J. Agric. Sci. Mansoura Univ., 34(2): 875 - 890, 2009

ECONOMTRIC STUDY OF THE CHANGES IN THE CONSUMPTION EXPENDITURE PATTERNS IN EGYPT

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ABSTRACT

The paper analyses the changes in the consumption expenditure patterns especially food consumption patterns of Egyptian household, as a result of economic liberalisation programs. Data come from the Household, Income, Expenditure, and Consumption Survey (HIECS) conducted by the Central Agency for Public Mobilisation and Statistics (CAPMAS) of Egypt for two survey periods, 1990/1991 and 2004/2005. In order to make the two survey periods comparable, expenditure data have been deflated by the consumer price index. Total expenditure elasticities for expenditure groups are estimated by using Engel curves. The double-log functional type is used to estimate the expenditure elasticities. Descriptive analysis show that the total and food consumption expenditure patterns have changed in the two survey periods as a result of liberalisation program and economic reform. The food expenditure share decreased for rural and urban areas from 1990/1991s to 2004/2005s, while for most of the other commodities the shares increased.

Empirical analysis indicated that total expenditures (as a proxy for permanent income) had a positive significant association with all expenditure categories. The expenditure elasticities of food, health, hotel-restaurant, and various commodities-services have decreased significantly, whereas transportation-communication, culture-entertainment, and education show significant increase in the total expenditure elasticity. This study revealed that the food expenditure structure in Egypt has diversified, where fruits, meats, fish, and milk-eggs were near to the luxury commodities in 1990/1991, and then moved up to the necessity commodities in 2004/2005.

Moreover, consumption expenditure patterns of urban and rural households and households at different income levels were analysed in order to investigate factors controlling consumption expenditure patterns. The results show that there are no statistically significant variations between the urban and rural total expenditure elasticity of commodity groups, except for food, and various commodities-services which are higher at rural than urban areas. For food sub-groups, rural elasticities tend to be higher than urban ones. Finally, the total expenditure elasticities of food, clothing, and hotel-restaurant are lower at high income groups. Also, households with higher income are less responsive to changes in income for all food sub-groups. On the basis of this observation it is deduced that the major factor in the change of food consumption during the study period is the change in real income. This study recommended enhanced future food policies through sustainable increased per capita real income is needed in order to improve the living standard and nutritional level, with focus on increasing animal production and fisheries.

Keywords: Engel curves, expenditure elasticity, consumption expenditure pattern, Egypt.

INTRODUCTION

The consumption patterns of households have been altering as the parallel of the economic development in Egypt. Especially, after 1987 due to political changes, the Egyptian economy was subject to a structural

adjustment and liberalisation program. Household consumption patterns have been changing as the result of some improvements for price, marketing, and delivering quota for main agricultural crops, reducing subsidies on inputs and encouraging private sector investments. The changes in the Egyptian economy from centrally planned to a market economy have led to changes in real income and income distribution. These changes can be affect household expenditure behaviour.

The relationship between income level and the quantity purchased is interpreted by Income consumption curves in economic theory. German economist Ernst Engel had established this approach firstly in 19th century. Since then the curve that shows the influence of the changes in the consumer income on the quantity demanded is called as Engel curve. The household expenditure behaviour can be analysed by using Engel curves (Sadoulet and Janury, 1995).

Income elasticities of demand are estimated from convenient regression model to Engel curve. Income elasticity represents the percentage change in the quantity demanded as a response to the percentage change in the income level. According to the income elasticities the commodities are classified into two categories as necessities and luxuries. The commodities which have income elasticity less than one are called necessities. In contrast, the commodities which have income elasticity exceed one are called luxuries. In the literature there is a tendency to use total expenditure instead of income as explanatory variable (Forsyth, 1960). The central theme behind this adoption is that people declare total expenditure more truly than income. For this reason, in this study the total expenditure elasticities are calculated instead of income elasticities. Total expenditures proxied permanent income; Friedman (1957) argued consumers attempt to maintain a given level of consumption over time and are relatively unresponsive to transitory increases or decreases in income. Thus, annual total expenditures represent consumption patterns over the lifespan better than annual income. It is expected that an increase in economic resources will lead to an increase in expenditure levels.

Before the estimation procedure of total expenditure elasticity, the choice of suitable function type to Engel curves get have importance. The estimated functional types must have general objectives (aggregation criteria, saturation level) of demand theory (Brown and Deaton, 1972). The general functional types which are used to estimate Engel curves are linear, semi-logarithmic, double-logarithmic and Working-Leser model (Leser, 1963, Houthakker, 1997).

The primary purpose of this study is to econometrically examine whether household consumption patterns are changed from 1990/1991 to 2004/2005 as the parallel of economic improvements. For this reason, the total expenditure elasticities of expenditure groups are estimated by using 1990/1991 and 2004/2005 Egyptian Household Income, Expenditure, and Consumption Surveys. The second purpose of the study is to determine the similarities and differences between the urban and rural household expenditure patterns. The final aim of the study is to test the differences of total expenditure elasticities between the high-income and low-income

households. These elasticities will be used to test the validity of Engel Laws for Egyptian households. The first of Engel laws says that the most important component of household budget is good expenditures. The percentage of good expenditures in total expenditures is lower as the income increases. The sources of significant changes of commodity groups elasticities from 1990/1991 to 2004/2005 can be followed from the difference between total expenditure elasticities of low and high-income level households.

METHODOLOGY AND DATA

There are several possible functional forms of Engel curves. The choice of a suitable functional form for Engel curves becomes important when the total expenditure elasticities are estimated. In this study, the double-log functional type is used to estimate the total expenditure elasticities. This function type gives constant income elasticity. A double-log specification has proven the most appropriate way of estimating the expenditure elasticity of demand; it generates more realistic expenditure elasticities.

