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The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.

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ABSTRACT

Nergis DAMA **JUNE 2012**

THE IMPACT OF SMOKİNG PROHIBITION ON HEALTH EXPENDITURE OF TURKEY IN 2008

Cigarette is considered as the most important preventable cause and illnesses by World Health Organization. Cigarette production and consumption has been supported for many years, but it causes many diseases such as lung cancer, premature birth, coronary heart disease. The damages of cigarette effect not only smokers, but also non – smokers get harmed. Thus, governments try to reduce the cigarette consumption by taking economic and social measures.

Turkey is one of the countries which have maximum consumption of cigarettes. Turkish government had to make law to restrict the cigarette consumption because of the harms to health, the economical cost and violation non – smoker' s right. 5727 Article is the most comprehensive law of tobacco in Turkey which is known as the law of smoking ban. According to the state institutions, the cigarette consumption decreased after the prohibition. So the health expenditure in related to smoking has decreasing.

This study is envisaged to estimate the reduction in cigarette consumption and probability smoking after smoking ban. In addition to, how the probability smoking is affected by prohibition. For this, the Household Budget Surveys (2006 – 2010) are used to predict the amount of cigarette consumption of household and the probability smoking of household. The surveys are ensured from Turkish Statistical Institute.

Key words: Cigarette Consumption, Prohibition, Health Expenditure

KISA ÖZET

Nergis DAMA **HAZİRAN, 2012**

2008 SİGARA YASAĞI' NIN TÜRKİYE' NİN SAĞLIK HARCAMALARINA ETKİSİ

Sigara, Dünya Sağlık Örgütü tarafından en önemli önlenebilir hastalık ve ölüm nedeni olarak kabul edilmektedir. Sigara üretimi uzun bir sure desteklenirken, tüketimi akciğer kanseri, koroner kalp hastalıkları, erken doğum gibi birçok hastalığa sebep olmaktadır. Bu hastalıklar sadece sigara içen kişiyi değil, aynı zamanda sigaraya maruz kalanları da etkilemektedir. Bu nedenle, hükümetler sigara tüketimini azalatmak için ekonomik ve sosyal önlemler almaya çalışmaktadır.

Türkiye, en çok sigara tüketen ülkelerden birisidir. Sağlığa verdiği zarar, getirdiği ekonomik yük ve sigara kullanmayanların haklarını koruma gibi sebeplerden dolayı, Türk hükümeti sigarayı tüketimini azaltmak için yasa çıkarmak zorunda kalmıştır. Sigara yasağı olarak bilinen 5727 numaralı yasa, Türkiye' de sigara ile ilgili çıkarılan en kapsamlı yasadır. Devlet kurumlarına gore, yasaktan sonra sigara tüketimi ve dolayısıyla sigaradan kaynaklanan sağlık harcamaları azalmıştır.

Bu çalışmada, 2008 sigara yasağından sonra sigara tüketiminde ve sigaraya başlama olasılığındaki azalma incelenmiştir. Bunun için, Türkiye İstatistik Kurumun tarafından hazırlanan 2006 – 2010 yıllarına ait Hanehalkı Bütçe Anketleri kullanılmıştır.

Anahtar Kelimeler : Sigara Tüketimi, Yasak, Sağlık Harcamaları

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LIST OF ABBREVIATIONS

WHO	World Health Organization
GATS	Global Adult Tobacco Survey
TURKSTAT	Turkish Statistical Institute
CDC	Centers for Disease Control and Prevention
SGR	Surgeon General Report
EPA	The U.S. Environmental Protection Agency
NTP	The U.S. National Toxicology Program
IARC	The International Agency for Research on Cancer
USDA	Department of Agriculture Food and Agricultural Organization of the U.S.
DALY	Disability – Adjusted Life Year
YLL	Total prevented years of the lost
NBD – CE	National Burden Disease – Cost Effectiveness
ESTC	Strategy for Tobacco Control
FCTC	Framework Convention of Tobacco Control
HBS	Household Budget Survey

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INTRODUCTION

Tobacco usage is a common habit which has come from past. It has been used as a pleasurable substance for centuries, and the first time it was spread throughout the world was by Christopher Columbus. Today, the tobacco plant is well proven to be harmful for health, which was believed to cure diseases in those years. This belief may be one of the reasons of the development of tobacco production and consumption in a short time. Rapid increase of the consumption has created a new field of industry; great number of factories was built in different countries. The USA was the fastest growing country among these countries.

Cigarette production gained a new momentum due to cigarette machine which was invented by James in 1881. 120,000 cigarettes were produced in ten hours with the help of the machine. The effect of smoking on health was not known until 1950's and the production has ensured big revenue for the country's economy. Therefore the consumption and production of tobacco has increased in the world. Scientists began to work on the relevancy between smoking and health in 1950's because the number of patients with lung cancer was dramatically increasing. During these years, there were two important studies which demonstrated the negative effects of smoking on health. First researchers who found the negative impact of smoking on health were Ernest Wynder and Evarts Graham. The study done with 604 patients shows that smoking is not the only reason which causes lung cancer, but it has a great impact on it (Wynder & Graham, 1950). Second important study about the issue was done by Richard Doll and Austin Bradford Hill. The data collected between April 1948 and October 1949 was examined and it was concluded that the consumption of tobacco gave rise to lung cancer and smoking was a significant factor for the disease (Doll & Hill, 1950). Doll and Hill (1954) explained new results about the relation between smoking and lung cancer. This time, 40.000 men and women were interviewed about their smoking habits. It is concluded that smoking leads to a significant increment of deaths caused by lung cancer. On the other hand, number of people smoking has also increased. Afterwards these studies have resulted with more intense researches on the relation between smoke and health care.

Cigarette consumption, which has spread quickly all over the world, has made a very serious source of income for all the countries. Therefore, countries did not want to abandon the economic revenue and did not accept the negative effect of tobacco usage. Even some scientists and doctors ignored the negative impact of smoking until 1964. In this year a report was released by Surgeon General. The report expressed that mortality rate of smokers was 70 percent higher than nonsmokers' rate. This report was published by a state institution. Hence the effect was much greater than scientific studies.

The cigarettes per capita were increasing steadily from 1900 to 1964 which decreased in 1965 for the first time. The studies which have been conducted since 1950 have proven that smoking causes many diseases such as cancer - especially lung cancer- , mouth and pancreatic cancer, heart attacks, strokes, emphysema and chronic bronchitis. People have endangered their health by using tobacco. According to the medical journal, The Lancet, tobacco is the third-most addictive recreational drug, after heroin and cocaine. In addition, the economic cost of treatment for health problems generates a burden for both the individuals and the country's economy. It also damages human health and economic situation, which requires a restriction of the cigarette consumption. However, the main two reasons of the restriction of cigarette consumption are to protect the people who smoke and who do not smoke. The greatest harm of smoking is mental retardation and premature birth in infants even if the person is a passive smoker.

Cigarette producing foundations which pursued the USA have not declined their production despite all of these scientific studies. Damages on a person's life which cigarette consumption does are much more than the benefits of its production. For this reason, the states which do not want to lose their revenue work to find new markets. Using many methods which are legal or illegal, smoking habits have spread in less developed or developing countries so that they keep their own economies alive and they do not lose their income. On the other hand, consumption restrictive principles aimed at protecting public health and the country's economy.

Today, smoking is considered as a factor which needs to be prevented, by the World Health Organization (WHO), it kills nearly 6 million people and causes billion

dollars of loss each year. If no actions are taken, tobacco will kill more than 8 million people each year globally (WHO Report, 2011). Therefore many studies are undertaken in the world to reduce cigarette consumption. Raising prices, increasing taxes and banning advertising all aim to decline the consumption.

The states try to protect their citizens, especially their youths who do not smoke. The economic implementations are not sufficient in order to reach this target. However, at least they apply the laws which ban free smoking. The first implementation of the smoking ban in the world occurred in California, USA, 1993.(1)

The smoking ban has been implemented in Turkey since 2008. This prohibition is expressed as a restriction of the freedom and protection of health at the same time. Although the prohibition has been implemented for only four years, statistics are published by the government agencies represent that the consumption has been declined.

In this study, using household budget surveys 2006-2010, 2008 smoking ban and 2009 smoking ban which is the extended form of 2008 ban are analyzed. According to Turkey Global Adult Tobacco Survey (GATS) in 2008, there are 16 million adult smokers in Turkey and Turkey has the highest rate of cigarette usage by men among the countries of the World Health Organization. If these facts are considered, the results of this work gain more importance.

(1) http: // en. wikipedia.org/wiki/Cigarette (accessed 3 April 2012)

CHAPTER 1

1. The General Overview of Cigarette and Smoking

1.1 The Content of Cigarette and Damages to Health

There are many kinds of tobacco, such as flue-cured, burley, Maryland, blend, dark air-cured, cigar wrapper, oriental, dark- fired, perique and rustica. The most popular types are flue–cured (Virginia), American blend, dark and oriental cigarettes. The use of tobacco styles are cigarette, cigar, water pipe, hookah tobacco, smokeless tobacco, chewing tobacco and snuff. The most common form of the tobacco consumption among them is smoking. That is why only "cigarette" is used to refer to tobacco in this study.

Cigarette smoke contains more than 4000 chemical items and more than 60 of them are proven to be toxic substances. The most important ones are,

- Ammonia
- Arsenic
- Acetone
- Butane
- Cadmium
- Carbon monoxide
- Naphthalene
- Nicotine
- Polonium

When all the damages caused by a substance are considered, it is clear that there is a negative correlation between cigarette consumption and human health. On the other

hand, the average particule [(1)] diameter of cigarette is 0.2 – 0.5 mm, in other words it has a respirable level. In this case, the damage covers not only smokers, but also the whole society.

Research done by Surgeon General in 1964 has confirmed the relationship between smoking and lung cancer for the first time in history. Lung cancer is still the most common type of cancer all over the world and cigarette is the main reason of this disease.

An estimated 90 % of all lung cancer deaths in men and 80 % of all lung cancer deaths in women are related to smoking (Surgeon General Report, 2004). Lung cancer is observed more commonly for males compared to females and this situation is explained by habits of smoking. Over 21 % of all male cancer patients and 5% of female patients have lung cancer. The main reason for this is the difference in pattern of cigarettes (Musellim, 2007). The 2004 Surgeon General's Report declares that there are other types of cancers caused by smoking such as stomach, cervix, kidney, pancreas, mouth and acute myeloid leukemia cancers as well as the lung cancer. In addition to cancer, heart diseases are one of the illnesses caused by smoking. Some of these are coronary heart disease, stroke, aortic aneurysm and peripheral arterial disease, because smoking damages the body's circulatory system. Foul breath, periodontal disease, gustatory disease, infertility, dead brain cells, learning disorder, dysmnesia, early dementia, cataract, pharyngitis, dysbarism, otitis media, early menopause, osteolysis, buerger's disease are all caused by smoking.

Many of these diseases also occur as a result of alcohol consumption at the same time. However, smoking is more harmful for public health because the alcohol consumption does not damage the other people except from the ones using alcohol whereas smoking effects whoever do not consume or consume. Especially pregnant

[(1)]There must be three mechanisms which provide the lungs of inhaled air, impaction, sedimentation and diffusion. Impaction has directly proportional to the speed and the square of the particle diameter.

women put life of infants at risk by continuing smoking which may cause preterm delivery, low birth weight, sudden infant death syndrome (SIDS). [1]

1.2 Passive Smoking

Passive smoking which constituted the restrictive precaution was conceived in Surgeon General Report by Jesse Steinfeld, in 1972, but its main definition was explained in SGR which was published in 1986. It is also called as environmental tobacco smoke which is the combination of side stream smoke [2] and mainstream smoke [3] (National Toxicology Program, Report on Carcinogens Program, 2005). There is no big difference about the damage of smoking between smokers and passive smokers, which is proven by testing. The second – hand smokers has been tested about the level of chemical substances and nicotine, cotinine, carbon monoxide have been found in their body. At least 69 toxic chemical substances such as arsenic, benzene, beryllium, cadmium and polonium are located in secondhand smokers which cause cancer. It is clear that all of these substances harm human bodies.

The risk of heart attack increases for people who are exposed to second – hand smoke as their circulatory system is affected. Therefore this situation clearly shows the danger of passive smoking (Institute of Medicine, 2009). In reference to WHO, 600.000 people die each year from exposure to passive smoking. Furthermore, the actual damage occurs primarily in children, which can be seen as coughing, sneezing, shortness of breath, bronchitis, pneumonia, asthma attacks and SIDS (Report Surgeon General, 2006). When the pregnant women smoke, it is called maternal smoking and their children may have retardation, deficits in intellectual

[1]SIDS is the sudden death of an infant one year old which remains unexplained after a through case investigation (Willinger et al, 1991).

[2]The smoke which is given off by a burning tobacco product, generated at lower temperature.

[3] The smoke which is exhaled by the smoker, includes many toxins found in cigarette. (USDHHS, 1986).

ability, behavioral problems in future, stillbirth, low birth weight, lack of lung function. The study which was conducted in Canada in 1996 expressed that living without exposure to smoke is the best life for the baby and mother (Health Canada, 1996). Second – hand smoke causes more than 600 000 premature deaths per year with respect to WHO' s data and it was the cause of 28% of the deaths in children in 2004.

The US Environmental Protection Agency (EPA), the US National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), and a branch of the World Health Organization (WHO) accept the secondhand smoke as a carcinogen which should be restrained by governments for the sake of human health, especially for the infants and little children. Because adults have the preference where will they stay or where they will not, whereas there is no choice for fetuses, babies and children. They have to live where their parents live. When parents do not care about life risks, many diseases and deaths may occur.

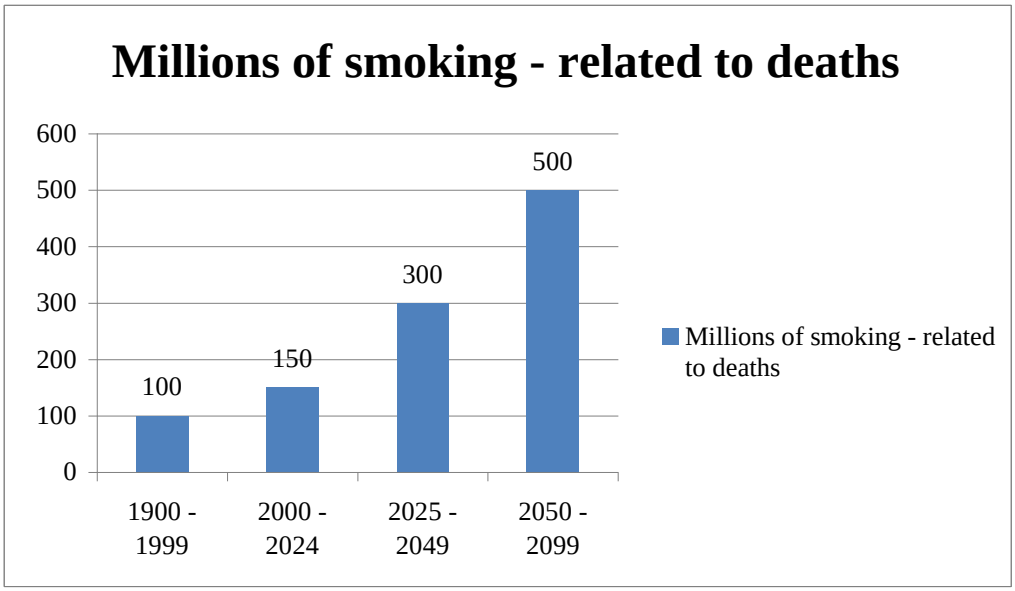
If smokers are compared to nonsmokers, estimated results are,

- the risk of coronary heart disease by 2 to 4 times
- stroke by 2 to 4 times
- men developing lung cancer by 23 times
- women developing lung cancer by 13 times
- dying from chronic obstructive lung diseases (such as chronic bronchitis and emphysema) by 12 to 13 times
- women having lower bone density during post menopause
- 12 minutes life span shortening caused by smoking one cigarette

Many studies found that quitting smoking reduced the risk of coronary heart disease (Gordon et al., 1974; Dobson et al., 1991; Negri et al., 1994). In another study, a 36% reduction in mortality was found for patients with coronary heart diseases who gave up smoking compared to the ones who continued smoking (Critchley & Capewell, 2003). The result shows that the reduction in tobacco smoking reduces the risk of coronary heart disease. 4 million people die prematurely

each year from illnesses which are caused by smoking and deaths are thought to rise to 10 million annually by 2030 (Howard, 1994). If there is no provision, 250 million children will be killed by tobacco (Murray and Lopez, 1996).

