

WPS 3068

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POLICY RESEARCH WORKING PAPER

Poverty and Economic Growth in Egypt, 1995–2000

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June 2003



Abstract

After a decade of slow economic growth Egypt's rate of growth recovered in the late 1990s, averaging more than five percent a year. But the effect of this growth on poverty patterns has not been systematically examined using consistent, comparable household datasets. In this paper El-Laithy, Lokshin, and Banerji use the rich set of unit-level data from the most recent Egyptian household surveys (1995–96 and 1999–2000) to assess changes in poverty and inequality between 1995 and 2000. Their analysis is based on household-specific poverty lines that account for the differences in regional prices, as well as differences in the consumption preferences and size and

age composition of poor households. The results show that average household expenditures rose in the second half of the 1990s and the poverty rate fell from 20 percent to less than 17 percent. But, in addition to the ongoing divide in the urban-rural standard of living, a new geographical/regional divide emerged in the late 1990s. Poverty was found predominantly among less-educated individuals, particularly those working in agriculture and construction, and among seasonal and occasional workers. These groups could suffer the most from the slowing economic growth evident after 1999–2000.

This paper—a product of the Poverty Team, Development Research Group—is part of a larger effort in the group to understand the impact of economic growth on poverty. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Patricia Sader, room MC3-632, telephone 202-473-3902, fax 202-522-1153, email address psader@worldbank.org. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The authors may be contacted at hflaithy@gega.net, mlokshin@worldbank.org, or abanerji@worldbank.org. June 2003. (28 pages)

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POVERTY AND ECONOMIC GROWTH IN EGYPT, 1995-2000

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1. Introduction

The late 1990s were, in economic terms, a watershed period for Egypt. After a decade of slow economic growth, averaging less than 4 percent per year between 1987 and 1995, overall growth rebounded to reach an average of 5.6 percent per year between 1996 and 2000. What was the effect of this growth on the economic dimensions of poverty (that is, poverty in consumption and income terms) in this nation of 65 million people? This paper answers that question, using a comprehensive set of household-level data from 1995-1996 and 1999/2000.

The economic background for the growth and poverty story in Egypt during the late 1990s involves both a liberalizing and an inward-looking economy. Following a significant liberalization of Egypt's economy beginning in 1991, Egypt experienced a growth spurt. During this period, Egypt began a slow process of controlling inflation, dismantling the historically overwhelming state domination of the economy, and opening markets to greater competition. As a result, the private sector emerged as a more important economic player in terms of output and jobs.

At the same time, the economy remained inward-looking, as high tariff rates and an appreciating currency made the domestic market more attractive for Egyptian businesses. Consequently, the growth spurt took place because of the service and industry sectors, and a strong demand for domestic products – especially tourism, construction, and import-substituting manufactured goods.

Our paper fills a critical gap in the literature on poverty in Egypt for three reasons. By making use of a rich and yet rarely available dataset on household expenditures in Egypt for two recent time periods – 1995/96 and 1999/2000 -- we offer the first analysis of the evolution of poverty in Egypt in late 1990s. Second, we use the opportunity provided by the large datasets to construct 'household-specific' poverty lines that effectively address methodological problems that have cropped up in previous papers in relation to economies of scale and regional differences. In doing so, we provide an example of a methodology that can be useful for similar work in other countries. Third,

our findings, especially on the distinct change in the spatial distribution of poverty over the course of 1990s, have critical implications for policymakers and advisors.

Limited formal and consistent empirical evidence exists on the levels and changes in poverty and inequality in Egypt during the 1990s. To a large extent, this stems from the fact that, up to now, no nationally representative unit-level data was available for public use in Egypt. The first study to introduce a consistent approach to poverty measurement in Egypt in 1995/96 was El-Laithy and Osman (1997), but follow-up studies did not use the same methodology to look at the evolution of poverty after 1996. Datt, Jolliffe and Sharma (2001) constructed a poverty profile for 1997 using data from a specially commissioned integrated household survey, but the sample size was relatively small (2,500 households) and the survey, being a one-off exercise, did not permit analysis of the evolution of poverty across time. The only recent paper that has used the 1999/2000 household data to examine poverty is El-Ehwany and El-Laithy (2001), but the paper was a preliminary effort, and used non-weighted data.

While these studies give useful information on poverty in Egypt, the poverty lines they use take into account neither regional and urban-rural differences in prices (with the exception of Datt, Jolliffe and Sharma 2001), nor the differences in costs of living due to economies of scale and demographic composition of the households. As a result, these papers could well overestimate poverty in large households and in households with children. At the same time, poverty rates in urban areas of Egypt could be underestimated, because urban households are on average smaller than rural households, and prices of most nonfood commodities and services and some food items are higher in the four metropolitan cities of Egypt.

We use a methodology that takes these problems into account. Although we follow the standard cost-of-basic-needs method to construct poverty lines, we introduce a new approach to estimate region-specific household poverty lines¹. The unit-level data in the most recent Households Income, Expenditure and Consumption Survey (HIECS) allows us to construct poverty lines for each household depending on its location, size, age, and gender composition. Economies of scale are also taken into account.

¹ This new approach was developed in a course of multiple discussions with Martin Ravallion.

The results presented in this paper are critical for understanding Egypt's policy options over the coming decade. While poverty declined for Egypt as a whole between 1995/96 and 1999/2000, there were significant differences in poverty alleviation and household expenditure increases across different regions and different sectors of employment. With a labor force growing at about 2.7 percent annually, over half a million job-seekers are entering the Egyptian labor market every year. The economic boom during the late 1990s clearly helped many in the labor force to improve their economic welfare. However, with a rapid decline in the construction sector since 1999, and a volatile tourism sector buffeted by the effects of regional security crises, the first decade of the 21st century will present policymakers with a challenge in terms of income expansion and poverty reduction.

Policymakers also need better information on the dynamics and causes of poverty because the government has had fewer resources available for social assistance program in recent years. A better understanding of changes in poverty and inequality in Egypt could facilitate both a more effective design of the social policies and greater efficiency in social assistance programs.

This paper is organized as follows. The next section discusses the data and methodology issues. Section 3 presents estimates of poverty and inequality in Egypt in 1999/2000. Section 4 describes the changes in poverty and inequality in Egypt between 1995 and 2000, and Section 5 paints a profile of the poor in Egypt. Section 6 presents the results of a multivariate poverty profile analysis and poverty simulations. Section 7 concludes.

2. Data and definitions

Our poverty analysis is based on the 1995/96 and 1999/2000 rounds of the HIECS conducted by the Central Agency for Public Mobilization and Statistics (CAPMAS), the official statistical agency of Egypt.