In the estimate of Engel curves the total expenditures are used as a proxy of income. The first reason for this is that total expenditure reflects permanent income of household better than income. Income is more likely to include transitory and unexpected elements. The second reason comes from the household declaration problem. The false reporting of the income levels by the households is a common situation in the surveys (Forsyth, 1960). So, it has been common to use total expenditure instead of income. The general model of a double-log Engel curve is as follows:

$$\ln E_{ij} = \alpha_i + \beta_i \ln y_j + \eta_i \quad (1)$$

Where the subscript j denotes total expenditure group and the subscript i denotes commodity group. So, E_{ij} is the average annual per capita expenditure on a commodity group i of households from expenditure group j, α_i and β_i are the estimated coefficients, y_j is the average annual total per capita expenditure of households from expenditure group j, and (η_i) is the disturbance term. The derivation of the Engel function assumes constant prices.

Model (1) is estimated for each commodity group for each survey (1990/1991 and 2004/2005), as shown in Tables 3 and 4.

Four hypotheses are to be tested in this section: First, it is assumed that the income (or expenditure) variable is an important determinant of commodity expenditures. Second, there is a difference in the elasticity for each commodity group between 1990/1991 year and 2004/2005 year (time effect). The third hypothesis suggests that there is a difference in the expenditure elasticity for each commodity group between rural and urban areas (location effect). Fourth, there is a difference between the consumption patterns of households at different income levels.

There are some important questions for explaining the effects of increasing consumption on household consumption pattern. These questions can be summarised as follows: Did household consumption elasticities change while the consumption had been increasing from 1990/1991 to 2004/2005? If there was any change, which commodity groups' elasticities changed? Did they increase or decrease? Did the change occur at the consumption patterns of high-income households or low-income households? Dummy variables are included to test the second, third, and fourth hypotheses. The equation estimated for this is of the form:

$$\ln E_{ij} = \alpha_i + \beta_i \ln y_j + \gamma_{i1} D + \gamma_{i2} (\ln y_j D) + \eta_i \quad (2)$$

In order to estimate the difference in the elasticity for each commodity group between 1990/1991 year and 2004/2005 year, dummy variable is used where D = 0 for 1990/1991, D = 1 for 2004/2005, γ_{i1} and γ_{i2} are the estimated coefficients, In this case γ_{i2} indicates by how much the consumption expenditure elasticity of the 1990/1991 differs from the consumption expenditure elasticity of the 2004/2005.Tables 5 and 6 show the results of model 2.

To find out the factors that cause the changes in expenditure patterns over time, consumption expenditure patterns of urban and rural households and the households at different income levels were also analysed

Dummy variable is also used to see the differences in total expenditure elasticities of urban and rural households. The model is same with the equation (2) except the dummy variable.

$$\ln E_{ij} = \alpha_i + \beta_i \ln y_j + \gamma_{i1} D + \gamma_{i2} (\ln y_j D) + \eta_i \quad (3)$$

where D = 0 for urban data, 1 for rural data, γ_{i2} is the differences in total expenditure elasticities of urban and rural households. Tables 7 and 8 show the results of model 3.

In order to determine the differences between the consumption patterns of households at different income levels, the data set is divided into two subsets. Dummy variable is used to see the differences in total expenditure elasticities of different income levels. The model is same with the equation (2) except the dummy variable.

$$\ln E_{ij} = \alpha_i + \beta_i \ln y_j + \gamma_{i1} D + \gamma_{i2} (\ln y_j D) + \eta_i \quad (4)$$

where D = 0 for first set (low income), 1 for second set (high income). γ_{i2} shows how much the expenditure elasticity of low income groups differs from the expenditure elasticity of high income groups. Tables 9 and 10 show the results of model 4.

All other variables have been as defined above.

The above models (1), (2), (3), and (4) are estimated using (OLS) regression. Expenditure elasticities are calculated as $(\varepsilon_i = \beta_i)$, where β_i is the coefficient of regression.

The data used are based on the Egyptian Household Income, Expenditure, and Consumption Surveys (EHIECS), for 1990/1991 and 2004/2005. These surveys were conducted by the official statistical agency of Egypt, the Central Agency for Public Mobilisation and Statistics (CAPMAS). In this study only those years are included because of surveys were carried out by CAPMAS at 1990/1991 and 2005/2006 years. The Egyptian economy was subject to a structural adjustment and liberalisation program in 1987. So, it can be seen obstacle to use 2005 data for the estimate income elasticities changes.

Due to the lake of access to the original data on individual household surveys we rely on the average annual data on household incomes and expenditure by income group, as taken from the official publications for the 1990/1991 and 2004/2005 surveys. The household in the sample fall into 14 expenditure groups for 1990/1991 year and 20 for 2004/2005 year according to their average annual per capita expenditure, for urban and rural areas. Over the 2 year research period, the expenditure groups had provided 68 observations for each variable. In order to make the two survey periods comparable, expenditure data have been deflated by the consumer price index (CPI). The total annual per capita expenditure and per capita expenditure on major commodity groups were calculated in real values.

This provides a basis for estimating Engel curves that are based on the relationships between expenditure on an individual good and the income level as measured by total expenditures. In cross-sectional budget studies, provided the surveys are completed in a short time-span, prices faced by all households can be regarded as constant, apart from minor variations due to social and regional factors. This allows focusing on responses of household demand to variation in income or total expenditure. After statistically estimating the Engel curves, the nature of these responses can be summarised by computing expenditure elasticities.

RESULTS AND DISCUSION

Descriptive Analysis of Consumption Expenditure Patterns

Results of the descriptive analysis are given in Table 1 and Table 2. This section considers consumption expenditure patterns in Egypt with special emphasis on the differences between urban and rural sectors, and on shifts in expenditure patterns over time. The average consumption expenditure is calculated for each commodity group and for urban and rural sectors over the two survey periods 1990/1991 and 2004/2005. According to the available data, there are eleven commodity groups including food and non alcoholic beverages, clothing, housing and its accessories, furniture, health, transportation-communication, culture-entertainment, education, restaurant-hotel, tobacco-narcotics-alcoholic, and various commodities-services. The same analysis is then applied to each food group to see the expenditure pattern of food. The consumption expenditure of different commodity groups and their expenditure shares are presented in Table 1 for urban and rural Egypt in1990/1991 and 2004/2005.

