

Main Determinants of the Dynamics of Poverty (Chronically and Transient Poverty) in Egypt, between 1998- 2006

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Abstract:

The main objective of this study is to investigate the dynamics of households' movements in and out of poverty and to assess the main factors affecting those movements between 1998 and 2006. To achieve the goal of this study, poor people are classified first into *chronically poor* and the *transient poor*. Second, the likelihoods of entering and exiting poverty in Egypt during the period (1998-2006) are calculated. Finally, the main factors that increase households' likelihood of being chronically poor, entering into poverty and exiting from poverty are examined (With special emphasis on labor market or employment variables). Basically, this study depends on the 1998 Egypt Labor Market Survey (ELMS 98) and the 2006 Egypt Labor Market Panel Survey (ELMPS 06).

One of the main results of the study that there are only 17.1 percent of individuals that enter into poverty or exit from it during the period (1998- 2006). There are 71 percent of individuals are never poor while 11.8 percent are chronically poor between 1998 and 2006.

The main factors that increase households' likelihood of being chronically relatively poor are: the education level of household heads (particularly the university and above education category), household lived in urban Upper Egypt, larger household size, the more persons per room, and owning household enterprise or sharing it. *Concerning the main factors that increase households' likelihood of entering into poverty are:* region of residence for the household (especially in urban Upper), the education level of household heads, the household size, the average persons per room, owning household enterprise or sharing it, the change in the household share of employed persons, wall material of the dwelling, and the type of sanitation facility in the dwelling. *Moreover, the main factors that increase households' likelihood of exiting from poverty* are: the education level of household heads, the region, owning household enterprise or sharing it, the change in the household share of government and public sectors employees, the household size, the type of sanitation facility in the dwelling, the average persons per room, and the wall material of the dwelling.

Accordingly, effort should be made for organizing programs to eliminate the illiteracy in Upper Egypt and fighting the dropping out of education. Increasing the awareness of the family planning programs and creates new effective means that encourage households to follow the family planning programs. Providing small and micro loans by specialized institutions and providing the necessary facilities for citizens to encourage them to do small projects.

1. Introduction

In many studies, poverty analysis has tended to focus on poverty at one point in time or on poverty trends as changes in the incidence, depth and severity of poverty over time. However, there is a very little interest in analyzing poverty dynamics as investigating the welfare movements of a set of households or individuals over time. This is largely due to scarcity of the type of survey data needed for this kind of analysis, which called for panel data.

Poverty dynamics analysis which focus on the movement of household's welfare over time provides useful insights into what determines movements in and out of poverty and why some households remain poor. When using static analysis of poverty based on cross sectional data, the poor can be differentiated on the basis of how far their consumption, expenditure or income lies below the poverty line. However using poverty dynamics provide an additional dimension to the nature of poverty.

Currently, there is a great necessity to study the main factors affecting the households' movement in and out poverty, particularly, after the success of the peaceful revolution of *25th January in Egypt which its basic slogan is "Bread - Freedom - Social justice"*. Accordingly, alleviating poverty and achieving social justice is one of the main objectives in the developing strategies in Egypt for the time being. Hence attempts to identify and determine dynamics of poverty can help policy makers to evaluate and assess economic and social policies during the period under study and based on it to put the suitable policies and programs to achieve the social justice and alleviating poverty.

Panel data, is also called longitudinal data or cross-sectional time series data. The panel data combines cross-sectional and time series data (Frees, E.W. and Kim, J.-S., [5]).

Accordingly, panel data investigates several units over several times periods. These units may be states, firms, individuals, households, etc. Therefore, units in panel data involve at least two dimensions; a cross-sectional dimension, indicated by subscript *i*, and a time series dimension, indicated by subscript *t*. However, panel data could have a more complicated clustering or hierarchical structure (Hsiao, C., [8]).

2. Objectives of the study

The main objective of this study is to investigate the dynamics of households' movements in and out of poverty and to assess the main factors affecting those movements between 1998 and 2006.

Therefore, the study focuses on three basic questions about poverty:

1. How can we classify poor people into chronically relatively poor and the transiently relatively poor?
2. What is the likelihood of entering and exiting poverty or being chronically poor?
3. What are the main factors that increase households' likelihood of being chronically relatively poor, entering into poverty and exiting from it? (With special emphasis on labor market or employment variables)

Mainly, the results of this study may benefit the decision makers and researchers who are interested in the issues of social justice and alleviating poverty. It will help them to set their priorities, and develop different policies towards alleviating poverty, both chronic and transient poverty.

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3. Poverty definitions

It has been widely recognized that poverty is a complex and multidimensional phenomena. The concept of poverty is broader than signifying a mere lack of material resources. But it also includes lack of things like freedom, civil rights, access to power and influence and finally lack of opportunities and choices. Accordingly, there is no single measure can reflect all these dimensions. The multidimensional nature of poverty appears in the variation of concepts and definitions, which can be classified into the following groups:

1. Income poverty (Money metric)

This approach to poverty measurements assumes that individuals and households are classified as poor if their income or consumption (expenditure) falls below a certain threshold (defined as a minimum) which is socially acceptable level of well being by a population group. This threshold is usually called the "poverty line". There are three basic types of poverty lines used to identify poverty level: absolute poverty line, relative poverty line, and subjective poverty line. (Lok-Dessallien, [11])

1. Absolute poverty line: It reflects the value of the resources needed to maintain a minimum level of welfare. The aim is to measure the cost involved in purchasing a basket of essential products (goods and services), which allow a person to reach minimum levels of satisfaction in terms of basic needs such as food, shelter and clothing that needed to preserve health. Absolute lines are of limited interest in developed countries. In underdeveloped or developing countries they are better accepted and are used to a greater extent. (National Statistics Institute, [13])

2. Relative poverty line: It based on approaches that consider the welfare position of each individual or household in relation to the welfare position of other individuals or households belonging to the same community. There are two methods to define relative poverty lines: the "income levels" method; and the "income positions" method. First, "income levels method" defines a poverty line as (less than mean income), (less than median income) or (less than a given percentage of either mean or median income). In any case, what counts is the level of individual incomes in the income distribution. By this property, the value of the poverty line automatically evolves over time as far as mean or median income evolves. Second, "income level method" defines as being "poor" all those individuals (or households) who fall below a given

quintile (usually the tenth or the twentieth) of the income distribution ranked in ascending order (Giovanni L., and Liberati P., [6]).

3. The subjective line: It is based on the opinion held by individuals on themselves in relation to society as a whole. In other words, the concept of poverty used in these lines to divide the population into poor and non poor is based on the perception of households and individuals themselves have in relation to what it is to be poor (National Statistics Institute, [13]).

2. Human capability poverty

This approach defines the phenomena as the absence of basic human capabilities to function at a minimally acceptable level within a society. An emphasis is placed on people's abilities and opportunities to enjoy long, healthy lives, to be literate and to participate freely in their society. For example about capability poverty indicators: life expectancy, literacy rates, malnutrition... etc (Lok-Dessallien, [11]).

3. Multidimensional poverty index (MPI)

The Multidimensional Poverty Index (MPI) is a new measure designed to capture the severe deprivations that people face at the same time. The MPI is an index of acute multidimensional poverty. The MPI reflects two numbers: the headcount or percentage of people who are multidimensional poor, and the average intensity of deprivation – which reflects the proportion of dimensions in which households are deprived. The MPI has three dimensions: health, education, and standard of living. These are measured using ten indicators. Each dimension is equally weighted; each indicator within a dimension is also equally weighted (Alkire, S. and Santos, M., [1]).

The current study depends on income poverty approach and in particular relative poverty (using the income level method), where the poorest 20% of the population is considering the poor population.

4. Background

Analysis of poverty and income distribution in Egypt goes back to 1977 and has increased in recent years. However the studies of poverty are frequently differing in approach and methodology, and their findings are not always comparable. Nevertheless, they offer important information about poverty in Egypt (Ikram, [10]).