The HIECS rounds were administered over 12 months, with 10 visits to each household over a period of one month. The 1995/96 survey's data were collected from October 1995 to September 1996. The 1995/96 HIECS includes 14,805 households, of

which 6,622 reside in urban and 8183 in rural areas. The sample frame of the 1995/96 survey is based on an updated frame of the 1986 Population Census of 503 area sampling units that include 276 units in urban and 227 in rural areas.

Data for the most recent survey were gathered from October 1999 to September 2000. The 1999/2000 sample comprises 47,949 households, of which 28,754 reside in urban and 19,195 in rural areas. This is the largest survey of its kind conducted in Egypt.² The 1999/2000 HIECS was based on the 1996 Population Censuses sample frame of 600 area sampling units distributed between urban and rural areas (360 and 240 units respectively).

The surveys of 1995/96 and 1999/2000 are highly comparable in terms of sampling procedure and data collection methodology. The samples of both surveys are stratified multistage random samples. The sample designs of both surveys are nationally representative and the size of these surveys is large enough to allow for inferences at the regional and governorate levels, with the exception of Border governorates where the sample sizes are small.³

Definitions of Regions in Egypt

The regional aggregates used in this paper are for Metropolitan, Lower Egypt, Upper Egypt and Border areas. Ninety-five percent of the population of Egypt lives in the first three regions. The Metropolitan governorates essentially comprise the four major cities of Cairo, Alexandria, Port-Said and Suez, all in northern Egypt. Lower Egypt (essentially the region of the Nile delta) is also in the northern part of Egypt, and Upper Egypt, perhaps counter-intuitively, is the area mostly south of Cairo, with governorates largely following the meandering upper reaches of the Nile. The Border areas are the less populated desert areas bordering the Red Sea, the Sinai, and the vast Marsa Matruh and El Wadi El Gadid areas west of the Nile.⁴

In 1999/2000, the Metropolitan cities had about 18 percent of Egypt's total population, Lower Egypt had 43 percent, mostly in urban governorates; and Upper Egypt,

² Starting from 1957 the household budget surveys were conducted in Egypt in 1964/65, 1974/75, 1981/82 and in 1990/91 (CAPMAS VARIOUS ISSUES).

³ For more information on the sample issues see, e.g., CAPMAS, Household, Income, Expenditure and Consumption Survey Report, Volume one, 2001.

⁴ Also see Table 2 for the specific governorates in each region.

had 38 percent, with more than two-thirds (27 percent of the Egyptian population) residing in rural areas.

Welfare Indicator

We measure welfare in terms of an aggregate money metric indicator, defined as the amount of money required, given a set of prices, to attain a particular level of utility. This indicator allows us to rank households' welfare levels by comparing household observable consumption. The consumption-based approach is particularly suited for measuring poverty in developing countries, since it relies for poverty comparisons on the notion of deprivation from certain commodities and resources (both food and nonfood) deemed essential for attaining a minimum level of well-being within a given society (Hentschel and Lanjouw 2000). Consumption is the preferred indicator of well-being also because it incorporates the life-cycle hypothesis. Households might use savings and credit to smooth fluctuations in income, and in that case, consumption would better reflect their actual welfare. Finally, respondents in developing countries might be reluctant to reveal information about their income, so consumption is usually measured more precisely than income.

The information on the components of total consumption we use in this paper draws upon responses from several sections of the survey. In the diary the respondents report daily food expenditures for a period of one month. Information about their expenditures on nonfood items is collected in the main questionnaire for the previous three months, or the previous year, depending on the type of commodity. All data are converted to an annual basis. Total household consumption is then measured as the sum of food consumption (home produced and purchased on the market), total nonfood expenses, and actual or imputed rental values of housing. In poverty comparisons, the value of household consumption for 1999/2000 was deflated to 1996 Egyptian pounds (LE).

Poverty Lines

Our analysis follows the cost-of-basic-needs (CBN) approach in order to construct household- and region-specific poverty lines. According to CBN methodology, poverty

lines represent the level of per capita expenditures at which the members of a household can be expected to meet their basic needs. The household-specific poverty line is calculated as a sum of the food and nonfood poverty lines.

An initial step in defining the food poverty line is to construct a minimum food basket, that can be anchored to normative nutritional requirements. We estimate minimum caloric requirements for 52 different types of individuals, by urban and rural, gender and age categories, using World Health Organization standards (WHO 1985). The total household caloric requirement is the sum of minimum caloric requirements of all household members. Next, based on reported prices for each region in Egypt, we evaluate the cost of obtaining a hundred calories for the households with expenditures close to the previously estimated (El-Ehwany and El-Laithy 2001) poverty lines, i.e., from the second quintile of expenditure distribution. The cost of a household-specific food poverty line is calculated as the product of a household's caloric requirements and the cost to that household of a hundred calories.

The share of nonfood expenditure is estimated by fitting Engel's curves of the food share onto total expenditure controlling for the household's demographic composition. The total poverty line is then calculated by dividing the cost of the food poverty line by the estimated share of nonfood expenditure. We use two alternative poverty lines. The *upper poverty line* allows a nonfood expenditure share typical of those individuals whose expenditure on food is equivalent to the food poverty line. The *lower poverty line* restricts a nonfood expenditure to the share typical of those individual whose total expenditure is equivalent to the food poverty line (Ravallion et al. 1994). Unless specified, the results presented in the paper are based on this lower poverty line.

To obtain the poverty lines for 1995/96 we deflate the food and nonfood components of the 1999/2000 poverty lines using food and nonfood CPIs. The food CPIs are calculated for each region based on information from the HIECS on food expenditure and quantity purchased. The nonfood components of the poverty lines are deflated with the official regionally disaggregated nonfood CPI. Seven region-specific cost-of-living indices for 1995-96 are derived as a weighted average of the food and nonfood CPI. We use these composite price indices to update the 1995/96 poverty lines.

Thus, constructed poverty lines ensure that differences in relative prices, food and nonfood consumption preferences, activity levels, and size and age composition of poor households are accounted for.

3. Poverty and inequality in Egypt 1999/2000

In 1999/2000, the poverty rate in Egypt stood at 16.7 percent, based on the lower poverty line (Table 1). Approximately 10.7 million Egyptians were poor according to this estimates. The poverty gap index was 2.97 percent, implying a per capita poverty deficit of LE 248 and an average deficit of LE 1,482 for the poor. The poverty severity index of 0.8 was low by the standards of middle-income countries. Applying the upper poverty line, the poverty rate in Egypt rises to 42 percent, bringing the number of poor to almost 27 million.