In Urban Egypt, the total average per capita expenditure on aggregate commodity groups in 1990/1991 was 1058.40 LE/year, of which 49.96 % are allocated to food group. In 2004/2005, this percentage had decreased reaching 40.83% (Table 1). However, the housing expenditure structure has suffered important changes during the two analysed survey periods. The relative importance of housing increased from 8.82 % of total average per capita expenditure in 1990/1991, to 15.05 % in 2004/2005. Something similar took place in the case of transportation - communication and education; their relative importance increased from 6.36 % and 2.90 % in 1990/1991 to 15.05 % and 8.39 % and 4.23% in 2004/2005, respectively.

Table 1 : Average Annual per Capita Expenditure (LE) on Different Commodity Groups in Rural and Urban Egypt in 1990/1991 and 2004/2005

Commodity Groups	1990/1991				2004/2005			
	Urban		Rural		Urban		Rural	
	Value	%	Value	%	Value	%	Value	%
Food	528.80	49.96	417.00	58.68	1347.10	40.83	975.60	50.28
Clothing	89.10	8.42	53.10	7.47	270.30	8.19	158.30	8.16
Housing	93.40	8.82	73.40	10.33	496.50	15.05	340.30	17.54
Furniture	51.40	4.86	30.00	4.22	152.30	4.62	78.00	4.02
Health	46.80	4.42	24.10	3.39	149.80	4.54	67.30	3.47
Transportation - Communication	67.30	6.36	19.60	2.76	276.80	8.39	80.90	4.17
Culture-Entertainment	33.50	3.17	12.30	1.73	115.20	3.49	29.50	1.52
Education	30.70	2.90	19.60	2.76	139.60	4.23	37.30	1.92
Hotel -Restaurant	24.90	2.35	6.80	0.96	126.1	3.82	54.50	2.81
Tobacco-Narcotics-Alcoholic	45.30	4.28	32.90	4.63	92.40	2.80	61.50	3.17
Various Commodities - Services	47.30	4.47	21.80	3.07	132.90	4.03	57.00	2.94
Total Expenditure	1058.40	100.00	710.60	100.00	3299.00	100.00	1940.20	100.00

Source: Calculated Based on Data from HIECS, CAPMAS, 1990/1991 and 2004/2005.

It is interesting to note that food expenditure share was much higher in rural areas than in urban areas. Food expenditure share in rural areas represented more than 58 % of the total average per capita expenditure on aggregate commodity groups in 1990/1991 while in 2004/2005 this percentage decreased to 50.28 %. With respect to housing and transportation - communication, their relative importance increased from 10.33 % and 2.76 % in 1990/1991 to 17.54 % and 4.17 % in 2004/2005, respectively

The food expenditure patterns examined so far are quite consistent with Engel's law that with higher average incomes, a lower fraction of income is spent on food. This is evident both over time and between urban and rural consumers.

According to the available data, there are ten food sub-groups including cereals, vegetables, fruits, meats, fish, milk-eggs, oils-fats, sugar, other food products, beverages. Each food group includes those commodities that have similar nutritional value and whose prices are very likely to move in

tandem. The average per capita food expenditure is calculated for each food commodity group at the rural and urban levels in1990/1991 and 2004/2005.

Table 2 : Average Annual per Capita Expenditure (LE) on Different Food Groups in Rural and Urban Egypt in 1990/1991 and 2004/2005

Food Groups	1990/1991				2004/2005			
	Urban		Rural		Urban		Rural	
	Value	%	Value	%	Value	%	Value	%
Cereals	102.20	19.33	124.40	29.83	185.2	13.75	183.40	18.80
Vegetables	62.90	11.89	49.60	11.89	149.0	11.06	132.40	13.57
Fruits	32.10	6.07	18.50	4.44	103.2	7.66	60.40	6.19
Meats	128.40	24.28	95.00	22.78	383.6	28.48	268.20	27.49
Fish	29.10	5.50	14.40	3.45	93.6	6.95	54.40	5.58
Milk - Eggs	63.30	11.97	36.20	8.68	194.3	14.42	101.50	10.40
Oils - Fats	39.70	7.51	34.60	8.30	101.5	7.53	85.50	8.76
Sugar	25.70	4.86	18.30	4.39	64.8	4.81	48.60	4.98
Other Food Products	25.90	4.90	13.30	3.19	23.9	1.77	14.90	1.53
Beverages	19.10	3.61	12.60	3.02	48	3.56	26.30	2.70
T. Food Expenditure	528.80	100.00	417.00	100.00	1347.10	100.00	975.60	100.00

Source: Calculated Based on Data from HIECS, CAPMAS, 1990/1991 and 2004/2005.

As shown in Table 2, the average per capita expenditure on meats occupied the largest share within the structure of food expenditure. It is higher for urban than rural areas. The expenditure share on meats was in 1990/1991 24.28 % for urban versus 22.78 % for rural areas. In 2004/2005, this share increased to 28.48 % and 27.49 % of total expenditure for urban and rural areas, respectively. This means that the Egyptian consumers tend to believe in the nutritional superiority of animal products and they are ready to spend more on these products. In general, every household would like to consume meats or fish at least once a week.

The second largest expenditure share went to the cereals group. The expenditures on cereal products are much higher for rural resulting from the high quantity consumed from these products. It was in 1990/1991 19.33 % and 29.83 % for rural and urban areas, respectively. However, in 2004/2005, the cereals share decreased to 13.75 % for urban versus 18.80 % for rural areas. The smallest expenditure share went to the beverages. It is higher for urban than rural areas.

