ECONOMETRIC ANALYSIS OF YOUTH SMOKING BEHAVIOR IN TURKEY

Zeynep Önder
Bilkent University
Faculty of Business Administration
Bilkent, Ankara 06533, Turkey
phone: (90-312) 290-2038
fax: (90-312) 266-4958
e-mail: zonder@bilkent.edu.tr

Public Disclosure Authorized

Background

There is no doubt that tobacco use has harmful effects. It is a problem for both developed and developing countries. More than 3 million people died in 2000 because of their tobacco use. It is expected that total death will increase to almost 8.5 million in 2020 if people continue to smoke at the same rate. Moreover, the projection indicates that the burden attributable to tobacco will affect developing countries more than developed ones (Gajalakshmi, et al 2000). In terms of tobacco use, developing countries carry similar characteristics: very high male smoking prevalence rate, increasing prevalence rate among women, high exposure to the second-hand smoking and the inexistence or weak enforcement of tobacco control measures.

Turkey is similar to many developing countries. Tobacco consumption increased more than 40 percent over the last ten years, from 82.5 million pieces in 1993 to 116 million pieces in 2003 (USDA, 2004). Nearly half of the over 15 years old population (44 percent) is estimated to be smoker and the smoking prevalence rate is higher among males than females in 1988 (62.8 percent versus 24.3 percent) (Bilir, Dogan and Yildiz, 2000). Youth prevalence rate is also very high. Bilir and Önder (2000) reported that the prevalence rate was 2 percent among the 7^{th} grade students and 16.3 percent among the 10^{th} grade students in 1998. When the share of youth population in total population is considered, these rates are high and designate the necessity for some immediate precautions to be taken by policy makers to reduce youth smoking. If youth smoking leads to adult smoking, it can have drastic implications for the health of the Turkish population.

In order to develop some policies to combat the tobacco epidemic among the youth, it is important to understand the factors that affect the youth's decision to smoke and their tobacco consumption. In this study, the data collected with the Global Youth Tobacco Survey (GYTS) are used to analyze the smoking prevalence rate among the youth and the consumption of tobacco among secondary and high school students in Turkey.

The report is organized as follows. The information about the GYTS is provided in the first part. The second part gives some descriptive statistics about the prevalence rate of students and their consumption based on several characteristics observed in the survey. The third part presents the empirical model and the variables used to estimate the probability of smoke and the quantity consumed. The fourth part presents the empirical results obtained from the

analysis. The last part summarizes the results and concludes the paper with some policy recommendations.

1. GYTS Study

The Turkish Global Youth Tobacco Survey (GYTS) was conducted in 2003. A two-step cluster sampling design is used to get a nationally representative sample of secondary and high school students from the seventh, eighth and ninth grades. The first step involves the selection of schools that will be surveyed from seven regions and three biggest cities, namely Ankara, İstanbul and İzmir. The second step is the selection of classes from each school using systematic equal probability sampling.

A total of 202 schools and 15,957 students were surveyed in the analysis. Table 1 shows the distribution of schools and students over seven regions and three cities. Almost the same number of schools in each region and city was surveyed in the study. The weighted distribution of students takes into consideration the population in the regions and cities.[1] See Ergüder, et al, 2004 for detailed description of the survey design, data collection and data entry processes).

The GYTS questionnaire asks about the general characteristics of students, such as age, grade, sex, income level, region, and their family whether their parents work, and their education levels. The other questions can be grouped into eleven categories. They are students' smoking habits, their accessibility, smoking habits of their parents or other family members, smoking habits of their friends, knowledge about the effects of smoking, perception about smokers, thoughts about tobacco control measures, exposure to pro- and anti-cigarette promotions, exposure to smoking in schools, tobacco in school curriculum, thoughts about quitting:

Smoking habits: Some questions ask about the smoking behavior of students. They include how many cigarettes they smoked, how much they smoked per day, types of cigarettes they smoked, the age that they experienced smoking, their addiction to cigarettes (whether they want to smoke as a first thing in the morning, whether it is difficult not to smoke for a week), the brand they preferred, the price they paid, their cigarette expenditures, the place they smoke.

[1] See Ergüder, et al (2004) for detailed description of the survey design, data collection and data entry processes.

Accessibility: Two questions in the survey are about the accessibility of the students to cigarettes from the market, i.e., whether they can purchase them easily from the market. They ask whether students were able to buy cigarettes from the market if they want to buy them, and the difficulty they faced in purchasing cigarettes from the market.

Smoking habits of their parents or other family members: The questions include whether their parents smoke, and the frequency that the students see their father, mother, brothers, sisters, or others smoking at home.

Smoking habits of their friends: Whether their best friends smoke, whether they accept to smoke if their best friend offers it, the number of students smoking in class are the questions about smoking habits of their friends.

Knowledge about the effects of smoking: Whether their family told about the hazards of smoking, whether smoking results in gaining/losing weight, thoughts about harmful effects of smoking, can be included in this category.

Perception about smokers: This group of questions asks whether the smoking boys or girls have more or less friends, their attractiveness, their comfort at social occasions, whether smoking boys or girls look self-confident, foolish, looser, successful, clever, intelligent, or macho.

Thoughts about tobacco control measures: Students' thoughts about whether cigarettes advertisement should be banned, whether cigarette prices should be increased, whether cigarette sales to children should be prohibited, whether smoking should be banned in public places are grouped in this category.

Exposure to pro- and anti-cigarette promotions: Some questions ask the places that they are exposed to pro- or anti-tobacco messages and the frequency of their exposure. They include their exposure to anti-tobacco messages on TV, radio, billboards, posters, newspapers and journals, cinema, in sport activities, fairs, concerts and public events; their exposure to tobacco advertisement on billboards, newspapers and journals, in sport contests, concerts, social meetings and public events, exposure to smoking artists, having stuff with cigarette brand logo,

exposure to cigarette brand on TV. Seeing tobacco sales representative offering free cigarettes can be included in this category.

Exposure to smoking in school: Seeing students, teachers and others smoking in school building, and outside of school buildings are grouped in this category.

Tobacco in school curriculum: Some questions ask whether tobacco and its effects are discussed in class. For example, whether they are informed about hazards of smoking and bad effects of it (yellowing teeth, wrinkles on skin, and bad smell) in class, discussion about smoking with peers, when they discussed it in class, are included in this category.

Thoughts about quitting: This set of questions is directly related to smokers. They incorporate whether the student wants to quit, the number of times they quitted smoking, when they quitted if they did, reasons for quitting, their feelings when they quitted, their ability to quit if they want to, whether they received any help to quit, whether it is safe to smoke and then quit, their thoughts about quitting if they smoke, future plans for smoking for the next 12 months, 5 years from now, and their difficulty to quit smoking forever.

2. Smoking Behavior of Turkish Students

The smoking prevalence rate of the Turkish students is found to be 10.43 %.[2] Although this rate is lower than the median of the tobacco use among the students at ages 13-15 (18.7 percent, ranging between 62.8 percent and 3.3 percent) according to the Global Youth Tobacco Survey Collaborative Group (2005), it is higher than the prevalence rate in some developing countries. As expected, males have higher prevalence rate than females: 13.32% versus 5.49%. Moreover, male students also smoke more cigarettes than female students. The smoking prevalence rate increases monotonically with the grade student is in. The smoking prevalence rates are 6.04%, 9.52% and 15.23% in the 7^{th}, 8^{th} and 9^{th} grades respectively. Those in the 9^{th} grade smoke more cigarettes too. Compared to the study by Bilir (2000), the smoking prevalence rate of the 7^{th} grade students increased by three times over the five year period from 1998 to 2003.

[2] The students are classified as smokers if they consistently reply to the most of the questions as they do not smoke. Twenty-five questions were used to determine whether the student smokes or not. These questions are listed in the Appendix Table A1.

The prevalence rate of smoking changes depending on the age, region and several characteristics of Turkish students. The prevalence rate and quantity smoked by students with different characteristics, such as age, grades and regions are reported in Table 2. When the students are grouped in terms of their age, the highest prevalence rate is observed at ages 17 and over. In general, the prevalence rate increases monotonically as age increases. Unexpectedly, the prevalence rate of students with age less than or equal to 13 is very high: 8.11%. It is higher than the prevalence rate of 14 years old students, 7.76%. The relatively lower prevalence rate among the 14 years old students can be explained by the regulation enacted in 1996 that bans smoking in public places, bans selling tobacco products to children less than 18 years old, etc. During the enforcement of this law, there were huge campaigns about the harmful effects of smoking but its enforcement has been declined over the years and as a result, there might be increase in the cigarette advertisements etc. that might lead to the increase in the trial of cigarettes by the students going to elementary and secondary schools. Another explanation might be related with the wrong reporting by the students about their ages because of the threat of their identification.

There are some variations among the regions and cities in terms of the youth's prevalence rate and their cigarette consumption. Youth smoking is highest in the Southeastern, Eastern and Inner Anatolia regions. Loose tobacco may be available in this region and students might be wrapping their own cigarettes. For example, although 6.41 percent of the smoker students in the overall sample said that they generally smoked hand-wrapped cigarettes, the percentage of smoker students increased to 11.81% and 14.54% in the Inner Anatolia and the Southeastern Anatolia regions of Turkey. These variations can be explained by the cultural differences as well. Tobacco use is considered as a normal activity that any adult male should do and might be considered as an indication of being mature in the Inner, Eastern and Southeastern regions. In terms of consumption, youth tobacco consumption is found to be highest in the Marmara region and Istanbul which is located in this region. Although the weighted average of the consumption of smokers in the sample was 85.80 pieces per month, smoker students smoked 111 pieces of cigarettes or 5.55 packages on a monthly basis or 3-4 pieces per day on average in the Marmara region.

It is found that 28.42 percent of the students in the 7^{th}, 8^{th} and 9^{th} grades have tried smoking by inhaling once or twice. It seems that they are more curious about smoking at ages between 12 and 13 years old. 8.04 percent of the students said that they first experienced smoking when

they were 12 or 13 years old. The trial age is very low. 4.19 percent of the students tried it when they were less than 7 or below. The majority of students tried smoking before they are 11 years old. For example, the trial age is between 8 and 9 years old for 3.53 percent of students, it is between 10 and 11 years for the 5.34 percent of students. 4.63 percent of students said that they first experienced smoking when they were 14 and 15 years old. Only 0.44 percent of the students responded that they were more than 16 years old when they tried smoking.

The smoking prevalence rate of students among income groups suggests that as the income of student increases, they are more likely to smoke and they smoke more cigarettes (Table 3). The only exception is those that have very low pocket money. They most likely wrap their cigarettes and although they have low pocket money, they smoke more. For example, 9.58 percent of the students with no pocket money and 8.81 % of students with income less than 1 million TL said that they generally smoke wrapped cigarettes instead of manufactured cigarettes.