The distribution of the poor is quite uneven across the regions. In rural areas poverty rates reach 22.1 percent. Most of the poor are concentrated in Upper Egypt. Thirty-four percent, or 5.8 million individuals, are poor in the Upper Rural region. In the Upper Urban region the poverty rate is lower, but still reaches 19.3 percent, or 1.4 million people. The Upper Rural region contributes the most to national poverty. Almost 54.4 percent of all poor in Egypt live in the Upper Rural region, even though its share of the total population is only 26.7 percent. Moreover, the Upper Rural region's share in overall poverty increases with distribution-sensitive measures, reflecting the low standards of living of the poor in this region. The ranking of the regions remains unchanged for the poverty gap and severity of poverty indices, suggesting not only that poor households represent a large proportion of Upper Egypt's population, but also that their expenditures are far below the regional poverty line.

The rate of poverty, particularly extreme poverty, is relatively low (9.2 percent) in urban areas where 41.5 percent of the population resides. The lowest incidence of poverty is in the Metropolitan region where only 5.1 percent of households are poor. These households constitute 3.9 percent of all poor in Egypt.

The incidence, depth and severity of poverty vary considerably within each region. Table 2 shows poverty measures for various governorates in urban and rural areas. The poverty indices in the urban areas of all governorates in Upper Egypt exceed

the corresponding national averages, except for Menia governorate. The poverty rates in rural Upper Egypt governorates surpass the national average, except for Giza and Aswan. Poverty incidence is highest in the governorate of Assuit followed by Sohag and Beni Suef. The same pattern holds for the poverty gap and severity indices.

In Lower Egypt, Menufiya is the only governorate in which poverty measures exceed the national average. In the Metropolitan region, Alexandria has the highest poverty rate. The incidence of poverty in Cairo amounts to 5.01 percent, ranking fifth among the urban governorates in Egypt.

The national level of expenditure inequality, measured by the Gini coefficient, reached 0.378 in 1999/2000 (Table 3). Urban areas of Egypt had higher levels of inequality in comparison with rural areas. The Upper Urban and Metropolitan regions had the highest inequality levels (Gini 0.406 and 0.386, respectively). The rural areas of Lower and Upper Egypt experienced relatively low inequality: 0.248 and 0.273, respectively. In some areas economic growth was positively correlated with changes in inequality – mean per capita expenditure in Metropolitan and Border Urban areas increased in tandem with inequality. Per capita expenditures in Border Rural areas declined as inequality declined. In Lower and Upper Egypt, however, changes in inequality and mean per capita expenditures go in opposite directions.

4. Poverty Trends: 1995/96 to 1999/2000

Following a rapid economic growth and an increase in per capita expenditure, poverty rates in Egypt decreased between 1995/96 and 1999/2000. The average annual per capita expenditure in 1999/2000 (evaluated at 1995 Metropolitan prices) was LE 1,599, compared with LE 1,407 in 1995/96 – an increase of 3.24 percent per year.⁵ The incidence of poverty, using the lower poverty line, decreased from 19.4 percent in 1995/96 to 16.7 percent in 1999/2000, or by about 800,000 people. The headcount, depth and severity of poverty calculated for both lower and upper poverty lines also showed statistically significant declines. The decreases in the poverty gap and severity indices indicate that expenditure distribution improved for the poor. The overall inequality in per

⁵ 1 LE = 0.30 USD in 1995 prices

capita expenditure, measured by Gini coefficient (Table 3), increased from 0.345 in 1995/96 to 0.378 in 1999/2000.

The growth of household expenditures, however, was not homogeneous across the regions (Table 4). While average per capita expenditures declined by 0.3 percent in Upper Rural Egypt and by 1.3 percent in Upper Urban Egypt between 1995 and 2000, it increased by 8 percent per year in the Metropolitan region. The annual growth rate of average household expenditures reached 2.9 percent for urban and 1 percent for rural areas in Lower Egypt.

To answer the question of how the gains from aggregate economic growth were distributed across households in relation to their initial expenditure we calculate the growth-incidence curves (Ravallion and Chen, 2002). The growth-incidence curves indicate growth rates by household expenditure quintiles. Integrating this curve up to the poverty headcount index gives a measure of the rate of “pro-poor growth” consistent with the Watts index for the level of poverty (Watts 1968).

Figure 1 shows the growth-incidence curves for five regions and Egypt as a whole. At the national level, per capita expenditure of the lower percentiles of expenditure distribution grew at a higher than average annual rate, suggesting that poor benefited more than the non-poor from economic growth. The aggregate picture, however, masks the considerable regional differences. Per capita expenditure of the lower percentiles of the expenditure distribution in Metropolitan and Upper Urban regions grew slower than their respective averages. In Lower Egypt and Upper Rural Egypt, growth of per capita expenditure of the poorest percentiles exceeded the regional average. Growth in Lower Egypt and Upper rural regions mainly benefited the poor.

As a result of this unequal growth among different income groups, the inequality in expenditure distribution differed across regions. The Metropolitan region and Upper Egypt experienced an increase in inequality (for instance, the Gini coefficient increased from .374 to .396 in the Metropolitan region). At the same time, the Gini coefficients declined, by about three percentage points, for both urban and rural areas of Lower Egypt (Table 3). Using the Theil index (Theil 1979) to decompose the inequality at the national level into inequality between and within regions shows that 82 percent of the inequality

in 1999/2000 can be explained by within-region variation, while 18 percent can be explained by between-region variation. The corresponding figures for 1995/96 are 87 percent and 13 percent. Comparisons over time suggest that inequality between regions is growing – the share of overall inequality explained by differences in regional means has increased by more than four percentage points over the period.

The interactions between changes in the mean expenditure and inequality could explain the observed poverty dynamics across regions (Table 1). Poverty rates decreased substantially in the Metropolitan region (from 13.1 percent to 5.1 percent) and in Lower Rural Egypt (from 21.5 percent to 11.8 percent). In Upper Egypt, the poverty headcount rose from 29.3 percent to 34.2 percent in rural areas and from 10.8 percent to 19.3 percent in urban areas. These differences in poverty across regions are statistically significant, and the ranking of regions remains unchanged for other measures of poverty – depth and severity.

Poverty Decomposition: Growth and inequality

A standard view of the relationship between economic growth and poverty is that continued economic growth would reduce poverty. But growth may also be associated with rising inequality, which then tends to offset part of the gains the poor make from growth. The decline in poverty depends crucially on the extent to which economic growth has reached the poorer members of the population.