4.1 Poverty analysis in Egypt over the time

From the mid of 1990s to 2000, Poverty decreased for Egypt as a whole (World Bank, [17]), however, during the period (2000-2009) shows a reversal in the direction of poverty. The result shows that all measurements of poverty increased between 2000 and 2009: the incidence of poverty increased from 16.7 percent to 22 percent, depth of poverty increased from 3.0 percent to 4.2 percent, and finally severity of poverty increased from 0.8 to 1.3 (at the national level) (World Bank, [19]).

Table (1)
Poverty measures during the period (1996-2009)

Poverty Measures	1996	2000	2005	2009
Headcount Ratio (P0)	19.4	16.7	19.6	22.0
Poverty Gap (P1)	3.4	3	3.6	4.2
Severity of Poverty (P2)	0.9	0.8	1.0	1.3

4.2 Analysis of Poverty Using Panel Data

The International Food Policy Research Institute (IFPRI) made a study analyzing poverty in Egypt using a panel data of 347 households. It is the first panel survey study of poverty dynamics in Egypt in North Africa at all. The analysis depends on a panel data set from eight governorates. The 347 households were first surveyed in early 1997 as a part of the national sample of 2450 households (the Egypt Integrated Households Survey or EIHS), and they were surveyed again in early 1999. This study decomposes poverty in Egypt over the 1997- 1999 period into chronic and transitory poverty. The study depends on the regression methods to identify the factors that explain total, chronic and transitory poverty. The main results of the study were that the per capita consumption decreased for all households from an average of 240 L.E to 213 L.E per month. The second result that the reductions in consumption were relatively large for the Upper Rural and Metropolitan regions. Additionally, the study tried to identify the determinants of total, chronic, and transitory poverty. The results show that the main determinants include the average years of schooling of adult household members, the value of land and livestock, the number of children under age 15, household size, the location of residence, and employment activity (Haddad and Ahmed, [7]).

The Ministry of Social Development, CAPMAS and the World Bank made a joint study on the new Household Income, Expenditure and Consumption Panel Survey (HIECPS) which conducted by CAPMAS to trace household consumption and living standards over 2005-2008. The data used in this report rely on a one-month sample of the full HIECS 2004/05 which includes 3552 households. The panel data are formed by a repeated visit in February 2008 of the household addresses visited in February 2005 with identical questionnaire. One of the main findings of this study that the poverty in Egypt is equally split between the chronically poor and those who go in and out of poverty. Ten percent of the population (or one-half of all poor) in Egypt remained in “chronic poverty” over 2005-2008. At the same time, the other half of the poor (12 percent of the population) moved out of poverty. This positive move was counterbalanced by an opposite flow on a smaller scale: that is, of non-poor falling into poverty (9 percent of the population). Also, the study showed that the chronic poverty is concentrated in Upper Egypt. Almost 23 percent of the population in Upper Rural Egypt was chronically poor – in sharp contrast with just 3 percent in Metropolitan areas; moreover 87 percent of the Metropolitan population stayed away from poverty (World Bank, [18]).

Mary and Ratcliffe (2002) examined the dynamics behind changes in the poverty rate over time and measure transitions into and out of poverty in USA. The study used two longitudinal data sets, the first one is the Panel Study of Income Dynamics (PSID) which is a data from the 1975- 1997 panels. The second study is a monthly data from the 1988, 1990, and 1996 panels of the Survey of Income and Program Participation (SIPP). In their study, they used the multivariate hazard model which disentangles the relationship between one event and poverty transitions from that of other events and demographic characteristics, by providing information about the role specific events play in individuals' entries into and exits from poverty. The main finding from the multivariate analyses—that changes in employment ⁽¹⁾, not household composition, are the most strongly related to poverty transitions (Mary,[12]).

5. Data and Methodology

5.1 Data

This study depends basically on the Labor Market Surveys (LMSs) and the Household Income, Expenditure and Consumption surveys (HIECs). Both types of surveys include information about the household members' demographic and socioeconomic characteristics, housing conditions, ownership of durables, access to basic services and the neighborhood infrastructure.

The (HIECs) are household budget surveys that contain information of consumption expenditures on more than 550 items of goods and services. These budget surveys are generally considered the major source of information on household income and expenditure in Egypt (Roushdy and Assad, [15]).

The 1998 Egypt Labor Market Survey (ELMS 98) and the 2006 Egypt Labor Market Panel Survey (ELMPS 06) which were conducted by the Economic Research Forum (ERF) in cooperation with the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS) are used in this study. The (LMSs) provide detailed information on labor market conditions, employment status, job mobility, migration and household enterprises. In addition, these surveys provided rich information about the household members' demographic and socioeconomic characteristics (Assad and Roushdy, [3]). The questionnaire of the two waves was designed to facilitate the comparison between the two waves. The ELMPS 06 is the second round of a periodic longitudinal survey that tracks the labor market and demographic characteristics of the households and individuals interviewed in the 1998, and any households that might have formed as a result of splits from the original households.

To determine the dynamics of entering and exiting poverty between 1998 and 2006, we have to differentiate between the poor and non poor households. Both ELMS do not have any information on expenditure or consumption level and hence cannot be used to determine the income poverty level of households. On the other hand HIECs involve detailed data on household consumption and characteristics of its members but it does not track households over time and hence dynamics of poverty cannot be traced. Merging information

⁽¹⁾ Changes in employment means individuals living in households that have experience a loss or gain of employment.

of these two types of surveys, as explained below, is necessary to study the dynamics of poverty over the period 1998-2006.

5.2 Data Limitations

First: The panel data used in the study includes only two waves and the interval between the two waves is 8 years. The study uses this data because there is no any other panel data in Egypt includes more waves and has shorter intervals.

Second: Using the relative poverty concept in this study which compares the lowest segments of a population with upper segments, usually measured in income quintiles or deciles. But the relative poverty concept is widely used in countries with high and medium levels of economic development not underdeveloped or developing countries.

5.3 Methodology

5.3.1 Multiple Linear Regression for estimating household income poverty for LMSs

The LMSs data does not include expenditure or income data. Accordingly, to estimate the poverty levels in LMSs data, a linear regression technique has to be used. This technique allows us to combine detailed income and expenditure information available from the HIECSs, with the survey data available from the LMSs. It combines the (HIECS 99) with the (ELMS 98), and (HIECS 04) with the (ELMPS 06) to estimate per capita consumption for the LMS surveys.

The steps: (Assad and Roushdy, [3])

- 1) Identify a set of common socio-economic variables in the four datasets ⁽¹⁾ which are used in this study. The choice of common explanatory variables is based on a thorough review of the poverty literature and a careful investigation of the descriptive statistics of the common set of explanatory variables and their correlation with the poverty measures.
- 2) Each of the two (HIECS) data is used to estimate per capita consumption as a function of the chosen common set of household characteristics. A natural logarithmic function of per capita consumption of household i , C_i , is estimated for each of the HIECS samples.

$$\ln C_i = X_i' \beta + \varepsilon$$

where C_i : is total per capita consumption for household i .

X_i : is a vector of characteristics of household.

β : are the estimated coefficients

ε : is the disturbance term that is distributed as $N(0, \sigma^2)$.

⁽¹⁾ The (HIECS 99) with the (ELMS 98) and the (HIECS 04) with the (ELMPS 06).

- 3) Applying the parameter estimates to the two (ELMPS) data. For each household, the estimated parameters from the regression are used to compute the predicted household consumption ⁽¹⁾.
- 4) Classify the households into poor and non poor households in the two (ELMPS) data. Households were arranged by their estimated per capita consumption and households in the first quintile (the poorest 20%) are identified as a poor in the two (ELMPS) data, therefore relative poverty in the two periods 1998 and 2006 is determined. Then, using the estimated relative poverty in the two periods, the Relative Chronic Poverty and the Relative Transitory Poverty were estimated.