Total expenditure elasticities of 1990/1991 and 2004/2005

Elasticities estimates are reported in Tables 3 and 4. Estimated expenditure elasticities for all groups and food sub-groups are positive, implying that they are normal goods. There are variations in elasticities for commodity groups that tend to indicate a difference in households' attitudes toward these groups as their income rises. The corresponding expenditure elasticities are reported for the two survey periods of 1990/1991 and 2004/2005 in Egypt.

It can be seen each commodity group elasticity that were estimated by model 1 in 1990/1991 and 2004/2005 (Table 3). For each year, food, housing, and tobacco-narcotics-alcoholic elasticities are necessities. In 1990/1991, clothing, furniture, health, transportation-communication, culture-entertainment, education, hotel-restaurant, and various commodities-services

are luxuries with elasticities exceed one. While health and hotel-restaurant moved up to the necessity commodities in 2004/2005.

In1990/1991, the expenditure elasticities for food sub-groups are positive and less than one except for fruits, fish, and milk-eggs, indicating that most of food sub-groups are normal and necessary goods, and there are no inferior products. The elasticity of cereals group is relatively similar at low numbers, which means that the consumption of these commodities is relatively little affected by income changes. The cereals group has an expenditure elasticity of 0.61, which means that as total expenditure rises by one percent the expenditure on cereals would tend to rise by only 0.61 %. This result is consistent with the fact that the consumption of cereals commodities is important for the poor and is likely to decrease with higher income. For meats the expenditure elasticity was about one, identify it as near to luxury commodity . Also, fruits, fish, and milk-eggs have expenditure elasticities larger than unity, which identifies them as luxuries. It is expected that these food sub-groups will experience an increase in demand when consumers' income increases in tandem with the overall economic growth of the country.

Table3 The Total Expenditure Elasticities of 1990/1991 and 2004/2005

Commodity Groups	1990/1991				2004/2005			
	α_j	β_j	R^2	F	α_j	β_j	R^2	F
Food	0.30 2.24*	0.84 39.02**	0.98	1522.92**	1.67 16.47**	0.60 38.12**	0.97	1452.96**
Clothing	-3.34 -22.66**	1.12 47.92**	0.98	2269.52**	-2.92 -12.67**	1.05 28.92**	0.96	836.41**
Housing	-1.44 -11.34**	0.87 42.63**	0.98	1817.30**	-0.51 -1.65	0.82 16.28**	0.87	265.24**
Furniture	-4.45 -7.63**	1.20 13.03**	0.87	169.96**	-3.42 -6.69**	1.04 12.96**	0.82	168.00**
Health	-3.86 -17.77**	1.09 31.69**	0.97	1004.20**	-2.86 -7.699**	0.95 16.27**	0.87	264.66**
Transportation-Communication	-6.38 -13.63**	1.49 20.15**	0.94	406.18**	-7.46 -16.44**	1.71 23.96**	0.94	574.09**
Culture-Entertainment	-4.85 -11.82**	1.16 17.87**	0.93	319.32**	-11.24 -12.88**	2.12 15.74**	0.87	239.52**
Education	-4.62 -10.62**	1.12 16.24**	0.98	263.59**	-11.84 -8.01**	2.22 9.55**	0.72	406.18**
Hotel -Restaurant	-5.74 -9.01**	1.22 12.15**	0.85	147.69**	-3.25 -8.23**	0.97 15.59**	0.87	243.18**
Tobacco-Narcotics, and Alcoholic	-2.52 -9.36**	0.89 20.91**	0.94	437.38**	-2.98 -3.96**	0.86 7.29**	0.59	53.26**
Various Commodities-Services	-7.25 -9.19**	1.66 13.33**	0.87	177.56**	-5.39 -23.84**	1.32 37.02**	0.97	1370.63**

Source: Computed Based on Data from HIECS, CAPMAS, 1990/1991 and 2004/2005.
**** Indicates significant at one percent level of significance**

The estimated expenditure elasticities for selected food sub-groups for 1990/1991 are relatively higher than those obtained from 2004/2005. This can be explained by the economic situation in Egypt. Many households, especially the poor, face tight budgetary constraints and all of the selected food commodity groups are considered as very important groups because they fulfill fundamental needs of people.

In 2004/2005, all expenditure elasticities have positive signs and for all of the food commodity groups are less than one, as shown in Table 4. This means that all food sub-groups are necessities for Egyptian households, i.e., as income increases their expenditure will increase at a lower rate. The estimated expenditure elasticity for vegetables group is only 0.32, the lowest, compared to other food sub-groups, while fruits group has a relatively high expenditure elasticity of 0.84.

For fish, the expenditure elasticity is 0.78, where an increase in total expenditure by one percent would tend to cause a 0.78 % increase in fish expenditure in Egypt, probably caused by a shift to higher quality fish (expensive species of fish). The expenditure elasticity for the meats group is 0.69, which indicates that an increase in total expenditure by one percent would tend to cause a 0.69 % increase in meats group expenditure.

Table 4 : Expenditure Elasticities for Food Groups in 1990/1991 and 2004/2005

	1990/1991				2004/2005			
Food Groups	α_j	β_j	R^2	**F**	α_j	β_j	R^2	**F**
Cereals	0.21 (0.45)	0.61 (8.44)**	0.72	71.24**	0.77 (5.79)**	0.44 (21.13)**	0.92	446.37**
Vegetables	-0.99 (-4.15)**	0.75 (14.72)**	0.94	588.72**	1.32 (11.36)**	0.32 (17.51)**	0.89	306.73**
Fruits	-4.34 (-25.29)**	1.11 (40.99)**	0.98	1680.27**	-2.48 (-6.04)**	0.84 (34.44)**	0.97	1189.66**
Meats	-1.88 (-13.28)**	0.99 (42.93)**	0.98	1843.00**	0.03 (0.27)	0.69 (36.66)**	0.97	1343.74**
Fish	-4.45 (-18.42)**	1.09 (28.83)**	0.96	831.32**	-2.32 (-9.71)**	0.78 (20.97)**	0.92	439.66**
Milk-Eggs	-3.00 (-17.74)**	1.01 (37.71)**	0.98	1421.65**	-1.05 (-3.69)**	0.70 (15.67)**	0.87	245.45**
Oils-Fats	-2.07 (-9.73)**	0.82 (24.34)**	0.95	592.42**	0.17 (0.67)	0.44 (10.73)**	0.75	115.28**
Sugar	-2.44 (-19.81)**	0.79 (40.94)**	0.98	1676.04**	-1.69 (-8.94)**	0.66 (22.24)**	0.93	494.88**
Others	-1.68 (-5.48)**	0.64 (13.27)**	0.87	176.277**	-2.10 (9.41)**	0.55 (15.61)**	0.86	243.61**
Beverages	-2.95 (-27.33)**	0.79 (46.66)**	0.98	2177.50**	-2.67 (-9.13)**	0.74 (16.15)**	0.87	260.88**