Figure 1.2.1 Number of deaths from tobacco smoking during the twenty – first century in the world



Source: Probhat Jha, "Avoidable global cancer deaths and total deaths from smoking", 2009.

Figure 1.2.1 illustrates the projected numbers of deaths caused by tobacco smoking during the twenty – first century in the world. According to this study, worldwide tobacco mortality will increase approximately 100 million per decade around 2030. Nearly 500 million people will die because of smoking in the period of 2050 – 2099 years.

Although tobacco consumption is known as resulting with lots of diseases and deaths as it is mentioned above and displayed in Figure 1.2.1, it is a contradiction that it is accessed easily and it is sold legally. Cigarette production has a great contribution to the economy and countries do not want to lose the yield. Therefore, a conflict occurs for governments. Neither yield nor public health is given up by them

CHAPTER 2

THE PRODUCTION AND CONSUMPTION OF CIGARETTE

2.1 The Production and Consumption of Cigarette in the World

Tobacco has been very important for producers to provide high revenue. Until 1950 there was no real evidence that tobacco was dangerous for health. After 1964 a report was published by Surgeon General and it included the connection between the lung cancer and smoking developed researches about the damage of tobacco. Although each scientific study shows smoking has harmful effect on health, not only smokers but also nonsmokers did not reject their production. The production did not decline even when it was proved cigarette consumption has economic loses for individuals and states. They tried to find new markets to commercialize their tobacco products instead of reducing their production. Middle East, Africa, Asian and Pacific countries are the some of the major countries in this market because

- Less - developing countries have high population
- Increased income will increase consumption
- These countries need the tax of cigarette to solve their problem of finance
- Women and teenagers might be the consumers of tobacco easily by cultural interaction

Tobacco monopolies follow many methods to extend their markets. Initially the tobacco products flow in the country illegally by smuggling, suitcase trade, etc. Needing financial aid less, developing countries have to make a custom union. The other methods are advertising and promotional tasks. Especially women and children are selected as the target. Capturing the leadership of tobacco industry, the USA pretended to have new markets like Western countries. In addition to these the USA takes advantage of the high technological opportunities and it produces the mixed tobacco which is consisted of oriental and Virginia tobacco, because it is more popular among the European

consumers than the normal one. More particularly the actual promotion was creating a market which is an economic package and known as the Marshall Aid. It is an economic program providing financial assistance to 16 European states, which includes Turkey, between the years of 1948-1951. Thanks to the positive results of all these strategies, cigarette consumption has rapidly increased. Until 2000, the production was increasing but it has started to decline because many countries fulfill the politics whose aim is to decline the consumption. This policy has been sustained that is why the consumption of cigarette has been decreasing.

Table 2.1.1 Production and consumption numbers (billion) of cigarettes in the USA, 1990 - 2007

Year	Production	Exports	Consumption
1990	709.7	164.3	525.0
1991	694.5	179.2	510.0
1992	718.5	205.6	500.0
1993	661.0	195.5	485.0
1994	725.5	220.2	486.0
1995	746.5	231.1	487.0
1996	754.5	243.9	487.0
1997	719.6	217.0	480.0
1998	679.7	201.3	465.0
1999	606.6	151.4	435.0
2000	594.6	148.3	430.0
2001	562.4	133.9	425.0
2002	532.0	127.4	415.0
2003	499.4	121.5	400.0
2004	493.5	118.6	388.0
2005	489.0	113.3	376.0
2006	484.0	119.0	372.0
2007	468.3	102.0	364.0

Source: U.S. Department of Agriculture, 2011, Tobacco Outlook

Major countries producing cigarette in the world are Brazil, China, India, Malawi, Indonesia, and

Turkey, as well as the USA. Because of the rules, legislation and arrangements relevant to agriculture and health politics, sequence can change.

2.2 The History of Cigarette in Turkey

2.2.1 Cigarette Production in Ottoman Empire

It is assumed that the end of VII. century was the first time tobacco used in the Ottoman Empire (Erdem, 1988, p.10; Köktener, 1995, p.45). One of the sovereigns of Ottoman Empire, III. Murat sent gifts, which included tobacco plants, to the King of Poland (Conte Corti, 1931).

The consumption was spreading rapidly and easily on this land until the prohibition which was implemented by Sultan I. Ahmet. He did not let their citizens smoke as he thought that the smoking was illicit according to the Koran. The prohibition, which was a royal decree, was known as the first legislation about smoking in this land and it claimed that numbers of diseases and deaths were increasing because of tobacco use. This expression is very important because the scientific truth is accepted today and it was shown nearly 300 years ago. Despite the smoking ban, the demand of cigarette was increasing due to the addictive effects, the smoking habit spread among the people. At that time the civil conflicts have led to disruptions in the implementation of the ban. In 1630, the tobacco ban was not being implemented according to the rules and the officers who were responsible with implementing the rules did not do their tasks accurately (BOA, MHM85, 134). The big fire of tobacco happened in 1633 so the tobacco ban was started to be applied firmly by IV. Murat. Moreover, the coffeehouses, where the tobacco was consumed intensively, were demolished. The decision might be interpreted as the roots of the ban which is implemented today. The ban was sustained after the death of IV. Murat (1640) but it was not as harsh as his period.

There is not much record about when the production exactly started in Ottoman Empire. However, according to some documents, we have the information about the time and place of production even if they are not so many. For instance, according to the charter published by I. Ahmet in 1610, tobacco was produced in Saruhan and Aydın for the first time On the other hand, prohibition decisions

included not only consumption but also production and trafficking of tobacco products (Uluçay, 1941, p.12 – 13).

The production has been spreading easily on the Ottoman lands because tobacco grows in the humus and water – repellent soil, reduced imports and the Ottoman Empire has become a producer of tobacco in the world. Until The Crimean War, the organization of tobacco customs was founded because of tobacco export (Sapan, 1997, p.13). Taxes for tobacco product were started to be collected in 1688 (BOA, MM 866). Thanks to all of these developments, tobacco has been one of the agricultural products of the empire. With respect to the regulation published in 1862, tobacco import was prohibited in the Ottoman Empire and the tobacco monopoly was carried out by a French company which was founded in 1883 (Buran, 1991, p.4). The agreement maintained its validity until 1923 and it was repealed by Economics Congress in 1923. Tobacco monopoly was brought under the control of the empire in 1925. Two basic reasons of the abolishment were national economic policy and difficulties experienced by tobacco manufacturers (Erdem, 1988, p.11).

There is no information about the amount of tobacco consumption in the Ottoman Period. Held for the first time in 1683, census provided information about tobacco acreage. According to the census data in 1691, tobacco plants were produced in 41 towns. Despite all prohibitions; production, consumption and trade of tobacco were not prevented.

2.2.2 Cigarette Production between the years of 1923 – 1990

State's taking control of tobacco production, was the beginning of a new era in which Turkey would have financial income from tobacco production. Furthermore, it may also be considered as a reflection of independence of economic policies.

"Tobacco Monopoly Law" was issued in 1930, organized in Agriculture Congress in 1932 and 1934. Turkish Tobacco Company Limited, which administered the arrangement of tobacco industry and sector, was established in 1933.

The mostly produced type of tobacco is oriental on the territory of Turkey. A new cigarette was manufactured by blending oriental tobacco and Virginia tobacco. Cigarette has been one of the most popular goods among the tobacco products for consumption and production since 1930. “Istanbul, Maltepe Cigarette Factory” is the first major cigarette production in 1969.

The constant development of the tobacco market and the economic power of the market provided by countries were based on the laws supporting tobacco production. As the effect of tobacco on human health was not proven scientifically in those years, the increase of consumption was interpreted as an indicator of a good economy.

The factors affecting tobacco production in Ottoman Empire were loss soil, wars, rainfall, drought (Özavcı, 2007, p.50). The new Turkish state‘s tobacco policy was based on economic independence hence the French factory (Reji) was dismissed. The economic independence means the state is the only one and the real power on Turkish lands. And tobacco production passing to the state control in 1925 had an important role in agricultural policy of the country. The following table shows the amount of tobacco produced in Turkey during the years 1925 – 1938. Tobacco production in these years was not considered stable but volatile.

Table 2.2.2.1 The amount of tobacco‘s production, 1925 – 1938

Year	Production (ton)
1925	56. 215
1926	54.377
1927	69. 604
1928	43. 480
1929	30. 503

1930	47. 211
1931	54. 111
1932	18. 040
1933	40. 148
1934	35. 678
1935	36. 004
1936	74. 059
1937	72. 676
1938	58. 800

Source: Turkish Statistical Institute (TurkStat), 1948, p.250 – 251.

Until 1938, tobacco production followed a volatile path as it is seen in the table. The main causes of this increase are Anatolia's being a suitable place for tobacco agriculture, amount of increased demand, supportive policies to production. Therefore it increased by 134 % from 1938 until 1960.

Table 2.2.2.2 shows the amount of unmanufactured tobacco production by 5 – year, the amount of production increased after 1962 and reduced after 1980. The reduction might be explained with crisis, climatic conditions and weak incentive structure. Production in 2010 is approximately 27% of production in 2000. While the aim of policies was to increase production and consumption of tobacco, the aim of the bans was to reduce both of them during the millennium years.

Table 2.2.2.2 The production of unmanufactured tobacco in Turkey, 1970 – 2010

Year	Production (MT)*
1970	149.861
1975	199.935
1980	228.349
1985	170.491

1990	296.008
1995	204.440
2000	200.280
2005	138.247
2010	55.000

Source: Food and Agricultural Organization of the United Nations (FAO).

*MT is total production of year

After the 2000s, Turkey has experienced a serious decline in production. From 1962 until 2007, Turkey was among the top 10 countries which produce tobacco in the world. Tobacco production in 2011 had the lowest amount since 1962.

Table 2.2.2.3 Production of unmanufactured tobacco in Turkey, 2000 – 2010

Year	Production (MT)
2000	200.280
2001	144.786
2002	152.856
2003	112.158
2004	133.913
2005	135.247
2006	98.137
2007	74.584
2008	93.403
2009	85.000
2010	55.000

Source: FAO

Restrictions imposed by the state to reduce consumption of tobacco caused the decline of income which was gained from tobacco. In tobacco progress reports

issued for Turkey by the European Union, there are restrictions for production of tobacco. While EU countries do not export tobacco to Turkey, there are interesting issues in progress reports such as encouraging import and reducing tobacco production. One way to reduce consumption is not to reduce production. Because of public health problem, all countries should make joint decisions by leaving the economic interests aside.

The amount of tobacco consumption increased during the years 1983 – 2000, while the production of tobacco was controlled by states which relinquished the income. Furthermore states were following liberalist policies for economic decisions. This situation resulted with an increase in cigarette consumption by 80 percent (Bilir, 2009, p.34). After the 2000s, the trend of consumption has been reduced. Table 2.2.2.4 reflects the consumption of tobacco in Turkey during 2000 – 2010.

Table 2.2.2.4 The consumption of tobacco in Turkey, 2000 – 2010

Year	Consumption (billion amount)
2000	111,70
2001	111,80
2002	110,00
2003	108,16
2004	108,87
2005	106,72
2006	107,91
2007	107,45
2008	107,86
2009	107,55
2010	93,35
2011	91,22

Source: Tobacco and Alcohol Regulatory Authority

The main reason for the decrease in cigarette consumption was the law which came into force on 19 Jan 2008. According to Law No. 4207, tobacco consumption was prohibited indoors except from citizens' own properties. Two steps were followed in implementation of this law. When the law was firstly applied on 19 May 2008, food and beverage industry was not included. Food and beverage industries were given 18 months to be adapted for the prohibition. All the provisions of the ban were started to be implemented on July 2009.

According to a survey (Global Omnius) which was conducted by Synovate, before the law came into force (14 February – 1 March 2008);

- 91 % of people knew the exposure of cigarette smoke threatening to human health
- 63 % of people supported the law, (include reinforcement of smokers)
    - 90 % of people supported that the ban should be carried out in workplaces, on subway, at airport and shops, 75 % of people in restaurant, 63 % of people in bars,
- 14 % of people were against the law
- People expect the restaurants and bars to be non-smoking places
- 93 % of people thought nonsmokers should have been protected from smoking
- 89 % of people indicated governments had to use power to protect their citizens from damage of secondhand smoking
- 63 % of people stated the law should not be extended to guarantee the rights of smokers

The citizens of Turkey supported the entry of the law into force in general, because of the strict implementation of law and public support in Turkey which is at the forefront of the fight against tobacco today. According to official information, the reduction was expected with the law actualize

CHAPTER 3

THE COST OF SMOKING

3.1 Negative Externality

Negative externalities occur when the consumption or production of a good causes a harmful effect to a third party. Smoking addiction brings a serious cost both in terms of health care and economical reasons (Denscombe, 2007). Financial losses of consumption are indicated as a consumption cost, the cost by deprivation, accidents and labor loss (Nielsen, Fiore, 2000).

The effect on passive smokers who are exposed to the smoke is called negative externality. It affects the country's economy negatively and it is resulted with negative externality costs such as the budget which is used for the treatment of diseases caused by smoke. Passive exposure to tobacco smoke in restaurants, which constitutes 55.9 % of total exposure, is quite more than the rest (GATS, 2010).

Internal and external costs of cigarette consumption are laid down by Manning, Keeler, Newhouse, Sloss, Wassenman in the Table 3.1.1. Each pack of cigarette causes the increase of medical cost by $ 0.38 and remittance 137 – minute in life expectancy.

Table 3.1.1 Costs of Smoking

Type	Internal	External
Premature death	Smoker and family	Coworkers and others
Pain and suffering	Smoker and family	Coworkers and others
Medical costs	Copayments	Insurance reimbursements
Sick leave	Uncovered sick loss	Covered sick loss
Disability	Foregone income not replaced by disability insurance	Disability insurance
Group life insurance	Negligible	Death benefit

Pension	Defined – contribution plans	Social security and defined – benefit plans
Wages	Foregone disposable income	Taxes on earnings
Other costs	Property loss due to fires by paid person	Insured property loss due to fires
Tobacco products	Cigarette purchases	

Source: Manning et al. 1989; No.11; 1604 – 1609.

