

Transitions in socioeconomic status of households in Egypt (1998-2006)

Evidence from Panel Survey Data

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Abstract:

The current study aims to assess the changes in the socioeconomic status of households in Egypt between 1998 and 2006. The study benefits from the availability of the panel data structure that extends over a period of 8 years to underlie changes in the household socioeconomic status. The data used in this study is the Egypt Labor Market Surveys data (1998 and panel data 2006). Principal Component Analysis (PCA) was used to construct three sub-indices that represent the three dimension of the socioeconomic status of households namely; the head of household, social and economic sub-index. In addition, the PCA was used to construct the composite socioeconomic status index (SES). Two validation tests were used to confirm the validity of the three sub-indices and the SES index as well. These tests are the internal coherence test and the comparison with the estimated expenditure data and test the significance of this relation. In addition, the two tests were used to select the most appropriate method for constructing a composite index. The results of the study indicate that using PCA in extracting the first PC of the three sub-indices is the most appropriate method to extract the composite index. Additionally, the results show that household head characteristics are not strong motive to change the status of households to higher quintiles, while the social characteristics sub-index has the greatest effect on changing the status of households between 1998 and 2006. The socioeconomic status of households changed over the period 1998-2006, however, the transition is directed to the lower socioeconomic statuses more than the higher socioeconomic statuses. Also, there is a little bit marked stability regarding households at the poorest quintile, while marked transitions were observed regarding the households in the richest quintiles.

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1. Introduction:

Over the last few decades, concerns for poverty alleviation and wellbeing of the poor have dominated the line of thoughts among researchers and policy makers on the national and international arena. A reading through social science literature clearly shows that poverty is the main underlying factor responsible for many social problems. In consequences, many policies that tackle poverty roots and determinants were adopted by various countries in their pursuit for socioeconomic development on the national levels. On the international level, concerns for the well being of the poor were clearly articulated in the high priority assigned to poverty alleviation in the United Nations Millennium Development Goals (MDGs). "Reduce by half the proportion of people living on less than a dollar a day, Reduce by half the proportion of people who suffer from hunger" were the first MDGs.

In response for these heightened concerns, substantial scientific and research, efforts have been devoted to identifying the poor and the various dynamics that contribute to the changes in the situation of the vulnerable social groups. Different approaches have been adopted in this area of research. Some researcher focused on measuring current socioeconomic status, while others were concerned with measuring the changes in the socioeconomic status. While the former perspective received substantial attention among researchers and policy makers, the latter is gaining more attention although restricted with various data limitation problems and technical and analytical obstacles.

The current study aims to explore the various (micro level) indexes for the household socioeconomic status. It further benefit from the availability of the panel data structure, that extends over a period of 8 years, to shed some light on the main factors that underlie changes in the household socioeconomic status. The research fills an important gap in the similar researches in Egypt by allowing the policy makers to understand the changes in the household socioeconomic status, and provides some guidelines in setting poverty alleviation policies.

Objectives of the study:

The aims of this study are to assess the changes in the socioeconomic status of households in Egypt between 1998 and 2006. Accordingly, this study tries to answer the following questions: Has the socio-economic status of the households in Egypt changed over the period 1998-2006? In other words, is there exist transition or dynamics happened in the socioeconomic status of households in Egypt between the two years? What is the direction of the change? What is the main index affecting the transitions in the socioeconomic status of the households?

Finally, the study compares between different methods in constructing a composite index to determine the most appropriate method.

Accordingly, the study aims to achieve the following objectives which include:

- [1] Constructing a Socioeconomic Status (SES) index for urban and rural areas and for total Egypt as well depending on two waves of data namely: Egypt Labor Market Survey data 1998 and Egypt Labor Market Panel Survey data 2006.

To reach this objective, the following procedures have to be achieved:

- 1- Constructing three sub-indices (using PCA) representing the main dimensions of the socioeconomic status of household namely, head of

the household sub-index, social characteristics sub-index and the economic sub-index.

- 2- Examine the validity of the three sub-indices. Two tests were used to investigate the validity of each sub-index namely, internal coherence test and testing the significance relation with the total consumption expenditure of the households as estimated by El-Laithy 2005.
- 3- Comparing four methods for constructing the composite Socioeconomic Status (SES) index and selecting the most appropriate method using two validity tests, namely, the internal coherence test and the comparison with the total consumption of the households.

The four methods used for constructing the SES index are:

- a. The Simple sum of the three sub-indices.
- b. The first factor extracted from the PCA of the three sub-indices.
- c. The first factor extracted from the PCA of all valid factors resulted from procedure (1) of the three dimensions.
- d. The first factor extracted from the PCA of all variables used in the analysis.

- [2] Assess the changes in the socioeconomic status of households between the two periods; 1998 and 2006 for each sub-index and for the composite SES index as well using the transition matrices.

This study is divided into five sections. The first section presents the main objectives of the study, followed by data and methodology used in the analysis. Section three presents a brief discussion of previous studies about the main household socioeconomic status indices that measure the familial well-being. Section four presents the results of the study and finally section five presents the conclusions and the recommendations.

2. Data and Methodology

2.1 Data

The data used in this study is the Egypt Labor Market Surveys data (ELMSs). These surveys were conducted in three waves (1988, 1998 and 2006) by Economic Research Forum (ERF) in cooperation with Central Agency for Public Mobilization and Statistics (CAPMAS). The questionnaire of the three waves was designed to allow for the comparison among the three waves available. The last wave of the survey was a panel of the 1998 survey. About three quarters of the households included in 1998 wave, was successfully interviewed in the 2006 ELMPS. The analysis in this study used the panel data of the last two waves of 1998 and 2006 to capture the changes in the socioeconomic status of the households in Egypt.

Variables used in the analysis:

Based on the Egypt Labor Market Survey 1998 (ELMS98) and Egypt Labor Market Panel Survey 2006 (ELMPS06), the following variables were included and classified according to different indices:

- 1- **The characteristics of the household head sub-index Variables:**
 - Age
 - Gender
 - Educational status

- Occupational status³
- Employment status
- Sector of Employment
- Marital Status

2- The households' social characteristics sub-index variables:

- Average years of schooling in the household
- Availability of one or more child labor in the household (age 6-14)
- Male female Ratio (15-64)
- Percentage of children of age less than 6 years at the household.
- Percentage of children of age 6 to 14 years at the household.
- Percentage of persons of age 15 to 64 years at the household (Working Age Population).
- Percentage of elderly persons of age 65 years or more at the household.

3- The households' economic status sub-index

Dwelling characteristics:

- Dwelling ownership
- Floor area per person in square meters
- Number of Persons per room at the house
- Floor material
- Ceiling type (availability of Reinforced concrete)
- Availability of tap water
- Waste disposal (availability of Collector)
- Owning telephone
- Availability of toilet at house

Other variables included in this sub-index:

- Enterprise ownership
- Availability of transfers
- Availability of Remittances
- All durable goods (23 Common items in 2006 and 1998)

2.2 Methodology:

This study used the multivariate statistical technique, namely, the principal components analysis (PCA) as it can play a useful role in constructing composite indices (Fergany, 1994). PCA is used effectively to obtain the most appropriate weights for the indicators of the proposed index, such that the first extracted principal components explains the largest percentage of total variance. This technique was used to calculate the sub-indices and the composite SES index for the two waves of households' data sets for urban and rural areas and for total Egypt as well. (For more details (Fidell, 1989) and (Afifi, 1996))

3. Review of Household Socioeconomic Indices

Many approaches have been used in developing the household socioeconomic indices. These approaches can be classified into four main categories: occupation based approach, income/expenditure-based approach, assets index approach, and the

³ **Note that:** Binary variables were used to represent the categories of the education status, occupation status, employment status, sector of employment and marital status of household head to be used efficiently with PCA.

multidimensional approach. The following section presents a brief review of the different approaches that have been adopted in this area of research.