Affordability can be also measured by the source of money for their personal needs. Table 3 shows the prevalence rate of students with different sources of money. Those that work and get money from other sources have a highest prevalence rate and they smoke more cigarettes than those that depend on their family or relatives financially. The financially dependent students have a lowest prevalence rate.

2.1 Exposure to Smoke at Home and in School

What is the relationship between smoking prevalence of students and the smoking behavior of their parents, brothers, sisters and their friends? It is expected that if the parents or the close friends smoke, the students are more likely to smoke. Table 4 shows the responses of students about the smoking behavior of their parents and friends, as well as the prevalence rate of students depending on the smoking behavior of their parents and their close friends. 40.40 percent of all students said that their parents do not smoke and 33.11 percent of smoker students said that none of their parents smoke. Although the smoking prevalence rates of mothers and fathers of smoker students are higher than those of non-smokers, the response rates indicate that the smoking prevalence rates of mothers are smaller than that of the fathers: 36.51 percent versus 5.82 percent, consistent with the lower prevalence rate of females in Turkey. This rate does not change much for the non-smoker and smoker students.

As expected, the prevalence rate is higher if the student's parents smoke. Smoking behavior of mothers seems to affect the prevalence rate of students more than smoking behavior of fathers. The prevalence rate of students is highest if their mother smokes, 13.41%. Although both mothers and fathers are taken as role models, the impact of mothers can be explained by the higher exposure of students to their mothers than their exposure to their fathers as well as the softness of mothers in terms of providing cigarettes to their children. Those students whose mother smokes consume more cigarettes. Smoker students might get free cigarettes more easily from their mothers compared to getting them from their fathers.

Smoker students are more likely to be friends with smokers and non-smoker students are more likely to be friend non-smoker students. For example, although 66.29 percent of the non-smoker students said that none of their close friends smokes, this rate declines to 15.30 percent for smoker students. On the other hand, almost one percent of the non-smoker students have friends that are all smoking, this response rate increases to 12.85 percent for smokers.

If all of their close friends smoke, we observe that these students tend to smoke. The prevalence rate is almost 61 percent for the students who have close friends that smoke. It also suggests that smokers prefer to be friends with smokers and non-smokers prefer to be friends with non-smokers. The prevalence rate of students with none of their friend smoking is 2.62 %.

The other factor that might affect the smoking prevalence of students is their exposure to cigarette and smoking at home. Although some parents smoke, they may not smoke at home and some parents do not smoke when their children are in the same room. Table 5 shows whether the students see their role models smoking at home and how frequently they see them. Almost one-third of the students and one-eighth of the students see that father or mother smokes everyday at home. The exposure to smoke at home is higher for smoker students than non-smoker students. In terms of smoking prevalence rate of students, those that see their brother/sister at home smoking have the highest prevalence rate: 27.41% if they see them smoking every day and 20.09% if they see them sometimes. Moreover, those that have smoker sister/brother at home smoke more cigarettes than others. It can be explained by the easy access to cigarettes if their brothers or sisters smoke. If they see their friends smoking at home everyday, they are also more likely to smoke and they smoke the highest number of cigarettes.

In addition to exposure at home, students might expose to cigarettes outside of their house. They might have access in school or around school, witnessing students or people smoking in school. The response rates suggest that smokers are more likely to witness students or teachers smoking inside and outside of their schools. More than half of the students in the sample witnessed their teachers smoking inside the school sometimes or almost everyday. It suggests that the 1996 law which restricts smoking inside schools is not enforced in these schools. Similarly, non-smokers are less likely to see students or teachers smoking inside or outside of their schools. It is found that those that witnessed people smoking inside and outside of school are more likely to smoke. It can be explained by endogeneity: they might witness smoking since they also smoke. In general, since smoking is not allowed inside the school, students are more likely to smoke in restrooms or certain parts of the school playground. Since they smoke, they are more likely to go these places and witness other people to smoke. Those that witness almost every day do not only smoke more likely, they also smoke more cigarettes.

2.2. Accessibility

If students can get cigarettes easily, they are more likely to smoke and they smoke more. The accessibility to cigarettes can be measured in two ways. The first one is the accessibility at home. The frequencies in the previous sub-section suggest that if students have easy access at home, they are more likely to smoke and they smoke more cigarettes. The second measure of accessibility is that from the market. If they do not easily purchase cigarettes from the market, they are less likely to smoke and they are expected to smoke less cigarettes.

Two questions are asked about the difficulty to purchase cigarettes from the market. The first one asks whether the sellers are refused to sell cigarettes to them. According to the 1996 Law, the cigarette sale to the children with age less than 18 is not allowed. The second question asks how difficult it is to buy cigarettes from the market.

Table 7 presents the response rates of students as well as their prevalence rate and quantity smoked according to their responses to these two questions. Only 6.63 percent of the students reported that the markets are enforcing the law that restricts selling tobacco products to the minorities. Those that did not have experienced any refusal in purchasing cigarettes have a higher probability of smoking. Since sometimes the parents or elderly people ask kids to buy tobacco products to themselves, the sellers get use to seeing some children to buy cigarettes for their parents and they do not refuse to sell. The weakness in the enforcement of this law can be

explained in this way. Similar to the answers in the first questions, those that can buy cigarettes easily have a higher probability of smoking and they consume more cigarettes.

2.3. Perception of Students About Smokers

The perception of students about smokers is also an important factor that might affect their participation to smoke. If they perceive that smoking is socially acceptable behavior, they are more likely to smoke. Table 8 shows the response rate of students to several questions about their perceptions about smokers, such as whether smokers have more friends, their social attractiveness, etc. Overall, students think that smoking boys or girls have less friends. However, there is a difference between smokers and non-smokers in terms of their thoughts about smokers. Although the majority of non-smoker students believe that smoking boys and girls have less friends, smoker students think that smokers and non-smokers are not different in terms of having friends.

Majority of all students and non-smoker students find smoking boys and girls less attractive. However, smoking girls are also found to be less attractive by both smokers and non-smokers. These results suggest that smoking among girls is not considered as a socially accepted behavior. Smoking is not preferred among girls, compared to boys. Majority of students, regardless of whether they are smoker or not, thinks that smoking makes people less comfortable in social activities. It can be because they do not want other people, especially elderly see them smoking. Moreover, when they see smoking man, they think that this person lacks self-confidence, and he is foolish and macho. On the other hand, when they see smoking woman, they think that she also lacks self-confidence, is foolish but intellectual. Smoker and non-smoker students think similarly.

The smoking prevalence rate of students who perceive that smoking is socially preferable is also higher than that of the students that perceive smoking not socially acceptable. For example, the smoking prevalence rate is highest for students who think that smoking boys or girls have more friends; or smoking makes people more confortable in social activities; smoking man is successful and clever; smoking woman is sucessful and clever. Those that think positively about smokers also smoke more cigarettes. In this way, the smoking students seem to justify their bad habits.

2.4. Health Effects of Smoking

In addition to youth's perception about social acceptance, youth's perception about health effects of smoking may affect their smoking behavior. Table 9 presents the response rate and the smoking prevalence rate and quantity smoked of students based on their perception about effects of smoking on health. Almost 80 percent of students are informed about harmful effects of smoking by their families but this rate declines to 72.49 percent for the smoker students. Although 82.22 percent of the non-smoker students thought that smoking is absolutely harmful to health, only 58.17 percent of smokers think in this way. Unfortunately, almost 10 percent of the smoker students and 4.29 percent of non-smoker students think that smoking is absolutely not harmful to health. Moreover, majority of students (41.24 percent) think that smoking causes losing weight.

When the smoking prevalence rate and quantity smoked are examined based on their thoughts about the effects of smoking, it is found that the prevalence rate of the students whose families told about the harmful effects of smoking is lower than those students whose families did not tell about the harmful effects of smoking (9.50 percent versus 12.32 percent). Those who thought that smoking is not harmful have very high prevalence rate and they smoke more than 6 packages per month. They might smoke more because they think that it is not harmful or since they smoke, they might justify their smoking by thinking that it is not harmful.

Another factor that might affect the smoking behavior of the youth is their knowledge about the effects of smoking. Table 10 shows different knowledge about smoking and their way of getting this knowledge. The first knowledge is related with the impact of second-hand smoking. The response rate indicates that in general, students are knowledgeable about the harmful effects of second-hand smoking. Almost 90 percent of smokers said that second-hand smoking is harmful. However, those who smoke either undermine the impact of second-hand smoking or do not know about the harmful effects of smoking. The prevalence rate of smoking is higher for students who do not consider second-hand smoking harmful. Students also smoke significantly more cigarettes if they think that second-hand smoking is not harmful than those that think that it is harmful.

The other factor that might affect the smoking behavior of students is whether they got some education about the bad effects of smoking in their classes. Table 10 indicates the response rates as well as prevalence rates of youth regarding to their knowledge in class about the

impacts of smoking. Only half of the students said that they were informed about the hazards of smoking in their courses and only 40 percent said that they discussed bad effects of smoking in class such as yellowing their teeth, having bad smell, etc. The response rates show that they did not discuss the harmful effects of smoking in class, but they did not discuss smoking with their peers, either. No significant relationship is observed between prevalence rate and the time that they talked about tobacco and health in class.

In the survey, they also asked about the students' thoughts about some restrictions specified in the 1996 Law, such as banning the advertisement of cigarettes, increasing prices of cigarettes, prohibiting the sale of cigarettes to children with ages less than 18, and prohibiting smoking in public places. The response rates and the prevalence rates of the students are presented in Table 11. Majority of students, almost 90 percent, responded that cigarette advertisements should be banned, the sale of tobacco products to children should be banned; and smoking in public places should be banned; two-thirds of the students agree that the prices of tobacco products should be increased. However, the responses are slightly different for smoker students. Only 35 percent of the smokers think that the prices of tobacco products are low; 60 percent of the smoker students think that cigarette advertisement and the smoking in public places should be banned. 71 percent of them agree that the sale of tobacco products to children should be prohibited. The higher percentage of non-smokers is in favor of these restrictions. Those that are against these restrictions are heavy smokers, they smoke almost more than 5 packages per month.

2.5. Exposure to Pro- and Anti-Tobacco Messages

Another factor that might affect the smoking behavior of students is their exposure to pro- and anti-smoking messages. In the dataset, several questions are asked about their exposure. Table 12 shows how much the youth is exposed to the anti-tobacco campaigns and pro-tobacco messages. Majority of students said that they are not exposed to the anti-smoking messages on TV, radio, billboards, posters, newspapers, journals, cinema and sport activities, fairs and other public events. When smokers and non-smokers are compared, the responses suggest that smokers are more perceptive about the anti-smoking messages than non-smokers.