How much would poverty have declined in Egypt if there were no changes in welfare distribution? To answer this question we apply growth-redistribution decomposition (Datt and Ravallion 1992). The change in poverty between two years can be decomposed into three components. The *growth component* is the difference between the two poverty indices when keeping the welfare distribution constants. The *redistribution component* is the change in poverty if the mean of the two distributions is kept constant. The *residual component* shows the change in poverty as a result of the interaction of growth and inequality. Table 5 presents the results of such decomposition for the national and regional levels. The 2.68 percentage point reduction in poverty in Egypt between 1995 and 2000 could be decomposed into a 1.72 percentage point decline

in poverty resulting from the increase in the mean per capita expenditure and a 1.1 percentage point decline due to the change in the distribution. In other words, if the mean per capita expenditure in Egypt remained unchanged between 1995 and 2000, the poverty incidence would decline by 1.1 percentage points just because of the change in the welfare distribution. On the other hand, if inequality stayed constant during this period, the growth in per capita expenditure would reduce poverty by 1.72 percentage points. Changes in both per capita expenditure and inequality resulted in decreased poverty rates.

From 1995/96 to 1999/2000, growth and redistribution components worked in opposite directions in the Metropolitan region, where reduction in poverty (-9.18 percentage points) resulting from increased per capita mean expenditure was hampered by worsening inequality (1.07 percentage points). In Upper and Lower Egypt both growth and redistribution effects affected poverty in the same direction. In Lower Egypt, growth in per capita expenditure accompanied decline in inequality, resulting in the reduction in poverty levels (growth components are -0.61 and -4.45 for urban and rural areas, respectively, while redistribution components were -1.51 and -5.93). The opposite occurred in Upper Egypt, where per capita expenditure dropped and inequality worsened. These turns for the worse were reflected in the rise of all poverty measurements. Growth in the Metropolitan region was high enough to improve poverty levels but it was not a pro-poor growth.

Poverty decomposition: Regional

How did these regional differences in the changes in poverty affected the incidence of poverty at the national level? To answer this question we use regional poverty decomposition (Ravallion and Huppi 1991). The change in poverty over time can be decomposed into three components. The *intra-regional* effect is a contribution of within-region change in poverty to the overall change in national poverty. The *interregional population shift* measures how much national poverty would have changed if population shifted across regions but poverty within regions remained unchanged. The third component accounts for the interaction of the intra- and inter- regional effects.

Applying the regional decomposition to Egypt over the period 1995/96-1999/2000 shows that almost all of the reduction in poverty at the national level can be

attributed to the intra-regional effect. This effect reduced poverty by 2.77 percent (Table 6). The inter-regional population movement and covariance effects were small.

With regard to regional roles in reducing poverty, the Metropolitan region may have contributed the most, lowering the overall incidence of poverty by 1.69 percentage points. The drop in poverty rates in the Metropolitan region and Lower Egypt dominated outweighed increases in poverty in Upper Egypt, resulting in a net decline in the level of national poverty. Thus, the decrease in national poverty between 1995 and 2000 could be attributed to decreases in poverty in the Metropolitan region and Lower Rural Egypt and, to smaller extent, to the decline in poverty in Lower Urban Egypt.

5. Who are the poor?

Poverty profiles reveal differences in the relative poverty of certain subgroups of the population, and analysis of the poverty profiles is essential for understanding the causes of poverty. A profile of the poor based on 1999/2000 HIECS data reveals that characteristics of the poor in Egypt are similar to those found in other countries of the Middle East. The Egyptian poor tend to live in large families, have low levels of education, work in an informal sector and be concentrated in low-paying unskilled activities. The rate of poverty of female-headed households is higher than the average for urban Egypt.

Table 7 shows the proportion of poor households by the education level of the head and type of locality. Education appears to be a key dimension of welfare in Egypt. About a third of poor households are headed by an illiterate person. The incidence of poverty declines as household heads become educated. The households whose heads have completed basic education are more than twice as unlikely to be poor compared with the households headed by illiterate individuals. The likelihood of being poor falls almost to zero for households with heads holding university or postgraduate degrees. The effect of a head's education on the welfare status of a household seems to be much stronger in urban areas.

Employment status of the household head also appears to influence the poverty status of households. The poor have lower rates of labor force participation than non-poor

(34.6 percent versus 37.8 percent respectively). Urban households with unemployed heads were twice as likely to be poor as urban households headed by a person with salaried employment. The lowest poverty incidence in urban areas occurs among households headed by a non-working head. In rural areas, employment status of the head appears to be uncorrelated with the poverty status of a household.

Another important factor affecting the profile of the poor is sector and industry of employment. Households in which the head works in the private sector are more likely to be poor, both in urban and rural areas of Egypt, (the private sector is most prevalent in rural areas). At the national level, 20 percent of households with heads working in the private sector were poor in 2000. This is almost twice as high as the poverty rate among households with the head working in the public sector (11 percent). The influence of the household head's sector of employment on welfare status is more pronounced in the urban areas of Egypt, where most of the public and government sector jobs are concentrated.

Looking at the industry of employment, the largest proportion of poor is concentrated in agriculture and construction. Table 7 shows that about 27 percent of poor households have heads employed in agriculture, followed by 20 percent in construction. The lowest incidence of poverty is registered in manufacturing and trade and finance.

6. Multivariate poverty profile and simulations

So far in the paper we have documented the incidence and changes in poverty rates from 1995 to 2000. These indicators are intrinsically ex-post measures of well-being. At the same time poverty-reducing policies are forward looking. Policy makers try to design interventions that protect populations from future poverty. Such interventions are often based on an ex-ante assessment of probability to fall into poverty.

To assess the probability of households in Egypt to be poor we rely on a two-step approach. Let total household consumption C_i be a function of household characteristics X_i and assume that C_i is log-normally distributed. In the log form:

$$\ln(C_i) = X_i\beta + \varepsilon_i \quad (1)$$

where ε_i is a normally distributed error term. Then the probability of household i to be poor is:

$$P_i = \text{prob}(\ln(C_i) < \ln(z_i)) = \Phi((\ln(z_i) - X_i\beta)/\sigma), \quad (2)$$

where z_i is the household-specific poverty line, σ is the standard deviation of the regression, and Φ is a standard normal distribution function. Thus, in the first stage we model the determinants of household consumption in the form of equation (1). In the second stage, we simulate the effect of the covariates from the consumption regression on the probability that a household will be poor. The poverty profile presented in the previous section provides guidelines for the selection of the potential variables to be included in this regression.