5.3.2 Count Method

It is used to calculate both the absolute number of individuals entering and exiting poverty, as well as the probability of entering and exiting poverty at a point in time (Mary, [12]).

Accordingly, "the number of people who are chronically poor in year t" (EC_t): is defined as the number of persons who were poor in t-1 and t.

Similarly, "the number of people who enter poverty in year t" (EN_t): is defined as the number of persons who were non poor, at year t-1, but is poor, at year t.

Finally, "the number of people who exit poverty in year t" (EX_t): is defined as the number of persons who was poor, at year (t-1), and non poor, at year t.

The probability of being chronically poor is defined as the ratio of the number of people who are poor in year t-1 and t (EC_t) to the number of the poor in year t-1 ($N_{p,t-1}$).

$$\text{Prob. (being chronically poor at t)} = \frac{EC_t}{N_{p,t-1}} \times 100$$

Similarly, the probability of entering poverty is defined as the ratio of the number of people who enter poverty in year t (EN_t) to the number of the non poor in year t-1 ($N_{np,t-1}$).

$$\text{Prob. (entering relative poverty at t)} = \frac{EN_t}{N_{np,t-1}} \times 100$$

Finally, the probability of exiting poverty is defined as the ratio of the number of people who exit poverty in year t (EX_t) to the number of the poor in year t-1 ($N_{p,t-1}$).

⁽¹⁾ The per capita consumption of the ELMSs samples were taken from Assad and Roushdy by personal communication.

$$\text{Prob. (exiting relative poverty at t)} = \frac{EX_t}{N_{p,t-1}} \times 100$$

5.3.3 Binary Logistic Model

A binary logistic model is used to determine the main factors that trigger individuals' entries into and exits from relative poverty. Accordingly, the binary logistic model simply provides information about the probability of experiencing an event at time t (e.g., exiting relative poverty) given that the event has not occurred prior to time t (e.g., the person is in poverty in the period prior to t, namely; t-1). It allows the probability of experiencing an event at time t to depend on a set of explanatory variables, i.e.; age, gender, educational attainment,...etc.,

The binary logistic model assumes that the probability of entering (or exiting) relative poverty in a given period (e.g., year t) is represented by a logit specification. The logit specification is popular as it is very easy to control and restricts the transition probabilities to lie between zero and one (Allison, [2]). Several studies of poverty dynamics have used the logit specification (Stevens, [16]) and (Iceland, [9]).

With this assumption, the study uses two models: the first model is concerned about relative chronic poverty and exits while the second is for the relative poverty entries.

The First Model: The Relative Chronic Poverty and Exits Model:

In this model the population is the households who were poor already in the year 1998. The probability of being chronically poor for household i at time t can be written as:

$$P_{it} = \frac{1}{1 + e^{-y_{it}}}$$

Where, $y_{it} = a_t + \delta'T_{it} + \beta'X_{it}$

Y: is dependent variable takes two values. It takes the value **one** if the household is chronically poor and the value **zero** if the household exits from poverty.

X: represents the vector of control variables which are the characteristics of the household head (e.g. age, sex, educational attainment..etc), household size, share of adults 15-64 in the household, share of children less than 6 years in the household, region, economic indicators (unemployment rate), the physical capital (the area of cultivated land that is owned by the household)...etc.

T: represents the vector of transition variables such as:

- Change in employment characteristics of (head, or other household members).
- Change in prevailed unemployment rate.
- Change in education status for household members.
- Change in the position of wealth index for household.

- Change in owning and renting out agricultural land for the household
- Change in owning household enterprise or sharing it.
- Migration inside or outside Egypt.

Table (1) in the Annex shows the list of variables that used in the models in detail.

The Second Model: The Model for Relative Poverty Entries

In this model the population is the households who were non poor already in the year 1998. The probability of entering poverty for household i at time t can be written as:

$$P_{it} = \frac{1}{1 + e^{-y_{it}}}$$

Where, $y_{it} = a_t + \delta'T_{it} + \beta'X_{it}$

Y: is dependent variable takes two values. It takes the value **one** if the household enters into poverty and the value **zero** otherwise.

X: represents the vector of control variables as mentioned previously.

T: represents the vector of transition variables such as:

- Child under age six enters household.
- Change in employment characteristics of (head, or other household members).
- Change in prevailed unemployment rate.
- Change in education status for household members.
- Change in the position of wealth index for household.
- Change in owning and renting out agricultural land for the household.
- Change in owning household enterprise or sharing it.
- Migration inside or outside Egypt.

• Reasons to justify using Income Poverty instead of the Wealth Index:

In the context of creating variables that measure the socioeconomic changes of the households during the period (1998-2006), the wealth index measures ***the change in the position of wealth for household*** during the period of the study (1998-2006).

The proposed index is a simple technique for the classification of households according to the welfare level. It is used data on asset ownership (i.e. owning a car, a colored TV ... etc.), housing characteristics (i.e. number of rooms, type of toilet facilities, floor material ... etc.) and the last set of variables was concerned with land ownership (6 acres or more per household).

This study constructed the wealth indices for 1998 and 2006 by following the steps in Rashed A. (2008). The study used thirty four variables in constructing the wealth index in both (ELMPS) data. Twenty four of these variables were assigned to possession of consumer durables (i.e. owning a

phone, a fridge ... etc.), while the second set of variables that consists of 10 variables measures housing characteristics for the household (i.e. number of rooms, type of toilet facilities, wall material ... etc.).

This part aims to investigate the relationship between the per capita consumption and the wealth index to justify the use of the per capita consumption. From Table (2) there are only 25.6 percent of all households are on the diagonal i.e. they fell in similar quintiles regardless of the indicator used in ranking (predicted per capita consumption or wealth index) while the percentage above and under the diagonal are 74.5 percent. This indicates that there is no strong relationship between the per capita consumption and the wealth index. Also, the Gamma statistic showed that there is a weak positive correlation between the per capita consumption and the wealth index ($\gamma = 0.23$).

Table (2)
Distribution of households according to wealth index and per capita consumption in 2006

Asset Poverty (Wealth index)	Per capita consumption					Total
	1 st Q	2 nd Q	3 th Q	4 th Q	5 th Q	
1 st Q	6.6	5.0	4.0	3.1	1.4	20.0
2 nd Q	4.3	3.9	4.9	4.2	2.7	20.0
3 th Q	3.2	3.8	4.4	4.7	3.9	20.0
4 th Q	4.0	4.7	3.9	3.9	3.5	20.0
5 th Q	2.6	3.0	3.5	4.1	6.8	20.0
Total	20.7	20.4	20.7	19.9	18.4	100

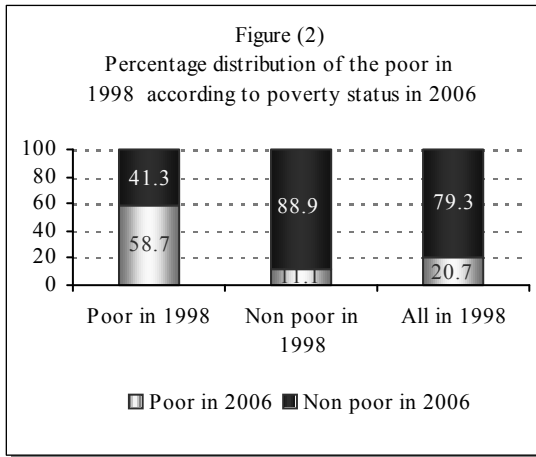
In the same context, the wealth index is a proxy for long-term wellbeing of the household. Therefore it is difficult to use the wealth index to measure to what extent the change in the household welfare in the short period (1998-2006). In the same time, the consumption of the household is changing more rapidly. *Accordingly, this study depends on the estimated per capita consumption as a measure of household welfare and to determine the households who enter or exit from poverty.*

6. Results

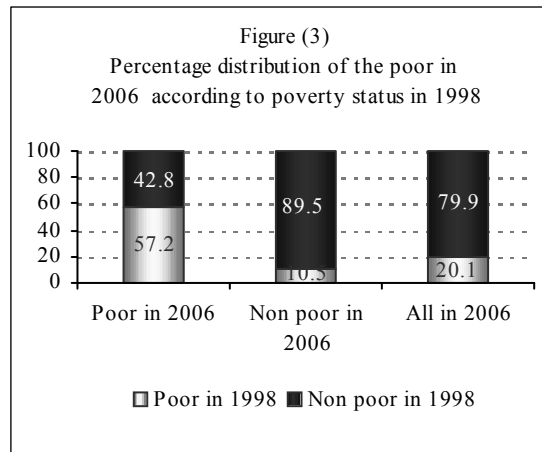
6.1 The Transition Matrix of the Egyptian individuals between 1998 and 2006

The transition matrix maps changes in individuals' consumption from 1998 to 2006 in relation to the poorest 20 percent of individuals. It is used to answer the first question "How can we classify poor people into chronically relatively poor and the transiently relatively poor?"

