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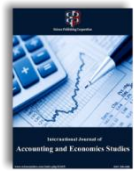

Estimating elasticities of main consumption groups for Egypt : using cross sectional data

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Abstract

The paper analyzes the demand of main consumption groups in Egypt to extraction parameter estimates of these groups. The consumer demand studies in Egypt are limited especially in addressing the demand groups. This paper considers elasticities of main consumption groups by estimating the linear approximation almost ideal demand system (LA/AIDS) using cross-sectional data from the Egyptian 2012/2013 household income and expenditure and consumption survey (HIECS). The estimated model was done by the Iterated Seemingly Unrelated Regressions (ISUR) estimator with the homogeneity and symmetry constraints imposed. The principal findings indicated that the Marshallian own-price elasticities were negative for main groups except for health, transport, and restaurants and hotels while the signs of expenditure elasticities were positive that meaning all groups are normal or luxury groups.

Keywords: *Consumer Price Index; Demand Analysis; Isur; La/Aids Model; Prices Elasticities.*

1. Introduction

Demand analysis uses information on consumer choices to predict responses to change's prices, incomes and characteristics. It represents the main core of the theory of choice, where the choices assume to correspond to the maximization of an objective subject to constraints of income (expenditure) and prices. Therefore, the analysis of choices can be restricted to the analysis of the allocation of a given total expenditure for consumer among different commodities taking consideration the effects of price variation and expenditure. The consumer's basic problem is how to allocate expenditures among different commodities (Mann; 1980) that aim to explain how some aggregate such as total household expenditure is distributed across its component categories.

In the recent years, increasing the studies that concern with the consumer demand either at the level of commodities or commodities groups due to the need to analysis the consumer's behavior. Therefore, to assure consumers satisfaction, we need clear information and understanding the consumption patterns and how the commodities linked with the prices and income. These relationships provide the facilities and mechanisms that permit a commodities price policy to function effectively a consumer demand context. Although the private consumption represents about 86% of the gross domestic product, the reliable information on the consumption patterns of commodities groups in Egypt is absent. Therefore, we need to undertake empirical studies address the main groups for the future projections and providing policy makers by with reliable estimates for the main demand groups.

Over time, the analysis of demand allocation developed from just econometric equations as in Nicholson (1949) to model verifies the constraint of demand theory there has been many forms used, it is the most famous the Rotterdam System introduced by Theil and Barten and the almost ideal demand system (AIDS) developed by Deaton and Muellbauer (1980). The main problem in chosen the best model is given a proximate picture about the structure of the demand relation and introduced an accurate estimate of elasticities. A familiar tool in practice of demand analysis is AIDS model, where it has some important advantages as satisfies the axioms of choice exactly, aggregates perfectly over the household, has a functional form consistent with known household budget data, and simple estimation, in addition, it used to test the restrictions of homogeneity and symmetry through linear restrictions on parameters (Deaton and Muellbauer; 1980).

Increasing the needs to analysis consumer behavior among the population leads to raising the consumer demand studies to assure satisfaction of consumers and provided clear information for understanding the consumption patterns in Egypt. This paper aims to investigate estimated parameters of the demand parameters estimating prices and expenditure elasticities for main groups. There are many studies analyzing the demand for groups or commodities in world countries. From these studies used the AIDS in investigating the demand. Özçelik and Şahinli(2009)estimated price elasticity for twelve product groups within LA/AIDS using generalized least squares (GLS) method through used data of the 2003 Turkish household income and consumption expenditure survey.They referred to the analysis of consumption demand helping in the process of the production decisions. Holt and Goodwin (2009) applied the LA/AIDS and translog demand system on quarterly historical meat price and consumption data for the United States from 1960 to 2004 using OLS method. They found that AID is slightly higher than the TL using likelihood function.

Tshikala and Fonsah (2012) estimated elasticities of imported fresh and frozen melons demand from U.S. quarterly data by static and dynamic LA/AIDS using iterative seemingly unrelated regressions (ISUR) estimation method using. They found elasticities in both models responsive price and income changes in the short and the long run. The results considered reference for exporting countries in pricing strategies for the different commodities.

