

Would taxes decrease tobacco consumption in Egypt?

Hala Abou-Ali

Racha Ramadan

Version September 2013

Abstract

Increasing the prices of tobacco is one of the most effective policies to reduce tobacco consumption. In this paper we use an Almost Ideal demand System to analyze the impact of the new taxes of cigarettes on Egyptian households' consumption. Own price elasticities and cross price elasticities are estimated using the Egyptian Household Income, Expenditure and Consumption Survey (2009), to show the effects of the new taxes on cigarettes' consumption as well as the substitution effects between the different tobacco products consumed by the households.

Introduction

By 2030, if the actual trend of cigarettes consumption is maintained, cigarettes smoking is expected to be the highest cause of death worldwide accounting for more than 10 million death per year (Eozenou and Fishburn, 2009). According to the tobacco Atlas (2013), 600 000 individuals died from second hand smoke in 2011 and 75% of these deaths were among women and children. Nearly 20% of the World's population smoke cigarettes: 800 million men and 200 million women. Some countries are envisioning end game for tobacco with prevalence targets of under 5% (Tobacco Atlas, 2013).

Evidence show that the health burden of tobacco consumption is increasing over time in low and middle income countries while it is the opposite case in high income countries. This can be explained by the strong tobacco control policies applied by high income countries such as advertising and sponsorship restrictions, health warnings, restrictions on smoking in public areas, restrictions on nicotine and tar in addition to excise taxes. Such policies were an incentive for tobacco industry to shift their market to the low and middle income countries (Blecher and Walbeek, 2004).

Despite the addictiveness of tobacco, studies show that a 10% increase in the real price of cigarettes reduce consumption by about 4% in high income countries and by between 4% to 8% in low and middle income countries (Blecher and Walbeek, 2004). Increasing the prices of tobacco is one of the most effective policies to reduce tobacco consumption. As rising tobacco prices will reduce the actual consumption and prevent new smokers from starting (Eozenou and Fishburn, 2009). Most of the literature about tobacco consumption and taxation agree on the fact that a tax that induces an increase in the real price of cigarettes is a very effective method of reducing cigarettes consumption (Blecher and Walbeek, 2004).

According to the Global Adult Tobacco Survey, Egypt Country Report (2009), over the past 30 years, the number of smokers in Egypt has increased over twice as fast as the population. Between 1980 and 1995; per capita consumption of tobacco declined due to cigarette price increases; however, this trend reversed in the late 1990s when price increases were frozen and personal income increased. Such high level of consumption has an important negative impact on the health and the productivity of the population. According to the Ministry of Health (MoH), in 2005, there were around 3.4 billion EGP (US\$ 616 million) spent annually in Egypt to treat the diseases caused by tobacco use.

In December, 2012, economic reform program is launched by the Egyptian government to respond to IMF's technical requirements. This included, among other measures, raising taxes on cigarettes and other types of tobacco which will yield to an increase of 50% and 150% of products' prices, respectively. The objective of this paper is to study the impact of these new taxes on the consumption of different tobacco products; namely how the rising price will affect the smokers' behavior. The paper will take into consideration the substitution effect that would rise from the new taxes, as consumers may switch from one tobacco product to another. As what happened in the early 1990s, when cigarette price increased it induced increase in consumption of hand-rolled cigarettes and shisha.

The paper is organized as follows: Section 1 reviews the literature of tobacco consumption and tax reform. Section 2 describes the tobacco consumption in Egypt. Section 3 presents the theoretical framework. Section 4, illustrates the data used and sketches the estimation results. Section 5 concludes.

1. Literature Review

Most of the literature about tobacco consumption and taxation agree on the fact that a tax that induces an increase in the real price of cigarettes is a very effective method of reducing cigarettes consumption. Rising tobacco price have positive impact on the government revenue and public health. The health burden of smoking can be measured by direct and indirect costs. The direct costs consist of the medical treatments while the indirect costs include the decrease of productivity from morbidity and mortality. (Guindon et al (2002), Blecher and Walbeek (2004), Hu et al (2009)).