Figure (2) shows that there are 41.3 percent of individuals that were relatively poor in 1998 are moved to higher quintiles in 2006. Almost 11 percent of individuals that were relatively non poor in 1998 are fallen into poverty in 2006. On the other hand, Figure (3) indicates that there are 57.2 percent of individuals that were relatively poor in 2006 were also poor in 1998.



Source: Calculated by authors using ELMS98 and ELMPS06.

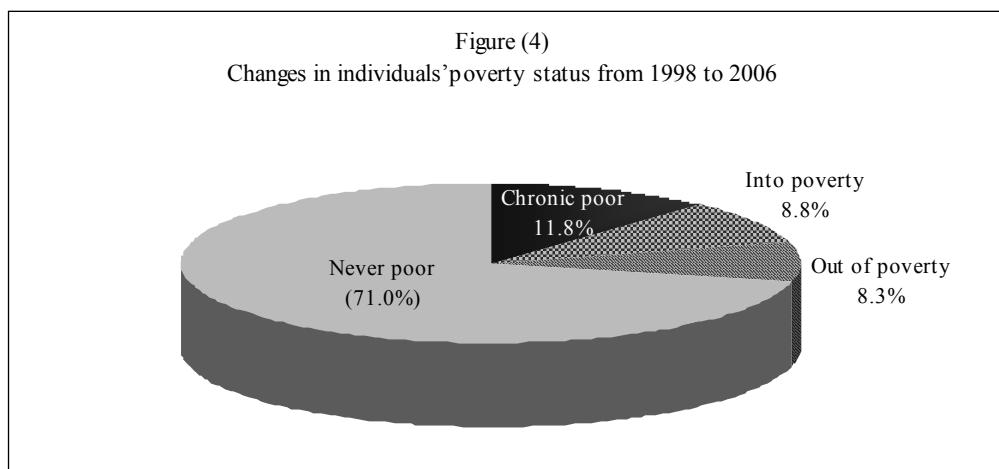


Source: Calculated by authors using ELMS98 and ELMPS06.

From Table (2) in the Annex, there are 82.8 percent of individuals on the diagonal cells; indicating that they did not move between categories, where almost all of them were never poor and only 11.8 percent of all individuals stayed poor. About 8 percent of individuals above the diagonal had moved from being poor to be non poor, thus in terms of per capita consumption had improved, while per capita consumption of 9 percent of individuals below the diagonal had worsened and hence they fell into poverty.

Accordingly, the individuals could be categorized into three distinct groups: first group “Chronically Relatively Poor” where individuals were poor in the two years (always poor), second group “Transiently Relatively Poor” where individuals were poor in one of the two years (sometimes poor), and third one where individuals were never poor in any year (never poor) as shown in Table (3) in the Annex.

From Figure (4) it is clear that 11.8 percent of all individuals are always poor. Overall, 17.1 percent of individuals were sometimes poor – 8.3 percent of individuals are moved out of poverty while 8.8 percent fell into poverty. Finally, 71 percent of individuals are “never poor” in both 1998 and 2006 surveys.



Source: Calculated by authors using ELMS98 and ELMPS06.

To answer the second question “What is the likelihood of entering and exiting relative poverty?”. The likelihood of being chronically poor is defined as the ratio of the number of people who were poor in t-1 and t (EC_t) and the number of poor people in year t-1 ($N_{p,t-1}$) times 100.

$$\begin{aligned} \text{Likelihood (being chronically poor at 2006)} &= \frac{EC_t}{N_{p,t-1}} \times 100 \\ &= \frac{2930}{4990} \times 100 = 58.8\% \end{aligned}$$

where (EC_t): the number of people who are poor in year t-1 and t.

($N_{p,t-1}$): the number of poor people in year t-1.

Similarly, the likelihood of entering relative poverty as the ratio of the number of people who enter relative poverty in year t (EN_t) and the number of non poor people in year t-1 ($N_{np,t-1}$) times 100.

$$\begin{aligned} \text{Likelihood (entering relative poverty at year 2006)} &= \frac{EN_t}{N_{np,t-1}} \times 100 \\ &= \frac{2189}{19783} \times 100 = 11.1\% \end{aligned}$$

where (EN_t): the number of people who enter poverty in year t.

($N_{np,t-1}$): the number of non poor people in year t-1.

Finally, the likelihood of exiting poverty is defined as the ratio of the number of people who exit relative poverty in year t (EX_t) and the number of poor people in year t-1 ($N_{p,t-1}$) times 100.

$$\begin{aligned} \text{Likelihood (exiting relative poverty at year 2006)} &= \frac{EX_t}{N_{p,t-1}} \times 100 \\ &= \frac{2060}{4990} \times 100 = 41.3\% \end{aligned}$$

where (EX_t): the number of people who exit poverty in year t.

($N_{p,t-1}$): the number of poor people in year t-1.

6.2 The Relationship between Relative Poverty Status and Household’s Characteristics

6.2.1 Relationship between relative poverty status and the characteristics of households' heads

Table (4) in Annex shows the relation between the characteristics of households’ heads and the levels of relative poverty. Regarding the **age and sex of households’ heads**, the Pearson X^2 test showed that there is a significant relationship between the age of household head and the levels of relative poverty (P-values<0.05). On the other side, there is no significance relation between the sex of households’ heads and the relative poverty.

Concerning the *education of household heads*, it is obvious from Table (4) in Annex that two thirds of the chronically poor individuals live with illiterate household heads. Additionally, half of the individuals who entered into poverty live with illiterate household heads. On the other hand, almost half of the never poor individuals live with household heads with intermediate education and above. Similarly, around one fifth of the individuals who exited from poverty live with household heads with intermediate education and above. Gamma statistic shows that there is a moderate positive relation between the two variables.

Regarding the *employment status of household heads*, Table (4) in Annex shows that 79.5 percent of individuals who exited from poverty live with employed households' heads, while the percentage decreases among individuals who entered into poverty to reach only 67 percent.

As regards to the *stability of work of household heads*, Table (4) in Annex reveals that the majority (75 percent) of never poor individuals live with household heads with permanent work while this percentage decreases among chronically poor individuals to reach 64 percent. Gamma statistic and X^2 test shows that there is a significant negative relation between the two variables.

Regarding *the sector of work for household heads*, there are around 63 percent of never poor individuals live with household heads works in private sector while this percentage increases among the chronically poor individuals to reach 93 percent and the relationship was confirmed by the Pearson X^2 test.

6.2.2 Relationship between relative poverty status and the social characteristics of the household members

Regarding the age composition, Table (5) in Annex shows that the percentage of children whose ages are less than 6 years among households who entered into poverty reached 22 percent, while this percentage decreased to only 14 percent between households who exited from poverty. Concerning the percentage of population at the working age (15-64) years, the data shows that 55 percent of persons at the working age are in households who entered into poverty while this percentage increased among households who exited from poverty to reach 70 percent.