Tash et al. (2012) investigated two estimations for LA/AIDS unrestricted and restricted to homogeneity and Symmetry using time-series data for Iran rural from 1971 to 2008 by ISUR method. Results of Iran's data showed the highest price sensitivity was in the transport group, and lowest price sensitivity is in the clothing group. The sign of income elasticity was positive that suggest that all groups are normal goods. Ngula (2014) examines the consumption patterns of four meat types in Central Kenya using cross-sectional data are obtained from a household's consumption survey. Ngula estimated the demand elasticities' LA/AIDS model using the maximum likelihood (ML) method.

The policy makers need to know how the consumer responses to changes prices and income from empirical evidence instead of assumptions. In tax policy analysis, Janský (2014) simulated influence of the rates on the value added tax in the Czech Republic for the eight main groups through estimating cross-prices and income elasticities using the Czech statistical office household expenditure and price data from 2001 to 2011.The demand elasticities were done by the quadratic almost ideal system (QUAIDS) with restrictions imposed using the ITSUR method. The study found taking the consumer responses into consideration increases in government revenues more than the static simulation. Furthermore, Beznoska (2014) investigated influence indirect taxation for Germany environmentally commodities using an income-tax simulation. The simulation process depended on the estimated cross-prices and expenditure elasticities using the LA/AIDS by OLS method.

The studies conducted in analyzing the consumer demand about Egypt are limited number and that used the LA/AIDS model in linear transformation analyzed the food demand whatever items or groups such as Dawoud (2005) and Alboghdady and Alashry (2010) except Abou-Ali and Ramadan (2013) used AIDS for analysis demand of cigarettes.

Dawoud (2005) discussed influence food demand on the economic conditions of Egyptian households through ten commodities, were estimated an Engel double-log model and LA/AIDS based on the Egyptian Household Income, Expenditure, and Consumption Survey (HIECS) 1999/2000 by OLS method. Depending on the estimated elasticities, Dawoud (2005) built projections for future food consumption up to the year 2015. Albogh dady and Alashry (2010) analyzed the demand for meat for six main types of meat were beef, mutton, rabbit, chicken, duck and fish. They estimated the LA/AIDS model using the ISUR method with the homogeneity and symmetry conditions imposed.

About-Ali and Ramadan (2013) used The LA/AIDS to analyze the influence of the new cigarettes' taxes on households' consumption based on the Egyptian HIECS 2008/2009. It is estimated own-price elasticities and crossed price elasticities to show the effects of the new taxes on cigarettes' consumption. The LA/AIDS model is estimated using the SUR method with the homogeneity and symmetry conditions imposed with add age at the household head in years, individuals number in a household, and dummy variables for gender, asset and urban.

Dawoud (2014) estimated the double-log model by weighted least squares (WLS) from aggregated data to analysis the groups of food patterns in Egypt. The study found expenditure elasticities were positive and less than one that meant that they decreased significantly over the time. Dawoud (2014) compare with the urban and rural and found the rural elasticities tend to be higher than urban. Furthermore, the study found it at high-income are lower than low-income. The results introduced guideline for future policy implication in respect of the demand management and food consumption in Egypt.

The main aim of the paper is producing estimates of the restricted demand parameter for main groups in Egypt. Therefore, we adopted the LA/AIDS model to estimate the demand of main groups then estimating the own-price, the cross-prices and expenditure elasticities. The paper is organized as follows: Section 2 provides the background of the LA/AIDS model and estimation method. Section 3 data sources. Section 4 the empirical results are given including the estimation of prices and expenditure elasticities of demand for main groups. Finally, the conclusion is given in section 5.

2. The model and estimation method

2.1. The linear approximation almost ideal demand system (LA/AIDS)

Deaton and Muellbauer (1980) were the first presented the AIDS model, since this date many empirical economists have estimated applied and adapted this model to various contexts. Therefore, the AIDS model for many reasons considers the most popular in applied demand analysis. From this reasons, homogeneity and symmetry restrictions depend on estimated parameters and thus easily imposed and tested. Addition to it is derived from a specific cost function and thus corresponds to a well-defined preference structure that convenient for welfare analysis.

Consumer demand theory measures the level of consumer satisfaction from consuming a particular bundle of commodities, it concerns with how a rational consumer choose the commodity bundle that yields maximum utility, $u(q)$, through chooses n element from a vector of quantities or commodities that maximize his utility subject to a budget constraint as

$$q(u,p) = \max_{q} u(q) \text{ subject to } p'q = E \quad (1)$$

Whereq (u, p) is the indirect utility function q is a vector of quantities or commodities, pa prices vector of consumed commodities and E is the consumer expenditure.