3.1 Occupation-based approach:

Occupation is the oldest and most commonly used approach in generating household socioeconomic status measure among researchers in developed countries. However, the main disadvantage of the occupation based approach is that its limitation to the people who are at workforce. In 2003, Davis et al. extended the using of the occupation approach to the individuals outside the labor market by adding new variables to capture the socioeconomic status of those households. Although of this extension, this approach was still limited to the economically active people. So the question is what about the households with persons outside the workforce namely, unemployed, unpaid family workers and those in the retirement. Unless special steps to be taken to collect information, for example, on previous occupational experience, the occupation based approach will work effectively but partially. Another problem concerned with applying this approach to the self-employed persons, especially who works at farms whose their socioeconomic scores are lower than reality. Finally, the occupation mobility may limit the use of this approach as a measure of socioeconomic status (Gabraith, 2003).

3.2 Income/expenditure Based Approach:

As the most direct measure of economic resources, income was adopted by many researchers to measure household socio-economic status. Turrell and colleagues (2002), discussed the relationship between the socio-economic status and diet within households. They addressed the household socio-economic status by constructing an index based income as well as two other indices based on occupation and education. The analysis showed that household income is the strongest and most robust independent predictor of food purchasing behavior. By contrast, the effects of education and occupation on food purchasing were satisfactory (ranging from non-significance to marginal significance) after adjustments were made for household income.

However, many researchers argue against the use of income in measuring the household socioeconomic status. Income questions are commonly characterized with high non-response rate due to its sensitive nature and more likely to be incomprehensive missing some of the main sources of income such as inherited wealth, ownership of assets, savings, benefits, and earnings from the informal economy, which can generate substantial bias in the real magnitude of inequalities. Furthermore, income may be problematic as an indicator, because it is less stable over time and more likely to be age-dependent.

In most cases, researchers rely on expenditure rather than income in classifying households. This approach is implemented in most studies that produce poverty lines. El Laithy (2002) has relied on the household expenditure in the production of poverty lines for Egypt. However, the raw data of the national expenditure surveys are not always available, but such surveys are conducted regularly every 4-5 years.

3.3 Assets Index Approach (Wealth Index):

In response to the limitations of the income as a measure of socio-economic status, Filmer and Pritchett (2001) proposed the use of the assets index. The proposed index is a simple technique for creating a wealth replacement for the classification of the households in case of the absence of either income or expenditure data. They used data on asset ownership and housing characteristics. The principal component analysis was used in producing the asset index. Filmer and Pritchett (2001) used the first principle

component since it captures the largest amount of information available in all variables and common to all of them.

The validity of this index for India was examined by comparing the state-level average of the asset index with data on poverty rates and gross state product per capita (GDP). In addition, they used data sets from Indonesia, Nepal, and Pakistan, which contain both assets and expenditure variables for the same households. They were able to show a reasonable correspondence between the classification of households based on the asset index and a classification based on expenditures.

However, the index was critiqued for the following weaknesses.

- The weights on individual items are not grounded theoretically.
- It carries possible problems with urban/rural comparisons.

It might reflect some community variables (especially locally available infrastructure such as electricity, piped water and sewerage) rather than household specific variables. For the last criticism, Filmer and Pritchett proposed excluding the infrastructure variables from their index. In general, the asset items included in the index were similar in most countries. However, the factor scores for any given asset varied greatly across countries, reflecting inter-country variations in general and inter-household distribution of each item under consideration.

3.4 Multidimensional Approach

This approach measures the socioeconomic status of the household through integrating more than one socioeconomic dimension used in the previous approaches. The most elaborate example is the work of Trewin (2001) in Australia. Trewin (2001) constructed the Australian socio-economic indices for areas (SEIFA), based on the previous indices. Previous indices were based largely on people's experience with other indices, rather than referring to a theoretical model.

The advantages of multidimensional approach as a measure of socioeconomic status of households are as follows:

- 1- It summarizes a number of social and economic indicators in just one measure
- 2- This single measure can be used to rank households and individuals and areas as well.
- 3- It is not limited to social or economic indicators and not as well as the wealth index which measure the assets only.
- 4- The multidimensional approach overcomes the avoiding of the infrastructure and community level indicators, by including variables of community and infrastructure.

Accordingly, the multidimensional approach was used in this study to measure the socioeconomic status of households

4. Results

4.1 Construction of Sub-Indices and Validation

In this section, the three sub-indices, namely the household head sub-index, the social characteristics of the household sub-index and the economic sub-index, will be constructed. The validation of each sub-index was shown after construction. Finally, the aggregated index of socioeconomic status will be constructed and its validation will be shown. Principal Component analysis technique was used to develop the three sub-indices in the two years 1998 and 2006. The first step in conducting the PCA is to investigate the correlation between the variables included in each sub-index. The second

step of producing each index was to carry out the PCA to extract the coefficients of the variables included in the index.

The results of the correlation matrix for the household head sub-index show that the correlation between different variables does not exceed 0.5 except for the variables related to the employment status and sector of employment, where the correlation coefficient reached 0.83 for both periods. Additionally, the correlation between the sex of head of household and his/her marital status reached 0.7 in 2006 and 0.61 in 1998.

The first principal factor extracted from PCA was used as the household head index, and it explained about 44.3 percent of the total variation of the included variables in 1998 and about 47.3 percent of the total variation in 2006. Table 1 shows the matrix of factor loadings (weights) and the correlation between the constructed sub-index of the household head and the variables used to construct the index. Moreover, this table shows that this sub-index correlated strongly and significantly with all of its indicators (variables) for both periods 1998 and 2006. The sub-index was highly correlated by the employment status variable, sector of employment, occupational status followed by sex and marital status.

Table (1): The matrix of first PCA loadings (weights) and the correlation coefficients between the head of household sub-index and its variables in 1998 and 2006

Variable	Weights		Correlation Coefficients	
	1998	2006	1998	2006
Age of Head	-0.25	-0.27	-0.53	-0.60
Sex of Head	0.26	0.28	0.58	0.68
Illiterate (without certificate)	-0.18	-0.19	-0.29	-0.34
High School or less	0.11	0.11	0.14	0.17
Above High School	0.10	0.10	0.21	0.22
Unemployed (occupational variable)	-0.40	-0.40	-0.89	-0.88
Workers	0.22	0.19	0.26	0.28
Workers in Agriculture	-0.01	0.00	0.17	0.15
Technician	0.18	0.18	0.48	0.41
Unemployed (employment variable)	-0.42	-0.41	-0.90	-0.89
Wage Workers	0.33	0.30	0.43	0.44
Employer & Self Employed	0.07	0.07	0.46	0.40
Unemployed (Sector variable)	-0.40	-0.40	-0.89	-0.88
Public Sector	0.25	0.20	0.28	0.23
Private Sector	0.12	0.16	0.53	0.54
Married	0.23	0.27	0.55	0.68
Variance explained	44.3%	47.3%		

Validation of household head sub-index:

Two tests were implemented to investigate the validity of household head sub-index, namely the internal coherence test and the classification power with the total estimated consumption expenditure and tests its significance.