Concerning the *education status of household members*, the percentage of illiterate persons in the chronically poor households reached 31.6 percent while this percentage decreased to only 14 percent among the never poor households. On the contrary, the percentage of university graduates persons in chronically poor households is only 0.6 percent while this percentage increased among the never poor households to reach 13.5 percent.

According to *the average household size*, the data shows that there is a significant relationship between the household size and the dynamic of relative poverty. The average household size among the never poor households is 4.6 persons compared to the average household size among the households who exited from poverty, which reach 5.2 persons while increased to 7.5 persons among households who entered into poverty and finally increased to 8 persons among the chronically poor households.

Table (5) in Annex reveals *the significant relationship between regions and the dynamic of relative poverty*, where the chronic poverty is concentrated in Upper Egypt. Almost 87 percent of chronically poor people lived in Upper Egypt especially in Upper rural Egypt – in contrast, only 2.6 percent lived in Metropolitan areas. On the other hand, there are 29 percent of the never poor people lived in Metropolitan. The data also shows high social mobility across the country. Almost 61 percent of people who were poor in 1998 and moved out from poverty in 2006 lived in rural areas whether in Upper or Lower Egypt.

6.2.3 Relationship between relative poverty status and dwelling characteristics

Concerning *the average floor area per person*, there is a significant relationship between the floor area and dynamics of relative poverty, where it is smaller among the chronically poor households (12.1 m²/person) compared to the households who entered into poverty (12.3 m²/person), the households who exited from poverty (21 m²/persons) and reached its highest value among never poor households (23.4 m²/person).

Regarding *the average persons per room* which represent an indicator of crowdedness, chronically poor households are more likely to live in crowdedness more than never poor households (2.4 persons per room vs. 1.2 persons per room).

According to *the dwelling ownership status*, Table (6) in Annex shows that around 63 percent of the never poor households have owned dwelling and 26.1 percent have rented dwelling. On the other hand, the pattern of dwelling ownership is different in chronically poor households, where there are about 81 percent of the chronically poor households have owned dwelling and most of them in rural areas. This is due to the dominant pattern in rural areas where most of the households in such areas own their dwelling.

It is clear from Table (6) in Annex that 38.3 percent of the chronically poor households live in dwelling whose *roof material* are reinforced concrete while this percentage increased among the never poor households to reach almost 89 percent.

It is obvious from Table (6) in Annex that almost one fifth of the chronically poor households live in *dwellings connected to sewerage system* while this percentage increased among the never poor households to reach almost 76 percent. Concerning the *waste disposal*, chronically poor households are less likely to use waste collector than the never poor households.

Concerning *the durable goods*, the ownership percentages of most of durable goods are higher among the never poor households compared to the chronic poor households.

6.3 Factors affecting Dynamics of Relative Income Poverty

6.3.1 The Chronic Relative Poverty and Exits Model

Utilizing the Binary Logistic model, the probability of being chronically poor has been estimated using all explanatory variables previously

described. Table (7) in Annex shows the *classification table of the chronic relative poverty households according to the estimated model*. Overall, the percentage of correct classification for chronically poor households' model attained 90.9 percent.

The results of the estimated model show that the model is significantly predicting chronic relative poverty. The results of the chronic model are presented in Table (8) in Annex, where the significant variables only are presented in the table.

The results show that *the most significant and effective variables of being the household chronically poor* are the education level of household heads (particularly the university and above education category), the region - particularly the urban Upper -, the household size, owning household enterprise or sharing it, the average persons per room, the change in the household share of government and public sectors employees, the work sector of household heads, the wall material of the dwelling, the type of sanitation facility in the dwelling, and the ownership of durable goods.

The results show that *the education level of household heads* affects significantly on being the households chronically poor. The head of the household who has completed university degree or above is less likely to stay in poverty by about 98 percent, compared by illiterate head after controlling all other factors.

The findings show that *the region of residence for household* affects significantly on being the households chronically poor. The household lived in urban Upper is more likely to stay in poverty than the household who lived in Metropolitan governorates by about 4 times after controlling all other factors.

Looking for the odds ratios, it is obvious from Table (8) in Annex that *the household size is* one of the main factors of being the household chronically poor. *When the household size increased by one unit*, the odds of being chronically poor increased by 3 times. Also, *for every unit increase in the average of persons per room*, the odds of being chronically poor increased by 8 times.

According to owning household enterprise or sharing it, the households who owned or shared household enterprise in the years 1998 and 2006 is less likely to be chronically poor than the households who did not own or share household enterprise in both years 1998 and 2006 by about 77 percent after controlling all other factors.

Concerning *the change in the household share of government and public sectors employees*, the decline of households shares of government and public sectors employees are more likely to be chronically poor than the households that their share were increased by about 5 times controlling all other factors.

The outcomes show the significant relationship between *the wall material of the dwelling* and being the households chronically poor. The households lived in dwellings with wall material made of mud are more likely to be chronically poor than the households lived in dwellings with wall material made of brick, stone and concrete by about 6 times.

It is clear from Table (8) in Annex that the households that have not any type of *sanitation facility* in their dwellings are more likely to stay in poverty than the households are connected by public network of sanitation by about 11 times after controlling all other factors. In the same time, the households depend on *tank as a type of sanitation facility* in the dwelling are more likely to stay in poverty than the households are connected by public network of sanitation by about 3 times.

On the same time, the model presented the most effective variables on households who exit from poverty, where these variables are the education level of household heads, the region, owning household enterprise or sharing it, the change in the household share of government and public sectors employees, the household size, the type of sanitation facility in the dwelling, the average persons per room, and the wall material of the dwelling.

The *education level of household heads* has a strongest impact on exiting the household from poverty. The head of the household who has completed university degree or above is more likely to exit from poverty by about 56 times, compared by illiterate head after controlling all other factors.

The findings show that *the household lived in urban Upper areas* is less likely to exit from poverty than the household that lived in Metropolitan governorates by about 72 percent after controlling all other factors.

Concerning owning household enterprise or sharing it, the households who owned or shared household enterprise in the years 1998 and 2006 is more likely to exit from poverty than the households who did not own or share household enterprise in both years 1998 and 2006 by about 4 times after controlling all other factors.

According to the change in the household share of government and public sectors employees, the decline of households shares of government and public sectors employees are less likely to exit from poverty than the households that their share were increased by about 81 percent controlling all other factors.

As expected *when the household size increased by one unit*, the odds of exiting from poverty decreased by 67 percent. Also, *for every unit increase in the average of persons per room*, the odds of exiting from poverty decreased by 87 percent.

The results show that the households depend on *tank as a type of sanitation facility* in the dwelling are less likely to exit from poverty than the households are connected by public network of sanitation by about 67 percent.

6.3.2 The Model of Relative Poverty Entries

The results of the logistic regression model show the significance of the model of relative poverty entries. Overall the percentage of correct classification for the model is 92.5 percent.

The results of the estimated model show that the model is significantly predicting the households who enter into poverty ($\chi^2=9800.1$, $df = 51$, $N = 4900$, $P\text{-value} < 0.05$).

Overall, the results presented in Table (10) in Annex show that ***the most effective variables on the households to enter into poverty*** are region of residence for the household (especially in urban Upper), the education level of household heads, the household size, the average persons per room, owning household enterprise or sharing it, the change in the household share of employed persons, the wall material of the dwelling, the way of waste disposal, the type of sanitation facility in the dwelling, and the ownership type of dwelling.

According to the region of residence for household, the household lived in Upper urban is more likely to enter into poverty than the household that lived in metropolitan governorates by about 3 times after controlling all other factors.

It is clear from Table (10) in the Annex that ***the education level of household heads*** affects significantly on entering the households into poverty. The head of household who has completed university degree or above is less likely to enter into poverty by about 66 percent compared by illiterate head.

When the household size increased by one unit, the odds of being entering into poverty increased by 3 times. Also, ***for every unit increase in the average of persons per room***, the odds of entering into poverty increased by 3 times.