Like anti-tobacco messages, pro-tobacco messages are seen more by smoker students. In general, students do not see pro-tobacco messages on programs on TV, billboards, newspapers, journals, sport contests, concerts, social meetings and public events although they see artists on

TV, video or cinema smoking. Similar to anti-smoking messages, those that often noticed pro-tobacco messages have higher smoking prevalence rate and they smoke more cigarettes than those that never or sometimes noticed these messages. Interestingly, those who noticed many anti-tobacco messages have higher smoking prevalence rate and they smoke more cigarettes than those who noticed none or few anti-tobacco messages. 9.24 percent of the students said that somebody offered them free cigarettes. Only 12.61 percent of students said that they have something with the brand logo on it.

2.6. Addiction

Addiction is measured by examining the responses to different questions. The first one is whether the student is willing to smoke as a first thing in the morning. The second one is measured with the difficulty of not smoking for a week. The third one depends on the difficulty of quitting smoking forever. Almost 8 percent of students want to smoke as the first thing in the morning. They can be considered as heavy smokers. Those students that think that they cannot quit smoking easily or those that have difficulty for not smoking for a week, are more likely to smoke and they smoke large amount of cigarettes.

2.7. Quitting Behavior of Smoker Students

In this sub-section, the students' thoughts about quitting smoking are examined. Several questions are related to quitting. Almost 50 percent of students think and want to quit, 20 percent of the smokers said that they do not think and want to quit soon. Although they think that they will not quit smoking in a year, they expect that they will quit smoking in the long-run, over five year period. Among the smoker students, 21.81 percent said that they tried quitting to smoke more than twice and 15.57 percent of them said that they tried to quit once. Table 14 reports the distribution of the responses regarding to their smoking behavior for one and five years later. The response rates of the quitted students suggest that majority of students quitted smoking because they did not like smoking and they do not get any professional help to quit smoking.

After the description of the behavior of Turkish students, the next step is the estimation of the probability of smoking and demand for cigarettes by the Turkish students.

3. Empirical Model

A two-step model is used in analyzing the tobacco consumption of the youth in Turkey. The first step involves the estimation of the probability of smoking for all of the students. The second step takes a sample of smokers and the demand for tobacco is estimated for them.

The probability of smoking is estimated using a logit model. Two models are used. The first one is the basic model which expresses the probability of smoking as a function of only demographic, some family characteristics and the price of cigarettes. The second model estimates the impact of the smoking habits of family members, accessibility, availability, affordability of cigarettes, perception about smoking, use of smoking at their school, exposure to pro- and anti-tobacco messages. Table 14 presents the description of all variables included in the model of the student's probability of smoke. Hence, the basic model (Model I) and the advanced model (Model II) are expressed as follows:

Model I:

P(SMOKE) = f(log(PRICE), AGE, MALE, INCOME, PAR_SMOKE, EDU_DAD, EDU_MOM,PAR_WORK, REGION1-REGION9)

Model II:

P(SMOKE) = f(log(PRICE), AGE, MALE, INCOME, PAR_SMOKE, EDU_DAD, EDU_MOM,PAR_WORK,REGION1-REGION9, ACCESIBILITY, PERCEPTION, KNOWLEDGE, SMOKE_SCHOOL, EXPO_PRO, EXPO_ANTI).

In this questionnaire, there were several questions that can be used to determine the price of the cigarette that students smoke. For example, one question is asked about the brand name of the cigarette that they preferred to smoke. Another one asks the price paid for a pack of cigarettes. In addition, they also reported how much they spent for cigarettes in the last 30 days. Hence, it is possible to identify the price of cigarettes by comparing the expenditures and the quantity they smoked. All of them were used in order to determine the price paid by students. We identified three prices for each smoker. The first one is determined based on the brand name. However, only five brand names were identified as choices in the question. They are Tekel 2000, Marlboro, Camel, Parliament and Samsun/Maltepe. The prices of these brands did not change during the period of the GYTS and the prices of cigarettes do not show any variation among regions. Unfortunately, most of students chose "other" instead of specifying a brand name. The second one is based on the price ranges specified in the questionnaire. In assigning

price by using the answer to this question, the mid-point of the range was used: 900,000, 1,250,000, 1,750,000, 2,250,000, 2,750,000 and 3,300,000 TL. Third, using the quantity of cigarettes consumed and from the total expenditure ranges, the prices paid was computed. The consistency of the prices calculated using different questions were checked by matching their answers to these questions. In determining the price, first the price specified by the respondent was used (887 students). However, there were some missing answers. Then, if the respondent specified the brand name, the price of this brand in November 2003 was used the price of cigarette (283 students). Third, the calculated price from total cigarette expenditures and total number of cigarettes consumed was used as the cigarette price faced by students (1196 students). If the price was missing after all these procedures, the average price at the school level in each region was calculated and this average price was used as the price faced by the smoker students.

The demographic characteristics include age and gender of students. In order to control for some regional differences, nine dummy variables are included in the model. The southeastern Anatolia is taken as a base group because it has the highest smoking prevalence rate. The income of the student is also included in the model.[3] Since tobacco products are considered as normal goods, the students that have a higher income are more likely to smoke tobacco products. The smoking behavior of parents, their education and whether they work or not are also included in the model to examined their effects on the students' decision to smoke.

In the second model, the impact of accessibility, perception, knowledge, smoking behavior of other students, and the exposure to pro-and anti-tobacco messages on the probability of smoke is examined. Accessibility is measured by the difficulty of buying tobacco products from the market (NO_ACCESS) and the availability of a smoker at home (ACCESS_HOME). Perception about the harmful effects of smoking is measured indirectly with several variables. If they see their parents, brothers, sisters or friends smoking at home almost every daya, they might perceive that smoking positively. Because of the endogeneity of some perceptions about the smokers, they are not included in the model directly. As presented in the previous section,

[3] Instead of income variable as defined above, the logarithm of the pocket money is taken as a measure of income and the models are estimated. The results did not change.

smokers are more likely to perceive smoking associated with positive characteristics compared to the non-smoker students.

Knowledge is measured with two variables. FAM_HARM is a dummy variable that takes a value of 1 if family told the students about the harmful effects of smoking. As presented in the previous section, smokers are less likely to know harmful effects of smoking. Therefore, the knowledge of student is proxied with the percentage of students who thinks that smoking is harmful in the school (MKNOW_HARM) in order to eliminate any endogeneity in knowledge. If students see other people smoking in the school building or in school premises, they are more likely to smoke. Therefore, MEXPOINS and MEXPOOUTS are included in the model to examine whether students witnessed other students or teachers smoking inside and outside of the school building since smokers identified other smokers in these places, the mean at the school level is included in the model. The average smoking behavior of students in the school building or around the school promises is included under MEXPOINS and MEXPOOUTS.

MEX_ADV and MANTIEX present the student's exposure to the advertisements of tobacco products and anti-tobacco activities respectively. Since smokers are more likely to remember that they are exposed to tobacco-related material and as it is presented in Section 2, the smoker students are more likely to be perceptive in the smoking related issues than non-smoker students. The mean values at the school level are taken in order to eliminate any endogeneity. In addition to these variables, PAR_SMOKE and FREERIDE are also included in the model in order to analyze the impact of the parents' smoking behavior on the smoking decision of students. If the student can get cigarettes without paying any price (FREERIDE), they are expected to smoke more.

The descriptive statistics of the variables used in the empirical model are reported in Table 16. The average age of the smokers is slightly higher that that of the non-smokers. Although half of the sample is male, 63.9 percent of the smoker is male students. The average income of smoker students is also higher than non-smoker students. The education levels of fathers and mothers of non-smoker students are higher than the education levels of parents of smoker students. It suggests that as the education level of their parents increases, they might explain more about the harmful effects of smoking and as a result, they are less likely to smoke. The higher percentage of smoker students always sees their fathers, mothers, brothers or sisters or friends that are smoking at home. Moreover, smoker students have more access to cigarettes at

home because of the smoking habits in their family. There are variations among regions in terms of their contribution to the total sample as well as for the smoker and non-smoker students. The highest percentage of smoker and non-smoker students is from Istanbul. The 15.1 percent of smokers and 17.2 percent of non-smokers are from Istanbul. 14.7 percent of smoker students are from Inner Anatolia and 13.9 percent of them are from Southeastern Anatolia regions. 12.7 percent and 11.6 percent of non-smoker students are from Black Sea and Marmara regions respectively. The mean of the students that know the harmful effects of smoking is higher for the non-smoker students than smoker students. This observation suggests that if the students know the harmful effects of smoking they are less likely to smoke. It is observed that the mean values for exposure to cigarette advertisements and anti-tobacco campaigns are higher for the smoker students than non-smoker students. This finding can not be explained by the perception of the smoker students since the school average is used. Furthermore, mean values suggest that the smoker students observe more people smoking both inside and outside of the school building than non-smoker students. It is found that hand-wrapped cigarettes are popular among the smoker students. 32.5 percent of the student said that they smoked hand-wrapped cigarettes at least once a week or everyday over the last 30 days although only 3.6 percent of the students wrapped their own cigarettes. It seems that cigar and pipe are also popular among students, 28.8 percent of the smokers said that they smoked them at least once a week if not everyday over the last 30 days. Chewing tobacco seems to less popular compared to other alternatives. 12.4 percent of smoker students said that they chewed cigarettes at least once a week or everyday over the last 30 days.

4. Empirical Results

In this section, the results of two-step procedure are presented. The first step involves the estimation of probability of smoking by all students using logit model. The second step explains the factors affecting the quantity smoked using a sample of smoker students.

4.1. Probability to Smoke

The results of the logit estimation are presented in Table 17. Almost all of the variables included in the model is found to affect the probability of smoking significantly. It is found that as the price of cigarettes increases, the probability of smoke declines significantly. The results suggest that a 10 percent increase in cigarette prices decreases the probability of smoking by 11.69 percent. Because of endogeneity, the predicted price is used in the estimations (see Appendix, Table A2 for the test of endogeneity of prices). Moreover, when tax is used instead

of the price, the similar results are obtained. The tax elasticity of probability to smoke is found to be 0.90, suggesting that if the government increases taxes on cigarettes by 10 percent, the cigarette consumption of the youth is expected to decline by 9 percent.

The older students are more likely to smoke: As age increases, the probability of smoking increases controlling for gender, income, region and other characteristics of students. Male students are found to be more likely to smoke than female students. Furthermore, as income of students increases, they are more likely to smoke cigarettes. The probability of smoke is different in different regions in Turkey. The results indicate that except Eastern and Inner Anatolia regions, the smoking prevalence rate is found to be lower than that in Southeastern region. This can be explained by the cultural difference. Smoking is generally considered as an indication of maturity and power in these regions than other regions. The parents' education seems to affect negatively student's smoking prevalence rate. If parents work, the probability of youth smoking declines significantly. All of these results are obtained regardless of the model used in the estimation and when tax is used as a proxy for price. The only exception is when other variables are included in the model the impact of mother's education on the probability of smoke turned out to be positive.