The internal coherence was used by Filmer and Pritchett (2001) to check the reliability of the wealth index for India. This test was used in this study that depends on comparing the means of the variables that used to construct the household head sub-index with its quintiles. Such comparison was done by investigating the differences of the means of the variables in the different quintiles of the index in urban and rural areas and for total Egypt.

The internal coherence test shows that there are significant differences between the means of the variables for the different quintiles of the household head sub-index for the two years, 1998 and 2006 and for urban and rural areas as well as for total Egypt.

Table (2) shows that there are large differences between the average values of the variables in the different quintiles of the household head sub-index. For the first quintile, the average value of age of head of household was 61.9 years in both 1998 and 2006, decreased to 38.9 years in 1998 and 33.8 years in 2006 for the last quintile. The percent of households headed by female for the first quintile of household head sub-index was 47 percent in 1998 and 54 percent in 2006. These figures decreased to zero percent in both years in the last quintile. In addition, the percentage of illiterate head for the first quintile holds 82 percent in 1998 and 67 in 2006, while it decreased to zero percent in the last quintile for both years.

Table (2): The average values of the variables used in constructing the household head sub-index according to different quintiles in 1998 and 2006 (Total Egypt)

Year	1998					2006				
	1 st Q	2 nd Q	3 rd Q	4 th Q	5 th Q	1 st Q	2 nd Q	3 rd Q	4 th Q	5 th Q
Age of Head	61.9	52.7	46.4	43.4	38.9	61.9	52.6	44.3	42.2	33.8
Sex of Head	0.53	0.7	1.0	1.0	1.0	0.46	0.7	1.0	1.0	1.0
Illiterate (without certificate)	0.8	0.7	0.7	0.4	0.0	0.67	0.7	0.7	0.1	0.0
High School or less	0.1	0.2	0.2	0.4	0.6	0.2	0.2	0.3	0.6	0.6
Above High School	0.0	0.1	0.1	0.2	0.4	0.1	0.1	0.1	0.3	0.4
Unemployed (occupational variable)	1.0	0.3	0.0	0.0	0.0	1.0	0.2	0.0	0.0	0.0
Workers	0.0	0.0	0.4	0.6	0.5	0.0	0.1	0.5	0.5	0.5
Workers in Agriculture	0.0	0.6	0.3	0.0	0.0	0.0	0.6	0.2	0.1	0.0
Technician	0.0	0.1	0.3	0.3	0.5	0.0	0.1	0.2	0.5	0.5
Unemployed (employment variable)	1.0	0.5	0.0	0.0	0.0	1.0	0.3	0.0	0.0	0.0
Wage Workers	0.0	0.1	0.5	0.9	1.0	0.0	0.1	0.5	0.7	1.0
Employer & Self Employed	0.0	0.5	0.5	0.1	0.0	0.0	0.6	0.5	0.3	0.0
Unemployed (Sector variable)	1.0	0.3	0.0	0.0	0.0	1.0	0.2	0.0	0.0	0.0
Public Sector	0.0	0.0	0.1	0.5	0.8	0.0	0.0	0.2	0.5	0.6
Private Sector	0.0	0.7	0.9	0.5	0.2	0.0	0.8	0.8	0.5	0.4
Married	0.5	0.7	0.9	0.9	1.0	0.5	0.7	0.9	1.0	1.0

The unemployed head were almost 100 percent in the first quintile while almost zero percent in last quintile. Same trend was observed for all other variables. These results indicate the strength of the household head characteristics in differentiating between the different quintiles of households.

The second test for validation is to compare the quintiles constructed by the household head sub-index with those constructed by the **estimated consumption expenditure** by El-Laithy as proxy for the economic status of households (El-Laithy, 2005).

Table (3) shows that almost two thirds (62 percent) and about 50 percent of the households who classified into the first quintile by expenditure data are classified into first and second quintiles by household head sub-index in 1998 and 2006 respectively for total Egypt. The classification of the other quintiles show less agreement, where less than half of the households in 1998 and 2006 classified by expenditure in last quintile are classified by household head sub-index in fourth and fifth quintiles. Additionally, there is significant correlation between different quintiles implemented by the expenditure data and the quintiles implemented by the household head sub-index, where the P-value associated with Pearson X² test of independence was less than 0.0005.

Table (3): Comparison between household head sub-index quintiles and household total estimated expenditure quintiles in 1998 and 2006 (Total Egypt)

Year	1998						2006					
	Expenditure Quintiles						Expenditure Quintiles					
Household head index quintiles	1 st Q	2 nd Q	3 rd Q	4 th Q	5 th Q	Total	1 st Q	2 nd Q	3 rd Q	4 th Q	5 th Q	Total
	Total Egypt											
1 st Q	37.71	21.27	13.98	13.24	11.14	20.03	29.59	17.28	14.25	12.53	12.57	20.17
2 nd Q	23.83	18.49	19.42	18.53	18.92	19.99	18.44	20.48	21.18	22.03	18.55	19.87
3 rd Q	17.34	19.73	22.12	19.15	23.21	20.26	18.49	20.55	21.84	20.23	21.96	20.11
4 th Q	13.14	18.64	21.15	22.97	24.38	19.89	14.07	15.63	21.78	30.04	33.88	19.9
5 th Q	7.99	21.87	23.32	26.11	22.35	19.83	19.41	26.06	20.95	15.17	13.03	19.95
Total	100	100	100	100	100	100	100	100	100	100	100	100
	Urban											
1 st Q	44.68	29.73	21.63	16.11	10.75	22.43	42.17	22.67	18.2	16.69	14.07	25.91
2 nd Q	16.37	14.21	15.09	13.46	15.1	14.83	12.31	13.13	12.39	13.25	10.49	12.38
3 rd Q	14.54	14.11	18.61	17.31	22.94	18.23	14.31	15.59	18.53	15.83	20.8	16.49
4 th Q	13.98	19.12	20.35	25.58	27.52	22.26	12.69	16.68	26.31	35.21	38.96	23.02
5 th Q	10.43	22.83	24.32	27.53	23.68	22.25	18.52	31.94	24.56	19.02	15.68	22.2
Total	100	100	100	100	100	100	100	100	100	100	100	100
	Rural											
1 st Q	34.04	15.09	7.08	10.16	11.86	17.8	20.58	12.31	10.33	7.93	9.09	14.7
2 nd Q	27.76	21.62	23.33	23.97	26.05	24.78	22.83	27.26	29.89	31.78	37.24	27.01
3 rd Q	18.81	23.83	25.29	21.11	23.7	22.14	21.48	25.11	25.12	25.1	24.65	23.56
4 th Q	12.69	18.29	21.88	20.17	18.52	17.68	15.06	14.66	17.3	24.29	22.13	16.92
5 th Q	6.70	21.17	22.43	24.59	19.87	17.59	20.05	20.65	17.37	10.9	6.89	17.81
Total	100	100	100	100	100	100	100	100	100	100	100	100

The results for the **social characteristics sub-index** show that most of the correlation coefficients between different variables are not so high but significant. At the beginning, weights of the variables with the first principal factor were checked. Two rounds of PCA were done to enhance the result and to increase the percentage of variation explained by the first principal component. To enhance the results of PCA, the variables that have weights less than 0.04 were excluded from the analysis. (Australian Bureau of statistics, 2001). The variable excluded from the analysis was the child labor variable. This procedure enhanced the results, and the percentage of variation explained by the first principal component was increased from 26 to 30.3 in 1998 and from 27 percent to 31.4 in 2006.