The results show that the households who ***owned or shared household enterprise*** in the years 1998 and 2006 is less likely to enter into poverty than the households who didn't own or share household enterprise in both years 1998 and 2006 by about 68 percent (odds ratio = 0.32) after controlling all other factors.

Concerning ***the change in the household share of employed persons***, the decline of household share of employed persons are more likely to enter into poverty by about 88 percent compared by households that their share were increased after controlling all other factors.

The findings show that the households lived in ***dwelling with wall material made of mud*** are more likely to enter into poverty than the households lived in dwellings with wall material made of brick, stone and concrete by about 4 times.

The outcomes show that the households who are used dump, burn or bury the waste are more likely to enter into poverty by about 3 times compared by the households that depend on waste collector after controlling all other factor. Looking for the odds ratios, it is obvious from Table (10) in Annex that ***type of sanitation facility*** is one of the main factors of entering the household into poverty (increases the likelihood of entering into poverty by 3 times).

7. Conclusions and Recommendations

7.1 Conclusions

One of the main results of the study that individuals' mobility between the different consumption groups were low. There are only 17.1 percent of individuals that enter into poverty or exit from it during the period (1998- 2006). However, there are 82.8 percent of individuals did not move out from their consumption groups whether it is the never poor or chronically poor group. In the same time, there are around 29 percent of individuals are poor during the period of study and almost 59 percent of them are transient poor.

The standards of living of some individuals have *improved* (8.3 percent climbed out of poverty) during the period (1998-2006) while there are 8.8 percent of individuals their standards of living are *worsened* by falling into poverty. In the same time, there are 71 percent of individuals are never poor while 11.8 percent are chronically poor.

The study shows that *the likelihood of being chronically poor is* 58.8 percent during the period (1998 -2006) while *the likelihood of entering into poverty is* 11.1 percent and *the likelihood of exiting from poverty is* 41.3 percent during the same period. The study reveals that the *chronic poverty is concentrated in Upper Egypt*. In the same time there are 28.9 percent of the never poor people lived in Metropolitan.

Regarding the main factors that increase households' likelihood of being chronically relatively poor, the findings show that the most powerful factors are the education level of household heads (particularly the university and above education category), the region of residence for the household (especially in urban Upper), the household size, owning household enterprise or sharing it, the more persons per room, the change in the household share of government and public sectors employees, the work sector of household heads, the wall material of the dwelling, the type of sanitation facility in the dwelling, and the ownership of durable goods.

Concerning the main factors that increase households' likelihood of entering into relative poverty, the results show that the most effective variables are region of residence for the household (especially in urban Upper), the education level of household heads, the household size, the average persons per room, owning household enterprise or sharing it, the change in the household share of employed persons, the wall material of the dwelling, the way of waste disposal, the type of sanitation facility in the dwelling, and the ownership type of dwelling.

With regards to the main factors that increase households' likelihood of exiting from relative poverty, the results show that the most effective variables are the education level of household heads, the region, owning household enterprise or sharing it, the change in the household share of government and public sectors employees, the household size, the type of sanitation facility in the dwelling, the average persons per room, and the wall material of the dwelling.

7.2 Recommendations

The findings of this study leads to some recommendations listed below:

The first recommendation is related to the future work of studying the dynamics of poverty in Egypt. As it was mentioned earlier, there is a scarcity of the panel data survey in Egypt. In the same time all the panel data that executed in Egypt are two rounds only. Accordingly, we strongly recommend fielding more rounds of panel data that allow for doing a comprehensive analysis for poverty dynamics as investigating the welfare movements of a set of households or individuals over long periods.

The second recommendation is, concerned with alleviating chronic and transitory relative poverty. We recommend that policy makers should adopt the following programs in collaboration with civil society organizations and charity foundations by:

- Preparing and organizing programs aims to eliminate the illiteracy in Upper Egypt and fighting the dropping out of education.
- Increasing the awareness of the importance of family planning programs and its impacts on improving the living standards of household and create new effective means that encourage the households to follow the family planning programs.
- Providing small and micro loans by specialized institutions such as Social Fund for Development with providing the necessary facilities for citizens to encourage them to do these projects. Also, the government and civil society organizations could provide citizens with necessary consulting and marketing services for projects implementation.
- Encouraging investors to establish large-scale projects through the use of natural and human resources available in Upper Egypt.
- Developing infrastructure in general. Particularly, Connecting sanitation services to deprived areas especially in Upper Egypt.

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Annex

Table (1)

The variables used in the models of binary logistic according to the five dimensions that affects on poverty status

The variables	
1. The household head characteristics in 2006	
Ln age	The marital status (Unmarried, Married)
The sex (male, female)	The employment status (Out of labor force, Employed, Unemployed)
The education status (Illiterate, Literate without any diploma, Basic education, Secondary & above, University & above)	The stability of work (Permanent, Temporary)
The sector of work (Government & Public enterprise, Private, Others)	
2. The socioeconomic characteristics of the household in 2006	
Household size	Share of elderly (65+) years old in the household
Share of children smaller than 6 in the household	The households place of residence (Metropolitan, Lower Urban, Lower Rural, Upper Urban, Upper Rural)
Share of children (6-14) in the household	The unemployment rate in the household
Share of adults (15-64) in the household	The cultivated area owned by the household
3. The dwelling characteristics in 2006	
The dwelling ownership (Owned, Rented, Fringe benefit or grant)	Roof material in the household (Reinforced concrete, Wood, Others)
Average persons per room	Waste disposal in the household (Public & private collector, Throw in road or stream, Others)
Average floor area per person in dwelling	Source of water supply in the household (Tab water, Others)
Floor material in the household (Mud, Tiles or cement, Others)	The sewerage system in the household (Public network, Tank, No sanitation)
Wall material in the household (Brick, stone and concrete, Mud, Others)	The type of toilet in the household (Toilet inside house, Others)
Source of illumination in the household (Electricity, Others)	
4. The ownership of durable goods in 2006	
Washing machine (Owned, Not owned)	Radio (Owned, Not owned)
Electric fan (Owned, Not owned)	Color TV (Owned, Not owned)
Cooker (Owned, Not owned)	Iron (Owned, Not owned)
Fridge (Owned, Not owned)	Phone (Owned, Not owned)
Water heater (Owned, Not owned)	
5. The socioeconomic changes in shares of the households during the period (1998-2006)	
Share of employed persons (Increased, Stable, Decreased)	Unemployment rate (Increased, Stable, Decreased)
Share of unemployed persons (Increased, Stable, Decreased)	Change in the household position in wealth index (Improve, Stable, Worse)
Share of government and public sectors employees (Increased, Stable, Decreased)	Share of employed persons who work permanently (Increased, Stable, Decreased)
Share of private sectors employees (Increased, Stable, Decreased)	Share of employed persons who work temporary (Increased, Stable, Decreased)
Share of persons who are working for family without wage (Increased, Stable, Decreased)	Getting the head of the household a job in 2006 (Getting a job in 2006, Other)
Share of the illiterate persons (Increased, Stable, Decreased)	Losing the head of the household a job in 2006 (Losing a job in 2006, Other)
Share of university graduates (Increased, Stable, Decreased)	Child under age six enters household (Entering a child under age 6, Other)
Share of persons who have basic education (Increased, Stable, Decreased)	Migration inside & outside Egypt (Migration in Egypt, Migration out of Egypt, No Migration)
Owning and renting out agricultural land (Owned and rented out agricultural land in 1998 & 2006, Owned and rented out agricultural land in 1998 & no land in 2006, No land in 1998 & owned and rented out agricultural land in 2006, No land in 1998 & 2006)	Owning household enterprise or sharing it (Didn't own or share household enterprise in 1998 & 2006, Didn't own or share household enterprise in 1998 then it owned or shared household enterprise in 2006, Owned or shared household enterprise in 1998 then didn't own or share household enterprise in 2006, Owned or shared household enterprise in 1998 & 2006)

Table (2)
Transition matrix for individuals' poverty status between 1998 and 2006

(%)

Poverty status for individuals in 1998	Poverty status for individuals in 2006		
	Poor	Non poor	Total
Row percent			
Poor	58.7	41.3	100
Non poor	11.1	88.9	100
Total	20.7	79.3	100
Column percent			
Poor	57.2	10.5	20.1
Non poor	42.8	89.5	79.9
Total	100	100	100
Total percent			
Poor	11.8	8.3	20.1
Non poor	8.8	71.0	79.9
Total	20.7	79.3	100

Source: Calculated by authors using ELMS98 and ELMPS06.

