	17.78	10.06	27.84	100

(a) Our own calculations from published results in The World Bank (1995a,b).



**[Table 5] Characteristics of the poor and the non-poor**  
 UL = Upper line; LL = Lower line.

	The Poor	The Poor	The Non-Poor	The Non-Poor
	LL	UL	LL	UL
Household Size	7.64	7.47	6.22	6.09
Age of the Head (Years)	46.13	47.23	50.05	50.26
Number of Children (0-18)	4.85	4.58	3.25	3.11

  

Head's Education levels (%)	The Poor	The Poor	The Non-Poor	The Non-Poor
Nothing	61.80	57.08	40.06	38.63
Primary	34.40	37.98	36.71	36.24
Secondary	3.8	4.94	18.49	19.86
Superior	0	-	4.73	5.25

**[Table 6] Poverty profile by regions**

a. Upper poverty line:

	Large Cities	Large Cities	Other Urban	Other Urban	Rural	Rural	National	National
	% of Population	Head-count index	% of Population	Head-count index	% of Population	Head-count index	% of Population	Head-count index
Tunis District	17.13	7.10	2.17	11.69	1.67	17.92	20.98	8.44
North-East	1.17	11.38	6.88	9.14	5.65	23.04	13.71	15.07
North-West	-	-	4.76	15.58	9.02	25.12	13.78	21.83
Centre-West	1.20	16.45	3.15	22.91	10.39	38.20	14.75	33.15
Centre-East	5.95	3.66	8.90	6.25	6.44	13.60	21.30	7.75
South	1.15	13.55	8.69	21.76	5.59	23.48	15.45	21.76
All Regions	26.63	7.22	34.58	13.87	38.78	25.86	100	16.75

b. Lower poverty line:

	Large Cities	Other Urban	Rural	National
Tunis District	1.81	1.32	9.35	2.36
North-East	2.09	2.77	10.42	5.87
North-West	-	4.69	13.93	10.74
Centre-West	5.42	12.20	21.29	18.05
Centre-East	0.70	2.17	7.39	3.34
South	4.26	8.14	12.91	9.58
All Regions	1.85	5.00	13.96	7.64

**[Table 7] Poverty profile by professional status of the household head**  
a. Upper poverty line:

	Large Cities	Large Cities	Other Urban Areas	Other Urban Areas	Rural Areas	Rural Areas	National	National
	% of Population	Head-count index	% of Population	Head-count index	% of Population	Head-count index	% of Population	Head-count index
Employer	1.91	0.72	2.11	3.47	1.21	18.13	5.24	5.85
Independent	3.74	7.47	7.08	10.58	14.00	21.01	24.83	15.99
Wage Earner	15.44	7.81	18.85	16.66	18.42	30.99	52.72	19.07
No Response	5.54	7.77	6.54	12.87	5.15	22.97	17.21	14.13
All Professional Status	26.63	7.22	34.58	13.87	38.78	25.86	100	16.75

b. Lower poverty line:

	Large Cities	Other Urban	Rural	National
Employer	0.00	1.14	8.52	2.43
Independent	2.79	3.04	10.26	7.07
Wage Earner	1.70	6.73	17.10	8.88
No Responses	7.22	13.87	25.86	16.75
All Professional Status	1.85	5.0	13.96	7.64

**[Table 8] Poverty profile by activity sector of the head**

a. Upper poverty line:

	Large Cities	Large Cities	Other Urban	Other Urban	Rural	Rural	National	National
	% of Population	Head-count index	% of Population	Head-count index	% of Population	Head-count index	% of Population	Head-count index
Agriculture and Fishing	0.73	11.02	4.31	17.54	17.90	25.63	22.95	23.64
Manufacturing Industries	4.09	4.65	4.41	9.19	2.04	21.04	10.55	9.73
Mining and Energy	-	-	7.16	10.03	6.46	17.23	13.62	8.31
Construction	2.35	14.42	3.74	37.53	6.39	42.10	12.49	35.51
Commerce	3.60	7.49	3.66	9.60	2.52	12.81	9.79	9.65
Transport and Telecommunications	2.20	2.31	1.92	10.93	1.34	21.20	5.47	9.97
Hotel, entertainment, etc Services	0.75	8.04	1.53	8.57	0.16	7.57	2.44	8.34
Retired	3.86	5.27	3.06	8.29	0.85	13.03	7.78	7.31
Unemployed	1.10	14.68	1.79	19.55	1.46	21.70	4.36	19.03
Head of household	0.49	11.84	1.64	14.39	2.64	27.69	4.77	21.48
All Activity Sectors	26.63	7.22	34.58	13.87	38.78	25.86	100	16.75