As a dependent variable in the consumption regression we use log of the total per capita household consumption. The set of explanatory variables includes household size, household demographic variables, shares of individuals with university degrees and illiterate household members, share of unemployed, characteristics of the household head that include gender, age and age squared, and a set of dummies for the head's educational level, working status and sector of employment. We run separate regressions for four urban and three rural regions of Egypt. Similar to Datt and Jolliffe (1998) we use a fixed effect regression specification on the governorate level to correct the bias in the estimated coefficients due to potential endogeneity or omitted variable bias. Local characteristics, such as the degree of infrastructure development, geographical location, fertility of land, etc., while not registered in our data, might affect the level of consumption of the households living in particular locality. Omitting these variables in our specification could lead to inconsistency of parameter estimates. The fixed effect specification should control for this type of omitted variable bias.

Consumption regression results

Table 8 shows the estimation results of the consumption regression for seven regions of Egypt. Focusing first on household demographics, household size has a significant and negative effect on the level of household per capita consumption in all seven regions. The elasticity of total household consumption to household size varies

from 0.44 in the Metropolitan region to 0.625 in Upper Rural Egypt. These elasticities are comparable with the elasticities reported in earlier studies. For example, Datt et al, (2001) reported an elasticity of about 0.55 for Egypt in 1997. The relationship between household consumption and household size does not change sign with the household size for Metropolitan, Lower urban and Border regions. For Upper Egypt and Lower Urban areas these relation changes sign for the households with more than eight members.

In all regions the household demographic composition has a strong and significant effect on the level of household per capita consumption. Controlling for household size, the presence of children age 0 to 6 has the strongest negative effect on household consumption for all seven regions except Border Urban areas. Larger shares of children age 7-15, the elderly and adult females also decrease household consumption. Households with a larger proportion of literate members, especially household members with university degrees or higher, have significantly higher per capita consumption levels.

Consistent with the descriptive results in the previous section, characteristics of the household head are important determinants of household consumption. The positive and significant coefficient on the household age variable indicates that in the Metropolitan, Upper, and Lower Urban Egypt regions, households with older head attain higher levels of consumption. For the Lower Rural and Border regions age of the household head has an insignificant effect on household consumption. Households headed by female are slightly better off in Metropolitan and Upper Urban areas, but worse off in Lower Rural Egypt.

The education level of the head has a strong impact on the level of household well-being. During the last decade Egypt experienced a skill-shortage in fields such as engineering and computer science. The lack of capacity pushed up the wages of workers with special types of university education, and increased the wage-gap across skill-levels. Technical secondary education, often geared towards traditional industrial occupations, is no longer in demand. Similarly, low-skill jobs of the type held by workers with primary education or less, have shrunk in number.

Relative to the omitted category – households in which heads have a postgraduate degree – households with the less educated heads have significantly lower level of per capita consumption. At biggest disadvantage are the households with illiterate heads. The return on a head's education is the highest for urban households, especially those in the Metropolitan region. In this region, households with university-educated heads have about 60 percent higher per capita consumption expenditures than the households with illiterate heads. For Egypt's rural areas the difference is only about 20 percent. Upper Egypt is the region with the lowest educational levels, and stable jobs for unskilled workers or workers with little education are not available here.

We also find that households in the Metropolitan, Upper, and Lower Urban areas that have heads employed in the private or foreign/joint venture firms have a significantly higher per capita consumption level than households whose heads work in public enterprises or in government, or are unemployed.

Simulations

The estimates of the consumption regression make it possible to simulate the impact of various parameters on the probability that a household will be poor. We present the results of the poverty simulation separately for seven regions of Egypt in Table 9. Although the data allows us to simulate various scenarios, we chose those that, from our perspective, have most relevance for policies aimed directly at reducing poverty.

We find that a newborn child increases risks of poverty in all regions of Egypt. The effect of childbirth on the probability of being poor is larger in urban areas. Families with a newly born child are 56 percent more likely to be poor in the Metropolitan region, 64 percent in Upper Urban Egypt, 45 percent in Upper Rural Egypt and by 24 percent in Lower Rural Egypt.

Female-headed households, which constitute about 10.4 percent of Egypt's population, are at higher risk of poverty than households with a male head in all regions of Egypt except the Upper Rural region. There, female-headed households are 3 percent less likely to be poor than male-headed households. Female-headed households face the

highest risk of poverty is in Metropolitan region, where they are 22 percent more likely to be poor than male-headed counterparts.

When a family member loses a job the household risk of poverty increases substantially. The impact of a job loss on the probability of being poor ranges from 113 percent for Upper Urban Egypt to 13 percent for Lower Urban Egypt. At the same time the impact of working status on poverty depends on the sector of employment. Relative to households with the heads who are out of the labor force, households with the heads holding government jobs have higher risks of poverty in the Metropolitan (11 percent), Upper Urban (7.5 percent) and Lower Urban (34 percent) region. In Upper and Lower Rural Egypt, households with heads employed in government have lower risk of poverty than households with heads out of the labor force.

Households with the head working in the public sector are less likely to be poor than the households with heads out of the labor force. This is true for all regions except Lower Urban Egypt. The risk of poverty for household with heads in the public sections are decrease by 4.5 percent in the Metropolitan region, by 3.6 percent in Upper Urban Egypt, 13 percent in Upper Rural Egypt, and 21 percent in Lower Rural Egypt. In the Lower Urban region the probability of being poor increases by 14 percent.

Employment in the private sector or in a foreign firm substantially reduces the risk of poverty. In the Metropolitan region, for example, households with heads employed in the private sector are 41 percent less likely to be poor than those with heads out-of-the labor force head. The poverty risks are lowest for the households with heads employed by the foreign firms.

To estimate the impact of education on the probability of being poor, we vary the head's level of education a household head possesses. All other variables are kept at sample mean levels. Consistent with the descriptive results of the previous section, a head's educational level strongly determines of the degree to which a household is more likely to be poor. A head's education level has greater impact on household poverty in urban areas. We observe a steady decrease in the risk of poverty for households headed by men and women with higher levels of education. Relative to households with illiterate heads, the probability of being poor is about 15 percent lower for households with heads

that can read and write, about 25 percent lower for households with heads possessing basic education, and 65 percent lower for the households headed by high school graduates. In all regions of Egypt, households with the heads with postgraduate degrees are twice less likely to be poor than households with illiterate heads.