In addition to this research,

"… nonsmokers subsidize smokers' medical care and group life insurance, smokers subsidize nonsmokers' pensions and nursing home payments. Smokers probably pay attention to the current excise of taxes on cigarettes, whereas nonsmokers wish to raise those to reduce the number of adolescent smokers…''

3.2 The Cost Smoking In Terms of Health

Deficiency in the workforce and defects created in the market economy as well as health expenditures create more economic damages. Unfortunately, the data which shows smoking – related health problems in Turkey is not available. But the researches about certain diseases and risk factors were conducted for the sake of Disability – Adjusted Life Year (DALY) in 2000. Consequently, the risk factors in tobacco were found to improve control policies. According to a report published by the Ministry of Health, 54.699 deaths in total related to smoking were preventable (Health Ministry of Turkey, RSHMB, 2004, p.407). The total preventable years of life lost (YLL) is totally 596.684, while the preventable DALY is 931.909, which is expressed in the same report. It would be said that, measures to reduce tobacco usage, also will provide prevention of YLL, DALY and deaths. These results demonstrated once again that tobacco control is very important.

The numbers of preventable death, preventable YLL and preventable DALY are so different in terms of gender. Table 3.2.1 demonstrates that the numbers of men are greater than women, so the results verified that the smoking is more popular

among men. Smoking is one of the leading causes of death for men. Therefore the number of deaths caused by smoking is much higher among men than among women. Moreover comparing men's smoking prevalence in the European Region to Turkey, Turkey has a higher rate.

Table 3.2.1 The numbers of preventable deaths, YLL and DALY with the prevention of risk factor, smoking (National burden of diseases – cost effectiveness, 2000, Turkey)

	Preventable deaths	Preventable YLL	Preventable DALY
Women	1.794	23.110	61.306
Men	52.905	573.573	870.603

The primary cause of chronic obstructive pulmonary disease (COPD) is smoking, which is accepted as a scientific fact. On the other hand, there are not great numbers of studies about the effects of air pollution indoors on COPD risk. This study was conducted in 2002 including women as a sample who have never smoked and been over the age of 40. The prevalence of COPD in women exposed to cigarette is 25.6%, while it is 13.6% for the women not having been exposed (Ekici A, Kurtipek E, et al; 2005). In this case, smoking induces the likelihood of developing COPD by 2.6 times.

According to National Burden Disease (NBD), Cost Effectiveness (CE), number of deaths in 2000, 2010 and expectations for 2020 due to COPD are as follows.

Years	Men	Women	Total
2000	18.183	6.922	25.104
2010	30.020	10.811	40.831
2020	47.925	15.315	63.239

Tobacco usage was expressed by National Burden Disease Report of the Ministry of Health in 2004, COPD is secondary reason for the deaths by 51.4%.

Table 3.2.2 The distribution of the burden of diseases and deaths in terms of diseases attributable to tobacco use (NBD –CE, 2004, Turkey)

Disease	Assignable deaths	Assignable YLL	Assignable DALY	The ratio of assignable DALY in total DALY
Trachea, bronchus and lung cancers	10.510	107.075	112.634	1.0
Another cancers	3341	43.163	45.883	0.4
COPD	12.902	72.689	150.406	1.4
Another respiratory diseases	2105	33.387	58.377	0.5
Cardiovascular diseases	21317	274.770	321.237	3.0
Other chosen medical reasons	3185	50.006	226.953	2.1
All reasons	54.669	596.684	931.909	8.6

It is considered that approximately 100 thousand people die due to the diseases caused by tobacco. According to a research conducted in 2008, 16 million adults smoke, which damages the economy and the budget of country. If no action is taken, the number of deaths is estimated to be 240 thousand due to smoking in 2030

(GATS, 2008). Moreover one cigarette decreases the expected life span of a person eleven minutes with respect to British Medical Journal.

5.741 billion euro for COPD disease and 2.953 billion euro for lung cancer have been spent for the study which was conducted in Germany, in 1996. It is taken into consideration that the habit of smoking causes an economic loss. The total expenditure for all the diseases caused by smoking is calculated as 16.6 billion euro (Tennesen P, Fagerstrom KO, et al; 2007). When it comes to Turkey, the total cost of COPD is 1.336 TL, while that of lung cancer is 1.978 TL which stems from direct effect of smoking (Hacıevliyagil S, Mutlu LC, Gülbaş G, et al; 2006).

For the treatment of smoking – related diseases in the United Kingdom, 1.5 billion pounds are spent annually. Nicotine replacement therapy which is applied to prolong the life and for one year 700 pounds are spent (Parrott S, Godfrey C, et al; 1998). According to the study conducted by Barendregt and his colleagues in the Netherlands that the cost of smoking – related diseases was 7.27 million dollars for men and 9.47 million dollars for women during a lifetime (Barendregt JJ, et al; 1997).

The saved average life for the person who quit smoking is 0.28 – 2.8 times higher than for those who continue to smoke, which was estimated in a research purpose of which was to calculate the cost of treatment to quit smoking. Saving for a person who quit smoking is $47 for the first year (Uysal A., 2007). Furthermore the initiatives to reduce smoking have a significant cost. The cost-effectiveness of smoking cessation is higher than cost effectiveness of preventive measures such as mammography, colon cancer screening, treatments of mild to moderate hypertension and high cholesterol (Cummings CM, et al; 1992). When the diseases caused by smoking are compared to the ones caused by unrelated diseases, the annual cost stemmed from smoking is calculated as $6 billion (Johnson E, Dominici F, et al; 2003).

The research results in Table 3.2.3 in which annual cost of life due to smoking cessation is evaluated are as follows.

Table 3.2.3 Cost per life year because of smoking cessation

Method of smoking cessation	Additional year of life gained ($)
Telephone consultation	311 – 401
Anti – smoking campaigns	950
Short recommended	282
Advise and visual material	358
The assessment of medical practitioner	949
Replacement of nicotine	10.520
Bupropion SR	10.520
Nicotine and Bupropion SR	19.492

Search: Tomson T, Helgason AR; Gilljam H. Outline in smoking cessation: A cost – effectiveness analysis, 2004, p. 469 – 74.

All of these studies indicate clearly that smoking threatens not only human and public health, but also the country within all aspects. The "quality adjusted life year" or "quality adjusted life expectancy" is considered as a result of medical studies carried out globally with respect to medical literature. An attempt whose aim is to improve the quality of life may have also a positive impact on human health and economic values. Therefore, the state must keep its citizens and future generations away from these habits. The Republic of Turkey took a major step in 2008 with the amendment of the law No. 4207 to struggle against tobacco.

CHAPTER 4

THE AFFECTED VARIABLES ON TOBACCO

4.1 The Global Policies of Tobacco

The first book written against tobacco in the history is "A Warning for Tobacconist" by Philirates in 1602, and tobacco was mentioned as a harmful substance into bloodstream. Usage of tobacco was prohibited in Britain in 1604, in Sweden and Denmark in 1632, in Russia in 1634 and in Sicily in 1640 (F. Braudel, Civilisation Materielle, 1, p.226). Started to be prohibited in churches in 1630, tobacco lasted about 100 years because of religious reasons in Peru. Smoking was permitted by Pope John Paul XIII in 1725, hence tobacco consumption increased rapidly. Despite the bans, the increase in tobacco consumption leads states to economic policies to reduce consumption.

Cigarette consumption has increased constantly since 1964 and was supported by each field to spread. The report written by Surgeon General contains scientific truths about the harmful effects of smoking. After the report smoking has gained a new meaning. Before the report tobacco was seen as a source of economic income, and consumption of tobacco was supported. Advertising campaigns, imposition of smoking as a symbol of freedom, applying low price on tobacco, incentive payments were some of the supportive policies. The economic income of production was lower than the cost of consumption, thus the policies was changed. The main goal is to reduce consumption without reducing the amount of production. For this purpose, new markets was tried to be created for trade tobacco and tobacco consumption was expanded in other countries. For this reason, in the following time of the policies, consumption of tobacco reduced in developed countries, while it increased in undeveloped and less developed countries.

Tobacco control policy has become very important for countries not only to maintain a good health policy, but also to maintain the economic stability. Strategy for Tobacco Control (ESTC) was adopted by the WHO Regional Committee in September 2002 to reduce the level of tobacco consumption in European Region. It

is a comprehensive study to make national tobacco policies effective which includes high taxes, bans on tobacco advertising and promotion, protection of nonsmokers from being exposed to smoke in public places and struggling against smuggling of tobacco. The principles are valid for European Region.

The first international treaty on tobacco control is the "Framework Convention on Tobacco Control", which was signed by WHO on 21 May, 2003.

The WHO Framework Convention on Tobacco Control (FCTC) points out major principles as follows: (1)

1. The definition of "child" from the Convention on the Rights of the Child is used and includes minors under 18.
2. Smoking and problems developing as a result of smoking are considered as public health problems.
3. Special emphasis is placed on the poor and the heavier health, economic and social burden that smoking places on the poor.
4. The number of women who smoke is increasing and gender – specific control mechanisms are necessary.
5. Cigarettes and other tobacco products cause addiction, which has been classified as a specific disease at international platforms.
6. People exposed to tobacco smoke and tobacco products need protection under tobacco control, in addition to those who consume tobacco.
7. A major comprehensive campaign against tobacco industry is needed, empowered by implementation of the FCTC.
8. Sponsorships by tobacco industry must be prevented.
9. Local cultural, social, economic, political and legal factors are needed to be taken into account to achieve effective tobacco control.
10. Intersectoral collaboration is needed in the fight against tobacco usage.

(1) WHO Framework Convention on Tobacco Control, 21 May, 2003, Geneva; http:// www.who.int/fctc/text download/en/index.html (accessed 3 April 2012).

Adopted in 56. Geneva World Health Assembly FCTC includes necessary regulations for tobacco control. Entered into force on 27 February 2005, FCTS has been signed by 168 countries so far. The Global Epidemic Report has been published to intensity the contract in which the strategies are determined as MPOWER.

According to MPOWER:

M: Monitor Tobacco Usage and Prevention Policies

P: Protect people from tobacco usage

O: Offer help to make people quit tobacco usage

W: Warn about the dangers of tobacco

E: Enforce bans on tobacco advertising, promotion and sponsorship

R: Raise taxes on tobacco

The main objective of these strategies is to reduce the rate of tobacco – related diseases as well as to protect future generations from the danger of tobacco. The tobacco policies can be developed by evaluating the results of implementing strategies in countries. Turkey has signed this treaty and it was come into force in 2004.

Table 4.1.1 Some of the countries with the date of signature on FCTS and entry into force

Country	Signature date	Entry into force
Finland	16 / 06 / 2003	27 / 04 / 2005
France	16 / 06 / 2003	27 / 02 / 2005
Greece	16 / 06 / 2003	27 / 04 / 2006
Hungary	16 / 06 / 2003	27 / 02 / 2005
Iceland	16 / 06 / 2003	27 / 02 / 2005
Italy	16 / 06 / 2003	30 / 09 / 2008
Netherlands	16 / 06 / 2003	27 / 04 / 2005
Norway	16 / 06 / 2003	27 / 02 / 2005

Spain	16 / 06 / 2003	11 / 04 / 2005
Bangladesh	16 / 06 / 2003	27 / 02/ 2005
Egypt	17 / 06 / 2003	26 / 05 / 2005
Canada	15 / 07 / 2003	27 / 02 / 2005
Cote d ‘ lvoire	24 / 07 / 2003	11 / 11 / 2010
Mexico	12 / 08 / 2003	27 / 02 / 2005
Gabon	22 / 08 / 2003	21 / 05 / 2009
Austria	28 / 08 / 2003	14 / 12 / 2005
India	10 / 09 / 2003	27 / 02 / 2005
Malaysia	23 / 09 / 2003	15 / 12 / 2005
Slovenia	25 / 09 / 2003	13 / 06 / 2005

Source: WHO, FCTC

The list displays that the FCTC treaty is an international agreement with the fact that the countries land in various areas and the culture, the economic structure, the level of developing, the history, the regime, the habits of people, the law systems, etc. are quite different from each other. Despite all these differences, the common decision about tobacco was acted by these countries.

According to World Bank statistics, the applied ban on cigarette by the agreement resulted a decline in consumption of tobacco by 4 – 10. After the ban in Uruguay, the consumption has declined by 25%, and also 41% of the tobacco users quit smoking in Ireland. 79% of smokers stated that the ban affected their decisions of quitting (Turkey Ministry Health, 2007). However, the researches need reliable evaluation of the results.

4.2 The Tobacco Policies of Turkey

Turkish society met with tobacco in the time of Ottoman Empire and tobacco consumption has grown so far. The popularity of tobacco has been tried to be diminished by the prohibitions which was applied by Rules by I. Ahmed and IV. Murad. This process resulted in applying tobacco taxes in 1688 and tobacco was

accepted as an agricultural product. After this date, the production of tobacco has been encouraged until 2000s for the economic revenue coming from tobacco production and have not encountered with a strict sanction.

During the 1990s, consumption of foreign cigarettes increased as a result of applied liberal policies. Moreover, foreign cigarette brands became available with the law adopted in1984; it was imported and sold by monopoly. The tobacco monopoly was ended in 1986, all decisions concerning the economy of tobacco was taken over by the Council of Ministers. In 1991, foreign companies were allowed to establish facilities of tobacco. If the foreign company produces over 20.000 tons, they shall be entitled to determine the cigarette prices. The first foreign cigarette factory was established in Bitlis, in 1991; big brands of cigarette such as Reynolds, Camel and Winston followed this factory.

The tobacco was assumed that it was a useful product for the economy and increase of demand would revive market mechanism, thus this case resulted in supporting production and investment of tobacco. Foreign cigarette brands increased their selling continuously by using promotion and advertising. While the share of non – consumption of foreign cigarettes was by % 2.4 in 1984, it rose to 15% in 1991.

In the world market the domination of Virginia tobacco produced by USA caused tobacco to be popular in Turkey and in many countries first illegally, then legally, and this domination affected the status of Turkey in terms of tobacco production badly. Tobacco manufacturers had many difficulties as foreign cigarette factories started to be effective on price. According to TURKSTAT, the total number of tobacco production was 406.000 tons in 2002 whereas the number is 55.000 tons in 2011. Moreover, there is another data verified by Tobacco and Alcohol Market Regulatory. There is a little difference between the data, the reason of this difference may be that TURKSTAT shows all the tobacco products and cigarette is only one of them. Over and above, the data of Tobacco and Alcohol Market Regulatory refers to the products which are ready to be sold. The number of tobacco manufacturers was nearly 550.000 in 1990s, but it declined to 200.000 in the early 2000s (Ozkul I, San Y, 2008).

The continuous reduction of tobacco production is shown in Table 4.2.1. The data that covers the period of 2006 – 2011 proves that tobacco is not accepted as an income for agriculture sector.

Table 4.2.1 The information of tobacco production in Turkey, 2006 – 2011

Year	Producer (item)	Production Area (ha)	The amount of production (ton)
2006	222.414	146.166	117.634
2007	207.051	144.904	117.883
2008	194.282	146.872	118.940
2009	80.766	116.149	92.615
2010	65.339	80.977	63.975
2011	53.314	82.657	67.863

Source: Tobacco and Alcohol Market Regulatory

Producers prefer other products in farming rather than tobacco because of tobacco's deficit. Especially, fund of tobacco was repealed on 1 January 2010, and the tobacco industry suffered from the law. All the implementation and results show that the production of tobacco is not as popular as in the past now. The government of Turkey defends the implementation of the law to try reducing consumption. However, the producers of tobacco have mainly profit maximization rule to reduce the effects of the law; they import to satisfy demand. The tobacco production of Turkey is 18th in the world, in 2010, and Turkey was not among the top 10 countries for the first time. One of the initiatives to reduce the consumption of tobacco has is to decline production. It is reflected to the economy as high import rate of tobacco. As well as cigarette which is the most commonly used, the other tobacco products have been started to be imported as follows.