Table (4) presents the factor loadings (weights) and the correlations between the constructed sub-index of the household's social characteristics and the variables used to construct the index. The table shows that the correlation coefficients between different variables and the constructed index for the two periods namely 1998 and 2006 are almost similar.

Table (4): The correlation coefficients between the variables and the constructed index, and the factor loadings (weights) of the index after excluding child labor variable in 1998 and 2006.

Variables	Correlation Coefficients		factor loadings	
	1998	2006	1998	2006
Average Number of Years of Schooling of the household	0.5941	0.6385	0.4406	0.4651
Male Female ratio	0.3688	0.3848	0.2735	0.2803
percentage of 0_5 year	-0.384	-0.318	-0.285	-0.232
percentage of 6_14 year	-0.135	-0.055	-0.1	-0.04
percentage of 15_64 year	0.8629	0.8542	0.6399	0.6223
percentage of 65 +	-0.648	-0.703	-0.48	-0.512

Child Labor (Excluded)		
Percentage of variation	30.3%	31.4%

Validation of Social characteristics sub-index:

Internal coherence test: Table (5) compares the means of each of the variables that construct the social characteristics sub-index across its five quintiles for total Egypt in 1998 and 2006. There are large differences across quintiles for almost all variables. The average number of years of schooling in the household was almost 2.3 years in 1998 and about 4 years in 2006 for the first quintile. These figures increased to 8.4 years in 1998 and 11 years in 2006 for the last quintile. Similar trend was observed in all other variables.

Table (5): The average values of the variables used in constructing the social sub-index according to different quintiles in 1998 and 2006 (Total Egypt)

		percentage of children 0_5 year	percentage of youth 6_14 year	percentage of persons 15_64 year	percentage of persons 65 +	Average No. of Years of Schooling in household	Male Female ratio
1998	1 st Q	0.21	0.17	0.32	0.30	2.3	0.67
	2 nd Q	0.21	0.26	0.48	0.05	3.8	1.10
	3 rd Q	0.12	0.22	0.63	0.03	4.6	1.29
	4 th Q	0.03	0.14	0.81	0.01	5.6	1.11
	5 th Q	0.02	0.09	0.88	0.01	8.4	1.93
2006	1 st Q	0.22	0.13	0.33	0.31	3.9	0.68
	2 nd Q	0.26	0.18	0.52	0.04	5.9	1.05
	3 rd Q	0.20	0.14	0.64	0.03	7.1	1.43
	4 th Q	0.03	0.12	0.84	0.02	8.5	1.12
	5 th Q	0.01	0.05	0.93	0.01	11.1	1.72

Expenditure Test: The comparison between the estimated household expenditure and the social sub-index indicates a significant and a reasonable power of the social sub-index, where 43.8 percent of the households classified into the first quintile by expenditure are also classified into the first quintile by the social sub-index for all Egypt and for urban and rural areas as well in both years. However, the results of 1998 show less coherence if compared by 2006, while about 44 percent was classified by expenditure and social sub-index in first quintile, only about 33 percent was classified by expenditure and social sub-index in the last quintile for total Egypt (Table 6). These figures reached 43 percent and 40 percent in 2006. Testing the significance of these tables with X^2 Test showed that there are significance relationships between households' quintiles by both socioeconomic sub-index and the estimated expenditure in 1998 and 2006.

Table (6): Comparison between social sub-index quintiles and household total estimated expenditure quintiles in 1998 and 2006 (Total Egypt)

Sub-index quintiles	Household total estimated expenditure quintiles											
	1998						2006					
	1 st	2 nd	3 rd	4 th	5 th	Total	1 st	2 nd	3 rd	4 th	5 th	Total
1 st Q	43.8	25.3	14.9	7.1	9.2	20.1	42.9	25	16.1	9.6	6.3	20
2 nd Q	12.4	24.7	23.4	20.7	18.4	19.9	15.5	24.3	24.8	20.8	14.6	20
3 rd Q	17.4	22.3	25.3	20.4	15.3	20.1	15.3	21.4	25.3	21.1	17	20
4 th Q	19.9	15.7	17.1	22.9	23.9	19.9	21.5	18	15.9	22.4	22.4	20
5 th Q	6.5	12.1	19.4	28.9	33.2	20	4.8	11.3	17.9	26.1	39.8	20
Total	100	100	100	100	100	100	100	100	100	100	100	100

The Economic Status sub-index:

To construct the economic status sub-index, the assets index was constructed first by applying the PCA for most durable goods owned by the households, in addition to the ownership of a private car, taxi, truck, motorcycle and bicycle. Applying the previous explained criterion⁴ that exclude the variables that have weights less than +/-0.01 to enhance the results, the percent of variation was increased to 29 percent in 1998, and to 24 percent at 2006. Additionally, the weights after removing the less significant variables were enhanced for the rest of the indicators.

After adding the variables of tenure characteristics and other variables (Toilet Type, Remittances, Enterprise, Transfers...etc.) to the assets index, the PCA was used to construct the economic status sub-index. The percent of variation explained by the first principal factor was 29 percent for 1998 and about 20.5 percent for 2006. By applying the previously mentioned criterion that eliminates the less significant variables, the percent of variation explained was increased to 30 percent at 1998 and to almost 24 percent at 2006.

Table (7) shows the correlations coefficients of the economic sub-index with all the variables that were used to conduct it. The economic sub-index is correlated significantly with most of the variables as shown in the table.

Table (7): The matrix of first principal component loadings (weights) of the economic sub-index and its correlation coefficients in 1998 and 2006

Variables	Weights		correlation coefficients	
	1998	2006	1998	2006
Dwelling status	-0.254	-0.213	-0.4624	-0.3463
Floor Area Per person	0.087	0.183	0.1578	0.2976
Floor Material	0.388	0.340	0.7079	0.5534
Ceiling type	0.403	0.428	0.7348	0.6962
Water Source	0.300	0.268	0.5473	0.4354
Waste Disposal	0.357	0.339	0.6504	0.5517
Owing Telephone	0.372	0.361	0.6782	0.588
Number of Persons Per Room	-0.183	-0.284	-0.334	-0.4618
Toilet Type	0.136	0.141	0.2479	0.2298
Remittances (Excluded)				
Owning Enterprise	-0.067	0.040	-0.1213	0.0651
Transfers (Excluded)				
Assets Index	0.450	0.451	0.8211	0.7343
Variation Explained	30%	24%		

Validation of the Economic Status sub-index:

Internal coherence test: This test shows large differences between different quintiles of the sub-index among almost all the components of that index. For example, the average floor area per person was 21 square meters in 1998 and 18.5 square meters in 2006 for the first quintile, while it increased to 30.5 and 36.5 in 1998 and 2006 respectively for the last quintile as shown in Table 8. The infrastructure variables (water source, waste disposal, telephone ... etc.) reflect the same direction. While 6 percent and 16 percent of households in 1998 and 2006 respectively use collector for the waste disposal in the first quintile, there are 94 percent in 1998 and 95 percent in 2006 use

⁴ The Australian Bureau of Statistics, 2000, used similar criterion in calculating the socioeconomic indices for areas, in order to enhance the results and to eliminate the less significant variables.

collector in the last quintile. Same pattern could be observed among all variables as shown in the table.