The exposure to smoking at home increases the probability of youth smoking. It can be explained by the accessibility of tobacco at home. It is found that although those students whose father or mother smokes are less likely to smoke, those students whose brother, sister or friends smoke at home, they are more likely to smoke cigarettes. In general, students may see their brothers and sisters as their role models and imitate their behavior by smoking. However, if their parents smoke, these students may observe the bad effects of smoking on the health of their parents and less likely to smoke. However, if both parents smoke, the probability of smoking increases significantly although students are less likely to smoke if they see their father or mother smoking at home every day.

The exposure to smoking at school also affects the probability of smoking of students. It is found that if students are exposed to smoking inside the school building they are less likely to smoke. Since smoking is not allowed in schools, smoker students usually smoke cigarettes in restrooms, which are usually crowded and smell very bad. Students may not want to be in this dirty environment, therefore, if they expose to smoking inside the school building, they are less

likely to smoke. On the other hand, if they are exposed to smoking outside of the school building, they are more likely to smoke.

The results indicate that the free-riders are more likely to smoke. Since students usually do not have any permanent income, those who can get cigarettes free are more likely to smoke than those who have to buy tobacco. It can be explained by the accessibility to tobacco related products. If they can borrow or steal, or elderly gives them free cigarettes to smoke, they are more likely to smoke. However, if they do not have any free access to tobacco products, they have to buy it from the market. They may not have enough money to spend or the seller may refuse to sell them cigarettes since they are less than 18 years old. It is found that if the students faced with a difficulty in buying tobacco products in the market, they are significantly less likely to smoke cigarettes. This finding suggests that the enforcement of the prohibition of selling the tobacco or tobacco products to the children will be effective to prevent them to start smoking.

Another factor that affects their smoking prevalence rate is their knowledge about the harmful effects of smoking. If the students whose parents told about the harmful effects of smoking, are found to be less likely to smoke than those whose parents did not tell the harmful effects of smoking. Moreover, the knowledge level at school also affects the probability of smoking by students. If students in that school know the harmful effects of smoking on average, they are less likely to smoke. It indicates that although they may not know the harmful effects of smoking, if their friends know its harmful effects, they may convince others not to smoke.

The other factor that might affect the probability of smoking is that students' exposure to cigarettes at the media. The results suggest that both positive and negative exposures to tobacco products or smoking will increase their probability of smoking. Interestingly, the anti-tobacco messages observed at the media increases the youth's probability to smoke.

Table 18 presents the estimates of the extended model for male and female students separately. Although in general, the impacts of the factors on the probability of smoking by male and female students are similar, there are some differences between male and female students in terms of the effects of some variables on their probability of smoking. It seems that the impact of price on probability of smoking is higher for female students than male students, controlling for their income level or pocket money. If both of the parents smoke cigarettes, the male

students are more likely to smoke but female students are found to smoke less likely. Most probably, female students are more sensitive bad smell of the tobacco and if they see their parents smoking always, they hate tobacco more. On the other hand, it adversely affects male students, their parents' smoking behavior increases the male students' probability of smoking. As the number of students that know harmful effects of smoking increases, the probability of smoking by both female and male students decreases significantly. However, the impact of this variable on the female students' smoking probability is three times higher than that on the male students' smoking probability.

Another difference between male and female students is that although the average exposure to advertisement of tobacco products increases the smoking probability of female students, it decreases the smoking probability of male students significantly. It might be explained by the advertising campaigns of cigarette manufacturers. They might be targeting females and therefore, they might be affected more. Some differences among regions are observed in terms of smoking prevalence rates of male and female students. These differences can be explained by the role of male children in their families. Their role and power is different among regions in Turkey. Boys are considered as favorite children in some parts of Turkey, especially in the eastern and southeastern regions and smoking is considered to be a positive feature among male children but not among females. If parents work, the probability of smoking by female students increases but the probability of smoking by male students declines significantly. Furthermore, if male students always see their father or mother smoking at home, they are less likely to smoke but if female students see their fathers or mothers always smoking at home, they are more likely to smoke. I could not explain this difference in the effects of parents' smoking behavior on the male and female students' smoking probability. The other findings are similar to the ones that are reported for all of the students in the sample.

4.2 Regression Results

In the second step, the demand for tobacco products is estimated by using a sample of smoker students. Table 19 presents the results of both the basic and the extended model. In the basic model, it is found that as the price of tobacco product increases by 10 percent, the demand for tobacco products increases by 5.87 percent and it is found to be significant only at 10 percent. This result is surprising since the demand elasticity is generally found to be negative, i.e., as price increases, the demand for these products declines. Several explanations can be provided. First, this is the basic model, it does not control some characteristics that might affect the

demand for tobacco products, such as knowledge about the harmful effects of smoking, exposure to tobacco products by their friends or families, etc. When these variables are included in the model, the impact of price is found to be insignificant although it is still positive. The result is similar to Chaloupka (1991) and Wasserman et al (1991) who find that there is no significant relationship between prices and youth smoking behavior.

The other significant coefficients are similar to our expectations. For example, as income level of students increases, they smoke more cigarettes. Those who chew tobacco, those who wrap their own cigarettes and those who smoke cigar, pipe or little cigarettes smoke more than those who smoke manufactured cigarettes. If there are more students that know harmful effects of smoking, the student smokes less cigarettes. However, if their family told them about the harmful effects of smoking, they smoke more. Since the sample includes only smoker students, their family might know that they are smoking and in order to motivate them not to smoke, they might be telling about the harmful effects of smoking. However, since these students are teenagers, the advise that their families gave might be taken adversely and they might increase the amount of cigarettes smoked instead of decrease as an act against their families.

If students are exposed to their brothers' or sisters' smoking everyday at home, they smoke more cigarettes. It can be explained by the possibility that they can get access cigarettes easily. Although the exposure of their friends' smoke everyday at home increases their consumption, it is not found to be significant. However, the students who are considered as free riders smoke less cigarettes. It can be explained in two ways. First, these students may not have their own cigarette packages and they smoke less. The second explanation is that if they borrow, they can get only few cigarettes. Therefore, free-riders smoke less cigarettes. Furthermore, the addicted students smoke significantly more cigarettes than those that are not addicted. [4]

The anti-tobacco messages seem to affect negatively the cigarette consumption by students although they are found to increase their probability of smoke. Although pro-tobacco messages are found to increase the cigarette consumption of the youth, their impact is not found to be significant.

[4] The addition is defined in two ways: Their ability to quit smoking easily and their ability to not to smoke for few days. Regardless of the definition of addiction, the results are found to be same: The addicted students smoke significantly more cigarettes than non-addicted students.

These results suggest that if the policy makers want to reduce the smoking by the youth, they might increase the anti-tobacco messages. Moreover, they have to increase the students' knowledge about the harmful effect of smoking. However, this information should not be provided at the family level but may be at the school level in their curriculum.

Table 20 presents the estimations for male and female students separately in order to examine whether there is a gender difference in terms of factors affecting their tobacco consumption. It is found that although female students decrease their cigarette consumption as the price of cigarettes increases, the male students increases their consumption. However, both of the coefficients are found to be insignificant. It is found that income is an important factor that affects the consumption of female students but not for male students. It can be explained by some cultural differences. Usually, boys are favorable children of many families and they might get more pocket money. Moreover, if they want something, they are more likely to get it. If they smoke, they might get cigarettes easily from their families, compared to girls. Hence, if girls have less money, they may not get cigarettes even though they are addicted. It is found that female students smoke more cigarettes if their families told them about the harmful effects of smoking, and if they have access cigarettes at home, if their brothers or sisters smoke cigarettes everyday at home, or if they are addicted to smoking or if they chew cigarettes. On the other hand, they smoke less cigarettes if they are exposed to smoking by their brothers or sisters everyday at home.

Different factors affect the quantity smoked by male students. For example, male students are more likely to smoke, if their mother is more educated, if they expose to their father's smoking or their brothers' or sisters' smoking everyday at home, or if they smoke cigar or pipe. Like female students, if they are addicted to smoking, they smoke more cigarettes. The exposure to anti-tobacco messages decreases the quantity smoked by male students significantly. Furthermore, if they are free-riders, they smoke less cigarettes.

The overall elasticity of cigarettes is presented in Table 21. Although the coefficient on the quantity smoked is found to be positive, the overall elasticity of demand for cigarette is found to be negative. It is estimated that if the cigarette prices increase by 10 percent, the youth consumption will decline by 5.82 and 9.10 percent depending on the model used in the estimation of elasticity. Moreover, there is a significant difference among students in terms of

their gender. The female students decrease their consumption by 30.53 percent and male students will decrease only by 5.34 percent. This huge difference can be explained by the cultural differences in Turkey. These results indicate that if the cigarette prices will increase, it will decrease not only the consumption of the youth but also it will result in a decline in the smoking prevalence rate of the youth.

5. Conclusion

This study analyzes the smoking behavior of Turkish secondary and high school students using the GYTS data. The smoking prevalence rate of the Turkish students is found to be 10.43% and it increases monotonically with the grade of the students. Male students have a higher prevalence rate and female students and they smoke more cigarettes. Furthermore, the results of the two-step estimation suggest that female students are more price sensitive than male students.

The results of this study have some important policy implications. First, the results indicate that price is an important factor that affects students' probability of smoke significantly. The female students are found to be more sensitive to prices than male students. One alternative to combat the tobacco epidemic among the Turkish youth is to increase the prices of cigarettes. Second, it is also found that the knowledge about the harmful effects of smoking decreases both the probability of smoking and tobacco consumption significantly. However, knowledge obtained at school is more effective than the knowledge acquired at home. Hence, health effects of smoking might be incorporated at the curriculum of primary as well as secondary school curriculum. Third, those students that have difficulty in getting tobacco products from markets are less likely to smoke and they smoke less cigarettes. Even though there is a regulation about not selling tobacco products to children under age 18, it is not enforced in many places. Fourth, if smoking is not allowed inside the school building, the students have a lower probability of smoking. Although smoking inside school buildings is not allowed according to the regulations, it is not enforced much. Hence, our results indicate that the enforcement of the regulation, restrictions on the sale of cigarettes to minorities and smoking inside schools, will be one of the effective instruments to fight against the tobacco.

References

Bilir, Nazmi, Bahar Guciz Dogan and Ali Naci Yildiz. 2000. Tutun Mamullerinin Zararlarinin Onlenmesine Dair Kanuna Uyum Duzeyi. Ankara: Hacettepe Halk Sagligi Vakfi Yayin No 2000/16.

Bilir, Nazmi and Zeynep Önder. 2000. "Impact of the Ban on Smoking in Public Places in Turkey," Proceedings II, The 7th International Conference on System Science in Health Care, Budapest, Hungary, 220-225.