Table 4.2.2 The production, import and worth of cigar in Turkey, 2003 - 2011

Years	Production (kg)	Import (kg)	Worth ($)
2003	1.500,00	0,00	0,00
2004	969,00	0,00	0,00
2005	708,00	0,00	0,00
2006	1.226,00	0,00	0,00
2007	2.974,00	0,00	0,00
2008	7.888,10	9.644,88	622.498,18
2009	9.118,51	21.000,33	1.391.695,10
2010	14.126,21	23.481,53	1.621.067,78
2011	15.748,99	26.281,80	2.241.424,54

Source: Tobacco and Alcohol Market Regulatory

Cigar imports increased in 2008, when 6.985 million items of cigarette have been legally imported in 2007 for the first time and $ 250.000 has been paid. In this circumstance, burdening tobacco production has no effect on consumption of tobacco. When all aspects are considered, nearly 55.000 producers make money from tobacco.

Reduction in production of tobacco means reducing the income provided by exports. Tobacco is exported to the United States and European Union countries and the export revenue is equal to 2% of the country's exports. Oriental tobacco is produced in Turkey and it attracts attention of other countries. Because the oriental tobacco is blended with another kind of tobacco and new product is preferred by smokers more.

Table 4.2.3 The amount of export of cigarette in Turkey, 2003 - 2011

Years	Export (Amount as items)	Worth ($)
2003	12.961.347.000	-
2004	9.142.850.000	-

2005	11.701.282.000	-
2006	16.927.678.000	147.290.888,91
2007	18.383.867.800	189.340.182,92
2008	25.658.999.200	228.951.950,11
2009	20.366.024.800	204.175.613,05
2010	24.037.012.800	246.852.616,08
2011	24.326.238.400	249.727.418,25

Source: Tobacco and Alcohol Market Regulatory

As stated above, the income of export is very important for the economy of a country. The consumption of tobacco can not be blocked by reducing the production. This circumstance only leads to reduction in export revenues and raise in imports.

Restrictions to reduce the international tobacco consumption can be argued, but production is increasing in developed countries while consumption decreases. In other words, countries give importance to international health care, but the importance is only on protecting their citizens from damages of tobacco and increasing their exporting. Turkey does not decrease tobacco consumption by restricting the production. Giving up tobacco production is not a good idea for Turkey, because oriental tobacco can grow in almost every region of this land. Also Turkey has enough experience of tobacco production and revenue from tobacco exports is ensured. Instead of restricting production other measures should be taken to reduce consumption; increasing taxes on tobacco, rising prices, control duty and strict tariff, restricting import and putting a law into force.

4.3 The Affected Variables on Cigarette Demand

Many studies have been conducted to determine the variables that affect the demand of cigarette. One of them is increase of price and rate of provisions used as economic measures by governments. In other words, the price elasticity of demand of cigarette are tried to be measured. Tax is the most common application in Turkey and in the world to reduce the consumption. These taxes are called sin taxes, which

have both economic and sociological importance. Taxes are not only sources for government budgets and but also restrictive measures to reduce consumption. MPOWER strategies including "rise of tobacco taxes" principle is defined as the most effective method for controlling tobacco consumption.

The greatest developing in restriction of tobacco usage was observed in the USA, which began to take tobacco tax in 1862 because of the war. A specific tariff was forced to Ottoman until the year 1633. Tobacco taxes were taken at regular intervals until the year 1855, but it was increased to alleviate the economic burden of the Crimean War. According to the law that was enacted on 26 February 1923, the government's every action on tobacco had to be controlled (Sapan, 1997). Rising taxes was used as a financial remedy by countries until 2000s. Applying high price on cigarette by increasing taxes is one of the most effective way to reduce consumption. The first time the tobacco tax was used to reduce consumption was in times of war in Australia in 1987, and also tobacco fund was established for the aim.

Rising taxes is a common method used all over the world. For instance, 47 states, Washington and several U.S. territories, have increased their cigarette tax 105 times. The cigarette tax of New York is $ 4.35, the average price for a pack of cigarette is about $5.95 (Orzechowski, Walker, 2010).

Taxes have been started to be collected not only to compensate budget deficit and to increase the income of the country, but also to reduce the demand of tobacco. It is found that elastic demand for cigarettes does not exist for the period of 1995 – 1998 by the study, on the other hand high taxes are more elastic than low taxes (Sissosko, 2002). But by another study by Sylvain, it is claimed that raising taxes on cigarette has no effect on cigarette consumption of adults, conversely it decreases the consumption of young smokers. If taxes on cigarettes increase one percent, the average percentage of young smokers decrease by 0.264 percent. In addition, the increasing of tax reduced the number of cigarettes smoked per day (Sylvain, The Michigan Journal of Business, 2008).

However, according to Wall Street tobacco industry analyst increasing cigarette taxes have more powerful effects on reduction of smoking. It is estimated

that cigarette consumption will decline by 4 % for every 10 % increasing in price (Zoller, Bonnie, 1998; Credit Suisse First Boston Corporation).

Texas increased the tax on cigarette by $1 per pack and the price is $1.41 per pack. Cigarette tax revenues nearly tripled, moreover 21 % decline in the number of packs sold was observed (Orzechowski, Walker, 2010).

It is clearly showed that tobacco taxes are not only economic revenue, but also a social aspect. Special consumption taxes intend to decrease the consumption of goods that are harmful for the community. The 26 % of total excise is cigarette taxes. A person who smokes a pocket with 7 TL per day pays 1.973 TL in total in a year (Action, 2010, p.59).

The study which was conducted by Lewit and Coate, display the impact of price is more effective on the probability of smoking than the quantity of tobacco consumption. 1976 Health Interview Survey was used and the estimation includes age and gender variables. The responsiveness of different ages are different from each other, for instance the young smokers which are between 20 – 25 is more sensitive to increase of price than other groups. Men are affected by the change of price, but there is no effect on women in terms of smoking (Lewit & Coate, 1982).

Table 4.3.1 The price elasticity of tobacco by age

	Age		
Age rank	20 -25	26 – 35	35 -74
Price elasticity of demand	-0.89	-0.74	-0.42

Source: Lewit, et al; "The Potential for Using Excise Taxes to Reduce"

The effects of cigarette prices and different socioeconomic status on cigarette smoking among 12 – 17-year-olds are examined by Lewit, Coate and Grossman. The

research was conducted by “Fairness Doctrine” [(1)], the price elasticity is found as -1.44 and the decision to start smoking is affected by -1.20 of increase of price. It is higher than the responsiveness of the smokers to price changes. The average price elasticity is -0.25 (Lewit, et al; 1981).

The study introduced by Chaloupka in 1991 suggests that the price increases have significant effect on reducing cigarette consumption. The effects are estimated without taking addiction into account (Chaloupka, 1991).

The National Health Interview Surveys are used by Evans and Farrely to estimate the price elasticity of cigarette among young adults and adults. The ages of young adults are between 18 and 24, and the ages of adults are between 25 and 39 and the average age of the group is 40. The price elasticity is estimated as -0.63 for young adults, no significant effect on smoking participation for 40 ages and older was mentioned (Evans, Farrely, 1996). Over 17.000 high school students are used as samples in a research by Ross and Chaloupka and an inversely relationship between price and consumption is found. If the price increases by $0.50 per pack, the demand of smoking will decrease by about %10 (Ross, Chaloupka, 2004).

The decrease of demand is expected by increase price of cigarettes, but the econometric studies display that the price elasticity of demand is so low in Turkey when it is compared to other countries. In Turkey, the effect of price increase on cigarette consumption is examined by A. Tansel firstly. The per capita tobacco consumption (over 15 years) is estimated by using the annual time series among 1960 and 1988 in this study. In addition, the effects of income, education, warning labels and anti – smoking campaigns are predicted. The increase of cigarette prices has a negative and but a significant effect on consumption for estimated four econometric models (-0.21 in short – run, -0.37 in long – run). Increase of income causes increase of cigarette consumption and the effect is significant. On the other

[(1)]The Fairness Doctrine was a policy of the United States Federal Communications Commission (FCC), introduced in 1949, that required the holders of broadcast licences to both present controversial issues of public importance and to do so in a manner that was, in the Commission's view, honest, equitable and balanced (http://en.wikipedia.org/wiki/Fairness_Doctrine. (accessed 3 April 2012).

hand, the warning labels and the campaigns against smoking have negative effects on consumption, which are also statistically significant (Tansel, 1993).

The impacts of many various factors on the demand of cigarettes are analyzed in 2002 by Onder. The econometric model includes real price of cigarette, reel income per capita and the dummy variables, which represent the law which was applied in 1996. The price elasticity of demand is between the range of -0,19 and -0,28. According to the results, the tax revenues will increase substantially and the cigarette consumption will decrease. Moreover, with an increase of income by 10% the demand increases by 2.3% when other variables are kept constant. It is obvious that smoking is seen as a normal behavior among consumers in Turkey according to the income elasticity of demand (Onder, 2002). Another result of this study is that cigarette price is very low in Turkey compared to other countries. When the consumption of cigarette decreased by 4.12% in the world, it increased by 52.18% in Turkey. The reason of this increase is not only the applied liberal policies on economy, but also the impact of lower prices. Finally, price of cigarette was raised on 13 October 2011 and 80.3% of price was collected as tax.

According to Finance Ministry of Turkey, the highest tax on tobacco is in Bulgaria and Turkey. The share of tobacco taxes of some countries in total tax revenue is displayed in Table 4.3.2.

Table 4.3.2 The percentage share of tobacco taxes in total tax revenue, 2011

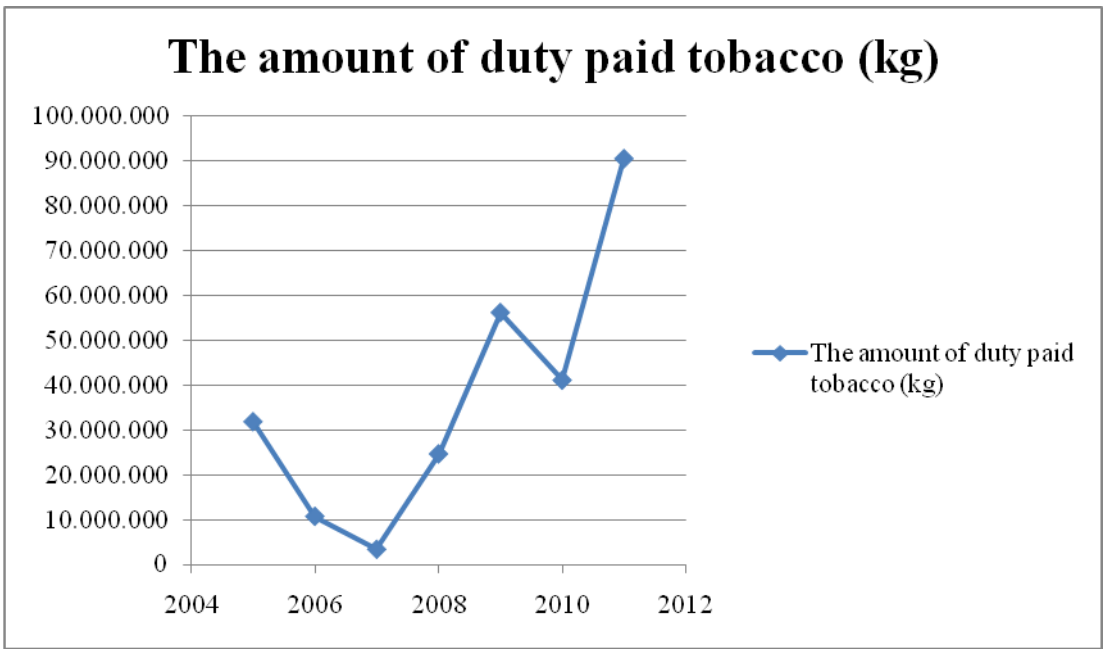
Country	Burden of tax (%)
Bulgaria	85.6
Poland	84.8
Estonia	84.5
Lithuania	83.9
Greece	83.7
The Netherlands	81.9
Slovakia	81.6
Denmark	80.6

France	80.6
Hungary	80.6
Turkey	80.3

Source: Finance Ministry of Turkey, 2011

The price of cigarette is determined by manufacturers, while the tax on tobacco is under the state's control. When the demand of goods increases, the price will increase in general economy terms, but it does not work for tobacco industry. It is observed that occasionally manufacturers decrease cigarette prices due to high taxes. Finally, the excise duty was raised from 65% to 69% on 12 October 2011, after that, price of some cigarette brands was lowered by Philip Morris / Sabanci firm. The main reason of the rising cigarette price was the tax applied after the 2000s. It is assumed that the high taxes cause declining of demand. On the other hand, the number of smuggling cigarette increases because of high taxes. According to Tobacco and Alcohol Market Regulatory, the trend of consumption has been falling since 2008, besides by the data provided from Finance Ministry, it can be implied that there are serious differences between years.

Figure 4.3.1 The amount of duty paid tobacco in Turkey, 2005 - 2011



Source: Finance Minister, Revenue Administration

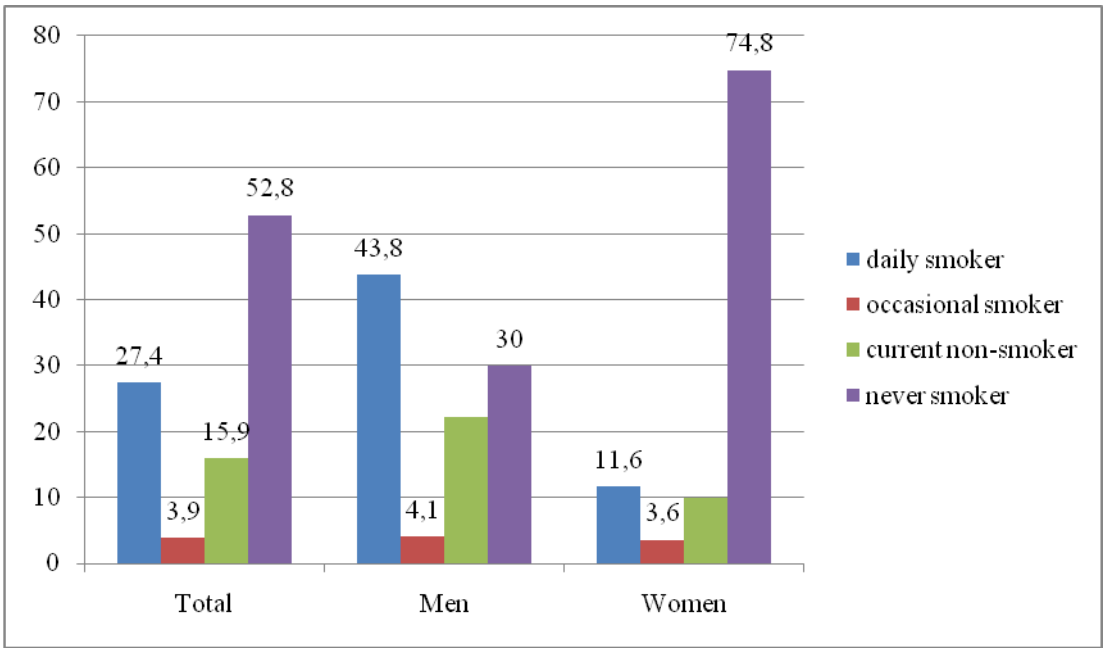
The number of taxes on cigarette has increased in recent years due to the strict implementations to prevent smuggling. Hence, as it is seen above that the increase of the numerical values can be explained despite the decrease in consumption.