Table (8): The average values of the variables used in constructing the economic status sub-index according to different quintiles in 1998 and 2006 (Total Egypt)

	Dwelling status	Floor Area Per person	Floor Material	Ceiling type	Availability of tap Water	Waste Disposal (collector)	Owning Telephone	Person Per Room	Availability of Toilet	Enterprise	Assets Index
1998											
1 st Q	2.89	20.87	2.14	0.07	52	6	0.4	1.86	94	0.40	-2.38
2 nd Q	2.80	21.62	2.74	0.60	91	15	4	1.68	100	0.40	-1.39
3 rd Q	2.60	22.78	2.88	0.85	95	31	18	1.55	100	0.33	-0.13
4 th Q	2.27	23.47	2.99	0.97	99	66	39	1.31	100	0.28	0.97
5 th Q	1.85	30.52	3.00	1.00	100	94	94	1.04	100	0.24	2.93
2006											
1 st Q	2.78	18.54	2.35	0.22	82	16	15	1.83	97	0.18	-2.11
2 nd Q	2.71	21.67	2.84	0.81	99	27	32	1.44	100	0.20	-0.86
3 rd Q	2.57	23.70	2.92	0.96	100	46	58	1.24	100	0.23	0.04
4 th Q	2.38	26.44	2.97	0.99	100	75	81	1.10	100	0.24	0.67
5 th Q	1.84	36.47	2.99	1.00	100	95	97	0.87	100	0.24	2.25

Expenditure validation: Assigning the households to different quintiles using the expenditure measure and the economic index was carried out to test the classification power of the economic status sub-index. Table (9) compares between the economic sub-index quintiles and household total estimated expenditure quintiles for the two periods, namely 1998 and 2006. In 1998, about two-thirds of the households classified into first quintile using expenditure was also classified into first and second quintiles using the economic sub-index, and only 3.3 percent of those in the first quintile by expenditure approach appear in the last quintile by economic status approach. Same pattern was observed among households in 2006. Also, when testing the significance of the relationship between the quintiles of the economic status sub-index and those for the expenditure data using X² significance test, it showed that there was significant relationship between the quintiles of the expenditure and the quintiles of the economic sub-index.

Table (9): Comparison between Economic Status sub-index quintiles and household total estimated expenditure quintiles in 1998 and 2006 (Total Egypt)

Sub-index quintiles	Household total estimated expenditure quintiles											
	1998						2006					
	1 st	2 nd	3 rd	4 th	5 th	Total	1 st	2 nd	3 rd	4 th	5 th	Total
1 st Q	37.8	30.6	18.6	9.1	4.2	20	35.9	20.9	19.2	14.3	9.8	20
2 nd Q	26.7	24.2	21.7	18.5	9.3	20.1	25.1	24.1	21.4	18	11.5	20
3 rd Q	19.8	17.7	23.2	23.5	15	19.8	18.9	23.4	21.4	20.7	15.6	20
4 th Q	12.5	18.8	23.6	24	21.4	20	11.5	18.5	21.2	24.8	24.1	20
5 th Q	3.3	8.8	12.9	25	50.2	20	8.6	13.2	16.9	22.3	39	20
Total	100	100	100	100	100	100	100	100	100	100	100	100

4.2 Construction of the Socioeconomic Status (SES) Index:

The construction of the socioeconomic status index that depends on all sub-indices, as a measure of the socioeconomic status, has four possibilities for its construction. The first possibility of the index is the simple sum of the three sub-indices. Second possibility is getting the SES index as the first principal component that resulted from carrying out the PCA over the three sub-indices. Third possibility, is getting the SES index as the first PC of all valid factors that resulted from the construction of each sub-index

(include the sub-index itself). Finally, the SES index will be constructed by applying the PCA over all variables used in the analysis.

1. The SES index as a simple sum of the three sub-indices:

The first possibility to construct the SES index was to simply aggregate the scores of each of the three sub-indices and test its validity as a socioeconomic status index. The correlation between the SES index and the three sub-indices shows that the three sub-indices correlated significantly with the SES index, that indicates that the three sub-indices represent three different aspects of households' socioeconomic status. The relation between the four indices (the aggregated and the three sub-indices) does not differ dramatically from 1998 to 2006.

2. The SES index as a first principal component of the three sub-indices:

The second possibility for producing the SES index is to take the first principal component factor after applying the PCA on the three sub-indices. This was achieved so that the weights of the three sub-indices have been selected by theoretical background and not selected subjectively. Therefore, PCA was run over the household head sub-index, the social sub-index and the economic sub-index. This index explained 47 percent of the variation in 1998 and 46 percent at 2006.

Table (10): The factor loadings (weights) and the correlation coefficients matrix of the SES index with the three sub-indices in 1998 and 2006

	1998				2006			
	Factor loadings	Correlation coefficients matrix			Factor loadings	correlation coefficients matrix		
		SES index	Household head	Social		SES index	Household head	Social
Household head	0.71	0.84	1	0.66	0.77	1		
Social	0.66	0.79	0.38	1	0.66	0.78	0.32	
Economic	0.24	0.28	0.14	-0.01	0.36	0.42	0.10	0.11

The equation that expresses the SES index that was derived by this method (PCA on the three sub-indices) is:

$$\text{SES Index} = 0.71 \text{ household head sub-index} + 0.66 \text{ Social Sub-index} + 0.24 \text{ Economic status sub-index} \quad (\text{for 1998})$$

$$\text{SES Index} = 0.66 \text{ household head sub-index} + 0.66 \text{ Social Sub-index} + 0.36 \text{ Economic status sub-index} \quad (\text{for 2006})$$

3. The SES index as the first principal component of all factors resulted from the construction of the three sub-indices:

The third possibility in constructing the SES index is applying the PCA to all factors resulted from the construction of the three sub-indices with the criterion that keep the factors with an eigenvalues greater than or equal to one. From the household head characteristics dimension there are three factors with eigenvalues greater than one, and from the social characteristics of the household dimension there are two factors, eventually there are five factors from the economic status dimension for both years 1998 and 2006. The PCA was applied over the resulted factors and the first principal component factor was taken as the SES index of households. The percent of variation explained by the first principal component was 17.1 percent in 1998 and 16.3 in 2006.

4. The SES index as a first PC of all valid variables:

The fourth possibility for producing the aggregate SES index was to obtain the first principal factor of all the variables used in the analysis by applying the PCA over all variables. The explained variation by the first principal component factor in 1998 was 15 percent and for 2006 was about 13 percent. But by applying the above criteria (remove the less significant indicators to enhance the result) for both two periods, the variation explained by the first principal component factor increased to 20.1 percent in 1998 and to 17 percent in 2006.

4.3 Comparison between Different Socioeconomic Status Indices:

The construction of the socioeconomic status (SES) index should follow a well definite pattern. There are some steps involved in the process of selecting the appropriate SES index as a measure of the socioeconomic status of households. The first step is to ensure that the SES index covers (have good relationship) all sub-indices that were used to construct the index. The second step is to examine its validity to show its powerful process in differentiating between different socioeconomic statuses of households. The two tests for validation; namely, internal coherence test and the comparison with the estimated total expenditure were applied.

The first step used for the comparison between different SES indices was to examine the relation between the index with its entries. This relation was examined in the previous sub-sections, and indicates a good relation for all SES indices. The next step is to examine the validity of the index by the two measures as follows.