According to Czubeck and Johal (2010), taxation is the single largest component in the price of a packet of cigarettes. Rising duties are translated into rising prices of cigarettes for the consumers. The rising duty will increase the tax revenue (positive impact) but will reduce cigarettes consumption (negative impact). Czubeck and Johal (2010) estimate the final revenue impact of different policy options. They estimate cigarette price elasticities in UK by an Engel Granger Two steps Cointegration procedure using quarterly time series data. The UK duty paid consumption of cigarette is the dependent variable explained by the price of cigarettes and of the substitutes in addition to other factors affecting consumption. The cigarette elasticity was found to be -1.05. They found that short run elasticity is inelastic than the long run. This is expected and can be explained by the fact that consumers adjust better their consumption patterns in the long run.

Cigarettes affordability is measured by the cost of the cigarettes relative to the per capita income. Blecher and Walbeek (2004) estimate affordability elasticities of demand for 28 high income countries and 42 developing ones. The paper shows the evolution of cigarette prices in these countries during the period of 1990 to 2001. Blecher and Walbeek (2004) found that instead the higher cigarette price in developed countries, high income make the cigarettes more affordable. Affordability is an important measure to take into consideration when controlling tobacco consumption. They conclude that for tobacco control, the governments should adjust the excise tax on cigarettes in order to increase the real price of cigarettes and to prevent cigarettes to become more affordable over time.

According to some authors, smoking cigarettes is not rational, so rising prices will not yield to decreasing consumption (Czubeck and Johal, 2010). However, there is a large literature demonstrating that tobacco consumption follows the economic laws and it is decreasing with price rise. Estimated price elasticities vary between -0.007 to -1.11 (Bai and Zhang, 2005; Escario and Morino, 2004; and Lance et al, 2004). It has also been noticed that lower income group are more price elastic. However, rising cigarette prices may yield to reduce the value of the consumption but not the volume. This means that consumers will switch from a higher to

a lower priced packet of cigarettes or they may switch to hand rolling cigarettes or smuggling. Such behavior will offset the health benefits of the higher taxes.

Discrepancies of tobacco prices between countries are an incentive for smuggling. This later was the reason behind decreasing tobacco taxes in countries such as Canada (in 1994) and Sweden (in 1998) (Guindon et al, 2002). In addition, rising real prices of cigarettes does not mean that cigarettes become less affordable as income and cigarettes consumption are positively related. An increase in income would offset the increase in real price of cigarettes (Guindon et al, 2002).

Guindon et al (2002) examine trends and price affordability of cigarettes in more than 80 countries in the 1990's. They found that cigarette prices are higher in wealthier countries and in countries where there are tobacco control programs. However cigarettes became more affordable in developing countries. According to a World Bank report in 1999, on average if tobacco products prices increase by 10%, demand is expected to decrease by 4% in high income countries and by 8% in low and middle income countries. The young and the poor are the more responsive to such price changes than the wealthier and the older individuals. There was supportive evidence in many countries such as UK, USA and South Africa. They conclude that, given the trends in the cigarettes prices, there is a possibility of rising cigarettes prices to increase government's revenue and improve public health. They recommend increasing uniformly all tobacco products prices to avoid substitution, earmarking a given percentage of such taxes revenues for tobacco control programs and adjusting cigarettes prices with change in the Consumer Price Index (CPI).

Hu et al (2009) study the impact of tobacco tax increase on tobacco consumption, government tax revenue, lives saved, employment and revenue loss in tobacco cigarette industry and tobacco farming in China. They estimate an elasticity of -0.15 and find that a tax increase of 1RMB per pack of cigarette will increase the Chinese tax revenue by 129 Billion RMB, reduce consumption by 3.0 billion packs of cigarettes and save 1.14 million lives.