Chaloupka, Frank J. 1991. "Rational Addictive Behavior and Cigarette Smoking," *Journal of Political Economy*. 99: 722-742.

Ergüder, Toker, Tahir Soydal and Mehmet Ugurlu. 2004. *GYTS National Report: Turkey*, Primary Health Care General Directorate Substance Dependence Department Ministry of Health.

Gajalakshmi, C.K., Prabhat Jha, Kent Ranson, and Son Nguyen. 2000. "Global Patterns of Smoking and Smoking-Attributable Mortality," in *Tobacco Control in Developing Countries* (editors Praghat Jha and Frank Chaloupka), New York: Oxford University Press.

Global Youth Tobacco Survey Collaborative Group 2002. "Tobacco Use Among Youth: A Cross-Country Comparison," *Tobacco Control* 11, 252-270.

Wasserman, Jeffry, Willard G. Manning, Joseph P. Newhouse and John D. Winkler. 1991. "The Effects of Excise Taxes and Regulations on Cigarette Smoking." *Journal of Health Economics*. 10(1): 43-64.

Table 1 – Distribution of Sample among Cities and Regions.

	Number of Schools Participated	Number of Students Participated	Percentage of Students in Total Sample (unweighted)	Percentage of Students in Total Sample (weighted)
Regions				
Aegean	21	1,478	9.26	8.05
Black Sea	20	1,683	10.55	12.64
Eastern Anatolia	20	1,639	10.27	8.00
Inner Anatolia	21	1,607	10.07	11.46
Marmara	20	1,616	10.13	11.55
Mediterranean	20	1,462	9.16	9.92
Southeastern Anatolia	20	1,594	9.99	9.18
Cities				
Ankara	20	1,754	10.99	6.79
Istanbul	20	1,482	9.29	16.94
Izmir	20	1,642	10.29	5.48
Total	202	15,957	100.00	100.01

Table 2 – Youth Smoking Prevalence Rate and Quantity Smoked by Students with Several Characteristics.

	Smoking Prevalence Rate (%)	**Quantity Smoked (pieces)**
All Students	10.43	85.80
Grades		
7th Grade	6.04	87.63
8th Grade	9.52	65.05
9th Grade	15.23	103.60
Gender		
Male	13.32	90.24
Female	5.49	76.82
Age Groups		
13 years old and less	8.11	99.34
14 years old	7.76	54.97
15 years old	12.47	68.80
16 years old	24.57	92.99
17 years old and over	42.78	154.37
Regions		
Aegean	8.42	73.82
Black Sea	9.96	73.10
Eastern Anatolia	13.88	74.62
Inner Anatolia	13.39	89.20
Marmara	10.21	111.61
Mediterranean	7.32	61.31
Southeastern Anatolia	15.80	91.42
Cities		
Ankara (Inner Anatolia)	6.74	77.53
Istanbul (Marmara)	9.27	107.06
Izmir (Aegean)	8.49	93.58

Table 3 – Youth Income and Their Tobacco Use.

	Smoking Prevalence Rate (%)	**Quantity Smoked (pieces)**
Pocket Money Groups		
No income	6.61	76.41
Less than 1 million TL	10.48	63.95
1 million TL - 3 million TL	8.65	57.87
3 million TL - 5 million TL	10.80	73.22
5 million TL - 7.5 million TL	11.19	92.38
7.5 million TL - 10 million TL	13.10	104.83
More than 10 million TL	21.58	135.97
Sources of Money		
Having no money to spend	8.71	55.42
Working	29.21	92.11
Family and/or relatives	8.62	84.34
Other sources	32.87	149.90

Table 4 - Youth Smoking and Smoking Behavior of Their Parents and Their Friends

	Response Rate of Students (%)			Prevalence Rate (%)	Quantity Smoked (pieces)
	All	Smokers	Non-smokers		
Smoking Behavior of Parents					
They do not smoke	40.40	33.11	41.25	8.55	78.20
Both smoke	16.15	20.47	15.64	13.22	103.88
Father smokes	36.51	36.64	36.50	10.46	81.48
Mother smokes	5.82	7.48	5.63	13.41	106.78
Number of Close Friends Smoking					
None	6.98	15.30	66.29	2.62	89.23
Some	31.02	46.69	29.20	15.69	63.27
Most	4.70	22.08	2.68	48.98	101.92
All	2.20	12.85	0.96	60.99	152.94

Table 5 – Exposure to Smoking at Home and Youth Smoking

	Father	Mother	Brother/sister	Best Friend	Other People
Panel A1 – Response Rate of All Students (%)					
No such person at home	8.22	6.81	21.28	19.74	17.14
Almost everyday	31.08	12.26	5.46	4.15	12.85
Sometimes	22.22	13.46	8.37	21.84	40.29
I never see	35.58	63.54	60.90	6.02	19.64
Panel A2 – Response Rate of Smoker Students (%)					
No such person at home	11.82	10.80	22.09	14.00	14.68
Almost everyday	38.93	18.14	14.34	8.63	20.48
Sometimes	19.40	15.89	16.12	13.74	35.62
I never see	25.79	49.29	42.20	12.03	15.08
Panel A3 – Response Rate of Non-Smoker Students (%)					
No such person at home	7.80	6.34	21.19	20.41	17.42
Almost everyday	30.17	11.58	4.42	3.63	11.96
Sometimes	22.55	13.18	7.47	22.79	40.83
I never see	36.72	65.20	63.08	5.32	20.18
Panel B – Smoking Prevalence Rate (%)					
No such person at home	14.99	16.55	10.82	7.40	8.93
Almost everyday	13.06	15.43	27.41	21.67	16.62
Sometimes	9.10	12.31	20.09	6.56	9.22
I never see	7.56	8.09	7.23	20.85	8.00
Panel C – Mean Quantity Smoked (pieces)					
No such person at home	116.82	107.69	85.36	72.35	102.80
Almost everyday	93.35	97.64	124.28	132.24	95.55
Sometimes	71.46	88.87	70.84	77.48	86.48
I never see	79.98	80.27	78.49	86.35	83.25

Table 6 - Response Rate and Smoking Behavior of Youth According to Their Exposure to Smoking Inside and Outside of the School Building

Panel A – Response Rate	**All Students**	**Smokers**	**Non-Smokers**
Witness Smoking Almost Every Day			
Inside school (students)	11.97	22.75	10.71
Inside school (teachers)	26.70	34.35	25.81
Outside school building (students)	16.18	29.08	14.68
Outside school building (teachers)	16.03	23.89	15.12
Outside school building (others)	10.99	18.19	10.15
Witness Smoking Sometimes			
Inside school (students)	22.22	25.08	21.89
Inside school (teachers)	32.02	27.44	32.55
Outside school building (students)	29.15	29.83	29.07
Outside school building (teachers)	31.32	30.59	31.41
Outside school building (others)	31.08	32.48	30.91
Never Witness Smoking			
Inside school (students)	48.34	31.29	50.32
Inside school (teachers)	26.28	21.30	26.86
Outside school building (students)	40.44	24.44	42.31
Outside school building (teachers)	34.80	26.61	35.75
Outside school building (others)	52.13	37.32	53.85
Panel B – Smoking Prevalence Rate			
Frequency of witnessing smoking	**Almost Every Day**	**Sometimes**	**Never**
Inside school (students)	19.83 %	11.77 %	6.75 %
Inside school (teachers)	13.42 %	8.94 %	8.45 %
Outside school building (students)	18.74 %	10.67 %	6.30 %
Outside school building (teachers)	15.54 %	10.18 %	7.97 %
Outside school building (other people)	17.27 %	10.90 %	7.47 %
Panel C - Quantity Smoked			
Frequency of witnessing smoking	**Almost Every Day**	**Sometimes**	**Never**
Inside school (students)	121.59	82.96	66.60
Inside school (teachers)	113.65	71.02	71.73
Outside school building (students)	122.39	77.85	67.54
Outside school building (teachers)	118.71	82.27	74.43
Outside school building (other people)	117.89	74.59	76.48

Table 7 - Difficulty to buy cigarettes.

	Response Rate (%)			Prevalence Rate (%)	Quantity Smoked (pieces)
	All	**Smokers**	**Non-smokers**		
Refused to sell cigarettes in the market					
No effort	55.82	21.38	59.82	3.99	2.32
Yes	6.63	14.22	5.74	22.38	17.06
No	34.72	57.29	32.10	17.21	17.06
Difficulty to buy Cigarettes from the market					
Very hard	24.41	16.59	25.32	7.09	4.89
A bit distressing	15.71	14.89	15.81	9.89	6.10
Fairly easy	12.87	19.79	12.07	16.04	11.84
Very easy	26.37	37.85	25.03	14.97	17.72
Not buy from the marke	17.82	9.42	18.80	5.51	3.46

Table 8 – Perceptions of Students About Smokers

	Response Rate (%)			Prevalence Rate (%)	Quantity Smoked (pieces)
	All	Smokers	Non-smokers		
Smoking boys have more/less friends					
More	23.41	32.62	22.34	14.53	91.26
Less	41.44	25.25	43.32	6.36	64.87
No difference	31.41	36.07	30.87	11.98	96.69
Smoking girls have more/less friends					
More	16.10	26.77	14.86	17.34	106.48
Less	53.08	35.46	55.13	6.97	64.34
No difference	28.15	33.91	27.48	14.30	95.07
Smoking boys are more/less attractive					
More	17.68	44.08	14.80	25.74	95.56
Less	77.82	46.90	81.42	6.29	73.88
Smoking girls are more/less attractive					
More	16.16	38.09	13.60	24.59	102.26
Less	79.89	53.51	82.97	6.98	72.52
Smoking makes people more comfortable in social activities					
More	15.68	27.86	14.26	18.54	97.30
Less	65.40	46.44	67.61	7.41	76.30
No difference	15.80	21.66	15.12	14.30	86.84
Thoughts about smoking man					
Lacks self-confidential	37.66	29.38	38.62	8.14	82.18
Foolish	26.69	14.92	28.06	5.83	86.27
Looser	9.48	11.74	9.21	12.92	84.94
Successful	1.40	4.81	1.00	35.88	115.59
Clever	1.13	4.21	0.77	39.02	122.36
Macho	20.29	29.92	19.16	15.38	85.32
Thoughts about smoking woman					
Lacks self-confidential	38.68	28.84	39.83	7.78	75.79
Foolish	31.87	23.26	32.88	7.61	86.27
Looser	10.00	11.21	9.86	11.69	78.89
Successful	1.69	5.68	1.23	35.01	103.63
Clever	0.98	3.68	0.67	39.00	196.69
Intellectual	14.10	23.52	13.00	17.40	87.60