7. Conclusions

In this paper, we analyze the changes in poverty and inequality during Egypt's high-growth years: 1995 to 2000. We find that poverty rates in Egypt as a whole declined from 19.4 percent in 1995/96 to 16.7 percent in 1999/2000 (early 2000). Strong economic growth and the resultant rise in household expenditures caused this decline. Redistribution effects, though present, were generally weak, and more than offset by the growth effects.

Despite a significant increase in average household expenditures in the late 1990s, poverty in Egypt remains pervasive. The lower poverty line used in this report, shows that almost 11 million people lived in poverty in 2000. The World Bank's measures of poverty – household expenditures below \$1/day and \$2/day (PPP adjusted) – show are 1.7 million people and 25.9 million poor people, respectively.⁶

We uncover substantial differences in the rates of growth and poverty dynamics among the four main regions of Egypt. Households living in the Metropolitan areas and in Lower Egypt saw their per capita expenditures grow and poverty rates decline between 1995/96 and 1999/2000. At the same time, households in Upper Egypt, and Lower Rural Egypt experienced negative or close to zero expenditure growth rates. The pattern of redistribution also varied within the regions, with the poorest households in Lower Egypt actually getting *proportionately* larger shares of expenditure growth.

The characteristics of the poor, however, were similar across regions. Households with many children, households with poorly-educated heads, and household with heads employed in agriculture were over-represented among the poor. Education most affected a household's chances of being poor or nonpoor. This finding is particularly significant

⁶ This is based on PPP conversion factors that make the relevant per capita poverty lines 55.78 LE/month and 111.56 LE/month respectively in 1999/2000.

because more than 45 percent of the poor in Egypt were illiterate in 1999/2000. Our model of the determinants of poverty reveals that household size, household demographic composition, and the level of education and employment status of the head are important factors affecting household capacity to escape poverty.

Looking ahead, the slowdown of the Egyptian economy after 2000 raises concerns about the extent of poverty today. The economic growth achieved through domestic expansionary policies and external transfers have ultimately proven unsustainable, and the construction boom has ended. In addition, a deteriorating fiscal situation and increasing pressures on the balance of payments have placed a limit on the degrees of freedom available for using an expansionary macroeconomic policy to boost growth.

There is a strong possibility that many of Egyptians who escaped poverty during the 1995-2000 slipped back into poverty in this decade again. Moreover, even though we found a positive relationship between economic growth and poverty in Egypt, the substantial growth of the last decade did not affect many of the poor. We believe that further research is needed to understand why these households did not benefit from growth. The insights of such analysis would help guide poverty reduction policy initiatives. By understanding of the growth and redistribution patterns of the late 1990s, and by preparing a flexible set of policies that could withstand economic fluctuations, it will be possible to devise a policy framework for a more sustained, sustainable, and equitable growth path in Egypt.

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Table 1: Poverty Measurements by Region 1995/96 and 1999/2000

<i>Regions</i>	1995/96			1999/2000		
	Headcount	Gap	Severity	Headcount	Gap	Severity
Metropolitan	13.10	2.61	0.80	5.06	0.91	0.26
Lower Egypt Urban	8.34	1.25	0.26	6.17	0.93	0.23
Lower Egypt Rural	21.53	3.48	0.89	11.83	1.57	0.33
Upper Egypt Urban	10.82	1.81	0.46	19.27	3.90	1.18
Upper Egypt Rural	29.32	5.39	1.50	34.15	6.57	1.82
Border Urban	5.63	1.26	0.38	3.70	0.39	0.08
Border Rural	13.82	1.75	0.36	18.31	2.97	0.66
All Egypt	19.41	3.39	0.91	16.74	2.97	0.80

Table 2: Poverty Measurements by Governorates 1999/2000 (percent)

<i>Governorate</i>	Urban			Rural			All Egypt			
	P ₀	P ₁	P ₂	P ₀	P ₁	P ₂	P ₀	P ₁	P ₂	
Metro	Cairo	5.01	0.96	0.29	-	-	-	5.01	0.96	0.29
	Alexandria	6.24	1.02	0.27	-	-	-	6.24	1.02	0.27
	Port Said	0.90	0.09	0.02	-	-	-	0.90	0.09	0.02
	Suez	1.91	0.20	0.03	-	-	-	1.91	0.19	0.03
Lower Egypt	Damietta	0.25	0.01	0.00	0.00	0.00	0.00	0.07	0.00	0.00
	Dakahlia	7.79	0.92	0.19	17.55	2.32	0.47	14.88	1.94	0.40
	Sharkia	9.12	1.37	0.33	13.71	1.79	0.37	12.70	1.70	0.37
	Qaliubia	6.05	1.16	0.31	9.09	1.30	0.30	7.94	1.25	0.30
	Kafr El-Sheikh	3.77	0.76	0.29	5.90	0.61	0.09	5.42	0.64	0.14
	Gharbia	4.51	0.67	0.16	7.84	1.14	0.25	6.85	1.00	0.22
	Menufia	9.81	1.34	0.27	21.12	2.83	0.57	18.96	2.54	0.52
	Beheira	6.16	0.84	0.24	8.36	1.10	0.22	7.85	1.04	0.23
	Ismailia	0.90	0.17	0.03	11.12	1.38	0.31	6.02	0.78	0.17
Upper Egypt	Giza	9.43	1.44	0.36	16.97	2.62	0.63	12.89	1.98	0.48
	Beni-Suef	32.35	7.21	2.23	51.66	10.66	3.10	47.26	9.87	2.90
	Fayoum	19.76	3.70	0.97	34.27	6.35	1.62	31.18	5.79	1.48
	Menia	9.12	1.89	0.60	24.03	3.48	0.78	21.41	3.20	0.75
	Assiut	39.21	9.60	3.34	56.76	12.59	3.78	52.08	11.79	3.66
	Sohag	35.61	7.77	2.44	41.09	8.11	2.34	39.88	8.03	2.36
	Qena	13.30	2.16	0.51	24.85	4.54	1.19	22.46	4.05	1.05
	Aswan	18.33	2.96	0.63	18.81	3.58	0.97	18.61	3.32	0.83
	Louxor	25.35	4.39	1.09	34.80	9.27	3.29	29.20	6.37	1.98
Border areas	Red Sea	7.52	0.88	0.21	12.22	1.68	0.37	9.52	1.22	0.28
	El.Wadi El-Gedid	4.85	0.53	0.09	10.94	1.84	0.36	7.36	1.07	0.20
	Matrouh	5.43	0.48	0.07	26.21	4.81	1.18	14.13	2.29	0.53
	North Sinia	0.00	0.00	0.00	36.49	5.99	1.28	16.17	2.65	0.57
	South Sinai	0.00	0.00	0.00	2.70	0.04	0.00	1.16	0.02	0.00
All Egypt	9.21	1.72	0.50	22.07	3.86	1.01	16.74	2.97	0.80	

Table 3: Measures of inequality for 1996 and 2000 by region.