An alternative way of modeling the consumer's decision is minimize the expenditure needed to attain a specific utility at a given set of prices (Deaton and Muellbauer; 1980), which known as the cost function that obtained by inverting the indirect utility function (1) and solving for E in terms of the level of utility u and a set of prices p

$$C^h(U,p) = \min_{q} p'q \text{ subject to } U^h(q) = u \quad (2)$$

The basic AIDS model is developed from a particular cost function taken from the general class of price independent generalized logarithmic (PIGLOG) cost function by

$$\ln C\,(U,p) = (1-u)\ln\{a(p)\} + u\ln\{b(p)\} \quad (3)$$

The utility lies between 0 subsistence and 1 bliss, so $a(p)$ and $b(p)$ can be regarded as representing the cost of subsistence and bliss, respectively (Deaton and Muellbauer; 1980).

$$\ln a(p) = \alpha_0 + \sum_i \alpha_i \ln(p_i) + 1/2 \sum_i \sum_j \gamma_{ij}^* \ln(p_i)\ln(p_j) \quad (4)$$

And

$$\ln b(p) = \ln a(p) + \beta_0 \prod_i p_i^{\beta_i} \quad (5)$$

$i, j = 1, \ldots, n$. Thus, the AIDS cost function is

$$\ln c(u,p) = \alpha_0 + \sum_i \alpha_i \ln(p_i) + 1/2 \sum_i \sum_j \gamma_{ij}^* \ln(p_i)\ln(p_j) + u\beta_0 \prod_i p_i^{\beta_i} \quad (6)$$

Where α_i, β_i, and γ_{ij}^* are parameters.According to Shephard's Lemma, differentiation of the logarithmic cost function (6) with respect to a logarithmic price yields the quantity demand $\partial \ln c(u,p)/\partial \ln(p) = q$ (Dawoud; 2005) then multiplying both sides by $p_i/c(u,p)$gives expenditure share, w_i, equations for each commodity ((Deaton and Muellbauer; 1980), (Holt and Goodwin; 2009) and (Meyer, Yu and Abler 2011))as a function of prices and utility

$$w_i = \alpha_0 + \sum_j \gamma_{ij} \ln(p_j) + \beta_i u \beta_0 \prod_i p_j^{\beta j} \quad (7)$$

Where $\gamma_{ij} = 1/2(\gamma_{ij}^* + \gamma_{ji}^*)$

Deaton and Muellbauer (1980) substituted the utility u in each share equation the indirect utility function $q(p, E)$, where the expenditure E equal to $c(u, p)$ as

$$w_i = \alpha_i + \sum_j \gamma_{ij} \ln(p_j) + \beta_i \ln\left(\frac{E}{P}\right), i, j = 1, \dots, n \quad (8)$$

P is the translog price index defined as

$$\ln(P) = \alpha_0 + \sum_i \alpha_i \ln(p_i) + 1/2 \sum_i \sum_j \gamma_{ij} \ln(p_i) \ln(p_j) \quad (9)$$

Prices generally tend to be a collinear plus to it does not allow for a linear estimation of the demand system. Therefore, in the estimation of the AIDS model, it is common practice to redefine P as a deterministic function and not a function of parameters. The most common choice is Stone's geometric price index P*and takes the form

$$\ln(P^*) = \sum_k w_k \ln(p_k) \quad (10)$$

Thus, the linear approximation AIDS (LA/AIDS) model is

$$w_i = \alpha_i + \sum_j \gamma_{ij} \ln(p_j) + \beta_i \ln\left(\frac{Y}{P^*}\right), i, j = 1, \dots, n \quad (11)$$

The LA/AIDS model in equation (11) consistent with the theory of demand, where achieves conditions of the adding-up restrictions$\sum w_i = 1$, the homogeneity and the symmetry restriction. The intended by homogeneity restrictions in the consumption models, homogeneity of the price coefficients are equal proportionate change in all prices and income will leave the demand shares unchanged while the symmetry restrictions indicate that the consumer response to price change is symmetrical with respect to two commodities i and j(Bewley 1986, Dawoud 2005, Deaton &Muellbauer1980 and Holt & Goodwin 2009). The adding-up restrict is $\sum_{i=1}^n \alpha_i = 1$, $\sum_{i=1}^n \gamma_{ij} = 0$ and$\sum_{i=1}^n \beta_i = 0$. The homogeneity restrictions are $\sum_{i=1}^n \gamma_{ij} = 0$. The symmetry restrictions are$\gamma_{ij} = \gamma_{ji}$fori ≠ j.