Table 9 – Thoughts about Health Effects of Smoking and Youth's Smoking Behavior

	Response Rate (%)			Prevalence Rate (%)	Quantity Smoked (pieces)
	All	Smokers	Non-smokers		
Family told students about harmful effects of smoking					
Yes	79.58	72.49	80.40	9.50	89.24
No	19.13	22.60	18.72	12.32	83.89
Student's thoughts about health effects of smoking:					
Absolutely not harmful	4.86	9.77	4.29	20.94	128.38
Possibly not harmful	1.54	6.07	1.01	41.15	140.86
Possibly harmful	12.76	22.96	11.57	18.77	72.61
Absolutely harmful	79.71	58.17	82.22	7.61	79.30
Does smoking cause gain/lose weight?					
Gain weight	18.92	15.98	19.26	8.81	86.48
Lose weight	41.24	39.15	41.49	9.90	92.03
Does not make any difference	30.58	39.52	29.53	13.48	82.75

Table 10 – Knowledge on Effects of Smoking and Youth's Smoking Behavior

	Response Rate				
	All	**Smokers**	**Non-smokers**	**Prevalence Rate**	**Quantity Smoked**
Is second-hand smoking harmful?					
Absolutely No	7.34	15.36	6.41	21.82	136.80
Possibly no	2.41	8.05	1.75	34.85	130.68
Possibily harmful	12.71	23.36	11.47	19.16	84.15
Absolutely Yes	76.34	50.52	79.57	6.88	67.87
Informed about hazards of smoking in courses					
Yes	50.45	41.28	51.52	8.53	79.39
No	22.98	25.86	22.65	11.73	82.79
Not sure	21.42	20.79	21.49	10.12	101.11
Discussion with peers about their smoking behavior					
Yes	22.59	23.61	22.47	10.90	88.04
No	58.52	48.31	59.71	8.61	90.44
Not sure	14.85	18.54	14.41	13.03	79.74
Discussion in class about bad effects of smoking					
Yes	39.03	32.86	39.75	8.79	82.67
No	38.37	37.92	38.43	10.30	87.21
Not sure	17.76	18.69	17.65	10.97	88.26
Time they talked about tobacco and health in class					
Never	42.23	35.87	42.97	8.86	94.13
This semester	12.18	18.54	11.44	15.87	77.46
Last semester	20.48	18.15	20.75	9.25	92.04
2 semester before	6.61	8.47	6.39	13.37	74.56
3 semester before	2.03	2.80	1.94	14.41	88.35
More than one year ago	11.66	10.59	11.78	9.47	82.56

Table 11 – Students' Thoughts about Several Restrictions and Their Smoking Behavior

	Response Rate (%)			Prevalence Rate (%)	Quantity Smoked (pieces)
	All	Smokers	Non-smokers		
Banning Cigarette Advertisements					
Yes	84.03	61.70	86.62	7.66	68.80
No	13.77	31.63	11.69	23.96	113.95
Increasing Prices of Tobacco Products					
Yes	67.57	35.02	71.36	5.41	65.13
No	28.74	58.48	25.28	21.22	95.71
Prohibiting the sale of tobacco products to children					
Yes	90.63	71.43	92.87	8.22	71.60
No	7.11	20.71	5.53	30.37	127.56
Prohibiting smoking in public places					
Yes	88.63	60.82	91.86	7.16	69.61
No	9.93	35.73	6.92	37.53	120.16

Table 12 – Exposure to Tobacco Messages and Smoking Behavior of Students

	Response Rate				
	All	**Smokers**	**Non-smokers**	**Prevalence Rate**	**Quantity Smoked**
Panel A – Anti-tobacco Messages on					
TV					
Many	13.18	20.24	12.36	16,01%	94.27
Few	36.95	32.58	37.46	9,20%	72.64
None	36.60	29.09	37.47	8,29%	89.29
Radio					
Many	7.25	13.51	6.52	19,43%	92.11
Few	22.29	24.09	22.08	11,27%	75.46
None	45.46	37.67	46.36	8,64%	86.24
Billboards					
Many	13.80	17.84	13.33	13,48%	102.75
Few	26.76	27.76	26.64	10,82%	82.61
None	53.66	43.84	54.80	8,52%	86.14
Posters					
Many	11.86	14.42	11.57	12,67%	83.71
Few	26.98	28.77	26.77	11,12%	78.04
None	56.10	46.59	57.21	8,66%	93.26
Newspapers/Journals					
Many	12.58	15.89	12.19	13,18%	89.18
Few	29.10	28.93	29.12	10,37%	79.26
None	52.93	44.00	53.97	8,67%	91.22
Cinema					
Many	10.05	14.62	9.51	15,17%	101.16
Few	15.28	19.38	14.80	13,22%	93.81
None	68.23	55.40	69.72	8,47%	82.36
Sport activities, fairs, public events					
Often	9.59	16.87	8.74	18,35%	80.73
Sometimes	29.28	31.89	28.98	11,36%	80.63
Never	29.86	26.04	30.30	9,09%	100.72

Table 12 – Exposure to Tobacco Messages and Smoking Behavior of Students (continued)

	Response Rate				
	All	**Smokers**	**Non-smokers**	**Prevalence Rate**	**Quantity Smoked**
Panel B – Exposure to pro-tobacco messages					
By artists on TV, video or cinema					
Often	41.19	42.74	41.01	10.82	86.64
Sometimes	35.46	26.96	36.45	7.93	88.39
Never	11.66	11.71	11.65	10.48	75.57
Sport or other programs on TV					
Often	12.96	23.75	11.70	19.12	106.62
Sometimes	33.42	31.57	33.64	9.85	75.99
Never	42.16	29.87	43.59	7.39	74.22
Billboards					
Often	10.15	16.73	9.39	17.19	107.77
Sometimes	23.12	23.59	23.07	10.64	79.07
Never	59.17	47.51	60.53	8.37	80.58
Newspapers/Journals					
Many	10.45	18.01	9.57	17.98	109.09
Few	18.87	22.95	18.40	12.68	81.06
None	65.26	49.97	67.04	7.99	79.76
Sport contests					
Often	7.85	19.96	6.44	26.53	104.61
Sometimes	19.53	24.22	18.98	12.93	91.78
Never	38.17	30.44	39.07	8.32	72.78
Concerts					
Often	6.06	13.77	5.17	23.68	115.70
Sometimes	13.93	18.45	13.40	13.81	87.66
Never	38.86	32.71	39.58	8.78	85.89
Social meetings/public events					
Often	6.96	15.55	5.96	23.31	98.27
Sometimes	16.16	22.59	15.42	14.57	89.97
Never	38.34	29.17	39.41	7.93	77.32
Offered free cigarette					
Yes	9.24	17.51	8.28	19.76	102.28
No	80.62	62.25	82.75	8.05	77.08
In personal stuff (logo)					
Yes	12.61	29.24	10.68	24.18	106.25
No	83.26	61.80	85.76	7.74	75.96

Table 13 – Level of Addiction and Their Smoking Behavior

	Response Rate (%)	Prevalence Rate (%)	Quantity Smoked (pieces)
Desire to smoke the first thing in the morning			
Not at all	27.02	45.94	63.96
Yes, sometimes	14.91	81.53	123.43
Yes, desire immediately	7.64	88.59	264.01
Difficulty of not smoking for a week			
Fairly difficult	20.54	68.46	136.58
Very difficult	15.98	72.34	118.91
Fairly easy	17.20	67.85	54.12
Very easy	12.81	42.26	61.91
Difficulty of quitting smoking forever			
Fairly difficult	19.30	64.90	133.31
Very difficult	19.76	72.59	107.56
Fairly easy	14.53	61.91	58.05
Very easy	11.43	47.76	70.81

Table 14 – Distribution of Smokers' Thoughts About Quitting Smoking

Panel A – Plans for Smoking in the Future		
Smoking	**for the next 12 months**	**after 5 years from now**
Absolutely No	34.16 %	44.05 %
Probably No	19.26 %	21.28 %
Probably Yes	27.33 %	20.15 %
Absolutely yes	13.67 %	10.68 %
Panel B – Distribution of Reasons for Quitting		
	Response Rate (%)	
Do not like smoking	34.72	
To improve health	29.88	
To cut off expenses	1.58	
To make family happy	5.90	
To make friends happy	0.90	
Other reasons	6.71	
Panel C – Types of Help Received when they Quitted Smoking		
	Response Rate (%)	
No help received	38.29	
From professional	8.09	
From friend	12.83	
From a family member	14.35	
From all	8.16	

Table 15 – Definitions of Variables Used in the Estimation of Decision to Smoke and The Demand for Cigarettes

Variables	Description
SMOKE	A dummy variable that takes a value of 1 if a student is classified as a smoker, 0 otherwise
PRICE	A continuous variable, it is the price paid by smokers, The average price in their school was assigned to non-smokers.
AGE	The age of the student, changes between 11 and 18.
MALE	A dummy variable that takes a value of 1 if the student is male, 0 if female.
INCOME	A variable that takes a value between 0 and 6. The higher the value, the higher the pocket money the student has. If the student does not have any pocket income, it takes a value of 0; if s/he spent less than 1 million TL for personal needs, it takes a value of 1; if s/he spent more than 10 million TL for personal needs, it takes a value of 6.
REGION1	A dummy variable that takes a value of 1 if the student is from Izmir; 0 otherwise.
REGION2	A dummy variable that takes a value of 1 if the student is from Aegean region excluding Izmir; 0 otherwise.
REGION3	A dummy variable that takes a value of 1 if the student is from Black Sea region; 0 otherwise.
REGION4	A dummy variable that takes a value of 1 if the student is from Eastern Anatolia region; 0 otherwise.
REGION5	A dummy variable that takes a value of 1 if the student is from Ankara; 0 otherwise.
REGION6	A dummy variable that takes a value of 1 if the student is from Inner Anatolia region excluding Ankara; 0 otherwise.
REGION7	A dummy variable that takes a value of 1 if the student is from Istanbul; 0 otherwise.
REGION8	A dummy variable that takes a value of 1 if the student is from Marmara region excluding Istanbul; 0 otherwise.
REGION9	A dummy variable that takes a value of 1 if the student is from Mediterranean region; 0 otherwise.
EDU_DAD	It indicates the education of the father, a continuous variable between 0 and 5; if he is illiterate or the student did not want to answer this question, it takes a value of 0, and values of 1,2,3,4 and 5 if he is literate but did not complete primary school, had completed primary school, secondary school, high school, and college respectively.
EDU_MOM	It indicates the education of the mother, a continuous variable between 0 and 5; if she is illiterate or the student did not want to answer this question, it takes a value of 0, and values of 1,2,3,4 and 5 if she is literate but did not complete primary school, had completed primary school, secondary school, high school, and college respectively.
PAR_WORK	A variable that takes a value of 0 if the parents do not work, 1 if one of the parents work and 2 if both parents work.
EXPO_DAD	A dummy variable takes a value of 1 if the student sees his/her father smoking at home almost everyday; 0 otherwise
EXPO_MOM	A dummy variable takes a value of 1 if the student sees his/her mother smoking at home almost everyday; 0 otherwise