Source: Computed Based on Data from HIECS, CAPMAS, 1990/1991 and 2004/2005.
**** Indicates significant at one percent level of significance**

Milk and eggs are used for breakfast and dinner in Egypt. Not only are they protein sources, but also their prices, compared to prices of other animal products, were for a long time relatively low. Increased total expenditure has a clear impact on the expenditure on milk -eggs; its

expenditure elasticity is 0.70. This means that a one percent increase in total expenditure would tend to cause an increase in expenditure on milk and its products by 0.70.

The estimated expenditure elasticity for the oils-fats group is 0.44, which means that a one percent increase in total expenditure would tend to cause an increase in the expenditure on the oils- fats group by 0.44 %. With higher income perhaps the quantity of oils-fats consumed will not increase but the quality of oils-fats consumed will improve, where in Egypt, the consumption of hydrogenated oils and sunflower oil increased more with higher income than the consumption of cottonseed oil.

The changes in the expenditure patterns from 1990 to 2005

To test the significance of change of commodity group elasticities from 1990/1991 to 2004/2005, data group that to belong common commodity groups both 1990/1991 and 2004/2005 were put together in one group. Regression equations were estimated by model 2 from associated group, as shown in Tables 5 and 6. The findings can be summarised as follows:

- The changes in total expenditure elasticities of clothing, housing, furniture, and tobacco-narcotics and alcoholic are not statistically significant.
- The total expenditure elasticities of food, health, hotel-restaurant, and various commodities-services have decreased significantly.
- Transportation-communication, culture-entertainment, and education commodity groups show significant increase in the total expenditure elasticity.

Table 5 : The Equations for the Expenditure Patterns in 1990/1991 and 2004/2005

Commodity Groups	α_j	β_j	γ_1	γ_2	R^2	F
Food	0.30 2.69**	0.84 46.93**	1.35 8.11**	-0.24 -9.22**	0.98	1077.37**
Clothing	-3.34 17.49**	1.12 36.99**	0.42 1.50	-0.07 -1.54	0.97	814.88**
Housing	-1.43 -6.01**	0.87 22.58**	0.92 2.46**	0.05 -0.96	0.95	364.21**
Furniture	-4.45 -8.48**	1.20 14.49**	1.03 1.43	-0.16 -1.34	0.85	117.01**
Health	-3.86 -12.81**	1.09 22.84**	1.00 2.27*	-0.14 -1.99*	0.93	295.47**
Transportation - communication	-6.38 -14.37**	1.49 22.26**	-1.07 -1.66**	0.22 2.13*	0.94	333.20**
Culture-Entertainment	-4.85 -7.13**	1.16 10.77**	-6.35 -6.42**	0.96 6.15**	0.88	155.25**
Education	-4.62 -4.32**	1.12 6.60**	-7.22 -4.56**	1.09 4.39**	0.76	63.51**
Hotel -Restaurant	-5.74 -11.52**	1.22 15.53**	2.49 3.41**	-0.25 -2.21*	0.88	156.82**
Tobacco- Narcotics, and Alcoholic	-2.52 -4.44**	0.89 9.91**	-0.46 -0.54	-0.02 -0.20	0.77	68.74**
Various Commodities-Services	-7.25 -13.61**	1.66 19.75**	1.86 2.39*	-0.34 -2.82**	0.91	204.16**

Source: Computed Based on Data from HIECS, CAPMAS, 1990/1991 and 2004/2005.
**** Indicates significant at one percent level of significance**

Table 6 : The Equations for the Food Expenditure Patterns in 1990/1991 and 2004/2005

Food Groups	α_j	β_j	γ_1	γ_2	R^2	F
Cereals	0.21 0.78	0.61 12.48**	0.56 1.25	-0.17 -2.31*	0.81	93.49**
Vegetables	-0.99 -5.68**	0.74 26.97**	2.31 9.05**	-0.43 -10.57**	0.95	313.19**
Fruits	-4.34 -27.07**	1.11 44.91**	1.85 8.09**	-0.27 -7.56**	0.98	1026.50**
Meats	-1.88 -15.32**	0.99 49.53**	1.92 10.66**	-0.30 -10.63**	0.98	1164.32**
Fish	-4.45 -19.21**	1.10 30.07**	2.13 6.28**	-0.31 -5.86**	0.95	446.47**
Milk-Eggs	-3.00 -12.98**	1.01 27.59**	1.96 5.78**	-0.31 -5.80**	0.94	362.82**
Oils-Fats	-2.07 -8.90**	0.82 22.26**	2.25 6.60**	-0.38 -7.03**	0.90	209.19**
Sugar	-2.44 -15.46**	0.79 31.95**	0.74 3.22**	-0.13 -3.66**	0.96	551.55**
Others	-1.68 -6.61**	0.64 16.00**	-0.43 -1.14	-0.09 -1.61	0.92	267.86**
Beverages	-2.95 -13.31**	0.79 22.73**	0.27 0.85	-0.05 -1.04	0.94	305.81**

Source: Computed Based on Data from HIECS, CAPMAS, 1990/1991 and 2004/2005.
**** Indicates significant at one percent level of significance**

- While health and hotel-restaurant were luxuries in 1990, they moved up near to the necessity commodities in 2004/2005.
- As shown in Table 6, expenditure elasticities of all food groups have decreased significantly except for beverages. While fruits, meats, fish, and milk-eggs were near to the luxury commodities in 1990/1991, they moved up to the necessity commodities in 2004/2005. The elasticities of expenditures for meat, fish, milk-eggs, and fruits are relatively high, and those of cereals and vegetables are low. This suggests that the food expenditure structure in Egypt has diversified, adding meats, fish, milk-eggs, and fruits to the most dominant food groups, cereals, vegetables and sugar. Moreover, it is likely that the share of food will increase with income enhancement due mainly to economic growth.