Studying the impact of price rising on tobacco consumption requires estimating a demand model in order to take into account the substitution and complementarities effects between the different goods and estimate price elasticities. The Almost Ideal Demand System (AIDS), the one used in this paper, is one of the common used models in the tobacco literature. Escario and Molina (2004) studied the optimal tax on three types of tobacco in order to control the social costs resulted from their consumption in Spain, using an addictive version of the Linear Almost Ideal Demand System (LAIDS). They use Spanish time series covering the period from 1964 to 1995 for four groups of goods; Virginia tobacco, black tobacco cigars and other goods. They found that the demands of all three tobacco goods are inelastic; the highest corresponding to the cigars (-0.93) and the lowest for the black tobacco (-0.47). The cross price elasticities show that the Virginia and Black Tobacco can be considered as substitute goods, as well as the black tobacco and cigars. However, Virginia tobacco and cigars are complementary goods. Finally they recommend the policy makers to correct the social cost resulting from tobacco by imposing taxes equal to this cost.

In 2009, Eozenou and Fishburn estimate cigarette price elasticity in Vietnam using an AIDS model using spatial panel from household cross sectional data. They consider spatial variation of prices and quantity demanded. They take into account both quality and quantity choices. Their estimates yield to a price elasticity for demand of cigarettes around -0.53. They also conclude that increasing taxes on cigarettes will yield to an increase in government's revenue. Ozclik and Sahinli (2009) estimate AIDS model using data from the Household Income and Consumption Expenditure conducted by the Turkish Statistical Institute for 2003 to estimate price elasticities for 12 groups of goods among which are alcoholic beverage, cigarettes and tobacco. They found that alcoholic beverages, cigarettes and tobacco are inelastic with a price elasticity of -0.9954.

In Egypt, Nassar (2003) estimate the expenditure (income) and price elasticities using the CAPMAS Household surveys for two periods of time (1995/1996 and 1999/2000) in order to study the impact of the increase of the tobacco prices on consumption. According to the paper results; expenditure elasticities are positive and less than 1 indicating that any change in income will induce small change in the tobacco consumption. For 1999/2000, each 1 percent increase in the price of cigarettes will yield to a decrease of the consumption by about 0.4% at the national level as well as at the urban and rural levels. Such small change in consumption will result in higher government revenue with any tax increase. An interesting result of the paper is that richer quartiles are more responsiveness to price changes than the poorer ones. Such a result is contrary to the economic theory and the empirical results for other countries.

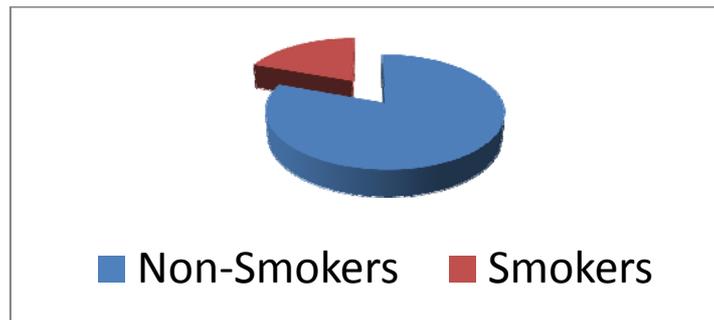
As a summary, there is no doubt that tobacco taxes are an effective way in tobacco consumption control in order to decrease the negative health effects of such consumption and increase government revenue. However, to maintain the required impact for such policy, the real value of the tax increase should be sustained, it should as well be applied to all tobacco products in order to avoid substitution between the different products. Smuggling possibilities should be taken into consideration while applying such policy as well as other policies as media campaigns, education and other public health efforts (Chaloupka, 1998).

2. Tobacco consumption in Egypt

Smoking tobacco is important in Egypt. Euromonitor International, 2012, shows that smoking tobacco registered current value growth of 9% in 2011. Tobacco production is dominated by Eastern Tobacco Company (SAE) with 67% volume share in 2011. The majority of this company is owned by the State.

Concerning smoking prevalence, 19.4% of the Egyptian population are smokers (Figure 1). Most of the smokers are male. According to the World Health Organization (country profile in 2011), in 2009, 37.6 % of the male population smoke any type of tobacco and around 31.8% smoke cigarettes (Table 1). While females smokers are around 0.5% and 0.2% any smoked tobacco and cigarettes, respectively.