Validation of the first SES index (Simple sum of the three sub-indices):

Internal Coherence Test: The internal coherence test shows significant differences between the average values of the variables that included implicitly (all the variables) or explicitly (the three sub-indices) in the index for the different quintiles of the SES index for the two years, 1998 and 2006. For the first quintile, just one third of the households in 1998 own fridge and about 60 percent in 2006, while for the last quintile hundred percent of households have fridge in both years. Same trend was observed for the other variables.

Expenditure Validation: The classification of households by SES index quintiles and the total household expenditure quintiles in 1998 shows that about 60 percent of the households who are at the first quintile according to the expenditure data lies also at the first quintile according to the SES index for total Egypt, and about 56.5 percent of the households classified in the last quintile according to the expenditure measure lies also at the last quintile according to SES index. At 2006, these figures reached 43 percent and 70 percent for the first quintile and for the last quintile respectively. A little difference of the classification power was noticed between urban and rural areas for both years 1998 and 2006. The X^2 test of significance showed that there is a significant relationship between the two measures namely the SES quintiles and the total expenditure quintiles.

Validation of the second SES index (1st PC of the three sub-indices):

Internal Coherence Test: The results of the internal coherence test show that there are considerable differences in the average values of the variables across different quintiles of the SES index. For example, 22 percent and 27 percent of households in 1998 and in 2006 respectively own water heater in the first quintile, while half of households in 1998 and two thirds of households in 2006 own this item in the last quintile. Additionally, about three quarters of households in the first quintile receiving transfers in 1998 and 2006, but this percent dropped down to 11 and 14 percent in 1998 and 2006 respectively for the last quintile.

Expenditure Test: The validity with the expenditure data shows that about 53 percent of households at the first quintile in 1998 were correctly classified by SES index and 47 percent were correctly classified at the fifth quintile. In 2006, the situation was little better, where slightly more than half of households in the first quintile were correctly classified by the SES index, while about 68.5 percent at the fifth quintile was correctly classified by the index. Pearson X^2 test of significance proved that there is a significant relationship between the quintiles of the estimated expenditure and the quintiles of the SES index for both 1998 and 2006.

Validation of the third SES index (1st PC of all extracted factors from the three sub-indices):

Internal Coherence Test: The results of this test show little differences between the average values of the variables across the different quintiles of the SES index. For example, the average years of schooling was 4 years for households in 1998 who are in the first quintile increased to only 4.8 at the last quintile. However, in 2006 the average number of years of schooling was 5.4 years at the first quintile increased to 8.5 years for the last quintile. Accordingly, the results show that the SES index which was conducted as a first PC of all valid factors of the three sub-indices is less coherent.

Expenditure Test: The comparison between the quintiles of the SES index and those for the expenditure data reveals that the percentage of correct classification was less than other SES indices. The percentage of households who classified in the poorest quintile (first quintile) according to the expenditure data and also classified in first quintile by the SES index was 41.5 percent and 44 percent for 1998 and 2006 respectively. However, for the last quintile only 23.3 percent and about 63 percent were correct classified in 1998 and 2006 respectively. These percentages considered small percentages (regardless fifth quintile in 2006) that make the SES cannot be reliable as a measure of SES of the households.

Validation of the fourth SES index (1st PC of all variables used in the analysis):

Internal Coherence Test: The comparison between the average values of the variables used to construct the SES index shows that there are little differences across different quintiles for almost all variables in 1998 and 2006. For example, the results show that the floor area per person was 23.3 meters in 1998 and 24.1 in 2006 for the first quintile, where these figures increased only to 28 and 29 meters in 1998 and 2006 respectively. Also, little differences emerged according to this index, where 1.7 and 1.6 person per room in 1998 and 2006 respectively was found for the first quintile, these figures dropped to only 1.1 person per room for both years at the fifth quintile. Accordingly, this index shows less coherence between different quintiles.

Expenditure Test: The results of the expenditure test show that about 47 percent of the households in 1998 who lies in the first quintile according to the expenditure data was classified also in the first quintile according to the SES index. For 2006, just one-third of the households were classified correctly at the first quintile by both measures. For the last quintile about 54.7 percent of households were correctly classified by both measures in 1998, while 65 percent of households were correctly classified in 2006.

So, this SES index behaves with less coherence and limited powerful with estimated expenditure especially at higher quintiles. For the lowest quintile it behaves very badly (in 2006 just one third of households were correctly classified).

Accordingly,

The preceding steps lead to choose the second SES index (The first PC of the three sub-indices) as the most appropriate SES index. This index has a significant relationship with the three sub-indices, accordingly, this index represents the three dimensions of measuring the socioeconomic status of the households for both periods, 1998 and 2006. Additionally, the validation techniques confirmed its validity and show that this index has the most classification power in differentiating between different socioeconomic statuses for households if compared by other indices. Moreover, the weights of the SES index have grounded theoretically through the extraction of the SES index using the PCA technique and not only a simple sum of the three sub-indices.

4.4 Transition Matrix and Indices

In this section, a discussion of the resulted outputs of the sub-indices and the selected SES index was conducted. The panel data was used to construct the transition matrices using the three sub-indices in addition to the selected SES index. The use of panel data to construct the transition matrices enables us to capture the dynamics happened to the socioeconomic status of households between the two periods 1998 and 2006. The panel data was obtained by tracing the same households that was interviewed in 1998 (4815). About three quarters (3659) of those households was re-interviewed successfully at 2006, those households considered as a second round of a longitudinal data of the households interviewed in 1998.

The transition Matrix of the three sub-indices:

In this section, the changes that occurred to the socioeconomic status of households according to the three sub-indices (Household Head, Social and Economic sub-index) between the two periods of the analysis will be shown. In addition, the SES index will be used to follow up the changes in the socioeconomic status of households in Egypt between 1998 and 2006.

4.4.1 The Transition Matrix according to the Household Head sub-index:

Table (11) shows the dynamics of households according to the changes in the characteristics of household head (using household head sub-index) across the two years, 1998 and 2006. The table shows that there exist slight transitions were occurred for households in both urban and rural areas and for total Egypt as well according to this sub-index especially for those in the first quintile.

The great dynamics occurred according to this sub-index was found in rural areas, where slightly than two thirds of households in the first quintile at 1998 remain at the first quintile in 2006 while the rest moved to the second and the third quintiles. However, slightly more than one third of households in the fifth quintile in 1998 stayed at the same level in 2006 according to the characteristics of head of households, while 8.5 percent of households moved to the first three quintiles in 2006. For total Egypt, 79 percent of households stayed at the same level at the first quintile between the two surveys. Additionally, 31 percent of households in the fifth quintile in 1998 stayed at the fifth quintile in 2006, and virtually the rest moved to lower quintiles in 2006. In addition, Table (11) shows that one quarter of households in the first quintile in 2006 in total Egypt came from the second quintile and 14 percent come from the third quintile (according to column percentage).

Table (11): Transition Matrix of households according to Household head sub-index by residence in 1998 and 2006.