Table 15 – Definitions of Variables Used in the Estimation of Decision to Smoke and The Demand for Cigarettes (continued)

Variables	Description
EXPO_BRO	A dummy variable takes a value of 1 if the student sees his/her brother/ sister smoking at home almost everyday; 0 otherwise
EXPO_FRI	A dummy variable takes a value of 1 if the student sees his/her friend smoking at home almost everyday; 0 otherwise
ACCE_HOM	It indicates whether the student can get an access to cigarettes from home environment. It changes between 0 and 4. If students do not see anybody smoking at home, it is 0; if s/he sees father, mother, brother /sister and other people smoking at home, then it takes a value of 4.
MEXPOINS	It is the school mean of a dummy variable that takes a value of 1 if students witnessed other students smoking inside school; 0 otherwise.
MEXPOOUTS	It is the school mean of a dummy variable that takes a value of 1 if students witnessed other students or other people smoking outside school building but on school promises; 0 otherwise.
FREERIDE	A dummy variable that takes a value of 1 if the student acquired cigarette without paying any money, by borrowing or stealing from somebody or as a gift from an elderly; 0 otherwise
PAR_SMOKE	It takes a value of 2 if both of his/her parents smoke; 1 if either mother or father or a person responsible for their care smokes; 0 otherwise.
MKNOW_HAR	It is the school mean of a dummy variable that takes a value of 1 if the students thinks that smoking is absolutely or possibly harmful, and 0 otherwise.
NO_ACCESS	A dummy variable that takes a value of 1 when the student tried to buy tobacco products from the market, the seller refused to sell these products or if it is very hard or a bit distressing to buy cigarettes from the market; 0 otherwise.
FAM_HARM	A dummy variable which is equal to 1 if anyone in the family told the student about the hazards of smoking; 0 otherwise.
MANTIEX	The school mean of the anti-exposure variable which takes values between 0 and 12 depending on whether the students had seen many or few anti-tobacco messages on TV, radio, billboards, posters newspapers and journals, cinema or in sport activities, fairs, concerts and public events.
MEX_ADV	The school mean of the pro-exposure variable which takes values between 0 and 12 depending on whether the students had seen many or tobacco advertisements on TV, radio, billboards, posters newspapers and journals, cinema or in sport activities, fairs, concerts and public events. .
CHEW	A dummy variable that takes a value of 1 if the student chewed or snuffed tobacco in the last 30 days; 0 otherwise.
CIGA_PIPE	A dummy variable that takes a value of 1 if the student smoked cigar/little cigarette or pipe in the last 30 days; 0 otherwise.
WRAPPED	A dummy variable that takes a value of 1 if the student generally wrapped cigarettes by herself or himself in the last 30 days; 0 otherwise.
ADDICT	It takes a value of 2 if the student desires to smoke as a first thing in the morning; 1 if the student sometimes desires to smoke as a first thing in the morning; 0 otherwise.

Table 16- Descriptive Statistics of Variables Used in the Estimations.

	All Students		Non-Smokers		Smokers	
	Mean	**Std.Dev.**	**Mean**	**Std.Dev.**	**Mean**	**Std.Dev.**
AGE	13.634	19.032	13.584	18.027	14.062	25.509
MALE	0.501	7.122	0.485	7.106	0.639	6.947
INC_C	2.193	27.369	2.122	26.899	2.800	29.832
FREERIDE	0.028	2.352	0.009	1.319	0.194	5.725
EDU_DAD	2.420	21.944	2.473	21.777	1.968	22.340
EDU_MOM	1.951	20.750	1.986	20.714	1.652	20.569
PAR_WORK	1.013	8.073	1.021	7.966	0.946	8.917
REGION1	0.055	3.241	0.056	3.268	0.045	2.987
REGION2	0.080	3.875	0.082	3.908	0.065	3.567
REGION3	0.126	4.733	0.127	4.736	0.121	4.713
REGION4	0.080	3.863	0.077	3.788	0.106	4.461
REGION5	0.068	3.584	0.071	3.645	0.044	2.964
REGION6	0.115	4.537	0.111	4.463	0.147	5.125
REGION7	0.169	5.342	0.172	5.360	0.151	5.174
REGION8	0.115	4.552	0.116	4.549	0.113	4.581
REGION9	0.099	4.258	0.103	4.316	0.070	3.683
REGION10	0.092	4.112	0.086	3.992	0.139	5.005
MKNOW_HAR	0.925	0.732	0.926	0.720	0.915	0.818
MNOT_KNOW	0.049	0.508	0.048	0.498	0.056	0.576
MANTIEX	2.941	8.021	2.923	7.914	3.093	8.610
MEX_ADV	2.326	6.788	2.310	6.659	2.462	7.566
MEXPOINS	0.120	1.218	0.116	1.206	0.151	1.229
MEXPOOUT	0.213	1.552	0.208	1.530	0.258	1.585
CHEW	0.019	1.938	0.007	1.149	0.124	4.776
CIGA_PIP	0.039	2.744	0.010	1.384	0.288	6.552
WRAPPED	0.005	1.013	0.001	0.547	0.036	2.697
ADDICT	0.037	3.300	0.006	1.309	0.302	8.724
NO_ACCES	0.435	7.062	0.441	7.059	0.387	7.046
EXPO_DAD	0.311	6.593	0.302	6.526	0.389	7.054
EXPO_MOM	0.123	4.672	0.116	4.550	0.181	5.575
EXPO_BRO	0.055	3.235	0.044	2.923	0.143	5.071
EXPO_FRI	0.042	2.842	0.036	2.660	0.086	4.063
EXPO_HOM	0.128	4.766	0.120	4.614	0.205	5.838
ACCE_HOM	0.617	11.583	0.581	11.220	0.919	13.658
PAR_SMOK	0.746	10.195	0.734	10.135	0.851	10.596
N	15,957		14,343		1,614	

Table 17 - Logit Results (N=15,957).

	Parameter Estimate		Standard Error	Parameter Estimate		Standard Error	Parameter Estimate		Standard Error
INTERCEPT	12.5971	***	0.2668	13.8531	***	0.3170	8.4108	***	0.0941
PPRICE1	-1.3412	***	0.0234	-1.4388	***	0.0276			
LNT2							-1.0074	***	0.0069
AGE	0.2505	***	0.0014	0.2103	***	0.0016	0.1925	***	0.0016
MALE	0.5036	***	0.0040	0.5794	***	0.0044	0.5980	***	0.0043
INC_C	0.2617	***	0.0011	0.2500	***	0.0012	0.2489	***	0.0011
REGION1	-0.7614	***	0.0104	-0.6217	***	0.0113	-0.6462	***	0.0114
REGION2	-0.5336	***	0.0103	-0.0020		0.0117	-0.1990	***	0.0103
REGION3	-0.3835	***	0.0080	-0.1034	***	0.0091	-0.1813	***	0.0088
REGION4	-0.0717	***	0.0082	0.1365	***	0.0093	0.0857	***	0.0091
REGION5	-0.7931	***	0.0107	-0.7043	***	0.0119	-0.7988	***	0.0115
REGION6	0.0062		0.0077	0.0996	***	0.0090	0.0452	***	0.0087
REGION7	-0.3948	***	0.0103	-0.4837	***	0.0116	-0.7611	***	0.0084
REGION8	-0.5897	***	0.0079	-0.3387	***	0.0089	-0.3929	***	0.0090
REGION9	-0.4428	***	0.0108	-0.1133	***	0.0122	-0.3920	***	0.0099
EDU_DAD	-0.2706	***	0.0016	-0.2413	***	0.0018	-0.2458	***	0.0018
EDU_MOM	-0.0181	***	0.0018	0.0070	***	0.0019	-0.0037	*	0.0019
PAR_WORK	-0.0817	***	0.0034	-0.0852	***	0.0037	-0.0907	***	0.0037
ACCE_HOM				0.3669	***	0.0054	0.3803	***	0.0054
EXPO_DAD				-0.2341	***	0.0075	-0.2491	***	0.0075
EXPO_MOM				-0.0326	***	0.0084	-0.0541	***	0.0084
EXPO_BRO				0.4382	***	0.0088	0.4377	***	0.0089
EXPO_FRI				0.6455	***	0.0082	0.6590	***	0.0082
MEXPOINS				-0.4503	***	0.0470	-0.5655	***	0.0478
MEXPOOUT				2.7522	***	0.0362	2.7959	***	0.0361
FREERIDE				3.1483	***	0.0084	3.2153	***	0.0086
PAR_SMOK				0.0963	***	0.0033	0.0923	***	0.0033
MKNOW_HAR				-2.3306	***	0.0530	-2.1602	***	0.0532
NO_ACCES				-0.1648	***	0.0043	-0.1446	***	0.0043
FAM_HARM				-0.3476	***	0.0048	-0.3586	***	0.0048
MANTIEX				0.3392	***	0.0053	0.2631	***	0.0053
MEX_ADV				0.0403	***	0.0063	0.1296	***	0.0063
Log Likelihood	-990349			-851463			-840399		

Table 18 – Logit Results for Female and Male Students.