2.2. The expenditure and price elasticities

Demand elasticity explains how the demand for a commodity is sensitive to the changes in household expenditure, price and other economic variables. Therefore, it is important for economists to understanding the potential change in demand due to changes in economic variables as the price and expenditure. Demand elasticity is a measure of how much the quantity demanded will change if another variable change. Interpretations of the demand elasticity, according to a price change, are elastic, inelastic and unit elastic. The expenditure elasticity measures the responsiveness of the quantity i to a change in the consumer expenditure, ceteris paribus. According to values of the expenditure elasticity, the commodities classified as normal if located between 0 and 1 is normal, greater than 1 luxury and less than zero is inferior.

The price elasticity measures the responsiveness of the quantity to a change in its price, ceteris paribus. The prices elasticities divided into two types, the compensated (Hicksian) price and the non-compensated (Marshallian) price elasticities. The Hicksian elasticities, $\varepsilon_{ij}^H = (\partial q_i / \partial p_j) * (p_j / q_i)$, describe quantities responding to changes in the predetermined prices as we move along the indifference curve. The Marshallian elasticities take consideration the income effects of a change in the predetermined prices (Bracke and Meyermans; 1997), $\varepsilon_{ij}^M = \varepsilon_{ij}^H - w_j \eta_i$. In brief, the Marshallian elasticity describes how demand response to change in prices and income while the Hicksian elasticity how demand response to change in prices and utility.

The Hicksian and Marshallian prices elasticities will be similar if the share of income devoted to commodity q is small or the income elasticity of q is small. Interpreting values of own-prices elasticities, i = j coefficients after take the absolute value mean that elastic if greater than one, inelastic if less than one and if unitary elasticity when equal one. The positive sign of cross price elasticity, i ≠ j, indicates that two groups are substitution and vice complements while are independent when equal zero.

The different elasticities for the LA/AIDS model are: the expenditure elasticity is $\eta_i = 1 + \beta_i / w_i$, the Marshallian prices elasticities are $\varepsilon_{ij}^M = -\delta_{ij} + \frac{\gamma_{ij}}{w_i} - \frac{\beta_i w_j}{w_i}$ and the Hicksian prices elasticities are $\varepsilon_{ij}^H = -\delta_{ij} + \frac{\gamma_{ij}}{w_i} - w_j$, where δ_{ij} the Kronecker delta take one if isi = j and zero otherwise.

2.3. Estimation method

The system of equations in case the dependent variable summing one, thus the estimated model is consistent with the constraint and require that one of the behavioral equations is essential redundant. Since Ω is singular, methods of estimation system equations can't be applied to full system (11), but an estimator based on a subset of the equations does exist except all regressors appear in each equation thus it can estimate the full system with the cost that estimates do not satisfy the adding-up restrictions (Bewley, 1986).Thus, the system can't be estimated jointly and to solve the singularity problem, we drop one equation and estimate the remaining system jointly. In estimating the demand system, we use the Iterated Seemingly Unrelated Regressions (ISUR) estimator.

A large number of economists and statisticians in demand analysis prefer the ISUR estimator. The ISUR estimators collapse to the OLS if the error terms across equations are not contemporaneously correlated or each of the n equations has the same regressors. The ISUR efficiency if restrictions are across equation, where we imposed restrictions of symmetry and homogeneity for demand theory.

3. Data sources

Analysis demand of main consumption groups based on data of the Egyptian HIECS 2012/2013 that conducted by CAPMAS. It is also based on data of consumer prices index (CPI) issued by prices department at CAPMAS. For estimating the LA/AIDS model we depend on 50% of raw data that introduced from CAPMAS for researchers. The HIECS survey is one of the most important household surveys implemented by statistical agencies in various countries. Data of HIECS combined into 12 main commodities described in in table 1. Also, CAPMAS produces the index of consumer prices (CPI) that publish according to the international classification COICOP-HBS 2003 (El-Sheikh and Kandil; 2013).