Figure 1: Overall Egyptian Smoking prevalence in 2009



Source: Global Adult Tobacco Survey, Egypt Country Report 2009

Table 1: Adult Smoking Prevalence in 2009

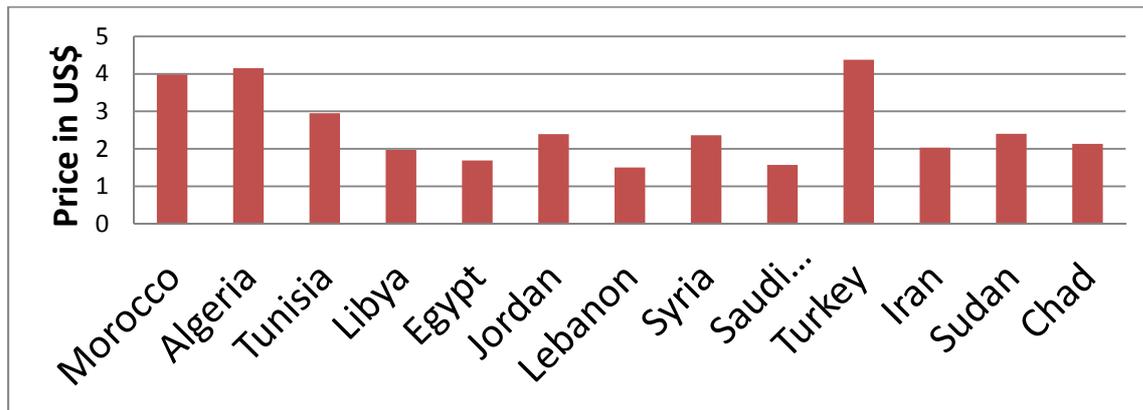
Adult prevalence, smoking (%)*	Any smoked tobacco		Cigarettes	
	Current	Daily	Current	Daily
Male	37.6	35.9	31.8	30.6
Female	0.5	0.5	0.2	0.2
Total	19.4	18.5	15.7	15.7

Source: World Health Organization, Country Profile of Egypt, 2011.

*Ages 15+, Global Adult Tobacco Survey, 2009

In 2010, the tax inclusive retail price of the lowest cost brand in Egypt, called *Cleopatra*, is 4EGP for a pack of 20 cigarettes. While the price of a *Marlboro* or similar brand is 10.50 EGP per pack (World Health Organization, 2011). In 2011, there was an important increase in the tobacco products price, especially cigarettes, with an average unit price increase of 22% (Euromonitor International, 2012). As a result, cigarettes volume sales fell by 15%. However, cigarettes prices in Egypt are amongst the lowest of different Arab Countries. Figure 2 shows that cigarette price in Egypt is lower than 2 US dollars. While it is 2 US dollars in Lybia and it is more than 2 US dollars in Jordan and Sudan. This pricing scheme suggests room for cigarettes price increase without inducing smuggling. However, illicit trade increased since the revolution of the 25th of January 2011. In 2011, 17% of the total volume sold is classified as illicit compared with 2% in 2010. Illicit products can be cheaper than duty paid products by 30% (Euromonitor International, 2012).

Figure 2: Cigarette prices in some selected countries



Data Source: www.TobaccoAtlas.org

According to the Euromonitor International, 2012, rising cigarettes prices drive the consumers to switch to cheaper alternatives, illicit products in addition to switching to shisha (Egyptian water pipe). The price of this later saw the highest tax increase in 2011 (100%) however given its low unit price before the tax increase; shisha remains cheaper than cigarettes.

Another Tobacco product consumed by Egyptians is the cigar. The price of this luxury imported product is very high, especially in 2011 with the economic problems in Egypt. Standard cigar's prices increase by 440% in 2011 (Euromonitor International, 2012).