Table (3)
Changes in individuals' poverty status from 1998 to 2006

(%)

Poverty dynamics	Percentage of individuals
Chronically Relatively Poor (Poor in both 1998 and 2006)	11.8
Transiently Relatively Poor Into Poverty (Non-poor in 1998 and Poor in 2006)	8.8
Out of Poverty (Poor in 1998 and Non-poor in 2006)	8.3
Never poor (Non-poor in both 1998 and 2006)	71.0
Total	100

Source: Calculated by authors using ELMS98 and ELMPS06.

Table (4)
The percentage distribution of the individuals by the characteristics of households' heads within relative poverty categories

Variables	Chronic poor	Into poverty	Out of poverty	Never poor	All
The age groups of households' heads					
Less than or equal 30	4.2	5.6	12.3	7.7	7.4
(31-40)	19.2	23.6	16.1	19.0	19.2
(41-50)	32.8	27.5	27.9	27.2	27.9
(51-60)	27.8	22.8	27.2	26.7	26.5
(61-64)	4.2	6.3	5.8	6.0	5.8
Greater than or equal 65	11.8	14.2	10.7	13.5	13.2
The sex of the households' heads					
Male Headed	85.6	84.2	85.7	85.1	85.1
Female Headed	14.4	15.8	14.3	14.9	14.9
The marital status of the households' heads					
Married	87.6	84.2	85.7	84.0	84.6
Other including (never married, divorced, widowed)	12.4	15.8	14.3	16.0	15.4
The educational status of households' heads					
Illiterate	66.9	50.6	45.1	24.0	33.2

Variables	Chronic poor	Into poverty	Out of poverty	Never poor	All
Literate without any diploma	12.2	12.1	15.6	9.4	10.4
Basic education	14.4	17.8	18.4	17.1	16.9
Secondary & above	6.1	18.1	17.2	29.6	24.8
University & above	0.5	1.4	3.6	19.9	14.7
The employment status of households' heads					
Employed	72.4	67.1	79.5	70.3	70.9
Unemployed	1.4	1.2	0.4	0.9	0.9
Out of labor force	26.2	31.8	20.1	28.8	28.2
The stability of work for households' heads					
Permanent	63.4	71.5	68.8	75.2	72.9
Temporary, Casual & Seasonal	36.6	28.5	31.2	24.8	27.1
The sector of work for households' heads					
Private	93.5	82.5	88.5	63.3	70.7
Government & Public enterprise	6.5	16.5	11.3	34.8	27.9
Others	0.0	1.0	0.2	1.9	1.4
Total	100	100	100	100	100

Source: Calculated by authors using ELMS98 and ELMPS06.

Table (5)
The characteristics of households' members within relative poverty categories

Variables	Chronic poor	Into poverty	Out of poverty	Never poor	All
The age compositions in households					
Percentage of children of age (0-5) years in household (%)	16.1	22.0	14.2	14.7	15.5
Percentage of children of age (6-14) years in household (%)	25.5	18.2	12.3	12.5	14.5
Percentage of adult male of age (15-64) years in household (%)	27.9	26.2	36.5	33.6	32.5
Percentage of adult female of age (15-64) years in household (%)	27.7	29.1	33.5	33.8	32.6
Percentage of people of age 65 + in household (%)	2.8	4.4	3.5	5.4	4.8
Total	100	100	100	100	100
The education characteristics of household members					
Illiterate persons in household (%)	31.6	26.2	27.3	14.1	18.3
University graduates persons and above in household (%)	0.6	1.5	2.7	13.5	10.0
Sex ratio (Male/Female) (%)	122.6	115.4	141.1	132.6	130.6
Average household size (person)	8.0	7.5	5.2	4.6	5.3
The households place of residence					
Metropolitan	2.6	10.1	6.7	28.9	22.3
Lower Urban	3.7	10.7	7.8	22.2	17.8
Lower Rural	7.2	31.2	14.0	23.6	21.5
Upper Urban	35.7	22.2	24.9	16.8	20.2
Upper Rural	50.8	25.8	46.6	8.5	18.2
Total	100	100	100	100	100

Source: Calculated by authors using ELMS98 and ELMPS06.

Table (6)
The percentage of the individuals by dwelling characteristics within relative poverty categories

Variables	Chronic poor	Into poverty	Out of poverty	Never poor	All
The indicators of crowdedness in the dwelling					
Average floor area/person in dwelling (m ² /person)	12.1	12.3	21.0	23.4	20.8
Average persons per room (persons/room)	2.4	2.2	1.4	1.2	1.5
The dwelling ownership					
Owned (%)	81.1	73.3	71.0	63.2	66.9
Rented (%)	7.1	14.3	10.2	26.1	21.5
Fringe benefit/grant (%)	11.8	12.4	18.7	10.7	11.7
The dwelling characteristics					
Floor material: tiles or cement (%)	47.4	74.4	73.2	92.0	83.6
Wall material: brick, stone or concrete (%)	70.1	76.6	83.9	88.9	85.2
Roof material: reinforced concrete (%)	38.3	61.2	64.6	89.3	78.7
Waste disposal (collector) (%)	24.0	34.0	35.9	63.1	53.7
Availability of tap water (%)	85.7	95.0	95.3	99.0	96.8
Connected to sewerage system (%)	20.0	40.3	34.1	76.1	62.8
Availability of any type of toilet inside house (%)	91.1	91.1	94.4	98.1	96.3
Electricity is source of lighting (%)	98.9	99.0	99.0	99.8	99.5
The percentage of individuals according to their ownership of durable goods by poverty status					
Washing machine (%)	80.7	83.9	93.8	96.5	93.3
Cooker (%)	69.0	77.5	85.9	93.2	88.3
Fridge (%)	61.9	74.7	79.3	95.0	88.0
Electric fan (%)	76.1	64.1	77.7	85.5	81.9
Color TV (%)	42.4	57.4	66.2	88.6	78.5
Radio (%)	51.2	54.2	70.5	81.7	74.7
Iron (%)	33.1	49.4	62.6	85.4	74.1
Phone (%)	24.8	37.2	47.3	70.8	60.5
Water heater (%)	1.4	10.7	14.9	59.5	44.6
Kerosene cooker (%)	38.4	33.8	25.8	19.7	23.6
Black & White TV (%)	47.3	35.2	27.3	10.5	18.4
Bicycle (%)	19.0	15.8	20.5	16.1	16.8
Computer (%)	0.3	1.0	1.0	14.9	10.8
Video (%)	0.8	0.7	1.7	14.1	10.3
Sewing machine (%)	1.3	6.9	3.0	9.8	8.0
Camera (%)	1.1	3.1	1.0	9.5	7.2
Private car (%)	0.0	0.0	0.1	9.2	6.5
Air condition (%)	0.0	0.0	0.0	7.5	5.3
Freezer (%)	0.0	0.0	0.2	6.8	4.8
Heater (%)	0.7	0.2	0.7	6.1	4.5
Microwave (%)	0.9	1.2	1.4	2.9	2.4
Motor cycle (%)	0.8	1.1	2.0	2.2	1.9
Dishwasher (%)	0.2	0.0	0.3	1.8	1.3
Truck (%)	0.7	0.0	0.6	1.5	1.2
Taxi (%)	0.0	0.0	1.9	0.9	0.8

Source: Calculated by authors using ELMS98 and ELMPS06.