Taxing on cigarette is now considered as a control tool to restrict tobacco usage in almost all countries in the world. Children and young people are more sensitive to increase of price in cigarette than adults. According to GATS which is conducted by Health Ministry and Turkish Statistical Institute, 58.9% of smokers are under the age of 18 while the tobacco must be sold to people who are over the age of 18. For this reason, states must use tax as a control tool on price to reduce consumption. The rising should be over the inflation rate. The cigarette price elasticity was found as -0.19 between the years of 1960 – 2000 by Onder. Also, the consumption of cigarette is estimated by the increase of taxes in the study. When taxes were raised by 50% government revenues increased by 22.1% and consumption declined by 7.8% (Önder, 2002).

Lower price of cigarette makes possible not only demand of cigarettes to increase, but also cigarette to be accessible for some age ranges. Increasing taxes to raise the price is the most common method used to restrict consumption. Cigarette taxes have been increasing in Turkey, especially since 2002. However, the consumption is still too high. According to GATS conducted in 2008, 31.3% of individuals who are 15 and older in Turkey use tobacco or tobacco products everyday or occasionally. This rate is 47.9% in men, while it is 15.2% in women.

The percentage of daily smokers and occasional smokers who live in an urban area is higher than the smokers who live in a rural area (urban: 33%, rural: 27.2%). On the other hand, 70.3% of women living in urban areas and 85.2% of women living in rural areas have never used tobacco products.

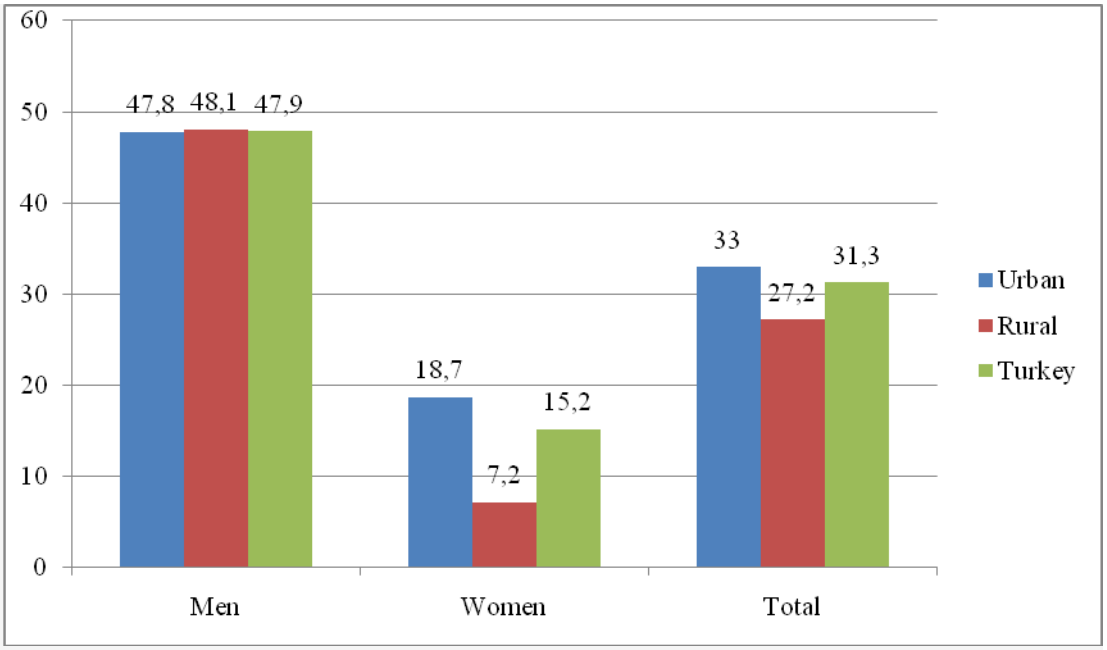
Figure 4.3.2 The percentage of adults who are 15 and older using tobacco or tobacco products and gender in Turkey



Source: GATS, 2008

The percentage of smoking status of adults who are 15 and older and who are current smokers in rural, urban and total are displayed in Figure 4.3.3.

Figure 4.3.3 The percentage of smokers in terms of the living area



Source: GATS, 2010

According to “General Directorate of Family Research Organization” which was founded by TURKSTAT in 2006, 33.4% of 18 – years - old and older were smokers. Men consumed more than women, 50.6% of men and 16.6% of women smoked. Even Family Structure Survey in 2006 includes the cigarette consumption amounts for the years 2000, 2007 and 2008. The results show that the cigarette consumption decreased year by year.

Table 4.3.3 The Cigarette Consumption per capita

Year	Population	The amount of cigarette consumption (billion items)	The cigarette consumption per capita (items)
2000	67.804.903	111.710	1.646
2007	70.596.256	107.455	1.522
2008	71.51.100	107.859	1.508

Source: TURKSTAT – General Directorate of Family Research Organization, 2006

Comparing these two researches, a total amount of smoking for both men and women declined. The decline is explained with the tobacco law which was put into force in 2008 by government. The purpose of this study is to estimate the effect of the smoking ban in 2008 on consumption and to explain the change in health expenditures.

The countries take reducing tobacco consumption as a major goal due to the unhealthy effects of smoking and economic losses. Tobacco kills 6 million people each year and more than 600.000 non – smokers die from exposure to secondhand smoking (WHO Report on the Global Tobacco Epidemic, 2011). The economic measures have been used to reduce the consumption for many years. The amount of consumption has not decreased despite all the economic implementations such as tax increase, raising the price of the input. Economic measures do not work because of the low price elasticity of cigarettes, hence new measures are needed to struggle against smoking.

First non – economic measures are regulations and legal restrictions on smoking which prevent access to tobacco. The effects of socioeconomic variables and laws on cigarette consumption have been investigated by researches in many scientific studies. Chaloupka and Grossman estimated the effects of tobacco control variables on cigarette consumption; one of them is the restriction of smoking in public places and private worksites. Restrictions are effective on reducing consumption among the youth; the prevalence of smoking decline is observed. The other tobacco control variable is the limit of the access to tobacco products for young smokers. The effect is found as negative but not effective (Chaloupka, Grossman, 1996). The different policies are assessed in another study which claims that higher taxes and clean air acts have a large impact on smoking rates. The school education programs and limits on retail sales are not much effective if they are implemented alone like media campaigns (Levy, Chaloupka, et al; 2004).

The tobacco control policies were examined in Argentina to estimate the change of smoking prevalence and expected premature mortality in future. By using the Argentina Tobacco Policy Simulation Model (ATPSM), the smoking prevalence and premature mortality decreased as 30% due to high taxes. If media campaigns, clean air acts, advertising bans, and youth access laws answer the purpose, smoking rates would reduce in the ratio of 45% by the year 2034 and nearly 16.000 lives would be saved per year (Ferrante, Levy, et al; 2007).

In the literature, studies present that tobacco control policies reduce consumption but it is not a great impact. The research is generated by using longitudinal data which claims cigarette taxation and prices are more effective than youth access laws and clean air laws on tobacco consumption of youth. If the economic sanctions and legal sanctions are compared, economic sanctions are conclusive (Liang, Chaloupka, et al; 2001).

Impact of tobacco control policies vary according to their social characteristics such as educational level, age, unemployment and race. The effectiveness of tobacco control is investigated in Europe by using people who have different educational levels. The quit ratio with Tobacco Control Scale do not have consistent differences between the high and low educated. On the other hand,

advertising ban is effective on quitting smoking after the price policies. Countries which enforce more developed tobacco control policies have higher quit ratios (Schaap, Kunst, Leinsalu, et al; 2008).

Nagelhout and Levy try to estimate the change of smoking prevalence and smoking variables which is controlled under the smoke – free legislations, anti smoking media campaigns, stronger advertising bans and health warnings in the Netherlands. According to results, smoking prevalence can be decreased by 21% in the first year. The reduction will be decreasing year by year. 7.706 deaths can be prevented by 2040 because of the strict rules about tobacco consumption (Nagelhout, Levy, et al; 2012).

Smoking ban has been applied since January 2005, it seems to be affective. Including all public and private indoor areas, bar and restaurants brought forth the reduction by 1.3% in smoking prevalence and by 8% in daily cigarette consumption (Buonanno, Ranzani; 2012).

Anti – smoking campaigns have negative effects on tobacco consumption in Turkey, which was come up with by Tansel in 1993 (the parameter is -0.054 for Model 1 and -0.099 for Model 3). Nevertheless, health warnings cause the reduction on consumption for all models (Tansel, 1993).

Önder and Yürekli try to determine the change in price elasticity of demand for cigarette during time series. They add dummy variables which represent the tobacco control variables for each year into their models. The results are unexpected because their effects cause an increase on cigarette consumption also they are significant as statistically (Önder, Yürekli, 2007).

The studies which intend to determine the variables on cigarette consumption include the dummy variables that represent Article 4207 and Article 5261. According to estimated models, Article 4207 has no significant effect on cigarette consumption. Although Article 5261 is considered as more effective to decline cigarette consumption, its effect is found as positive. In other words Article 5261 increases the cigarette consumption, which is unreasonable. On the other hand its effect is significant in 10% significance level (Karaöz, Albeni, Büyüktatlı; 2010).

The study of Önder and Yürekli was conducted before implementing of Article 5261 while the other study of Karaöz, et al; was generated two years later. Time is needed to determine the real impact of the Article 5261. In this study, the effects of the Article 5727 on the probability of smoking and cigarette consumption and the expanded form of this law will be examined.

4.4 The Regulatory of Tobacco in Turkey

State administrators have to take measures to reduce cigarette consumption because it has gained a great momentum since 1990. The primary goal is to protect citizens, especially non – smokers exposed to secondhand smoke. Besides the diseases related to smoking or passive smoking, there is an economic loss for individuals and community. Enacted by Grand National Assembly of Turkey the laws always supported tobacco production because tobacco was an important good to export for Turkey. Although Turkey is one of the leading tobacco producing countries, it tries to restrict the cigarette consumption and prevent the exposure to secondhand smoking.

The first ban on cigarette consumption implemented was in Turkish Airlines in 1988. This implementation was adapted from France and the USA. The laws aiming to restrict consumption have been legislated after this application.

These laws are as follows:

- Article 3694: "Tobacco and The Prevention of Tobacco Products Law" was put into force in 1991.
- Article 4207: The law, aim of which is to protect people from the harms of tobacco products, to prevent advertising campaign, promotions and taking measures to reduce the harms.
- Article 4733 was established on 7 December 1996: Known as "The Tobacco Act" was legislated on 3 January 2002. This law allowed the privatization of General Directorate of Monopolies and a new institution was founded called Tobacco and Alcohol Market Regulatory. Moreover, the special consumption

taxes on tobacco products must be complied with European Union norms and must have the same standards. According to the law, Tobacco and Alcohol Market Regulatory is responsible for making alternative arrangements and taking decisions which prevent all medical, public or social harms related to consumption of alcohol and tobacco.

- Article 5261: Adopted by WHO on 21 May 2003 and has been signed by FCTC on 28 April 2004 in Turkey. It came into force as Article 5261 on 30 December 2004.

- Article 5326: The legislation adopted on 30 March 2005 is called "Law of Misdemeanor". According to the law, tobacco consumption can be fined in closed areas of public service buildings, public transport, indoor areas of buildings belonging to private legal persons such as associations, foundations, corporations, labor unions.

- Article 5727: The article includes the change of the Article 4207. It is the most comprehensive law of Turkey that consists of eleven items. While it was adopted on 19 January 2008, it became valid on 19 May 2008. This law was applied in two stages. A specific time was given to food and beverage industries to convert their places into smoke – free zones.

The changed Article 4207 has been implemented with all provisions on 19 July 2009. The provision is related to the food and beverage industries. In addition to these laws, "The National Tobacco Control Program" which covered 2008 – 2012 years was prepared by Ministry of Health. All applications were enforced to reduce cigarette consumption and to protect people from all damages related to tobacco products.

CHAPTER 5

THE EFFECTS OF SMOKING BAN ON CIGARETTE CONSUMPTION AND HEALTH EXPENDITURES

5.1 Methodology

Initially, a model for cigarette prices was constructed using 2003 HBS, which is preferred by smoker households. The cigarette price (P) represents the function of annuity income, educational level, marital status and living area. All independent variables belong to household head. 2003 HBS provides us with the amount of monthly cigarette consumption and total cigarette expenditures, so cigarette price per pack can be calculated by the author via dividing total monthly cigarette expenditures to the amount of monthly cigarette consumption in 2003. The data is obtained from Turkish Statistical Institute. The household budget survey is conducted every year, also it represents the preference of consumption.

After the regression, some parameters which determine the price of cigarette come out. Then we calculate the preferred price of cigarette by using the parameters in the specified years which are 2006, 2007, 2008, 2009 and 2010. When the price of cigarette is calculated for smoker household, the amount of cigarette consumption is calculated via dividing total monthly cigarette consumption to the cigarette price of household. The price of cigarette represents the price in 2003, because they are calculated by using the estimated parameters. Hence the price is specified according to the years. The relative price shows the real price for specified years.

The relative prices are found for each smoker household. The monthly expenditure of cigarette is known from each HBS between 2006 – 2010 years, and then the monthly cigarette consumption is calculated by dividing the monthly cigarette consumption to price of cigarette. At last the monthly cigarette consumption for each smoker household is available. After these calculations, two kinds of terms about cigarette are mentioned in the model: one is the probability of smoking and the other is the monthly cigarette consumption. Heckman Selection model was constructed to estimate the parameters of variables which determine the probability

of smoking and monthly cigarette consumption. All parameters are estimated by using STATA computer program.

Before Heckman Selection Model, regression analysis of the cigarette consumption of household is made per month. For regression analysis the explanatory variables are the same in selection model. The effects of smoking ban on cigarette consumption are estimated by using Ordinary Least Squares Methods (OLS). The data of smoker household is used.

After the linear regression, the smoking probability is predicted as the function of annuity disposable income, age, marital status, living area, educational level and smoking ban. Except from smoking ban, all variables display the socioeconomic and demographic features of household head. There are two variables which represent the smoking ban. One of them refers to the regulation of smoking in 2008, the other one symbolizes the prohibition in 2009. Its value is 1 if the data is collected in specified years, while its value is 0 for other years. Then cigarette consumption per month is estimated by using the smoker household from all households.

The results of Heckman Selection and linear regression are tested at their significance level. The correlation level test between independent and dependent variables are generated in the empirical study.

5.2 Data

In this study, the Household Budget Survey (HBS) is used as data, which has been collected every year since 2002 by TURKSTAT. HBS provides the expenditure preference of households, besides information about each household's socioeconomic and demographic features. The HBS was carried out between 2006 – 2010 years, because the comprehensive smoking ban has been into force since 2008 and the year of 2008 was chosen as the median.

Before the analysis (2006 – 2010) the monthly cigarette consumption of household has to be determined. Therefore the HBS of 2003 is used. It ensures the data about the amount of tobacco consumption of household per week. Tobacco

products include cigarettes, cigar, etc. In this study, cigarette is used as the tobacco product, because it is the most preferred product among the kinds of tobacco in Turkey.