Egypt has a number of laws and regulations which prohibits smoking in public places, bans advertising on televisions and radio (but it is allowed in print, on billboards and at the point of sales). There is a health warning label on cigarette packs and print advertisement. According to law 4/1994, there is a fine of 10 EGP for smoking in public transportation (Nassar, 2003).

The maximum quantity of tar allowed is 15mg per cigarettes according to the ministerial decree 28/1997 (Nassar, 2003). In addition to other policies that were applied for tobacco control, such as:

- Establishment of a **directorate of tobacco control** in the Ministry of Health (MoH).
- Establishment of an **implementation/enforcement cell** in the MoH to follow up on implementation.
- Adoption of pictorial **health warnings** on all tobacco packs; this was implemented in August 2008.
- Adoption of the principle of **taxation increase** as a tool for controlling tobacco.
- Establishment of a national coordinating mechanism; a high national committee for tobacco control was formed that involved multisectoral representation.

- A plan of action was approved by the National Democratic Party to free Egypt from tobacco in 5 years.

3. Theoretical framework

Price elasticity is one of the most important parameter used to simulate the impact of new tobacco taxes on tobacco consumption, government revenue, population health and the overall economy. In this paper we estimate price and income elasticities of different tobacco products in Egypt using an AIDS model. The AIDS was first presented by Deaton and Muellbauer at 1980; it gives an arbitrary first order approximation to any demand system. This model is one of the most popular approaches as it is simple to estimate and in the same time it has desirable properties of other demand models as Rotterdam and translog model (Deaton and Muellbauer, 1980, Eozenou and Fishburn, 2009). Deaton and Muellbauer (1980) represent the budget share w_i equations as follow:

$$w_i = \alpha_i + \sum_j \gamma_{ji} \log P_j + \beta_i \log (E/P) \quad (1)$$

where w_i is the share of the i th tobacco good in the total expenditure of tobacco, E is the total expenditure on tobacco and P is a price index defined as follows:

$$\log P = \alpha_0 + \sum_k \alpha_k \log P_k + 0.5 \sum_j \sum_k \gamma_{jk} \log P_{jk} \quad (2)$$

The AIDS model is based on the consumer's expenditure function. The budget share, as can be seen from equation (1), is expressed as function of the log of the prices of the different goods and the total expenditures deflated by the price index (Ali Koç and Savaş Alpay)

In order to be consistent with the consumer theory, some restrictions are imposed on the parameters of the AIDS model. These constraints should be taken into account when estimating the AIDS model:

- Adding up restrictions that budget shares add up to total expenditure:

$$\sum_i \alpha_i = 1, \quad \sum_i \gamma_{ij} = 0, \quad \sum_i \beta_i = 0$$

- Symmetry restrictions that the Slutsky matrix are symmetric:

$$\gamma_{ij} = \gamma_{ji}$$

- Homogeneity restrictions that demands are homogeneous of degree 0 in the prices:

$$\sum_j \gamma_{ij} = 0$$

The estimated parameters of the AIDS model are used to compute income and price elasticities of the different tobacco goods, such measures are required for the taxation and the subsidies policies (Ali Koç and Savaş Alpay):

- The expenditure elasticity: $\varepsilon_i = \beta_i/w_i + 1$
- The own price and cross price elasticities: $\varepsilon_{ij} = \gamma_{ij}/w_i - \delta_i$

Where δ_i is a kronecker variable that equals 1 if $i=j$, 0 otherwise.

The estimated β_i 's permit to determine if the good is luxury ($\beta_i > 0$) or necessity ($\beta_i < 0$).

While the γ_{ij} 's measure the change in the budget share of good i due to 1 proportional change in the price of good j maintaining the total expenditure constant (Deaton and Muellbaaur, 1980).

As can be seen from the definition of the price index P , the AIDS is a non linear model. This non linearity is solved by Deaton and Muellbaaur (1980) by using the Stone price index to make the empirical estimation easier. The Stone price index is defined as:

$$\log P = \sum_i w_i \log (p_i) \quad (3)$$

The use of the Stone price index in order to get a linear version of the AIDS model is known in the literature as the Linear Approximated-Almost Ideal Demand System (LA-AIDS)•.