1998	2006						2006					
	1 st	2 nd	3 rd	4 th	5 th	Total	1 st	2 nd	3 rd	4 th	5 th	Total
	Row percentage					All Egypt	Column percentage					
1 st Q	78.9	14.4	6.0	0.7	0.0	100	48.0	10.1	3.9	0.6	0.0	15.7
2 nd Q	35.9	51.6	8.6	2.1	1.8	100	26.4	43.9	6.8	2.1	4.1	19.0
3 rd Q	16.3	31.0	47.3	4.4	1.0	100	14.0	30.9	43.7	5.0	2.8	22.2
4 th Q	13.8	11.6	46.1	25.0	3.5	100	11.2	10.9	40.2	26.7	9.0	21.0
5 th Q	0.4	4.3	5.9	58.3	31.1	100	0.4	4.2	5.4	65.7	84.2	22.1
Total	25.9	22.4	24.0	19.6	8.1	100	100	100	100	100	100	100
Urban												
1 st Q	87.2	8.9	3.7	0.3	0.0	100	50.9	10.6	3.4	0.3	0.0	18.9
2 nd Q	55.4	31.9	7.5	3.9	1.3	100	23.3	27.5	5.0	2.2	2.1	13.5
3 rd Q	19.4	28.3	46.6	5.4	0.4	100	11.3	33.9	43.0	4.3	0.8	18.9
4 th Q	19.1	12.4	36.0	28.9	3.6	100	13.9	18.6	41.5	29.0	10.5	23.6
5 th Q	0.7	5.9	5.8	60.0	27.6	100	0.6	9.4	7.1	64.2	86.6	25.2
Total	32.3	15.7	20.4	23.5	8.0	100	100	100	100	100	100	100
Rural												
1 st Q	67.8	21.8	9.1	1.3	0.0	100	43.7	9.9	4.3	1.0	0.0	12.9
2 nd Q	25.8	61.7	9.2	1.2	2.0	100	31.2	52.3	8.1	1.9	5.9	24.1
3 rd Q	14.2	32.9	47.8	3.7	1.5	100	18.0	29.3	44.2	5.8	4.5	25.3
4 th Q	7.6	10.7	57.9	20.4	3.4	100	7.1	7.0	39.2	23.7	7.6	18.5
5 th Q	0.1	2.4	6.1	56.3	35.2	100	0.1	1.6	4.3	67.6	82.0	19.2
Total	19.9	28.4	27.4	16.0	8.3	100	100	100	100	100	100	100

4.4.2 The Transition Matrix according to the social characteristics sub-index:

Table (12) shows the transition matrix between the two years, 1998 and 2006 according to the social characteristics sub-index. This transition matrix captured the dynamics that happened to the households between the two surveys. The table shows that there exist great transitions occurred for the households at all quintiles in urban and rural areas and for total Egypt as well. The table shows that almost 60 percent of households who were in the first quintile at 1998 moved to higher quintiles at 2006. Moreover, almost 45 percent who were in the second quintile at 1998 moved to the richest two quintiles at 2006 according to their social characteristics.

Additionally, half of households in total Egypt who were at the fifth quintile in 1998 were stayed also at the fifth quintile in 2006, while the rest move to the lower quintiles (21 percent moved to the lowest two quintiles). Looking to the column percentage, the data shows that almost 60 percent of households in the first quintile at 2006 came from quintiles other than the first quintile. Great transitions were observed also regarding the fifth quintile, where one third of households who were in the fifth quintile at 2006 came from the second and the third quintile. Same pattern was observed for urban and rural areas as shown in Table (12).

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Table (12): Transition Matrix of households according to social characteristics sub-index by residence in 1998, 2006.

1998	2006						2006					
	1 st	2 nd	3 rd	4 th	5 th	Total	1 st	2 nd	3 rd	4 th	5 th	Total
	Row percentage						Column percentage					
	All Egypt											
1 st Q	41.62	23.78	17.96	13.72	2.91	100	41.33	28.75	21.27	10.73	2.06	18.62
2 nd Q	12.35	20.18	21.76	28.84	16.87	100	13.15	26.16	27.63	24.2	12.8	19.97
3 rd Q	14.96	14.95	15.93	29.19	24.98	100	16.23	19.74	20.6	24.95	19.31	20.35
4 th Q	15.98	8.43	14.17	26.01	35.4	100	17.38	11.16	18.38	22.29	27.44	20.39
5 th Q	10.8	10.57	9.22	20.54	48.88	100	11.9	14.18	12.12	17.83	38.39	20.67
Total	18.75	15.4	15.73	23.8	26.32	100	100	100	100	100	100	100
Urban												
1 st Q	41.13	22.01	18.57	14.35	3.95	100	34.52	23.77	20.11	9.78	2.07	15.58
2 nd Q	11.25	18.6	21.2	29.25	19.69	100	11.59	24.65	28.16	24.46	12.65	19.12
3 rd Q	13.4	17.03	15.53	28.65	25.39	100	14.3	23.39	21.39	24.84	16.91	19.82
4 th Q	18.53	8.89	10.15	22.61	39.82	100	23.06	14.24	16.29	22.85	30.92	23.1
5 th Q	13.72	8.99	9.03	18.45	49.81	100	16.54	13.94	14.05	18.07	37.46	22.38
Total	18.57	14.43	14.39	22.86	29.76	100	100	100	100	100	100	100
Rural												
1 st Q	41.96	24.97	17.56	13.3	2.21	100	47.47	32.8	22.17	11.55	2.04	21.41
2 nd Q	13.28	21.51	22.24	28.49	14.49	100	14.56	27.39	27.22	23.97	12.99	20.76
3 rd Q	16.33	13.12	16.27	29.66	24.62	100	17.98	16.78	19.99	25.05	22.16	20.84
4 th Q	12.96	7.88	18.95	30.05	30.16	100	12.26	8.66	20.01	21.8	23.33	17.9
5 th Q	7.66	12.27	9.42	22.78	47.87	100	7.72	14.37	10.61	17.63	39.48	19.09
Total	18.92	16.3	16.96	24.67	23.15	100	100	100	100	100	100	100

4.4.3 The Transition Matrix according to the economic status sub-index:

Table (13) shows the dynamics of households according to the economic status sub-index across the two years 1998 -2006. The transitory movements that occurred to the households according the economic status sub-index seems to be very limited compared to that was observed by the previous sub-index (social sub-index). For total Egypt, the table shows that slightly less than three quarters of households (71 percent) who were in the first quintile at 1998 still at that quintile at 2006, while this percentage reached 69 percent for the richest quintile. Households in urban areas are more sensitive to the changes in the economic variables than rural areas, where 37 percent of households in the first quintile at 1998 transfer to the second and third quintiles at 2006 according to the economic changes that occurred in the period between the two surveys. Additionally, 20 percent of households in urban areas who were at the middle quintile at 1998 moved to the richest quintile at 2006.