The question related to cigarette variables in HBS of 2003 as follows:

- The monthly expenditure of cigarette for each household (TL)
- Whether the household has smoking habit or not
- Number of smokers
- How many packs of cigarettes consumed per week

25.920 households were surveyed for a period of one year (1 January – 31 December 2003). There are 14.681 households with cigarette expenditures. There are 5 options of obtaining cigarette which refers to table number. They are:

1. Buying
2. Tobacco products which are consumed by households of their own production
3. Tobacco products which are brought by enterprising individuals from the workplace for survey month
4. The goods and services are given by the employer to employees for survey month
5. The goods and services are purchased in order to give a special gift or assistance to person or entities

In this study, number 1 is used as a table number that refers to provide cigarette by buying. Obtaining other forms of tobacco has been ignored, because they do not present the preferences of households. The table numbers are the same in all HBS. Additionally, only cigarette is used as tobacco products in this research, as it is the most preferred in Turkey. 14.392 households ensure cigarette by buying according to the restrictions above. Furthermore, the monthly cigarette expenditure and the amount of cigarette consumption (as a package) per week are known.

All HBS provide information about demographic and socioeconomic characters of each member of households such as gender, age, marital status,

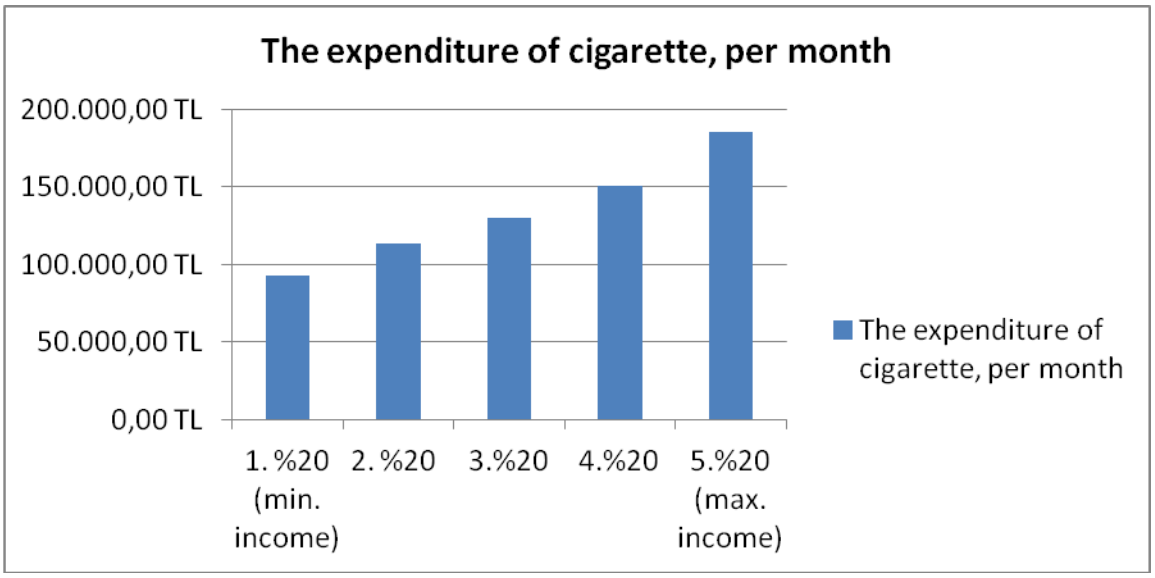
educational status, total monthly personal income, total annuity personal income, living in a rural or urban area, annual disposable income of households. The data sets between 2006 and 2010 do not include cigarette consumption of households. Only the smoking expenditure of household is contained, thus this study will process with four stages:

1. To estimate the effects of annuity income, marital status, educational level and the type of living area on the price of cigarette consumption of smoker households by using data from HBS of 2003.
2. To calculate the price of cigarettes for smoker households in between 2006 and 2010 by using estimated parameters above.
3. To find the relative prices for each year and determine the amount of cigarette consumption (as a package) of smoker households per month by dividing monthly cigarette expenditures to the relative prices.
4. To predict the impacts of Article 5727 on the smoking possibilities for all smoker and nonsmoker households for the years 2006 – 2010. Also to measure the effects of this law on monthly cigarette consumption by using the data of smoker households.

5.2.1 The Effects of Socioeconomic Variables of Household Head on the Price of Their Preferred Cigarette

The Household Budget Survey of 2003 includes cigarette expenditures and the amount of cigarette consumption for each smoker household per month. The price of cigarette per pack is calculated by dividing total monthly cigarette expenditures to amount of cigarette consumption. Figure 5.2.1 shows the expenditure rate of cigarette consumption for 20% of groups. According to Figure 5.2.1; the price of cigarette increases with the high income level of households. In other words, rich household prefers more expensive cigarettes compared to poor household.

Figure 5.2.1 The expenditure rate of cigarette consumption for 20% of income groups, 2003



Source: HBS of 2003, TURKSTAT

After determining the price of cigarette for each household, the econometric model which consists of annuity income, educational level, marital status, and rural / urban area is constructed. The regression analysis to investigate the relation between variables is displayed Table 5.3.

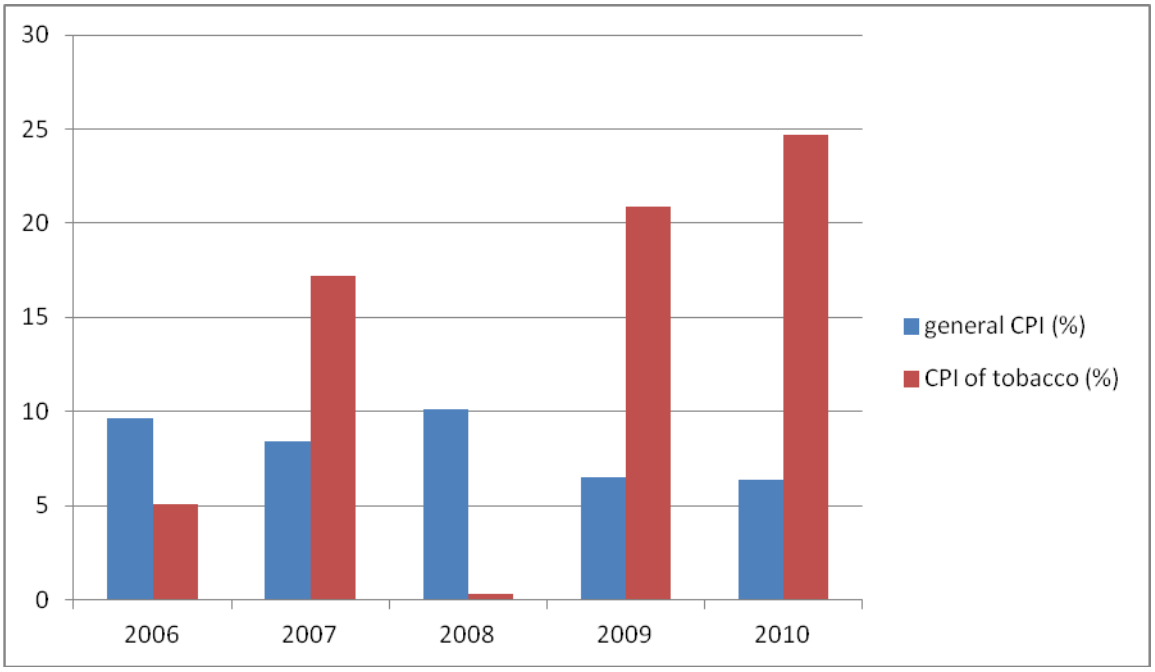
5.2.2 The Calculation of Cigarette Prices for the Years 2006 – 2010

The effects of socioeconomic variables of household head on cigarette consumption of household are estimated. After this process, the price of cigarette is calculated for each smoker household between the years 2006 – 2010 by using former parameters. Consequently, cigarette price, which is preferred by smoker households, comes out. This process has to be gone through to find the prices, because the HBS between 2006 and 2010 do not include the cigarette prices, they are found by estimation according to 2003. On the other hand, the relative prices of cigarette are needed.

5.2.3 The Relative Price of Cigarette

The ratio of general consumer price index on December and consumer price index of tobacco on December for each year is multiplied by former prices. In this way, cigarette prices are transformed according to their years. Figure 5.2.2 displays the general consumer price (CPI) index and consumer price index (CPI) of tobacco for 5 years period between 2006 and 2010.

Figure 5.2.2 The general CPI and CPI of tobacco on December, 2006 – 2010



Source: TURKSTAT

Relative price of cigarette can be reached after this process for each smoker household. The cigarette consumption of smoker households per month is calculated by dividing monthly expenditure of cigarette to relative prices from 2006 to 2010.

5.2.4 The Analysis of Smoking Ban on Cigarette Consumption and Probability of Smoking

The goal of analysis is to estimate the impact of smoking ban on monthly cigarette consumption and probability of smoking for both of smoker and non – smoker households. Therefore, Ordinary Least Squares Method (OLS) is used for smoker households and Logit Model for all households. The impact of smoking ban on cigarette consumption for smoker households and probability of smoking for all households are provided by Logit Model.

5.3 The Models

Initially, the function of cigarette prices is constructed for smoker households, hence the data from HBS of 2003 is used. It is included in the logarithmic function for price and annuity income of household head, due to the constant elasticity model.

$$\ln(P) = \alpha_0 + \alpha_1 \ln(I) + \alpha_2 E + \alpha_3 M + \alpha_4 L + u, \quad (1)$$

P represents the price of cigarette for each smoker household; I, annuity income of household head; E, educational level of household head; M, marital status of household head; L, the type of living area. Educational level, marital status and living area are classified as follows:

- Educational level: 1. Illiterate
  2. Literate without a diploma
  3. Elementary school (5 years)
  4. Elementary education (8 years)
  5. Secondary school
  6. Equal to secondary school

7. High school

8. Equal to high school

9. College education (2 years)

10. College education, faculty (4 years)

11. Post graduate, doctorate

- Marital status: 1. Single
  2. Married

- Type of Living area: 1. Rural (The population is 20.000 or less)
  2. City (The population is 20.001 or more)

The econometric model above (1) is analyzed by using OLS and the results of regression analysis are shown in Table 5.3.1

Table 5.3.1 RESULTS OF REGRESSION ANALYSIS, HBS of 2003

	Econometric Model				
Statistics	$\ln(P) = \alpha_0 + \alpha_1 \ln(I) + \alpha_2 E + \alpha_3 M + \alpha_4 L + u$				
	Annuity income (I)	Educational Level (E)	Marital Status (M)	Living in rural / city (L)	Constant
Coefficient	0.14	0.03	-0.01	0.12	-0.95
Standard errors	(0.006)	(0.002)	(0.018)	(0.011)	(0.062)
t – value	21.44	11.43	-5.34	10.37	-15.33

Significant	at 1%, 5%, 10%	at 1%, 5%, 10%	at 1%, 5%, 10%	at 1%, 5%, 10%	at 1%, 5%, 10%
R^2 0.0799	Adjusted R^2 0.0796	N. Obs. 13.015			

The regression analysis reveals that the annuity income of household head has a positive effect on cigarette prices of smoker households. In other words, families with high level of income have preferred expensive cigarettes. According to the estimation, if annuity income of household head increases by 100 percent, the price of cigarette will increase by 14%. Additionally, the cigarette price will increase by 3% in terms of educational level, thus smokers with high educational level prefer more expensive price of cigarette. On the other hand, marital status has negative effects on preferred prices of cigarette. If household head is single, smoker households spend much to buy cigarette. The smoker households who live in a city prefer higher – cost cigarettes.

The parameters are important to ensure the cigarette prices between the years 2006 and 2010. They are applied to each year and the preferred cigarette of households is calculated. The calculation is not used for all households, it is only put in practice for smoker households. The households are accepted as smoker if they have monthly cigarette consumption. After the determination of prices, they are converted to relative prices as the coefficients are taken from regression of the year 2003. In this way, cigarette prices are transformed according to the years. The monthly cigarette consumption is found by using monthly cigarette consumption and cigarette prices of households. Table 5.3.2 displays the results of regression analysis which are based on the years 2006, 2007, 2008, 2009, 2010. The independent variables are different from the previous one. Although the type of living area and the marital status are the same, the income is different and annuity disposable income of household is used as an income. Moreover, educational level and age of household head are classified as follows:

Educational level: 1. Illiterate or illiterate without diploma, e_1

2. Elementary school (5 years), e_2

3. Elementary education (8 years) or secondary school or equal to secondary school, e_3

4. High school or equal to high school, e_4

5. College education (2 or 4 years), post graduate or doctorate

Age: 1. 15 – 24 age range

2. 25 – 44 age range

3. 45 – 64 age range

4. 65 +

TABLE 5.3.2 THE EFFECTS OF DETERMINED VARIABLES ON CIGARETTE CONSUMPTION OF HOUSEHOLD PER MONTH, 2006 – 2010

Variables	Years				
	2006	2007	2008	2009	2010
The annuity disposable income	0.21* (0.021)	0.19* (0.021)	0.18* (0.021)	0.18* (0.02)	0.20* (0.022)
Age	0.10* (0.021)	0.08* (0.024)	0.06* (0.027)	0.08* (0.025)	0.15* (0.026)
Rural / City	-0.07*	-0.11*	-0.13*	-0.14*	-0.14*

	(0.029)	(0.028)	(0.031)	(0.029)	(0.03)
Single / Married	-0.06 (0.049)	-0.01 (0.046)	0.02 (0.069)	0.01 (0.04)	-0.02 (0.043)
e_2	0.13* (0.049)	0.01 (0.045)	0.09 (0.05)	0.03 (0.045)	0.04 (0.049)
e_3	0.03 (0.06)	-0.07 (0.057)	0.01 (0.061)	-0.04 (0.056)	-0.01 (0.06)
e_4	-0.13* (0.058)	-0.19* (0.053)	-0.11 (0.057)	-0.28* (0.053)	-0.20* (0.057)
e_5	-0.39* (0.068)	-0.47* (0.064)	-0.44* (0.066)	-0.58* (0.062)	-0.43* (0.065)
constant	1.45	1.73	1.97	1.88	1.66
R^2	0.0523	0.0423	0.0455	0.0559	0.05
F	31.81	26.11	25.93	39.07	33.75
(*) indicates the parameter is significant at 5% level					

When the years are compared to each other, a big difference can not be seen among the results. The annuity disposable income of household has a positive effect on cigarette consumption and it is significant at 5% level. Similarly, the age of household head increases the cigarette consumption of household per month. If the households live in a city, they smoke less than the households living in a rural area. The marital status of household head has no impact on cigarette consumption. In terms of educational level, it can be said that the smokers with high education consume less than the basic smoker groups including the smokers who are illiterate or literate without diploma. However, the situation is valid for smokers whose education levels represent as e_4 and e_5. Except e_4 in 2008, the parameters are significant at 5% level.