According to the consumption theory, the prices and income are not the only determinants of the consumption decision. Demographic variables, such as the family size, the different regions, the age and the education, have as well an impact on the consumption pattern of the households (Pollak, 1981 and Liu, 2001). For this, we introduce some demographic variables

• “Econometrics for the Firm”, Notes of Professor Alban THOMAS

to the LA-AIDS model in order to study the impact of the household characteristics on the expenditure share of the tobacco goods. Therefore, the estimated model becomes:

$$w_i = \alpha_i + \sum_j \gamma_{ji} \log P_j + \beta_i \log (E/p) + \lambda D_h \quad (4)$$

where D_h is a set of individual and socio demographic characteristics of the consumer h that may affect tobacco consumption. Given that the share equations sum up to 1, the parameters λ_i should satisfy the following condition: $\sum_i \lambda_i = 0$

4. Data and Estimation Results

4.1 Data

The analysis in this paper makes use of the 2009 Egyptian Household Income, Consumption and Expenditure Survey (HIECS) conducted by the Egyptian Statistical Bureau (CAPMAS, 2010). The survey is nationally representative administered over 12 months, with 10 visits to each household over a period of one month. The data were collected from April 2008 to March 2009. It covered about 47 thousand households. As concerns prices, data are collected from CAPMAS in the case of local and imported cigarettes and shisha. However, we will use unit price (ratio of expenditures on quantities purchased) and not exogenous prices in the case of cigar. Unit prices are correlated with the total expenditure and affected by the quality choice (Eozenou and Fishburn, 2009). Therefore, we test for the difference in the estimation results in the case where we have exogenous price data and no significant difference was detected in our case. Table 2 provides a detailed data description of tobacco prices and consumption shares together with relevant socio-demographic variables.

Table 2: Description of the sample and variables used in the analysis.

Variable	Description	Mean	StD	Min	Max
Local cigarettes	Price of a pack of 20 cigarettes of the brand Cleopatra in Piasters†	275.79	27.35	3.00	344.00
Imported Cigarettes	Price of a pack of 20 Marlboro cigarettes in Piasters	761.82	134.12	9.00	917.00
Cigar	Price of a cigar in Piasters	19.63	3.79	1.25	540.00
Shisha	Price of a pack of shisha tobacco in Piasters	102.97	33.89	1.00	225.00
S_Local cigarettes	Share of local cigarette smoked by the household	0.819	0.378	0	1
S_Imported Cigarettes	Share of imported cigarette smoked by the household	0.023	0.15	0	1
S_Cigar	Share of cigar smoked by the	0.007	0.084	0	1

S_Shisha	household Share of shisha smoked by the household	0.15	0.35	0	1
Age	Age of household head in years	47.408	12.942	18	99
Gender	= 1 if the head of the household is a male	0.928		0	1
Asset	= 1 if the household possesses financial and/or non financial assets	0.069		0	1
Urban	= 1 if the household is living in an urban area	0.438		0	1
Household size	Number of individuals in a household	5.206	2.3	1	30

† 1 LE (Egyptian pound) = 100 Piasters and US\$1= 7.04 LE in September 2013.

4.2 Results

The tobacco demand system is estimated using the Seemingly Unrelated Regression (SUR) method. This method allows gaining efficiency taking into account the correlation between the error terms in the equations. It permits as well to impose the symmetry and homogeneity constraints on the parameters (Moon and Perron, 2006). Given that the share equations sum up to one, we dropped one equation to avoid singularity of the residual covariance matrix. The choice of the dropped equation has no impact on the results. Therefore, we dropped the shisha share equation. Parameters of dropped equations are recovered through the homogeneity and symmetry constraints. The estimated parameters of the demand system are presented in Table 3. All of the estimated parameters, with some exceptions, are significant. Concerning the socio demographic variables; we found that the age has a negative impact on the cigarettes consumption shares, however this effect is very small. For the household size, the bigger the household the higher the consumption of shisha. While, it has a negative impact on the cigarettes consumption. Moreover, households with male heads and living in urbanization tend to increase cigarettes consumption.