<i>Regions</i>	Measures of inequality			
	Gini 1996	Gini 2000	Theil 1996	Theil 2000
Metropolitan	0.374	0.396	0.268	0.308
Lower Urban	0.316	0.288	0.180	0.154
Lower Rural	0.280	0.248	0.145	0.113
Upper Urban	0.383	0.406	0.301	0.370
Upper Rural	0.268	0.273	0.128	0.137
Border Urban	0.254	0.308	0.111	0.169
Border Rural	0.365	0.283	0.253	0.132
All Egypt	0.345	0.378	0.234	0.295
Decomposition				
Within regions			0.204	0.243
Between regions			0.031	0.052

Table 4: Average and annual percentage change in per capita consumption between 1996 and 2000.

<i>Regions</i>	Average expenditure per capita		Annual percent growth
	1996	2000	
Metropolitan	2096.82	2848.92	7.96
Lower Urban	1582.81	1649.97	1.04
Lower Rural	1123.08	1257.62	2.87
Upper Urban	1529.47	1450.05	-1.32
Upper Rural	912.03	900.00	-0.33
Border Urban	1436.53	2082.77	9.73
Border Rural	1549.30	1310.72	-4.09
All Egypt	1407.72	1599.30	3.24

Table 5: Growth and redistribution decomposition of poverty changes between 1996 and 2000 by region.

<i>Regions</i>	Percentage change in incidence of poverty between 1996-2000			
	Growth	Redistribution	Residual	Actual Change
Metropolitan	-9.178	1.073	0.061	-8.044
Lower Urban	-0.611	-1.511	-0.046	-2.168
Lower Rural	-4.449	-5.934	0.679	-9.704
Upper Urban	1.294	6.906	0.247	8.448
Upper Rural	3.552	1.083	0.198	4.833
Border Urban	6.836	-4.416	-4.355	-1.934
Border Rural	29.055	-10.415	-14.158	4.483
All Egypt	-1.723	-1.074	0.119	-2.677

Table 6: Regional decomposition of change in poverty between 1995/96 and 1999/2000

<i>Regions</i>	Intra-region Effect	Inter-region Effect	Covariance Term	Change in poverty
Metropolitan	-1.688	-0.026	0.016	-1.698
Lower Urban	-0.276	-0.001	0.000	-0.277
Lower Rural	-2.911	-0.044	0.020	-2.935
Upper Urban	0.975	0.029	0.022	1.026
Upper Rural	1.135	0.020	0.003	1.158
All Egypt	-2.765	-0.022	0.062	-2.725

Table 7: Proportion of poor households by characteristics of the head and type of locality. Egypt 2000.

<i>Level of education</i>	Urban	Rural	All Egypt
Illiterate	21.43	30.37	28.15
Read & Write	12.69	20.35	17.73
Basic	7.32	17.19	12.21
Secondary	4.88	11.40	8.12
Diploma	3.44	6.84	4.95
University	0.72	4.87	1.90
Postgraduate	0.51	9.24	1.45
<i>Employment Status</i>			
Salaried employment	9.41	22.45	16.73
Self Employed, non agriculture	21.44	24.97	24.75
Self employed, agriculture	9.67	18.84	13.86
Unemployed	21.05	18.30	19.69
Not working, Out of Labor Force	8.84	19.77	13.14
<i>Sector of employment</i>			
Government	8.40	19.01	14.59
Public	6.48	17.50	11.27
Private	11.89	24.84	20.81
<i>Industry of employment</i>			
Agriculture	20.9	27.04	26.56
Industry	7.84	16.02	11.53
Construction	12.54	25.17	19.77
Trade Finance	9.34	19.08	13.62
Personal services	9.19	19.43	15.09

Table 8: Regression of log consumption per capita on characteristics of household and household head for seven regions of Egypt.

	Metro	Upper urban	Upper rural	Lower Urban	Lower rural	Border urban	Border rural
Household characteristics							
Log household size	-0.440**	-0.522**	-0.625**	-0.463**	-0.420**	-0.510*	-0.371
Log household size ²	-0.019	0.035*	0.087**	-0.003	0.028*	0.006	-0.038
Share of children 0-6	-0.201**	-0.270**	-0.303**	-0.226**	-0.269**	-0.298	-0.428*
Share of children 7-15	-0.085**	-0.158**	-0.273**	-0.119**	-0.237**	-0.209	-0.380**
Share of elderly	-0.148**	-0.110*	-0.113**	-0.105*	-0.087*	-0.239	-0.380
Share of adult females	-0.086**	-0.039	-0.058*	-0.065	-0.021	-0.318*	-0.324*
Share of adult males				<i>Reference</i>			
Share of literate	0.325**	0.253**	0.261**	0.297**	0.288**	0.299*	0.193
Share of university	0.453**	0.192**	0.304**	0.635**	0.394**	-0.099	-0.022
Share of unemployed	0.002	0.037	-0.014	0.107**	0.081**	0.447**	0.202
Characteristics of the head							
Age	0.017**	0.006*	0.005**	0.019**	-0.002	0.019	0.005
Age ² /100	-1.040**	-0.231	-0.322	-1.438**	0.457*	-1.623	-0.201
Male	-0.072**	-0.043**	0.005	-0.022	-0.039**	-0.034	-0.051
Female				<i>Reference</i>			
Education							
Illiterate	-0.928**	-0.738**	-0.645**	-1.030**	-0.395**	-0.960**	-0.382
Read & Write	-0.881**	-0.693**	-0.634**	-0.960**	-0.353**	-0.791**	-0.273
Basic	-0.788**	-0.581**	-0.571**	-0.944**	-0.336*	-0.745**	-0.286
Secondary	-0.668**	-0.521**	-0.523**	-0.773**	-0.269*	-0.640**	-0.077
Diploma	-0.571**	-0.421**	-0.472**	-0.701**	-0.212	-0.564**	-0.045
University	-0.387**	-0.359**	-0.475**	-0.617**	-0.162	-0.458*	-0.003
Postgraduate degree				<i>Reference</i>			
Working status							
Government	-0.031	-0.017	0.024	-0.123**	0.034	-0.249*	0.023
Public	0.017	0.010	0.034	-0.051	0.093**	-0.130	-0.019
Private	0.158**	0.107**	0.043**	0.029	0.092**	-0.114	0.040
Foreign/JVC	0.242**	0.159*	0.072	0.201**	0.055	-0.148	-0.096
Unemployed	0.069	0.160*	0.035	0.049	0.121	-0.031	-0.199
Out of labor force				<i>Reference</i>			
Industry of employment							
Agriculture				<i>Reference</i>			
Manufacturing	0.026	-0.008	0.023*	0.061**	0.003	0.095	-0.015
Construction	0.026	-0.040	0.025	0.060*	0.007	-0.115	-0.058
Trade and finance	0.077*	0.016	0.059**	0.085**	0.047**	0.111	-0.006
Personal services	0.004	-0.004	-0.014	0.024	0.020	0.064	-0.143
Constant	8.773**	8.741**	8.555**	8.278**	8.000**	9.044**	8.773**