Table (13): Transition Matrix of households according to Economic sub-index by residence in 1998, 2006

	2006						2006					
	1 st	2 nd	3 rd	4 th	5 th	Total	1 st	2 nd	3 rd	4 th	5 th	Total
1998	Row percentage						Column percentage					
	All Egypt											
1 st Q	71.13	18.53	8.25	1.9	0.2	100	63.91	20.46	9.79	1.99	0.18	20.36
2 nd Q	30.39	37.45	18.41	11.67	2.08	100	26.86	40.69	21.48	12.02	1.87	20.03
3 rd Q	9.14	24.47	26.9	25.07	14.42	100	7.92	26.08	30.79	25.32	12.71	19.64
4 th Q	1.36	10.89	25.69	37.18	24.88	100	1.16	11.42	28.95	36.97	21.58	19.34
5 th Q	0.17	1.2	7.48	22.36	68.8	100	0.15	1.34	8.99	23.71	63.66	20.63
Total	22.66	18.43	17.16	19.45	22.29	100	100	100	100	100	100	100
	Urban											
1 st Q	60.56	26.74	10.47	0	2.23	100	41.82	8.9	2.33	0	0.21	3.78
2 nd Q	25.04	38.6	18.97	13.28	4.11	100	35.14	26.1	8.57	4.02	0.78	7.69
3 rd Q	4.67	20.56	29.66	26.08	19.04	100	15.58	33.02	31.85	18.76	8.54	18.27
4 th Q	1.1	10.48	23.69	37.16	27.57	100	6.13	28.09	42.45	44.59	20.63	30.48
5 th Q	0.18	1.11	6.33	20.84	71.54	100	1.32	3.89	14.8	32.63	69.85	39.78
Total	5.48	11.37	17.01	25.4	40.74	100	100	100	100	100	100	100
	Rural											
1 st Q	72.16	17.72	8.04	2.08	0	100	66.8	25.32	16.54	5.3	0	35.61
2 nd Q	31.6	37.2	18.28	11.31	1.62	100	25.77	46.81	33.16	25.38	9.54	31.38
3 rd Q	12.73	27.62	24.68	24.25	10.71	100	6.92	23.17	29.83	36.28	42.04	20.91
4 th Q	2.15	12.16	31.85	37.27	16.57	100	0.51	4.43	16.73	24.23	28.27	9.09
5 th Q	0	2.24	21.4	40.78	35.59	100	0	0.27	3.73	8.8	20.16	3.02
Total	38.47	24.93	17.3	13.98	5.33	100	100	100	100	100	100	100

Accordingly,

The previous transition matrices that present the dynamics of households between the two surveys namely, 1998 and 2006 indicate that household head characteristics (that represent one of the dimensions of the socioeconomic status of household) are not strong motive to change the status of households to higher quintiles. However, the social characteristics sub-index has the greatest effect on changing the status of households between the two surveys.

4.5 The transition Matrix according to the Selected SES index (1st PC of the three sub-indices)

In this section, the transition matrix according to the selected SES index was presented to capture the dynamics that happened to the households according to the changes of the socioeconomic status between 1998 and 2006. Overall, Table (14) shows that the socioeconomic status of households changed over the period 1998-2006, however, the transition is directed to the lower socioeconomic statuses more than the higher socioeconomic statuses.

There is a little bit marked stability regarding households at the first quintile, where slightly less than 16 percent of households who were at the first quintile in 1998 moved to higher socioeconomic statuses in 2006, 4 percent of those households moved to the third and the fourth quintiles and less than one percent moved to the fifth quintile. Marked transitions were observed regarding the households in the richest quintiles,

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where 32 percent of households who were at the fifth quintile in 1998 were dropped in their socioeconomic status to lower quintiles in 2006 (18 percent dropped to the second and the third quintiles).

Additionally, almost 16 percent of households who are in the first quintile in 2006 came from the highest three quintiles, while only 15 percent who are in the fifth quintile in 2006 came from the lowest three quintiles.

Regarding the transition of households according to the socioeconomic status in both urban and rural areas, Table 14 shows that 19 percent of households in rural areas who were in the richest quintile at 1998 were dropped to the poorest three quintiles at 2006. This percentage reached 22 percent in urban areas. Additionally, more than two thirds of households in urban areas who are in the fifth quintile in 2006 having the same socioeconomic status in 1998, while this percentage reached 69 percent among rural households.

Table (14): Transition Matrix according to the selected SES index
 by residence in 1998, 2006.

	2006						2006					
	1 st	2 nd	3 rd	4 th	5 th	Total	1 st	2 nd	3 rd	4 th	5 th	Total
1998	Row percentage						All Egypt					
	Column percentage											
1 st Q	84.3	11.5	2.4	1.3	0.5	100	59.6	10.1	2.7	1.4	0.3	16.2
2 nd Q	28.9	41.6	17.3	8.2	4.0	100	24.7	44.2	23.7	10.3	2.7	19.6
3 rd Q	11.7	19.7	27.6	23.7	17.3	100	10.5	21.8	39.6	31.5	12.2	20.5
4 th Q	2.6	12.0	11.9	28.3	45.3	100	2.6	15.2	19.3	42.6	36.4	23.2
5 th Q	2.9	7.9	10.2	10.7	68.3	100	2.6	8.8	14.6	14.2	48.5	20.5
Total	22.9	18.4	14.3	15.4	29.0	100	100	100	100	100	100	100
Urban												
1 st Q	88.2	8.7	0.9	1.3	1.0	100	60.6	9.0	1.2	1.6	0.5	16.9
2 nd Q	35.4	37.2	15.2	7.3	4.9	100	24.4	38.7	21.4	9.0	2.5	16.9
3 rd Q	12.7	16.2	25.3	24.5	21.3	100	9.1	17.5	37.1	31.4	11.2	17.6
4 th Q	4.0	13.3	9.6	22.8	50.3	100	4.0	20.0	19.4	40.7	36.7	24.4
5 th Q	2.0	10.0	10.4	9.8	67.9	100	2.0	14.9	20.9	17.3	49.1	24.2
Total	24.6	16.3	12.0	13.7	33.4	100	100	100	100	100	100	100
Rural												
1 st Q	80.5	14.3	4.0	1.3	0.0	100	58.6	10.8	3.8	1.2	0.0	15.5
2 nd Q	24.3	44.8	18.9	8.8	3.3	100	25.1	48.2	25.3	11.3	3.0	22.0
3 rd Q	11.0	22.1	29.3	23.2	14.5	100	11.9	25.0	41.4	31.6	13.5	23.2
4 th Q	1.1	10.7	14.2	33.8	40.2	100	1.1	11.6	19.2	44.0	35.9	22.2
5 th Q	4.2	5.1	9.9	11.9	68.9	100	3.3	4.3	10.4	12.0	47.6	17.2
Total	21.3	20.4	16.4	17.0	24.8	100	100	100	100	100	100	100

5. Conclusion:

- The previous literatures regarding the socioeconomic status indices shows that the multidimensional approach is the preferred approach as it measures the socioeconomic status of households from all dimensions. The household head characteristics dimension was chosen because of the belief in his/her characteristics that affect the SES of the household. In other words his/her age, education level, employment status and other aspects determine the position of the SES of the households. The other two dimensions (social characteristics and the economic status) represent an output of the first dimension.
- The comparison between the different methods of constructing the composite SES index shows that using PCA in extracting the first PC of the three sub-indices is the most appropriate method. This method represents the three dimensions of measuring the socioeconomic status of the households and has the most classification power in differentiating between different socioeconomic statuses for households and finally has theoretical background in assigning the weights of the three sub-indices.
- Household head characteristics are not strong motive to change the status of households to higher quintiles. However, the social characteristics sub-index has the greatest effect on changing the status of households between 1998 and 2006.
- The socioeconomic status of households changed over the period 1998-2006, however, the transition is directed to the lower socioeconomic statuses more than the higher socioeconomic statuses.
- There is a little bit marked stability regarding households at the poorest quintile, while marked transitions were observed regarding the households in the richest quintiles. The socioeconomic status of 4.2 percent of households who were in the poorest quintile in 1998 was changed to the richest three quintiles, while 21 percent of households who were at the richest quintile in 1998 their socioeconomic status dropped to the lowest three quintiles.

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