For estimating our demand system, we combined HIECS data with CPI, where we use CPI at eight regional levels with the 12 different consumption shares categories. Price indexes belong to commodity groups were used separately for every group and month. Table 1 shows summaries of main consumption groups from 50% of raw data.

Table 1: Description of Study Variables

Variable	Description	Mean	Std	Min	Max
Group1	Food and Non-Alcoholic Beverages	0.412	0.112	0.000	0.816
Group2	Alcoholic Beverages, Tobacco and Narcotics	0.041	0.063	0.000	0.469
Group3	Clothing and Footwear	0.054	0.029	0.000	0.246
Group4	Housing, Water, Electricity, Gas and other fuels	0.190	0.088	0.008	0.770
Group5	Furnishings, Household, Equipment and Routine Maintenance of The house	0.039	0.038	0.000	0.746
Group6	Health	0.090	0.085	0.000	0.812
Group7	Transport	0.041	0.047	0.000	0.759
Group8	Communications	0.021	0.018	0.000	0.199
Group9	Recreation and Culture	0.015	0.044	0.000	0.763
Group10	Education	0.028	0.052	0.000	0.644
Group11	Restaurants and Hotels	0.037	0.037	0.000	0.570
Group12	Miscellaneous Goods and Services	0.031	0.024	0.000	0.532

Source: The Authors' calculations from the Egyptian HIECS 2012/2013.

4. Empirical results

To avoid singularity of the residual covariance matrix that caused from the share equation's sum up to one (the adding-up restrictions), we dropped the equation of miscellaneous goods and services group. The criterion of dropped equation depends on the last equation considers the rest commodities that doesn't classify in the previous groups that remain on the major classified groups. The estimated parameters of the LA/AIDS model from the Egyptian HIECS 2012/2013 and CPI data in Table 2 are presented. The ISUR method has been used in estimating the model to obtain on consistent and asymptotically efficiently estimates. The parameters of the restricted LA/AIDS model and their elasticities were estimated with the demand restrictions imposed using the micEcon Aids package version: 0.6-16 in R software version 3.2.0 for windows (Henningsen; 2014).

Table 2: The Result of Restricted LA/AIDS

β_i	γ_{i11}	γ_{i10}	γ_{i9}	γ_{i8}	γ_{i7}	γ_{i6}	γ_{i5}	γ_{i4}	γ_{i3}	γ_{i2}	γ_{i1}	α_i	I
-0.09*	-0.09*	-0.06*	0.01	0.06*	-0.05*	0.04	-0.02*	0.09*	-0.01	-0.10*	0.14*	0.97*	1
0.00	0.01	0.05*	0.00	0.02	-0.01	0.00	0.01	0.05*	0.01	-0.03	-0.10*	0.07*	2
0.01*	-0.03*	0.00	-0.05*	-0.04*	-0.09*	0.14*	0.00	0.02*	0.05*	0.01	-0.01	-0.02	3
-0.04*	0.12*	-0.02^{+}	0.00	0.01*	0.00	-0.19*	0.00	-0.10*	0.02*	0.05*	0.09*	0.34*	4
0.01*	0.00^{+}	0.01*	0.00	0.00*	0.00	0.00	0.00^{+}	0.00	0.00	0.01	-0.02*	0.00	5
0.01*	-0.19*	-0.03	-0.01	0.03	-0.14*	0.35*	0.00	-0.19*	0.14*	0.00	0.04	0.06*	6
0.03*	0.09*	0.04*	0.05*	0.05*	0.08*	-0.14*	0.00	0.00	-0.09*	-0.01	-0.05*	-0.10*	7
0.01*	-0.04*	-0.02*	0.02*	-0.09*	0.05*	0.03	0.00*	0.01*	-0.04*	0.02	0.06*	-0.05*	8
0.02*	0.01	0.00	-0.04*	0.02*	0.05*	-0.01	0.00	0.00	-0.05*	0.00	0.01	-0.08*	9
0.03*	0.02*	0.02	0.00	-0.02*	0.04*	-0.03	0.01*	-0.02^{+}	0.00	0.05*	-0.06*	-0.19*	10
0.01*	0.10*	0.02*	0.01	-0.04*	0.09*	-0.19*	0.00^{+}	0.12*	-0.03*	0.01	-0.09*	0.00	11

Source: The Authors' findings from the Egyptian HIECS 2012/2013 and CPI.
Note: Signif. Codes: 0.05 '*' and 0.1 '+'