## b. Lower poverty line:

	Large Cities	Other Urban	Rural	National
Agriculture and Fishing	1.09	7.14	13.41	11.83
Manufacturing Industries	1.06	2.34	9.36	3.21
Mining and Energy	-	2.70	-	1.18
Construction	3.24	19.29	23.61	18.48
Commerce	1.97	2.38	5.97	3.16
Transport and Telecommunications	0.36	2.34	9.43	3.28
Hotel, entertainment, etc	5.58	-	7.57	2.22
Services	1.71	2.87	8.57	3.41
Retired	2.38	2.17	7.60	2.87
Unemployed	-	5.20	12.96	6.48
Heads of household	6.69	3.68	19.14	12.54
All Activity Sectors	1.85	5.00	13.96	7.64

【Table 9】 Poverty profile by education level of the household head

## a. Upper poverty line:

	Large Cities	Other Urban	Rural	National
Nothing	12.93	19.38	28.43	22.92
Kouttab	7.65	12.56	20.05	15.01
Primary	9.41	16.20	26.49	18.07
Secondary, 1st Cycle	2.43	7.47	18.49	8.05
All Levels	7.22	13.87	25.86	16.75

Categories 'Secondary, 2<sup>nd</sup> Cycle' and 'Superior' are not shown because too few sample households belong to these categories to make the estimates meaningful.

## b. Lower poverty line:

	Large Cities	Other Urban	Rural	National
Nothing	2.87	8.35	15.95	11.31
Kouttab	3.50	3.40	7.45	5.29
Primary	2.81	5.01	14.14	7.70
Secondary, 1st Cycle	-	2.10	12.25	3.60
All Levels	1.85	5.00	13.96	7.64

Categories 'Secondary, 2<sup>nd</sup> Cycle' and 'Superior' are not shown because too few sample households belong to these categories to make the estimates meaningful.

**[Table 10] Poverty profile by household size**

## a. Upper poverty line:

	Large Cities	Other Urban	Rural	National
1-2 persons	2.27	4.31	3.93	3.59
3	1.90	2.79	6.28	3.54
4	2.32	5.65	14.65	6.85
5	5.43	9.87	19.48	11.45
6	6.89	12.99	23.62	14.91
7	12.02	16.29	31.76	22.02
8 and more	16.47	23.37	34.05	27.81
All sizes	7.22	13.87	25.86	16.75

## b. Lower poverty line:

	Large Cities	Other Urban	Rural	National
1-2 persons	0.63	0.32	1.86	0.90
3	0.40	0.78	2.34	1.12
4	0.96	1.29	6.50	2.61
5	0.92	3.41	9.78	4.61
6	1.62	3.47	13.47	6.41
7	4.02	5.34	16.56	9.91
8 and more	3.93	10.13	19.12	13.81
All sizes	1.85	5.00	13.96	7.64

**[Table 11] Variation of the poverty profile by regions between 1990 and 1995 (%)**

## a. Upper Poverty line

	Large Cities	Other Urban	Rural	National
Tunis District	-7.7	-	1.1	-2.3
North-East	24.2	68.5	33.7	39.8
North-West	-	-4.3	-10.4	-9.5
Centre-West	-12.2	41.4	66.8	57.3
Centre-East	-58.8	52.4	-30.2	-20.4
South	27.1	80.2	44.2	60.3
All Regions	-16.2	51.1	19.9	19.1

## b. Lower Poverty line

	Large Cities	Other Urban	Rural Areas	National
Tunis District	-33.3	-	2.2	-27.2
North-East	75.0	115.4	-16.8	-3.3
North-West	-	-45.3	-18.7	-25.7
Centre-West	-26.0	35.5	38.3	35.1
Centre-East	-74.0	83.3	-28.8	-25.0
South	230.8	50.0	79.2	65.5
All Regions	-32.1	25.0	6.9	2.7

**[Table 12]** Variation of the poverty profile by activity sector of the head between 1990 and 1995 (%)

Upper Line = UL, Lower Line = LL.

	Large Cities		Other Urban		Rural		National	
	UL	LL	UL	LL	UL	LL	UL	LL
Agriculture and Fishing	19.6	-56.0	76.8	91.9	16.9	2.3	38.8	28.3
Manufacturing Industries	-44.7	-15.4	-22.0	-20.7	27.3	11.9	-11.0	3.2
Mining and Energy	0	0	-23.1	-69.0	107.2	-	10.7	-75.5
Construction	-28.4	-71.2	102.7	101.0	46.2	36.4	51.1	39.1
Commerce	-20.2	-4.8	18.5	-29.4	-7.9	-21.1	-1.0	-17.9
Transport and Telecommunications	-65.2	-69.2	354.2	-	241.9	370.0	96.1	230.0
Hotel, entertainment, etc	263.6	-	24.6	-	8.6	8.6	59.6	-15.4
Services	29.8	-29.2	11.1	-12.1	-31.6	-49.4	-10.8	-44.3