The differences of the expenditure patterns of urban and rural Households

To find out the factors that cause changes of commodity group elasticities from 1990/1991 to 2004/2005, consumption expenditure patterns of urban and rural households are analysed. To test the differences of the consumption patterns of urban and rural households, the regression model 3 was estimated (Tables 7 and 8). The findings are as follows:

- There is no any difference between the urban and rural total expenditure elasticity of clothing, housing, furniture, health, transportation-communication, culture-entertainment, education, hotel-restaurant, and tobacco-narcotics and alcoholic .

- The total expenditure elasticities of food and various commodities-services are higher at rural than urban areas.
- For food sub-groups rural elasticities tend to be higher than urban ones.

Table 7 : The Equations of Commodity Groups for Urban and Rural Households

Commodity Groups	α_i	β_i	γ_1	γ_2	R^2	F
Food	1.21 6.46**	0.68 23.48**	-0.69 -2.49**	0.12 2.78**	0.95	379.09**
Clothing	-3.34 -17.92**	1.12 38.64**	0.49 1.76	-0.08 -1.88	0.97	836.15**
Housing	-1.13 -2.57**	0.87 12.51**	0.21 0.32	-0.02 0.24	0.81	90.03**
Furniture	-3.51 -6.75**	1.06 13.12**	-0.99 -1.28	0.15 1.25	0.85	116.71**
Health	-3.45 -12.51**	1.05 24.63**	0.39 0.96	-0.10 -1.56	0.94	349.82**
Transportation - communication	-7.04 -16.37**	1.65 24.76**	0.73 1.13*	-0.17 -1.68	0.94	349.42**
Culture-Entertainment	-7.57 -9.18**	1.60 12.53**	-0.07 -0.06	0.06 0.32	0.82	96.80**
Education	-7.74 -6.33**	1.62 8.59**	0.22 0.12	-0.10 -0.38	0.69	45.68**
Hotel-Restaurant	-4.58 -7.07**	1.17 11.62**	0.70 0.72	-0.20 -1.36	0.80	82.11**
Tobacco- Narcotics, and Alcoholic	-2.24 -3.56**	0.82 7.74**	-0.67 -0.66	0.11 0.67	0.66	39.84**
Various Commodities-Services	-5.00 -9.56**	1.27 15.70**	-3.20 -4.09**	0.52 4.21**	0.91	207.61**

Source: Computed Based on Data from HIECS, CAPMAS, 1990/1991 and 2004/2005
**** Indicates significant at one percent level of significance**

Table 8 The Equations of Food Groups for Urban and Rural Households

Food Groups	α_i	β_i	γ_1	γ_2	R^2	F
Cereals	0.86 2.51**	0.44 8.24**	-1.27 -2.48*	0.26 3.26**	0.77	70.38**
Vegetables	0.58 1.72	0.45 8.73**	-1.26 -2.57**	0.23 2.92**	0.77	69.32**
Fruits	-3.37 -14.82**	0.98 27.66**	-0.16 0.47	0.01 0.27	0.96	465.90**
Meats	-0.97 -5.05**	0.84 27.07**	-0.13 -0.44	0.03 0.78	0.96	447.41**
Fish	-2.99 -11.00**	0.90 21.34**	-0.85 -2.08*	0.10 1.62	0.94	312.03**
Milk-Eggs	-1.65 -6.56**	0.81 20.79**	-0.78 -2.08*	0.09 1.58	0.93	298.35**
Oils-Fats	-0.68 -2.52**	0.57 13.60**	-1.00 -2.48**	0.19 3.01**	0.87	145.78**
Sugar	-1.62 -10.83**	0.66 28.30**	-1.13 -5.06**	0.18 5.30**	0.97	605.46**
Others	-0.88 -1.34	0.44 4.34**	-1.97 -2.01*	0.28 1.78	0.51	21.31**
Beverages	-2.94 -14.46**	0.79 25.35**	0.42 1.38	-0.08 -1.82	0.94	359.69**

Source: Calculated Based on Data from HIECS, CAPMAS, 1990/1991 and 2004/2005.
**** Indicates significant at one percent level of significance**

Expenditure Elasticities of Commodity Groups by Expenditure Quartile,

Due to determine the differences between the consumption patterns of households at different income levels, model (4) was estimated by using 1990/1991 and 2004/2005 data. The results of regression equations can be seen at Tables 9 and 10. As expenditure level becomes higher, expenditure elasticity declines for the highest quartile. This is consistent with economic theory: at lower incomes, changes in income have a greater effect on expenditures, since spending is more constrained. At higher incomes, changes in income have less impact on spending decisions on a commodity. The results can be summarised as follows:

- At the food, clothing, and hotel-restaurant commodity groups, the differences between the total expenditure elasticities for the lower and higher income groups are statistically significant. The expenditure elasticities of these groups are lower at high-income groups.
- Clothing, housing, health, culture-entertainment, education, and hotel-restaurant groups are luxury commodities for low-income groups whereas they are necessity commodities for high-income groups.
- For food sub groups, the total expenditure elasticities of vegetables, fruits, meats, fish, milk-eggs, and oils-fats are lower at high-income groups.