The majority of the estimated parameters of the LA/AIDS are significant coefficients, and overall the model fits the data well. Coefficients of the system are significantly different from zero and most prices of food and non-alcoholic beverages; housing, water, electricity, gas and other fuels; transport; communications and restaurants and hotels groups appear with significant considerable regularity. The estimates of β Classify the food and non-alcoholic beverages and housing, water, electricity, gas and other fuels as necessities groups while the other groups are luxuries except alcoholic beverages, tobacco and narcotics as constant regardless of changes in expenditure ($\beta = 0$). Classifying the food group corresponds to axioms of demand theory that states the food necessities group as at results of Deaton and Muellbauer (1980).

The estimated expenditure elasticities, in table 3, are positive implies that raising the quantity demand if income rises. The expenditure elasticities for food and non-alcoholic beverages (0.79) alcoholic beverages, tobacco and narcotics (0.98) and housing, water, electricity, gas and other fuels (0.80) are less than one, which implies that they are normal commodities groups. On the other hand, the rests of groups are greater than one, which implies that they are luxury groups. It's clear in demand theory that all necessary commodities are inelastic and not vice versa. All luxury commodities are elastic and not vice versa.

Table 3: Total Expenditure and Own –Price Elasticities of Restricted LA/AIDS

Groups	Expenditure Elasticity	Marshallian Elasticities	Hicksian Elasticities
Group1	0.79	-0.58	-0.25
Group2	0.98	-1.68	-1.64
Group3	1.22	-0.14	-0.07
Group4	0.80	-1.47	-1.32
Group5	1.19	-1.09	-1.05
Group6	1.12	2.93	3.03
Group7	1.64	0.80	0.87
Group8	1.34	-5.18	-5.15
Group9	2.28	-3.94	-3.90
Group10	2.22	-0.34	-0.28
Group11	1.30	1.68	1.73

Source: The Authors' findings from the Egyptian HIECS 2012/2013 and CPI.

The Marshallian own-price elasticities are found to be negative, as expect except for health, transport, and restaurants and hotels groups. According to the law of demand, if the price of a commodity increase, it will lead to a fall in the quantity demanded and vice versa, ceteris paribus (see (O'Sullivan; 1991) and (Jehle and Reny; 2011)). The reason for this unexpected sign in health, transport, and restaurants and hotels groups may be due to Giffen goods, which the commodities that people consume more of as the price rises and vice versa. Regarding the Marshallian elasticities, the main groups are elastic except food and non-alcoholic beverages, clothing and footwear, transport and education groups that mean the consumers less responsive to price variation within these groups versus he is more responsive the other groups which have elastic greater than one.

According to the Marshallian own-price elasticities, prices increases by 1 percent led to fall the quantity demand more than 1 percent for alcoholic beverages, tobacco and narcotics group (1.68%); housing, water, electricity, gas and other fuels (1.47%), furnishings, household, equipment and routine maintenance of the

house group (1.09%); communications group (5.18%) and recreation and culture group (3.94). These results indicate to fall the revenue of new tax from this groups while the positive elasticities(health, transport, and restaurants and hotels) and inelastic negative groups (food and non-alcoholic beverages, clothing and footwear, and education) are expected increasing the revenue from imposing new taxes. However, we should be care with the substitution and complementary effects of commodity groups. It's clear that the prices elasticities measure the expect influence for imposing new taxes or change in price's commodities not suggesting new taxes. Furthermore, the expenditure elasticities measure the expected influence for change in household expenditure.

Table 4 shows the Marshallian cross prices elasticities while table 5 contains the Hicksian cross price's elasticities. The Marshallian price's elasticities indicate that the gross substitution and complementary effects of commodity groups have been poor in general (less than absolute one). The food group is gross complementary with alcoholic, furnishings, transport, education and restaurants groups and is gross substitution with clothing, housing and other fuels, health, communications and culture groups. According to the Marshallian or Hicksian price's elasticities, The alcoholic beverages, tobacco and narcotics group is gross complementary with food, transport and culture groups and is gross substitution with the rest groups that indicate when the government go to raise a tax on this groups the consumer expect to reduce their expenditure on groups such as transport, education and health groups.