**[Table 13]** Poverty Gap (P1) by regions

## a. Upper Poverty line

	Large Cities	Other Urban	Rural	National
Tunis District	0.0138	0.0162	0.0574	0.0175
North-East	0.0195	0.0202	0.0516	0.0331
North-West	-	0.0321	0.0670	0.0550
Centre-West	0.0423	0.0652	0.1049	0.0913
Centre-East	0.0060	0.0146	0.0331	0.0178
South	0.0299	0.0520	0.0637	0.0546
All Regions	0.0143	0.0322	0.0684	0.0415
All Regions 1990	0.0194	0.0223	0.0587	0.0363

## b. Lower Poverty line

	Large Cities	Other Urban	Rural	National
Tunis District	0.0035	0.0017	0.0374	0.0061
North-East	0.0032	0.0043	0.0194	0.0104
North-West	-	0.0077	0.0290	0.0216
Centre-West	0.0175	0.0238	0.0494	0.0413
Centre-East	0.0116	0.0043	0.0131	0.0061
South	0.0075	0.0149	0.0292	0.0195
All Regions	0.0038	0.0090	0.0308	0.0161
All Regions 1990	0.0051	0.0086	0.0325	0.0174

[Table 14] Watts' Poverty index by regions

## a. Upper Poverty line

	Large Cities	Other Urban	Rural	National
Tunis District	0.0171	0.0184	0.0856	0.0227
North-East	0.0228	0.0246	0.0643	0.0408
North-West	-	0.0400	0.0861	0.0702
Centre-West	0.0550	0.0839	0.1374	0.1192
Centre-East	0.0070	0.0187	0.0420	0.0224
South	0.0362	0.0650	0.0827	0.0693
All Regions	0.0176	0.0404	0.0888	0.0531

## b. Lower Poverty line

	Large Cities	Other Urban	Rural	National
Tunis District	0.00449	0.00183	0.0536	0.0081
North-East	0.00352	0.00507	0.0233	0.0124
North-West	-	0.00979	0.0359	0.0269
Centre-West	0.02168	0.02834	0.0623	0.0517
Centre-East	0.00127	0.00553	0.0163	0.0076
South	0.00861	0.01775	0.0363	0.0238
All Regions	0.00469	0.0109	0.0387	0.0200

## Tunisia에서의 빈곤의 변화

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### 논문초록

본 논문에서는 1995년 튀니지의 빈곤 상황을 제시하며 1990년과 1995년 사이에 이러한 빈곤상황이 어떻게 변화하였는지 분석하고자 한다. 서로 다른 지리적 계층에 따른 준거집단의 소비에 기초한 최신 빈곤선을 이용하여 우리는 지속적인 경제성장과 90년대에 이전에 시작한 구조조정 정책에도 불구하고 1990년과 1995 사이에 빈곤이 증가했다는 사실을 발견했다. 튀니지의 1995년 빈곤의 성격은 다른 국가에서 발견되는 양식과 일치한다. 빈곤은 가계 구성원이나 자식의 수가 많은 가계일수록, 가장이 부재이거나 무직인 가계일수록, 가장이 건설업이나 농수산 부문에서 일하는 가계일수록, 가장이 젊거나 교육수준이 낮은 가계일수록 증가했다. 튀니지에서는 빈곤이 서북, 중서, 남쪽 지방에 집중되었다. 더욱이 각 지방의 도시지역과 그 부근의 농촌 지역에서는 일관되게 빈곤 환경이 형성되었다. 이러한 빈곤의 지리적 변화는 대도시의 여건개선과 다른 도시·농촌 지역의 여건악화를 수반하였다. 농촌지역에서의 빈민의 비율은 비록 여전히 도시지역보다 두 배 가량 높지만 감소하였다. 끝으로, 1990년과 1995년 사이에 지역에 따른 빈곤의 집중과 그 행태는 변화하였다. 1995년의 빈곤은 1990년에 비해 중서, 그리고 도시지역 부근에 더 집중되었다. 그리고 빈민은 농수산업, 건설업, 수송업, 전자통신 분야와 같은 일부 분야에 집중되었고 서비스 분야에는 빈곤이 적었다. 따라서, 가장이 전통적인 분야에 종사하고 있는 가계는 계속 빈곤하지만 가장이 확장분야, 관광, 무역 분야에 종사하고 있는 가계는 빈곤에서 벗어날 가능성이 높다. 이러한 변화는 빈곤퇴치 정책에 의거하였다고 보아야 한다.

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