	Female Students			Male Students		
	Parameter Estimate		**Standard Error**	**Parameter Estimate**		**Standard Error**
INTERCEPT	21.613	***	0.675	12.442	***	0.395
PPRICE1	-2.093	***	0.059	-1.369	***	0.035
AGE	0.237	***	0.004	0.257	***	0.002
INC_C	0.314	***	0.003	0.223	***	0.002
PAR_SMOK	-0.090	***	0.008	0.164	***	0.004
MKNOW_HAR	-4.318	***	0.115	-1.214	***	0.068
NO_ACCES	-0.242	***	0.009	-0.094	***	0.005
FAM_HARM	-0.305	***	0.010	-0.340	***	0.006
MANTIEX	0.205	***	0.012	0.457	***	0.007
MEX_ADV	0.496	***	0.013	-0.192	***	0.008
REGION1	-0.120	***	0.024	-0.621	***	0.015
REGION2	0.670	***	0.026	0.132	***	0.015
REGION3	0.492	***	0.022	-0.149	***	0.011
REGION4	0.703	***	0.023	0.077	***	0.012
REGION5	-0.007		0.026	-0.772	***	0.016
REGION6	0.441	***	0.023	0.193	***	0.011
REGION7	-0.203	***	0.027	-0.276	***	0.014
REGION8	0.332	***	0.021	-0.396	***	0.011
REGION9	0.151	***	0.029	0.031	**	0.015
EDU_DAD	-0.247	***	0.004	-0.191	***	0.002
EDU_MOM	-0.091	***	0.004	-0.011	***	0.002
PAR_WORK	0.175	***	0.008	-0.114	***	0.005
ACCE_HOM	0.188	***	0.011	0.445	***	0.007
EXPO_DAD	0.213	***	0.016	-0.383	***	0.009
EXPO_MOM	0.409	***	0.017	-0.131	***	0.011
EXPO_BRO	0.710	***	0.018	0.292	***	0.012
EXPO_FRI	0.684	***	0.018	0.720	***	0.010
MEXPOINS	-0.851	***	0.097	-0.615	***	0.061
MEXPOOUT	2.279	***	0.074	3.237	***	0.047
FREERIDE	3.986	***	0.016	2.805	***	0.011
Log Likelihood	-210167			-520279		
N	6,787			7,968		

Table 19 – The Estimation of Demand for Cigarettes (N=1613)
Dependent Variable= log(quantity smoked) only smoker students

	Model I			Model II		
	Parameter Estimates		**Standard Error**	**Parameter Estimates**		**Standard Error**
INTERCEPT	-4.1654		3.9646	0.4042		4.0291
PPRICE1	0.5867	*	0.3457	0.3794		0.3412
AGE	0.0390		0.0271	-0.0044		0.0272
MALE	0.0560		0.0942	0.0896		0.0909
INC_C	0.1103	***	0.0238	0.0400	*	0.0235
EDU_DAD	-0.0616	*	0.0356	-0.0558		0.0343
EDU_MOM	0.0487		0.0383	0.0539		0.0366
PAR_WORK	-0.0828		0.0736	-0.0734		0.0709
CHEW	0.3360	**	0.1448	0.2564	*	0.1384
WRAPPED	0.7649	***	0.2400	0.4269	*	0.2317
CIGA_PIP	0.3931	***	0.1064	0.2535	**	0.1045
PAR_SMOK				0.0271		0.0655
MKNOW_HAR				-2.2029	**	1.0340
NO_ACCES				-0.1407		0.0907
FAM_HARM				0.3035	***	0.0980
MANTIEX				-0.3053	***	0.1096
MEX_ADV				0.1924		0.1270
ACCE_HOM				0.0220		0.1070
EXPO_DAD				0.0922		0.1477
EXPO_MOM				-0.0511		0.1639
EXPO_BRO				0.2921	*	0.1698
EXPO_FRI				0.1060		0.1551
MEXPOINS				0.0719		0.9503
MEXPOOUT				0.8743		0.7149
FREERIDE				-0.3736	***	0.1090
ADDICT1				0.8486	***	0.0754
Adj. R2	0.0466			0.1468		
F Value	8.88			12.10		
Pr > F	<0.0001			<0.0001		

Table 20 – Regression Results for Female and Male Students

	Female Students			Male Students		
	Parameter Estimate		**Standard Error**	**Parameter Estimate**		**Standard Error**
INTERCEPT	16.8512	*	8.8910	-3.1355		5.1171
PPRICE1	-1.0744		0.7560	0.6528		0.4282
AGE	0.0496		0.0575	-0.0001		0.0338
INC_C	0.1767	***	0.0473	-0.0036		0.0302
PAR_SMOK	0.0418		0.1397	0.0953		0.0818
MKNOW_HAR	-2.7992		2.3708	-1.7210		1.3317
NO_ACCES	-0.0700		0.1922	-0.0828		0.1140
FAM_HARM	0.6378	***	0.1903	0.1907		0.1268
MANTIEX	-0.2099		0.2323	-0.3682	***	0.1357
MEX_ADV	0.1987		0.2624	0.1762		0.1589
EDU_DAD	-0.0985		0.0742	-0.0411		0.0434
EDU_MOM	0.0035		0.0768	0.1078	**	0.0467
PAR_WORK	0.0282		0.1576	-0.0766		0.0941
ACCE_HOM	0.5628	***	0.2161	-0.2008		0.1348
EXPO_DAD	-0.2688		0.3084	0.3046	*	0.1838
EXPO_MOM	-0.3990		0.3199	0.0241		0.2090
EXPO_BRO	-0.6519	*	0.3370	0.7754	***	0.2180
EXPO_FRI	-0.0007		0.3326	0.0924		0.1964
MEXPOINS	-2.5367		1.8809	1.1043		1.2062
MEXPOOUT	0.8035		1.3431	1.3011		0.9299
FREERIDE	-0.1802		0.1946	-0.4716	***	0.1463
ADDICT1	0.6942	***	0.1456	0.9523	***	0.0970
CHEW	0.8021	**	0.3127	0.2245		0.1775
WRAPPED	0.6508		0.6137	0.3482		0.2773
CIGA_PIP	0.1223		0.2515	0.3025	**	0.1283
N	359			1031		
Adj. R^2	0.2009			0.1733		
F Value	4.78			10.00		
Pr. > F	<0.0001			<0.0001		

Table 21 – Price Elasticity of Demand for Cigarettes.

Students	**Prevalence Rate**	**P(smoke)**	**Q(smoke)**	**Prevalence Elasticity**	**Total Elasticity**
Overall (Model I)	0.1043	-1.3046	0.5867	-1.1685	-0.5818
Overall (Model I)	0.1043	-1.4339	0.3794	-1.2889	-0.9095
Female	0.0549	-2.093	-1.0744	-1.9781	-3.0525
Male	0.1332	-1.369	0.6528	-1.1867	-0.5339

Appendix A - Identification of Smokers or Tobacco Users[5]

Table A – Questions that are used to identify smokers and non-smokers and distribution of responses

Questions	Answers		
	Missing	I have never smoked[6]	Indicate that they are smokers
1. Have you ever tried smoking even by inhaling once or twice?	453	11,005	4,499
2. How old were you when you first experienced smoking?	400	11,416	4,141
3. For how many days have you smoked in the last 30 days (one month)?	760	13,835	1,362
4. How many cigarettes in general have you smoked in the days you smoked in the last 30 days?	648	12,947	2,362
5. Do you generally smoke hand-wrapped cigarette or manufactured (pack) ones?	150	14,705	1,102
6. How often in the last 30 days (one month) have you smoked hand-wrapped cigarette?	531	14,093	1,333
7. How often in the last 30 days (one month) have you smoked manufactured cigarette?	262	15,233	462
8. How often in the last 30 days (one month) have you smoked cigar / little cigarette?	258	15,257	442
9. Have you chewed /snuffed tobacco in the last 30 days (one month) ?	409	15,257	291
10. Have you smoked a pipe in the last 30 days (one month)?	267	15,381	309
11. Have you ever smoked /desired to smoke a cigarette as your first action immediately after you woke up in the morning?	97	13,289	2,571
12. How did you generally acquire your cigarette in the last 30 days (11 month)?	397	14,124	1,436
13. Which brand of cigarette did you prefer in the last 30 days (1 month)?	222	14,040	1,695
14. How much in general do you pay for a pack of 20 cigarettes?	78	13,765	2,114
15. How much did you spend for cigarettes in the last 30 days (1 month)?	161	13,671	2,125
39. Where do you usually smoke?	296	13,675	1,986
47. if you are smoking , do you think quitting soon?	302	13,846	1,809

[5] Smokers and tobacco users are used interchangeably in this report. So, they include those that smoke hand-wrapped or manufactured cigarette, cigar, little cigarette, pipe or chew or snuff tobacco.

[6] Instead of I have never smoked, the answer to the first and third questions were “No” and “0 days” respectively.

Table A – Questions that are used to identify smokers and non-smokers and distribution of responses

Questions	**Answers**		
	Missing	**I have never smoked**	**Indicate that they are smokers**
50. Is it easy or difficult for you not to smoke for a week?	225	12,229	3,503
51. How easy/difficult do you think it will be for you when you decide to quit smoking forever?	396	12,261	3,300
52. Do you want to quit smoking at this moment?	282	12,456	3,219
53. How many times did you try quitting last year?	284	12,507	3,166
54. How long it has been since you quit smoking?	357	12,838	2,762
55. What was your basic reason for quitting smoking?	210	12,732	3,015
56. How did you feel when you quitted smoking?	280	12,868	2,809
57. Do you think that you can quit if you want to?	473	12,654	2,830

Appendix B - Test of Endogeneity of price variable.

The endogeneity of price variable is tested Wu-Hausmann procedure. In the first step, the price variable is predicted using the lagged values of prices for the last two quarters where the prices were changed, the percentage of students using Marlboro, Camel, Parliament and Samsun/Maltepe as instrumental variables. The average price at school level is assigned to non-smokers. The second stage involves estimation of quantity smoked for all students in the sample. In the estimations, the average quantity smoked by students at school level is used as the quantity smoked by non-smokers in that school. Table >>> presents the estimations. The test results indicate that price is endogeneous. Therefore, the predicted price is used in the analysis.

Dependent Variable	**Log(PRICE)**			**Log(CONSUMPTION)**		
	Parameter Estimate		**Standard Error**	**Parameter Estimate**		**Standard Error**
INTERCEPT	20.552	***	1.424	-1.026		1.243
LNP2				0.111		0.109
RPRICE1				-0.263	**	0.111
LNMPT_1	-38.659	***	3.883			
LNMPT_2	38.401	***	3.826			
MMARLBOR	0.033	***	0.011			
MCAMEL	0.072	***	0.019			
MPARLIM	0.053	***	0.014			
MSAMSUN	-0.148	***	0.014			
AGE	0.008	***	0.003	0.067	***	0.007
MALE	-0.025	***	0.007	0.161	***	0.017
INC_C	0.008	***	0.002	0.073	***	0.005
PAR_SMOK	0.006		0.006	-0.010		0.014
NO_ACCES	-0.009		0.007	-0.055	***	0.017
ACCE_HOM	-0.001		0.005	0.138	***	0.012
FAM_HARM	0.007		0.009	-0.070	***	0.021
REGION1	0.046	**	0.019	-0.302	***	0.047
REGION2	0.201	***	0.017	-0.286	***	0.047
REGION3	0.115	***	0.016	-0.236	***	0.039
REGION4	0.083	***	0.017	-0.124	***	0.042
REGION5	0.122	***	0.018	-0.312	***	0.046
REGION6	0.102	***	0.016	-0.127	***	0.040
REGION7	0.296	***	0.015	-0.315	***	0.049
REGION8	-0.001		0.016	-0.199	***	0.039
REGION9	0.269	***	0.016	-0.320	***	0.049
EDU_DAD	0.003		0.003	-0.079	***	0.007
EDU_MOM	0.013	***	0.003	-0.002		0.008
PAR_WORK	0.001		0.006	-0.038	**	0.016
FREERIDE	-0.026		0.021	1.590	***	0.052
Adj. R2	0.0979			0.1188		
F-statistic	67.56			98.78		
Prob >F	<0.0001			<0.0001		
N	15957			15957		

*, **, and *** show significance at 1, 5 and 10 percent levels respectively.