Table 9: Impact of changes in household characteristics and characteristics of the household head on poverty. Percent change.

	Metro	Upper Urban	Upper Rural	Lower Urban	Lower Rural	Border Urban	Border Rural
Child born in the family	56.22	63.93	45.02	34.79	23.97	65.91	34.82
Family member loses job	26.93	113.06	13.26	13.22	45.9	-13.6	-42.07
Female headed households	-21.95	-17.47	2.92	-5.49	-10.08	-16.67	-15.59
Head education							
change from illiterate to read and write	-14.93	-17.28	-6.25	-16.06	-11.58	-57.86	-30.25
change from illiterate to basic	-39.7	-51.05	-31.64	-19.57	-15.68	-66.66	-26.09
change from illiterate to secondary	-62.68	-63.97	-47.6	-50.59	-32.03	-82.64	-68.38
change from illiterate to diploma	-75.57	-79.4	-61.19	-60.89	-44.36	-89.15	-72.72
change from illiterate to University degree	-89.92	-85.74	-60	-70.74	-53.26	-94.83	-75.95
change from illiterate to postgraduate degree	-98.95	-99.01	-99.14	-98.51	-76.38	-99.92	-77.53
Sector of employment							
Unemployed	0.42	3.12	0.52	4.55	3.86	24.65	8.39
employed in the government job	10.85	7.42	-9.77	34.12	-7.59	221.22	-5.77
employed in the public sector job	-4.55	-3.57	-13.12	13.75	-20.79	89.91	6.57
employed in the private sector job	-41.27	-36.8	-17.25	-6.81	-21.13	79.88	-9.42
employed in the foreign firm	-57.17	-50	-29.26	-43.17	-12.22	121.15	30.69

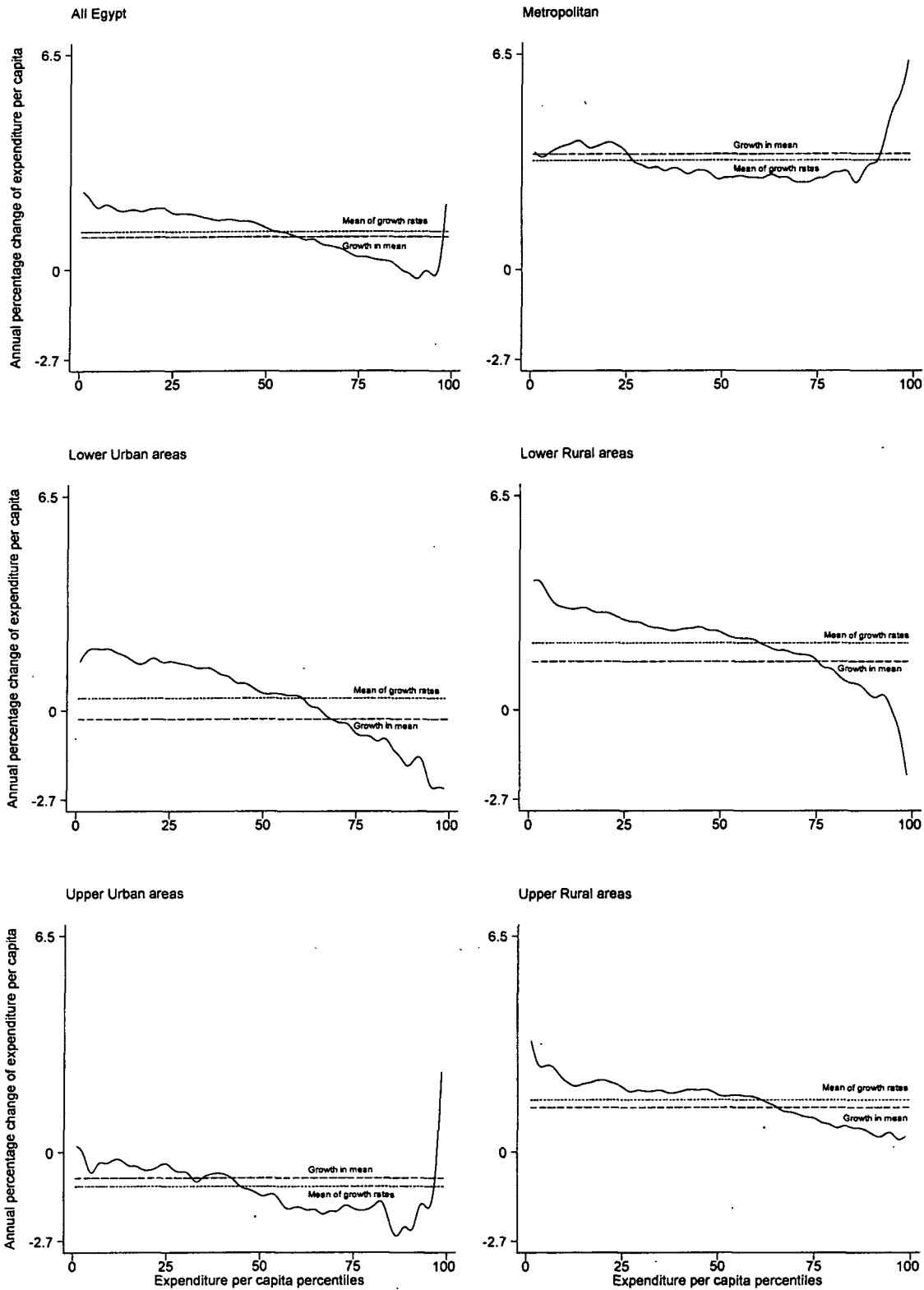


Figure 1: Growth Incidence curve for Egypt and the Regions.

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