Table 9 : The Equations of Commodity Groups at different Expenditure Quartile

Commodity Groups	α_j	β_j	γ_1	γ_2	R^2	F
Food	0.21 0.60	0.85 12.25**	1.14 2.52**	-0.18 -2.56**	0.94	350.76**
Clothing	-4.02 15.05**	1.24 26.20**	2.04 5.79**	-0.31 -5.46**	0.98	1276.88**
Housing	-2.26 -3.06**	1.07 8.23**	0.53 0.54	-0.13 -0.87	0.83	101.35**
Furniture	-4.12 -4.74**	1.16 7.14**	0.42 0.35	-0.04 -0.23	0.85	115.04**
Health	-4.12 -7.51**	1.15 11.93**	1.29 1.79	-0.21 -1.77	0.93	270.24**
Transportation - communication	-6.50 -7.94**	1.52 10.52**	1.09 1.02	-0.12 -0.68	0.93	295.66**
Culture-Entertainment	-5.04 3.47**	1.08 4.25**	-1.32 -0.69	0.33 1.03	0.82	96.91
Education	-4.85 -2.37**	1.04 2.87**	-0.21 -0.08	0.20 0.45	0.70	50.18**
Hotel -Restaurant	-8.37 -6.82**	1.80 8.31**	5.34 3.30**	-0.90 -3.42**	0.77	68.33**
Tobacco- Narcotics, and Alcoholic	-3.61 -3.11**	1.01 4.94**	2.92 1.91	-0.43 -1.72	0.68	44.76**
Var. Commodities-	-5.18	1.27	-1.41	0.25	0.88	161.26**
Services	-5.01**	7.02**	-1.04	1.12		

Source: Calculated Based on Data from HIECS, CAPMAS, 1990/1991 and 2004/2005.
**** Indicates significant at one percent level of significance**

Table 10 : The Equations of Food Groups at different Expenditure Quartile

Food Groups	α_j	β_j	γ_1	γ_2	R^2	F
Cereals	0.53 0.69	0.52 3.82**	0.06 0.61	-0.01 -0.03	0.63	36.11**
Vegetables	-1.05 -1.67	0.74 6.69**	1.68 2.02**	-0.28 -2.09**	0.73	57.62**
Fruits	-5.03 -15.15**	1.26 21.56**	2.45 5.59**	-0.40 -5.66**	0.97	688.28**
Meats	-2.31 -7.85**	1.05 20.36**	2.15 5.58**	-0.33 -5.59**	0.97	611.26
Fish	-5.74 -14.77**	1.36 19.85**	3.81 7.44**	-0.62 -7.43**	0.96	483.77**
Milk - Eggs	-3.62 -8.19**	1.14 14.56**	2.41 4.14**	-0.40 -4.19**	0.93	298.67**
Oils - Fats	-2.30 -4.34**	0.87 9.30**	1.64 2.34*	-0.28 -2.49**	0.84	114.01**
Sugar	-2.23 -7.01**	0.76 13.56**	-0.07 -0.18	0.002 0. 03	0.95	410.24**
Others	-0.78 -1.34	0.39 4.34**	-2.01 -2.01*	0.32 1.78	0.47	18.37**
Beverages	-2.96 -7.52**	0.80 11.49**	-0.01 -0.03	-0.01 -0.06	0.93	295.08**

Source: Calculated Based on Data from HIECS, CAPMAS, 1990/1991 and 2004/2005.
**** Indicates significant at one percent level of significance**

Conclusion

On the basis of the structure of total and food expenditure, we can conclude that the consumption expenditure patterns have changed in the two survey periods as a result of liberalisation of economic activity. This study is made to find out the changes in total expenditure elasticities of households from 1990/1991 to 2004/2005 surveys. The changes in total expenditure elasticities of seven consumption expenditure groups are statistically significant. Otherwise, the total expenditure elasticities of four consumption expenditure groups do not change from 1990/1991 to 2004/2005. The total expenditure elasticities changing groups are food, health, transportation-communication, culture-entertainment, education, hotel-restaurant, and various commodities-services. The education and the culture-entertainment expenditures are the most luxury consumption expenditure groups with the total expenditure elasticities that exceed two in 2004/2005 survey.

When the reasons of the changes in consumption expenditure patterns are investigated it can be seen a difference between the elasticities for the lower and higher income groups. The total expenditure elasticities of food, clothing, and hotel-restaurant are lower at high-income groups. The clothing is a luxury commodity for low-income households. But it passed to necessity commodity group for high-income households. For food sub-groups, the total expenditure elasticities of vegetables, fruits, meats, fish, milk-eggs, and oils-fats are lower at high-income groups. The total expenditure elasticity of food and various commodities-services are higher at rural than urban areas, also for food sub-groups of cereals, vegetables, oils-fats, and sugar.

Recommendations

As a result of this study, several recommendations can be made for the future food policies as follows:

- Increased per capita real income is needed to improve the living standard and nutritional level,
- Focussing on increasing animal production and fisheries, aiming at increasing the per capita consumption of animal protein,
- Food subsidies should be better targeted to the poor people, and more public policies favouring the poor are needed.

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دراسة قياسية للتغيرات فى أنماط الاتفاق الاستهلاكى فى مصر

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شهدت الفترة الأخيرة الكثير من التغيرات الاقتصادية التى أثرت بصورة مباشرة على دخول الأفراد ومستوى إنفاقهم ، ونمط استهلاكهم لمجموعات السلع الغذائية وغير الغذائية. ويعد النمط الاستهلاكي مؤشر لما يستهلكه المجتمع من السلع الغذائية وغير الغذائية فى وقت معين ومكان معين بغية إشباع حاجاته الإنسانية. لذلك تهدف الدراسة إلى التقدير القياسى للتغيرات التى حدثت فى أنماط الانفاق الاستهلاكي بصفة عامة والغذائية بصفة خاصة للفترة ١٩٩٠/١٩٩١- ٢٠٠٤/٢٠٠٥، وتحليل العوامل المسببة للتغير فى النمط الانفاقى الاستهلاكي من خلال التقدير القياسى لأثر المكان (ريف ، حضر) وأثر الاختلاف بين الفئات الانفاقية على

نمط الانفاق الاستهلاكي ، وتقدير المرونات الإنفاقية لمجموعات الإنفاق الرئيسية والمجموعات الفرعية للغذاء ، حتى يمكن الاسترشاد بتلك النتائج فى رسم السياسات الإنتاجية والاستهلاكية والغذائية فى ظل المستويات الانفاقية والدخلية الراهنة.