Table (7)
Classification table of the relative chronic poverty and exits model

Observed		Predicted		
		Poor		Percentage Correct
		Exit from poverty 0	Chronically poor 1	
Poor	Exit from poverty 0	1869	191	90.7
	Chronically poor 1	265	2665	91.0
Overall Percentage				90.9

Source: Calculated by authors using ELMS98 and ELMPS06.

Table (8)
Logistic regression results of the chronic relative poverty and exits model

Variables	Coefficient	Sig.	Exp(B)	
			Chronic poverty model	Exits poverty model
The characteristics of the head of the household				
- Educational level		0.000		
Illiterate (Ref.)				
Literate without any diploma	-1.310	0.000	0.270	3.704
Basic education	-1.278	0.000	0.279	3.584
Intermediate education or above intermediate	-1.096	0.000	0.334	2.994
University & above	-3.995	0.002	0.018	55.556
- The sector of work		0.000		
Government & public enterprises (Ref.)				
Other including (Private, investment, foreign, etc.)	-2.053	0.000	0.128	7.813
The social characteristics of the household				
Household size	1.098	0.000	2.998	0.334
Share of elderly (65+) years old (Ref.)				
Share of children smaller than 6 years old	0.108	0.000	1.114	0.898
Share of children (6-14) years old	0.076	0.000	1.079	0.927
- Region		0.000		
Metropolitan governorates (Ref.)				
Lower Urban	0.679	0.084	1.972	0.507
Lower Rural	-2.578	0.000	0.076	13.158
Upper Urban	1.266	0.000	3.545	0.282
Upper Rural	-1.087	0.002	0.337	2.967
The dwelling characteristics				
Average persons per room	2.070	0.000	7.922	0.126
- Wall material		0.000		
Brick, stone and concrete (Ref.)				
Mud	1.831	0.000	6.243	0.160
Other including (wood & tree branches, etc.)	1.021	0.010	2.775	0.360
- The sewerage system		0.000		
Public network (Ref.)				
Tank	1.107	0.000	3.026	0.330
No sanitation	2.436	0.025	11.430	0.087
The durable goods				

Variables	Coefficient	Sig.	Exp(B)	
			Chronic poverty model	Exits poverty model
Washing machine	-1.728	0.000	0.178	5.618
Radio	-1.239	0.000	0.290	3.448
Color TV	-1.262	0.000	0.283	3.534
Iron	-1.182	0.000	0.307	3.257
Phone	-2.369	0.000	0.094	10.638
Water heater	-2.771	0.000	0.063	15.873
The Unemployment rate				
Unemployment rate	0.032	0.000	1.033	0.968
*The change in the household share of				
- Government & public enterprises employees		0.000		
Increased (Ref.)				
Stable	2.447	0.000	11.552	0.087
Decreased	1.677	0.000	5.350	0.187
Family projects: owning or sharing household enterprise				
The H.H didn't own or share household enterprise in 1998 & 2006 (Ref.)				
The H.H didn't own or share household enterprise in 1998 then it owned or shared household enterprise in 2006	-0.551	0.001	0.576	1.736
The H.H owned or shared household enterprise in 1998 then it didn't own or share household enterprise in 2006	-1.579	0.000	0.206	4.854
The H.H owned or shared household enterprise in 1998 & 2006	-1.470	0.000	0.230	4.348
<i>Constant</i>	-9.498	0.000	0.000	

* Equals the household share in ELMPS 1998 - the household share in ELMPS 2006

** Equals the household position in wealth index in ELMPS 1998 - the household position in ELMPS 2006

Source: Calculated by authors using ELMS98 and ELMPS06.

Table (9)
Classification table of the model of relative poverty entries

Observed	Predicted			Percentage Correct
	Enter into poverty			
	0	1		
Enter into poverty	0	16190	1399	92.0
	1	80	2104	96.3
Overall Percentage				92.5

Source: Calculated by authors using ELMS98 and ELMPS06.

Table (10)
Logistic regression results of the model of relative poverty entries

Variables	Coefficient	Sig.	Exp(B)
The characteristics of the head of the household			
- Educational level		0.000	
Illiterate (Ref.)			
Literate without any diploma	-0.429	0.004	0.651
Basic education	-0.761	0.000	0.467

Variables	Coefficient	Sig.	Exp(B)
Intermediate education & above	-0.121	0.348	0.886
University & above	-1.091	0.000	0.336
- Marital status		0.000	
Unmarried (Ref.)			
Married	-0.560	0.000	0.571
The social characteristics of the household			
Household size	0.971	0.000	2.641
Share of elderly (65+) years old (Ref.)			
Share of children smaller than 6 years old	0.066	0.000	1.068
Share of adults (6-14) years old	0.025	0.000	1.026
Share of adults (15-64) years old	-0.021	0.000	0.979
- Region		0.000	
Metropolitan governorates (Ref.)			
Lower Urban	-0.341	0.055	0.711
Lower Rural	-2.615	0.000	0.073
Upper Urban	0.955	0.000	2.598
Upper Rural	-1.346	0.000	0.260
The dwelling characteristics			
Average floor area per person	-0.062	0.000	0.940
Average persons per room	1.169	0.000	3.220
- The ownership of dwelling		0.000	
Owned (Ref.)			
Rented	1.007	0.000	2.738
Fringe benefit or grant	-0.492	0.002	0.612
- Floor material		0.000	
Mud (Ref.)			
Tiles or cement	0.047	0.733	1.048
Other including (wooden, brick, stone, etc.)	-0.739	0.008	0.478
- Wall material		0.000	
Brick, stone and concrete (Ref.)			
Mud	1.274	0.000	3.574
Other including (wood & tree branches, etc.)	-0.224	0.282	0.799
- Waste disposal		0.000	
Public & private collector (Ref.)			
Throw in road or stream	0.166	0.179	1.181
Other including (dump, burn, bury etc.)	1.124	0.000	3.078
- The sewerage system		0.000	
Public network (Ref.)			
Tank	1.116	0.000	3.052
No sanitation	-2.531	0.005	0.080
The durable goods			
Washing machine	-1.710	0.000	0.181
Electric fan	-0.964	0.000	0.381
Cooker	-0.878	0.000	0.416
Fridge	-0.643	0.000	0.526
Radio	-0.774	0.000	0.461

Variables	Coefficient	Sig.	Exp(B)
Color TV	-1.112	0.000	0.329
Iron	-0.897	0.000	0.408
Phone	-1.714	0.000	0.180
Water heater	-2.684	0.000	0.068
The Unemployment rate			
Unemployment rate	0.009	0.020	1.009
*The change in the household share of			
- Illiterate persons		0.000	
Increased (Ref.)			
Stable	-0.937	0.000	0.392
Decreased	-0.174	0.101	0.840
- University graduates		0.000	
Increased (Ref.)			
Stable	1.056	0.000	2.874
Decreased	0.102	0.680	1.107
- Employed persons		0.000	
Increased (Ref.)			
Stable	0.674	0.002	1.910
Decreased	0.632	0.000	1.881
- Unemployed persons		0.000	
Increased (Ref.)			
Stable	-1.208	0.000	0.299
Decreased	-1.091	0.000	0.336
Family projects: owning or sharing household enterprise			
The H.H didn't own or share household enterprise in 1998 & 2006 (Ref.)			
The H.H didn't own or share household enterprise in 1998 then it owned or shared household enterprise in 2006	-0.181	0.135	0.834
The H.H owned or shared household enterprise in 1998 then it didn't own or share household enterprise it in 2006	-0.154	0.233	0.858
The H.H owned or shared household enterprise in 1998 & 2006	-1.145	0.000	0.318
<i>Constant</i>	-26.585	0.000	0.000

* Equals the household share in ELMPS 1998 - the household share in ELMPS 2006

** Equals the household position in wealth index in ELMPS 1998 - the household position in ELMPS 2006

Source: Calculated by authors using ELMS98 and ELMPS06.