The possession of assets increases the share of the imported cigarettes and the cigar consumption while decreases the share of the local ones and the shisha. This is an expected result given that mainly wealthy people can afford high price cigarettes and cigars.

The price and expenditure elasticities are computed using the estimated coefficients of the price and the tobacco expenditure. The elasticities are computed at the average of the shares of the different tobacco products. Table 4 represents the own price and cross price elasticities; all the own price elasticities are of the expected sign. The demand of the imported cigarettes, cigar and shisha are elastic as their own price elasticities higher than 1. Given the positive sign of the cross price elasticity between the local and the imported elasticity; we can

consider that both products are substitutes. Both the shisha and the local cigarettes are complementary while the shisha is a substitute for the imported cigarettes and the cigar.

The expenditure elasticities are represented in Table 5. Shisha is considered as an inferior good, an income increase yields to the decrease of its consumption. While an increase of income is accompanied by larger increase in the demand of imported cigarettes and cigars.

Table 3: Estimated Parameters of the AIDS model

	Local cigarettes		Imported Cigarettes		Cigar		Shisha	
	Coef.	t value	Coef.	t value	Coef.	t value	Coef.	t value
constant	0.176	7.46	-0.116	-8.43	-0.06	-6.28	1.0001	51.29
Price of:								
Local cigarettes	-0.039	-3.53	0.017	3.03	0.03	8.91	-0.008	-1.41
Imported Cigarettes	0.017	3.03	-0.022	-3.98	-0.024	-9.52	0.029	7.39
Cigar	0.03	8.91	-0.024	-9.52	-0.028	-12.48	0.022	11.47
Shisha	-0.008	-0.99	0.029	7.88	0.0222	10.42	-0.042	-5.91
Tobacco Expenditure	0.169	50.73	0.03	20.96	0.0113	12.71	-0.21	-74
Age	-0.0013	-6.26	-0.0001	-1.71	-0.0001	-1.65	0.0022	8.61
Gender	0.059	5.99	0.007	1.78	-0.003	-1.21	-0.063	-7.46
Asset	-0.032	-3.2	0.0347	8.01	0.0024	0.97	-0.004	-0.49
Urban	0.026	4.71	0.023	12.78	-0.003	-2.25	-0.0525	-11.1
Household size	-0.007	-5.99	-0.003	-6.04	-0.00004	-0.15	0.0098	10
N	19402		19402		19402		19402	

Source: Estimated by the authors using the data of HEICS 2008/2009

Table 4: Own price and Cross price elasticities of the different tobacco products

	Local Cigarettes	Imported Cigarettes	Cigar	Shisha
Local Cigarettes	-1.03	0.03	0.03	-0.03
Imported Cigarettes	1.04	-2.21	-1.07	1.24
Cigar	3.95	-3.44	-4.79	3.28
Shisha	-3.87	3.99	3.28	-4.40

Source: Calculated by the authors based on the estimated parameters of the AIDS model

Table 5: Expenditure Elasticities

	Expenditure elasticity
Local Cigarettes	1.20
Imported Cigarettes	2.28
Cigar	2.73
Shisha	-0.37

Source: Calculated by the authors based on the estimated parameters of the AIDS model

5. Conclusion

Evidence from countries of all income levels suggest that tobacco price increases are highly effective in reducing demand and increasing government revenue. Higher taxes induce some smokers to quit or reduce consumption, reduce the number of ex-smokers who return to smoking and prevent other individuals from starting. Furthermore, reducing tobacco consumption will not only reduce the global burden of disease but also, among other things, increase the wellbeing of the individuals around us. Therefore, the policy implications inherent in pricing tobacco products take on a vital role. This paper aims at anticipating the impact of taxation on the level of tobacco consumption for Egyptian households, through the estimation of the demand price elasticity. This is implemented using cross-section data while exploiting spatial price variations. The paper will aid in evaluating the policy intervention of increased tobacco taxation. The estimated price elasticity of tobacco is less than one. Therefore, the introduction of tobacco taxation for these goods is expected to generate additional revenue for the government budget. It also suggests that tobacco taxation in Egypt is likely to have a significant impact on tobacco consumption. It is expected that middle aged men are the ones who would mostly bear the burden of such tax as this is the population among which tobacco consumption is more prevalent.