تم تقدير الدوال والمرونات الانفاقية فى الصورة اللوغاريتمية المزدوجة لمجموعات السلع الغذائية وغير الغذائية، كما تم استخدام أسلوب المتغيرات الصورية وذلك لقياس أثر الزمن (الفترتين ١٩٩٠/١٩٩١ ، ٢٠٠٤/٢٠٠٥)، البعد المكانى (ريف ، حضر) ، واختلاف الفئات الانفاقية (تم تقسيم الفئات الانفاقية إلى مستويين : منخفض ، مرتفع). واعتمدت الدراسة على البيانات الثانوية المنشورة الصادرة من الجهاز المركزى للتعبئة العامة والإحصاء، بحث الدخل والانفاق والاستهلاك خلال الفترة ١٩٩٠/١٩٩١ والتى واكبت بداية تطبيق برنامج الإصلاح الاقتصادي فى مصر ، وحتى أحدث هذه النشرات للفترة ٢٠٠٤/٢٠٠٥. وللمقارنة بين الفترتين اعتمدت الدراسة فى التحليل القياسى على القيم الحقيقة لبيانات الانفاق بعد استبعاد أثر التضخم.

وتوصلت الدراسة إلى انخفاض الأهمية النسبية للإنفاق على الطعام والشراب فى عام ٢٠٠٤/٢٠٠٥ عن نظيرتها فى عام ١٩٩٠/١٩٩١ فى كل من ريف وحضر مصر، وارتفاع نسبة المنفق على كل من : السكن ومستلزماته، والنقل والاتصالات. وبالنسبة لمجموعات الغذاء الفرعية احتلت نسبة المنفق على اللحوم من إجمالى المنفق على الطعام والشراب المرتبة الأولى سواء فى الريف أو الحضر. وتبين نتائج التحليل القياسى انخفاض قيمة معامل المرونة الانفاقية لمجموعات الغذاء ، الخدمات والرعاية الصحة ، الفنادق والمطاعم ، والسلع والخدمات المتنوعة فى عام ٢٠٠٤/٢٠٠٥ عن نظيرتها فى عام ١٩٩٠/١٩٩١ ، بينما ارتفعت قيمة معامل المرونة للمجموعات الانفاقية النقل والاتصالات ، الثقافة والترفيه ، والتعليم. وبالنسبة لمجموعات الغذاء الفرعية فقد انخفضت قيمة معامل المرونة الانفاقية لها مما يعنى أن هذه المجموعات تمثل سلعا أكثر ضرورة ، حيث تحولت مجموعات الفاكهة ، الألبان والبيض ، الأسماك ، واللحوم من السلع الكمالية أو شبه الكمالية فى عام ١٩٩٠/١٩٩١ إلى السلع الضرورية فى عام ٢٠٠٤/٢٠٠٥. مما يعنى أن الإجراءات التى تتصل بزيادة الدخول ، خاصة ما يستهدف منها إعادة توزيع الثروة فى صالح الطبقات محدودة الدخل ، والسياسات الاقتصادية الإصلاحية المطبقة خلال الفترة المدروسة كان لها تأثيرا إيجابيا ومعنويا على تغير النمط الانفاقى الاستهلاكي. كما أوضحت نتائج التحليل القياسى لأثر المكان عدم وجود فروق معنوية إحصائيا فى النمط الانفاقى عدا مجموعتى الغذاء ، والسلع والخدمات المتنوعة. وبالنسبة للمجموعات الفرعية للغذاء فقد تبين عدم وجود فروق معنوية إحصائيا فى النمط الاستهلاكي الغذائي لمجموعات الفاكهة ، اللحوم ، الأسماك ، الألبان والبيض ، والمشروبات بين الريف والحضر، ووجود فروق معنوية إحصائيا فى النمط الاستهلاكي للمجموعات الأخرى حيث ترتفع المرونة الانفاقية لمجموعات الحبوب والخبز ، الخضروات ، الزيوت والدهون ، والسكر والأغذية السكرية بالريف عنه فى الحضر. وبدراسة أثر اختلاف الفئات الانفاقية على نمط الإنفاق الاستهلاكي تبين انخفاض قيمة معامل المرونة الانفاقية لذوى فئات الانفاق المرتفعة لمجموعات الغذاء ، الملابس ، والمطاعم والفنادق ، وكذلك بالنسبة لمجموعات الغذاء الفرعية: الخضر ، الفاكهة ، اللحوم ، الأسماك ، والألبان والبيض مما يشير إلى التحسن الملحوظ فى نمط الإنفاق الاستهلاكى والغذائي لذوى الدخول المرتفعة.

فى ضوء النتائج السابقة توصى الدراسة بالعمل على تحقيق زيادة مستمرة فى مستوى الدخول الفردية الحقيقية لتحسين المستوى المعيشي بصفة عامة والغذائي بصفة خاصة ؛ العمل على زيادة الإنتاج من مختلف السلع الغذائية وبصفة خاصة مجموعات اللحوم ، الأسماك ، والألبان ومنتجاتها لمقابلة الزيادة المتوقعة فى استهلاكها ؛ وضرورة تدخل الحكومة بمزيد من السياسات الغذائية التى تعمل على إعادة توزيع الدخول لصالح الطبقات محدودة الدخل.