Table 4: Marshallian (Uncompensated) Price Elasticities

Groups	1	2	3	4	5	6	7	8	9	10	11
1	-0.58	-0.23	-0.02	0.26	-0.05	0.11	-0.11	0.15	0.03	-0.14	-0.20
2	-2.40	-1.68	0.24	1.25	0.13	0.01	-0.30	0.41	-0.04	1.20	0.21
3	-0.32	0.17	-0.14	0.39	-0.02	2.59	-1.63	-0.82	-0.88	0.05	-0.62
4	0.56	0.28	0.14	-1.47	0.02	-0.96	0.01	0.08	0.02	-0.10	0.62
5	-0.66	0.12	-0.03	0.04	-1.09	0.08	0.00	0.05	0.08	0.13	0.10
6	0.35	0.00	1.57	-2.09	0.04	2.93	-1.60	0.28	-0.09	-0.37	-2.14
7	-1.49	-0.32	-2.15	-0.10	-0.02	-3.52	0.80	1.12	1.09	0.86	2.11
8	2.62	0.76	-2.08	0.61	0.08	1.17	2.18	-5.18	1.09	-0.84	-1.73
9	0.18	-0.18	-3.32	0.02	0.17	-0.67	3.08	1.58	-3.94	-0.01	0.84
10	-2.70	1.70	0.04	-0.94	0.14	-1.27	1.24	-0.65	0.00	-0.34	0.61
11	-2.46	0.22	-0.91	3.06	0.10	-5.17	2.35	-0.99	0.34	0.49	1.68

Source: The Authors' findings from the Egyptian HIECS 2012/2013 and CPI.

Table 5: Hicksian (Compensated) Price Elasticities

Groups	1	2	3	4	5	6	7	8	9	10	11
1	-0.25	-0.20	0.03	0.41	-0.02	0.18	-0.08	0.16	0.04	-0.12	-0.17
2	-2.00	-1.64	0.30	1.44	0.16	0.09	-0.26	0.43	-0.03	1.23	0.25
3	0.19	0.22	-0.07	0.63	0.02	2.70	-1.58	-0.79	-0.86	0.08	-0.58
4	0.89	0.31	0.18	-1.32	0.06	-0.89	0.05	0.10	0.04	-0.08	0.65
5	-0.17	0.17	0.03	0.27	-1.05	0.19	0.05	0.07	0.10	0.17	0.14
6	0.81	0.04	1.63	-1.87	0.08	3.03	-1.55	0.31	-0.08	-0.34	-2.10
7	-0.81	-0.25	-2.06	0.21	0.05	-3.37	0.87	1.15	1.11	0.90	2.17
8	3.17	0.82	-2.01	0.86	0.13	1.29	2.24	-5.15	1.11	-0.80	-1.68
9	1.12	-0.09	-3.20	0.45	0.26	-0.47	3.18	1.63	-3.90	0.06	0.93
10	-1.79	1.79	0.16	-0.52	0.23	-1.07	1.33	-0.61	0.03	-0.28	0.70
11	-1.92	0.27	-0.84	3.31	0.15	-5.05	2.41	-0.96	0.36	0.52	1.73

Source: The Authors' findings from the Egyptian HIECS 2012/2013 and CPI.

5. Conclusions

This paper used the LA/AIDS model to derived price and expenditure elasticities for main groups of consumption in Egypt. As indicator on the fit of the model, it contained several significant coefficients. According to the estimates of β, food and housing group are necessities groups, other commodities groups are luxuries except alcoholic group as constant. The expenditure elasticities are positive implies that all groups are normal or luxury commodities, where food, alcoholic and housing groups are normal commodities groups and the rest of groups are luxury groups. There are converging between values of the Marshallian and Hicksian own-price elasticities. The Marshallian shows that most the main groups are elastic except food and non-alcoholic beverages, clothing and footwear, transport and education groups.

The paper used the 50% from the raw data of Egypt HIECS that conducted by CAPMAS in 2012/2013 and data of CPI is issued by CAPMAS, where we combine the two data sets for estimating the coefficients of LA/AIDS model then expenditure and price elasticities. The estimated elasticities can be used as an indicator in determining tax's rate, for example, the Marshallian own-price elasticity of Alcoholic Beverages, Tobacco and Narcotics was -1.683 thus increasing tax will reduce the demand on it but accompanied by a decline in tax revenues. The Elasticities are represented as evidence to the decision maker in predicting results of future taxes planning on final consumption of groups.

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