We are planning to extend the analysis of this study by using the HIECS (2012), refine the data used on tobacco pricing. This will enable us to understand better the relation between price and consumption and in turn the vital role of policy makers in increasing taxes and increasing government revenues attributable to tobacco consumption.

REFERENCES:

1. Bai Y., and Zhang Z. 2005 “Aggregate cigarette demand and regional differences in China”. *Applied Economics*, 37, 2523-2528.
2. Blecher, E.H. and Walbeek, C.P.V (2004) “International Analysis of cigarettes affordability”. *Tobacco Control*, doi: 10.1136/tc.2003.006726. Pp: 339–346.
3. Chaloupka, F.J. (1998) “How effective are taxes in reducing Tobacco Consumption”. University of Illinois at Chicago. Preliminary draft prepared for the International Conference on the Social Cost of Smoking, Lausanne, Switzerland, August 21-22, 1998.
4. Czubeck, M. and Johal, S. (2010) “Econometric analysis of cigarette consumption in the UK”. HMRC Working Paper Number 9.
5. Deaton, A. and J. Muellbauer (1980), *Economics and Consumer Behavior*, Cambridge: Cambridge University Press.
6. Eozenou, P. and Fishburn, B. (2009) “Price Elasticity Estimates for Cigarettes Demand in Vietnam”. DEPOCEN Working Paper Series No.2009/05.
7. Escario, J.J. and Morino, J.A. (2004) “Modeling the Optimal Fiscal Policy on Tobacco Consumption”. *Journal of Policy Modeling* No.26. Pp: 81-93.
8. Euromonitor International (2012) “Cigarettes in Egypt”. Country Report. <http://www.euromonitor.com/cigarettes-in-egypt/report>. Website visited in July 2013.
9. Euromonitor International (2012) “Smoking Tobacco in Egypt”. Country Report. <http://www.euromonitor.com/smoking-tobacco-in-egypt/report>. Website visited in July 2013.
10. Euromonitor International (2012) “Tobacco in Egypt”. Country Report. <http://www.euromonitor.com/tobacco-in-egypt/report>. Website visited in July 2013.
11. Global Adult Tobacco Survey, Egypt Country Report (2009); World Health Organization, Regional office for the Eastern Mediterranean.
12. Guindon, G.E., Tobin, S. and Yach, D. (2002) “Trends and affordability of cigarette prices: ample room for taxes increases and related health gains”. *Tobacco Control*;11.Pp:35–43
13. <http://www.tobacco-control.mohealth.gov.eg/Burden.htm>. Website visited in July 2013.

14. Hu, T.W., Mao, Z., Shi, J. and Chen, W. (2009) “The role of taxation in tobacco control and its potential economic impact in China”. *Tobacco Control*
15. Lance P, Akin J, Dow W, et al. (2004) “Is cigarette smoking in poorer nations highly sensitive to price? Evidence from Russia and China”. *Journal of Health Economics*, 23, 173-189.
16. Moon, H.R. and Perron, B. (2006). “Seemingly Unrelated Regression”, *The New Palgrave Dictionary of Economics*.
17. Nassar, H. (2003) “The Economics of Tobacco in Egypt”. *Health, Nutrition and Population (HNP) Discussion Paper. Economics of Tobacco Control paper No8*.
18. Ozclick, A. and Sahinli, M.A. (2009) “Estimating elasticities with the Almost Ideal Demand System: Turkey results”. *The International Journal of Economic and Social Research*, Vol.5, issue 2, pp.12-23.
19. [Tobacco Atlas](http://www.tobaccoatlas.org/). <http://www.tobaccoatlas.org/>. Website visited in July 2013.
20. WHO Report on the Global Tobacco Epidemic, 2011.