Furthermore, 3 regression analyses are also needed to be analyzed to estimate the effects of smoking ban on cigarette consumption. All these studies show the amount of cigarette consumption of smoker households between years 2006 – 2010. Socioeconomic variables such as educational level, marital status, age of household head and type of area, annuity disposable income of household are also ensured from HBS from 2006 to 2011. Initially, aggregate all data which belongs to each year and regress by using OLS to estimate the smoking ban on cigarette consumption. In this regression analysis, smoker households are used.

$$\ln(C) = \gamma_0 + \gamma_1 \ln(I) + \gamma_2 e_2 + \gamma_3 e_3 + \gamma_4 e_4 + \gamma_5 e_5 + \gamma_6 M + \gamma_7 L + \gamma_8 a_2 + \gamma_9 a_3 + \gamma_{10} a_4 + \gamma_{11} R_{2008} + \gamma_{12} R_{2009} + u.$$

I represents the annuity disposable income of household; e_2, household head with 5 years of education; e_3, household head with 8 years of education; e_4, household head with 12 years of education; e_5, household head with more than12 years of education; M, marital status of household head (1. single, 2.married); L, type of living area of household (1. rural, 2.city); a_2, age of household between the range 25 – 44; a_3, age of household head between range 45 – 64; a_4, age of household head is 65 or more.

R_{2008} is a dummy variable which represents the smoking ban in 2008. It is equal to 1, if year is 2008; otherwise it is 0. R_{2009} is also a dummy variable. It displays 2008 smoking ban with all provisions, because the smoking ban has been applied step by step. When it was started to be applied, all of the public areas were not included. The ban has been implemented in the food and beverage sector since 2009. The variable is 1 if year is equal to 2009, otherwise it is 0.

After the regression analysis, Heckman Selection Model is constructed to estimate the effects of smoking ban on cigarette consumption and probability of consumption. For this reason, Logit model and regression model are analyzed.

1) The Logit Model:

The Smoking Probability of Household

$$P(s) = \beta_0 + \beta_1 \ln(I) + \beta_2 e_2 + \beta_3 e_3 + \beta_4 e_4 + \beta_5 e_5 + \beta_6 M + \beta_7 L + \beta_8 a_1 + \beta_9 a_2 + \beta_{10} a_{3+} \beta_{11} R_{2008} + \beta_{12} R_{2009} + u,$$

S represents the probability of consumption (1 or 0); the other variables are the same with OLS in regression analysis. In this analysis, smoker and non – smoker households are used. Smoker households are represented as 1, non – smoker household are represented as 0.

2) The Regression Model:

The Cigarette Consumption of Household per month

$$\ln(C) = \mu_0 + \mu_1 \ln(I) + \mu_2 e_2 + \mu_3 e_3 + \mu_4 e_4 + \mu_5 e_5 + \mu_6 M + \mu_7 L + \mu_8 a_2 + \mu_9 a_3 + \mu_{10} a_4 + \mu_{11} R_{2008} + \mu_{12} R_{2009} + u,$$

C represents the amount of cigarette consumption of household per month; the other variables are the same with the analysis above.

5.4 Empirical Results

There are 3 results of regression analysis, one of them is applied in Heckman Selection Model which includes 2 results, the other one is applied by using OLS. First of all, the results of regression model are investigated with OLS method. The results presented in Table 2.4.1 indicate monthly cigarette consumption of household after smoking ban in the first regression. Additionally, the effects of socioeconomic variables on cigarette consumption of household are observed. It can be concluded that there is no multicollinearity and nonlinearity between variables. High R squared ratio is not observed, but it is known that R squared ratio is not a measure to

determine the correction of model. The results of R squared value is 0,4038. Robust regression methods are used to remove the lacks of OLS methods.

TABLE 5.4.1 RESULTS OF REGRESSION ANALYSIS (OLS), 2006 – 2010

Econometric model $\ln(C) = \gamma_0 + \gamma_1 \ln(I) + \gamma_2 e_2 + \gamma_3 e_3 + \gamma_4 e_4 + \gamma_5 e_5 + \gamma_6 M + \gamma_7 L + \gamma_8 a_2 + \gamma_9 a_3 + \gamma_{10} a_4 + \gamma_{11} R_{2008} + \gamma_{12} R_{2009+} u_t$				
Right – hand side variables	Coefficient	Robust standard error	Significant	t value
Constant value	-1.74	0.195	at %5 level	-8.90
Annuity disposable income, I	0.749	0.02	at %5 level	36.07
Education (5 years), e_2	-0.083	0.028	at %5 level	-2.91
Education (8 years), e_3	-0.158	0.036	at %5 level	-4.39
Education (12 years), e_4	-0.353	0.035	at %5 level	-10.04
Education (12 +), e_5	-0.529	0.045	at 5% level	-11.57
Marital status, M	-0.185	0.029	at %5 level	-6.30
Type of living area, L	-0.183	0.018	at % 5 level	-9.85
Age (25 – 44), a_2	0.111	0.069	not significant	-1.60
Age (45 – 64), a_3	-0.047	0.07	not significant	-0.67
Age (65 +), a_4	-0.921	0.083	at 5% level	-11.67

Smoking ban in 2008, R_{2008}	-0.897	0.019	at 5% level	-45.75
Smoking ban in 2009, R_{2009}	1.727	0.014	at 5% level	118.23
Sample years 2006 - 2010	Number of obs. 24.068	R squared 0.4038	F value 3802.61	Root MSE 1.2501

Regression analysis reveals that there is a positive coefficient of annuity disposable income of household. In other words, if annuity disposable income of household increases by 100%, cigarette consumption of household will increase by 74% per month. The ratio is very high, and the result indicates that cigarette is accepted as normal goods for consumers. The smoker households with 5 years, 8 years, 12 years and more education smoke less than illiterate smoker groups, -0.083; -0.158; -0.353; -0.529 respectively. As the education levels of household heads are compared to each other, it can be concluded that education can be an efficient method to reduce smoking. All parameters of education level are significant. The household head who has at least 12 years of education also smoke.

In this study it is proved that the marital status of household head has a negative effect on cigarette consumption. When single and married household heads are analyzed, it can be seen that single smokers consume more cigarettes than married smokers.

The age of smokers gives a clue about smoking habits. According to researches, the age of starting to smoke is an important factor about smoking habits. Start age is very low in Turkey. The age of starting to smoke is 16.6 for men, 17.8 for women. In addition, 19.6% of tobacco users started daily smoking before the age of 15. The ratio is 39.3% for the range of 15 – 17, 21.4% for 18 – 19, 19.7% for 20 and above. For the smokers who are between 25 – 34 and 35 – 45, cigarette consumption is the highest among the age groups, respectively 40.3%; 39.6% (GATS, 2008). The results confirm the outcomes, the household heads who are

between 25 – 44 smokes more than basis group (15 – 25). On the other hand, the parameter is not significant like a_3. It can be said that, the elderly group has the least ratio of cigarette consumption (-0.921). The parameter is significant at 5% level.

The smoker households who live in a city consume less than smokers who live in rural area (-0.183). The type of living area has a negative impact on cigarette consumption, even if the impact is higher in cities than in rural areas.

The major goal is to estimate the effect of smoking prohibition on cigarette consumption of households. There are 2 variables which represent the smoking ban. If smoking ban is in force, the cigarette consumption of household will decline (-0.897). It is significant at 10%, 5% and 1% significance level. According to this research, R_{2008} and R_{2009} (with all provisions of smoking ban in 2008) have different effects on cigarette consumption. It is expected that smoking ban with all provisions is more effective on cigarette consumption and the ratio of decline can be observed by the smoking ban in 2008. However, the parameter of R_{2009} is positive and significant. In this case, the smoking ban causes an increase in cigarette consumption. It is not plausible. On the other hand, the effect of smoking ban is observed only in 2008 and 2009. Other studies can investigate the cigarette consumption of household after smoking ban.

In our work it is proved that the education level is a major measure to reduce cigarette consumption. Additionally, the decline of cigarette consumption was observed in 2008 due to the smoking ban. The effect of smoking ban was not valid in 2009 which was expanded form of 2008. The awareness of smokers was not observed in 2009, although smoking ban was effective in 2008. In this case, it can be said that the prohibition is not a solution to reduce cigarette consumption. According to the results, education helps to protect people from damages of cigarette.

Heckman Selection Model is constructed to estimate the impact of smoking ban on cigarette consumption and ban of smoking. The first model of Heckman Selection Model is Logit Model.

$$P(s) = \beta_0 + \beta_1 \ln(I) + \beta_2 e_2 + \beta_3 e_3 + \beta_4 e_4 + \beta_5 e_5 + \beta_6 M + \beta_7 L + \beta_8 a_1 + \beta_9 a_{2+} \beta_{10} a_{3+} \beta_{11} R_{2008} + \beta_{12} R_{2009} + u_.$$

S represents the smoking probability of household; other independent variables are the same in former models. In this model, smoker and non – smoker households are used. The results of Logit Model are displayed in Table 5.4.2.

TABLE 5.4.2 THE RESULTS OF LOGİT MODEL, 2006 – 2010

Logit Model

$$P(s) = \beta_0 + \beta_1 \ln(I) + \beta_2 e_2 + \beta_3 e_3 + \beta_4 e_4 + \beta_5 e_5 + \beta_6 M + \beta_7 L + \beta_8 a_1 + \beta_9 a_{2+} \beta_{10} a_{3+} \beta_{11} R_{2008} + \beta_{12} R_{2009} + u_.$$

Right – hand side variables	Coefficient	Robust standard error	Significant	z
Constant value	-2.465	0.10	at 5% level	-23.10
Annuity disposable income, I	0.21	0.01	at 5% level	20.42
Education (5 years), e_2	0.281	0.02	at 5% level	14.07
Education (8 years, $e_{3)}$	0.34	0.02	at 5% level	12.77
Education (12 years), e_4	0.24	0.02	at 5% level	9.68
Education (12 + years), e_5	-0.121	0.02	at 5% level	-4.23
Marital status, M	0.176	0.02	at 5% level	8.73

Type of living area, L	0.085	0.01	at 5% level	4.96
Age (25 – 44), a_2	-0.065	0.05	not significant	-1.24
Age (45 – 64), a_3	-0.269	0.05	at 5% level	-5.05
Age (65 +), a_4	6.56	0.05	at 5% level	110.16
Smoking ban in 2008, R_{2008}	-0.025	0.06	not significant	-0.43
Smoking ban in 2009, R_{2009}	0.002	0.05	not significant	0.04
Sample years 2006 - 2010	Number of obs. 45.728	Log pseudolikelihood = -70026.65	Prob > chi2 0.3173	

The logit model is the first step of Heckman Selection Model. In this study, all households are observed. If a household has cigarette expenditures, it is called smoker household and its value is 1, if the household does not have cigarette expenditures it is called non – smoker households and its value is 0. The variable is represented as ‘s’.

The results are almost the same as regression model. Initially, the annuity disposable income has a positive effect on probability of smoking. That is to say, the households with the high annuity disposable income are under the probability of smoking risk. Especially in recent years, the Gross National Product (GNP) has been scaled up, it indicates that the probability of smoking will increase. A number of variables or policies are needed to reduce smoking probability.

As the education levels of households are compared to each other, the results are miscarried. It is expected that if education level increase, the smoking probability will decrease by household’s acquiring awareness. In many European countries, people with high education level have less probability of smoking in comparison to

people with lower education. Turkey has a reverse situation about the issue. The results suggest that if education levels of household heads increase, their smoking probability is higher than basis groups (basis group is illiterate). The smoking probability of household heads with 5 years, 8 years and 12 years of education is greater than the basis group, respectively 28%, 34%, 24%. Only people having more than 12 years education have less probability of smoking. In this case, the political measures can be focused on education, especially on college education or higher. Additionally, all parameters are significant at 5% level, which indicates that the education should be used to decrease the ratio of smoking probability. The impact of marital status of household head is different from the results of regression model.

The living area has a positive influence on the probability of smoking of household. The smoking possibility of people living in a city is 8% more than those living in rural areas. Its effect is positive in Logit model, while it is negative in regression model with OLS. If the household head is single, smoking probability will increase by 18%; if the household head is married, the smoking probability will increase 36%. Once again, the parameter is significant at 5% level.

The smoking probability of household heads whose ages are between 25 – 44 and 45 – 64 are lower than the household heads whose ages are between 15 – 24. The starting age is mostly between 18 – 24, but the parameter of 25 – 44 age range is not significant, thus the effect is not mentioned. Moreover, being 65 and above has a great effect on smoking probability (6.56). Although the effect is significant as robust method, it is not plausible. It is logical in terms of social aspects, the health risk and having illnesses increase with age.

The law introduced on 19 January 2008 is the prevention of losses of tobacco products and also known as the smoking ban by society. The law, which consists of 12 clauses in total, has been in force by two stages. After 8 months, the third clause, subparagraph of law has been implemented. This law is the most comprehensive application in Turkey so far. According to the law, consumption of tobacco is prohibited in all public domain and advertising to encourage consumption and promotion is forbidden. The tobacco products can not be used on television

programs. The places which serve health, education and training, culture and sports activities can not sell tobacco products. Their basis major is to prevent people from damage of smoking, reduce the consumption and create awareness against smoking. According to the results, smoking ban in 2008 and in 2009 have no effect on smoking probability of household in their years. The parameters are not significant. In these circumstances, the smoking ban can not be a measure to reduce smoking probability. The smoking bans were investigated only in the year when they were put into force.

The major expectation from smoking ban is to reduce cigarette consumption. In this study, it is proved that smoking ban has a negative effect on cigarette consumption in 2008. The second step of Heckman Selection model is regression analysis by using smoker households.

$$\ln(C) = \mu_0 + \mu_1 \ln(I) + \mu_2 e_2 + \mu_3 e_3 + \mu_4 e_4 + \mu_5 e_5 + \mu_6 M + \mu_7 L + \mu_8 a_2 + \mu_9 a_3 + \mu_{10} a_4 + \mu_{11} R_{2008} + \mu_{12} R_{2009} + u_.$$

C represents the amount of cigarette consumption of household per month; the other variables are the same with the analyses above. The results are displayed in Table 5.4.3.

TABLE 5.4.3 THE RESULTS OF REGRESSION OF HECKMAN SELECTION, 2006 – 2010

Regression Model $\ln(C) = \mu_0 + \mu_1 \ln(I) + \mu_2 e_2 + \mu_3 e_3 + \mu_4 e_4 + \mu_5 e_5 + \mu_6 M + \mu_7 L + \mu_8 a_2 + \mu_9 a_3 + \mu_{10} a_4 + \mu_{11} R_{2008} + \mu_{12} R_{2009} + u_.$				
Right – hand side variables	Coefficient	Robust standard error	Significant	z
Constant value	-1.827	0.18	at 5%	-9.94

Annuity disposable income, I	0.753	0.01	at 5% level	39.32
Education (5 years), e_2	-0.078	0.02	at 5% level	-2.61
Education (8 years), e_3	-0.149	0.03	at 5% level	-3.98
Education (12 years), e_4	-0.349	0.03	at 5% level	-9.57
Education (12 +), e_5	-0.534	0.04	at 5% level	-11.76
Marital status, M	-0.18	0.02	at 5% level	-6.06
Type of living area, L	-0.183	0.02	at 5% level	-6.59
Age (25 – 44), a_2	-0.111	0.06	not significant	-1.61
Age (45 – 64), a_3	-0.05	0.06	not significant	-0.72
Age (65 +), a_4	-0.89	0.08	at 5% level	-10.06
Smoking ban in 2008, R_{2008}	-0.663	0.07	at 5% level	-8.98
Smoking ban in 2009, R_{2009}	1.515	0.05	at 5% level	28.17
Sample years 2006 – 2010	Number of obs. 21.660	Log pseudolikelihood: -70026.65	Prob > chi2 : 0.0000	

The results of annuity disposable income are verified from former studies. The annuity disposable income has a positive effect on cigarette consumption of household per month. The outcomes of all variables may change, except from income. Its effect is found as the same in all models. The parameter is also significant. Cigarette consumption increases with high income, which means smoking is still counted as a normal good in economic literature.

Many studies have been conducted to show the relationship between the demand of cigarette and the years of education. The reduction is expected with high education. According to GATS (2008), 38.9% f the people graduated from university smoke, while the ratio is 46.8% for the people who are illiterate. There is no big difference between the ratios. As far as females are concerned, higher education leads to more cigarette consumption. This case includes social conditions; the smoking is seen as freedom by females. These models do not include the gender variable, because the features belong to household head. Household heads are always considered to be male in Turkey. The effects of education level of household head on cigarette consumption are analyzed, gender is ignored. The results show that the education level is effective to reduce cigarette consumption. The smokers who have 5 years education use cigarette less by almost 8% than the basis group which is illiterate or literate without diploma. Similarly, smokers with 8 years of education consume less than the primary group (-0.149). If the education level increase, cigarette consumption of household will decrease per month. The big decline is seen in last group, who has more than 12 years of education. Therefore it is mentioned that education level would provide the awareness about the damage of smoking or being exposed to smoke. Because of their significant parameters, the cigarette consumption might decrease with effective educational policies.

The household head who is married consume cigarette less than single household head. If their marital status is single, the monthly cigarette consumption will decrease by 18% while the reduction is two times more for married household head. The parameter is significant.

The type of living area provides much information about the social and economic aspects of households in Turkey. Urban population approaches to millions while the population of villages is decreasing day by day because of migration. It has been continuing from 1960 so far. The cigarette is expected to be consumed more in a city due to the population of the city. However the results are different from the expectation. The smokers who live in a city smoke less almost by 18% than smokers who live in rural area.

The smokers who are between the ages of 15 – 24 are found to have the highest ratio of cigarette consumption in comparison to other age ranges. The age of 25 – 44 and 45 – 64 have no significant effect on cigarette consumption. The age of 65 and more has negative impact on cigarette consumption and it is significant. It is plausible, because the health risk increases with age.

All socioeconomic variables are estimated, but the major goal is to estimate the effect of smoking ban on cigarette consumption. Initially, the parameters of R_{2008} which does not include all clauses of the smoking ban are predicted. The negative impacts of the smoking ban on monthly cigarette consumption in 2008 (-0.663) are found. R_{2008} is 1, only the year is equal to 2008. In a sense, the households are sensitive to the smoking prohibition only in 2008. The effect is significant. "The Prevention of Losses of Tobacco Products Law" includes 11 clauses. Most of them are relevant to the regulation of consumption. In this case, the smoking prohibition worked in 2008.

Secondly, the impact of the expanded smoking ban is predicted on monthly cigarette consumption of household. The expanded smoking ban includes all clauses of smoking law. The provision is excluded from the scope which includes the food and beverage industry. They were given 18 months to arrange their places which have to be adapted to the smoke – free zone. The overall objective of the prohibition is to reduce cigarette consumption. Besides, its goal is to protect the non – smoker citizens. It is expected that the smoking ban with all provisions will have a negative effect on cigarette consumption. However, the parameter is found positive and significant (1.515). The result is the same as the other studies which have been

conducted before. The reason of the unexpected result might be lack of time. R_{2009} is equal to 1, if year is 2009. The tobacco law has been implemented with all provisions since 19 July 2009. Our data includes the terms before July and after July. Only if 2009 is divided into two terms, a successful analysis might be conducted.

CONCLUSION

Cigarette was considered as an important agricultural product, as it ensured personal income and revenue for governments. Although its production and exportation yield to the government budget, consumption of tobacco has been restricted by laws. Firstly the restriction started by rising the price of cigarette, but it was not effective, especially among adults. Major causes of provisions are economic burden, the diseases related to smoking and to be exposed to cigarette. It is thought that cigarette consumption would decrease after the ban; consequently the health expenditure would decline.

According to institutions of state, the smoking ban is useful to decrease the consumption of cigarette. The explained data displays the reduction in cigarette consumption. The real outcome is ensured by using preferences of household. Thus, the household budget surveys (HBS) which were conducted during the years 2006 – 2010 are used to estimate the real effects of smoking ban on cigarette consumption. Additionally, the smoking probability of household is predicted by using smoker and nonsmoker households.

The first ban is effective on monthly cigarette consumption of household only in 2008. On the other hand, it has no effect on smoking probability of household in the same year. The second ban with all provisions has positive effects on monthly cigarette consumption of household in 2009. The effect of second ban on smoking probability of household is like the first ban. It has no significant effect, in other words the decision of people about smoking is not affected by the smoking ban.

Although smokers under the age of 18 are prohibited from buying tobacco products, the ratio of smoking is the highest among the age of 15 – 24. In this case, they provide them illegally. As the law is not sufficient to prevent illegal selling and buying, the control mechanisms should be more strict than the current ones.

The educational level cause to decrease the monthly cigarette consumption of household. The damages of smoking should be taught at primary school. According to recent researches, smoking is not related to education. In this study, cigarette consumption can be decreased by high educational level.

The reduction in cigarette consumption following the ban displays that the awareness has been started to be generated. A decline of health expenditure is expected in the future. The implementation of ban with all provisions has no effect on cigarette consumption and smoking probability. This circumstance shows that the workers who work in food and beverages industry are faulty, because they were against the law. It is assumed that food and beverage industry could be harmed by the smoking ban.

As the Household Budget Survey of 2006 – 2010 has no data about the cigarette consumption, the Household Budget Survey of 2003 is used to estimate the monthly cigarette consumption of household. To find more realistic results, the HBS should be included with the data of cigarette. The data should be the amount of cigarette consumption, brand of preferred cigarettes, the numbers of smokers, the age of smokers, the numbers of packets which are smoked indoors or outdoors. Only if all data about cigarette is provided, the scientific research will display the real – like outcomes.

BIBLIOGRAPHY

Barendregt, JJ., Bonneux, L., von der Maas, J., (1997). The health care of costs of smoking. *N Engl J Med, 337: 1052-7.*

Benan, Musellim., Sempozyum Dizisi *No:58, Kasım 2007: 13-18.*

Bilir, N., Güçiz, B., Yıldız, AN., (1997). Smoking Behaviors and Attitudes. Ankara, Hacettepe Public Health Foundation, International Development Research Centre, Ankara.

Buonanno,P., Ranzoni, M., (2012). Thank you for not smoking: evidence from the Italian smoking ban. *Working papers; No.246.*

C.J, Murray., A.D, Lopez., (1996). The Global Burden of Disease: A Comprehensive assessment of Mortality and Disability from Disease, Injuries and Risk Factors in 1990 and Projected to 2020. *Cambridge, MA: Harvard School of Public Health.*

Chaloupka, F.J.,(1991). Rational Addictive Behavior and Cigarette Smoking. *Journal of Political Economy, 99: 722-42.*

Chaloupka, F.J., Grossman, M., (1996). Price, Tobacco Control Policies and Youth Smoking. *NBER Working Paper No.5740.*

Chaloupka, F., (1999). Macro- Social Influences: the Effects of Prices and Tobacco Control Policies on the Demand for Tobacco Products. Nicotine and Tobacco Research. (http://digger.uic.edu, accessed April, 2012).

Chaloupka and Warner, (2000). International Agency for Research on Cancer, 2011.

Cummings, CM., Stiks, J., Mahoney, MC., Sciondra R., (1992). Health and economic impact of cigarette smoking in New York State, 1987-1989. *N Y State J Med, 92: 469-73.*

Denscombe, M., (2007). UK Health Policy and underage smokers: The case for smoking cessation services. *Health Policy, 80(1): 69-76.*

Ding, A., (2005). Curbing adolescent smoking: a review of the effectiveness of various policies. *Yale J Biol Med. 78(1): 37-44.*

Doll, R., Hill, A., (1950). Smoking and carcinoma of the lung Preliminary Report. *British Medical Journal, 30: 739-748.*

Doll, R., Hill, A., (1954). The Mortality of Doctors in Relation to Their Smoking Habits. *British Medical Journal: 1451-1455.*

Erdem, E. (1988). Dünden Bugüne Tütün. İstanbul: *Tütün Dergisi, Sayı:2*

Environmental Tobacco Smoke in Home Environments, Health Canada, (1996).

Evans, W.N., Farrelly, M.C., Montgomery, E., (1996). Do Workplace Smoking Bans Reduc Smoking? *Departmen of Eonomics, University of Maryland.*

Ferrante, D., Levy, D., Perupa, A., Compton, C., Romano, E., (2007). The role of public policies in reducing smoking prevalence and deaths: the Argentina Tobacco Policy Simulation Model. *Rev Panam Salud Publica, 21(1): 37-49.*

Hacıevliyagil, S., Mutlu, LC., Gülbaş, G. ve ark., (2006). Göğüs Hastalıkları Servisine Yatan Hastaların Hastane Yatış Maliyetlerinin Karşılaştırıması. *Toraks Dergisi, 7(1): 11-16.*

Howard, Bornum., (1994). The Economic Burden of The Global Trade in Tobacco, presented at the 9th World Conference on Tobacco and Health.

Institute of Medicine, Secondhand Smoke Exposure and Cardiovascular Effects: making Sense of Evidence. Washington, National Academy of Sciences, Institute of Medicine, 2009 (accessed April 2012).

Jha, P., Chaloupka, J., (1999). *Governments and Economic Tobacco Control. World Bank Publications.*

Johnson, E., Dominics, F., Griswold, M., Zeger, SL., (2003). Disease cases and their medical costs attributable to smoking: An analysis of the national medical expenditure survey. *J Econometrics, 112: 135-51*.

Karaöz, M., Albeni, M., Büyüktatlı, F.,(2010). Effects of Regulatory Forms on Cigarette Consumption. *Alanya İşletme Fakültesi Dergisi, 2/2: 19-36.*

Köktener, A. (1988). Yüzyılların Tutkusu Tütün. İstanbul: *Tütün Dergisi, Sayı:*2
Manning, G., Keeler, B., Newhouse, P., Sloss, M., and Wasserman, J. (1989). Do Smokers and Drinkers Pay Their Way? *JAMA, 261(10), 1604-1609.*

Levy, DT., Chaloupka, F.J.,Gitchell, J., (2004). The effects of tobacco control policies on smoking rates. *J Public Health Manag Pract., 10(4): 338-53.*

Lewit, E.M., Coate, D., Grossman, M., (1981). The Effcets of Government Regulations on Teenage Smoking. Journal of Law and Economics, 24: 545-69.

Lewit, E.M., Coate, D.,(1982). The Potential Excise Taxes to Reduce Smoking. *Journal of Health Economics, 1: 121-45.*

Liang, L., Chaloupka F., Nichter M., Claylon, R., (2003). Prices, policiesa and Youth Smoking, May 2001. *98 Suppl 1: 15-22.*

Nagelhout, GE., Levy, DT., Blackman, K., Currie, L., Clancy, L., Willemsen, MC., (2012). The Effect of tobacco control policies on smoking prevalence and smoking-attributable deaths. (http://www.ncbi.nlm.nih.gov//pubmed/21906197).

Nielsen, K,. Fiore, M., (2000). Cost –benefit analysis of sustained-release bupropion, nicotine patch, or both smoking cessation. *Prev Med, 30: 209-16.*

Orzechowski and Walker, (2010). Tax Burden on Tobacco, media reports.

Önder. Z., (2002). Economics of Tobacco Control in Turkey. HNP Discussion Paper, Economics of Tobacco Control Paper, Washington D.C. *The International Bank for Reconstruction and Development / the World Bank, 2002; 2.*

Önder, Z., Yürekli, A., (2007). A Regressivity of Cigarette Excise Taxes and Tobacco Control. A Case Study in Turkey. *Washington Working Paper.*

Özkul, İ., San, Y., (2008). Türkiye' de Tütün Sektörünün Durumu, Sorunları ve Çözüm Önerileri.

Parrott, S., Godfrey, C., Raw M., et al., (1988). Guidance for commissioners on the cost effectiveness of smoking cessation interventions. *Health Educational Authority, 53: 1-38.*

Ross, H., Chaloupka, F.J., (2004). The effect of public policies and prices on youth smoking. *Southern economic Journal, 70: 796-815.*

Sağlık Bakanlığı, RHSMB, Hıfzıssıha Mektebi Müdürlüğü, Ulusal Hastalık Yükü ve Maliyet Etkililik Çalışması, (2003), Ankara.

Sağlık Bakanlığı, RHSMB – Refik Saydam Hygiene Center Presidenty, the School of Public Health.

Sağlık Bakanlığı Temel Sağlık Hizmetleri Genel Müdürlüğü, Küresel Yetişkin Tütün Araştırması Türkiye Raporu.

Schaap, MM.,Kunst, AE., Leinsalu, M., Regidor, et al., (2008).effects of nationwide tobacco control policies on smoking in high and low educated groups in 18 European Countries. (www.ncbi.nlm.nih.gov/pubmed/18483129).

Serginio Sylvain, (2008). The Effects of Excise Tax on Cigarette Consumption: A Divergence in the Behavior of Youth and Adults. *The Michigan Journal of Business, 1(2): 87-109.*

Surgeon General Report, (2004). *p.61,137,167,170,183,254,324-325.*

Tansel, A., (1993). *Applied Economics, 25: 521-529.*

Tauras, J., et al., (2001). Effects of Price and Access Laws on Teenage Smoking Initiation: A National Longitudinal Analysis. *Bridging the Gap Research , Impacteen.* (accessed April, 2012).

Tennesen, P., Carozzi, L., Fagerstrom, KO., et al., (2007). Smoking cessation in patients with respiratory diseases: A high priority, integral component of therapy. *Eur Respir J, 390-17.*

Tomson, T., Helgason, AR., Gilljam, H., (2004). Outline in smoking cessation. A cost-effectiveness analysis. *Int J Technol Assess Health Care, 20: 469-74.*

Turkish Statistical Institute, The Research of family structure, 2006.

U.S. Department of Health and Human Services, Public Health Services, National Toxicology Program. *Report on Carcinogens. Eleventh Edition, 2005*.

U.S. Department of Health and Human Services, The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of The Surgeon General. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006. (accessed April 2012).

U.S. Department of Health and Human Services, Women and Smoking: A Report of the Surgeon General (2001).

U.S. Environmental Protection Agency. Respiratory Health Effects of Passive Smoking: Lung cancer and Other Disorders, Washington: Office of Research and Development, Office of Health and Environmental Assessment, 1992. (accessed April 2012).

Uysal, A., (2007). Sigara Bırakma Tedavilerinin Ekonomisi, Etkinlik, Ödeyici Kurumlar. *Yedikule Göğüs Hastalıkları ve Göğis Cerrahisi Eğitim ve Araştırma Hastanesi, İstanbul, Türk toraks Derneği Okulu.*

WHO, Framework Convention on Tobacco Control, (2003), Geneva.
http://www.who.int/fctc/text download/en/index.html.(accessed April, 2012).

WHO Report on The Global Tobacco Epidemic, 2011.

Wynder, EL., Graham, EA., (1950). Tobacco smoking as a possible etiologic factor in bronchogenic carcinoma: a study six hundred and eight-four proved cases. *Journal of the American Medical Association, 143: 329-36.*

http://www.cancer.gov/cancertopics/factsheet/Tobacco/ETS (April 2012).
http:// www.cancer.org/downloads/COM / OH2006GASTipsheet.pdf. (accessed April 2012).